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A road toll for Germany: Every kilometre counts

The contribution of an HGV, coach and car toll to the environment-oriented financing of transport infrastructure

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Introduction

Politicians and society at large are lamenting the state and financial situation of German transport infrastructure. At the same time there is a broad consensus that users should be made to bear more of the costs, in conjunction with an increase in absolute terms in the funds availableⁱ. Fees in the form of a toll are a viable additional option to financing through taxes. What is more, funds saved by reducing environmentally harmful subsidies can flow into transport infrastructureⁱⁱ.

If the legislature should opt to increase user funding through tolls, it should choose the distance-based variant. A distance-based toll can help to secure the long-term financing of transport infrastructure. Unlike a vignette this would be consistent with the polluter-pays principle and could contribute to making mobility in Germany more sustainable.

Table 1 shows the vehicles for which a toll is currently charged in Germany, to what extent and on which roads.

Table 1

Status of road toll charges in Germany (October 2015)

| Toll for ... | Type of cost | | Road network | | |
|----------------------------|----------------------|---------------------|-------------------|------------------|----------------------|
| | Infrastructure costs | Environmental costs | Federal motorways | Federal highways | Non-motorway network |
| Cars | - | - | - | - | - |
| Buses | - | - | - | - | - |
| Lorries from 3.5-7.5 t GVW | - | - | - | - | - |
| Lorries from 7.5-12 t GVW | + | (+) | + | (+) | - |
| Lorries over 12 t GVW | + | (+) | + | (+) | - |

Legend:
 + full charge/collection
 (+) limited charge/collection
 - no charge/collection

Source: German Environment Agency (own graphic)

This paper outlines the positions of UBA on the issue of road tolls – for lorries, buses and cars.

Lorries

Current status

Current forecastsⁱⁱⁱ predict continued strong growth, especially in road freight transport. The HGV toll is a major pillar of infrastructure financing in Germany. As the most important transit country in Europe, Germany's roads are used by a huge number of lorries which however, to the extent permitted by their route planning, fill up with fuel abroad for cost reasons. These so-called "grey imports" lead to the conclusion that the HGV toll is the only reliable way to force lorries operating internationally to participate in the financing of German road infrastructure and to share the burden of other costs which they incur (e.g. due to air pollution, noise, accidents, greenhouse gases, land use).

The distance-based HGV toll was introduced in 2005 on German motorways for lorries with a gross vehicle weight (GVW) of 12 tonnes or over. European legal requirements^{iv} initially meant that only those costs for the construction and maintenance of roads (infrastructure costs) caused by HGV traffic could be taken into account in the road toll. The current report on infrastructure costs of the Federal government^v sets the average toll level for 2017 at 13.7 cents per HGV kilometre on federal motorways - see table 2.

Some of the state revenue from the HGV toll goes back to the haulage companies. These funds, granted, for instance, as a subsidy for the purchase of new low-emission HGV, have been the primary reason alongside the pollutant-specific toll categories for the dynamic rejuvenation of HGV fleets.

The amendment of the European legislation^{vi} in 2011 made it possible for the first time to include the external costs of air pollution and noise emissions in the toll amount. The condition for this is that the costs must be determined in an expert report. However, the Eurovignette Directive stipulates maximum rates with regard to the toll surcharges for air pollution and noise emissions that are below the cost rates referred to in the UBA method convention^{vii}. Moreover, the Eurovignette Directive still prohibits the internalisation of other external costs, e.g. those caused by greenhouse gases or land use. The cost rates of the UBA method convention are shown in table 3.



As of 2015, air pollution costs also form part of the toll in Germany alongside infrastructure costs. The same does not yet apply to noise costs. The expert reports required under EU law on different types of noise on the road network are not yet available in Germany.

The toll is currently in force on just under 12,900 km of motorways and 2,100 km of busy near motorway standard federal highways. The maximum toll-free weight limit for vehicles fell from 12 tonnes to 7.5 tonnes GVW on 1 October 2015. The Ministry of Transport and Digital Infrastructure (BMVI) is planning to expand the HGV tolls to all Federal highways from 2018^{viii}.

UBA proposal for further development

The HGV toll in Germany is successful and socially accepted. It successfully combines user financing with the polluter-pays principle due to the fact that it is distance-based. The UBA recommends developing it as follows:

In the interest of ensuring that the polluter pays and for environmental protection reasons, the UBA recommends extending the toll to the whole German road network and to cover vehicles weighing upward of 3.5 tonnes GVW. This is possible under EU law.

As soon as the data necessary to distinguish between different kinds of noise on the road network becomes available, the HGV toll rates should be supplemented by adding the noise costs, at least up to the highest rates permissible under EU law. In the medium term, this cap on the rates for noise should be lifted. The same applies also to the cost rates for air pollutants.

Germany should therefore work towards ensuring that the next amendment of the Eurovignette Directive permits the further internalisation of external costs and that the toll charges reflect the estimated external costs. Above all, European law should make

it possible to impose toll charges for greenhouse gas emissions. The corresponding costs, for instance, for lorries weighing over 3.5 t GVW are set by the UBA method convention at an average of 5.4 cents per kilometre (table 3).

Coaches

Current status

The coach toll under discussion is aimed at long-distance coaches and occasional services (e.g. excursions or class trips). Local buses should continue to be exempt from the toll.

The infrastructure and environmental costs caused by a coach are similar to those of an HGV (see tables 2 and 3). Whereas lorries weighing 7.5 tonnes or over pay the toll and thereby, at least in part, cover the costs to which they give rise, a coach at around 18 tonnes in weight currently pays no toll at all.

The most recent infrastructure cost report of the Federal Government from 2014 calculated that coaches would have to pay about 11 cents per vehicle km on motorways in 2017 to cover the road wear to which they give rise (see table 2). However, in the reform of the Carriage of Passengers Act (*Personenbeförde-*

rungsgesetz - PbfG) and the associated long-distance coach liberalisation of 1 January 2013, the legislature decided against introducing a coach toll.

UBA proposal for further development

The long-distance coach market has developed a great deal since its deregulation, and long-distance coaches have now established themselves as a means of transport. UBA recommends the introduction in the short term on all Federal highways and, in a second step, over the entire German road network of a distance-based coach toll, analogous to the HGV toll.

The idea of the coach toll must be to cover the infrastructure costs caused by coaches. In addition to the infrastructure cost the coach toll should be designed in line with the polluter-pays principle so that it also takes into account the external costs.

Cars

Current status

In order to compel foreign road users to participate more fully in transport infrastructure funding and to stabilise the infrastructure budget, the Federal Ministry of Transport (BMVI) has proposed the introduction of a time-based vignette in transport policy discussions. UBA does not consider this as a reasonable solution. A vignette is not consistent with the polluter-pays principle since it is a one-size-fits-all charge which is levied irrespective of the kilometres travelled and the associated environmental impacts. It is therefore a flat rate charge: Frequent drivers pay just as much as occasional drivers, a fact which disadvantages the latter (e.g. pensioners). Moreover, a vignette offers extremely limited opportunities to bring about a reduction in environmental damage and to influence traffic flow.

The EU Commission advocates an interoperable toll system for all EU States^x. This would make the cross-border use of toll roads easier. The amount of the levy should be set in dependence on the number of kilometres driven.^x

UBA proposal for further development

Car traffic imposes high costs on society, for example for infrastructure, the environment and health^{xi}. Road tolls are therefore justified^{xii}.

However, before new financing instruments are introduced, the deficiencies in the existing system should be addressed. This would also be less expensive and could in some cases be implemented in the short term. So the discussion on financing transport should be preceded by the development of a specific idea of what a sustainable transport system might



look like. The UBA has made a contribution with arguments for a national mobility strategy^{xiii}. Before new sources of funding are tapped, environmentally harmful transport subsidies^{xiv}, such as the tax breaks for commuters and the company car privilege, should be dismantled and inefficiencies in the existing system reduced. Such inefficiencies exist, for instance, in the organisation of the existing system for the planning, construction and operation of roads and also in the wrongheaded prioritisation of road construction projects.

An additional starting point, feasible in the short term, is the adaptation of the energy tax (formerly the mineral oil tax). Because the energy tax is a volume tax, it loses value over time in real terms through inflation and its ecological steering effect declines. In the wake of the last increase in the energy tax in 2003, the tax had lost 14% of its value in real terms by 2014. A regular adjustment of the energy tax to take inflation into account is required to maintain the steering effect intended by the ecological tax reform. An appropriate increase in the energy tax on fuels would be the cheapest and easiest way to recover the costs of road traffic in line with the polluter-pays principle. That this can be bypassed by “fuel tourism” and “grey imports” is less significant for private car traffic than for HGV traffic with its strong international orientation. Moreover, the energy tax also has a positive ecological steering effect because it depends on consumption. It also contributes to the financing of the state budget.

In the medium term, however, the revenue from the energy tax on fuels on the basis of an unchanged tax base and unchanged real tax rates will decrease. This is due to the fact that the consumption of traditional petroleum-based fuels (diesel and petrol) will tend to decrease due to the increasing use of non-fossil energy sources and further decreases in specific vehicle consumption.

Unlike the vignette, a distance-based toll for cars could in the medium term be a useful instrument for the financing of transport infrastructure in line with the polluter-pays principle. This will enable an increasingly differentiated range of toll rates to be set with the concomitant positive environmental steering effects. For example, setting different rates according to traffic volume (congestion) would render possible a more efficient use of the existing road infrastructure and might reduce the amount of cost- and resource-intensive road construction and expansion work. Furthermore, such differentiation, for instance in line with pollutant and CO₂ emissions, would accelerate the trend toward less polluting cars that are less damaging to the climate.

However, before such a distance-based toll system can be realised, the necessary conditions must first be put in place. In the case of a distance-based toll for cars, data privacy is a major challenge and must be absolutely guaranteed. The data should be collected only for the intended purpose of toll calculation and stored no longer than is necessary for payment of the toll. In addition, it must be ensured that the collection costs of such a toll system are in proportion to the revenues.

For motorways, the infrastructure costs report compiled on behalf of the Ministry of Transport^{xv} sets an infrastructure costs toll rate for cars of 2 cents per kilometre for 2017 (see table 2). For Federal highways subject to the HGV toll this amount is approximately 3 cents, and for other Federal highways it is 5 cents per vehicle kilometre.

In addition, the legislature should charge car users for the environmental costs of car traffic to bring about a better environmental steering effect (see table 3).

Conclusion

The *distance-based toll for HGV, coaches and cars* will make it possible to set differentiated charges for infrastructure costs and additional costs incurred by society as a result of road traffic – for instance, environmental costs. This will result in positive environmental and traffic steering effects. In this respect, the use of this instrument in Germany should be expanded. The *time-based vignette* is not a meaningful solution, since it is not consistent with the polluter-pays principle and generates almost no environmental or traffic steering effects.

A distance-based toll is currently in force only for HGV. The environmental steering effect of the *distance-based HGV toll* should be increased by increasing the internalisation of external costs. The UBA also recommends extending the toll to all roads and all lorries of 3.5 tonnes GVW or more (currently 7.5 tonnes GVW or over).

There is no sound reason for the exemption of coaches from the toll. The introduction of a *distance-based coach toll* is consistent with the polluter-pays principle and would be a better way of charging for infrastructure and environmental costs.

The *distance-based toll for cars* has the medium-term potential to contribute to the sustainable financing of transport infrastructure. Work should therefore begin now on this supplementary pillar for the financing of transport infrastructure. To this end, further research and development are required. The introduction of a distance-based toll for cars will be meaningful only if the collection costs can be reduced compared with the status quo and once data privacy issues have been resolved.

Infrastructure and environmental costs

Infrastructure costs include the costs incurred for the construction (including depreciation and interest) and maintenance of roads. In 2014, in order to extend the HGV toll and update the toll rates until 2017, the Federal Ministry of Transport (BMVI) commissioned the calculation of the infrastructure costs for the Federal highway network pursuant to the Eurovignette Directive.^{xvi} In the process, the cost rates for delivery vans, cars and coaches were calculated in addition to the HGV rates.

Table 2

Cost in cents per vehicle kilometre in 2017 by road category^{xvii}

| Vehicle category | Federal motorways | Federal highways subject to the HGV toll | Other Federal highways |
|---------------------------|-------------------|------------------------------------------|------------------------|
| Delivery vans up to 3.5 t | 2,3 | 3,6 | 5,8 |
| Lorries from 3.5 to 12 t | 4,4 | 7,4 | 11,1 |
| HGV over 12 t | 13,7 | 29,3 | 34,4 |
| Cars | 2,0 | 3,1 | 5 |
| Coaches | 10,9 | 26,2 | 37,3 |

Source: Federal Ministry for Transport and Digital Infrastructure

Road traffic is responsible for considerable damage to people and the environment. The inclusion of these environmental costs in the toll alongside the infrastructure costs is imperative on the grounds of the polluter-pays principle. Table 3 shows the environmental costs of greenhouse gases, pollutants (exhaust), abrasion (tyre and brake), noise and other areas according to the UBA method convention for the assessment of environmental costs. The cost rates for noise and pollutants have been incorporated in the current infrastructure costs report of the Federal Government^{xviii}.

Table 3

Environmental cost in cents per vehicle kilometre in 2010 (averaged over all roads)^{xix}

| Vehicle category | GHG* | Pollutants (exhaust) | Abrasion | Noise | Life cycle** | Total |
|------------------------------------|------|----------------------|----------|-------|--------------|-------|
| Delivery vans up to 3.5 t (diesel) | 1,7 | 4 | 0,2 | 4,7 | 2,3 | 12,9 |
| Delivery vans up to 3.5 t (petrol) | 1,5 | 1,1 | 0,2 | 4,7 | 2,2 | 9,6 |
| Lorries over 3.5 t (diesel) | 5,4 | 7,5 | 0,9 | 4,6 | 6,6 | 25,1 |
| Cars (diesel) | 1,2 | 1,5 | 0,1 | 0,7 | 2,3 | 5,8 |
| Cars (petrol) | 1,4 | 0,5 | 0,1 | 0,7 | 1,8 | 4,5 |
| Coaches (diesel, Euro V) | 6 | 4,9 | 0,7 | 4,6 | 6,8 | 23,1 |

* Greenhouse gases

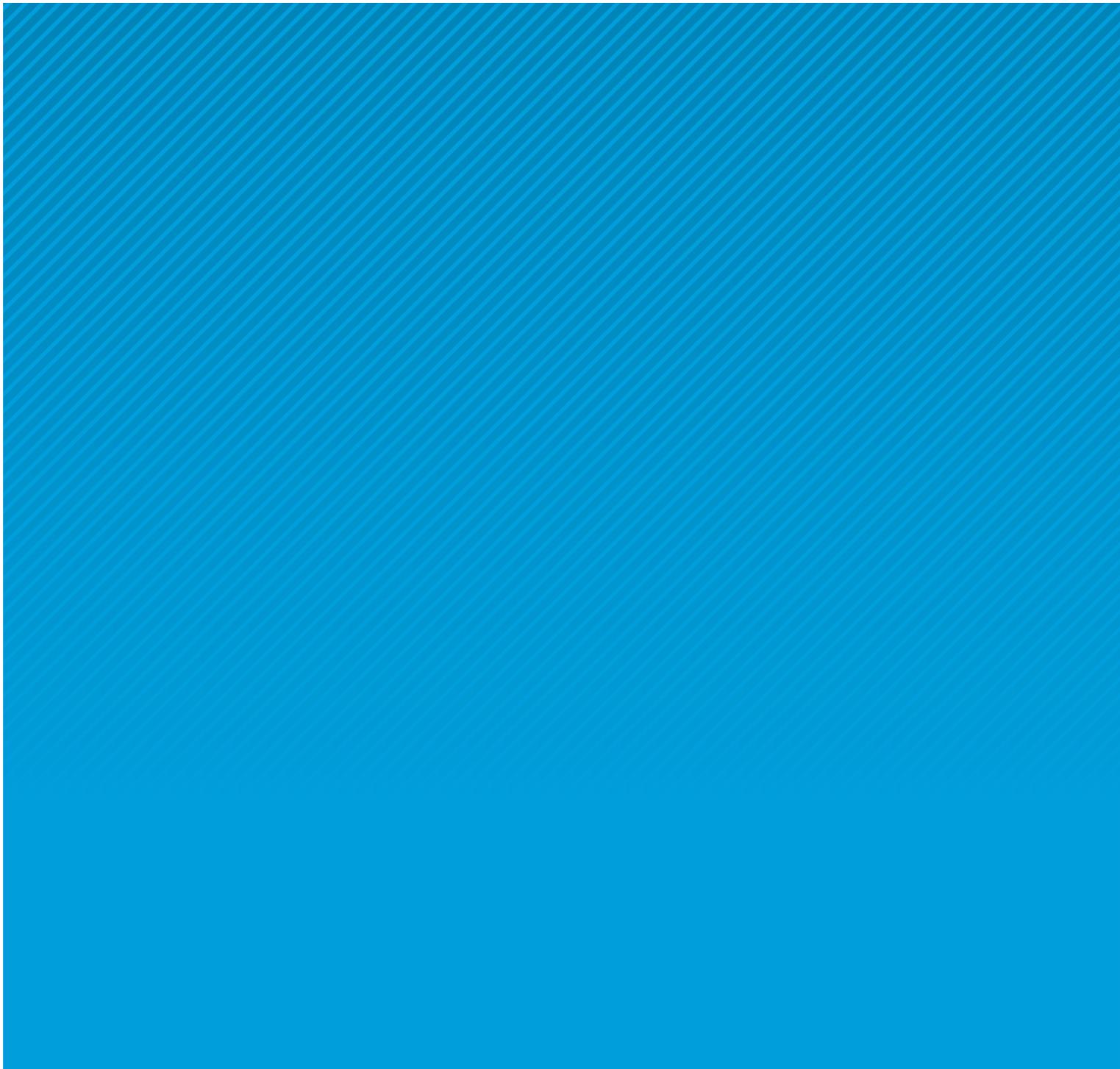
** Includes the areas of "construction, maintenance, disposal", "fuel provision" and "nature and landscape"

Source: German Environment Agency

Collection costs for distance-based toll systems

The toll system costs for lorries, buses and cars are an important factor in determining whether an instrument is efficient and makes sense from a fiscal perspective. The system costs for a distance-based toll for cars cannot as yet be precisely estimated. Examples from other countries and the experience derived from the German HGV toll show that collection costs of two cents per vehicle kilometre are currently possible.^{xx} Economies of scale in the expansion of the toll to include cars and those brought about by technical progress mean that significant reductions in these costs can be expected in the future. This is especially true of the introduction of an EU-wide interoperable toll system.

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- i See Bodewig, K. et al. (2013): “Nachhaltige Verkehrsinfrastrukturfinanzierung” (“Sustainable transport infrastructure financing”) – concept document (Bodewig-Kommission) and Daehre, K.-H. et al. (2012): Zukunft der Verkehrsinfrastrukturfinanzierung – Bericht der Kommission (Daehre-Kommission) (Future of transport infrastructure financing - report of the Commission (Daehre Commission))
 - ii UBA (2014): Umweltschädliche Subventionen in Deutschland, (Environmentally harmful subsidies in Germany) p. 35 et seq. Dessau-Roßlau
 - iii BMVI [Ed.] (2014): Verkehrsverflechtungsprognose 2030 – Zusammenfassung der Ergebnisse; (Traffic integration prognosis 2030 - summary of the results) Berlin.
 - iv Directive 1999/62/EC of the European Parliament and of the Council of 17 June 1999 on the charging of heavy goods vehicles for the use of certain infrastructures (OJ L 187 of 20.7.1999, p. 42), last amended by Directive 2011/76/EC of the European Parliament and of the Council of 27 September 2011 (OJ L 269/1 of 14.10.2011) (hereinafter referred to as the Eurovignette Directive).
 - v BMVI [Ed.] (2014): Berechnung der Wegekosten für das Bundesfernstraßennetz sowie der externen Kosten nach Maßgabe der Richtlinie 1999/62/EG für die Jahre 2013 bis 2017 (Calculation of infrastructure costs for the Federal highway network as well as of external costs in accordance with Directive 1999/62/EC for the years 2013 to 2017), pp. 168 et seq.; Berlin.
 - vi Directive 2011/76/EC of the European Parliament and of the Council of 27 September 2011 (OJ L 269/1 of 14.10.2011) amending Directive 1999/62/EC on the charging of heavy goods vehicles for the use of certain infrastructures.
 - vii UBA (2012) updated February 2014: Best-practice cost rates for air pollutants, transport, power generation and heat generation - Annex B to the “Methodenkonvention 2.0 zur Schätzung von Umweltkosten” (“Methodological Convention 2.0 for Estimates of Environmental Costs”), p. 21; Dessau-Roßlau.
 - viii Federal Ministry for Transport and Digital Infrastructure (BMVI) (2015): Dobrindt extends HGV tolling scheme to further federal highways; Press release of 30.06.2015; Berlin.
 - ix EU Commission (2011): The European Electronic Toll Service (EETS) - Guide for the application of the directive on the interoperability of electronic road toll systems in the European Union; Luxembourg.
 - x EU Commission (2015): Traffic: Commission launches infringement case on the introduction by Germany of a new road charging scheme for private vehicles („PKW-Maut”) (Press release of 18.06.2015); Brussels.
 - xi UBA (2012) updated February 2014: Best-practice cost rates for air pollutants, transport, power generation and heat generation - Annex B to the “Methodenkonvention 2.0 zur Schätzung von Umweltkosten” (“Methodological Convention 2.0 for Estimates of Environmental Costs”), p. 21; Dessau-Roßlau.
 - xii UBA (2010): Pkw-Maut in Deutschland? Eine umwelt- und verkehrspolitische Bewertung (Road pricing for cars in Germany? An evaluation from an environmental and transport policy perspective) p. 4; Dessau-Roßlau.
 - xiii UBA (2014): Umweltverträglicher Verkehr 2050: Argumente für eine Mobilitätsstrategie für Deutschland – Kurzfassung (Environmentally friendly transport in 2050: arguments for a mobility strategy for Germany - short version); Dessau-Roßlau.
 - xiv UBA (2014): Umweltschädliche Subventionen in Deutschland (Environmentally harmful subsidies in Germany), p. 35 et seq. Dessau-Roßlau
 - xv BMVI [Ed.] (2014): Berechnung der Wegekosten für das Bundesfernstraßennetz sowie der externen Kosten nach Maßgabe der Richtlinie 1999/62/EG für die Jahre 2013 bis 2017 (Calculation of infrastructure costs for the Federal highway network, and of external costs in accordance with Directive 1999/62/EC for the years 2013 to 2017), p. 21; Berlin.
 - xvi BMVI [Ed.] (2014): Berechnung der Wegekosten für das Bundesfernstraßennetz sowie der externen Kosten nach Maßgabe der Richtlinie 1999/62/EG für die Jahre 2013 bis 2017 (Calculation of infrastructure costs for the Federal highway network, and of external costs in accordance with Directive 1999/62/EC for the years 2013 to 2017), p. 21; Berlin.
 - xvii BMVI [Ed.] (2014): Berechnung der Wegekosten für das Bundesfernstraßennetz sowie der externen Kosten nach Maßgabe der Richtlinie 1999/62/EG für die Jahre 2013 bis 2017 (Calculation of infrastructure costs for the Federal highway network, and of external costs in accordance with Directive 1999/62/EC for the years 2013 to 2017), p. 21; Berlin.
 - xviii BMVI [Ed.] (2014): Berechnung der Wegekosten für das Bundesfernstraßennetz sowie der externen Kosten nach Maßgabe der Richtlinie 1999/62/EG für die Jahre 2013 bis 2017, S. 168 ff (Calculation of infrastructure costs for the Federal highway network as well as of external costs in accordance with Directive 1999/62/EC for the years 2013 to 2017), pp. 168 et seq.; Berlin.
 - xix UBA (2012) updated February 2014: Best-practice cost rates for air pollutants, transport, power generation and heat generation - Annex B to the “Methodenkonvention 2.0 zur Schätzung von Umweltkosten” (“Methodological Convention 2.0 for Estimates of Environmental Costs”), p. 21 + 23; Dessau-Roßlau.
 - xx St. Galler Mautstudie – Eine kennzahlengestützte Gegenüberstellung der Lkw-Mautsysteme in der Schweiz, Deutschland, der Slowakei und Polen (University of St. Gallen (2013): St. Gallen toll study - a key figure-based comparison of the HGV toll systems in Switzerland, Germany, Slovakia and Poland); p. 58; St. Gallen



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