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Update 2021

by:
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German Environment Agency, Dessau-Roßlau

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List of abbreviations

Act on the Joint Task	Act on the Joint Task for Improving the Regional Economic Structure (Gesetz über die Gemeinschaftsaufgabe 'Verbesserung der regionalen Wirtschafts-struktur')
BBergG	Bundesberggesetz (Federal Mining Act)
BesAR	Besondere Ausgleichsregelung (Special Compensation Scheme)
BImSchG	Bundes-Immissionsschutzgesetz (Federal Imission Control Act)
BImSchV	Verordnung zur Durchführung des Bundesimmissionsschutzgesetzes (Regula-tion implementing the Federal Imission Control Act)
Biokraft-NachV	Biokraftstoff-Nachhaltigkeitsverordnung (Biofuel Sustainability Regulation)
BMF	Bundesministerium der Finanzen (Federal Ministry of Finance)
BMU	Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety)
BMWi	Bundesministerium für Wirtschaft und Energie (Federal Ministry for Economic Affairs and Energy)
bn	Billion(s)
CAP	Common Agricultural Policy
CCTV	Closed circuit television
cf.	Confer
CHP	Combined heat and power production (cogeneration of heat and electricity)
CO_2	Carbon dioxide
DFS	Deutsche Flugsicherung GmbH
DIN	Deutsches Institut für Normung (German Institute for Standardization)
EC	European Community
EEG	Erneuerbare-Energien-Gesetz (Renewable Energy Sources Act)
EKF	Energie- und Klimafonds (Energy and Climate Fund)
EMAS	Eco-Management and Audit Scheme
EMFAF	European Maritime, Fisheries and Aquaculture Fund
EMFF	European Maritime and Fisheries Fund
EN	Europäische Norm (European standard)
EnergieStG	Energiesteuergesetz (Energy Tax Act)
EntsorgFondsG	Entsorgungsfondsgesetz (Disposal Fund Act)
EnWG	Energiewirtschaftsgesetz (Energy Industry Act)
EStG	Einkommensteuergesetz (Federal Law on Income Tax)
et seq.	and what follows
ETD	Energy Taxation Directive
EU	European Union
EUR	Euro

FAME	Fatty acid methyl esters
GAEC	Good Agricultural and Environmental Condition
GJ	Gigajoule
GWh	Gigawatt hour(s)
ha	Hectare(s)
Habitats Directive	Directive on the conservation of natural habitats and of wild fauna and flora
ICES	International Council for the Exploration of the Sea
ILUC	Indirect land use change
ISO	International Organisation for Standardization
Joint Task	Joint Task for Improving the Regional Economic Structure (Gemeinschaftsaufgabe 'Verbesserung der regionalen Wirtschaftsstruktur')
JStG	Jahressteuergesetz (Annual Tax Act)
KAV	Konzessionsabgabenverordnung (Network Concession Agreement)
KlimaSchStRUmsG	Gesetz zur Umsetzung des Klimaschutzprogramms 2030 im Steuerrecht (Law implementing the Climate Action Programme 2030 in the Tax Law)
km	Kilometre(s)
km²	Square kilometre(s)
KSG	Bundes-Klimaschutzgesetz (Federal Climate Change Act)
kWh	Kilowatt hour(s)
KWKG	Kraft-Wärme-Kopplungsgesetz (Cogeneration Act)
l	Litre(s)
LuftVG	Luftverkehrsgesetz (Air Traffic Act)
m	Million(s)
MSFD	Marine Strategy Framework Directive
MSY	Maximum sustainable yield
MWh	Megawatt hour(s)
n.q.	Not quantifiable
NRW	North Rhine-Westphalia
PJ	Petajoule(s)
PPP	Plant protection products
RDE	Real driving emissions
RED	Renewable Energy Directive
REM	Remote electronic monitoring
SDGs	Sustainable development goals
SME	Small and medium-sized enterprises
SpaEfV	Spitzenausgleich-Effizienzsystemverordnung (Peak Equalisation Efficiency System Regulation)
StromNEV	Stromnetzentgeltverordnung (Ordinance on Electricity Network Charges)
StromStG	Stromsteuergesetz (Electricity Tax Act)

t	Ton(s)
TEMP	Temporary
TFEU	Treaty on the Functioning of the European Union
USD	US dollar(s)
UStG	Umsatzsteuergesetz (Law on Value Added Tax)
VermBG	Vermögensbildungsgesetz (Capital Formation Act)
WFD	Water Framework Directive
WLTP/WLTC	Worldwide harmonized light vehicles test procedure/worldwide harmonized light duty test cycle
WoFG	Wohnraumförderungsgesetz (Act on Social Housing Promotion)
WoGG	Wohngeldgesetz (Housing Benefits Act)
WoPG	Wohnungsbau-Prämiengesetz (Housing Premium Act)

1 Introduction

1.1 Why environmentally harmful subsidies must be reduced

Protection of the climate and the environment has been one of the most important political issues in Germany for years, and representative surveys of the population show that there has been a further significant surge in these topics in recent years.[1] This was also due in part to the 'Fridays for Future' movement, which raised awareness of the catastrophic impact of climate change among the population and vehemently demanded that subsidies for fossil fuels be cut immediately.[2]

At the same time, the need for action on climate protection and in other areas, such as biodiversity and resource conservation, is huge. The latest report by the Intergovernmental Panel on Climate Change proves that climate change is advancing even more quickly than previously expected.[3] It also makes clear that political decisions in this decade will determine whether the goal enshrined in the Paris climate agreement of limiting the rise in temperature to well below 2 °C and and, if possible, to 1.5 °C, can still be achieved. In light of this, the German Federal Government ('Federal Government') has significantly intensified the climate protection targets for 2030 laid down in the Climate Change Act (*Klimaschutzgesetz*) and is now aiming for greenhouse gas neutrality by 2045.[4] One key motive for this was a judgment made by the Federal Constitutional Court (*Bundesverfassungsgericht*, BVerfG), which ruled that the Climate Change Act of 2019 was not compatible with fundamental rights.[5]

In spite of this pressure to act, Germany still has a long way to go before achieving a sustainable fiscal policy that systematically promotes environmental and climate protection and systematically takes environmental concerns into account in all government revenue and expenditure decisions. In fact, there is a blatant contradiction: On one hand, the government has massively increased financial assistance and tax concessions for environmental and climate protection in recent years. According to the latest Federal Government's Subsidies Report, 'two thirds of financial assistance will be dedicated to climate-related and environmental measures. For 2021, for example, financial assistance with an estimated total financing volume of €16.2 billion was directly linked to the environmental and climate goals set out in the German Sustainable Development Strategy (*Deutsche Nachhaltigkeitsstrategie*).'[6] On the other hand, the government provides substantial economic incentives for environmentally harmful activities through its subsidy policies. As this report shows, in 2018 subsidies amounting to around EUR 65.4 billion[7] were granted in Germany that are to be classified as environmentally harmful. Notable examples include the exemption of commercial air transport from kerosene tax, the

[1] BMU/UBA (2019), p. 9.

[2] https://fridaysforfuture.de/forderungen/

[3] IPCC (2021).

[4] https://www.bundesregierung.de/breg-de/themen/klimaschutz/klimaschutzgesetz-2021-1913672

[5] BVerfG (2021).

[6] https://www.bundesfinanzministerium.de/Content/EN/Pressemitteilungen/2021/2021-08-18-future-oriented-subsidy-policy.html

[7] This amount is mainly made up of subsidies from the federal level. It also takes into account subsidies that the federal level grants together with the federal states ('Länder') — under joint taxation and co-financing schemes — or in which it is involved through framework legislation. The environmentally harmful proportions of some subsidies cannot be quantified within the context of this report and are therefore not included in the amount of EUR 65.4 billion (cf. table 2 in section 3.1.3).

energy tax reductions for the manufacturing sector and the agricultural industry, the energy tax reduction on diesel and the tax advantage granted for company cars.

There are in fact several reasons why environmentally harmful subsidies should be reduced and/or reformed:

1. *Environmentally harmful subsidies are not consistent with the 'polluter pays' principle and they are unfair:*[8] They result in increased environmental costs which the polluters do not bear themselves, but instead impose on society. This is unfair, especially because the burden is often shouldered by subsequent generations (as in the case of climate protection, for example).
2. *Environmentally harmful subsidies counteract the tools and measures of environmental policy:* If environmentally harmful subsidies make fossil fuels cheaper, the incentive to switch to renewable energies or to use energy more efficiently is reduced. This makes support schemes that encourage energy savings or the use of renewable energies less attractive.
3. *Environmentally harmful subsidies distort competition to the detriment of environmentally friendly products and production methods*: As a result, market forces are not acting for environmental protection, but against it. Reducing them is therefore a central element of a regulatory environmental policy that provides an adequate framework for sustainable production and consumption decisions.
4. *Environmentally harmful subsidies put a massive burden on public budgets in several ways*: Firstly, they directly result in additional expenditure and reduced revenue in public budgets. Secondly, the government often has to bear part of the costs of remedying or reducing the environmental damage that is caused. And thirdly, when environmentally harmful subsidies distort competition, the government needs to do more to promote environmentally friendly products and technologies. All of this decreases the government's financial scope for other important social functions, for example, social services, healthcare, education or the development of sustainable infrastructures.
5. *Environmentally harmful subsidies usually have negative distribution effects*: In most cases, it is companies and households with higher incomes that profit from environmentally harmful subsidies. At the same time, households with lower incomes often suffer above average from the negative environmental impacts that these subsidies cause. This is the case with noise and air pollution on busy roads, for example.
6. *Environmentally harmful subsidies jeopardise the long-term competitiveness of Germany as a business location:* By hampering the development of and transition to resource-efficient, environmentally friendly products and technologies, environmentally harmful subsidies inhibit the development of greener future markets, which will be of central importance in terms of competitiveness.

Conversely, major societal benefits arise from the *reduction* of environmentally harmful subsidies. Reducing environmentally harmful subsidies makes environmental and climate protection and resource conservation more efficient and effective. It also creates additional financial leeway for the government. These are urgently required to successfully bring about the socio-ecological transformation of the economy and society.

The challenges are enormous: In order to implement greenhouse gas-neutral industrial technologies, develop sustainable infrastructures (e.g. expand public transport and the network of charging stations for electric vehicles), upgrade the energy performance of housing stock,

[8] See also, for example, SVR (2019), p. 53. — Of course, this also applies for the inadequate internalisation of environmental costs, as not all production and consumption costs are taken into account (see — among many further sources —, Fritsch 2018, p. 103 et seq.).

support the expansion of renewable energies and promote adaptation measures to climate change, extra government funding amounting to hundreds of billions will be required in the coming years. Support schemes for companies and private households and extra government investment in a sustainable infrastructure are both required. According to a recent study, an extra EUR 30 billion per year will have to be provided for support schemes and climate protection investments in the federal budget alone to enable climate targets in Germany to be achieved.[9] The reduction in environmentally harmful subsidies could make a substantial contribution towards funding these measures.

However, the fiscal impacts of reducing environmentally harmful subsidies are complex, and the subsidy volume stated in the study usually does not correspond to the extra financial leeway gained (cf. section 3.1.2). Adjustment responses by companies and private households tend to decrease this leeway, but the costs saved on remedying environmental damage and other factors increase it in the long term. Furthermore, when dismantling environmentally harmful subsidies, accompanying measures are often useful for social and economic reasons, whereby these also promote the socio-ecological transformation to a considerable extent (e.g. advisory assistance for private households on saving energy, expansion of public transport, support of companies with the transition to post-fossil manufacturing processes and adjustment allowances for employees, for example, in the context of phasing out coal). This uses up some of the revenue that the government receives by reducing environmentally harmful subsidies.

As most environmentally harmful subsidies have negative distribution effects, reducing them can directly contribute to social objectives. In some cases, however, social hardship may arise for certain groups as a result of the reduction of environmentally harmful subsidies, e.g. for long-distance commuters with lower incomes if the commuting allowance is abolished. In these cases, it is necessary to develop *socially responsible* solutions. There are various ways of doing this, including hardship regulations or support schemes. It is also important to provide alternative services, for example, by expanding public transport. Which strategies are the most worthwhile depends on the particular case. In this report, specific proposals are therefore also made as to how the reduction in subsidies can be carried out in a socially responsible way.[10]

In light of the aforementioned benefits, there is a general consensus among the scientific community that environmentally harmful subsidies need to be reduced.[11] The OECD has also repeatedly advised in recent years that Germany should abolish tax concessions for environmentally harmful activities.[12]

However, not all environmentally harmful subsidies can be abolished fully and immediately. Sometimes, there are legal obstacles at EU or international level, for example with regard to the kerosene tax and the VAT exemption for international flights (cf. sections 2.2.8 and 2.2.9). It may also be necessary to ease the burden on highly energy-intensive companies that are exposed to strong international competition to ensure that they remain internationally competitive and to prevent production from being relocated to countries with lower environmental standards (cf. section 2.1). Therefore, in certain cases, a subsidy may be even be necessary in order to enable a higher level of environmental ambition in the first place. One example of this are the subsidies provided through free allowances in the EU emissions trading system in order to prevent carbon leakage (cf. section 2.1.10).

[9] Agora Energiewende et al. (2021), p. 10.

[10] See also FÖS (2021).

[11] See, among many further sources, Barbier (2010) and Coady et al. (2019).

[12] OECD (2016), p. 132 et seq., OECD (2017), p. 133.

It is therefore not sufficient to develop a strategy for reducing environmentally harmful subsidies at national level and to quickly implement it. Besides this, it is essential to expand the leeway for reducing environmentally harmful subsidies at EU and international level — for example, by an ambitious reform of the EU Energy Taxation Directive, international agreements on the reduction of subsidies for fossil fuels, the introduction of border adjustment mechanisms, the protection of domestic industries against environmental dumping, or voluntary agreements on minimum standards for climate protection. It is a good time to do so: numerous developments at EU and international level are providing tailwinds, which should be used (cf. section 1.3).

To ensure that the reduction and reform of environmentally harmful subsidies is systematic and subsidy policy overall is made more effective and efficient, the study describes environmental principles in subsidy policy (cf. section 4.1) and an 'environmental check' is recommended for all subsidies in respect of their implementation in practice (cf. section 4.2). In principle, only subsidies that are in line with sustainable development should be granted in the future. The sustainability check on subsidies by the Federal Government is a first but insufficient step in this direction (cf. section 4.3). For example, regular checks should be carried out as to whether the primary aim of a subsidy — for example, securing income in the agricultural sector or the creation of housing — could also (or perhaps even better) be achieved by making subsidies more environmentally friendly or by using other instruments. The term 'subsidy' should also be understood in a wider sense, as it currently does not comprise key environment-related concessions.

1.2 Subsidies and their (close) relatives

Neither in the public finance literature nor in practice is the term 'subsidy' uniformly and clearly defined. Every definition and every expansion or limitation of the term 'subsidy' is ultimately associated with methodical and normative problems. The decisive criterion for the suitability of the chosen definition of the term subsidy is the purpose of the findings in each case. To cover all the benefits granted for environmentally harmful economic activities, this study uses the term 'subsidy' in a broader sense (see text box 1). In this way, governmental lack of action and undesirable developments in the environmental sector can be identified.

When considering environmentally harmful subsidies, various types of subsidies must be taken into account. Table 1 provides an overview of which subsidies are covered by the term 'subsidy' when used in this document and distinguishes it from other definitions of this term. The focus of the Federal Government's Subsidies Report is on financial assistance and tax concessions. This study considers the concept of tax concessions more broadly, however, and also takes into account tax incentives that are not included in the Federal Government's Subsidies Report.

According to the Subsidies Report, tax concessions are special tax exemptions from existing legal regulations that lead to a decrease in revenue for the public sector. This definition is too narrow in some cases, because it disregards the fact that a subsidy can also consist of the exclusion of certain activities from taxation. For example, the consumption of kerosene is not subject to tax within the context of energy tax, although the energy tax is a consumption tax by its very nature and therefore all energy sources should be included. This shows that it is not just the wording of the law that is crucial for the existence of a tax concession; it has to be examined as well whether the spread of the tax base corresponds to the aim of the taxation and its reasoning.

Another example is the energy tax concession for diesel over petrol, which the Federal Government's Subsidies Report does not indicate as a subsidy either. In this case, the advantage does not result from the exclusion of certain elements from taxation, but instead from the choice of a

tax rate that is — based on the energy content of petrol and diesel — too low, and therefore leads to competition distortions and an adverse impact on the environment.

Not every tax concession is automatically an unjustifiable subsidy, however. For example, within the context of eco tax (*Ökosteuer*), there are different tax rates based on how harmful to the environment energy sources are, and the legislator uses these different tax rates deliberately to create economic incentives for the benefit of environmental and climate protection.

Text box 1: Definition of environmentally harmful subsidies

What are environmentally harmful subsidies?

Subsidies are benefits granted by public authorities to companies for which no or only less than normal market consideration is given. Moreover, assistance provided to private households also amounts to subsidies if it specifically favours certain consumption patterns and therefore indirectly influences economic activity. When considering environmentally harmful subsidies, both subsidies that are directly or potentially relevant to the budget and hidden subsidies that do not have a direct effect on the budget should be taken into account.

Subsidies are considered environmentally harmful if they have negative effects on the environmental goods climate, air, soil, water and biodiversity, if they cause environment-related health problems, or if they favour the use of raw materials.

Table 1: Selected definitions of the term 'subsidy'

Subsidy type	Definition of a subsidy					
	German Federal Ministry of Finance (BMF), Subsidies Report of the Federal Government	Organisation for Economic Co-operation and Development (OECD)	German Environment Agency (UBA)	Green Budget Germany (Forum Ökologisch-Soziale Marktwirtschaft, FÖS)	Institute for European Environmental Policy (IEEP)	International Monetary Fund (IMF)
Subsidies that affect the budget (explicit subsidies)						
Financial assistance (grants for specific purposes, debt management support, loans)	x	x	x	x	x	x
Tax concessions	x	x	x	x	x	x
Used sureties/ guarantees		x	x	x	x	x
Subsidies that do not directly affect the budget (implicit subsidies)						
Unused sureties/ guarantees		x	x	x	x	x
Targeted advantages within		x	x	x	x	x

Subsidy type	Definition of a subsidy					
governmental regulation						
Provision or procurement of goods, services and rights by the government at prices that are not in line with market prices		x	x	x	x	x
Incomplete internalisation of environmental costs					(x)[13]	(x)[14]

Source: Own illustration based on IEEP (2007), p. 26f. and Withana et al. (2012), p. 6; definitions of the term 'subsidies' taken from BMF (2013), OECD (2005), Küchler/Meyer (2012), Valsecchi et al. (2009) and IMF (2013).

Besides financial assistance and tax concessions, sureties and guarantees can also have environmentally harmful effects. Therefore, they should also be taken into account when considering environmentally harmful subsidies. Even implicit subsidies, i.e. concessions, which are hidden and do not have a direct effect on the budget, must be taken into consideration. This includes unused sureties and guarantees, targeted advantages within government regulation or the provision or procurement of goods, services and rights by the government at prices that are not in line with market prices. One example of an implicit environmentally harmful subsidy is the reduced EEG surcharge for electro-intensive companies and railways (Special Compensation Scheme).

The definition of implicit subsidies should not be expanded to include the insufficient internalisation of environmental costs, however. It is true that the inadequate internationalisation of environmental costs — like environmentally harmful subsidies — is actually shouldered by the environment and society. However, this is a general problem related to inadequate environmental policy and not due to targeted benefits for individuals. The internationalisation of environmental costs[15] is an overarching guiding principle that goes beyond the bounds of subsidy policy and is therefore not part of this study.[16]

1.3 International initiatives for reducing environmentally harmful subsidies

The fiscal and environmental benefits of the international reduction of environmentally harmful subsidies are substantial. In the G20 countries alone, subsidies for fossil fuels amounted to USD 3.3 trillion between 2015 and 2019 (cf. Figure 1).

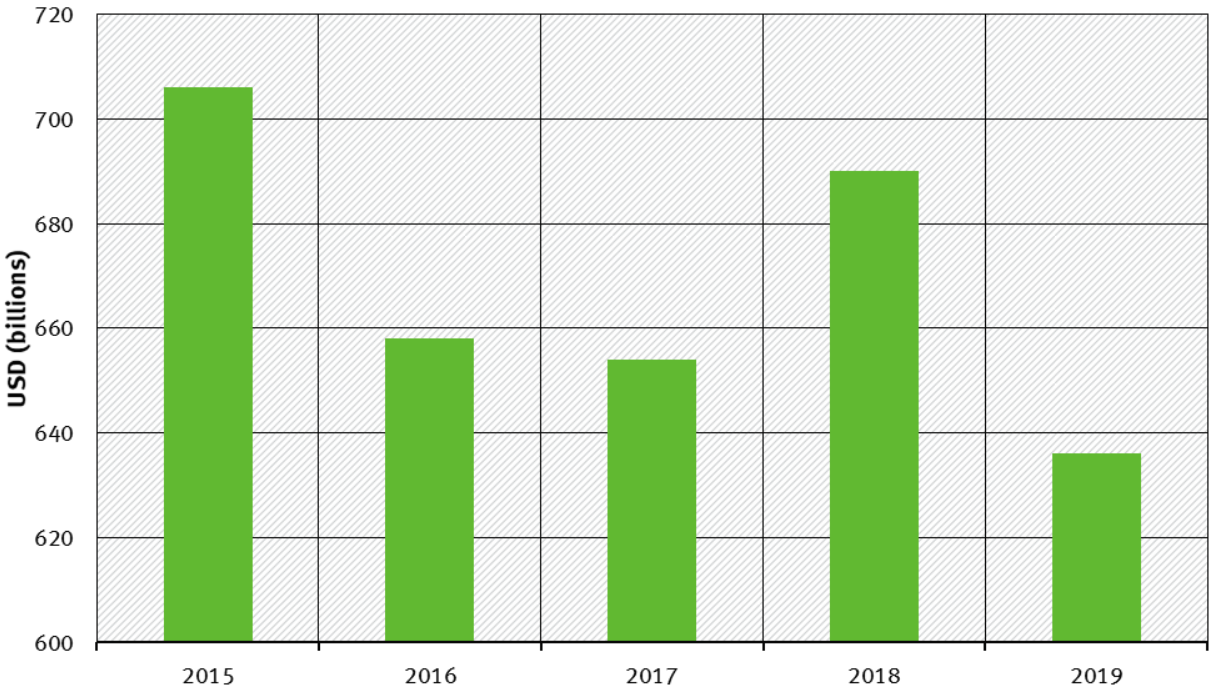
[13] The IEEP does not consider externalities as subsidies per se, but it does allow them to be taken into consideration provided that they can be reasonably quantified and policy does not respond to the recognised environmental problems.

[14] When considering subsidies for fossil fuels, the IMF uses, among other things, a definition of the term 'subsidy' that takes the internalisation of environmental costs into consideration, see IMF (2013), p. 1.

[15] UBA (2020c).

[16] In respect of other issues, however, it may be worthwhile taking into account the additional external costs besides subsidies; for example, when designing measures to reduce the distortion of competition between energy sources.

Figure 1: Subsidies for fossil fuels in the G20 countries



Source: BloombergNEF (2021), p. 5.

In this context, the reduction of environmentally harmful subsidies is strived for internationally at various levels and in various initiatives:

- The Kyoto Protocol already explicitly requires the abolition of subsidies that inhibit the reduction of greenhouse gases.[17]
- As part of the G20 pledges in Pittsburgh in September 2009, heads of government promised for the first time to phase out in the medium term any subsidies for fossil fuels which encourage wasteful consumption.[18] Subsequently, this pledge was repeatedly reaffirmed, most recently at the summits in Osaka in 2019 and Riyadh in 2020.[19] The 'G20 Energy Transitions Working Group' was also set up, which is kept informed through 'update' reports.[20]
- In May 2016, the G7 agreed to end inefficient subsidies for oil, gas and coal by 2025.[21] At the most recent summit in Cornwall, this decision was reaffirmed[22]: 'We reaffirm our existing commitment to eliminating inefficient fossil fuel subsidies by 2025, and call on all countries to join us, recognising the substantial financial resource this could unlock globally to support the transition and the need to commit to a clear timeline.'[23]

[17] Kyoto Protocol to the UNFCCC (2007), Article 2(1) (a) (v).

[18] G20 Leaders (2009).

[19] While 'inefficient fossil fuel subsidies' were not addressed in the outcome documents at the summits in 2017 (Hamburg) and 2018 (Buenos Aires), they were again found in the joint declaration in 2019 (Osaka), cf. G20 Leaders (2019, 2020).

[20] IEA/OECD (2019).

[21] G7 Leaders (2016).

[22] Unfortunately, the declarations at the summits in 2017 (Taormina, Italy), 2018 (Charlevoix, Canada) and 2019 (Biarritz, France) did not address this issue.

[23] G7 Leaders (2021), p. 15.

- A pledge to reduce environmentally harmful and inefficient subsidies, specifically in relation to fossil fuels and fishing, was also found in the outcome document of the Rio+20 conference in 2012.[24]
- Agenda 2030, which was adopted by all United Nations Member States in 2015, contains 17 *Sustainable Development Goals* (SDGs), each with their own *targets*. Within it, environmentally harmful subsidies are also addressed within SDG 12 ('Ensure sustainable consumption and production patterns').[25]
- Stimulus at EU level is particularly relevant for changes in legal regulations at national level. In 2019, the EU Commission proposed a comprehensive agenda for environmental transformation in Europe in the form of its *European Green Deal*. This also calls for a departure from environmentally harmful subsidies.[26]
- The European Parliament is pushing for the end of all subsidies that are detrimental to the climate by 2025 and all other environmentally harmful subsidies by 2027. A '*toolbox*' is also to be created to help Member States reduce environmentally harmful subsidies.[27]
- Specific measures for reducing environmentally harmful subsidies can be found in the EU Commission's proposal to revise the Energy Taxation Directive (2003/96/EC). Its explicit aim is to reduce subsidies that favour fossil fuels.[28] The proposals presented by the Commission include the gradual inclusion of air and waterborne transport in energy taxation and the end of tax concessions for diesel fuel.[29] This initiative is a very positive development, because an ambitious reform of the EU Energy Taxation Directive would also make it considerably easier to reduce environmentally harmful subsidies in Germany.

Germany should support and promote all initiatives at EU and international level that are aimed at reducing environmentally harmful subsidies. This is also necessary because regulations at international and EU level sometimes inhibit the legal leeway for reducing environmentally harmful subsidies at national level. This applies, for example, in the case of the kerosene tax exemption, the EU-wide VAT exemption for cross-border flights, the energy tax concessions for highly energy-intensive companies, and the environment-orientated reform of the EU Common Agricultural Policy. A coordinated approach at EU and/or international level would also make reducing environmentally harmful subsidies easier from an economic perspective.

Because many states are reporting very high budget deficits due to the coronavirus crisis and will be pursuing ambitious consolidation targets in the coming years, the time is very favourable for initiatives to reduce environmentally harmful subsidies at EU and international level.

[24] UN (2012), paragraphs 173 (p. 33) and 225 (p. 43).

[25] SDG 12, target 12.c. reads: 'Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by remedying market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist [...]'.

[26] EU Commission (2019), p. 17: 'A greater use of green budgeting tools will help to redirect public investment, consumption and taxation […] away from harmful subsidies.' — It also reiterates the importance of the G20 initiative in respect of bringing an end to 'fossil fuel subsidies' globally: 'The EU should also reinforce current initiatives and engage with third countries on cross-cutting climate and environment issues. This may include ending global fossil fuel subsidies in line with G20 commitments […].' (ibid. p. 21)

[27] https://www.endseurope.com/article/1721721/parliament-pushes-end-fossil-fuel-subsidies-2025 and https://www.europarl.europa.eu/news/en/press-room/20210701IPR07517/new-eu-environment-programme-to-address-challenges-facing-people-and-planet?xtor=AD-78

[28] EU Commission (2020a), p. 1 et seq.

[29] EU Commission (2021).

1.4 Ways of reducing environmentally harmful subsidies

There are already examples of the successful reduction of environmentally harmful subsidies at both international and national level:

- Domestic hard coal mining ceased at the end of 2018 with the closure of the last two mines, Prosper-Haniel and Ibbenbüren. This meant the end of the subsidisation of the sale of hard coal.[30]
- In 2011, due to the strain on the budget, the Federal Government adopted an austerity package which included, among other things, a reduction in the general electricity and energy tax concession and in peak equalisation (*Spitzenausgleich*). This significantly reduced the subsidy volume for both advantages.
- The government of New Zealand radically reduced agricultural subsidies in the 1980s. The reduction of subsidies in turn significantly reduced the negative environmental effects, particularly in respect of land take and fertiliser use.[31]
- The Netherlands have taken a more environmental approach to tax benefits for commuting. This approach makes travelling by car significantly less attractive, while the use of public transport and bicycles is given preferential treatment.

These examples show that reducing environmentally harmful subsidies is definitely feasible. Overall, the reduction of environmentally harmful subsidies also enjoys huge support from the general population. Approximately 75% of the population in Germany support the tightening of laws and the withdrawal of environmentally harmful subsidies by the government.[32] In a recent survey on environmental awareness in Germany, 55% of the respondents agreed with the statement that reducing subsidies that are detrimental to the climate is very important in order to advance climate protection, and a further 33% believed that it was rather important.[33]

In practice, however, there are a number of obstacles inhibiting the reduction of environmentally harmful subsidies:[34]

- The reduction of subsidies often affects well-informed and organised groups which effectively push for the retention of subsidies, e.g. through lobbying. By contrast, the advantages of reducing subsidies are usually distributed among all taxpayers, i.e. those who could be relieved by the reduction of environmentally harmful subsidies and those who would benefit from the reduction of environmentally harmful subsidies thanks to a lower environmental impact.[35] Smaller, relatively homogeneous groups of stakeholders often have rather good prospects of success because they are better organised to engage in a rent-seeking lobbying policy. It not just in respect of environmentally harmful subsidies that this is a great challenge for the welfare of society.[36]

[30] However, payments in arrears are still being made.

[31] Bär et al. (2011), p. 27 et seq.

[32] OECD (2012), p. 99 et seq.

[33] UBA (2021a), p. 27.

[34] For details, see also Withana et al. (2012), p. 44 et seq.

[35] The explanations for this draw in particular on the research agenda of *political economy* and the economic theory of policy (see e.g. Fritsch 2018, p. 347 et seq.); with regard to environmentally harmful subsidies, see OECD (2005), p. 59 et seq.

[36] Cf. Olson (1965) as a classic author.

- The withdrawal of existing advantages usually provokes a certain level of resistance. It is not unusual for normative claims to be made on the basis of sheer factuality ('it's always been that way') and for the reduction of privileges to be falsely considered a 'punishment'. Harari described this attitude in a succinct phrase: 'Once people get used to a certain luxury, they take it for granted.'[37]
- There are also legal factors that could make reducing subsidies difficult, e.g. if regulations at EU level limit national room for manoeuvre, as is the case with kerosene taxation.[38]

It is therefore worthwhile to address obstacles right from the start and to look for solutions to any conflicting targets. The following remarks provide an overview of the key starting points for overcoming obstacles and helping to successfully reduce environmentally harmful subsidies.

1.4.1 Fully involve the public and improve communication

When developing reforms, there are many interests and perspectives to be taken into account. In doing so, it is important to also include those interests that are often inadequately represented by lobby organisations, e.g. environmental interests. One example from the Netherlands shows what widespread involvement may look like in practice. There, the government set up a network for organising the structural change involved in the long-term transformation of the energy sector. In addition to various actors from the energy sector, it also involves the scientific community, environmental organisations and the government. The network is intended to foster acceptance of the transformation of the energy sector and of short-term burdens, e.g. those resulting from the reduction of subsidies. In this way, the companies involved can also adjust to the necessary long-term changes in good time.[39]

To increase acceptance of specific reform measures among the general population, it also makes sense to improve communication on environmentally harmful subsidies. This initially includes the transparent representation of existing environmentally harmful subsidies, e.g. through regular environment-orientated subsidies reporting. The advantages of reducing environmentally harmful subsidies should also be communicated effectively to the public. This concerns the attainable relief of environmental burdens and the resulting advantages for health and quality of life, as well as the fiscal and economic advantages. It is also helpful to embed the reduction of environmentally harmful subsidies into an overall strategy, e.g. into an ecology-based financial reform or a national sustainability strategy.

1.4.2 Sustainability review in the Federal Government's subsidy report to create transparency

One important way of creating transparency is the Federal Government's Subsidies Report.[40] The fact that this Subsidies Report has contained a sustainability impact assessment for subsidies for several years is a positive development.[41] This is a first step towards more clarity in respect of the impact of subsidies. However, it is necessary to significantly improve the method and the process of sustainability impact assessments.[42] Effective subsidy management would

[37] Harari (2011), p. 98.

[38] See section 2.2.8.

[39] Bär et al. (2011), p. 31 et seq.

[40] The 28th Subsidies Report is the latest report (BMF 2021).

[41] The 25th Subsidies Report (BMF 2015) was the first to contain such a sustainability impact assessment. This has been found in all Subsidies Reports since then (BMF 2017, 2019a, 2021).

[42] Cf. section 4.3.

require a systematic review of the impact on environmental goods such as climate, air, water, soil, biodiversity and the landscape, as well as on health and the use of raw materials, in addition to a mandatory examination of alternative courses of action. This should also be carried out when introducing *new* subsidies and it would make a major contribution to sustainable financial policy.[43] This is why the German Environment Agency recommends environment-related subsidy controlling (cf. section 4.2).

1.4.3 Supporting environmental structural change and preventing economic hardship

Reducing environmentally harmful subsidies gives companies environmental incentives to manufacture in a more environmentally friendly, resource-saving way. The government should support companies with this process until a stronger, more environment-orientated way of doing business is attained. This does not just increase acceptance in the economy; it also increases the positive environmental impacts. At the same time, promoting environmental structural change can have a positive impact on international competitiveness and employment.[44] When doing so, it is worthwhile funding supportive measures using budget funds that are freed up through the reduction of environmentally harmful subsidies.

To support companies and environmental structural change, the government can provide financial resources for research and development on environmentally friendly technologies and products, and also support the environmentally friendly reorientation of companies through advisory programmes. Regional structural assistance measures might be considered if the reduction of environmentally harmful subsidies has a particularly great economic impact on certain regions, e.g. with regard to the reduction of hard coal mining subsidies. Accompanying support schemes for improved energy and resource efficiency, which cushion the cost increases resulting from the reduction of environmentally harmful subsidies, are also worthwhile.

In some cases, however, supportive measures are not sufficient to prevent the unreasonable economic hardship resulting from the reduction of environmentally harmful subsidies. In such cases, hardship regulations make sense. However, they should be limited to companies whose costs significantly increase as a result of the reduction of subsidies and which, in the face of international competition, are unable to pass increasing costs on to their customers. Reducing subsidies gradually can also be a key strategy for preventing economic hardship for companies. This gives companies more time to make the necessary changes.

1.4.4 Preventing social disparities and exploiting synergies with social objectives

Reducing environmentally harmful subsidies is not necessarily associated with negative social impacts. Quite the contrary: Studies show that — besides companies — it is primarily high-income groups of the population that profit from environmentally harmful subsidies.[45] This applies in particular for the transport sector, e.g. for tax advantages for company cars or the commuting tax allowance.[46] It should also be taken into account that low-income households in particular suffer as a result of environmental pollution, for example, because they often live on busy streets with high levels of noise and air pollution. In this respect, reducing environmentally harmful subsidies can improve the quality of life of these segments of the population to an exceptional degree.

[43] The Federal Government's subsidy policy guidelines state that subsidy policy takes into account the impact of growth, distribution and competition policy as well as environmental policy.

[44] Cf. section 1.1 above.

[45] Jacob et al. (2016), FÖS (2021).

[46] Also, in this regard UBA (2020e).

Reducing environmentally harmful subsidies also creates financial leeway for measures that have above-average benefits for households with low incomes. This includes, for example, the provision of good quality, attractively priced public transport, including in rural areas.

However, it cannot be denied that reducing environmentally harmful subsidies can also lead to social hardship in some cases. This needs to be prevented through an appropriate design of the reform and by accompanying measures. This is guided by the principle of 'just transition', i.e. a socially equitable transition to environmentally friendly consumer behaviour. This study therefore contains a wealth of reform proposals that explicitly take social aspects into account.

One example is the proposed increase in energy tax for coal. From an environmental point of view, it is undoubtedly sensible, but it could have a big impact on low-income households with coal heating. To prevent social hardship, we therefore recommended to increase coal tax for private households gradually rather than in one go, and to support it with a retrofitting scheme for the heating systems, which are often outdated and inefficient. Private households that replace their coal heating with new, environmentally friendly heating should receive a grant towards the costs of conversion. Such a reform package could even reduce the heating costs of the households concerned in the medium and long term, because more efficient heating systems enable substantial savings.

Another example is the reform of the commuting tax allowance. The benefits obtained by households with high incomes are far above-average, but reducing it could also result in social hardship in certain cases. To prevent this, it is worthwhile making the costs of journeys to work deductible against income tax in the future within the framework of a hardship regulation. This would specifically provide relief for those that have to spend a lot on commuting relative to their income. In particular, this concerns long-distance commuters who have to put up with long work commutes for social or professional reasons. Greater support for the public transport network would also be a worthwhile accompanying measure.

1.4.5 Using windows of opportunity

Experience has shown that the reduction of environmentally harmful subsidies is easier to implement during times in which the budget is under strain. Ten years ago, for example, relieving the strain on the federal budget was a central motive for reducing the general electricity and energy tax concessions and the peak equalisation. In light of the high levels of government debt due to the coronavirus crisis and the need to increase investment in climate protection, digitalisation and the development of sustainable infrastructures, for example, there is now once again a great opportunity to make progress while reducing environmentally harmful subsidies, because this would create urgently needed financial leeway.[47]

In addition, the pressure to act has significantly increased, particularly in relation to climate protection. The national climate protection targets set in the Climate Change Act (*Klimaschutzgesetz*) 2021 are binding and will be difficult to achieve without reducing environmentally harmful subsidies, particularly in the transport sector. Therefore, also from this point of view, it is a good time to initiate the immediate and systematic reduction of environmentally harmful subsidies.

1.5 Procedure

Subsidies favour economic activities that could have an adverse effect on the environment in a number of ways. This report analyses how subsidies have a negative impact on the environmental goods climate, air, soil, water, biodiversity and the landscape, as well as on human health and

[47] UBA (2020a), p. 18, and (2020b), p. 25.

the use of raw materials. To do so, it uses the assessment criteria on which the Environmental Impact Assessment (*Umweltverträglichkeitsprüfung*) is based.

The report analyses subsidies and their environmental impacts in the fields of energy supply and use, transport, construction and housing, as well as in the fields of agriculture, forestry and fishing, as they cause the biggest environmental problems and benefit the most from environmentally harmful subsidies. The report focuses on the main federal subsidies, taking only a peripheral look at support schemes at European, regional and local level.

The analyses illustrate how complex and varied the impacts of subsidies are on the environment, resource consumption and health.

For example, the commuting tax allowance increases traffic, which leads to environmentally harmful emissions of carbon dioxide (CO_2), air pollution and noise. It also provides incentives for increased urban sprawl, one of the main causes of the loss of biodiversity. Urban sprawl in turn indirectly leads to other forms of traffic-related environmental pollution, for example, because the distances to be travelled become longer, land take due to new traffic infrastructures increases and the basic conditions of public transport deteriorate.

In light of the difficulties associated with quantitatively attributing various detrimental environmental effects to particular subsidies, this report illustrates the impact relationships between subsidies and their environmentally harmful effects on a purely qualitative basis. The volume of each subsidy is quantified, provided that the data required to do so is available. The uniform reference period is the year 2018.[48]

The following main part (chapter 2) of the study documents the most important environmentally harmful subsidies in key sectors. It is divided into the following sections:

Section 2.1 Energy supply and use,

Section 2.2 Transport,

Section 2.3 Construction and housing, and

Section 2.4 Agriculture, forestry and fishing

Each section first provides an overview of the negative impacts of the relevant sector on the environmental goods under consideration, human health and resource consumption. Subsequently, the most important environmentally harmful subsidies from the relevant sector are described. Their negative effects on the environment, health and resource consumption are then analysed and reform proposals made.

Chapter 3 contains a summary of environmentally harmful subsidies in Germany. It also provides a timeline of their development and their distribution among different sectors. Finally, conclusions are drawn and perspectives are outlined.

Chapter 4 describes how environment-related subsidy controlling can contribute to the systematic reduction of environmentally harmful subsidies and to a sustainable subsidy policy.

In the Annex, the subsidies considered here are presented in the form of fact sheets to provide a quick overview.

[48] There are already current estimates of subsidy volumes for some subsidies. For the sake of consistency, 2018 was chosen as the reference year for this report.

2 The most important environmentally harmful subsidies

2.1 Energy supply and use

Despite the progress that has already been made in expanding renewable energies, the German energy supply still largely relies on fossil fuels and nuclear fuels. In 2019, they still accounted for more than 82% of total gross final consumption of energy.[49] This causes substantial pollution and hazards to the environment.

Already during the extraction of fossil fuels, long-term and sometimes even irreversible damage is caused in the mining and extraction sites. This includes widespread destruction of the landscape and the associated biodiversity loss, subsidence and mining damage arising from coal mining underground, detrimental effects on the water balance and the supply of drinking water, and particulate contamination. The transport of fossil fuels also poses great environmental risks. Pollution of soil, water and coastlines along transport routes, as well as serious damage resulting from broken pipelines, oil tanker accidents and gas explosions are imminent.

End-use energy — e.g. electricity, heat, heating fuels and motor fuels — is primarily produced using the non-renewable primary energy sources coal, oil, gas and uranium. The environmental problems associated with energy supply, transformation and use are diverse. Burning fossil fuels to provide electricity, heating, and heat for industrial processes results in air pollutants such as sulphur dioxide, nitrogen oxide, carbon monoxide and particulates. Air pollutants have an adverse effect on human health, lead to the acidification and eutrophication of water and soil, and damage nature, buildings and cultural assets such as monuments. They also result in high emissions of the greenhouse gas CO_2, which is the biggest contributor to the anthropogenic greenhouse effect and thus to global climate change.

The negative impacts of climate change are becoming clearer and clearer. These include, in particular, the more frequent occurrence of heatwaves, droughts and heavy rainfall and the increase in tropical storms, the rise in sea level, the decline in ice and snow cover, and the acidification of the oceans. Detrimental effects on the climate have global detrimental impacts on ecosystems, jeopardise human health, threaten biodiversity and, in many sectors, result in financial loss, such as in agriculture and forestry. If the targets of the Paris Climate Agreement are not met and the temperature increase is not limited to 1.5°C, there is the risk of catastrophic environmental, social and economic consequences.[50]

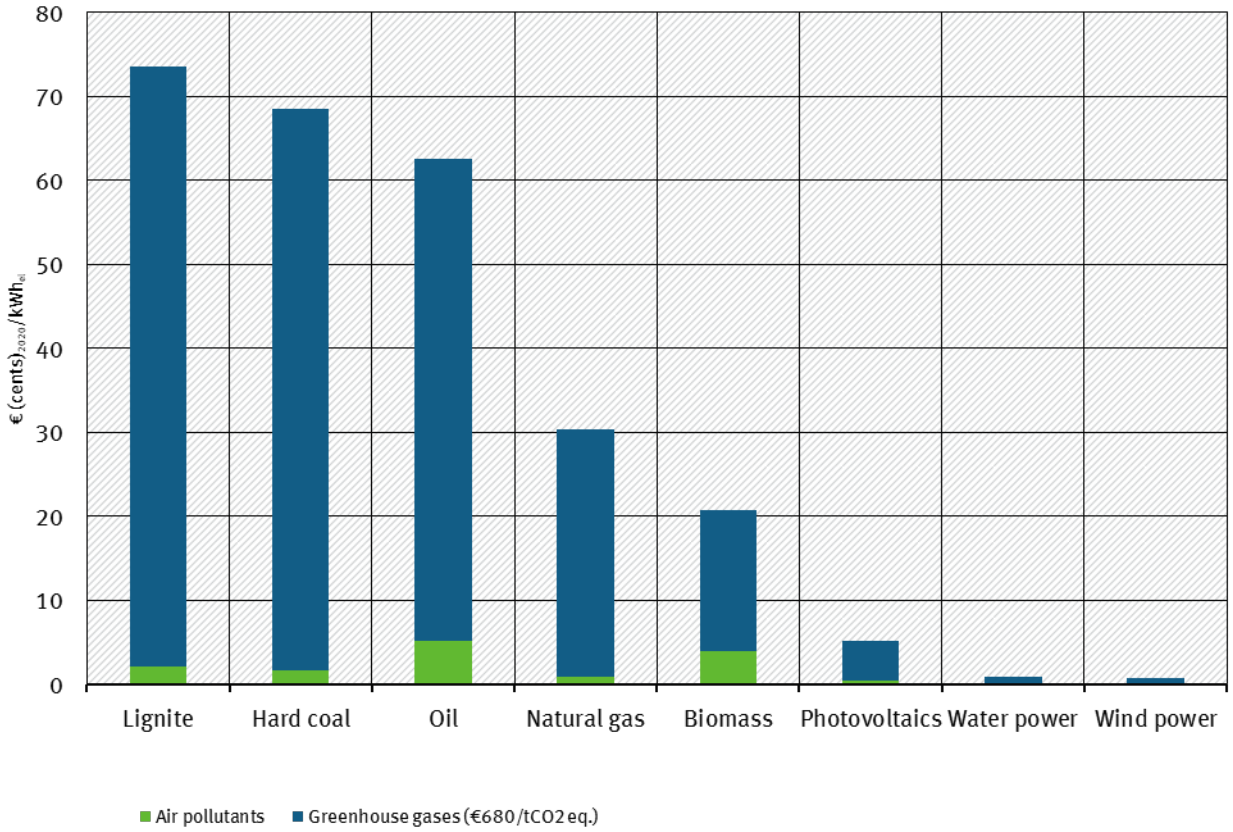
The German Environment Agency has been quantifying the costs of environmentally harmful activities for years.[51] Figure 2 illustrates the environmental costs of electricity generation through greenhouse gas emissions and air pollutants. It is clear from this that the environmental costs of energy generation strongly depend on the energy source used: In the case of fossil fuels (especially coal and oil), the environmental costs are many times higher than in the case of renewable energies.

[49] BMWi (2021), p. 46, and (2020a), p. 9. — The target of an 18% proportion of renewable energies in 2020 was therefore probably achieved (Löschel et al. 2021, p. Z-8; data for 2020 not yet published). On the other hand, this demonstrates the extent to which the energy system is still reliant on unsustainable energy sources.

[50] IPCC (2021, 2018).

[51] Cf. for example UBA (2020c).

Figure 2: Environmental costs of energy generation in Germany, including upstream chains (2018)



Source: UBA (2020c), p. 19.

Nuclear energy also has substantial disadvantages from an environmental perspective. As the nuclear reactor disasters in Chernobyl and Fukushima have shown us, for example, nuclear power plants pose the risk of accidents with unforeseeable damage for humans and the environment. The final disposal of radioactive waste is also a lasting and as yet unresolved problem.

Besides the environmental pollution and risks mentioned, conventional energy use is also unsustainable, because oil, gas, coal and uranium are not renewable and will run out sooner or later. High resource consumption restricts the possibility of use by future generations, to whom raw materials will no longer be available. An energy supply that is reliant on fossil and nuclear energy sources is also heavily dependent on imports.

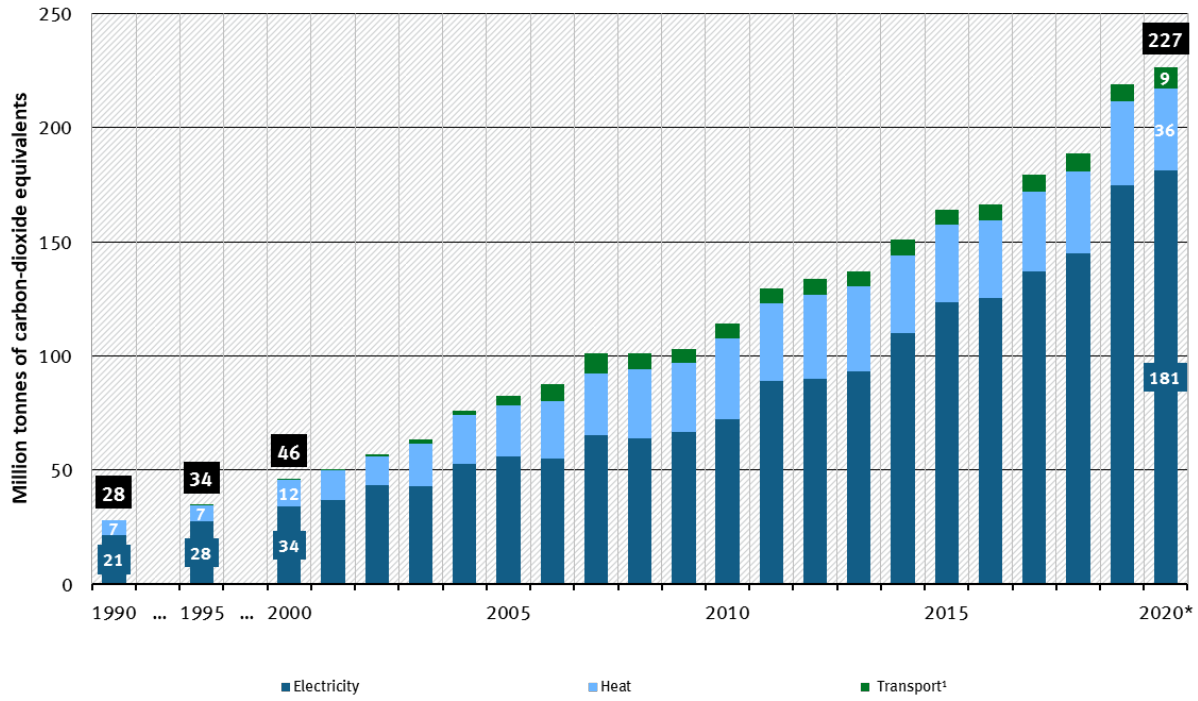
Through the energy transition, Germany is therefore striving for a sustainable energy supply. In its 'Energy concept for a reliable and affordable eco-friendly energy supply system' (*Energiekonzept für eine umweltschonende, zuverlässige und bezahlbare Energieversorgung*) (2010), the Federal Government provides a compass for the energy transition. The energy concept has since been complemented by various decisions and laws. These include the decisions on the nuclear phase-out (2011), the Climate Change Act (*Klimaschutzgesetz*, 2019, 2021), the decisions on the coal phase-put (2020), the Future Package (*Zukunftspaket*) and the Hydrogen Strategy (*Wasserstoffstrategie*) (both 2020).

The targets for reducing greenhouse gas emissions in particular are central to this. The Climate Change Act, the reduction targets of which were most recently intensified in light of the Federal Constitutional Court judgment of 24 March 2021, is crucial. Germany is now striving for greenhouse gas neutrality by the year 2045. Additional pressure to act is also created by the fact that a reduction in greenhouse gas emissions of at least 65% is to be achieved in 2030 instead of the

previous target of 55% (compared to 1990). According to the amended Climate Change Act, the energy industry will be allowed to emit a maximum of 108 million tons of CO_2 equivalent by 2030.

To achieve this target, it is crucial to expand the use of renewable energies further. In 2019, 201 million tons of CO_2 equivalent were cut by using renewable energies (cf. Figure 3).

Figure 3: Greenhouse gas emissions avoided by using renewable energies



[1] Exclusively biogenic fuels in the transport sector, based on data from the Federal Institute for Agriculture and Food (*Bundesanstalt für Landwirtschaft und Ernährung*, BLE)

* Preliminary data

Source: Own illustration, UBA.

In the interest of climate protection and in order to reduce other energy-related environmental pollution, it is necessary to remedy distortions of competition that are detrimental for renewable energies and to provide economic incentives to save energy. Reducing environmentally harmful subsidies therefore plays a key role in the supply and use of energy.

As demonstrated in the following sections, explicit or implicit subsidies are granted for all links in the value chain — from extraction and transformation to the use of fossil fuels. Through various mechanisms, they have a negative impact on environmental and climate protection, health and resource consumption.

Subsidies which lower energy costs for commercial or private energy consumers diminish the economic incentives to use energy economically and efficiently, and therefore encourage energy consumption. Examples include the numerous exemptions from and reductions of energy and electricity taxes for companies.[52]

Subsidies in the energy sector are also considered environmentally harmful when they distort the competition between energy sources to the advantage of relatively more environmentally

[52] Cf. sections 2.1.1 to 2.1.4 and 2.1.7 to 2.1.9.

harmful energy sources and, in this way, favour an unsustainable mix of energy sources. This often involves subsidies for the energy sources coal and nuclear energy.[53] Renewable energies have to compete with fossil and nuclear power generation, which have been subsidised for decades and also enjoy advantages due to the insufficient internalisation of external environmental costs.[54] The resulting distortion of competition is a fundamental reason why renewable energies need to be promoted by means of the Renewable Energy Sources Act. Subsidies for power generation and use also result in a change in the price ratio between competing products that are produced with little or high energy in favour of the energy-intensive products.

Subsidies in the transport and construction sectors sometimes have negative effects on energy-related environmental pollution too.[55] For example, the indirect encouragement of urban sprawl as a result of the commuting tax allowance leads to growth in the length of transport networks per head of the population. District and local heating networks in particular become unprofitable as a result of the decreases in population density. This undermines the future potential of the cogeneration of heat and electricity and diminishes opportunities for the reduction of CO_2 emissions through efficient energy use. Therefore, a long-term decrease of CO_2 emissions in the energy sector also requires the reduction of environmentally harmful subsidies in other sectors.

2.1.1 Electricity and energy tax reductions for the manufacturing industry, agriculture and forestry

Companies in the manufacturing sector, agriculture and forestry are granted an electricity and energy tax reduction.[56] This means that, in principle, companies entitled to such relief pay only 75% of the usual tax rates for electricity and heating.[57] According to the Federal Government's 27th Subsidies Report, 33,192 companies profit from the electricity tax allowance and 14,889 companies from the energy tax allowance.[58] In 2018, the general tax concessions for the manufacturing sector, agriculture and forestry amounted to a total of

EUR 1,144 million.

Of this, EUR 990 million was attributable to electricity tax concessions and EUR 154 million to energy tax concessions.[59]

The tax concession was introduced to avoid jeopardising companies' international competitiveness and to prevent manufacturing being relocated overseas, because this could lead to the loss of jobs and to an increase of greenhouse gas emissions due to partly lower climate policy standards in other countries.[60]

However, the general electricity and energy tax reduction applies for all companies in the manufacturing sector and agricultural industry, regardless of whether they compete internationally or not. Tax concessions also have serious negative effects on climate protection because they

[53] Cf. sections 2.1.5 to 2.1.7 and 2.1.17 and 2.1.18.

[54] FÖS (2017).

[55] Cf. sections 2.2 and 2.3.

[56] Paragraph 9b StromStG and paragraph 54 EnergieStG.

[57] In the case of electricity tax, companies are granted a relief of EUR 5.13 (paragraph 9b(2) StromStG) on the standard rate of EUR 20.50 (paragraph 3 StromStG). This equates to a relief of 25%. In accordance with paragraph 54(2) EnergieStG, a relief of 25% is also granted in principle in the case of energy tax, with the exact rates of reduction being dependent on the tariff for the relevant heating fuel in accordance with paragraph 2(3), 1st sentence EnergieStG. In the case of heating fuels in accordance with paragraph 2(3), 1st sentence, number 1a) EnergieStG (tax rate amounting to EUR 76.35), companies are granted a relief of EUR 15.34 which, by way of deviation, equates to a percentage relief of 20%.

[58] BMF (2019a), p. 84.

[59] BMF (2019a), Annexes 2 and 8 respectively, paragraphs 59 and 63, p. 84, 388 et seq. and 395 et seq.

[60] Fifo et al. (2019), p. 28.

reduce economic incentives to implement energy-efficiency and energy-saving measures among the companies that are entitled to these reliefs. The energy tax concession also makes using fossil fuels cheaper and thus inhibits the increased use of renewable energies.

In actual fact, the energy consumption and greenhouse gas emissions of the manufacturing sector could be substantially reduced, through both energy efficiency and energy saving measures as well as a change in energy sources. There is a great need to catch up in terms of improving energy efficiency, particularly in respect of cross-cutting technologies — e.g. electrical drives, compressed air systems, pumps and ventilators, and the utilisation of process heat. Electrical drives are particularly important, since they account for a large part of the electricity consumption in the industrial sector (67%).[61] There are great economic opportunities for saving power and opportunities for reducing the CO_2 footprint here.

A tax concession that is granted across the board and practically without any conditions is not a plausible response to differences in international energy taxation and the challenges that may arise for the international competitiveness of German companies. If there is not a level playing field internationally,[62] border adjustment measures can be considered. In light of the European Green Deal, these are currently being promoted at European level.

If this is not possible, energy tax concessions are justifiable under certain circumstances — but only if and to the extent that there is actually a threat to international competitiveness. The cross-sectoral granting of subsidies using a 'shotgun approach' in accordance with paragraph 9b StromStG and paragraph 54 EnergieStG, which also benefits companies that are barely engaged in international competition or have low energy intensity, should therefore be ended immediately.

For the other companies, the concessions should be granted in a staggered manner depending on trade and energy intensity. The Forum Ökologisch-Soziale Marktwirtschaft (FÖS) has developed proposals for this as part of a research project.[63] Direct subsidies for fossil fuels in accordance with paragraph 54 EnergieStG should be discontinued as quickly as possible. The additional revenue should be used by the government to provide targeted support to companies for the transition to greenhouse gas-neutral manufacturing.

Concessions should also be linked to environmental improvements in return. This includes the introduction of an energy management system and, within this framework, the development of an energy-saving programme to be implemented consistently and verifiably.[64] Additionally, businesses should at least be obliged to take those energy saving measures that are worthwhile from a business point of view. This would ensure that businesses attain energy savings and more energy-efficient manufacturing methods as reciprocal input in return for the tax reductions.

These aspects should be taken into account if the Federal Government, as recently proclaimed, plans to restructure the tax relief for the manufacturing sector in energy and electricity tax legislation by 2023.[65] Besides the aforementioned aspects, such restructuring should also take into consideration the effects of different energy sources and be aimed at paving the way for the electrification that is worthwhile from a climate protection perspective.

[61] BMWi (2020b), p. 56.

[62] A level playing field could be created in the form of a 'climate club'. The idea is that several states and/or economic regions submit to a common climate protection regime. Besides the EU, this should also include other major industrialised countries such as the USA or China.

[63] Reuster et al. (2019).

[64] This was also called for by Fifo et al. (2019), p. 30.

[65] BMF (2021), Annex 8, paragraphs 55, 59 et passim.

2.1.2 Peak equalisation on environmental tax for the manufacturing sector

In addition to the general electricity and energy tax reduction, companies in the manufacturing sector also are granted the so-called peak equalisation.[66] According to the peak equalisation mechanism, companies are reimbursed for up to 90% of the environmental tax payments (electricity tax and energy tax) which exceed the reduction in employers' contributions to the pension insurance resulting from the 1999 environmental tax reform.[67] In accordance with the Federal Government's 27th Subsidies Report, 9,409 companies were granted electricity tax relief and 5,448 energy tax relief on this basis.[68] In 2018, the tax deficit resulting from peak equalisation amounted to

EUR 1,720 million.

Of this, EUR 1,561 million was attributable to electricity tax and EUR 159 million to energy tax.[69]

Like the general electricity and energy tax reduction, peak equalisation is also intended to avoid a threat to the international competitiveness of energy-intensive companies through the environmental tax.[70] However, the peak equalisation significantly diminishes the incentive for energy-saving activity among the privileged companies in the manufacturing sector. In 2011, the legislator therefore reduced the peak equalisation from 95% to 90%. Since the peak equalisation was extended beyond 2012, the law also requires two conditions for the advantage to be granted:[71] Firstly, companies must introduce an energy or environmental management system in accordance with ISO 500 01[72] or participate in the European Eco-Management and Audit Scheme (EMAS);[73] and secondly, they must meet the targets for reducing energy intensity laid down in the Efficiency Agreement (*Effizienzvereinbarung*) between the Federal Government and industrial companies.[74] Claiming the subsidy is therefore associated with stricter requirements than the general electricity and energy tax reduction.[75]

For a reform, the same applies here as stated in section 2.1.1 regarding the general energy and electricity tax concessions. If it is not possible to create a level playing field through international cooperation on climate protection or an equalisation scheme, a concession can be considered for companies in principle — but only if their international competitiveness is actually under threat.[76] The amount of the concession should be staggered based on trade and electricity

[66] Paragraph 10 StromStG and paragraph 55 EnergieStG.

[67] The revenue from the 'environmental tax' largely went into the pension fund. This decreased employees' and employers' contributions.

[68] BMF (2019a), p. 84 et seq.

[69] Ibid., p. 84 et seq., 390, 399.

[70] Ibid., p. 390, 399, and Fifo et al. (2019), p. 25, 33.

[71] Paragraph 10(3) StromStG and paragraph 55(4) EnergieStG. — This was due to requirements associated with EU state aid rules. The approval of peak equalisation under state aid rules by the European Commission expired at the end of 2012. In order for it to be extended, the EU Commission required efficiency improvements in return. In 2012, peak equalisation for companies in the manufacturing sector in Germany became subject to the Second Amendment to the Law on Energy and Electricity Taxes (*Zweites Gesetz zur Änderung des Energiesteuer- und des Stromsteuergesetzes*) until 2022.

[72] 'Alternative systems for improving energy efficiency' were also permitted for small and medium-sized enterprises (SME), provided that they meet the requirements of the energy auditing standard DIN EN 16247-1, cf. the last subparagraph of paragraph 10(3) StromStG and paragraph 55(4) EnergieStG.

[73] 'Alternative systems for improving energy efficiency' are also permitted for small and medium-sized enterprises (SME), provided that they meet the requirements of the energy auditing standard DIN EN 16247-1 or implement the system in Annex 2 of the Peak Equalisation Efficiency System Regulation (cf. the last subparagraph of paragraph 10(3) StromStG and paragraph 55(4) EnergieStG, as well as paragraph 3 of the Peak Equalisation Efficiency System Regulation (*Spitzenausgleich-Effizienzsystemverordnung*, SpaEfV)).

[74] BMWi (2012) and paragraph 10(3), no. 2 StromStG and paragraph 55(4), no. 2 EnergieStG; also, Prognos (2018).

[75] Fifo et al. (2019), p. 27, 35, as well as section 2.1.1, above.

[76] Reuster et al. (2019).

intensity. An advantage should also be granted in the form of a partial tax refund based on product benchmarks.

The direct subsidisation of fossil fuels by partially refunding energy tax payments should be degressive and be brought to an end as quickly as possible. The additional revenue should be used by the government to provide targeted support to companies for the transition to greenhouse gas-neutral manufacturing.

From an environmental protection perspective, it is worthwhile abolishing peak equalisation, i.e. not extending the time limit on the peak equalisation scheme that was set in 2012 to 31 December 2022. The co-existence of different subsidies that all ultimately have the same aim of preventing threats to international competitiveness caused by electricity and energy tax burdens is not worthwhile and results in high expenditure for the government and for companies. It could be replaced by the regulation described above, which staggers concessions consistently based on trade intensity and electricity consumption and only provides support for companies that are under threat.

If peak equalisation is not abolished, the government should at least require environmental improvements to a greater extent in return. Thus, the legislator should impose upon companies an obligation to at least implement energy saving measures that have been identified as profitable within the energy and environmental management system.[77] The targets for reducing energy intensity in accordance with the Efficiency Agreement between the Federal Government and industry should also be significantly more ambitious. Between 2015 and 2018, the targets were largely surpassed.[78] Structural changes in German industry and in the energy sector (nuclear phase-out, expansion of renewable energies, autonomous efficiency increases), had already brought about a considerable reduction in energy intensity. The evaluation study commissioned by the Federal Ministry for Economic Affairs and Energy calculated a savings potential of more than 4% p.a.[79] This figure should not fall below this target.

2.1.3 Relief from electricity and energy taxes for certain energy-intensive processes and procedures

Many energy-intensive processes have also been fully exempted from energy and electricity taxes since 2006 on the grounds of international competitiveness.[80] In principle, dual-use energy products (for example, energy sources for steel production, which are also used as a raw material) and for use in mineralogical procedures (e.g. in the basic materials and the building materials industries) are exempt from energy taxation. Specifically, electrolysis, chemical reduction methods, metal production and metalworking processes, and thermal waste and waste air treatment are exempt. Also exempt are processes in the glass, ceramic, brick, cement and limestone industries and the manufacture of other building materials such as plaster, sand-lime brick, porous concrete products, asphalt as well as mineral fertilisers. The total tax concessions for 2018 amounted to

EUR 1,290 million.

[77] The assessment of the efficacy of the energy saving measures should not be left to the companies' subjective evaluation; instead, it should be based on criteria such as the proven amortisation period of and rate of return on investments.

[78] Between 2015 and 2018, the actual reduction of energy intensity was almost three times higher than the agreed target, cf. Prognos (2018), p. 3 et seq.

[79] Ibid., p. 38.

[80] Paragraph 9a StromStG and paragraphs 37 and 51 EnergieStG.

This amount is made up of EUR 807 million from electricity tax and EUR 483 million from energy tax.[81]

As there are no tax incentives to save energy in the privileged industrial processes, these across-the-board exemptions for the aforementioned chemical, metallurgical and mineralogical production methods should be axed, at least insofar as they concern the use of fossil fuels. In terms of European law, it is relevant here that in accordance with the European Energy Taxation Directive — which, in principle, lays down mandatory taxation for energy products and electricity, including minimum tax rates[82] — these tax exemptions are in fact permitted, but not mandatory.[83]

Looking at the concession in the context of the electricity tax, a more differentiated picture emerges. Here, the reduction of concessions does indeed have positive impacts as a result of the increase in economic incentives favouring the economical and efficient use of electricity. At the same time, however, the impacts can be environmentally counterproductive, because an increase in electricity prices in certain areas impedes the transition to a decarbonised economy. For example, this concerns electrolysis, which is of crucial importance for the development of a hydrogen economy. Accompanying supportive measures and an appropriate reform of state-determined electricity price components are therefore required in order to *specifically* promote post-fossil production methods and reduce distortions of competition.

For processes and procedures that are subject to strong international competition, the concession could be staggered based on electricity consumption and trade intensity in order to protect competitiveness. The Forum Ökologisch-Soziale Marktwirtschaft (FÖS) has already made a specific proposal in this regard (cf. section 2.1.1) which could serve as the basis for a reform.[84]

2.1.4 Energy tax allowance for electricity generation

For energy products that are used for electricity generation in fixed installations, an application for exemption from energy tax can be made.[85] In the case of coal, even full tax exemption is possible.[86]

According to the Federal Government's Subsidy Report, the purpose of the subsidy is to avoid double taxation in electricity generation.[87] In 2018, the volume of subsidies based on this advantage was

EUR 2,003 million.[88]

The subsidy benefits electricity generation using fossil fuels and thus diametrically contradicts the objectives of climate protection. The energy tax allowance should therefore be abolished immediately. Legally, this is definitely possible.[89] At the same time, the tax rates on different energy sources should be adjusted, because previously, the energy tax rate for coal has only been very

[81] BMF (2019a), Annex 2 and 8 respectively, paragraphs 54 and 64.

[82] Article 4(1) of the European Energy Taxation Directive reads: 'The levels of taxation which Member States shall apply to the energy products and electricity listed in Article 2 may not be less than the minimum levels of taxation prescribed by this Directive.'

[83] Article 2(4)(b) of the European Energy Taxation Directive. — Here, as with a number of other subsidies covered by this report, the pending reform of the European Energy Taxation Directive is crucial in respect of room for manoeuvre at national level.

[84] Reuster et al. (2019).

[85] Paragraph 53 EnergieStG.

[86] Paragraph 37 EnergieStG.

[87] BMF (2019a), p. 384.

[88] Ibid.

[89] FÖS/Klinski (2018).

low. Otherwise, this would lead to a unilateral increase in the price of gas and the relative preferential treatment of coal as a source of energy, which is particularly harmful to the environment.[90]

2.1.5 Hard coal subsidies

Domestic hard coal mining ceased at the end of 2018 with the closure of the last two mines, Prosper-Haniel and Ibbenbüren. This meant the end of the subsidisation of the sale of hard coal, although payments in arrears were still incurred after 2018.[91] Even back in 2007, the Federal Government and the Länder of North Rhine-Westphalia and Saarland reached an agreement with RAG AG and the Industrial Mining, Chemical and Energy Union (*Industriegewerkschaft Bergbau, Chemie, Energie*, IG BCE) to reduce hard coal subsidies and end subsidised coal mining in a socially responsible way by the end of 2018. According to the Federal Government's Subsidies Report, hard coal mining still received sales subsidies in the sum of EUR 967.3 million in 2018.[92] Until 2014, this was the largest source of financial assistance provided by the Federal Government for many years, and even in 2018, it was still the second largest source.[93] The sales subsidies include federal adjustment allowances for hard coal-mining employees in the sum of EUR 90.4 million.[94]

In addition to the Federal Government, the Land of North Rhine-Westphalia also grants subsidies for both items. For example, in 2018, North Rhine-Westphalia provided grants for sales totalling EUR 161.2 million, as well as resources for funding the adjustment allowances amounting to EUR 43.7 million.[95]

The subsidies for hard coal provided using federal and Länder funds in 2018 therefore amounted to

EUR 1,263 million.

Figure 4 shows the development of the two aforementioned types of financial assistance from the Federal Government (sales subsidies and adjustment allowances) since 1999, plus the aid paid to maintain an underground labour force (*Bergmannsprämie*), which existed until 2008.[96]

The values forecast in the 27th Subsidies Report for the years 2019 and 2020 are already included in the figure.[97] This shows that despite the discontinuation of hard coal funding at the end of 2018, there are still burdens on the federal budget. There were payments in arrears for sales subsidies in 2018 that were only made in 2019. One-off payments of grants for the

[90] FÖS (2021), p. 19 et seq.

[91] BMF (2019a), p. 146

[92] BMF (2019a), p. 146 The exact description: 'Grants for the sale of German hard coal for electricity generation, for sale to the steel industry, and to compensate for burdens due to capacity adjustments' (ibid.).

[93] BMF (2015), p. 18, and (2017), p. 22.

[94] BMF (2019a), p. 148.

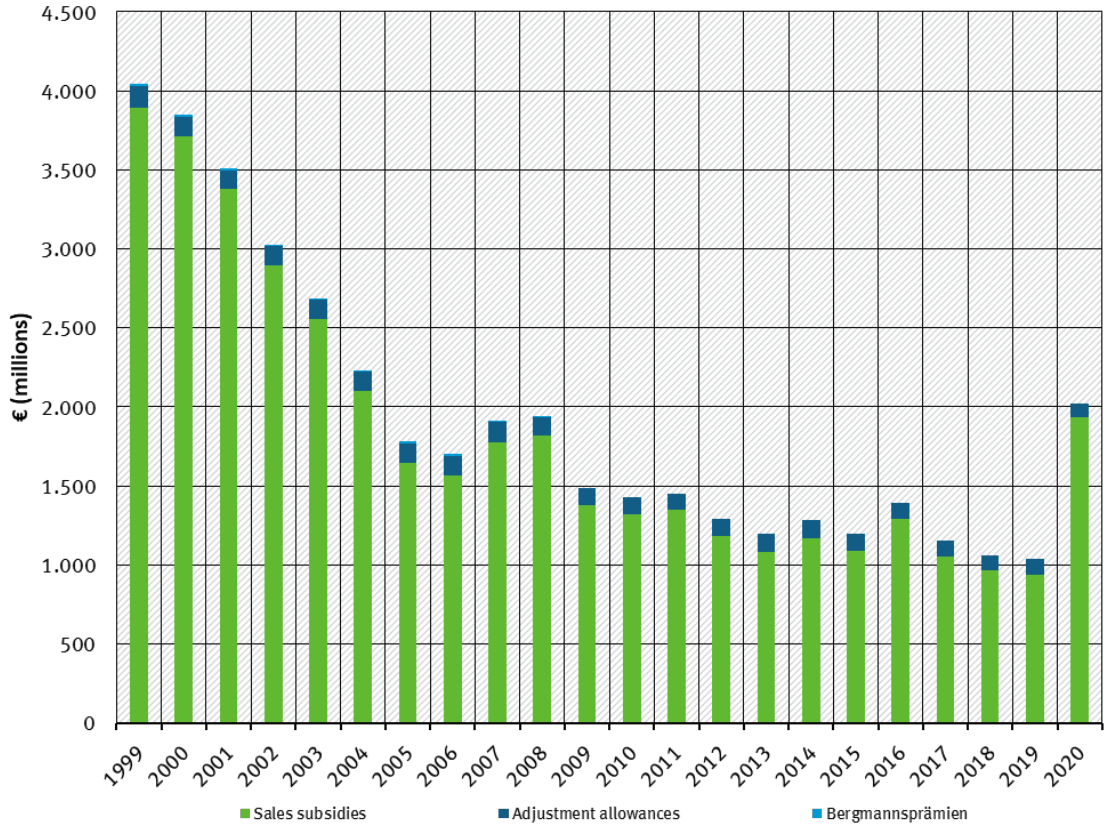
[95] See the budget plan on the website of the Ministry of Finance of the Land of North Rhine-Westphalia, https://www.haushalt.fm.nrw.de/grafik/index.php?type=2 — The 'grants for the sale of German hard coal for electricity generation, for sale to the steel industry, and to compensate for burdens due to capacity adjustments' are listed under budget item 14 750 683 20 631 and the 'state share of funding for the adjustment allowances for coal-mining employees' under budget item 11 029 698 20 253.

[96] Miners who work underground were paid a '*Bergmannsprämie*' per shift. This aid was introduced in 1956 as recognition by the government of their high-risk work, cf. BMF (2007), p. 36.

[97] BMF (2019a), p. 146, 148.

management of orphan pollution from previous mining activities are scheduled for 2020.[98] The ultimate abolition of the adjustment allowances is planned for 2027.[99]

Figure 4: Federal financial assistance for hard coal from 1999 to 2020



Source: BMF (2019a, 2017, 2015, 2013, 2011, 2010, 2007, 2006, 2003, 2001).

The costs of hard coal funding in Germany compared to production costs in other countries are so high that coal mining in Germany could only continue with permanent subsidies. From an economic perspective, the end of hard coal subsidies is therefore worthwhile. Coal mining also results in serious environmental problems and extra costs. Coal mines emit the greenhouse gas methane, which is particularly harmful to the environment. Spoil tips require complex sealing to prevent any risk to the groundwater. Subsidence causes substantial damage to buildings and transport facilities. The sinking ground results in flooding risks, which must be permanently contained using dykes and pump systems. This results in the so-called eternal liabilities. The parliament (*Landtag*) of North Rhine-Westphalia expects the costs of permanent polder water retention in order to compensate for the impacts of mining in the Ruhr region to add up to EUR 51 million per year (plus inflation, base year: 2005).[100] In accordance with the German Hard Coal Financing Act (*Steinkohlefinanzierungsgesetz*)[101] on the financing of eternal liabilities by the RAG Foundation, the Federal Government and the mining Länder might have to bear part of the eternal liabilities under certain circumstances if the foundation's assets are not sufficient.

[98] Ibid., p. 146.

[99] Ibid., p. 149.

[100] Landtag Nordrhein-Westfalen (2010), p. 20.

[101] German Hard Coal Financing Act of 20 December 2007.

The environmental costs (greenhouse gases and air pollutants) of electricity generation by coal-fired power plants in Germany amounted to approximately EUR 11.6 billion in 2019.[102] Although ending German hard coal funding initially only results in substitution by coal imports, discontinuing hard coal subsidies still sends an important signal for a long-term environmentally friendly energy policy. This is important, because a rapid phase-out of coal-fired electricity generation, among other things, is inevitable to enable the climate targets set for Germany in the Climate Change Act to be achieved.[103] In the Coal Phase-Out Act (*Kohleausstiegsgesetz*), Germany set an end date for coal-fired electricity generation of 2038 at the latest. This involves granting closure premiums for hard coal-fired power plants, which are calculated based on calls for tenders on the market.[104] During the first auction, closure premiums were granted for eleven power plant units, with the operators of the plants receiving approximately EUR 317 million in total.[105]

2.1.6 Advantages for the lignite industry

The German lignite industry receives subsidies of various types and in various ways. One particularly important aspect is the exemption of open-cast lignite mining from the extraction charge for mineral resources. In accordance with the Federal Mining Act, 10% of the market price is payable in principle as an extraction charge on non-mining mineral resources.[106] The Länder are authorised to vary this rate from time to time or to exempt certain raw materials from the extraction charge, and individual Länder do make use of this in different ways. Based on old rights, open-cast lignite mining is completely exempt from this extraction charge, however.[107]
166.3 million tons of lignite were produced in Germany in 2018.[108] A extraction charge at a rate of 10% of the price of EUR 16.06 per ton[109] would therefore amount to approx. EUR 267 million per year.

Another subsidy is granted in the sense that the lignite industry is not required to pay a water abstraction charge. Water abstraction charges have been introduced in most Länder and are charged in all Länder with open-cast lignite mining. Among other things, their purpose is to pass the environmental and resource costs resulting from the abstraction of the public good 'water' on to the parties responsible.[110] Unless the adverse environmental effects caused by mine dewatering (i.e. the fall of the groundwater table) can be fully counterbalanced by environmental requirements, the environmental and resource costs have to be passed on to the parties responsible, i.e. the lignite industry. However, the Länder Saxony, Saxony-Anhalt, Brandenburg and Lower Saxony grant the drainage of open-cast lignite mines exemption from this charge

[102] With a time preference rate of 1%. If a pure time preference rate of 0% is applied, the environmental costs come to approx. EUR 39 billion. Calculation based on UBA methodical conventions (UBA 2020c, p. 19) and the data on gross electricity generation according to AGEB (2020a).

[103] https://www.nachrichten-heute.net/686991-umweltbundesamt-fordert-nach-karlsruher-klima-urteil-frueheren-kohleausstieg.html

[104] https://www.bmuv.de/en/topics/climate-adaptation/climate-protection/national-climate-policy/translate-to-english-fragen-und-antworten-zum-kohleausstieg-in-deutschland

[105] https://www.spiegel.de/wirtschaft/unternehmen/staat-zahlt-317-millionen-euro-fuer-stillgelegte-kohlekraftwerke-a-1fce62d3-fcac-43f1-96ad-09aa3d85be38

[106] Paragraph 31 BbergG.

[107] Paragraph151(2), no. 2 BbergG.

[108] kohlenstatistik.de, last accessed July 2021.

[109] Own calculation; based on a price of EUR 6.4 per MWh (Federal Government 2019, p. 41 et seq.) and a value of approx. 2.51 MWh for 1 ton of lignite (AG Energiebilanzen, unit converter).

[110] Article 9 EU WFD.

— unless the water is used for other purposes, such as for cooling power plants — and subsidise the lignite industry in this way.[111]

The German Environment Agency estimates the subsidisation of free water abstraction at about EUR 20 million per year, using the water abstraction charges — which differ between the Länder — as a guide for the costs of resource use.[112]

As a result of the waiver of the extraction charge for mineral resources and the wide-scale exemption from water abstraction charges, the Federal Government and the Länder implicitly favour lignite through the free use of resources by a total of

at least EUR 287 million per year.

Based on its energy content, lignite is the fossil fuel with the greatest impact on the climate, the environment and health. The serious effects of open-cast mining include the destruction of the natural groundwater balance, which is associated with damage to sources of drinking water wells as well as to wetlands and their flora and fauna. Besides damage to the ecosystem, the decrease in the groundwater level results in a high energy consumption. One example of the large-scale adverse effects of open-cast mining on water quality can be seen along the River Spree. Open-cast lignite mining in the Lausitz region (Lusatia) contaminates the Spree with iron hydroxide and sulphate (sedimentation of iron ochre or 'iron clogging'). In higher concentrations both substances are harmful. Besides the impact on flora and fauna, the brown discolouration of the Spree has also affected tourism.[113]

The large amount of land needed for open-cast lignite mining also results in the large-scale destruction of the landscape and of communities. Once the mining has ended, the site needs to be restored so that it can used again. This has required, and still does require, substantial financial resources. Between 2018 and 2022, the Federal Government and the Länder will provide EUR 1.21 billion to address the orphan pollution from lignite mining during the GDR era in Lusatia and central Germany.[114]

In terms of environmental protection, it is therefore necessary to reduce the implicit advantage granted for lignite. In the long term, this would help to decrease the proportion of lignite-based electricity generation in the fuel mix and therefore reduce the pollutant and CO_2 emissions and other environmental and health-related impacts of the lignite industry. The extraction charge of 10% of the market value should be levied for lignite extraction. This would require an amendment to the Federal Mining Act. The rate of the charge would then be approximately EUR 1.6 per ton of lignite. The Länder should also levy water abstraction charges for open-cast lignite mining, as is already the case in North Rhine-Westphalia. Lignite-fired power plants and open-

[111] Brandenburg: paragraph 40(4), no. 7 of the Brandenburg Water Act (*Brandenburgisches Wassergesetz*, BbgWG); Lower Saxony: paragraph 21(2), no. 12 of the Lower Saxony Water Act (*Niedersächsisches Wassergesetz*, NWG); Saxony: paragraph 23(4), no. 6 of the Saxony Water Act (*Sächsisches Wassergesetz*, SächsWG); Saxony-Anhalt: paragraph 105(1) 3rd sentence of the Water Act for the Land of Saxony-Anhalt (*Wassergesetz für das Land Sachsen-Anhalt*, WG LSA) and paragraph 1(3), no. 7 of the Regulation on a charge for the abstraction of water from bodies of water for the Land of Saxony-Anhalt (*Verordnung über die Erhebung eines Entgelts für die Entnahme von Wasser aus Gewässern für das Land Sachsen-Anhalt*, WassEE-VO LSA). — North Rhine-Westphalia abolished the exemption for lignite in 2011, however. There, the previous paragraph 1(2), no. 9 of the Water Abstraction Charge Act of the Land of North Rhine-Westphalia (*Wasserentnahmeentgeltgesetz des Landes Nordrhein-Westfalen*, WasG) was withdrawn.

[112] The scope of these subsidies is difficult to quantify precisely, so this is a ballpark figure. Lechtenböhmer et al. (2004, p. 43) estimate it to be between EUR 22.8 million and EUR 57.7 million. In 2018, the Forum Ökologisch-Soziale Marktwirtschaft (FÖS) estimated the concessions granted through the waiver of water abstraction charges for 2017 to be EUR 17 million (FÖS 2018a, p. 9). The German Environment Agency considers an estimated value of free water abstraction in the sum of EUR 20 million to be plausible.

[113] Uhlmann et al. (2015).

[114] Government-State Agency for Lignite Remediation (*Bund-Länder-Geschäftsstelle für die Braunkohlesanierung*) (2020) and UBA (2021b), p. 57.

cast lignite mines should receive neither explicit nor implicit subsidies that contradict the polluter pays principle.

A reduction in the subsidy volume is expected in the coming years, because the use of lignite for firing power plants in Germany will decrease as a result of the coal phase-out and lignite will not be exported due to its low energy content. However, the lignite industry will receive compensation payments in the billions in the coming years on the basis of the agreed closure of lignite-fired power plants. In a public-law contract, the Federal Government promised the operators of lignite-fired power plants compensation payments in the total sum of EUR 4.35 billion. In return, the companies waived any claims on the grounds of closures of their plants and on the grounds of the resulting employee redundancies.[115]

2.1.7 Energy tax concessions for coal

Unlike other heating fuels such as oil and gas, coal remained untaxed in Germany for a long time. As required by the European Energy Tax Directive, the Federal Government introduced taxation, for coal used for heat generation only, within the framework of the Energy Tax Act as of 1 August 2006. The tax rate is EUR 0.33 per gigajoule (GJ), based on calorific value.[116] It corresponds to the minimum tax rate laid down in the EU Energy Taxation Directive for the private use of coal. For social reasons, the coal tax for private households remained suspended until 2010. As of January 2011, private consumers also pay the tax rate of EUR 0.33 per GJ.

Based on energy and CO_2 content, coal is taxed far less than other fossil fuels. This results in distortions of competition on the heating market that are associated with high social costs, as coal is the most environmentally and climate damaging fossil fuel. In addition, the energy tax rate does not even remotely reflect the environmental and health impacts of coal use in terms of sulphur dioxide, CO_2 emissions and particulate matter. The low energy tax rate for coal should therefore be classified as an environmentally harmful subsidy.

In principle, energy taxation should be based on uniform benchmarks such as energy content and CO_2 intensity. If the energy tax rate is based in equal parts on CO_2 emissions, and if the current tax rate for light heating oil of EUR 61.35 per 1,000 litres is used as a reference value, the appropriate tax rate for coal is EUR 1.98 per GJ, which is six times higher than the current rate.[117] Multiplying this tax rate difference (EUR 1.65 per GJ) by the volume of coal subject to tax for 2018 in the sum of 51,427,228 GJ results in a subsidy volume for 2018 of approximately

EUR 85 million.

To remedy the environmentally harmful advantage granted for coal on the heating market, it is therefore necessary and appropriate to raise the energy tax rate on coal. This should apply equally for both business and private use.

In this context, the reform of the European Energy Tax Directive will also provide guidance. At EUR 0.9 per GJ, the proposed minimum tax rate for coal laid down in the European Commission's draft is significantly higher than the current tax rate in Germany. Regular adjustments of the tax rate in line with inflation are also laid out.[118] However, taxation of all fossil fuels based on energy

[115] https://www.bmuv.de/en/topics/climate-adaptation/climate-protection/national-climate-policy/translate-to-english-fragen-und-antworten-zum-kohleausstieg-in-deutschland

[116] Paragraph 2(1), no. 9 EnergieStG.

[117] If the energy tax rate is based only on energy content as suggested by the EU Commission in its proposed reform of the Energy Taxation Directive, the tax rate is somewhat lower.

[118] EU Commission (2021).

content would have to be even higher if the current tax rate for heating oil is taken as a reference.

To avoid social hardship, the government should set up an accompanying support scheme to provide financial support for the replacement of the often old and inefficient coal-fired heating systems. However, it must be ensured that financial support is only provided for environmentally friendly solutions, e.g. for heat pumps.

2.1.8 Manufacturer privilege for producers of energy products

According to the manufacturer privilege provided for in the Energy Tax Act, companies that produce energy products — e.g. refineries, and gas production and coal plants — do not pay tax on energy sources used in their production processes.[119] This concerns both energy products produced on their own premises and those that are procured externally, such as mineral oils, gases or coal. According to information provided by the Federal Government, the tax losses incurred in 2018 amounted to

EUR 342 million.[120]

Refinery processes and other processes involved in the manufacture of energy products are often very energy- and emission-intensive. Given the manufacturer privilege, there are no tax incentives to improve the energy efficiency of such processes and consequently to reduce greenhouse gas and air pollutant emissions. This advantage that is granted to producers of energy products under environmental policy is therefore inappropriate. Heating fuels that are available on the market — such as light heating oil or gas — should be subject to regular energy taxation even if they are used in manufacturing facilities. In this respect, refineries and gas production and coal plants should be subject to the same energy tax regulations as other energy-intensive companies in the manufacturing industry.

By contrast, non-marketable substances such as distillation and conversion residues from refineries should still not be taxed. The aim must still be to ensure that such residues are used on the refinery site (or nearby) using suitable equipment with effective and extensive waste gas cleaning facilities. Taxation would increase the incentive to make uncontrolled use of these residues for other purposes that are particularly harmful from an environmental perspective — for example, as heavy fuel oil.

It is central to any reform endeavours that the manufacturer privilege exists EU-wide and the European Energy Taxation Directive excludes the taxation of internally generated energy sources.[121] Under EU law, it is currently only possible to tax purchased energy sources. Efforts should therefore be made to lift the ban on taxation for internally generated energy sources in the Energy Taxation Directive. A corresponding amendment to this Directive was actually called for in a report commissioned by the Federal Ministry of Finance in 2009.[122] The planned reform of the European Energy Taxation Directive provides an opportunity to do this.

2.1.9 Energy tax exemption for non-energy uses of fossil fuels

Energy products that are not used for heating or as fuel or for the production thereof are excluded from energy taxation.[123] For example, mineral oils are used as raw materials for the

[119] Paragraphs 26, 37, 44, 47a EnergieStG.

[120] BMF (2019a), p. 379.

[121] Article 21(3), 1st sentence EU Energy Taxation Directive.

[122] Fifo et al. (2009), p. 17.

[123] Paragraph 25(1) EnergieStG.

production of plastics, paints, solvents and fertilisers. Natural gas is a raw material in the production of ammonia. And there are also refinery products used for non-energy purposes, such as bitumen and lubricants. In 2018, the non-energy use of energy sources in Germany corresponded to an energy equivalent of 807 PJ (petajoules). This amounted to 6.1% of total primary energy consumption.[124]

The tax exemption for non-energy uses of fossil fuels is not justified, because use as feedstock ultimately also contributes to the depletion of finite resources, and waste is generated and greenhouse gases are emitted during the life cycles of the manufactured products. Greenhouse gases are also generated during the production and use of chemical and petrochemical products, because carbon oxidises and is released as CO_2.

The tax rates for light heating oil of EUR 61.35 per 1,000 litres (corresponding to EUR 1.69 per GJ) and for natural gas of EUR 5.50 per MWh (corresponding to EUR 1.53 per GJ) should be taken as reference values for the appropriate level of taxation.[125] Taking into account a consumption of 807 PJ, the tax loss for 2018 amounts to EUR 1,362 million and EUR 1,236 million, respectively. On average, there is a tax loss of EUR 1,299 million. However, because the majority of non-energy use is attributable to heating oil, which is taxed at a higher rate, the value should be considered a minimum value. On this basis, the subsidy volume for the non-energy use of fossil fuels is

at least EUR 1,299 million.

In light of this, tax incentives should also be created within a political context to encourage fossil fuels to be used more efficiently, even as raw materials, and to replace them with renewable materials, as well as to avoid waste and greenhouse gas emissions. Energy sources that are not used for energy purposes should be taxed based on their environmental impact on the consumption of resources. In the interests of effective environmental policy and international competitiveness, such a regulation should be introduced EU-wide, if possible, or in a group of pioneer states. The planned reform of the European Energy Taxation Directive provides an opportunity to do this.

2.1.10 Free allocation of greenhouse gas emission allowances

Since the beginning of the third trading period (2013–2020), emission allowances have predominantly been auctioned through the European Emissions Trading System. All allowances for emissions from electricity generation must therefore be purchased on the market.[126] In principle, auctioning emission allowances is the preferable approach because this is the only way in which the 'polluter pays' principle can be fully accommodated, and the resulting proceeds can be used for climate protection measures. If competing companies abroad are subject to lower climate protection requirements or to lower CO_2 prices or no CO_2 prices at all, there is the risk that European energy-intensive industries will become less competitive or that production processes and the associated emissions will be relocated abroad (carbon leakage). For the manufacturing industry and heat production, a decreasing number of allowances per year are therefore granted for free on the basis of strict and EU-wide consistent benchmarks.[127]

[124] AGEB (2020b), table 2.2. This percentage is calculated based on primary energy consumption of 13,129 PJ (ibid.).

[125] Paragraph 2(3), no. 3, 4 EnergieStG. — GJ = gigajoule(s).

[126] In accordance with Article 10c of the Emissions Trading Directive, there are exceptions for Eastern European Member States, which can by contrast grant electricity producers allowances for free in return for investment in the modernisation and diversification of electricity production.

[127] Air transport within Europe is also subject to the European Emissions Trading System, and aircraft operators receive allowances for emissions amounting to around 85% of the emissions cap set for the aviation sector as a free allocation. Since, in the EU ETS, it is not aircraft emissions but instead aircraft operators that are attributable to individual states, however, no specific conclusions can be

By allocating emission allowances for free, the government forgoes revenue that it would have obtained if it had auctioned the emission allowances. The free allocation of emission allowances therefore constitutes an implicit subsidy (indirect budgetary effect insofar as the government grants rights at prices below the market price). The free allocation does not change the amount of the *caps*, i.e. the total volume of emissions that can be emitted. However, there is the risk that industry will feel less motivated to reduce its emissions.[128] Investments could also be made in emission-intensive processes and technologies ('lock in' effects) or investments in low-emission processes and technologies may not be made at all. On the other hand, the aim of free allocation is to facilitate an ambitious climate protection policy while ensuring the competitiveness of European energy-intensive industries and avoiding carbon leakage. Because the free allocation is carried out in accordance with consistent EU-wide regulations, Germany has no direct influence on the amount of this subsidy either.

In 2018, approximately 145 million of the annual greenhouse gas emission allowances in Germany were allocated for free to plants in energy-intensive industries and to a limited extent to the energy industry.[129] With the average price in 2018 being valued at EUR 15.96 per emission allowance or per ton of CO_2 equivalent,[130] this results in a subsidy volume of

EUR 2,134 million.

The amount of the subsidy fluctuates over the years: on one hand, free allocation decreases every year; on the other hand, the price of an emission allowance has been subject to strong fluctuation in recent years. While, in 2016, an emission allowance was on average EUR 5.36, the average price rose to almost EUR 16 in 2018 and almost EUR 25 in 2019. Allowance prices of more than EUR 50 have now been recorded, due, among other things, to stricter EU climate protection targets.

The scale of free allocation is limited: Each company only receives as many allowances as the most efficient companies in the relevant sector EU-wide. There are 52 products for which such an emission benchmark exists; for the other products, so-called 'fallback' approaches are used. The less a certain plant's emissions surpass this product benchmark, the fewer allowances a company has to purchase for this plant. The benchmarks will be gradually reduced in the fourth trading period (2021–2030).[131] Alternatives and supplements to free allocation are currently being discussed at European level with the aim of avoiding carbon leakage alongside ambitious climate targets.

2.1.11 Grants for electricity-intensive companies to compensate for the rise in electricity prices due to emissions trading

Since 2013, EU Member States have been able to pay grants to companies in certain sectors to compensate for the rise in electricity prices due to emissions trading (electricity price compensation).[132] For this purpose, the particularly electricity-intensive sectors that are in international

drawn as to the German proportion of these emissions and of free allocations, respectively. Therefore, this report does not show the free allocation for German air traffic.

[128] BMU (2018).

[129] Approximately 15.5% of the emission allowances allocated for free were attributable to energy plants and approximately 84.5% to industry, cf. DEHSt (2019), p. 68 et seq.

[130] DEHSt (2019).

[131] https://www.dehst.de/EN/european-emissions-trading/installation-operators/2021-2030/2021-2030_node.html;jsessionid=7687C29C0A6E32A60193428537E8482A.2_cid292

[132] Cf. Article 10a(6) of Directive 2003/87/EC with regard to an improvement and extension of the greenhouse gas emission allowance trading scheme of the Community. The regulation was added by Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending the aforementioned Directive.

competition were identified at EU level. At national level, the Federal Ministry for Economic Affairs has drawn up guidelines on providing compensation for indirect CO_2 costs that have been approved by the European Commission and have been in force retrospectively since January 2013.[133] In 2018, approximately EUR 202 million in total was paid out to 322 companies as electricity price compensation for 2017. While the number of companies remains the same, approximately

EUR 219 million

was paid out for 2018 in 2019 due to the slightly higher price for emission allowances.[134] Funding is provided by the Energy and Climate Fund (*Energie- und Klimafonds*, EKF).

The electricity price compensation system contradicts the emissions trading scheme: The price of emission allowances under the EU emissions trading system is also reflected in electricity prices and thus provides incentives to improve energy efficiency. The electricity price compensation system significantly decreases these incentives. It also has a tendency to lead to unequal competitive conditions in the European single market, as only states with the necessary budgetary leeway can finance a compensation system. In 2019, 13 compensation systems in twelve EU Member States were approved by the Commission (Germany, Flanders and Wallonia (Belgium), Finland, France, Greece, Great Britain, Lithuania, Luxembourg, Netherlands, Poland, Spain and Slovakia). There is also a system in Norway.

This is why the advantage provided through electricity price compensation should in principle be abolished. However, while the direct CO_2 costs of emissions trading are compensated for by free allocation to avoid carbon leakage, it is difficult to justify why there should be no compensation for indirect CO_2 costs. It applies for both the free allocation of emission allowances in emissions trading and for electricity price compensation that the advantages granted should only apply for those companies for which there is actually a risk of carbon leakage, however. Alternatives and supplements to free allocation are currently being discussed at European level in order to prevent carbon leakage. Depending on the structure, the introduction of certain instruments would have effects on the structure of the electricity price compensation scheme too.

For the fourth trading period, compared to the third trading period, the Emissions Trading Directive no longer just provides the option to compensate for indirect CO_2 costs; it also contains a requirement for Member States to implement corresponding financial measures.

The basis for the electricity price compensation scheme under European law is the EU ETS state aid guidelines for indirect CO_2 costs. These were revised by the European Commission for the fourth trading period and published in September 2020.[135]

In particular, they contain amendments to the list of sectors that are eligible for aid in accordance with Annex II, a constant maximum aid intensity of 0.75 for the entire period from 2021 to 2030, actual production volumes and electricity consumption levels as a basis for calculating the aid, the obligation to make environmental improvements in return when a company is of a certain size or above, and the option to increase the amount of aid depending on the gross value added of the company applying.

[133] Announcement by the Federal Ministry for Economic Affairs on the amendment of the directive for subsidies for companies in sectors or sub-sectors in which it is assumed that, in light of the costs associated with the EU ETS allowances, which can be passed on the price of electricity, there is a substantial risk of carbon leakage (subsidies for indirect CO_2 costs) of 23 July 2013 (BAnz AT 06/08/2013 B2), last amended by the second amendment to the directive (BAnz AT 28/08/2017 B1).

[134] DEHSt (2020), p. 3.

[135] EU Commission (2020c).

The possibility to increase the amount of the aid depending on the gross value added of the applying companies is seen negatively because it would again lead to a significant increase in the electricity price compensation paid.

The obligation to implement environmental improvements in return is a positive new element — for the first time, companies do not just have to introduce an energy management system; they also have to take measures to improve energy efficiency, for example, in order to receive the electricity price compensation.

The EU state aid guidelines are implemented at national level in the form of a funding guideline (*Förderrichtlinie*) issued by the Federal Ministry for Economic Affairs and Energy. The German Funding Guideline for Electricity Price compensation from 2021 onwards had not yet been published at the time of going to press, so the exact details of implementation in Germany are still unknown.

2.1.12 EEG Special Compensation Scheme

The Renewable Energy Sources Act (*Erneuerbare-Energien-Gesetz*, EEG) is a tool for promoting the expansion of renewable energies in the interest of climate and environmental protection. The aim is to increase the proportion of electricity generated using renewable energies as a proportion of gross electricity consumption to 65% by 2030 and to achieve greenhouse gas neutrality in electricity generation by 2050.[136] The promotion of renewable energies is financed by a surcharge on electricity consumption.[137]

The aim of the EEG BesAR (*Besondere Ausgleichsregelung*, Special Compensation Scheme) is to limit the burden of the surcharge on certain groups of users.[138] This includes companies with high electricity costs[139] and railway operators.[140] Since the new EEG 2021, the following categories now also fall under the BesAR:

- Electricity that is used by the company for the electrochemical production of hydrogen,[141] and
- On-shore electricity that is supplied by on-shore electricity production facilities to seagoing vessels and used on seagoing vessels.[142]

The objective of the BesAR is to maintain international competitiveness for companies with high electricity costs. As is the case with electricity and energy tax concessions, it addresses the danger of the potential relocation of production abroad, with the associated risks (job losses and carbon leakage). Additionally, the BesAR also allows in part for the risk of an increase in the surcharge, because, if production were relocated abroad, the surcharge would be shared among a smaller group of end users.[143] The net effect is unclear, however, because the surcharge increases not least as a result of the (expansion of the) concession rules too.

[136] Paragraph1(1), (2), (3) EEG 2021.

[137] Based on the premise that the expansion of renewable energies is beneficial for the environment overall, the assistance itself (feed-in payment, *Einspeisevergütung*) is not considered in this report.

[138] Paragraphs 63 to 69a EEG 2021.

[139] Paragraph 63, no. 1 in conjunction with paragraph 64 EEG 2021.

[140] Paragraph 63, no. 2 in conjunction with paragraph 65 and 65a EEG 2021. In the EEG 2021, the matter of electric buses (governed by paragraph 65a EEG 2021) is now covered too.

[141] paragraph 63, no. 1a in conjunction with paragraph 64a EEG 2021.

[142] Paragraph 63, no. 3 in conjunction with paragraph 65b EEG 2021.

[143] BAFA (2019a), p. 1.

For a company to be considered to have high electricity costs, it must, in accordance with paragraph 64(1) EEG 2021, belong to one of the sectors listed in Annex 4 EEG 2021, have consumed in the last financial year a volume of electricity of more than 1 GWh that is fully or partially subject to the surcharge and exhibit a minimum electricity cost intensity of between 11% (list 1) and 20% (list 2).[144] For these companies, the EEC surcharge for electricity consumption above the first gigawatt hour is limited to 15% of the regular surcharge rate.[145] The surcharge payable is reduced even further if necessary as it should amount to a maximum of 0.5% (with an electricity cost intensity of at least 20%) or 4.0% (with an electricity cost intensity of below 20%) of the gross value added.[146] However, the surcharge payable for the proportion of electricity above 1 GWh cannot exceed a value of 0.1 cent per kWh.[147]

For the railways, the BesAR is aimed at protecting inter*modal* competitiveness, i.e. competition between different modes of transport. A limitation of the EEG surcharge is subject to proof that the volume of electricity, excluding any fed-back energy, amounted to at least 2 GWh and was used 'directly for vehicle operation' at the delivery point concerned in the last financial year.[148] If such proof is provided, the surcharge payable for the company is limited to 20% of the usual surcharge for the entire volume of electricity that it uses directly for transport (excluding any fed-back energy) at the delivery point concerned.[149]

The Federal Office for Economic Affairs and Export Control (*Bundesamt für Wirtschaft und Ausfuhrkontrolle*, BAFA) is responsible for handling the BesAR. According to information provided by the BAFA, the relief granted to companies with high electricity costs and to railways in 2018 amounted to

EUR 5.4 billion.[150]

Figure 5 shows the extent to which the total relief granted through the BesAR has increased since 2006. This is due in particular to the increasingly generous regulations resulting from the amendments to the EEG.

Granting such relief to industry and the railways significantly decreases the incentives to use electricity efficiently and to not make use of savings potential. As the EEG is financed by a surcharge, the relief granted to industry and the railways inevitably leads to a greater burden on unprivileged consumers.[151] This primarily affects private households, but also companies that fall below the thresholds for electricity consumption and electricity intensity. As a result, there

[144] For a company to fulfil the condition of having high electricity costs, it must, in accordance with paragraph 64(1) EEG 2021, belong to one of the sectors listed in Annex 4 EEG 2021, have consumed in the last financial year a volume of electricity of more than 1 GWh that is fully or partially subject to the surcharge, exhibit a minimum electricity cost intensity of between 11% and 20% (depending on whether allocated to ['list 1', 'list 2'] in Annex 4 EEG 2021 and — in the case of list 1 — the specific year of application) and operate a certified energy or environmental management system. In respect of the last point, the following applies: If the company has consumed less than 5 GWh electricity in the last financial year, a so-called 'alternative system for improving energy efficiency' in accordance with paragraph 3 of the Peak Equalisation Efficiency System Regulation is sufficient.

[145] Paragraph 64(2), no. 1, 2 EEG 2021. — In 2018, under the EEG 2017, the surcharge payable was solely limited to 20% if a company was on 'List 2' of Annex 4 EEG 2017, provided the electricity cost intensity was between 14% and 17% (cf. paragraph 64(2), no. 2b EEG 2017).

[146] Paragraph 64(2), no. 3 EEG 2021.

[147] Paragraph 64(2), no. 4 EEG 2021. For delivery points that are allocated to sectors that handle the production and initial processing of lead, zinc, tin, copper and other metals, the minimum value payable is lower at 0.05 cents per kWh, however (cf. paragraph 64(2), no. 4a in conjunction with Annex 4 EEG 2021).

[148] Paragraph 65(1) EEG 2021.

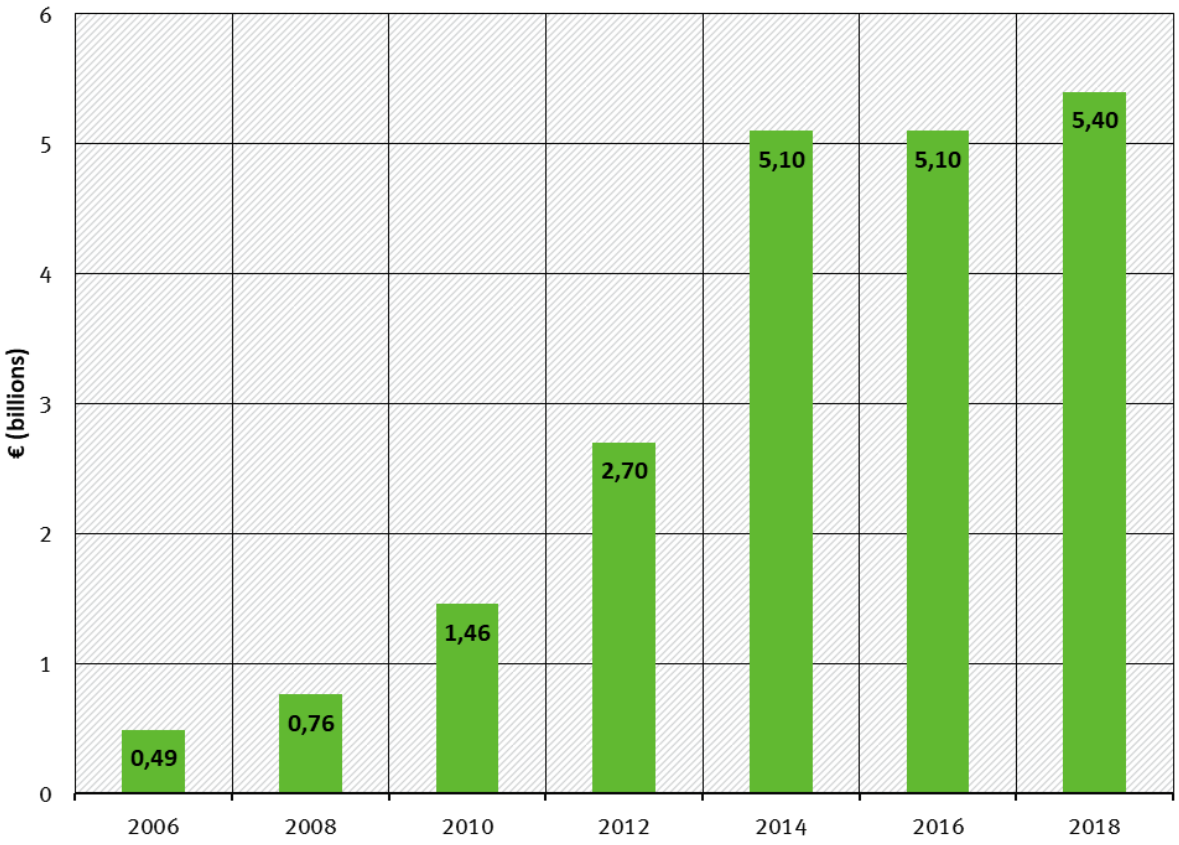
[149] Paragraph 65(2) EEG 2021. — The new paragraph 65a of EEG 2021 on the regulation of the BesAR for electric buses running scheduled services is not discussed here.

[150] BAFA (2019a), p. 12.

[151] The higher burden on unprivileged consumers actually increases their incentive to use electricity efficiently. This does not lead to a cost-effective improvement in energy efficiency, however.

are negative distribution effects. It also gives rise to distortions of competition between beneficiary and non-beneficiary companies. In addition, the unequal burden on consumers also has a negative impact on solidarity in financing the energy transition.

Figure 5: Development of the scope of the reductions granted through the Special Compensation Scheme



Sources: BAFA (2019a), p. 12, for 2018 and 2016; BMWi (2015), p. 76, for 2014; BMWi (2014a), p. 103, for 2012; BMWi/BMU (2012), p. 93, for 2010, 2008 and 2006.

The list of sectors is interpreted too broadly, i.e. electricity-intensive companies also benefit from the concessions although there is no significant risk of carbon leakage. The European Commission's list of industries that are entitled to electricity price compensation can be taken as the basis for the more stringent limitation of the list of eligible industries.

Companies that have previously benefited from the BesAR but have lost their status as a result of the revised regulation should pay the full EEG surcharge in future. Transition regulations may be helpful as a means of helping companies adjust to the higher surcharge payments. The fact that privileged companies only have to achieve minor environmental improvements in return is also seen in a negative light. Currently, they only have to operate a certified energy or environmental management system. If they have consumed less than 5 GWh electricity in the last financial year, even the so-called alternative system for improving energy efficiency in accordance with paragraph 3 of the Peak Equalisation Efficiency System Regulation is sufficient. It would make sense to require them to take the economic energy-saving measures identified within the context of the energy or environmental management system. Delivery points with more than 10 GWh of electricity procured per year should also fulfil the technical, organisational and legal conditions for use of load management on the electricity market.

2.1.13 Self-consumption privilege under the EEG for existing plants

The aim of the EEG is to promote electricity generation from renewable energies and related investments. This measure is financed by a surcharge on electricity consumption (EEG surcharge). Besides the existing (and expanded) Special Compensation Scheme (cf. section 2.1.12), the use of internally generated power initially benefited from preferential treatment in respect of the EEG surcharge too.

Up to and including the EEG 2012, the use of internally generated power was exempt from the surcharge.[152] When the EEG came into force in 2000, as well as in the years that followed, internally generated power only made up a small proportion of all power. This proportion has constantly increased over time, however, especially because exemption from the surcharge provided an incentive to ramp up internal energy production. This also meant that the surcharge could be distributed among fewer and fewer users and therefore constantly increased.[153] Furthermore, the initiation of state aid proceedings by the EU Commission against the EEG exemptions also prompted corrective action in this regard.[154]

Against this backdrop, a correction was made in principle with the EEG 2014, so that since then internal power generation has also generally been included in financing.[155] However, there is still some privileged use of internally generated power, of which — from an environmental perspective — the continuing privileges of the existing plants must be taken into account because plants that were commissioned prior to August 2014 are still fully exempt from the surcharge.[156] This includes plants that generate energy on the basis of fossil fuels and which make up a large part of industrial internal power generation.

The continued exemption of internally generated power from the EEG surcharge diminishes the incentive to save electricity among the privileged companies. This is negative from a climate protection point of view. For existing fossil fuel-fired facilities, the regulation also has a lock-in effect, in a similar way to a subsidy for unsustainable power generation. The continued existence of such a privilege is also considered critically from the perspective of distribution and competition, because unprivileged users have to carry the burden of the renewable energies funding to a greater extent.

In connection with the remaining self-consumption privilege, there are therefore environmentally harmful subsidies in the sum of

[152] Paragraph 37(3) 2nd sentence EEG 2012 stated: 'If the end user operates the power generation plant as a self-producer and uses the power generated themselves, the transmission system operator's claim for payment of the EEG surcharge for this power is lost [...], unless the power 1. passes through a network or 2. is used within the vicinity of the power generation plant.'

[153] The result is a spiral in which an increasing surcharge provides an incentive to generate power internally and the expansion of internal generation (which is exempt from the surcharge) in turn causes the surcharge to increase, cf. BMWi (2014a), p. 35.

[154] On 18 December 2013, the European Commission initiated state aid proceedings against Germany, cf. Agora Energiewende (2014), p. 4, 6.

[155] Paragraph 61(1) EEG 2021. — This refocus was agreed in the coalition agreement between the CDU, CSU and SPD in 2013: '[We] advocate that all internally generated power should be included in the EEG surcharge in principle. All new producers of internally generated power should therefore contribute to the basic financing of the EEG by means of a minimum surcharge [...].' (CDU et al. 2013, p. 40) As a result, paragraph 61(1) EEG 2021 now reads: 'Network operators are entitled and obliged to charge end users the EEG surcharge for 1. internally generated power and 2. other consumption of power that is not supplied by an electricity supply company.'

[156] Paragraphs 61e to 61h EEG 2021. — The surcharge payable is also reduced to 40% of the regular surcharge when using renewable energies and fire-damp (paragraph 61b(1) EEG 2021) and for highly efficient heat and electricity cogeneration plants (paragraphs 61c and 61d EEG 2021). In accordance with paragraph 61a, full exemption is still granted for power plants' own use (no. 1), for stand-alone power systems (no. 2), for complete self-supply with power generated using renewable energies (no. 3) and in minor cases (no. 4). Since the EEG 2021, full exemption is now also granted for a maximum of 30 MWh of self-consumed power per calendar year for internal generation facilities in which only renewable energies and fire-damp are used and which have an installed capacity of up to 30 kilowatts (paragraph 61b(2) EEG 2021).

EUR 3,660 million.[157]

The inclusion of internally generated power in the EEG surcharge is a positive development, particularly because it counteracts the deconsolidation in respect of the financing of the EEG. The grandfathering in respect of fossil fuels should be brought to an end.

2.1.14 Concessions for energy-intensive industry with regard to electricity grid fees

Electricity grid operators charge a fee for using their networks. As the networks have a natural monopoly, the setting of fees is regulated by the government through the Ordinance on Electricity Network Charges (*Stromnetzentgeltverordnung*, StromNEV).[158] The costs of the electricity network are passed on the end users through the regulated network fees.[159] The network fees are calculated based on a schedule of the different costs.[160] In light of this, the fees vary regionally, as the relevant cost drivers differ by region.[161] On the demand-side, the fee owed is in principle still only based on the relevant individual user's use of the network.[162]

There is an exemption for energy-intensive companies, however. When both at least 7,000 operating hours and an electricity consumption of more than 10 GWh are attained per delivery point and calendar year, the consumer should be offered an 'individual network fee'.[163] In this case, the user may receive reductions of up to 90% against the regular network fee.[164]

The relief provided through reduced ('individual') network fees in accordance with paragraph 19(2), 2nd sentence StromNEV in 2018 amounted to

EUR 611 million.[165]

An increase has been observed here in recent years. This development might also have been influenced by handling changes.[166]

The exemption in accordance with paragraph 19(2), 2nd sentence StromNEV provides privileged companies significantly less of an incentive to use electricity efficiently. As an advantage is only granted for 7,000 hours or more of full load, this provision also creates a strong incentive to continuously keep electricity consumption above this threshold. In order to justify this advantage, it is also argued that a consistently very high level of electricity consumption 'contributes significantly to grid stability'.[167] With regard to the energy transition, however, it must be noted that government incentives for consistently high electricity consumption inhibit the integration into the electricity market of renewable energies, which are characterised by fluctuating yields. To improve grid stability with increasingly fluctuating levels of renewable energies being feed back in, it is particularly important that there are flexible consumers who can cut down on

[157] FÖS (2021), p. 54.

[158] It reads: 'Payment of the network fee covers use of the network or transformer levels of the relevant operator of the electricity supply network to which the network user is connected, and all higher network levels (paragraph 3(2) StromNEV).

[159] BNetzA/BKartA (2019), p. 164.

[160] Paragraph 3(1), 1st sentence in conjunction with paragraphs 4 et seq. StromNEV.

[161] These factors include: Network capacity, population density, differing costs for feed-in management measures, age and quality of networks (BNetzA/BKartA 2019, p. 164).

[162] Paragraph 17(2) StromNEV.

[163] Paragraph 19(2), 2nd sentence StromNEV.

[164] Paragraph 19(2), 3rd sentence StromNEV. — The exact criteria for calculating individual network fees were last laid down in 2013 by the Federal Network Agency (*Bundesnetzagentur*, BNetzA), cf. BNetzA/BKartA (2019), p. 186.

[165] BNetzA/BKartA (2019), p. 188.

[166] Ibid., p. 186 et seq.

[167] German Bundestag (2012), p. 14.

their usage at short notice if supplies are low and ramp it back up again when the electricity supply is high.[168] Besides counterproductive incentives for grid stability and the electricity market resulting from consistently high electricity consumption, granting advantages on network fees also reduces incentives to save electricity.

In principle, companies should pay the full fee to use the electricity networks to adequately cover their share of the costs. This would also create stronger incentives for energy efficiency measures. It should be possible to grant benefits to grid users who provide a service to society, for example by contributing to grid stability. However, it is important here that the contribution consists of more than simply the consumption of electricity and actually constitutes a relevant input. Companies should not be disadvantaged by the performance of system services or the decrease in network demand from renewable energies resulting from load management either. If there are also demonstrable and unreasonable disadvantages for companies that are engaged in international competition, a hardship regulation should apply.

2.1.15 Privileges for special-contract customers with regard to concession charges for electricity (and gas)

On the basis of concession agreements, cities and communities can demand a payment — the concession charge — from electricity and gas network operators for the use of public space.[169] This is an important source of revenue for cities and communities. The Network Concession Agreement (*Konzessionsabgabenverordnung*, KAV) of 1992 lays down the maximum permitted charge rates. They depend among other things on the population of the community, the voltage level (for electricity), the type of use (for gas) and the annual consumption. The permitted maximum charge rate for electricity is 2.39 cents per kWh and for gas 0.93 cents per kWh.[170]

By contrast, when supplying so-called special-contract customers, the maximum concession charge is 0.11 cents per kWh for electricity and 0.03 cents per kWh for gas.[171] Such classification can result in savings of up to 95%. This legal privilege in respect of the concession charge is subject to the condition that the customer consumes more than 30,000 kWh of electricity per year and uses more than 30 kW in at least two months.[172] Under certain circumstances, the concession charge is even waived completely.[173] It can be assumed that all electricity-intensive companies are fully exempt from the concession charge.[174]

The reason given for the exemption (or reduction in the charge rates) for electricity is that a large proportion of the special-contract customers are directly connected to the medium and high-voltage grids and therefore make less use of the public infrastructure than a typical

[168] VDE (2012), p. 57; BMWi (2014b), chapter 3 and section 4.3.

[169] Paragraph 48(1), 1st sentence of the German Energy Industry Act (*Gesetz über die Elektrizitäts- und Gasversorgung*, *Energiewirtschaftsgesetz*/EnWG) states: 'Concession charges are fees that energy supply companies pay for being granted the right to use public roads to lay and operate lines that are used to directly supply energy to end users in the municipal area.'

[170] Paragraph 2(2) KAV. — In practice, the amounts of the charges set by the communities vary greatly.

[171] Paragraph 2(3) KAV.

[172] Paragraph 2(7), 1st sentence KAV.

[173] The concession charge is waived in full if the average price for special-contract customers is less than the calculated threshold price. For this purpose, the average price for the individual special-contract customer is calculated including electricity tax as well as surcharges in accordance with the EEG and the Cogeneration Act, without value added tax and concession charge, but including the remuneration under paragraph 10 StromStG. The German Federal Statistical Office (*Statistisches Bundesamt*) calculates the threshold price as the average price per kilowatt hour for the supply of electricity to all special-contract customers in the penultimate calendar year, excluding value added tax. Supply companies and municipalities can agree higher threshold prices (cf. paragraph 2(4) KAV). — For gas, the concession charge for special-contract customers is waived completely in the event of annual consumption of 5million kWh or above (cf. paragraph 2(5) KAV).

[174] IZES (2009), p. 89.

household customer who is connected via the low-voltage grid.[175] Even taking this into account, complete exemption from the concession charge is in any case a subsidy for the companies concerned as public infrastructures are used. Another question that arises is whether the maximum amount for special-contract customers is determined appropriately.

In 2018, the total relief for industry due to the concession charge scheme for electricity and gas amounted to

EUR 3.6 billion.[176]

The privileges for special-contract customers reduce the incentive to improve energy efficiency and thus lead to adverse environmental and climate impacts. This applies in particular to schemes that permit exemption from the concession charge because for companies with an electricity consumption just below the threshold figure of 30,000 kWh or 5 million kWh (gas) per year, they constitute a massive incentive to increase their electricity consumption. At the same time, companies who are just above the threshold value have no further incentive to make full use of their efficiency potential and thereby decrease their electricity consumption.[177]

The legislator should therefore reform the Network Concession Agreement. Complete exemption from the concession charge should no longer be possible in future. In addition, changes in the eligibility criteria must be permitted to ensure that there are no incentives for increased electricity consumption and that efficiency potentials are utilised. Like network fees, concession charges should also be designed to be compatible with the electricity market so that, for example, plants for internal consumption are not operated against the electricity market.

2.1.16 Reduced rates for the cogeneration surcharge

Technologies that combine electricity generation and heat production (cogeneration of heat and electricity) enable particularly high efficiency when using energy sources.[178] They are therefore legally encouraged by the Cogeneration Act (*Kraft-Wärme-Kopplungsgesetz*, KWKG).[179] This law aims to increase electricity generation using the cogeneration of heat and electricity to 110 terawatt hours by 2020 and to 120 terawatt hours by 2025. This is promoted in the interest of saving energy and protecting the environment and the climate.[180] At 115 terawatt hours, the net electricity generation from cogeneration in 2018 was already above the target value for 2020. Accordingly, the cogeneration expansion target will probably be achieved.[181] Other targets are now coming to the fore too, particularly reducing the amount of cogeneration-related CO_2 through increasing proportions of renewable energies.

Similar to the EEG, the Cogeneration Act provides a connection and purchase obligation for the feed-in of CHP power into the network[182] as well as an entitlement to premium payments for CHP power in order to support the development of cogeneration plants.[183] Consumers bear the

[175] Monopolies Commission (*Monopolkommission*) (2013), p. 231.

[176] Based on own calculations.

[177] Raue LLP (2013), p. 18.

[178] The energy sources are used to generate both power and heat so that the degree of efficiency is significantly higher than in power plants, which do not make use of waste heat. — See also, for example, BMWi (2019), p. 157, and (2018), p. 104.

[179] Full title: Act on the Preservation, Modernisation and Expansion of Cogeneration of Heat and Electricity (*Gesetz für die Erhaltung, die Modernisierung und den Ausbau der Kraft-Wärme-Kopplung*).

[180] Paragraph 1(1) KWKG.

[181] UBA (2020d), p. 13.

[182] Paragraph 3 KWKG.

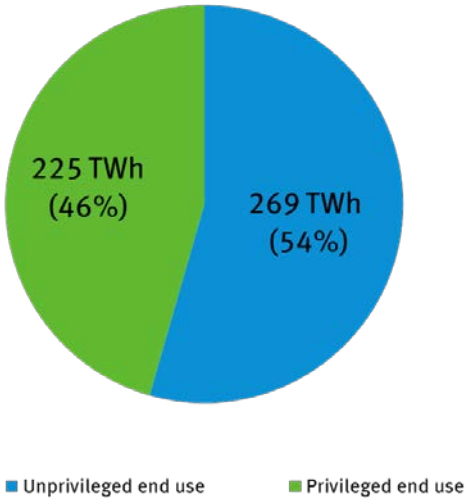
[183] Paragraph 5 et seq. KWKG. — Premium payments are also granted for heating and cooling networks (paragraphs 18 et seq. KWKG) as well as heating and cooling accumulators (paragraphs 22 et seq. KWKG).

costs of this scheme through the so-called Cogeneration Act surcharge.[184] The amount of this surcharge is primarily based on the need for assistance and is recalculated every year.[185] As with the EEG, the amount of the surcharge also depends on the scope of privileges among consumers, however.[186]

The Cogeneration Act surcharge is limited for electricity cost-intensive companies in particular.[187] The objective is to protect the international competitiveness of the companies concerned. Furthermore, there are caps on the Cogeneration Act surcharge for systems for generating electricity using by-product gases, for energy storage devices and for railways.[188] At the same time, the regulations of the Special Compensation Scheme under the EEG were largely transferred to the Cogeneration Act in 2016.[189]

In 2018, 225 terawatt hours (TWh) were used by privileged customers.[190] With a total consumption of around 495 TWh, this corresponds to approx. 46% or almost half of the total consumption (cf. Figure 6).

Figure 6: Volume of electricity consumed (in TWh) in 2018, broken down to privileged/unprivileged according to the Cogeneration Act



Source: www.netztransparenz.de/portals/1/KWKG_Jahresabrechnung_2018.pdf[191]

[184] Paragraph 26 KWKG.

[185] Paragraph 26a KWKG.

[186] If there is a need for assistance, the surcharge is increased (for unprivileged users) when the privileges for certain groups of users increase.

[187] Paragraph 27 KWKG.

[188] Paragraph 27a, 27b, 27c KWKG.

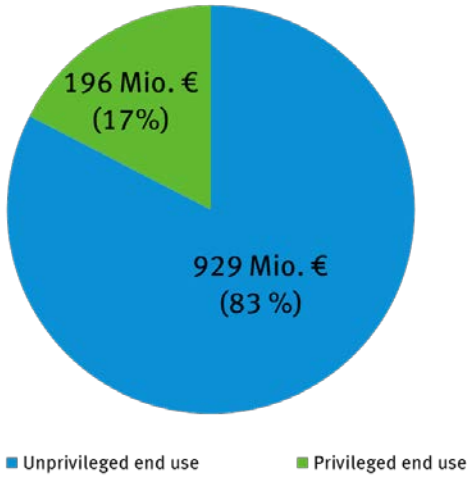
[189] Paragraphs 63 et seq. EEG 2017, as well as section 2.1.12 above. — BMWi (2018), p. 181, and (2016), p. 89.

[190] www.netztransparenz.de/portals/1/KWKG_Jahresabrechnung_2018.pdf —This is also the basis for the data provided below and includes the privileges in accordance with paragraphs 27, 27a, 27b and 27c KWKG. In addition, there are privileges due to transition regulations for electricity-intensive consumers and for electricity cost-intensive consumers in the manufacturing industry in accordance with paragraph 36(3) KWKG.

[191] In this source, a total amount of almost 485 TWh is reported in the table 'Record of End Use and Revenue from Cogeneration Act Surcharge in 2018' ('*Erfassung Letztverbrauch (LV) und Erlöse aus KWKG-Umlage in 2018*' for electricity consumption. There has clearly been a miscalculation here, however. Adding up the figures in the table column 'Quantity of electricity' (*Strommenge*), the result is almost 495 TWh.

By far the largest part of the heat and electricity cogeneration surcharge is paid by unprivileged customers. By contrast, the privileged consumers, who have to pay a much lower surcharge, only contribute EUR 196 million to the EUR 1.125 billion of surcharge revenue, which is approximately 17% (cf. Figure 7).

Figure 7: Surcharge payments (in millions of EUR) in 2018, broken down to privileged/unprivileged according to the Cogeneration Act



Source: www.netztransparenz.de/portals/1/KWKG_Jahresabrechnung_2018.pdf

Measured based on the surcharge applicable in 2018 (0.345 cents per kWh), the privileged end users saved around EUR 581 million in surcharge payments. To calculate the effective saving made by privileged consumers, it must be taken into account that if there were a need for financing, the regular surcharge rate would be lower. In light of this, the privileged end users save an amount of

EUR 316 million.[192]

As a result of the lower costs, there is less of an incentive to use electricity efficiently than for households and small businesses. The reduced surcharges should therefore be abolished and the same amount of surcharge should apply for all end users. This way, the surcharge would decrease for households and small businesses.

2.1.17 Subsidies for nuclear power

Germany will cease to generate nuclear power by the end of 2022 at the latest. As a result of the Thirteenth Amendment to the Atomic Energy Act (*Dreizehntes Gesetz zur Änderung des Atomgesetzes*), eight nuclear power plants were decommissioned and the closure of the remaining power plants is planned for 2022 at the latest. Therefore, what the Bundestag decided upon with a large majority following the nuclear disaster in Fukushima in March 2011 will now become reality in the imminent future.

Due to the health risks and environmental pollution resulting from uranium mining, the unresolved issue of the final disposal of waste and the danger of serious incidents, nuclear energy is an inherently environmentally harmful technology. There are more effective and efficient ways of reducing CO_2 emissions for climate protection too. During nuclear power generation — for example, during the mining and enrichment of uranium for fuel elements — more greenhouse

[192] Own calculations based on www.netztransparenz.de/portals/1/KWKG_Jahresabrechnung_2018.pdf.

gases are produced than when using wind power, hydropower or solar power. Increasingly scarce uranium reserves mean that the commodity is being mined even when the ore content is low, and, due to the increased energy consumption for the mining activities, the CO_2 emissions in the overall balance increase.[193]

The explicit and implicit subsidies granted for nuclear energy strengthen its economic viability and are the very reason why it is profitable from a business point of view at all. According to estimates, a nuclear accident could cause damage costing several trillions of euros.[194] In practice, nuclear disasters are therefore uninsurable.[195] The operator only bears a very small proportion of this risk. The remaining risk is borne by the government (and ultimately by society), which in this way *implicitly* subsidises nuclear energy. It is extremely difficult to quantify this subsidy. Estimates of the advantage resulting from the limited insurance obligation for nuclear power plants range — with respect to electricity generation — from EUR 0.139 per kWh and EUR 67.3 per kWh.[196] In addition, there are substantial financial benefits for power plant operators due to the creation of provisions, but the amount of these benefits is difficult to quantify and depends heavily on the underlying assumptions.[197]

Especially when it first started to be used for generating electricity, nuclear energy also received high *explicit* subsidies, particularly for research. There are also other government expenditures that are similar to subsidies, e.g. for the search for radioactive waste repositories.[198]

Calculating amounts of subsidies for specific years is particularly challenging in the case of nuclear energy. The Forum Ökologisch-Soziale Marktwirtschaft (FÖS) did calculate a subsidy figure of EUR 5.1 billion for 2019.[199] However, the FÖS used the term 'subsidy' in its study in a very comprehensive sense. Moreover, estimating the very significant volume of implicit subsidies (reserves and assumption of liability risks by the government) is extremely difficult. For these reasons, this report does not quantify the volume of subsidies for 2018.

As the end of nuclear energy becomes imminent, the issue of disposal takes centre stage. Nuclear power plant operators are indeed held responsible for financing through the Disposal Fund Act.[200] Furthermore, a wide range of expenses is to be expected, which taxpayers will ultimately have to cover, including the costs of finding a repository site, decommissioning former repository sites or potential compensation payments. The Forum Ökologisch-Soziale Marktwirtschaft (FÖS) considers government expenditure of at least EUR 7 billion in 2022 to be conceivable.[201]

[193] The intensity of greenhouse gas emissions from nuclear energy varies widely, depending on the study and its assumptions on ore content, and ranges from 2 to 288 g CO_2/kWh. However, the climate balance of nuclear power can be expected to deteriorate as a result of decreasing ore content (Wallner, A. (2011), p. 2 et seq.).

[194] Versicherungsforen Leipzig (2011), p. 94 et seq.

[195] Ibid., p. 103.

[196] The extra costs arising from an appropriate insurance premium — which is entirely hypothetical because, as described, the damage is uninsurable — strongly depend on the assumed period in which the funds would be provided (10 to 100 years) and the number of insured nuclear power plants individually or within a pool, cf. Versicherungsforen Leipzig (2011), p. 103.

[197] FÖS (2020b), p. 40.

[198] For the entire period from 1955 to 2022, FÖS estimates that nuclear energy will have received subsidies amounting to EUR 169.4 billion. Including implicit subsidies, this adds up to a subsidy volume of EUR 287.2 billion (in real terms at 2019 prices), cf. FÖS (2020b), p. 7.

[199] Ibid.

[200] Disposal Fund Act / Act on the Creation of a Fund for Financing Nuclear Disposal (*Gesetz zur Errichtung eines Fonds zur Finanzierung der kerntechnischen Entsorgung / Entsorgungsfondsgesetz*, EntsorgFondsG).

[201] FÖS (2020b), p. 3.

2.1.18 Export credit guarantees ('Hermes guarantees') for coal-fired power plants

The Federal Government's export credit guarantees serve to safeguard companies and banks against the economic and political risks of default in export transactions. Examples include risks arising from legislative or official measures, acts of war, or bankruptcy of the business partner. In this way the government supports German export transactions on difficult and high-risk markets.

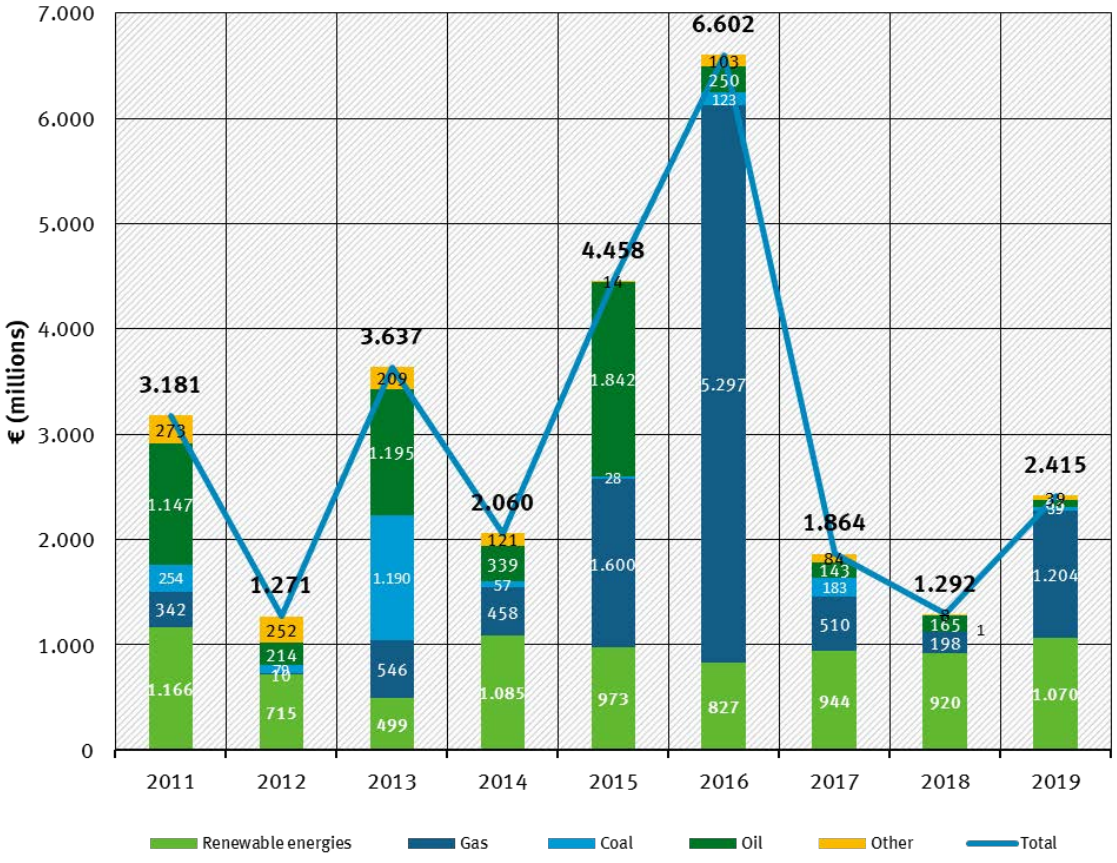
Export credit guarantees are a subsidy, since the government provides an insurance service that the market does not offer, at least not at the market price. Additional advantages arise from the fact that companies with the assurance of an export credit guarantee obtain more favourable financing conditions.

In 2018, the Hermes guarantees for coal amounted to only

EUR 1 million.[202]

However, the volume of cover in the energy sector is subject to huge fluctuations due to the volatile materialisation of large transactions.[203] In 2017 it amounted to EUR 183 million, while in 2019 it totalled EUR 39 million. In 2013 it even reached EUR 1,190 million (cf. Figure 8).

Figure 8: Development of Hermes guarantees by energy source (in millions of EUR)



Source: https://www.agaportal.de/exportkreditgarantien/grundlagen/energiesektor[204]

[202] https://www.agaportal.de/exportkreditgarantien/grundlagen/energiesektor

[203] Ibid.

[204] The homepage has since been updated, so this diagram and these data are no longer provided there. However, the data has already been confirmed by Euler Hermes (agaportal.de) on request.

In addition to the preconditions for assistance, such as 'risk-related justifiability' and 'eligibility',[205] the Federal Government also considers the environmental and social effects of potential projects. In doing so, it applies the rules and standards of the OECD.[206] In November 2015 the Member States of the OECD agreed on conditions and requirements specific to assistance for coal-fired power stations, which must be met in order for export credit guarantees to be provided. Requirements for the climate-friendliness and efficiency of the technologies were also laid down, but exceptions can be granted.[207]

Export credit guarantees for coal-fired power stations conflict with climate protection targets and have further negative environmental impacts. In addition, power plants have a very long lifecycle and stand in the way of the necessary transition to renewable energies in the long term. The fact that the KfW group decided in 2019 to stop financing the coal industry is therefore a positive development.[208]

[205] In addition to a general export interest, the eligibility criteria can be protecting jobs, structural policy considerations or foreign policy objectives, for example.

[206] BMWi (n.d.), p. 2.

[207] https://www.agaportal.de/exportkreditgarantien/grundlagen/energiesektor

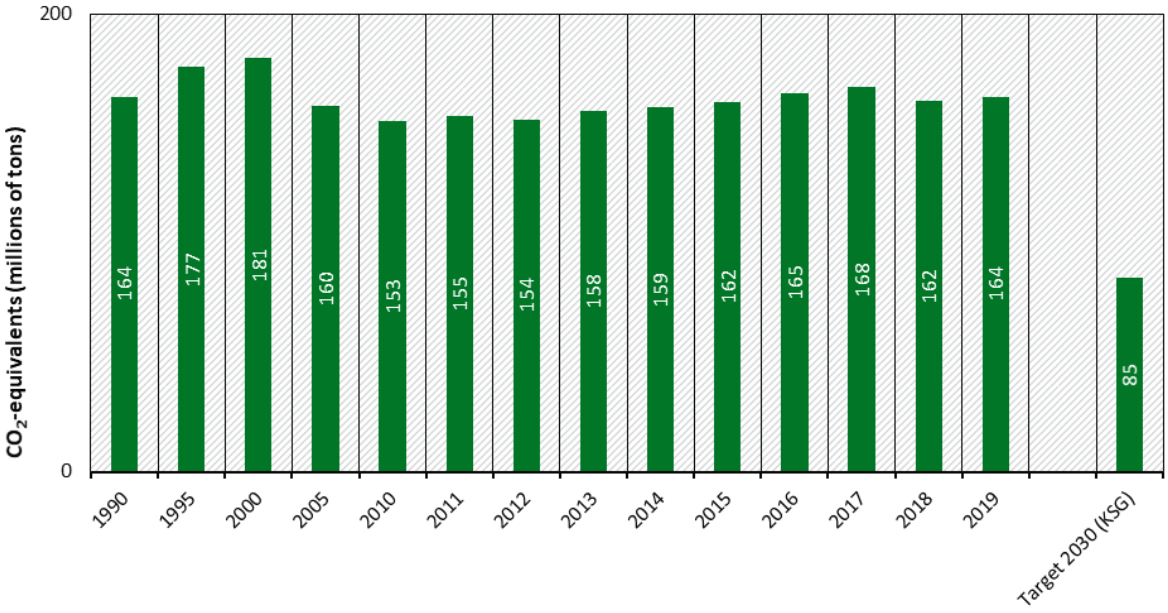
[208] KfW (2019), p. 1. The exclusions stated there also include no. 8, the 'prospecting, exploration and mining of coal; land-based vehicles and infrastructure used predominantly for coal; power plants, thermal power stations and combined heat and electricity cogeneration facilities fired predominantly with coal, as well as the associated branch lines.' (Ibid.) — However, an exception is made for electricity transmission networks that feed in a significant amount of coal-fired power in Länder and regions with 'ambitious national climate protection policies' and for developing countries 'in individual cases to be strictly reviewed'.

2.2 Transport

The environmental damage caused by the transport sector is primarily due to traffic-induced emissions and land take.

The transport sector has not made any substantial contribution to climate protection in recent decades. With 163.5 million tons of CO_2-equivalent in 2019, its greenhouse gas emissions were only marginally below those in 1990 (164.3 million tons, cf. Figure 9). However, the amended Climate Change Act also sets a target of 85 million tons of CO_2 equivalent for 2030. A highly ambitious combination of instruments is required to achieve this.[209] To this end, environmentally harmful subsidies in transport should also be reduced.

Figure 9: Development of greenhouse gases in Germany — Transport sector



Source: Own illustration, UBA.

In 2018, transport was also a significant source of emissions of carbon monoxide (33%), nitrogen oxide (43%), volatile hydrocarbons (8%), particulates (13%) and fine particulate matter (26% for $PM_{2.5}$; 19% for PM_{10}) in Germany.[210] As with CO_2 emissions, a large part of the air pollutants were also created by road traffic.

Emissions of nitrogen oxides and volatile hydrocarbons by the transport sector play a major part in ozone levels in atmospheric layers close to the ground. Nitrogen oxides are also responsible to a large extent for the acidification and eutrophication of terrestrial and some aquatic ecosystems and the subsequent loss of biodiversity. Moreover, traffic-induced emissions of atmospheric pollutants pose a substantial risk to human health. For example, elevated concentrations of fine particulate matter in city centres, in which traffic plays a major part, have harmful effects on human health — in the form of increased respiratory diseases, for example. According to the WHO, air pollution — caused by transport, among other things — is the most important environmental risk factor for health in Europe. It contributes to the burden of disease on society, for example,

[209] The German Environment Agency presented a corresponding proposal in its paper 'Kein Grund zur Lücke', cf. UBA (2019a).

[210] Calculations based on https://www.umweltbundesamt.de/daten/luft/luftschadstoff-emissionen-in-deutschland#entwicklung-der-luftschadstoffbelastung-.

through strokes, heart disease, lung cancer, and chronic and acute respiratory illnesses (including asthma).[211]

Transport also results in noise emissions. People can be considerably annoyed by noise and their communication and relaxation can be disturbed. Growing noise pollution also increases the risk of illness. Among the main effects are sleep disorders and the associated stress. Even low continuous sound levels of 40 dB(A) at night produce a significant rise in the risk of cardiovascular diseases and psychological disorders.[212]

Due to the construction of routes, traffic also contributes to land take and urban sprawl.[213] The associated negative impact on habitats and the fragmentation of habitats are a major cause of the continuous loss of biodiversity.[214] Growing urban sprawl, to which the building of transport routes on land contributes, also leads to more car traffic because the range of buses and trains in regions with lower population densities becomes more and more unattractive and expensive. This in turn has negative environmental consequences, such as additional greenhouse gas and air pollutant emissions. Besides other factors, transport infrastructure thus has a major effect on the proportion of different modes of transport relative to transport as a whole and on the volume of traffic in general.

Subsidies in the transport sector contribute to environmental pollution in various ways. The subsidisation of fuels or drive technologies with comparatively poor environmental properties reduces their cost and thereby increases their proportion of the overall traffic volume. One example is the tax allowance for diesel fuel over petrol (cf. section 2.2.1). Another result of low fuel or operating costs due to subsidies is that there is little incentive to invest in innovative, efficient drive technologies or to buy low consumption, low-emission vehicles or vessels. Such negative effects arise in the inland waterway sector, for example, (cf. section 2.2.5) or as a result of the tax advantage for the private use of company cars (cf. section 2.2.3).

Subsidising environmentally harmful modes of transport makes them more competitive, which results in them gaining a growing proportion of the total transport volume. This is true of the tax advantage for air transport, for example (cf. sections 2.2.8 to 2.2.11). Moreover, subsidies create incentives to increase transport by lowering the overall cost of transport. One example of this is the commuting tax allowance (cf. section 2.2.2). It indirectly encourages expansion of the transport network and increasing urban sprawl, resulting in longer distances travelled — e.g. between home and work — and further traffic growth.

2.2.1 Energy tax concessions for diesel fuel

The energy tax rate for petrol is 65.45 cents per litre,[215] whereas the tax rate for diesel fuel is only 47.04 cents per litre.[216] The tax rate for diesel is thus 18.41 cents per litre lower than the tax rate for petrol. Including value added tax, the tax advantage for diesel fuel is actually 21.9 cents per litre. This gives cars with diesel engines a significant competitive advantage.

The original purpose of the privileged treatment of diesel fuel under energy tax rules was to encourage commercial road transport and protect it against international cost competition. When

[211] WHO (2016), p. 20.

[212] UBA (2013a), p. 48.

[213] See also section 2.3 above.

[214] BfN (2020), p. 21.

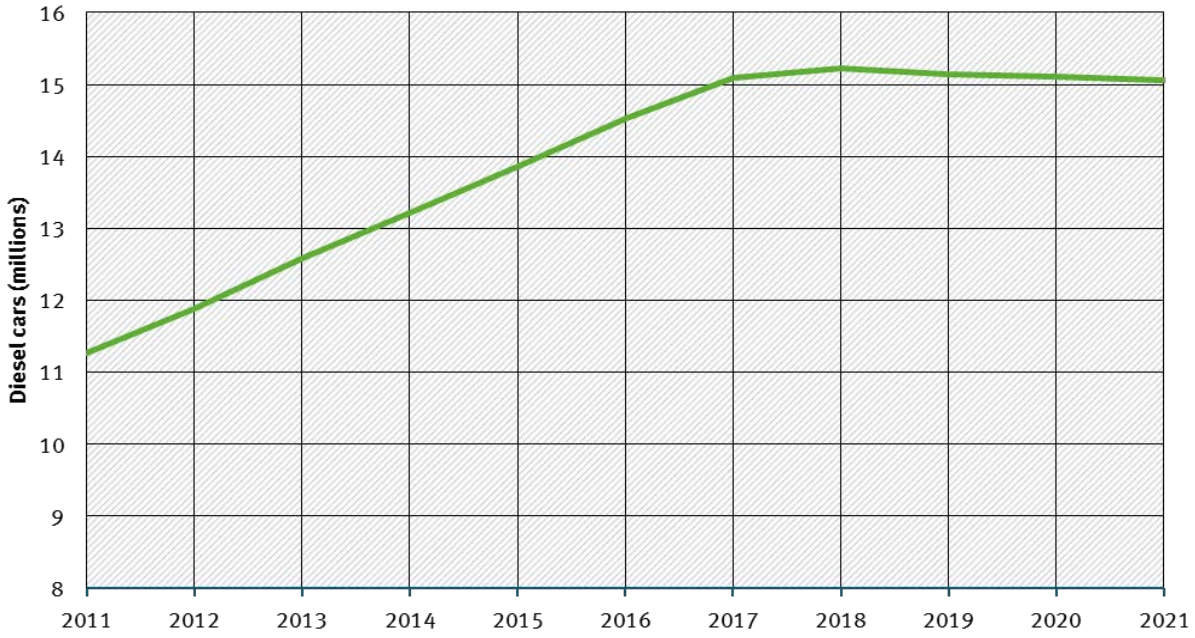
[215] Paragraph 2(1), no. 1b EnergieStG.

[216] Paragraph 2(1), no. 4b EnergieStG.

the concession was introduced, there were barely any cars with diesel engines.[217] Even in 2001, the market share of diesel cars was only 14.5%. For 2020 the Federal Motor Transport Authority (*Kraftfahrt-Bundesamt*) reported approx. 15.1 million diesel cars; diesel cars now make up a share of 31.7% of the total number of diesel cars (cf. Figures 10 and 11).

Until 2018 the number of diesel cars grew continuously from 11.3 million (2011) to approximately 15.2 million (cf. Figure 10). In these years the number of diesel cars grew faster than the total number of cars, which was also increasing. As a result, the number of diesel cars as a proportion of the total number of cars increased as well (cf. Figure 10). It was only following discussion of shutdown systems and high nitrogen oxide emissions of diesel cars in the field that diesel became less acceptable and attractive to consumers. As a result, the number of diesel cars decreased proportionately at first (2018) and then, in recent years, in absolute terms (2019) (cf. figures 10 and 11).

Figure 10: Number of diesel cars in Germany (2011—2021)



Source: KBA (2021), p. 12.

The tax concession for diesel fuel compared to petrol constitutes an environmentally harmful subsidy because it diminishes the economic incentive to reduce fuel consumption and to decrease greenhouse gas emissions. In addition, diesel fuel has a higher carbon content than petrol. As a result, the CO_2 emissions from burning one litre of diesel fuel are around 13% higher than from burning one litre of petrol.[218]

Moreover, a diesel car (particularly up to Euro 5) pollutes the air with nitrogen oxide emissions many times more than a petrol car.[219] In terms of pollution with fine particulate matter, diesel

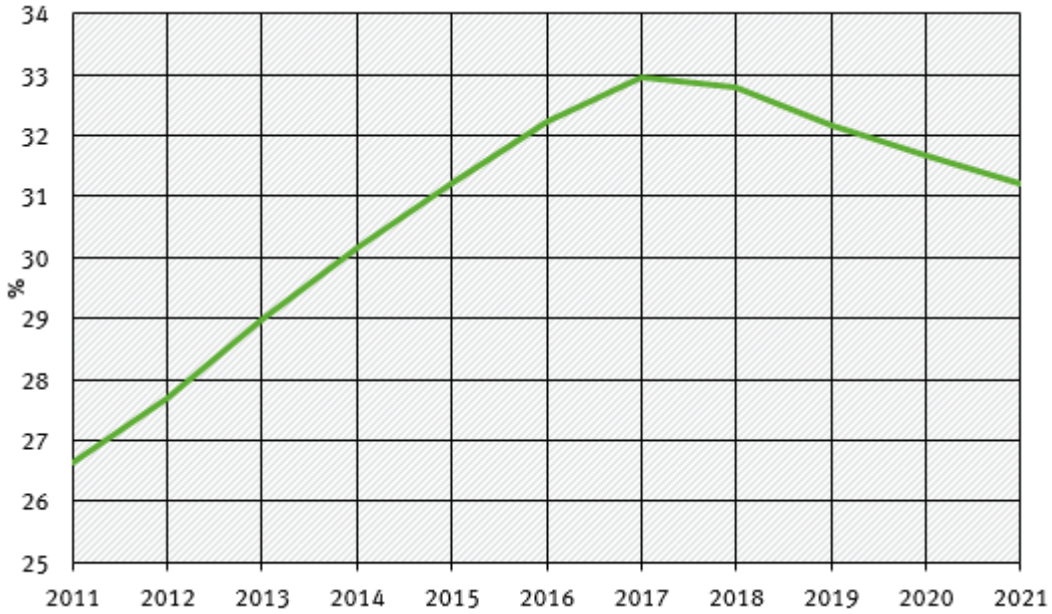
[217] FÖS (2015), p. 2.

[218] VDA (2016), p. 2 et seq.

[219] The introduction of the Euro 6 standard (Euro 6a to 6c) reduced this difference. However, the Euro 6 standard has only been mandatory for newly registered cars since September 2015, which means that there will still be considerable environmental pollution from nitrogen emissions until all these cars are replaced. A further reduction was achieved by limiting the nitrogen emissions from driving in the field (real driving emissions — RDE) for new vehicle types from 2017 and 2020, respectively; from 2017, newly registered vehicle models are subject to the emissions standard Euro 6d, for the first time with qualitative RDE requirements, and from

cars that do not yet have a particulate filter pose a significantly higher health risk than petrol cars because of the detrimental health impact of fine particulate matter.[220]

Figure 11: Proportion of diesel cars in Germany as a proportion of the total number of cars (2011-2021)



Source: KBA (2021), p. 12.

In light of this, the tax rate must as a minimum be brought in line with that for petrol. If one conservatively takes the tax rate for petrol as a basis, diesel fuel consumption of 44.6 billion litres in 2018[221] results in an annual tax loss of

EUR 8.2 billion.[222]

In recent years, the subsidy volume has increased continuously (cf. Figure 12). As the tax rates for petrol and diesel have not changed since 2003, this increase is solely attributable to the increase in the sale of diesel over time. In 2018, sales and the annual tax loss exceeded the 2006 values by one third (33.4%).[223]

2020 to the standard Euro 6d, in which RDE factors are tightened even further) (Euro 6d-TEMP and Euro 6d). But even after all that, there will still most likely be a notable difference between the NO_x emissions of petrol and diesel engines from driving in the field.

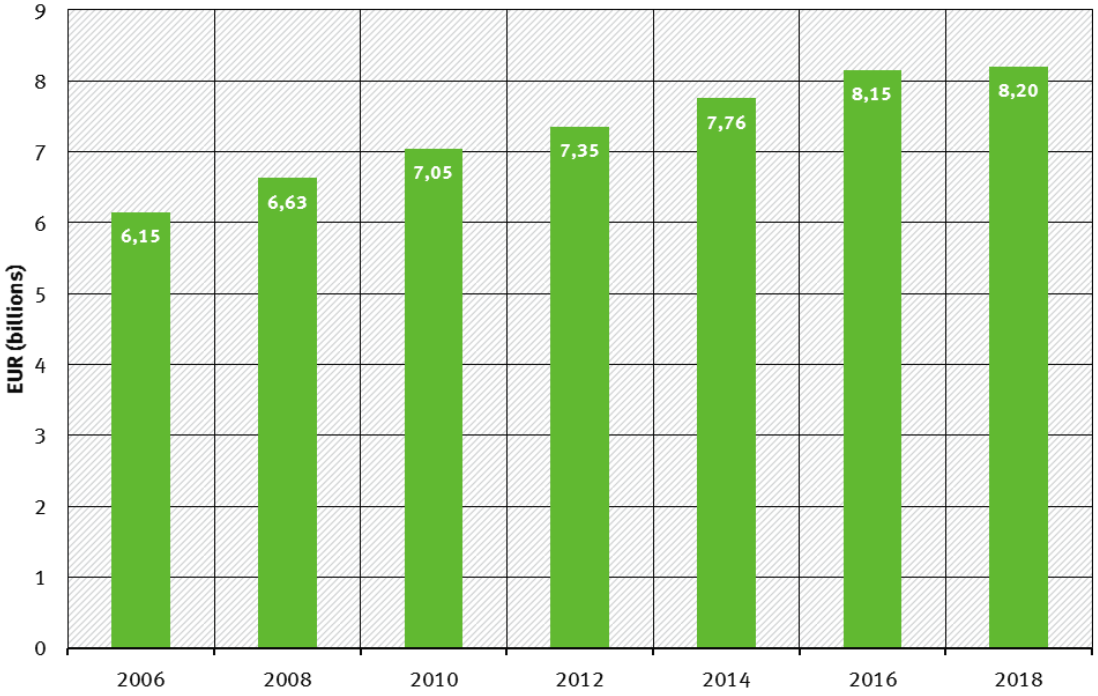
[220] In recent years, more and more new vehicles with petrol engines with direct injection have been registered. Until 2018, the threshold value for the particulate number of these was still 10 times higher than for diesel cars. However, future legislation will bring the particulate emissions from petrol direct injection engines into line. It is becoming apparent that these will also be fitted with particulate filters.

[221] German Federal Statistical Office (2019a), p. 3.

[222] When calculating the subsidy amount, the currently applicable tax rate for petrol is also used for diesel fuel. Taxation therefore adheres to the principle of applying the same tax rate for a litre of fuel. This amount does not take into account the additional losses in terms of value added tax. By the same token, it is also not taken into account that in the event of a reform, as proposed here, the vehicle excise duty for diesel cars would decrease as well. The savings for government budgets would therefore be rather small.

[223] The increase in sales was also encouraged by the fact that the diesel tax rate of 47.04 cents per litre had not been adjusted in line with inflation since 2003. The tax rate therefore decreased in real terms, which led to a further reduction in the steering effect and in tax revenue, cf. UBA (2019a), p. 17, FÖS (2015), p. 2.

Figure 12: Energy tax concessions for diesel fuel (2006–2018)



Source: Own calculations, data basis: German Federal Statistical Office (2019a), p. 3.

Because of the negative effects on the environment, the concession on the diesel tax rate should be gradually abolished and the diesel tax rate should be increased to the same level as the petrol tax rate at least.[224]

The EU Commission's proposal to revise the Energy Taxation Directive also includes equal taxation on diesel and petrol, based in fact on the energy content. As the energy content of diesel (0.0355 GJ per litre) is higher than that of petrol (0.0318 GJ per litre), the tax rate for diesel of 73.07 cents per litre would actually have to be higher in absolute terms than that of petrol (65.45 cents per litre). This would also be appropriate given the higher level of environmental pollution described above.

According to a model analysis from 2018, the abolition of privileged treatment of diesel ('*diesel privilege*') will lead to an increase in the price of diesel by 20 per cent and thus to a decrease in greenhouse gas emissions by 3.7 million tons of CO_2 equivalent by 2030.[225] In the event of a lower share of diesel vehicles in the vehicle fleet or a higher diesel price before taxes, the greenhouse gas reductions may turn out to be lower due to interactions.

If the energy tax concession for diesel were omitted, there would be no reason for higher vehicle tax on diesel cars. Vehicle excise duty for diesel cars should therefore be decreased to that for petrol cars alongside the increase in energy tax for diesel cars. As a result, diesel and petrol cars would be taxed based on uniform standards in respect of vehicle and energy tax.

The calculation for taxation on cars in respect of vehicle excise duty should be based on realistic CO_2 emissions in future. Type test values for CO_2 emissions from cars determined under test conditions differ substantially from the actual values in the field. The discrepancy has increased

[224] The decrease in the energy tax rate for petrol to the same level as the diesel tax rate would diminish the environmental incentive to drive in an energy-saving way and to buy more fuel-efficient cars and would therefore be negative from a climate protection point of view.

[225] Agora Verkehrswende (2018), p. 24. This figure also estimated by FÖS (2020a), p. 25, for example.

significantly in just a few years. The unrealistic consumption data has resulted in revenue shortfalls for vehicle excise duty. Vehicle excise duty should therefore at least be calculated based on a realistic measurement cycle (WLTP/WLTC).[226] For the same reason, the German Environment Agency recommends using the Real Driving Emissions measurement method (RDE method) to calculate air pollutants.

2.2.2 Commuting tax allowance

Employees can deduct expenses they incur commuting to work as income-related expenditure against their income tax by claiming the commuting tax allowance (*Entfernungspauschale*).[227] This allowance amounts to 30 cents per kilometre for the one-way distance between the place of residence and the place of work. The commuting tax allowance is applicable for every day on which the employee travels to the place of work and is limited to EUR 4,500 per calendar year. However, this maximum amount does not apply for employees who commute to work by a private car. They can claim a higher total tax deduction than users of public transport. The commuting tax allowance reduces the tax burden once the deduction for professional expenditures of EUR 1,000 per year has been exceeded.[228]

Under the Climate Action Programme 2030, the commuting tax allowance was increased as from the 21st kilometre.[229] The increase will be from 35 cents per kilometre in 2021–2023 to 38 cents per kilometre in 2024–2026.[230] This measure was introduced in order to avoid social hardship for commuters due to the prices for CO_2 emissions set in the Fuel Emissions Trading Act (*Brennstoffemissionshandelsgesetz*, BEHG). However, the increase of the tax allowance from 2021 onwards will provide relief predominantly for households with medium and higher incomes.[231] In addition, it is detrimental to the climate because it cancels out the reduction of greenhouse gas emissions that the BEHG aims to achieve.[232]

The commuting tax allowance has significant negative environmental impacts and primarily benefits private car usage. In 2016, for example, around 68% of commuters used private cars as their means of transport.[233] Accordingly, the commuting tax allowance boosts the volume of traffic and reinforces the trend towards long commutes. The latter in turn encourages urban sprawl, resulting also in climate-damaging impacts. Furthermore, the commuting tax allowance aggravates air pollution and noise, while land take as a result of urban sprawl processes is a key cause of biodiversity loss and other environmentally harmful impacts.

The commuting tax allowance is also problematic because of its negative distribution effects. On average, households with high incomes benefit from the commuting tax allowance far more than low-income earners. Firstly, this is because households with high incomes are subject to a higher (marginal) rate of tax; secondly, because, on average, they commute further; and thirdly,

[226] For new vehicles, this has been mandatory since 1 September 2018.

[227] Paragraph 9 (1), no. 4 EStG.

[228] Paragraph 9a, 1st sentence, no. 1a) EStG.

[229] Article2, no. 3a) KlimaSchStRUmsG.

[230] An eighth sentence was inserted into paragraph 9(1) no. 4 EstG which reads as follows: 'To compensate for the expenses in accordance with sentence 1, for the tax periods 2021 to 2026, in deviation from sentence 2, for every working day on which employees attend their primary place of work, a commuting tax allowance will be applied for every full kilometre of the first 20 kilometres of the distance between home and their primary place of work of EUR 0.30 and for every additional full kilometre a) of EUR 0.35 for 2021 to 2023, b) of EUR 0.38 for 2024 to 2026, up to a maximum of EUR 4,500 per calendar year; an amount higher than EUR 4,500 will be applied if the employees use their private vehicles or a vehicle assigned to them for their use.'

[231] The reason for this is that low-earners rarely have long commutes and, because of lower tax rates, benefit less from the relief (Bach et al. 2020, p. 5 et seq.)

[232] This at least applies in the initial years up to 2026, for which the BEHG does not yet set an emission cap.

[233] https://www.destatis.de/DE/Themen/Arbeit/Arbeitsmarkt/Erwerbstaetigkeit/Tabellen/pendler1.html

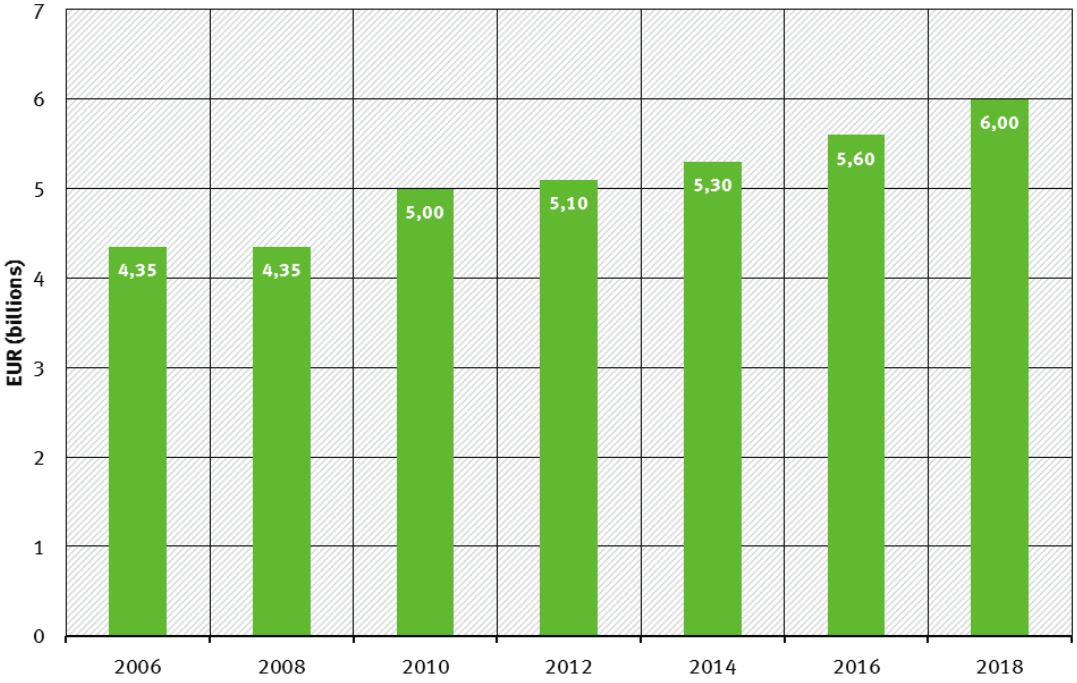
because they often have other professional expenditure. Together with their deductible travel costs, they therefore often reach cost levels above the flat-rate deduction for professional expenditures. [234] The limited increase of the commuting tax allowance reinforces these negative distribution effects.[235]

According to an estimation by the Federal Ministry of Finance, the tax losses resulting from the commuting tax allowance in 2018 amounted to

EUR 6.0 billion.

Continuously increasing tax losses resulting from the commuting tax allowance have been observed since 2006 (cf. Figure 13).

Figure 13: Tax losses resulting from the commuting tax allowance since 2006



Source: Unpublished calculations by the Federal Ministry of Finance.

In light of the negative environmental impacts, the commuting tax allowance should be abolished. If the commuting tax allowance were abolished immediately, it is expected that there would be a reduction in greenhouse gases of around 2 million tons of CO_2 equivalents by 2030.[236] The longer the abolition is postponed, the lower the contribution to climate protection by 2030 will be.

Instead of the current commuting tax allowance, in future the costs of travelling to work should only be tax-deductible in accordance with a hardship regulation, e.g. through the possibility of deducting travel costs as an extraordinary expense for tax purposes. This would specifically provide relief for those employees that have to pay very high travel costs relative to their income, e.g. because they have to put up with long work commutes for social or professional reasons.

[234] Jacob et al. (2016), p. 26; UBA (2020e), p. 17.

[235] Bach et al. (2020), p. 5 et seq.

[236] Zimmer et al. (2021), p. 72.

The government could also use the extra tax revenue gained by abolishing the commuting tax allowance to provide greater support for public transport or to increase the deduction for professional expenditures. An analysis of the distribution effects shows that, on balance, this would have a progressive income effect (cf. Figure 14).

Figure 14: Distribution effect if the commuting tax allowance were abolished in favour of a hardship regulation and alternative forms of redistribution (increase in the basic tax-free allowance and subsidisation of public transport)

Source: based on Jacob et al. (2016), p. 117 et seq.

If abolition of the commuting tax allowance cannot be achieved in political terms, second-best solutions should at least be implemented. For example, the legislator could significantly reduce the commuting tax allowance and set a maximum amount for the total amount of deductible work-related travel costs.

2.2.3 Flat-rate taxation of privately used company cars

Company cars are owned by employers and then provided to employees who can also use them for private purposes. For private use, 1% of the list price of the vehicle at the time of initial registration is to be taxed monthly as a non-cash benefit when calculating income tax.[237] This regulation constitutes a subsidy because the actual non-cash benefit is many times higher.[238] It is estimated that only 40% to 50% of the actual non-cash benefit is taxed.[239] Such low flat-rate

[237] Paragraph 6(1), no. 4, 2nd sentence EStG. — As an alternative to this flat-rate approach, what is known as the 'logbook method' (*Fahrtenbuchmethode*) can also be used (ibid., 3rd sentence). However, there are clear incentives for using the flat-rate '1% method', which is why it is almost always chosen in practice, cf. Fiedler et al. (2016), p. 105.

[238] For example, Jacob et al. (2016), p. 28.

[239] Ibid., p. 160, and also Blanck et al. (2021), p. 49.

taxation is an incentive for employers to pay employees part of their salaries in the form of company cars.

Since 1 January 2020, only 0.25% of the gross list price has to be applied for vehicles with electric motors. This applies for fully electric cars without any carbon dioxide emissions with a gross list price of no more than EUR 60,000. For more expensive electric cars and plug-in hybrids, 0.5% of the gross list price is subject to tax.[240]

The mileage of company cars is typically higher than that of cars that are only used privately.[241] It must also be taken into account that company cars influence the number of private cars, as they are usually replaced after a period of 2.5 to 3 years and sold on the used car market. Of the 3.61 million new cars registered in Germany in 2019, 65.5% were registered to commercial keepers.[242] The proportion of company cars of the number of newly registered cars is therefore estimated at 20%.[243] In this respect, tax regulations for company cars are an important lever to exert influence on greenhouse gas and pollutant emissions.

The so-called 'company car privilege' (*Dienstwagenprivileg*) conflicts with the objective of climate protection as tax concessions are granted for the use of cars with combustion engines. Moreover, if an employee receives not only the company car but also fuel free of charge, there is an additional incentive to use the company car more often than a private vehicle would be used. The tax concessions for company cars also affect the incentive to use public transport.

In addition, subsidising company cars conflicts with social objectives. Those with higher incomes benefit more from the regulation because they more often have company cars[244] and — due to tax progression — the advantage gained increases with higher incomes.[245] Men benefit from company car privilege significantly more often than women too.[246]

Calculating the subsidy volume is challenging because a reference value has to be determined at which the non-cash benefit gained through private use of the company car is fully taxed, i.e. a value at which no economic advantage arises from the provision of a company car compared to a private vehicle. The estimated subsidy amount results from the difference between such a taxation and the current tax revenues. Based on 2018 and the regulation on company car taxation that applied at that time, there was a subsidy volume of

approx. EUR 3.1 billion.[247]

In light of the negative impacts on the climate and environment, the tax advantage granted for cars with combustion engines should be eliminated. The aim should be a reform in which it makes no economic difference to the user whether a vehicle is private or provided as a company

[240] Paragraph 6(1), no. 4, 2nd sentence, no. 1 to 5 EStG. — Assuming there are 1 to 2 million electric company cars in the long term, there is estimated additional loss of tax revenue totalling EUR 1.5 to 3 billion, cf. Blanck et al. (2021), p. 54. — The first modifications to the policy relating to climate protection were made back in 2013. Even back then, the underlying list price for electric cars was reduced by a certain fixed amount to compensate for the comparatively high purchase price due to the high costs of batteries, cf. also Jacob et al. (2016), p. 150.

[241] Jacob et al. (2016), p. 160.

[242] KBA (2020).

[243] Blanck et al. (2021), p. 51.

[244] In 2019, 40% to 60% of employees with an annual salary of EUR 90,000 or more had a company car, cf. Compensation Partner (2019), p. 6. However, the total percentage of employees with a company car was only 12%, cf. ibid., p. 2.

[245] Jacob et al. (2016), p. 154. — With regard to critical comments on distribution effects cf. SVR (2011), p. 212.

[246] In 2019, 60% of the employees with a company car were men and 40% were women, cf. Compensation Partner (2019), p. 2.

[247] The subsidy level for 2018 is calculated using the method taken from Diekmann et al. (2011), p. 159 et seq. — Based on this method, Fiedler et al. (2016) estimate the total annual amount of this subsidy to be between EUR 3.11 billion and EUR 5.26 billion. The variance mainly results from the variation in assumptions on the proportion of private use (between 60% and 90%, cf. Fiedler et al., 2016, p. 120).

car. This could enable a decrease in greenhouse gas emissions in the transport sector of approximately 1.3 to 3.9 million tons of CO_2 equivalents by 2030, depending on how high the effect on private journeys is assumed to be.[248]

A reform should take into account both acquisition costs and the scale of private use. The non-cash benefit provided through the provision of fuel free of charge should also be taxed.

A CO_2 component should also be factored into company car taxation to provide incentives to purchase lower emission vehicles. This is already practised in other countries.[249] When doing so, a distinction should be made within the category of cars with combustion engines and the category of hybrid cars, each based on CO_2emissions.[250] The advantage granted to plug-in hybrids (0.5% rule) should also be promptly abolished, because large hybrid vehicles with relatively inefficient combustion engines and low levels of electric mode actually have a worse CO_2 balance than pure combustion engines.[251] Finally, the subsidisation of electric cars should only be carried out for a limited period of time until market diffusion has been achieved and it should be considered a second-best instrument, not least because the associated political distribution problems remain.[252]

Besides the abolition of company car privilege, a general, environment-orientated reform of the treatment of company cars for tax purposes is required to create incentives to purchase fuel-efficient, low-emission vehicles among companies too.[253] When doing so, the legislator should stagger the deductibility of acquisition and operating costs based on vehicles' greenhouse gas emissions or fuel consumption. For example, the acquisition costs of low-emission vehicles (up to a maximum of 50g CO_2 per kilometre) could be fully tax-deductible; however, the acquisition costs of vehicles with CO_2 emissions above this threshold should only be partly deductible. The deductible proportion of costs should decrease on a staggered basis as a vehicle's volume of CO_2 emissions increases. It would also be worthwhile decreasing the threshold over time.

2.2.4 Biofuels

Biofuels are liquid or gas fuels made from biomass. Various renewable resources as well as biogenic residues and waste can be used as feedstock. The use of this feedstock is based on the concept of bio-economy, i.e. the transition from a fossil-fuel based economy to an economy based on renewable resources.[254]

The actual impacts of biofuels on climate and the environment are often very negative, however.[255] What exactly these impacts are depends strongly on the biomass used, the conditions under which it is cultivated and further processing steps. The intensive cultivation of rapeseed, maize, sugar beet, sugar cane, soya, palm and other agricultural products that are used to produce biofuels is usually associated with soil, water and air pollution from residues of fertilisers and pesticides, greenhouse gas emissions from soil cultivation and damage to biodiversity (cf.

[248] Agora Verkehrswende (2018), p. 27. — Based on this, Breisig et al. (2021), p. 92 et seq., estimate a value of 2.8 million tons.

[249] FÖS (2018b).

[250] In the case of hybrid cars, there is the problem that the CO_2 emissions depend on the proportion of kilometres travelled with electric drive. Large hybrid vehicles with relatively inefficient combustion engines and low proportions of electric drive can actually have a worse CO_2 balance than pure combustion engines, cf. Blanck et al. (2021), p. 51.

[251] Ibid.

[252] General, direct promotion in the form of purchase premiums is preferable.

[253] There should also be incentives to purchase fuel-efficient, low-emission vehicles for company cars that are not used privately.

[254] German Bundestag (2019), p. 21, with further references.

[255] UBA (2013b).

also section 2.4). These are side effects of biofuels based on cultivated biomasses, which still dominate in quantitative terms.

The production of biomass for biofuels also promotes the global expansion of arable land. Valuable natural spaces and habitats are often converted into areas for cultivating biomass, which leads to high levels of greenhouse gases being released (ILUC[256]) and a substantial loss of biodiversity. Indirect effects should also be taken into account here: The interest in cultivated biomass for biofuels leads to a — global — increase in (total) demand for land which in turn results in rising prices. It is therefore increasingly profitable to tap into areas that have not previously been used for agricultural industry, including in particular areas and habitats that should be protected. Besides problems for biodiversity and nature conversation, this contributes to the deterioration of the greenhouse gas balance too.[257]

Furthermore, biofuels made from cultivated biomass are also problematic from a social perspective because arable crops that are rich in oil, starch or sugar are also suitable as human food or livestock feed. There is competition for the use of land in this respect, with the 'food or fuel' approach giving rise to fears of an increase in food prices and restrictions on the local food supply in developing countries. Another growing problem is the displacement and expulsion of traditional users such as indigenous peoples, with the cultivation of biomass violating water and land rights.

Biofuels that are made from biogenic residues and waste and for which there are no greater possible uses are seen in a positive light. Should lignocellulosic raw materials such as wood and grasses also be usable for producing biofuels, the spectrum of feedstock could be extended to include more eco-friendly materials. Here too, however, there is competition for use as well as for possible higher-value uses, particularly in the case of wood. Moreover, carbon sinks are reduced through logging. Here too, however, it must be remembered that environmental considerations mean that the area under cultivation should not be expanded.

In recent years, the proportion of biofuels made from biogenic residues and waste has increased (cf. Figure 15). This is a positive development in principle. The majority of conventional biofuels are still made from cultivated biomass, however.

Between 2007 and 2014, the so-called biofuel quota (as a volume quota) was the central funding instrument in order to abolish the assistance by the aforementioned tax concession. In accordance with paragraph 37a(1) and (3) of the Federal Imission Control Act, such promotion consisted in setting a minimum proportion of energy from biofuels as a proportion of the total volume of fuels sold. This level was 6.25% for each year from 2010 to 2014. The fuel distributors were responsible for adhering to this quota.

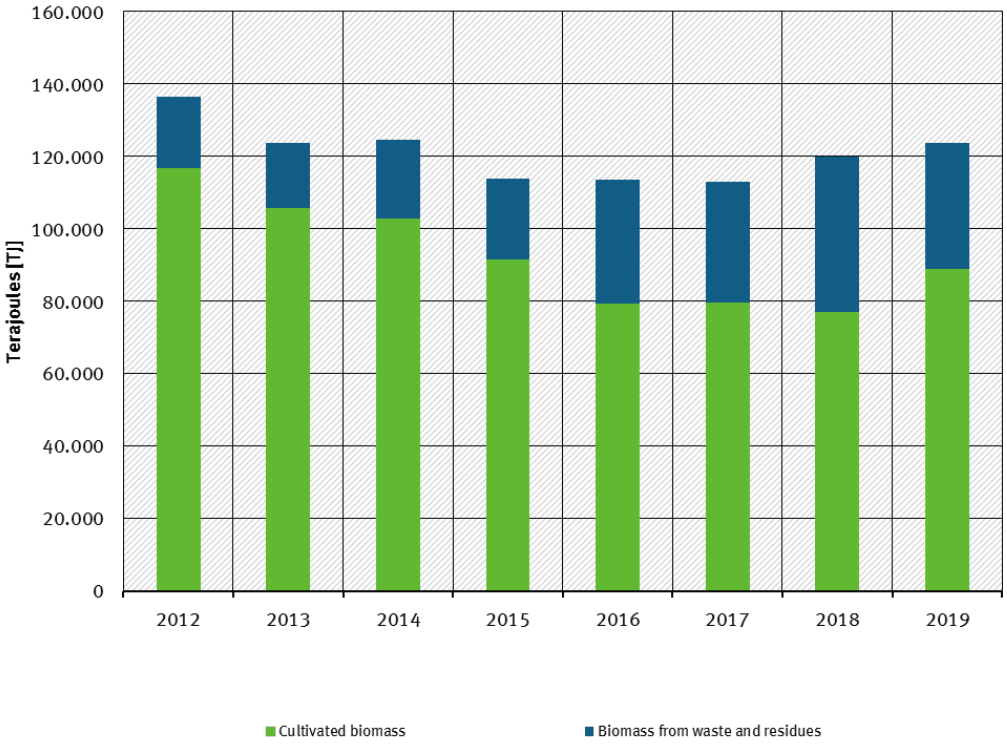
In 2015, the volume quota was replaced by a greenhouse gas reduction quota.[258] This means that a minimum proportion of energy from biofuel as a proportion of the total volume of fuel sold is no longer set; instead, a level of greenhouse gas reduction is required, particularly through the use of biofuels. The reference value is calculated based on the greenhouse gas emissions that would be generated if the total volume of fuel were produced using fossil fuels. As of 2015, 3.5% of the greenhouse gases emitted through the consumption of fuel had to be cut every year; from 2017 (4%). Since 2020, 6% must be saved annually.

[256] So-called indirect land use change.

[257] For example, Daiogolou et al. (2020).

[258] Paragraph 37a(1) and (4) BImSchG.

Figure 15: Amounts of energy from biofuels in Germany, broken down by use of cultivated biomass and biomass from waste and residues



Source: BLE (2020), p. 36;(2019), p. 36;(2017), p. 34;(2015), p. 33.

Due to the problematic sustainability effects of biofuels produced from cultivated biomass, which are still dominant, sustainability requirements were set, particularly through the European Renewable Energy Directive 2009/28/EC. The sustainability criteria were implemented into national law through the Biofuel Sustainability Regulation (*Biokraftstoff-Nachhaltigkeitsverordnung*, Biokraft-NachV) and have been in force since 2011. This means that the biomass used cannot be from areas that are of particular importance for biological diversity (woodlands, areas for nature conversation, grassland with a high level of biological diversity, cf. paragraph 4 Biokraft-NachV), from areas with high carbon stock above ground or underground (paragraph 5) or from peat bogs (paragraph 6). There are also requirements in respect of the calculation of the greenhouse gas balance (paragraph 8). These provisions can indeed offer relative protection against some relevant environmental risks that directly result from the production of biofuels, but not against the indirect consequences of relocation and displacement effects.

Even in 2018, it was still primarily biofuels from cultivated biomass that were being used. Having abolished the tax concession granted by paragraph 50 EnergieStG, an explicit subsidy no longer exists. However, the quota regulations in accordance with paragraph 37a BImSchG shift the additional costs of biofuel production on to fuel producers and consumers. Implicit subsidisation therefore remains through targeted promotion within the framework of governmental regulations. For biofuels made from cultivated biomass, the additional costs incurred by fuel producers and consumers as a result of the greenhouse gas reduction quota in 2018 amounted to

EUR 960 million.[259]

From an environmental perspective, both the conversion of a tax concession to a volume quota and the conversion of a volume quota to a greenhouse gas reduction quota are, in retrospect, a positive development in principle because the latter provides an incentive to use biofuels, which could significantly reduce greenhouse gas emissions when compared with the reference fossil fuel. This, and the restriction on the level of biofuels made from cultivated biomass, strengthen the attractiveness of more favourable options, such as the production of biofuels using biogenic residues and waste. In order for the system to be fully effective, the calculation of greenhouse gas emissions must be expanded to include indirect emissions (i.e. ILUC-induced emissions).

The proportion of fuels made from cultivated biomass should be reduced further and brought to an end in the medium term. The greenhouse gas reduction required by the EU and the required minimum proportion of renewable energies in the transport sector, together with the national implementation of RED II (the second Renewable Energy Directive) by 2030,[260] could not and should not be achieved by an absolute increase in the volume of biofuel but instead by a reduction in end energy consumption, e.g. through more efficient vehicles, shifting and avoiding transportation, and a market increase in electromobility in road transport. This would result in a decrease in the absolute demand for biofuels, while limited quantities of advanced alternative fuels could cover a large proportion. The use of electricity in road transport is already counted towards the minimum greenhouse gas reduction. The role of electricity is reinforced further by the implementation of RED II.

2.2.5 Energy tax exemption for inland waterway transport

Diesel fuel used in commercial inland waterway transport is exempted from taxation.[261] The purpose of the subsidy is to create a level playing-field in the international competitive environment and to promote internal waterway transportation because of its advantages as a mode of transport, including in terms of environmental policy.[262]

From a transport and environmental policy perspective, inland waterways transport does indeed have advantages and is therefore promoted as an alternative to road and railway transport.[263] However, such promotion should not involve the subsidisation of fossil fuels. This contradicts the aim of environmental and climate protection and diminishes incentives to increase energy efficiency. The complete tax exemption for diesel in particular is clearly a negative development because the resulting emissions contribute to climate change, air pollution and the acidification of soil and water.

[259] Own calculations based on BLE (2020), UFOP (2018), www.icis.com and statistics from Mineralölwirtschaftsverband e.V. (www.mwv.de). — Listed here are the subsidies that result from the price disadvantages of biofuels made from cultivated biomass for biodiesel (FAME) and bioethanol.

[260] Act on the development of the greenhouse gas reduction quota and regulation laying down further provisions on the development of the greenhouse gas reduction quota (*Gesetz zur Weiterentwicklung der Treibhausgasminderungsquote und Verordnung zur Festlegung weiterer Bestimmungen zur Weiterentwicklung der Treibhausgasminderungsquote*) (38. BImSchV).

[261] Paragraph 27(1) EnergieStG. — Paragraph 52 EnergieStG also enables tax relief to be claimed for energy products for which no exemption is granted in accordance with paragraph 27(1), particularly for liquefied gas, which is more environmentally friendly, cf. Fifo et al. (2019), p. 38. However, gas oils (diesel) continue to be the dominant type of fuel, which means that the proportion of relief in accordance with paragraph 52 is also only very low, cf. Fifo et al. (2019), p. 80, 291.

[262] The Federal Government's Subsidy Report explains accordingly: 'Harmonisation of the competition situation for waterway transportation on other waterways with the exemption from charges applicable for the Rhine region on the basis of international agreements. The measure should help to maintain the share of inland waterway transport in total transport, to relieve the burden on rail and road infrastructure, and to reduce emissions in freight transport.' (BMF 2019a, p. 417)

[263] Fifo et al. (2019), p. 39.

In 2018, the energy tax exemption for inland waterway transport resulted in tax revenue losses in the amount of

at least EUR 141 million.[264]

The amount of EUR 141 million stated in the Federal Government's Subsidies Report is considered a lower threshold ('minimum') as the amount would turn out to be higher in the event of an increase in the energy tax rate on diesel, as called for in this report.

In order to create a level playing-field between the different modes of transport — particularly between inland waterway transport, road transport with HGVs and rail freight transport — marine diesel oil should be subject to tax in the same way as diesel fuel for commercial road transport (currently 47.04 cents per litre). Taxing fuel would create incentives to increase energy efficiency. European and international regulations should be amended so that the tax exemption is abolished Europe-wide, particularly for international navigation on the Rhine, and a European minimum tax rate is introduced. This affects the Strasbourg Agreement (Agreement on customs and tax regime for gas oil applicable to the stores of vessels in Rhine navigation) and the Energy Taxation Directive in particular. The current process of reforming the Energy Taxation Directive can and should prevail here.

When abolishing tax concessions, it would be worthwhile using the additional tax revenue for the environmental modernisation of inland waterway transport. For example, the support scheme 'Sustainable Modernisation of Inland Waterway Vessels' (*Nachhaltige Modernisierung von Binnenschiffen*) could in particular be consolidated and expanded to promote the conversion to battery drives. The additional tax revenue could also be used for the development and market launch of new vessel concepts. The promotion of smaller, highly automated and battery-driven inland waterway vessels would be conceivable here. To create further impetus to improve the environmental properties of inland waterway vessels, particularly in respect of pollutant emissions, staggered tolls and canal fees (i.e. those based on environmental properties) should be introduced.

2.2.6 Financing of cruise ships using KfW IPEX loans

The cruise ship sector was a growing industry for many years, both in Germany and internationally. Consequently, there was also high demand among cruise ship operators for such ships. To promote Germany as a shipyard location on this market, the Kreditanstalt für Wiederaufbau (KfW) subsidiary IPEX finances low-interest contracts for German shipyards. Such granting of government loans is essentially intended to achieve structural policy targets (employment in structurally weak regions, securing Germany as a shipyard location).

As the cruise ships financed by the KfW are driven by fossil fuels, the climate-damaging impact is evident, however. In addition, nitrogen oxides, soot and sulphur are emitted. And there are other problematic implications of this form of tourism, particularly the congestion of destinations such as Venice or Amsterdam. The granting of government loans has therefore come under strong criticism (even before the coronavirus crisis).[265]

It is not possible to quantify the subsidies for 2018 based on the data available. In 2019, the volume of ongoing loans amounted to EUR 8.4 billion, with 73 ships being financed.[266] The subsidy volume is calculated based on the difference between the market interest rate and the lower

[264] BMF (2019a), p. 417.

[265] https://www.ndr.de/fernsehen/sendungen/panorama3/Umweltfreundliche-Staatsbank-KfW-Bank-finanziert-Kreuzfahrtschiffe,kreuzfahrt768.html

[266] Ibid.

KfW interest rate, multiplied by the loan volume. There is also the possibility of loan default, for which a certain level of protection is provided by Hermes guarantees from the Federal Government. In the event of a credit default arising from cruise ship exports, taxpayers could incur total damage of up to EUR 25 billion (approximately EUR 18 billion of capital claims and approx. EUR 7 billion of interest claims).[267] In light of the coronavirus crisis, which has hit the cruise industry massively, this scenario is even more relevant at present.[268]

Assistance for the building of cruise ships should be brought to an end. Instead, structural change should be promoted more actively in the affected regions, and cushioned by social policy.

2.2.7 Energy tax concession for machinery and vehicles used exclusively for the movement of goods in seaports

Machinery and vehicles used exclusively for the movement of goods in seaports have benefited from the privilege of an energy tax allowance since 2008.[269] Instead of the tax rate for motor fuels, only the lower tax rate for heating fuels is applied.[270] For example, diesel fuel is not taxed at around 47 cents per litre, but at only about 6.1 cents per litre. The energy tax allowance is intended to help reduce competitive disadvantages for German seaports compared with their European competitors.[271]

According to the Federal Government's Subsidies Report, the subsidies in 2018 amounted to

EUR 25 million.[272]

In the most recent evaluation of tax concessions on behalf of the Federal Ministry of Finance, this concession in particular is seen as a negative development on the whole.[273] From an environmental point of view, the energy tax allowance is counter-productive, because it considerably reduces the incentive for the more efficient use or the substitution of fossil energy sources. It would therefore make sense to discontinue the energy tax concession and apply the regular tax rate. However, an EU-wide approach would be desirable here to prevent distortion of competition. An EU-wide approach is recommended in order to prevent carriers from switching to other ports and to avoid the possible increases in overland transport. The reform of the Energy Taxation Directive, which is currently under discussion, is crucial here.

If a coordinated EU-wide approach is not possible, assistance should be provided in the form of financial assistance instead of tax concessions on production factors with negative environmental impacts.[274] This concerns assistance for the direct electrification of machinery and vehicles in particular. This approach could have several advantages: lower greenhouse gas and pollutant emissions, less noise pollution and additional energy efficiency benefits, if engines no longer have to constantly be kept switched on so that they are ready for operation.

[267] German Bundestag (2020a), p. 1, 5.

[268] https://www.wiwo.de/unternehmen/banken/kfw-tochter-ipex-das-25-milliarden-kreuzfahrt-risiko-des-bundes/26189182.html

[269] Paragraph 3a EnergieStG.

[270] Paragraph 2(3) EnergieStG.

[271] BMF (2019a), p. 413.

[272] Ibid.

[273] Fifo et al. (2019), p. 36f.

[274] Ibid., p. 37, 332.

2.2.8 Energy tax exemption for kerosene

Unlike the fuels used by motor vehicles and in rail transport, kerosene used in commercial air transport is exempted from energy tax.[275] According to the Federal Government's Subsidies Report, this is to ensure that domestic air traffic remains competitive.[276]

The kerosene tax exemption leads to environmental pollution by promoting the growth of air transport and diminishing the economic incentives to develop and use more fuel-efficient aircraft. The taxation of kerosene is particularly important for climate protection. Owing to the altitude at which they are emitted, emissions from air transport are considerably more detrimental to the climate than ground-level emissions.[277] This is due in particular to contrails and the resulting cloud effects as well as to nitrogen oxides, which have a much greater climate impact at high altitude than at ground level. Moreover, the number of passenger-kilometres travelled is growing considerably faster than the emission reductions in air traffic.

In principle, kerosene should be taxed at a rate of 65.45 cents per litre.[278] According to the Federal Government's Subsidies Report, the tax exemption on kerosene resulted in tax revenue losses amounting to around EUR 584 million in 2018.[279] However, this only takes into account fuel consumption for domestic aviation. In economic terms, however, the energy tax exemption on kerosene which is used for flights to international destinations constitutes a subsidy. When calculating the volume of the subsidy, it therefore makes sense to take the total amount of kerosene sold domestically for commercial aviation as a basis.

In 2018, with domestic sales of 10.2 million tons of kerosene[280] and a reference tax rate of 65.45 cents per litre for civil aviation, exempting air transport from energy tax resulted in a tax loss of around

EUR 8,357 million.

The aim should be to apply a tax rate of 65.45 cents per litre for kerosene use in commercial aviation too. The Forum Ökologisch-Soziale Marktwirtschaft (FÖS) estimates that taxing kerosene could result in a total saving of around 26 million tons of CO_2 equivalents in 2030. For national aviation, a good 0.5 million tons of CO_2 equivalents could be saved.[281]

Taxation of kerosene should be pursued in addition to the inclusion of the aviation sector in the EU Emissions Trading Scheme. Whereas emissions trading is a climate protection tool, the kerosene tax is primarily a consumption tax justified entirely on fiscal grounds, which in principle is also imposed on other modes of transport. In this way, the existing unequal tax treatment is to be reduced. The kerosene tax also includes an eco-tax component. It makes sense to raise this too, because EU emissions trading in aviation is only based on CO_2 emissions and does not take into account the other environmental impacts of aviation, such as the change in natural cloud formation. As its purpose is limited to climate protection, it also does not contribute to the internalisation of the external costs that are incurred as a result of the other negative environmental

[275] Paragraph 27(2) EnergieStG.

[276] BMF (2019a), p. 415.

[277] For example, Lee et al. (2021).

[278] Paragraph 2(1), no. 3 EnergieStG. — The tax rate is made up of a consumption tax component of 50.11 cents per litre and an eco-tax component of 15.34 cents per litre.

[279] BMF (2019a), p. 415. — This value decreased to EUR 231 million in 2020 and 2021, apparently in the wake of the coronavirus pandemic. In 2022, it is estimated that the value will again increase to more than EUR 300 million, cf. BMF (2021), Annex 8, paragraph 76.

[280] BAFA (2019b), table 7j (total domestic deliveries of jet fuel, heavy, without deliveries to the military).

[281] FÖS (2020a), p. 29.

impacts of aviation (e.g. the impairment of air quality due to the emission of nitrogen oxides and ultra-fine particulates as well as pollution from aircraft noise).

European requirements must also be taken into account when taxing kerosene. There has long been an EU-wide ban on kerosene taxation. The 2003 EU Energy Taxation Directive[282] now permits the taxation of kerosene for domestic flights and flights between Member States, provided there are bilateral agreements in this regard. In principle, however, there should be an EU-wide kerosene tax, because then all flights within the EU would be taxed. The EU Commission's current proposal on the reform of the Energy Taxation Directive takes this goal into account.

It proposes the gradual alignment of EU-wide minimum tax rates for kerosene with the minimum tax rates for fossil fuels.[283] According to the EU Commission, the alignment process will take place over a transition period of at least 7 to 10 years. After this period, the tax rate would only be 46.76 cents per litre or EUR 13.25 per gigajoule, which is significantly less than the energy tax rate of 65.45 cents per litre in accordance with paragraph 2(1), no. 3 EnergieStG.[284] The privileged treatment of aviation in Germany would then remain to some extent. The Federal Government should therefore work towards a higher minimum tax rate and shorter transition periods in the upcoming negotiations. It should also implement ambitious taxation on aviation at national level and through bilateral agreements with other Member States as soon as possible.

At international level, the Chicago Convention and other bilateral agreements such as the Open Skies Agreement limit taxation on fuels in aviation. However, the Chicago Convention only prohibits the taxation of kerosene that is already on board and is used for international onward flights. The taxation of kerosene that is refuelled for international flights at German airports would therefore definitely be possible if contradicting bilateral agreements were amended.

2.2.9 VAT exemption for international flights

Transboundary commercial air transport is exempt from value-added tax (VAT) in Germany and only domestic flights are subject to VAT.[285] This tax exemption favours air transport over other modes of transport and should therefore be abolished. This is also urgently needed from an environmental point of view, as aircraft are the most harmful means of transport in terms of climate impacts (cf. section 2.2.8).

Subsidies for the air transport sector resulting of VAT exemption in 2018 amounted to

EUR 4.0 billion.[286]

The Forum Ökologisch-Soziale Marktwirtschaft (FÖS) estimates that abolishing the VAT exemption could result in a saving of around 7.3 million tons of CO_2 equivalents in 2030.[287]

For the abolition of the VAT exemption for international air transport, an EU-wide solution makes sense in order to create uniform framework conditions for cross-border flights and to prevent distortion of competition and an exodus of passengers. In order to enable this, the EU VAT Directive could be reformed. If the legal situation were changed so that the VAT for the entire flight could be levied in the country of departure, this would have a considerable

[282] Article 14 of the EC Energy Taxation Directive.

[283] This alignment would take 'energy content' (EUR/GJ) as the basis of calculation.

[284] EU Commission (2021).

[285] Paragraph 4, no. 2 in conjunction with paragraph 8(2), no. 1 UStG.

[286] Own calculations based on Federal Statistical Office of Germany (2021a, table 4.1 'Total passenger and goods transport', 'Turnover (less VAT) from transport') and Federal Statistical Office of Germany (2019b, p. 22, 'VAT before deduction of VAT paid (input tax)', row 51, 'Aviation'). This provides a gross value from which input tax is still to be deducted.

[287] FÖS (2020a), p. 30.

environmental steering effect while requiring little administrative input. It would rule out double taxation in Europe.

In view of the existing legal restrictions, a possible second-best solution for the short term would be to levy VAT only on the domestic part of the flight routes. Another short-term solution would be to at least double the aviation tax and, by 2030, to increase it so far that the aforementioned tax losses resulting from the VAT exemption are compensated for by cross-border flights.[288]

2.2.10 Reduction of air traffic control charges through government grants

Deutsche Flugsicherung (DFS) performs various roles to ensure the 'safe, orderly and smooth running of aviation'.[289] Its services are financed in part by air traffic control charges which aviation companies pay to DFS.[290]

In 2016, the Federal Ministry of Transport and Digital Infrastructure decided to reduce air traffic control charges. This was justified by the international competition to which the aviation industry is exposed. In light of this, the aim of the decrease was to strengthen aviation companies and to free up room for investment.[291] For 2017, the Federal Government there absorbed a cost component of EUR 111 million. DFS's equity base was also increased by EUR 102 million, in order to decrease the charges in this way too.[292] By doing so, the Federal Government plans to '[continue] the measures taken to sustainably strengthen the aviation industry in terms of air traffic control.'[293] There are no figures for 2018. Therefore, it is not possible to quantify the subsidies for 2018.

The reduction of the charges brings down ticket prices and thus promotes the growth of aviation, an industry which is particularly detrimental to the climate. The decrease in the air traffic control charges should therefore be reversed.

The newly introduced financial support to 'assist with the provision of charge-funded air traffic control services at small airfields' is also a step in the wrong direction for the reasons stated above.[294] It should therefore be withdrawn.

2.2.11 Funding of regional airports

In light of the increasing popularity of 'low cost airlines', airports that are located further away from the international hubs have been becoming more important in recent years. This system of regional airports came at a price through subsidies from government budgets, however. It has become clearer and clearer in recent years that there are excess capacities and that the German airport system is inefficient. The regional airport crisis has again intensified further during the coronavirus crisis.[295]

Transport policy reasons were invoked as justification for the promotion of regional airports. Better transport connections to the respective regions are given as the main argument here.

[288] UBA (2019b), p. 33.

[289] Paragraph 27c(1) LuftVG.

[290] A distinction is made between arrival/departure and fees for the route. The charges depend on the charge rate, the weight of the aircraft and the route (cf. https://www.dfs.de/dfs_homepage/de/Services/Geb%C3%BChren/).

[291] https://www.spiegel.de/wirtschaft/unternehmen/luftfahrt-dobrindt-will-gebuehren-fuer-flugsicherung-senken-a-1122085.html

[292] Ibid.

[293] BMF (2019b), p. 64.

[294] BMF (2021), Annexes 4 and 7, paragraph 109.

[295] Kemfert (2020).

However, doubts are increasingly being raised as to whether this can be justified in terms of transport policy. According to a recent study by the Forum Ökologisch-Soziale Marktwirtschaft (FÖS), due to the low proportion of passengers who simply change to a different mode of transport, only three out of the 14 regional airports (Bremen, Dresden and Friedrichshafen) make a relevant contribution to connectivity.[296]

Even under purely economic aspects, the heavily subsidised system of regional airports is hardly justifiable.[297] And even before the coronavirus crisis, it was becoming clearer and clearer that the regional airports are not a profitable business model. 12 of 14 airports persistently report negative annual results.[298]

The detrimental impact on the environment is evident, however. In principle, flying is the most environmentally harmful way of travelling, primarily (but not only) because of its climate-damaging impact.[299] In 2019, the climate impact of regional airports was almost 4.2 million tons of CO_2 equivalents.[300]

In 2018, the public subsidies for the 14 regional airports amounted to

at least EUR 40 million.[301]

This figure is made up of operating cost grants (EUR 12.7 million), the assumption of losses (EUR 26.7 million) and investment grants (EUR 0.5 million). Examples of items not included in the figure are guarantees and sureties, loans from public funds, declarations of subordination or the land tax exemption for passenger airports. It must also be taken into account that the airports also benefit indirectly from the tax concessions for *airlines*.[302]

The subsidy policy in respect of regional airports was already targeted by EU state aid rules several years ago. In 2014, it was determined at EU level that as of 2024, grants towards the costs of the ongoing operation of airports (operating aid) would be prohibited. In light of this, the subsidies for regional airports should be reduced consistently and, if possible, before 2024.

[296] FÖS (2020c), p. 4. — The concept of connectivity is based on the frequency of aircraft movements at an airport (cf. ibid., p. 20).

[297] For example, Deutsche Bank Research (2015).

[298] FÖS (2020c), p. 18.

[299] See, for example, UBA (2019b) with regard to the impact of flying on the climate and environment.

[300] FÖS (2020c), p. 19.

[301] Ibid., p. 16.

[302] Ibid., p. 17.

2.3 Construction and housing

One central challenge of housing policy is, on one hand, to specifically create adequate, affordable housing in regions with a housing shortage and, on the other hand, to cause as few negative impacts on the environment and resources as possible. This is important because construction activities involve a very high consumption of resources. They require substantial amounts of materials and energy and are undertaken at the expense of a limited natural resource: land and soil. A substantial proportion of greenhouse gases is attributed to the manufacture of construction materials too.

All in all, the land take for human settlements and the transport infrastructure in 2019 comprised 14.3% of the total area of Germany.[303] The soil is sealed on nearly half (45%) of this area.[304] The aim of the German Sustainable Development Strategy is to reduce the additional land take for residential and transport purposes to 30 ha per day by 2030.[305] In 2018, however, this figure was still 58 ha per day. The lowest level of land take in recent years was in 2016, at 51 ha per day. It has increased again since then.[306] The long-term aim is to attain circular flow land use management in which no additional (net) land is used for residential and transport purposes.[307]

To achieve the 30-hectare target by 2030, the goal of reducing land take must be systematically taken into account in all government regulations that affect land take for residential and transport purposes. It is also necessary to prioritise the use of brownfield sites in settlement areas (land recycling) over areas on the outskirts, as they have substantial potential for reducing land take.[308]

Land take and increasing urban sprawl directly and indirectly lead to a variety of negative environmental effects. Land take results in the loss of both living space and soil for agricultural use as a natural resource. The consequences of urban sprawl include traffic generation, landscape fragmentation and soil sealing. These consequences in turn contribute to the pollution of various environmental goods — such as the climate, water, soil, air and biodiversity — but also to human health.

The destruction and fragmentation of habitats as a result of the increased land take for human settlements and the transport infrastructure are key causes of the decline in biodiversity.[309] Soil sealing also limits natural soil functions and has an adverse effect on the water balance. Faster rainfall run-off is detrimental to groundwater recharge and increases flood risks.

Increasing urban sprawl generates additional traffic and therefore leads to rising emissions of pollutants and noise. The large volume of traffic is also the reason for the comparatively high energy consumption in sparsely populated areas. Due to constantly increasing population density (users per km^2 of settlement area), the profitability of local and district heating networks and thus the potential for future use of combined heat and power production is decreasing because network lengths per resident are growing and the per capita costs of building and maintaining

[303] Federal Statistical Office of Germany (2020), p. 45, 119.

[304] Statistics Offices of the federal states (*Statistische Ämter der Länder*) (2020), table 4.9.

[305] Federal Government (2018), p. 55, target 11.1a.

[306] Federal Statistical Office of Germany (2021b), p. 84 et seq.

[307] Ibid., p. 84.

[308] There is no reliable and recent national data concerning the number of local brownfield sites. In the first half of the 2010s, inventories estimated the number to be approx. 150,000 to 176,000 hectares; https://www.umweltbundesamt.de/themen/boden-land-wirtschaft/flaechensparen-boeden-landschaften-erhalten/flaechenrecycling-innenentwicklung#innenentwicklung-und-flachenrecycling.

[309] BfN (2020), p. 21.

infrastructures are rising. This reduces the medium-term options for cutting CO_2 emissions. Urban sprawl therefore also has indirect adverse impacts on climate protection.

The increased land take for human settlements and the transport infrastructure is mainly at the expense of agricultural land. This means there is a permanent change in land use which cannot be reversed at all, or only at high cost. The loss of fertile soils reduces the potential for organic agricultural food production and for the environmentally sound production of renewable raw materials. In many cases, failure to make adequate use of brownfield sites also has adverse impacts on environmental goods. As a result of previous commercial use, brownfield sites often exhibit a high degree of soil sealing. Sealed soil prevents rainwater from seeping away into the ground, and therefore — as already mentioned — has harmful impacts on the water balance. Another common characteristic of brownfield sites is soil contamination, which would have to be remedied in the event of development for commercial or housing purposes. The adverse effects on environmental goods therefore arise not only from the use of new land, but also from failure to clean up contaminated brownfield sites.

Substantial quantities of material are also needed for the construction of residential buildings and infrastructures. In 2018, the building materials and non-metallic minerals industry extracted approx. 584 million tons of mineral construction materials.[310] In addition to mineral resources, such as limestone, gypsum, slate, gravel or sand, the construction industry also uses considerable amounts of metals. Of the 3.5 million tons of aluminium used in Germany in 2018, 15% were used in the construction sector. For copper, the proportion was around 15%, whereas for zinc it was around 42%.[311] This also gives rise to substantial environmental impacts. The harnessing of mineral resources and their extraction and preparation involve high consumption of natural resources. The production and further processing of raw materials is associated with land take, goods transport on a substantial scale, the consumption of materials and energy, greenhouse gas emissions and pollutant inputs into soil, water and the air. Mining affects landscapes, ecosystems and the water balance.[312]

The subsidies described below actually or potentially favour the expansion of construction activities for residential purposes, land take and the progressive destruction of the landscape. From an environmental perspective, priority should be given to promoting investment in existing buildings and the use of brownfield sites and of gaps between buildings in cities for residential purposes.

2.3.1 Housing premium

The housing premium is an instrument used by the government to promote saving for building purposes.[313] All building society savers whose taxable annual income does not exceed EUR 35,600 (married couples: EUR 70,000) can receive the premium.[314] The support amounts to 10% of the eligible deposits made up to a maximum of EUR 700 (married couples: EUR 1,400) per year.[315] These regulations have been in force since 2021 and constitute an expansion of the

[310] BBS (2020), p. 8.

[311] WVM (2019), p. 7 et seq.

[312] UBA (2011), p. 164.

[313] Further regulations on promoting saving for building purposes include the Home Ownership Pensions Act (*Eigenheimrentengesetz* or *Wohn-Riester*), cf. section 2.3.2) and the employee savings allowance (*Arbeitnehmer-Sparzulage*, cf. section 2.3.3).

[314] Paragraph 2a of the Housing Premium Act (*Wohnungsbauprämiengesetz*, WoPG).

[315] Paragraph 3 WoPG.

range of beneficiaries and the scope of the assistance compared with the legal position at the end of 2020.[316]

In recent years, the subsidy volume has decreased continuously.[317] An explanation of this is provided in the latest study by the German Institute for Economic Research (*Deutsches Institut für Wirtschaftsforschung*, DIW) commissioned by the Federal Ministry of Finance. The study attests to the decreasing efficiency of the instrument in recent years, as the subsidy rates and income thresholds have not been aligned with general developments in incomes and prices.[318] The increase in subsidy rates and income thresholds that has applied since 2021 will again result in a considerable rise in the subsidy volume in coming years, however.[319]

The goal of the housing premium is the 'acquisition of home ownership on a greater scale, earlier and in a more stable way and the functional integrity thereof in the sense of rent-free and qualitatively satisfactory housing after retirement.'[320] The instrument has a socio-political aim, because it primarily supports households with lower incomes.[321] The aforementioned study found the instrument to be very efficient.[322] However, a comparison with alternative instruments (efficiency analysis) was not carried out.[323]

The instrument may also be associated with environmentally harmful impacts, however. If it promotes the construction of new homes ('new builds') on greenfield sites, i.e. outside of towns and communities, the premium also aggravates land usage.[324] This conflicts with the aim of the German Sustainable Development Strategy of lowering land take (i.e. the increased land take for human settlements and the transport infrastructure) to below 30 ha per day by 2030.[325] It is also associated with extra commutes that have further negative effects on the environment and the climate.[326]

According to the Federal Government, the funding volume in 2018 was EUR 162 million.[327] Part of this is not considered harmful to the environment, however, for example, when it does not involve new builds. A very rough estimate of the environmentally harmful proportion here would be 50%. In light of this, in 2018 this environmentally harmful subsidy is estimated to have reached a volume of

EUR 81 million.

[316] Article 27, paragraphs 1 and 2 of the Act on Additional Tax Support for Electromobility and on the Amendment of other Tax Regulations (*Gesetz zur weiteren steuerlichen Förderung der Elektromobilität und zur Änderung weiterer steuerlicher Vorschriften*, JStG 2019). — Until 31 December 2020, the income threshold was EUR 25,600 (EUR 51,200 for married couples). The premium amounted to only 8.8% of expenditure and the annual maximum amount for expenditure eligible for the premium was EUR 512 (EUR 1,024 for married couples).

[317] In 2012, government spending due to the premium still amounted to around EUR 386 million, cf. BMF (2013), p. 162.

[318] DIW (2020), p. 7.

[319] Ibid, p. 11.

[320] BMF (2019a), p. 310.

[321] DIW (2020), p. 5.

[322] Ibid., p. 6.

[323] Ibid., p. 7.

[324] The acquisition of existing building stock, the extension of attics and renovations are indeed promoted by the premium (cf. BMF 2019a, p. 311). However, support for new builds is not ruled out.

[325] Federal Government (2018), p. 55, target 11.1a.

[326] With regard to the impacts of transport on the environment and the climate, cf. section 2.2.

[327] BMF (2019a), p. 310.

It is recommended that support for new builds on the outskirts of communities be excluded from the housing premium. The support should be focused on the acquisition of existing building stock, the extension of attics and (primarily energy-efficient) renovations.

2.3.2 Home ownership pensions (*Wohn-Riester*)

This instrument, which, since 2008, has included owner-occupied home ownership in the Riester pension (*Riester-Rente*), promotes the purchase or construction of an apartment or a house as well as the repayment of housing loans and the acquisition of shares in housing cooperatives.[328] Since 2014, the barrier-free conversion of owner-occupied homes has also been promoted. Renovations or energy-saving measures are not eligible.

Home ownership pensions give rise to similar environmental problems as with the housing premium. It provides undifferentiated incentives for housing construction and therefore contributes to further urban sprawl. According to information provided by Deutsche Rentenversicherung, the subsidy volume for home ownership pensions in 2018 amounted to around EUR 91 million. A proportion of approximately 50% of this is assumed to be environmentally harmful (cf. Housing premium, section 2.3.1). In light of this, in 2018 this environmentally harmful subsidy is estimated to have reached a volume of

EUR 46 million.

As this amount also includes proportions of the subsidy that are not environmentally harmful, this should therefore be considered a maximum amount.

As with the subsidies for savings with building societies, it is recommended that support for new builds on the outskirts of communities be excluded from the support. The support should be focused on the acquisition of existing building stock, the extension of attics and (primarily energy-efficient) renovations.

2.3.3 Employee savings allowance for savings with building societies

The employee savings allowance (*Arbeitnehmer-Sparzulage*) is intended to provide a financial incentive to build up capital.[329] In addition to other forms of building capital, the government also uses this to promote investment in saving schemes with building societies. The employee allowance for savings with building societies ranges from 9% up to maximum savings of EUR 470 per year,[330] which means that savers with building societies can receive support of EUR 42.30 per year.

The volume of the employee savings allowance in 2018 amounted to a total of EUR 80 million.[331] However, the Federal Government's Subsidies Report does not state what proportion of this consists of savings with building societies. No exchange between sub-funds is currently possible.

It is also recommended here that support for new builds on the outskirts of communities be excluded and that the support be limited to more environmentally friendly forms of capital formation.

[328] Paragraph 92a EStG.

[329] BMF (2019a), p. 443. — The employee savings allowance is regulated by paragraph 13 et seq. of the 5th Fifth Act on the Promotion of Capital Formation by Employees / the Fifth Wealth Formation Act (*Fünftes Gesetz zur Förderung der Vermögensbildung der Arbeitnehmer / Fünftes Vermögensbildungsgesetz*, VermBG).

[330] The support is granted up to an income threshold of EUR 17,900 of taxable income (EUR 35,800 in the case of joint assessment).

[331] BMF (2019a), p. 443.

2.3.4 Funding of social housing

In accordance with paragraph 1(1) of the Act on Social Housing Promotion (*Wohnraumförderungsgesetz*), the aim of promoting social housing is to support households with the rental housing (including cooperative housing) and with the creation of owner-occupied housing. The support is aimed at households for which the market does not provide adequate housing.[332] The objects of the support are housing construction, the modernisation of housing and the acquisition of housing or occupation rights.[333] The support is provided by granting funds, giving sureties, guarantees and other indemnities, and providing land for construction.[334]

While the goal of social housing promotion is undisputed, the selection of the instruments to achieve this goal is the subject of scientific debate. Even regardless of the environmental implications, it is pointed out that focussing on the 'subject-related assistance' (*Subjektförderung*, i.e. the payment of housing benefit for households in need) would be more beneficial from a macroeconomic perspective than 'object-related assistance, as is the case with the funding of social housing which is taken as a signal of scarcity distorts market prices.[335]

From an environmental perspective, the promotion of social housing gives rise to conflicts of interest when housing is supplied in the form of new builds, as this leads to excessively high consumption of resources and land and also has direct and indirect negative impacts on climate protection. The Act on Social Housing Promotion itself also calls for the 'alignment of economic and social needs with protection of the environment' (paragraph 6 WoFG). Various 'general principles of support' are also provided in paragraph 6 WoFG. The economical use of land and soil must therefore also be taken into account within the context of the support.[336]

Since the Act on Social Housing Promotion (*Wohnraumförderungsgesetz*) of 2002, there has been a refocus to promote the modernisation of existing housing stock. This is a positive development from an environmental perspective as it means that land is protected. There has been a major challenge in recent years, in which the size of the population has increased, mainly due to immigration, and the growing number of households has led to an increase in demand for housing in many regions.[337]

In 2018, the Länder spent a total of EUR 2,381 on the promotion of social housing.[338] The volume of support for the construction of new houses is not given separately. Based on experience from 2010 to 2013, it is assumed that a share of 74% of the total funding is accounted for by the construction of new houses.[339] Taking into account that, for a part of the subsidised new houses,

[332] Paragraph 1(2) WoFG. — Here, the support for rental housing is aimed in particular at households with low incomes, families and other households with children, single parents, pregnant women, elderly people, disabled people, homeless people and other people who need help; cf. paragraph 1(2), no. 1 WoFG; and the support for the creation of owner-occupied housing is aimed in particular at families and other households with children, as well as disabled people who, taking into account their income and the home owner allowance (*Eigenheimzulage*), would not be able to cover the costs of building or purchasing a home without such support, cf. paragraph 1(2), no. 1 WoFG.

[333] Paragraph 2(1) WoFG.

[334] Paragraph 2(2) WoFG.

[335] For example, Fritsch (2018), p. 349. — As 'subject-related assistance', the housing benefit essentially has the same aim as the funding of social housing. Paragraph 1(1) of the Housing Benefits Act reads: 'The purpose of housing benefit is to secure in economic terms adequate housing that is suitable for families.'

[336] Paragraph 6(9) WoFG. Reference is made there to: '[t]he economical use of land and soil, environmental requirements for building and the modernisation of housing, as well as resource-efficient building methods.'

[337] German Bundestag (2020b), p. 5.

[338] This is the total amount provided by the Federal Government and the Länder for grant funding and interest subsidies. In 2018 (as in 2017 and 2019), the scale of federal funds ('compensation') was EUR 1,518 million, cf. German Bundestag (2021), p. 3.

[339] German Bundestag (2015), p. 16. The funding paid out between 2010 to 2013 amounted to a total of EUR 3,335.96 million, while the funding for the construction of new houses amounted to EUR 2,461.02 million. This corresponds to a proportion of around 74% for new-build homes.

there might not have been an alternative to new builds, the proportion of environmentally harmful subsidies is very roughly estimated at 50%. In light of this, the subsidy volume classified as environmentally harmful within the context of the promotion of social housing in 2018 is estimated to amount to

EUR 1,191 million.

The public sector should continue to pursue this fundamental reorientation — away from new builds — and set clear priorities in respect of housing provision. Opportunities to provide housing by renovating and converting existing attic spaces or by adding additional storeys should primarily be exploited. If such opportunities have been exhausted then, secondly, gaps between buildings, unused industrial and commercial sites and converted land should be taken into account. Only if there is an urgent need for residential accommodation over and above this level should new open spaces be developed. In this case, the main focus should be on space-saving apartment blocks.

To provide more targeted support for those who do not have the resources of their own to find appropriate accommodation on the housing market, the assistance should focus more on the households actually affected (subject-related assistance). This is because object-related assistance often gives rise to the problem that households only benefit from cheaper housing if their earnings significantly improve. The German Environment Agency therefore recommends that the instrument of housing subsidies be used to a greater extent. Also, in growth regions where the market suffers from a shortage of housing for low-income households, local authorities should expand municipal acquisition of occupancy rights in existing buildings for households in need.

2.3.5 Joint Task for Improving the Regional Economic Structure

The Joint Task for Improving the Regional Economic Structure (*Gemeinschaftsaufgabe 'Verbesserung der regionalen Wirtschaftsstruktur'*) is a central instrument of regional economic policy in Germany. The aim of the Joint Task is to support structurally weak regions and to compensate for location disadvantages in respect of investment. The Joint Task is intended to enable the regions concerned to get in line with general economic development, to reduce regional developmental differences and to provide incentives to generate income and create jobs.

The Länder are responsible for regional structural policy in principle, but the Federal Government also is involved in this task.[340] The Joint Task is governed by a specific federal law,[341] according to which support is provided through grants, loans and guarantees.[342] The Federal Government is involved in framework planning and financing. The Federal Government and the Länder each provide 50% of the funds.[343]

A distinction is made between support for trade and industry and support for 'industry-orientated infrastructure'.[344] The latter is particularly relevant in terms of environmental policy because in practice, support for industrial and commercial sites[345] is often associated with the development of unused space.

[340] Article 91a(1), no. 1 GG.

[341] Act on the Joint Task for Improving the Regional Economic Structure (*Gesetz über die Gemeinschaftsaufgabe 'Verbesserung der regionalen Wirtschaftsstruktur'*, GRW-Gesetz/GRWG).

[342] Paragraph 3 GRWG.

[343] Paragraph 7(1) GRWG.

[344] Paragraph 1(1), no. 1 and 2 GRWG.

[345] Joint Task Coordination Committee (2019), p. 28.

The total volume of the infrastructure support in 2018 amounted to EUR 649 million.[346] Due to the wide variety of measures that are eligible for support, however, it makes sense to consider this as an environmentally harmful subsidy generally. The scale of the environmentally harmful subsidy is therefore not quantified here.

Subsidising the development of new industrial and commercial spaces as a regional structural policy measure is seen as a negative development in light of the land take often associated with it. The uncritical funding of such projects conflicts with the land-saving objectives of the German Sustainable Development Strategy. It also increases the volume of traffic. The promotion of industry and commerce can also contribute to a growing volume of traffic, however, even when the majority of output is exported to other regions. The volume of support given to industry and commerce in 2018 amounted to EUR 591 million.[347]

Especially in structurally weak, rural regions which are key assistance areas, settlement areas usually grow faster than the population. At the same time, the intensity of use of newly developed areas is frequently low, and the number of vacant lots in newly developed industrial and commercial areas is growing. The development of land for industry and commerce usually also entails the increased use of land for the transport infrastructure, which — in addition to land take — leads to more traffic-related environmental pollution.

Structural assistance instruments such as the Joint Task could provide important stimuli for saving space.[348] For this reason, the funding guidelines of the Joint Task should be expanded to include environment-orientated assistance criteria, e.g. giving brownfield site recycling and the development of existing space clear priority over the development of new commercial spaces. The corresponding advantage, as it is currently found in the current coordination framework,[349] is still too weak an instrument in terms of its environmental management. The requirement to take into account the requirements of spatial planning is not effective enough either.[350]

Structural assistance measures should serve the internal development and refurbishment of existing settlement areas and infrastructures, especially since long-term funding of the maintenance of existing public infrastructures is subject to great risks in structurally weak regions. One precondition for support should be that the applicant must first present an inventory of potential vacant lots and of unused former commercial and industrial sites. Additional land development should only be undertaken if the available reserves of land are exhausted and opportunities for land-saving building methods are exploited.

Furthermore, instead of aiming at promoting construction measures, the Joint Task should instead be aimed at promoting human capital and environmental innovations and strengthening regional economic cycles. Another factor of central importance for improving regional economic structure is sustainable and efficient management of natural resources in the region in order to maintain and develop the natural capital. In this respect, the forward-looking orientation of the Joint Task therefore requires a definition of investment that does not consist solely of investment in real capital.[351] Is it therefore considered a positive development that cooperation networks, innovation clusters and training for companies are also eligible for support under the

[346] Bafa (2020).

[347] Bafa (2020).

[348] EEA (2006), p. 7.

[349] Joint Task Coordination Committee (2019), p. 28 et seq.

[350] Ibid., p. 26.

[351] In any case, the latest evaluation of the Joint Task by the Halle Institute for Economic Research (*Institut für Wirtschaftsforschung Halle*, IWH) also acknowledges the need to invest in skills (human capital), cf. IWH (2020), p. 6.

current coordination framework, i.e. assistance is provided for investments in activation schemes for local people.

2.3.6 Family housing grant

The family housing grant (*Baukindergeld*) was and is a central housing policy project of the coalition agreement from 2018. The aim of the instrument is to promote home ownership among families.[352] Families receive EUR 1,200 per year and child over a period of ten years. This applies for the purchase or construction of a property between 1 January 2018 and 31 March 2021 (funding period). The support is subject to an income threshold of EUR 75,000 (taxable household income) plus EUR 15,000 per child. The family housing grant is often termed the 'successor' of the home owner allowance, which was abolished in 2006.[353]

While there is little doubt in the aforementioned housing policy objective under debate, the considerable weaknesses of the instrument have long been highlighted in literature.[354] The fact that the family housing grant helps households in the higher income groups in particular is considered to be a central deficit.[355]

From an environmental perspective, the inefficient design of the instruments is problematic in respect of the aim of reducing land take. Because of the fixed amount, for which no differentiation is made by region, the effect in rural areas is likely to be even significantly greater than in urban areas. As a result, the family housing grant incentivises in particular new builds in regions in which there is only little need for construction. This in turn intensifies property vacancies in these regions.[356] From an environmental perspective, however, it would make sense to limit the instrument to city-centre areas and existing buildings.

The family housing grant is also particularly expensive from a fiscal perspective.[357] Throughout the funding period from 2018 to 2021 and the associated backlog of payment claims spanning many years, the family housing grant costs the tax authorities a total of at least EUR 3.6 billion, but at a realistic estimate probably more likely between EUR 4 and 5 billion.[358] The financial volume in 2018 amounted to EUR 11 million.[359] The proportion for new builds is not given separately. Analogous to the estimate of the volume for the promotion of social housing (cf. section 2.3.4), a very rough estimate of a proportion of 50% is considered environmentally harmful here. On this basis, this environmentally harmful subsidy in the form of the family housing grant for 2018 amounts to

EUR 6 million.

In the years that followed, the financial volume of this scheme soared, however. The Federal Government therefore expects a financial volume of EUR 955 million in 2022.[360] In this respect, ending the support scheme is a positive development not just for environmental reasons but for fiscal reasons too.

[352] CDU et al. (2018), p. 110.

[353] Voigtländer/Henger (2018), p. 16; Michelsen et al. (2018), p. 2; UBA (2016), p. 52 et seq.

[354] Voigtländer/Henger (2018), p. 16 et seq.; Michelsen (2018); Michelsen et al. (2018), p. 2 et seq.

[355] Michelsen et al. (2018).

[356] Voigtländer/Henger (2018), p. 17.

[357] Voigtländer/Sagner (2019), p. 4; Voigtländer/Henger (2018), p. 17.

[358] Voigtländer/Henger (2018), p. 17.

[359] BMF (2019a), p. 308.

[360] BMF (2021), Annex 7, paragraph 126.

2.3.7 KfW Home Ownership Programme

The KfW Home Ownership Programme (*Wohneigentumsprogramm*) provides very low-interest loans for the purchase or construction of owner-occupied apartments and homes. The level of assistance is capped (at EUR 100,000).[361] Typically, it is not the entire property but rather a part thereof that can be funded through the programme. The KfW Home Ownership Programme is another instrument relating to the housing policy and social policy aim to create the highest home ownership rate possible.[362]

This programme is considered environmentally harmful because it promotes new builds and therefore land take. In this regard, the instrument thus does not provide for a differentiation of funding according to ecological criteria. In 2018, the subsidy volume of the KfW Home Ownership Programme amounted to EUR 3,452 million.[363] The proportion for new builds is not given separately. Only part of the new builds lead to additional land take too. Analogous to the estimate of the volume for the promotion of social housing (cf. section 2.3.4), a very roughly estimated proportion of 50% is considered as environmentally harmful here. On this basis, this environmentally harmful subsidy in 2018 amounts to

EUR 1,726 million.

Various regulations might be considered in order to make environmental distinctions. It is therefore conceivable that a distinction could be made between the credit terms for new builds and existing buildings and that housing on the outskirts of communities could be excluded from the support. It also appears to be worthwhile making a distinction in respect of the support for new builds based on various climate protection factors. In principle, support should only be provided for new builds if they are in line with climate protection targets.

[361] https://www.kfw.de/inlandsfoerderung/Privatpersonen/Neubau/Finanzierungsangebote/Wohneigentumsprogramm-(124)/

[362] Voigtländer/Sagner (2019).

[363] https://de.statista.com/statistik/daten/studie/70412/umfrage/kfw-wohneigentumsprogramm---ausgaben-1996-bis-2007/

2.4 Agriculture, forestry and fishing

Around half of the total area of Germany is used by the agricultural industry.[364] The agricultural industry is therefore the most important sector of the Germany when it comes to land use. Extensive agricultural use performs important ecological functions by maintaining the cultural landscape and keeping it open. Among other things, it contributes to the maintenance of biodiversity and supports both soil and water conservation and groundwater recharge.

In recent decades, however, agricultural land use has been characterised by increasing intensification and specialisation. This leads to various environmental problems.[365] In respect of greenhouse gases, the agricultural sector was responsible for 64.4 million tons of CO_2 equivalents in 2020, representing 8.2% of the total annual greenhouse gas emissions in Germany.[366] Of this, 38 millions tons of CO_2 equivalents of GHG emissions alone were attributed directly to livestock farming. This is equivalent to 61.6% of emissions from the agricultural industry and almost 5% of Germany's total emissions.

With a proportion of 5%, carbon dioxide makes up only a very small part of the greenhouse gas emissions from the agricultural industry. The major gases are methane (51.2%) and nitrous oxide (44.2%). Methane is primarily created during the process of digestion (fermentation) in cattle and dairy cows. Nitrous gas emissions are primarily generated when spreading mineral and organic fertilisers on agricultural soil.[367] The Climate Change Act of 2021 contains annual maximum greenhouse gas emission volumes for every sector for the 2020s, with the agricultural industry not being allowed to emit more than 56 million of tons of CO_2 equivalents in 2030.[368]

Further environmental problems arise from material pollution from nutrients, pesticides and other harmful substances. Excess nutrients are released into the air (particularly as ammonia and nitrous oxide) and into water bodies (particularly as nitrates). This leads to the acidification and eutrophication of terrestrial, aquatic and coastal ecosystems with resulting damage to biological diversity and pollution of the groundwater, surface waters and the seas. Excessive use of nitrogen fertilisers in particular plays a major role in this context.

Further material pollution results from the use of plant protection products (PPP, pesticides). PPP are used to get rid of weeds and pests in order to increase yields and productivity. However, even if high-quality broad-spectrum insecticides and herbicides are used, the use of PPP also leads to various environmental problems, which in turn affect opportunities for long-term (sustainable) farming.[369] The use of PPP leads to the depletion of field weeds, with the result that many mammals, birds and other species are deprived of their food supply. PPP use can also affect soil fertility by damaging soil organisms. Finally, PPP seep into the groundwater and, through drinking water or agricultural produce, end up in food products.

Besides material pollution, agricultural production can result in the destruction or impairment of soils. Such impacts are largely due to the use of heavy machinery in arable farming as well as to inappropriate crop rotation for the relevant areas.

[364] In 2019 it was 50.7%, cf. Federal Statistical Office of Germany (2020), p. 191.

[365] https://www.umweltbundesamt.de/en/topics/soil-agriculture/ecological-impact-of-farming

[366] https://www.umweltbundesamt.de/daten/land-forstwirtschaft/beitrag-der-landwirtschaft-zu-den-treibhausgas#treibhausgas-emissionen-aus-der-landwirtschaft

[367] Ibid.

[368] Annex 2 (to paragraph 4) of the Federal Climate Change Act.

[369] https://www.umweltbundesamt.de/daten/land-forstwirtschaft/pflanzenschutzmittelverwendung-in-der#zulassung-von-pflanzenschutzmitteln

In light of this, the government should reduce environmentally harmful subsidies in the agricultural industry and in return pay for environmental inputs in line with the principle of 'public money for public goods', for example, through the funding of agri-environmental measures or assistance with the transition to organic farming. Direct payments should also be linked to compliance with demanding environmental standards.

2.4.1 European Union agricultural subsidies

As one of the longest standing EU policies, the Common Agricultural Policy (CAP) entered into force back in 1962, when there was still a long way to go before environmental issues would become the focus of attention. In fact, sustainability issues have received increasing attention in recent years. However, there was no change with regard to the basic goals.[370] These include increasing agricultural productivity by promoting technological advancement, streamlining agricultural production, stabilising agricultural markets and ensuring the supply of food at reasonable prices.

The CAP is one of the largest budget items of the EU. In the funding period 2014 to 2020, Germany was provided with more than EUR 6.2 billion per year.[371] The CAP plays a key part in defining the economic framework conditions for Germany's agricultural industry. It could therefore also be a crucial part of environmental transition in the agricultural industry. This is subject to the CAP being environmentally friendly, however, and there is still major room for improvement here.

Since 1999, the CAP has been based on two pillars. The first pillar, which is significantly better equipped in financial terms, consists of market-based expenditures and direct payments to farmers (EUR 40 billion in 2017). The second pillar, which was only introduced in 1999, addresses the development of rural areas (EUR 14 billion in 2017).[372]

The first pillar[373] was converted from the former form of support based on production (price and purchase guarantees) into an area-dependent (i.e. production-dependent) direct subsidy in a process which began in the early 1990s[374] in order to diminish the incentive to intensify agriculture. The cross compliance and greening requirements were added later. 'Cross compliance' means that recipients of direct payments are obliged to comply with certain selected European standards, including standards covering environmental health and animal protection.[375] The EU has also added cross compliance requirements to the 'Good Agricultural and Environmental Condition' (GAEC). As of 2015, there were also the greening requirements for crop diversification, the preservation of permanent grasslands and the designation of agricultural areas in the environmental interest (areas set apart for ecological purposes (so-called ecological priority areas)).[376]

[370] Article 39 TFEU (Treaty on the Functioning of the European Union), Pe'er et al. (2019), p. 449.

[371] https://www.bmel.de/DE/themen/landwirtschaft/eu-agrarpolitik-und-foerderung/gap/gap_node.html

[372] Pe'er et al. (2019), p. 449.

[373] EU Regulation 1307/2013.

[374] Of central importance in this context were, for example, the Luxembourg decisions of June 2003, which have largely decoupled direct payments from production since 2005. But it is only since 2013 that Germany has purely had what is referred to as a regional model, in which all a farm's payment claims in a region are based solely on the farm area (regionally uniform area-based premium), regardless of the agricultural use in the individual case.

[375] Article 93 and Annex II EU Regulation 1306/2013. This also includes, among others, Articles 4 and 5 of the EU Nitrates Directive 91/676/EEC and 6(1) and (2) of the EU Habitats Directive 92/43/EEC. — This also applies in respect of feed and food safety. Annex II of EU Regulation 1306/2013.

[376] Articles 43–47 EU Regulation 1307/2013.

Based on the environmental challenges of the agricultural industry, however, the requirements are not sufficient. The agricultural industry continues to cause considerable environmental damage in respect of the condition of water, soil and air, biodiversity and greenhouse gas emissions. The greening according to the first pillar has led to barely any environmental improvement.[377] The contribution to the protection of biodiversity is also low.[378] There is a special report by the European Court of Auditors titled: 'Biodiversity on farmland: CAP contribution has not halted the decline'.[379] On the whole, the direct payments have turned out to be ineffective in relation to *all* dimensions of sustainability, especially from a social and economic perspective.[380]

It does not make sense to class a fixed amount from the first pillar as an environmentally harmful subsidy. The important thing is to design the eligibility criteria in such a way that the CAP is an effective way of working towards sustainable agriculture.

The second pillar[381] consists of targeted support schemes for sustainable and environmentally friendly farming and rural development. This includes, among other things, voluntary measures as agri-environmental and climate action, the promotion of organic farming and compensatory payments for areas facing natural constraints. Measures according to the second pillar can therefore be a targeted contribution to environmental protection. However, there are a few measures that can have detrimental effects on the environment. For example, these include the promotion of certain water management measures or of agricultural and forestry road construction.[382]

In the next CAP period, the Member States will have considerable leeway to use funds more strictly in line with the principle of 'public money for public goods'. However, the EU has not made this mandatory through ambitious minimum standards and requirements. CAP 2020 is designed as a two-pillar model, but it does contain new instruments too. Specifically, the 'green architecture' provided for in the CAP 2020 contains three instruments to promote environmental and climate protection in the agricultural industry:

1. The previous minimum standards in the first pillar, cross compliance and greening, will be restructured and made a so-called 'conditionality'. In principle, the requirements remain the same. Conditionality consists of the standards for the good agricultural and environmental condition of spaces and the functional requirements of farm management.
2. Member States will also be introducing a new instrument for environmental requirements into the first pillar, namely eco-schemes. Eco-schemes mark an initial step away from the flat-rate direct payments and towards the payment for services in the first pillar. Participation is voluntary for farmers, however.
3. As before, there are support schemes for agri-environmental and climate protection in the second pillar.

In Germany, the new CAP funding period should be used to move away from flat-rate area-based direct payments towards payments for general interest services such as environmental and climate protection. This means that environmental and climate protection may also be financially worthwhile for farms in regions characterised by intensive agricultural use. For this reason, it makes sense to shift financial support away from the first pillar to the second pillar as much as

[377] Röder et al. (2019).

[378] SRU (2020, 2018), in respect of the deficient result, also Pe'er et al. (2019), p. 451.

[379] ECA (2020a). — The report reads: 'Some direct payment requirements, notably greening, and cross-compliance, have potential to improve biodiversity, but the Commission and Member States have favoured low-impact options' (ibid., p. 5).

[380] Pe'er et al. (2019), p. 450 (emphasis added by the authors); also, Pe'er et al. (2017), Navarro/López-Bao (2018).

[381] EU Regulation 1305/2013.

[382] SRU (2016), p. 279, and https://www.bmel.de/DE/themen/laendliche-regionen/foerderung-des-laendlichen-raumes/gemeinschaftsaufgabe-agrarstruktur-kuestenschutz/gak-foerdergrundsaetze.html

possible and to use it for agri-environmental and climate measures. It is also important to equip the eco-schemes as a new instrument in the CAP architecture with a growing budget in order to press on with the necessary restructuring of agricultural support beyond the first pillar too.

2.4.2 Tax concession for agricultural diesel fuel

Agricultural and forestry undertakings can apply for a partial refund of the energy tax paid on their fuel consumption.[383] Agricultural diesel fuel is subject to a reduced tax rate of 25.56 cents per litre compared with the regular tax rate of 47.04 cents per litre.[384] The tax relief granted therefore amounts to 21.48 cents per litre.[385] The concession on the use of diesel fuel in the agricultural industry was introduced in 1951[386] to ensure that agricultural and forestry undertakings remain competitive.[387]

However, the Supplementary Budgetary Act (*Haushaltsbegleitgesetz*) of 2005[388] limited the tax relief per undertaking to 10,000 litres per year and also provided for a deductible (excess) of EUR 350. However, this restriction on the support was revoked by the Act Amending the Energy Tax and Electricity Tax Act (*Gesetz zur Änderung des Energiesteuer- und des Stromsteuergesetz*) of March 2011.[389]

The privileged treatment of agricultural diesel conflicts with the aim of climate protection as it subsidises fossil fuels and greatly diminishes the economic incentives to use energy sources efficiently. Furthermore, the support is not sustainable in respect of the principles of sustainability laid down under no. 3a of the German Sustainable Development Strategy (resource conservation, soil protection and air quality control). Monitoring of the subsidy on behalf of the Federal Ministry of Finance also concluded that the agricultural diesel fuel concession is only moderately appropriate for ensuring the competitiveness of agricultural and forestry undertakings and should not be continued in its current form.[390] In particular, it is criticised that the subsidy distorts the use of production factors in favour of diesel, is not accurate and has critical distributional effects.

In 2018, the tax allowance for agricultural diesel fuel resulted in tax revenue losses in the sum of

EUR 467 million.[391]

For the reasons provided, the agricultural diesel fuel concession should be abolished. The Federal Government's latest Immediate Action Programme for Climate Protection 2022 of 23 June 2021 provides for a critical examination of environmentally harmful subsidies. Quite rightly, this also relates to this subsidy.[392] A reform in Germany will also be determined by the current reform of the EU Energy Taxation Directive in this respect.

[383] Paragraph 57 EnergieStG.

[384] Paragraph 2(1), no. 4b) EnergieStG.

[385] Paragraph 57(5), no. 1 EnergieStG.

[386] At that time stipulated in the Agricultural Gas Oil Use Act (*Landwirtschafts-Gasölverwendungsgesetz*), cf. BMF (2019a), p. 339.

[387] BMF (2019a), p. 339.

[388] Federal Law Gazette (*Bundesgesetzblatt*), 2004, part I, no. 73; Bonn, 28/12/2004.

[389] Fifo et al. (2019), p. 214.

[390] Fifo et al. (2019), p. 16.

[391] BMF (2019a), p. 339.

[392] BMF (2021), Annex 8, paragraph 20.

Depending on elasticity of demand, abolishing this subsidy would result in a reduction in greenhouse gas emissions of between 0.14 and 0.45 million tons of CO_2 equivalents per year.[393]

Abolishing the agricultural diesel fuel concession would free up a considerable amount of public funds. They could be used to strengthen the competitiveness of the agricultural industry and agricultural income in a more efficient, environmentally friendly way. The use of revenue to increase the payments made for environmental services and the proportion of other sustainable sources of income for the agricultural industry, for example, might be considered. Concessions relating to the production factor 'work' are also conceivable.[394]

2.4.3 Exemption of agricultural vehicles from vehicle excise duty

In accordance with paragraph 3, no. 7 of the Vehicle Excise Duty Act (*Kraftfahrzeugsteuergesetz*, KraftStG), agricultural vehicles are exempted from vehicle excise duty. This tax exemption goes back to 1922, when it was intended to promote the motorisation of agricultural and forestry undertakings. This objective is now outdated, also according to the Federal Government's Subsidies Report.[395] However, the regulation is part of the portfolio of instruments used for achieving the goal of general promotion of agriculture and forestry.[396]

The exemption is detrimental to the environment and the climate as it reinforces the trend of using increasingly heavy machines in the agricultural industry. This tends to result in an increase in fuel consumption and greater damage to agricultural soils through compaction. Such damage is often irreversible and restricts the natural functions of the soil. There are also negative impacts on air quality. At the same time, the concession presents an obstacle to exploiting efficiency and rationalisation opportunities, such as through machinery pools, the purchase of efficient vehicles and efficient operation. In this sense, it is not effective on economic grounds either. The distribution effects of the subsidy are also problematic as they primarily benefit farms with a large machinery inventory.

In 2018, the exemption of the agricultural industry from the vehicle excise duty resulted in a loss of tax revenue for the federal authorities totalling

EUR 470 million.[397]

For the reasons stated, the exemption of agricultural vehicles from vehicle excise duty should be abolished. The Federal Government's Immediate Action Programme for Climate Protection 2022 of 23 June 2021 provides for a critical examination of environmentally harmful subsidies. Quite rightly, this also relates to this subsidy.[398]

One alternative to this subsidy would be the use of funds by the government to reinforce rural development or to directly pay for environmental services, for example, for the conservation of environmentally valuable spaces through extensive use or by landscape management services.

[393] FÖS (2020a), p. 33.

[394] Fifo et al. (2019), p. 16, 233.

[395] BMF (2015), p. 240.

[396] BMF (2019a), p. 336.

[397] BMF (2019a), p. 336. — For 2012, an amount of EUR 60 million was indicated in the Federal Government's Subsidies Report (BMF 2013, p. 60 and 180) and consequently also in the UBA's previous report (UBA 2016, p. 64). There are methodical reasons for this blatant increase. On one hand, until the Federal Government's 24th Subsidies Report, this was based solely on the proportion attributed to the use of public roads, cf. BMF (2013) and (2015), p. 240. On the other hand, customs redeveloped statistical evaluation when it took over the management of vehicle excise duty.

[398] BMF (2021), Annex 8, paragraph 18.

2.4.4 European Union fisheries subsidies

Fisheries is traditionally a sector facing major environmental challenges. It is regulated at European level through the Common Fisheries Policy (CFP).[399] Fundamental problems include overfishing and the effect of fishing on marine ecosystems. Approximately 38% of the fish stocks in the North-East Atlantic and the Baltic Sea are currently considered to be overfished in the EU.[400] Aquaculture as currently practised also contributes to overfishing of the oceans, as every sixth wild fish is caught to provide aquaculture feed (FAO 2020).[401] By-catches of non-target species and large-scale damage to habitats by bottom-scouring fishing gear such as bottom trawls are some of the negative effects of fishing on marine ecosystems.[402] According to the regular condition assessments carried out by the Member States within the context of the EU Marine Strategy Framework Directive (MSFD),[403] European seas are not in a good condition in terms of biodiversity and the environment. Reports on the state of the North Sea and the Baltic Sea are compiled by Germany as well.[404] The effects of greenhouse gases on the atmosphere also change the physical and chemical conditions of the oceans. This means that marine organisms that are affected by fishing, e.g. by climate change-related marine heatwaves, oxygen depletion or ocean acidification, face potential impact on their growth, reproduction and survival.[405]

The principal cause of the environmental challenges associated with fishing is a form of market failure known as the 'tragedy of the commons'. In the case of so-called 'common goods' (here: fish stocks), there is rivalry on one hand but a lack of means to prevent exclusive use on the other hand.[406] As a result, there is the risk of fishing companies systematically over-exploit the good, even though this is not in their own interests. To avoid collective self-inflicted damage, institutional (politically organised) constraints on use are required.

The CFP, which also provides Germany with a framework for the management of fish stocks, aims to address this market failure and to organise these constraints. In this context, annually set catch quotas (fishing allocations) are a central instrument.[407] The setting of fishing quotas is based, among other things, on the scientific recommendations of the International Council for the Exploration of the Sea[408] (ICES Advice). The maximum sustainable yield (MSY) has been embedded in the CFP since 2014 as a measure of the sustainability of stocks.[409] It can be used to determine the volume of fish that can be caught without jeopardising the yields and the reproductive capacity of the stocks. However, the catch quotas within the CFP are set at a political level by the Council of the Fisheries Ministers of the EU Member States. The maximum quantities determined in this way are often criticised by the scientific community as the quotas allow higher fishing allocations than recommended by ICES. In addition to the instrument of fishing allocations, the landing obligation for by-catches (discard ban) has been in force since 2019 and is intended to give fishers an incentive to reduce by-catches and to protect the ecosystems. Other

[399] https://ec.europa.eu/oceans-and-fisheries/policy/common-fisheries-policy-cfp_en

[400] STECF (2020). — For comparison: According to the FAO, approximately 35% of fish stocks worldwide were not fished sustainably in 2017, FAO (2020).

[401] FAO (2020).

[402] For example, Wolff et al. (2014).

[403] https://ec.europa.eu/environment/marine/good-environmental-status/descriptor-1/index_en.htm

[404] https://www.meeresschutz.info/berichte-art-8-10.html

[405] For example, IPCC (2019).

[406] See, among many further sources, Fritsch (2018), p. 96 et seq.

[407] Cf. e.g. Klöckner (2019), p. 15.

[408] International Council for the Exploration of the Sea; https://ices.dk/advice/Fisheries-overviews/Pages/fisheries-overviews.aspx

[409] https://wirtschaftslexikon.gabler.de/definition/maximum-sustainable-yield-39324

regulatory instruments include the minimum mesh sizes to protect fish below minimum sizes, the designation of protected zones and times, and the restriction of fishing efforts. To this end, a ship's days at sea or its size, for example, are limited by regulation. However, threatened marine species and habitats are still not sufficiently protected, for example, because of a lack of regulation of fishing in the designated protected areas.[410]

European fisheries policy is characterised by circumstances that result in a rather sluggish transformation towards sustainability. One obstacle is the influence on political decisions of lobbying groups in the fishery sector, particularly with regard to setting catch quotas, which consequently often leads to the provision of quotas deviating from scientific recommendations. The politically motivated interest in income and employment in often structurally weak coastal regions also contributes to this effect. Another problem is the knowledge base (inventory-taking) required for the quantitative substantiation of the regulation. The knowledge required in this regard is complex, costly and, for some species, unavailable due to insufficient data collection on these fish stocks. This also encourages a tendency to set excessively high fishing allocations during the political negotiation process, if the precautionary principle is not applied in the interests of sustainability and stock protection. It has been possible to promote the necessary expansion of the knowledge base and the strengthening of environmental measures since 2014 via the European Maritime and Fisheries Fund (EMFF). In addition, regulatory approaches often face implementation problems. The use of new technologies (e.g. remote electronic monitoring (REM) and closed circuit television (CCTV)) could make up for insufficient monitoring, e.g. at sea. Tests are currently funded by the EMFF.[411]

Within this context of difficult regulation, what exactly subsidies are used for under the CFP makes a key difference for the protection of ecosystems and a sustainable use of the oceans. In respect of negative environmental impacts, this means that '[s]ubsidies […] are key drivers of the unsustainable exploitation of the world's depleted fish populations.'[412] This challenge is also expressly addressed in SDG 14.6 of the Agenda for Sustainable Development.[413] Subsidies which increase fishing capacities and therefore contribute to the intensification of fishery operations are classified as environmentally harmful. This refers to capacity-enhancing subsidies, which must be reduced in the interest of protecting resources and the ecosystem. They are compared with the favoured beneficial subsidies, which ensure the protection and management of fish stocks. A third category are the so-called ambiguous subsidies, whose environmental impact depends on the exact design.[414]

In light of this classification, it is clear that by setting up the EMFF[415] in 2014, the EU has taken a substantial step towards transforming the sustainability of the sector. The EMFF should now help European companies with converting to sustainable fishery, assist coastal communities with developing new economic activities and support projects that create new jobs and improve the quality of life on European coasts. In particular, measures such as fleet adaptation with the aim of achieving a balanced ratio with the available catch opportunities and small-scale coastal fishing are promoted in the interest of sustainable fishing. No more funds should be provided for

[410] SRU (2020), p. 494, with further references; and ECA (2020b).

[411] This applies in particular for the implementation of the discard ban. The power to enforce this and compliance with it are still low (cf. EU Commission 2020b).

[412] Sumaila/Pauly (2007), p. 945. Similarly also Sumaila et al. (2019a), p. 36.

[413] SDG 14.6 reads: 'By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies, recognizing that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organization fisheries subsidies negotiation.'

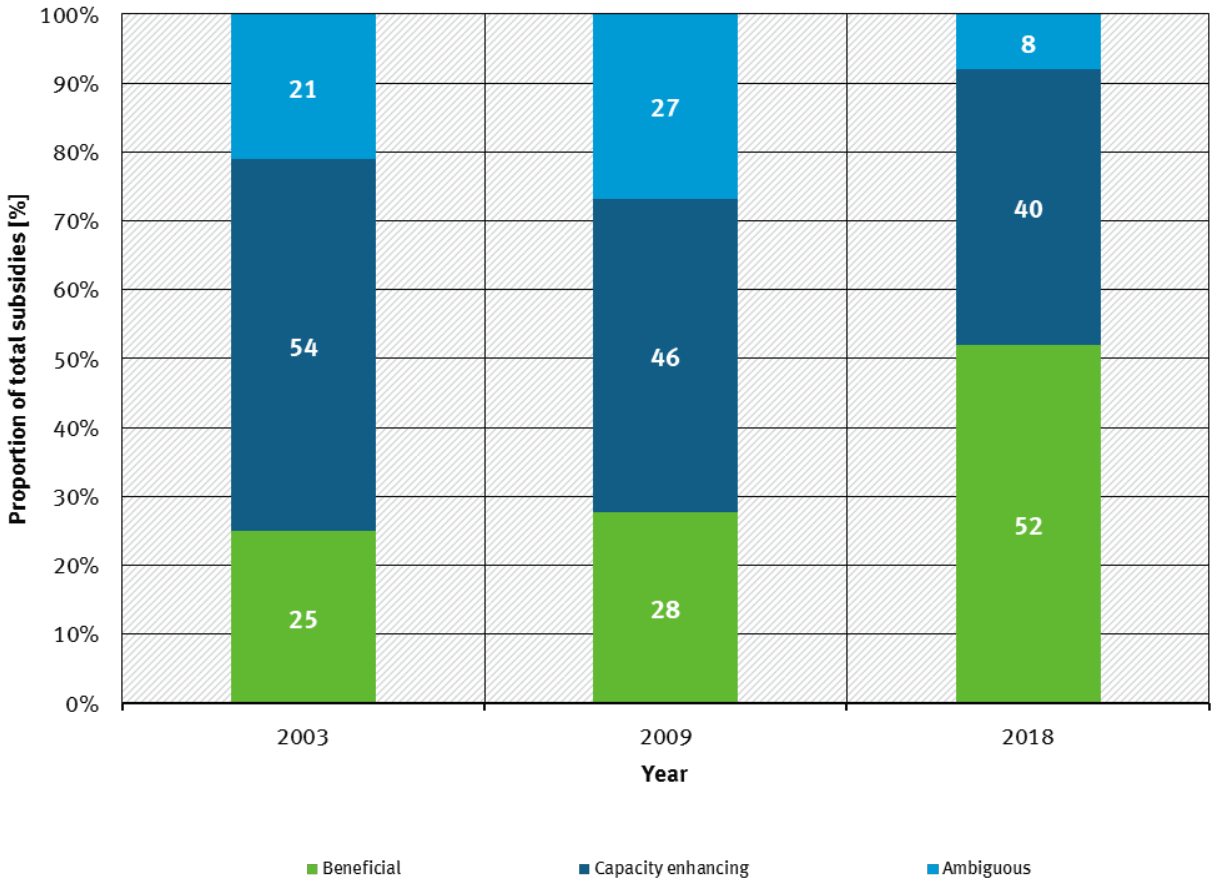
[414] Sumaila et al. (2019b), p. 2.

[415] https://ec.europa.eu/oceans-and-fisheries/funding/european-maritime-and-fisheries-fund-emff_en

building new trawling vessels or for other initiatives that would contribute to an increase in the fishing capacity. General measures for protecting and restoring aquatic biodiversity and marine ecosystems should also be eligible for support.

Meanwhile, the 'capacity-enhancing subsidies' were reduced to 40% (2018) while the 'beneficial subsidies' became more important with an increase to 52% (2018) (cf. Figure 16). This shows that EU fisheries policy is moving in the right direction, but that there is still a considerable need for action.

Figure 16: Certain categories as proportions of the total subsidies for the EU fisheries sector



Source: Skerritt et al. (2020), p. 2749, with further references.

In the analysis by Skerritt et al. (2020), the scale of environmentally harmful capacity-enhancing subsidies is not provided separately for Germany. An overview of the projects funded by the EMFF can be found on the website of the Federal Institute for Agriculture and Food (*Bundesanstalt für Landwirtschaft und Ernährung*).[416] It is apparent from the data provided on this website that in land-locked countries, it was mainly restocking fish, particularly eel, and infrastructures for fish-processing sectors that received support. The three large coastal Länder primarily provided support services for the preservation of fish stocks, e.g. herring or cod, or for research into aquaculture and the biological fundamentals of fishery. In certain cases, the EU funds were used to assist with measures to modernise trawling vessels or to build new fisheries surveillance vessels for the authorities. In some cases, these services are environment-focused, such as the funding of mussel bed monitoring in Lower Saxony or investigations into the effects of shrimp fishing

[416] https://agrar-fischerei-zahlungen.de/Fischerei_empfaenger

in Schleswig-Holstein. From 2016 to 2020, the project 'Fishing for litter'[417] also received support. Within the framework of this project, litter fished from the ocean in harbours as 'by-catch' ca be collected and disposed of in an environmentally friendly way.

In its 2020 special report, 'Marine environment: EU protection is wide but not deep', the European Court of Auditors laid down measurable steps for the protection of the marine environment in the Atlantic as a result of the EU measures. However, as only 'a small share of the European Maritime and Fisheries Fund was used to support marine conservation', the report gives recommendations on how to improve the potential of this EU funding.[418] An analysis by Environmental Action Germany (*Deutsche Umwelthilfe*, DUH) also indicated the subsidisation of marine diesel oil as a factor which, if abolished, would make fishery more sustainable.[419]

In the funding period from 2021 to 2027, it was not just the promotion of small-scale fishery and vessels of under 24 metres in length but also aquaculture that was taken into greater account, as the new name 'European Maritime, Fisheries and Aquaculture Fund' (EMFAF) indicates.[420] Subsidies for shipbuilding primarily relate to modernisation. At EU level, however, there are definitely fears that modernisation is associated with an increase in capacities.[421] Like the EMFF, the EMFAF also facilitates the funding of measures to protect and improve the marine environment which have no direct connection to fishery.[422] This means that measures to implement 'Natura 2000' or the MSFD (Marine Strategy Framework Directive) and WFD (Water Framework Directive) are available for support, among others. The recitals also state the systematic inclusion of climate protection targets and the provision of a fixed proportion of funding for biodiversity targets (10% by 2027).[423] Both the scientific recommendations and the SDG 14.6 (see above) should be taken as a starting point and as motivation for the uniform abolition of capacity-increasing subsidies at EU and at national level. With regard to the strategic and content-related orientation of the EMFAF support, it must therefore be ensured that the fishery and marine conservation-specific support needs are adequately taken into account and reflected in the distribution of the funds. This applies in particular for the definition of the distribution of funds in national EMFAF programmes.

2.4.5 VAT allowance for meat and other animal products

In accordance with paragraph 12(1) of the Law on Value Added Tax (*Umsatzsteuergesetz*, UStG), the regular VAT rate in Germany is 19%. In paragraph 2, however, groups of products are listed in a positive list for which a reduced tax rate of 7% applies. The reduced VAT rate was introduced in 1968 to make certain essential goods cheaper for social policy reasons. The reduced VAT rate applies for almost all food, including fish and other animal products such as dairy products, fish and eggs.

The subsidisation of animal products through the reduction of VAT increasingly comes under criticism. Various expert committees have also repeatedly recommended abolishing the reduced VAT rate on animal products because the production of animal products is detrimental to the

[417] https://www.nabu.de/natur-und-landschaft/aktionen-und-projekte/meere-ohne-plastik/fishing-for-litter/index.html

[418] ECA (2020b).

[419] Environmental Action Germany (2019), p. 130.

[420] https://www.eu2020.de/eu2020-en/news/pressemitteilungen/fisheries-and-aquaculture-fund-emfaf/2423678

[421] Skerritt et al. (2020).

[422] Article 25 of the new EMFAF Regulation: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1139&from=EN

[423] Recital 15 of the new EMFAF Regulation.

environment and the climate.[424] In Germany, livestock farming contributes to more than 60% of the greenhouse gas emissions emitted in agriculture. It is also associated with other negative environmental impacts, such as the loss of biodiversity and water pollution. The cultivation of feed requires large areas and is often associated with negative effects due to intensive arable farming. There are also negative environmental and climate impacts abroad, as a considerable proportion of feed is imported. This exacerbates, among other things, the destruction of rainforests through land-use changes.[425] Per calorie and kilogram, animal products have a significantly higher environmental footprint than plant products.[426]

In 2019, an average of 59.5 kg of meat was consumed per capita.[427] This is far above the maximum amount of 300 g to 600 g per week as recommended by the German for Nutrition (*Deutsche Ernährungsgesellschaft*).[428] Therefore, subsidising meat consumption is also not advisable for health policy reasons.

The income and expenditure sample survey carried out by the Federal Statistical Office of Germany is used to quantify the scale of subsidies for food of animal origin. Series of data on expenditure on food are only collected and published on an irregular basis, however. Data from 2013 is therefore used instead.[429] Based on this, the subsidy amounts to

at least EUR 5,242 million.[430]

In the interest of protecting the environment, the climate and health, it makes sense to tax the consumption of animal products at the regular VAT rate of 19%. By decreasing the consumption of animal products, a total reduction in greenhouse gas emissions of around 4 million tons of CO_2 equivalents can be expected.[431]

To guarantee socio-political compatibility and acceptance, the government should invest the additional tax revenue to further lower the reduced VAT rate for plant-based foods and public transport. The recommendation made by the scientific advisory boards on agricultural policy at the Federal Ministry of Food and Agriculture that the budget for food in social transfers should be adjusted, particularly the standard rates for ensuring subsistence, should also be followed. It would also make sense to use the freed-up funds for free meals in childcare facilities and schools.[432] These should be based on the standards of the Planetary Health Diet from the EAT-Lancet Commission.[433]

[424] SRU (2012), p. 118; SRU (2015), p. 384. Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection (*Wissenschaftlicher Beirat Agrarpolitik, Ernährung und gesundheitlichen Verbraucherschutz*) and Scientific Advisory Board on Forest Policy (*Wissenschaftlicher Beirat für Waldpolitik*) at the Federal Ministry of Food and Agriculture (*Bundesministerium für Ernährung und Landwirtschaft*) (2016), p. IV, 346 et seq.

[425] Also, in this regard German Bundestag (2020c).

[426] For example, SRU (2012), p. 118.

[427] BLE/BZL (2020), p. 20.

[428] https://www.dge.de/ernaehrungspraxis/vollwertige-ernaehrung/10-regeln-der-dge/

[429] Federal Statistical Office of Germany (2016).

[430] This figure includes expenditure on meat and meat products; fish, fish products and seafood; dairy products and eggs; and cooking fats and oils, cf. Federal Statistical Office of Germany (2016), p. 14 et seq., 18.

[431] According to estimates, the greenhouse gas reductions vary from 1.8 to 6.3 million tons of CO_2 equivalents depending on the level of price elasticity assumed, Postpischil et al. (2021).

[432] Scientific Advisory Board on Agricultural Policy, Food and Consumer Health Protection and Scientific Advisory Board on Forest Policy at the Federal Ministry of Food and Agriculture (*Wissenschaftlicher Beirat Agrarpolitik, Ernährung und gesundheitlichen Verbraucherschutz und wissenschaftlicher Beirat für Waldpolitik beim BMEL*) (2016), p. 347.

[433] https://doi.org/10.1016/S0140-6736(18)31788-4

3 Summary: Overview of the situation and development of environmentally harmful subsidies

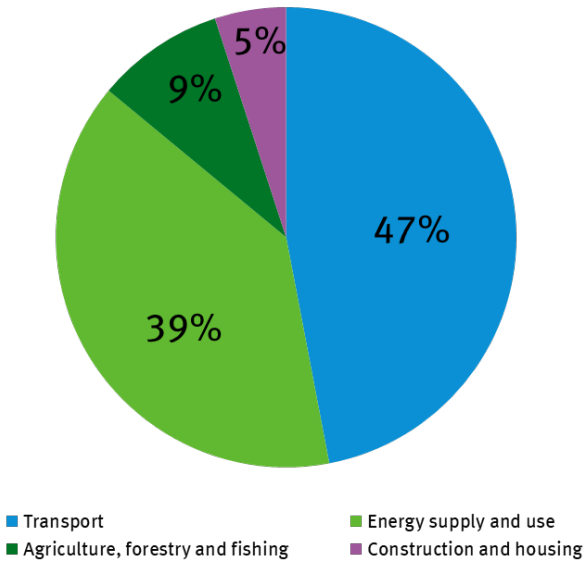
3.1 Environmentally harmful subsidies in 2018 and an overview of their impacts

3.1.1 Scope of the environmentally harmful subsidies

In 2018, environmentally harmful subsidies in Germany amounted to approximately EUR 65.4 billion (cf. table 2). Since the report provides an overview only of the main federal subsidies and takes almost no account of support schemes at regional and local levels, it can be assumed that the actual volume of environmentally harmful subsidies in Germany was even significantly higher. Furthermore, in some cases it was not possible to quantify the environmentally harmful share of the subsidies. Also, for this reason, the total volume shown in the table indicates only a minimum value.

Looking at how the environmentally harmful subsidies analysed are distributed among individual sectors, we find that in 2018, the transport (EUR 30.8 billion) and energy (EUR 25.4 billion) sectors ranked first with proportions of 47% and 39% of the total environmentally harmful subsidies. They are followed, by a clear margin, by the agriculture, forestry and fisheries sectors (EUR 6.2 billion, or 9%) and construction and housing (EUR 3.1 billion, or 5%) (cf. Figure 17). However, the environmentally harmfully components of subsidies cannot always be quantified in these sectors, e.g. in the case of agricultural and fisheries subsidies from the European Union. The actual scale of environmentally harmful subsidies is therefore significantly higher than stated in the overview.

Figure 17: Breakdown of subsidy volume by sectors



Source: Own illustration, UBA.

3.1.2 Fiscal effects

It is clear from the subsidy volume of approximately EUR 65.4 billion in 2018 (cf. table 2) that the reduction of environmentally harmful subsidies provides great potential for relieving

government budgets. In light of the huge increase in new debt and the various methods of financing, this gives the government urgently required room for manoeuvre, e.g. in respect of climate protection, resource conservation, the development of sustainable infrastructures, or education and healthcare.

It must be emphasised here that the subsidy volumes given are not identical to the anticipated fiscal effects of reducing environmentally harmful subsidies. Reducing environmentally harmful tax concessions usually results in changes in environmentally desirable changes in behaviour among companies and private households, which in turn leads to a lower increase in tax revenue. However, there are also interactions that have a positive fiscal effect. For example, reducing environmentally harmful subsidies means that the government has to spend less on remedying environmental damage in the future and that lower environment-related illness costs are incurred.

It should also be taken into account that when reducing environmentally harmful subsidies, accompanying measures are also required to avoid social hardship or to assist companies with the transition to environmentally friendly, resource-efficient production. For logical reasons, this uses up some of the money that the government gains by reducing environmentally harmful subsidies or saves by abolishing environmentally harmful financial assistance.

It should also be taken into consideration that not all environmentally harmful subsidies can be reduced at national level, e.g. the kerosene tax exemption. Therefore, the benefits for environment/climate protection, resource conservation and public budgets that are associated with abolishing the tax exemption can only be fully realised in these cases by means of measures at EU and international level. It is all the more important that the Federal Government supports corresponding initiatives, such as the planned amendments of the EU Energy Taxation Directive.

3.1.3 Impacts on the environment, the climate, health and resource conservation

Table 2 provides an overview of the negative impacts of individual environmentally harmful subsidies on the environmental goods climate, air, water, soil, biodiversity and landscape. The impacts on health and the use of raw materials are also illustrated. It is apparent from the overview that the subsidies harm the environment in various ways, both through primary and secondary effects, although it is often difficult or even impossible to quantify the impacts in light of the complex interactions.[434]

All of the environmentally harmful subsidies identified have a direct or indirect detrimental effect on the climate too. More than three quarters of the environmentally harmful subsidies have a direct detrimental impact on the climate as a result of primary effects, particularly through the subsidisation of fossil fuels. Reducing them often results in considerable additional benefits because in most cases, environmentally harmful subsidies have harmful primary effects on air quality and health too. More than one third of the environmentally harmful subsidies (15 of 41) exhibit harmful primary effects on biodiversity and the landscape. It is also worth noting that almost all environmentally harmful subsidies in the area of energy supply and use have a negative impact on health and the use of raw materials. In respect of the use of raw materials, this also applies for environmentally harmful subsidies in the construction and housing sector.

[434] Primary effects are environmental damage which is the direct consequence of the subsidy, i.e. the subsidy favours activities which directly trigger the environmental damage. Secondary effects are environmental damage which the subsidy triggers indirectly via cause-and-effect chains. These so-called second-round or feedback effects extend from the primarily damaged environmental assets to other environmental goods.

Table 2: Environmentally harmful subsidies in Germany in 2018

Current	Environmentally harmful subsidies by sector	2018 (EUR millions)	Negative impacts on the environment, the climate, health and resource conservation						
			Climate	Air	Water	Floor	Biodiversity and landscape	Health	Resources
	1 Energy supply and use	**25,374**							
1.	Electricity and energy tax reductions for the manufacturing industry and for agriculture and forestry	1,144							
2.	Peak equalisation on environmental tax for the manufacturing sector	1,720							
3.	Tax relief for certain energy-intensive processes and technologies	1,290							
4.	Energy tax concession for electricity generation	2,003							
5.	Hard coal subsidies	1,263							
6.	Advantages for the lignite industry	min. 287							
7.	Energy tax concessions for coal	85							
8.	Manufacturer privilege for producers of energy products	342							
9.	Energy tax exemption for non-energy uses of fossil fuels	min. 1,299							
10.	Free allocation of CO_2 emissions trading allowances	2,134							
11.	Grants for electricity-intensive companies to compensate for the rise in electricity prices due to emissions trading	219							
12.	EEG Special Compensation Scheme for electricity-intensive companies and railways	5,400							
13.	Self-consumption privilege under the EEG (industrial sector)	3,660							
14.	Concessions for energy-intensive industry with regard to electricity grid fees	611							

Current	Environmentally harmful subsidies by sector	2018 (EUR millions)	Negative impacts on the environment, the climate, health and resource conservation						
			Climate	Air	Water	Floor	Biodiversity and landscape	Health	Resources
15.	Privileges for special-contract customers with regard to concession charges for electricity	3,600							
16.	Reduced rates of cogeneration surcharge for the manufacturing sector and energy-intensive industries	316							
17.	Subsidies for nuclear power	n.q.							
18.	Export credit guarantees (Hermes guarantees) for coal-fired and nuclear power plants	1							
	2 Transport	**30,822**							
1.	Energy tax concessions for diesel fuel	8,202							
2.	Commuting tax allowance	6,000							
3.	Flat-rate taxation of privately used company cars	min. 3,100							
4.	Biofuels	960							
5.	Energy tax exemption for inland waterway transport	min. 141							
6.	Financing of cruise ships using KfW IPEX loans	n.q.							
7.	Energy tax concession for machinery and vehicles used exclusively for the movement of goods in seaports	25							
8.	Energy tax exemption for kerosene	8,357							
9.	VAT exemption for international flights	3,997							
10.	Reduction of air traffic control charges through government grants	n.q.							
11.	Funding of regional airports	min. 40							
	3 Construction and housing	**3,050**							
1.	Housing premium	81							
2.	Home ownership pensions	46							
3.	Employee savings allowance	n.q.							

Cur-rent	Environmentally harmful subsidies by sector	2018 (EUR mil-lions)	Negative impacts on the environment, the climate, health and resource conservation						
			Climate	Air	Water	Floor	Biodiversity and land-scape	Health	Resources
4.	Funding of social housing	1,191							
5.	Joint Task for Improving the Regional Economic Structure	n.q.							
6.	Family housing grant	6							
7.	KfW Home Ownership Programme	1,726							
	4 Agriculture, forestry and fishing	**6,179**							
1.	European Union agricultural subsidies	n.q.							
2.	Tax concession for agricultural diesel fuel	467							
3.	Exemption of agricultural vehicles from vehicle excise duty	470							
4.	European Union fisheries subsidies	n.q.							
5.	VAT reduction for animal products	min. 5,242							
	Total	**65,425**							

n.q. = not quantifiable Primary effects Secondary effects

3.1.4 Quantitative analyses of the impacts of a reduction in climate-damaging subsidies

Climate-damaging subsidies contradict the aim of the Paris Climate Agreement and the Federal Government's climate protection targets. Several studies are now available that estimate the amount of greenhouse gas reductions for selected subsidies in the event of a reduction or reform of the subsidy. These reductions are provided in the sections on the individual subsidies. They show that the reduction of climate-damaging subsidies in Germany can bring about a significant contribution to the necessary cuts in greenhouse gas emissions. For example, the Forum Ökologisch-Soziale Marktwirtschaft (FÖS) concludes that reducing climate-damaging subsidies might lead to an annual greenhouse gas reduction of around 100 million tons of CO_2 equivalents. However, this estimate is based on analyses of specific subsidies. Taking interaction with other instruments into account, the reduction could turn out to be lower. In the energy and transport sector in particular, the reduction of climate-damaging subsidies would be of crucial importance to the achievement of the sectoral climate protection targets.

3.1.5 Environmentally harmful subsidies in specific sectors

Energy supply and use received support through subsidies to the tune of EUR 25.4 billion in 2018. This relates to both the extraction of energy sources (e.g. lignite and hard coal) and energy generation and use. Subsidies that lower energy prices diminish the incentive to use energy economically and efficiently. The consequences are higher energy consumption, combined with higher energy-related environmental pollution. Examples include the tax exemption from and relief on energy and electricity taxes for companies in the manufacturing industry and in the agricultural sector.

Subsidies in the energy sector are also considered environmentally harmful when they distort the competition between energy sources to the advantage of relatively more environmentally harmful energy sources and, in this way, favour an unsustainable fuel mix. This applies for the free allocation of CO_2 emissions trading allowances, advantages granted to the lignite industry, the energy tax concession for coal, and the explicit and implicit subsidies for nuclear energy, which are the reason for the profitability of nuclear energy from a business point of view in the first place. These subsidies also tend to increase the need for assistance for renewable energies.

The subsidies in the energy sector primarily benefit businesses. In some cases, such as the EEG Special Compensation Scheme for electricity-intensive companies and railways, this is achieved through cross-subsidisation at the expense of private households. In this respect, the subsidies concerned are also problematic from the perspective of distribution.

In **transport**, subsidies of EUR 30.8 billion had an impact on the environment in 2018. The highest levels of subsidies were found to be the kerosene tax exemption (EUR 8.4 billion) and the energy tax concession for diesel (EUR 8.2 billion). The tax advantage granted to fossil fuels is detrimental to the environment and the climate in a number of ways. It diminishes the economic incentive to purchase fuel-efficient cars and to reduce fuel consumption through changes in behaviour, e.g. by driving differently or increasing use of other more environmentally friendly modes of transport. In addition, low fuel or operating costs due to subsidies reduce the incentives to invest in innovative, efficient drive technologies or vehicles.

Other environmentally harmful subsidies that are highly relevant from a fiscal perspective include the commuting tax allowance, the company car privilege, the VAT exemption for international flights and the advantages granted for biofuels.

Granting advantages to environmentally harmful modes of transport makes them more competitive, causing their share of total transport to grow. One particularly prominent example of this is the tax advantage for air transport. Moreover, subsidies create incentives to increase transport by lowering the overall cost of transport. This applies, e.g., for the commuting tax allowance, which also contributes to urban sprawl. Subsidising biofuels can also have various detrimental effects on the environment, for example, through intensive agricultural production processes or land use changes when biofuels are imported.

It should be emphasised that environmentally harmful subsidies in the transport sector almost always have negative distribution effects, i.e. private households with high incomes benefit from them much more, both in absolute terms and based on income, than households with lower incomes. There is therefore the opportunity to create a link between environmental and social targets by reducing these subsidies, e.g. by using the freed-up funds to build and expand an attractive, affordable public transport network.

In the **construction and housing sector**, the volume for 2018 comes to EUR 3.1 billion. The subsidies support the construction of new homes or the development of new areas for industry, commerce and transport. Government funds have a tendency to increase the incentive to construct new buildings, whereby a distinction is not usually made between previously used areas or newly developed areas 'in the open countryside'. Such subsidies based on a 'shotgun approach' benefit increasing land take for residential and transport purposes, growing urban sprawl, rising energy consumption and traffic volumes, and high demand for resources. Their distribution effects vary greatly: For example, while it is primarily those on higher incomes who benefit from the family housing grant, the distribution effects from the promotion of social housing are positive.

There are also numerous environmentally harmful subsidies in the **agriculture, forestry and fishing** sector. As they are frequently extremely difficult to quantify, the total volume of environmentally harmful subsidies of EUR 6.2 billion provided in the table is to be considered only as the 'tip of the iceberg'. EU agricultural and fishery subsidies and their national implementation, as well as measures within the Joint Task for Improving the Regional Economic Structure, are of crucial importance. Various subsidies for agricultural production factors also contribute to damage to the environment and the climate by incentivising increased use of these. This concerns the reduced energy tax rate for agricultural diesel and the vehicle excise duty exemption for agricultural vehicles.

The VAT concessions for animal products are also seen in a negative light as the production of meat and dairy products, for example, results in great climate damage and is often associated with other negative environmental impacts (particularly nutrient surpluses and water pollution). The subsidy volume is more than EUR 5.2 billion. From an environmental perspective, it makes sense to charge the general VAT rate of 19% for animal products. To avoid negative distribution effects, the government should also lower the reduced VAT rate of 7% for plant-based foods and public transport and increase the standard rate for ensuring subsistence.

3.2 Development of environmentally harmful subsidies

The German Environment Agency last analysed environmentally harmful subsidies for the year 2012 in a study that was published five years ago.[435] At that time, the volume of subsidies amounted to a good EUR 57 billion and was thus below the value of EUR 65.4 billion for 2018. The increase is due to a number of factors.

[435] BA (2016).

- There are subsidies the volume of which has significantly increased, especially because of the growth in exemptions. This is the case with the EEG Special Compensation Scheme (increase from EUR 2.7 (2012) to 5.4 (2018) billion (+ EUR 2.7 billion)), and in respect of self-consumption privilege (increase from EUR 1.6 to 3.66 billion (+ EUR 2.06 billion)).
- The volume of a whole range of subsidies increased because the assessment base has grown over time. For example, this applies in the case of the privileged treatment of diesel and the energy tax exemption for kerosene, where the privileged fuel consumption increased.
- However, the increase in the total volume was also partly due to the fact that new circumstances were included in this report or subsidy volumes could now be quantified. For example, the energy tax concession for electricity generation was now included (EUR 2 billion). The electricity price compensation was also quantified for the first time (EUR 219 million). A change in the method of calculation also led to a strong increase in the subsidy volume reported in the Federal Government's Subsidies Report for the exemption of agricultural vehicles from vehicle excise duty.

There were some positive developments, however:

- The environmentally harmful subsidies for production of spirits and the home owner allowance have expired. Funding for hard coal has also been abolished de facto. There will still be a backlog of government payments in the coming years, however. The ultimate abolition of the adjustment allowances is planned for 2027.
- Some subsidy volumes decreased (slightly) because the basis of calculation decreased. This is the case for some electricity price-based subsidies, as the privileged electricity consumption has decreased slightly over the years.

In the individual subsidised sectors, the development of the subsidy volume varied:

Energy supply and use reported an increase of EUR 5.1 billion (from around EUR 20.3 to around 25.4 billion) between 2012 and 2018. This development was largely driven by the exemptions under the EEG, i.e. the Special Compensation Scheme and the self-consumption privilege. The subsidy volumes here hugely increased. Together, they came to a volume of EUR 4.3 billion in 2012.[436] In 2018, the volume amounted already to more than EUR 9 billion. The increase is even more striking given that in 2006 both subsidies together only came to EUR 780 million.[437] The volume of electricity tax-based subsidies decreased slightly, which is essentially due to the slight decrease in electricity use.[438]

Also, in **transport**, the volume of environmentally harmful subsidies increased from EUR 28.6 billion to EUR 30.8 billion (+ EUR 2.2 billion) between 2012 and 2018. The increase in the energy tax exemption for kerosene, from EUR 7.0 to 8.6 billion (+ EUR 1.6 billion), is particularly strong. As the tax rates have not changed, the increase is due solely to the increase in sales of kerosene. There were also strong increases in lost revenue due to the privileged treatment of diesel, from EUR 7.3 to 8.2 billion, and in the commuting tax allowance, from EUR 5.1 to 6.0 billion (both + EUR 0.9 billion). As with kerosene, higher sales of diesel are the sole cause for this increase. This also applies for the commuting tax allowance (income tax): As the rate per km did not change between 2012 and 2018, the increase in the subsidy volume is due solely to the increase in commuting. By contrast, the subsidy volume in respect of VAT exemption for

[436] Ibid., p. 76.

[437] Ibid.

[438] BMWi (2021), p. 70.

international flights visibly decreased from EUR 4.8 to 4.0 billion (- EUR 0.8 billion). Decreasing flight prices could be a key cause of this.

In **construction and housing** the volume increased from EUR 2.3 (2012) to 3.1 billion (2018). One particular reason for this is the inclusion of the KfW Home Ownership Programme in this report. The subsidy volume in respect of social housing promotion also increased between 2012 and 2018 from EUR 0.5 to 1.2 billion. A new subsidy was also introduced in recent years in the form of the family housing grant, which was associated with environmentally harmful incentive effects. This subsidy did not yet have a strong fiscal effect in 2018, but this will change in the coming years. However, the abolition of the home ownership grant had a noticeable effect.

In the **agriculture, forestry and fishing** sector, there has been barely any change in quantitative terms, and the majority of the environmentally harmful subsidies cannot be clearly quantified. An important budget item continues to result from the preferential VAT rate for meat and dairy products (around EUR 5 billion). However, the subsidy for the production of spirits has been abolished. The huge increase in vehicle excise duty exemption for agricultural vehicles from EUR 60 to 470 million is, as already explained, due to methodical changes in levying.

3.3 Conclusions and perspectives

As this study shows, overall there has not been any significant progress in the reduction of environmentally harmful subsidies in recent years. Some environmentally harmful subsidies have expired, but new environmentally harmful subsidies have been introduced at the same time and existing environmentally harmful subsidies have been extended by expanding the range of beneficiaries or the funding scope. Alongside these developments, environment-related support schemes have significantly increased in recent years, particularly those for climate protection. As a result, this lack of coherence leads to subsidy policy — but also policy as a whole — partly paralysing itself because there are economic incentives working in opposite directions at the same time, both for and against environmental and climate protection and resource conservation. The co-existence of the privileged treatment of diesel and the purchase premiums for electric cars, or the introduction of emissions trading in the transport sector together with an increase in the commuting tax allowance, are examples of this.

A policy that gives conflicting incentives is fiscally expensive and environmentally inefficient. This is particularly problematic in the current situation. The new public debt due to the coronavirus pandemic contrasts with a variety of financing requirements, particularly for climate protection and the development of sustainable infrastructures. At the same time, rapid, far-reaching changes must be made in production and consumption patterns so that the legally prescribed climate targets can be achieved. For these reasons it is high time that the contradictions within subsidy policy were remedied, environmentally harmful subsidies were systematically and quickly abolished, and the freed-up funds were used for the socio-ecological transformation.

The conditions for this are favourable because the EU's Green Deal is providing tailwind for this, e.g. through the planned reduction of climate-damaging subsidies in respect of energy tax. Environmental and climate protection are gaining ever more importance on the financial markets and in international competition. Subsidies such as the privileged treatment of diesel, which serve to maintain climate-damaging products and production methods, increasingly lead to locational disadvantages in such an environment. By the same token, reallocating the corresponding funds, for example, for the development and market diffusion of green technologies or complementary infrastructures (e.g. electricity grids and charging columns), can create new opportunities for generating added value and jobs.

Frequently, social arguments are put forward against the reduction of environmentally harmful subsidies. At first glance, these concerns are justified if households with lower incomes will, in terms of percentages, be more heavily burdened or certain groups of the population in particular are affected, e.g. long-distance commuters. However, as this study shows, there have now been a number of proposals as to how social hardship can be avoided. A key role is played here by the use of the freed-up funds for specific support schemes or to provide general relief for low-income households. Often — and this has only played a minor role in public discussion so far — the reduction of environmentally harmful subsidies is associated with positive distribution effects. This creates an opportunity to achieve a win-win situation, i.e. to combine environmental and climate protection with social justice.

To enable the systematic reduction or reform of environmentally harmful subsidies, clear environmental principles in subsidy policy, a regular evaluation of all environment-related subsidies and their integration into environmentally focused subsidy controlling are of key importance. There has been considerable progress in recent years, particularly with regard to evaluations — including through the introduction of a sustainability impact assessment for subsidies, which is referred to in the Federal Government's Subsidies Report. The relevant preconditions for an environmentally oriented subsidy policy will be discussed in the next section.

4 Ways of working towards an eco-friendly subsidy policy

4.1 Principles of an environment-orientated subsidy policy

The long list of environmentally harmful subsidies shows that the examples mentioned are not just single cases but a far-reaching problem which can only be solved by systematically taking into account the different environmental aspects of subsidy policy. This would ease the burden on the environment and in addition make subsidy policy more effective and efficient. The German Environmental Agency has therefore developed ten principles for an environmentally friendly subsidy policy (see text box 2), which must be observed both when reforming existing subsidies and introducing new subsidies. They partly correspond to the subsidy policy guidelines of the Federal Government,[439] but specify and expand them by including environmental aspects.

Many subsidies have already existed for decades — there are numerous tax concessions dating back to pre-1940. Therefore, the objectives of many subsidies are no longer up-to-date. This illustrates the importance of regular reviews of the rationale behind subsidies. Furthermore, some subsidies are not just environmentally harmful; they also fail to achieve their primary goals or only achieve them at a very high cost, and the subsidies concerned are in need of reform simply for this very reason. One example of this is the energy tax advantage for diesel fuel, which was originally created for the benefit of commercial road freight transport but also applies for private cars.[440] It therefore makes sense to check whether alternative instruments can achieve the key aim of a subsidy in a better or more cost-effective way without harming the environment.

Experience has shown that it is very difficult to withdraw or reform subsidies once they have been put into place. There are obstacles arising from the lack of transparency and in the political process. Frequently information about the exact modes of action and the beneficiaries of the subsidies is lacking, or this information is unevenly distributed among stakeholders. The recipients of subsidies are usually homogenous groups, which are often well-informed and well-organised and understand how to protect its own interests in the political process. The group of those who finance subsidies as taxpayers and voters is heterogeneous, very large and thus difficult to organise and is neither particularly interested in nor committed to the abolition of a specific subsidy. Consequently, in terms of votes, it is often advantageous for political decision-makers to maintain or expand subsidies. With regard to environmentally harmful subsidies, there is also the fact that additional environmental costs are being passed on to the general public, which means that the recipients of the subsidies do not have to bear these costs. It is therefore wise to put a time limit on subsidies from the outset.

Sometimes it also makes sense to design subsidies degressively in order to avoid habituation effects and to ensure that beneficiaries are given incentives to adapt to changing conditions. The possibility of a self-contribution by the beneficiaries should also be considered in order to ensure that beneficiaries act responsibly. According to the Federal Government's subsidy policy guidelines, new subsidies should primarily be granted as financial assistance and existing tax concessions should preferably be transformed into financial assistance or other measures that reduce the burden on the national budget.

Frequently, subsidies are focused on improving the beneficiaries' economic situation. To achieve this goal, however, environmentally harmful activities are sometimes favoured. This is not just

[439] BMF (2019a), p. 44 et seq.

[440] Cf. section 2.2.1.

bad for environmental protection, but mostly inefficient as well. One prominent example is the tax concession for agricultural diesel.[441] In such cases, it makes sense to grant allowances directly to the subsidy recipients regardless of production and/or consumption.

Sometimes, it is not possible to reduce environmentally harmful subsidies immediately and fully because this would jeopardise the companies' international competitiveness. For example, this concerns electricity and energy tax concessions for energy-intensive enterprises, which are subject to strong international competition. In such cases, it makes sense for companies to implement in return for the subsidy at least those environmental protection measures that are profitable from a business point of view." Finally, for an effective and efficient subsidy policy, it is also necessary to verify consistency with other subsidies and government measures. One example is the energy tax concession for diesel fuel, which makes diesel cars very attractive in terms of operating costs and therefore contradicts the parallel promotion of electromobility.

Text box 2: Principles of an effective, efficient and environmentally sound subsidy policy

- Detailed investigation of rationale for the subsidy:

At regular intervals it is necessary to check whether the justification for the subsidy still holds good, or whether, as a result of ongoing changes — e.g. of an ecological, economic, technical or political nature — the need for a subsidy no longer exists. In this way, the rationale for state intervention is subject to a recurring justification pressure.

- Examination of alternative instruments

Subsidies are only one of a number of instruments for achieving economic or environmental objectives. This makes it necessary — in addition to checking the justification for the subsidy — to determine whether the subsidy chosen achieves its objective effectively and economically, or whether other instruments would be more suitable.

- Limitation

Placing a time limit on subsidies prevents beneficiaries from getting used to them and ensures timely adjustment to new economic conditions. Limited-term subsidies can expire without the need for a new political decision. An extension of the subsidy would then have to be justified once more.

- Degressive design of subsidies

Subsidies that decline as time goes on give the beneficiaries an incentive to gradually become independent of the assistance and adapt to changing circumstances. Degressively designed assistance, for example, is needed when dealing with crisis situations in individual industries or when launching new technologies on the market. The degression underlines that the subsidy is not a permanent solution, and simplifies its complete abolition.

- Self-contribution by the beneficiaries

If subsidies did not cover the entire financing needs and the beneficiaries had to bear part of the costs themselves, an incentive would remain to apply for funding only after careful consideration. Beneficiaries would not get used to the state aid that much and would remain more independent.

[441] Cf. section 2.4.2.

- Reducing tax concessions and replacing them with other types of subsidies

Tax concessions are relatively opaque, hard to quantify and difficult to abolish in the political process. Owing to the progressive nature of the tax system, income tax concessions may also give rise to undesirable reallocation effects and hence cause fiscal equity problems. To remedy these disadvantages, and in the interests of simpler taxation, preference should be given to more transparent types of subsidies — such as direct financial assistance.

- Subject- instead of object-related assistance

Instead of subsidising production methods or consumer habits (objects) that have harmful environmental impacts, it is more expedient to provide direct assistance for the selected subsidy recipients (subjects).

- Abandonment of volume-based subsidies

Volume-based subsidies further stimulate production and consumption and thereby encourage the consumption of environment and resources. Instead, the beneficiaries should receive lump-sum subsidies adjusted to the extent of their eligibility.

- Improvement of the recipients' environmental performance in return for subsidies, environmental requirements

Linking subsidies to conditions or environmental requirements ensures that beneficiaries do in fact pursue activities that are beneficial to the environment. This way, the government can prevent or at least limit the negative incentive effects of environmentally harmful subsidies.

- Consistency with other subsidies and government measures

To avoid inconsistencies between different policy areas — for example environmental and economic policy — every subsidy should be checked for interactions with other subsidies and government measures, and synchronised with them if necessary.

4.2 Environment-related subsidy controlling: The ‘environmental check’ for subsidies

In order for a subsidy policy to be effective, efficient and environmentally friendly, it is crucial to create transparency around its economic, environmental and social impacts. One suitable way of doing this is performing regular, systematic impact and performance analyses for all subsidies through environment-related subsidy controlling. The Federal Government took a step in this direction in 2015 when it introduced the sustainability impact assessment for subsidies (cf. section 4.3).

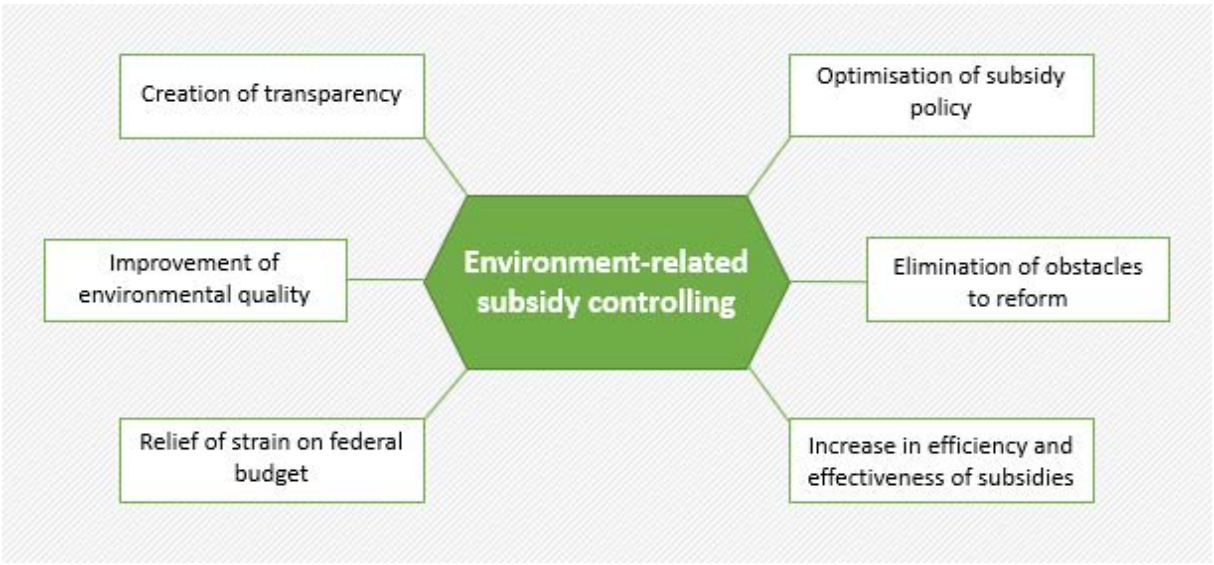
The main purpose of environment-related subsidy controlling is

- to identify environmentally harmful (side-)effects of subsidies,
- to assess the efficacy and efficiency of environmentally harmful subsidies in respect of their key objective, and
- to critically examine the aims of environmentally harmful subsidies.

Environment-related subsidy controlling should therefore be introduced not just for existing subsidies but also for all new ones. Besides relieving the burden on the environment, such a

system would provide a series of other benefits (cf. Figure 18). It is not least an important way of using taxpayers' money efficiently.

Figure 18: Benefits of environment-related subsidy controlling



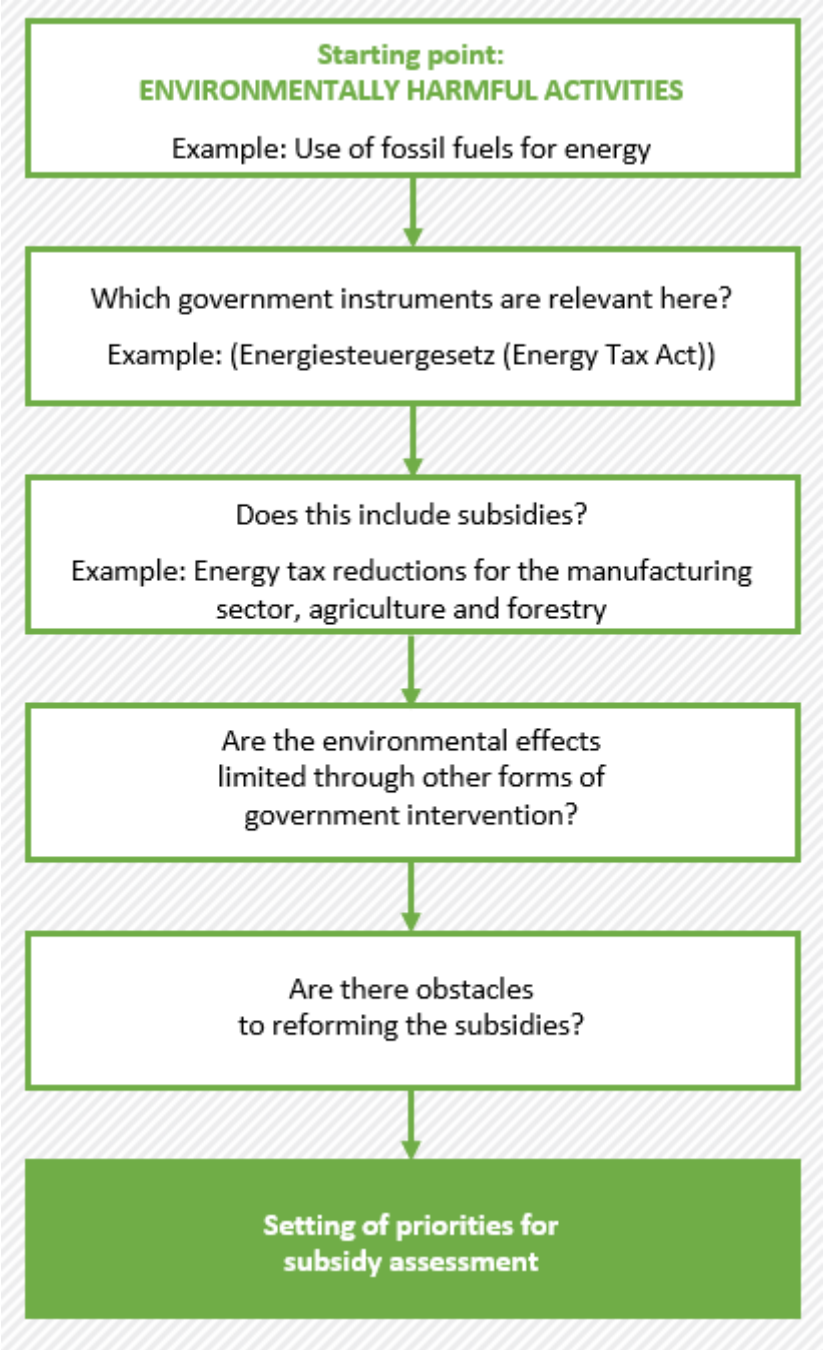
Source: Own illustration, UBA.

Environment-related subsidy controlling should comprise three phases:[442]

1. Subsidy screening: The aim of this first step is to identify all explicit and implicit subsidies which may be harmful to the environment and to set priorities for further analysis of the elements of the subsidy.
2. Subsidy assessment: The purpose of this phase of subsidy controlling is to analyse subsidies which are potentially harmful to the environment in depth — in terms of both their environmental impacts and the question of whether their main purpose is still up to date and whether the relevant subsidy achieves this purpose efficiently.
3. Subsidy management: The focus of this phase is drawing up specific proposals for the abolition or reform of environmentally harmful subsidies and thereby paving the way for political decisions in the interests of an effective, efficient and environmentally sound subsidy policy.

[442] The environment-related subsidy controlling draft presented here is, based on the OECD recommendation, a checklist for environmental harmfully subsidies (OECD 2005), the results of a completed UFOPLAN project (Sprenger/Rave 2003) and the results of the research project 'Monitoringbericht zu klimaschädlichen Subventionen und umweltbezogenes Subventionscontrolling' (*Monitoring report on climate-damaging subsidies and environment-related subsidy controlling*), project no. 204 14 106 (cf. Rave/Thöne 2010). The European Commission also researches environment-related subsidy controlling models (Valsecchi et al. 2009, Withana et al. 2012).

Figure 19: Development of a screening system for environmentally harmful subsidies



Source: Own illustration, UBA.

The following sections explain the individual phases of subsidy controlling. They concentrate on describing the environment-related steps of investigation and analysis. In other words, the outline below does not provide a detailed description of the analysis of the main purposes of the subsidies and the efficiency in achieving their individual purposes.

4.2.1 First phase: Screening of environmentally harmful subsidies

The first step in the screening process is to systematically identify all subsidies that are potentially harmful to the environment. This is an ambitious task, firstly because the effects of subsidies are complex, and secondly because it is not sufficient to screen explicit subsidies only. In

fact, it is necessary to take a look at all forms of government intervention so as to cover implicit subsidies as well, i.e. concealed concessions.[443]

Building on this analysis, the second step is to set priorities for treatment of the selected subsidies in the further phases of subsidy controlling (subsidy assessment and steering). The aim is to select those subsidies where abolition or reform is expected to achieve the greatest environmental benefits. Setting priorities enables the efficient use of the time and financial resources available for subsidy controlling. But screening is not an exclusion procedure. In the long term the aim is to closely examine all existing and potential new subsidies.

To identify and prioritise subsidies that are potentially harmful to the environment, the screening process focuses on the following key issues:

1. Does government intervention have effects that are potentially harmful to the environment?
2. Is the measure a subsidy?
3. How environmentally harmful is the subsidy? Do other political instruments prevent or reduce potential harm to the environment?
4. Are there any obstacles that currently rule out a reform of the subsidy?

Ad 1. To ensure targeted identification of measures that are potentially harmful to the environment, the first step in the screening process should be to identify those economic activities which can be expected to have a special impact on the environment (cf. Figure 19), for example, the use of fossil fuels for energy, the intensive use of fertilisers in arable farming, or construction activities on open land. It makes sense here to determine the environmental relevance based on specific criteria. These could be indicators, e.g. greenhouse gas emissions, nitrogen surpluses in the agricultural industry, or the increased use of land for human settlements and transport infrastructure. If the economic activity in question contradicts political objectives — e.g. of the kind defined in the National Sustainability Strategy —, the second step should be to identify as fully as possible the government instruments which can be expected to foster the relevant economic activity. In the case of fossil fuels, for example, this includes government regulations on the production, trading and use of fossil fuels.

Ad 2. The screening process also clarifies whether the instrument in question is indeed a subsidy. The crucial issue here is the scope of the term 'subsidy'. To make it possible for subsidy analysis to fully identify all governance deficits and negative developments in the environmental sector, it is advisable here to use a broad definition of subsidies.[444] If on this basis an instrument proves not to be a subsidy, it should not be scrutinized in the subsidy assessment, but possibly using a different approach.

Ad 3. If it is a subsidy, the next step is to investigate whether there are any factors indicating that an intensive subsidy assessment should not be carried out for the time being. For example, it is possible that other instruments (such as statutory limits or quotas) effectively restrict or prevent the potential harmful effects of a subsidy on the environment. If this were the case, assessing the subsidy from an environmental point of view would not be a high priority,[445] because abolishing the subsidy would hold little or no promise of improvement in the environmental situation.

[443] Cf. section 1.2.

[444] Cf. section 1.2.

[445] However, there may be other reasons for making the assessment of the subsidy a high priority, e.g. the aim of effective and efficient distribution of public funds.

Ad 4. Furthermore, obstacles might exist which make it difficult to abolish or modify the subsidy. For example, the design of a subsidy may be prescribed by the EU, or abolition of the subsidy might conflict with EU law or international agreements. One example of this is the international bilateral air transport agreements which prevent the introduction of a widespread kerosene tax. This may be an argument for temporarily postponing a thorough examination of the subsidy.

If there are no such obstacles, and if abolition or reform of the subsidy can be expected to result in a significant easing of the environmental situation, an in-depth review of the subsidy should definitely be undertaken in the subsidy assessment.

4.2.2 Second phase: Eco-oriented subsidy assessment

The core task of an environment-oriented subsidy control system is to use an intensive subsidy assessment to create transparency. The public, the government and Parliament need a sound basis of information in order to take decisions on subsidies — independently of the special interests of the beneficiaries. The subsidy assessment creates this basis by means of an independent technical assessment. It is thus an essential prerequisite for subsidy steering on the basis of sustainability objectives. The essential principles and elements of the subsidy assessment are described below.

The aim of the assessment is to analyse whether the reasons for the subsidy make sense, whether and how it achieves its primary promotion purposes, and what negative, environmentally harmful (side) effects it causes. The scale and effects of the concessions must be determined, and the fiscal cost, the beneficiaries and the parties responsible must be disclosed. If the subsidy had an adverse impact on the environment, it would also be necessary to examine whether ways and means existed to avoid or at least reduce these negative effects by modifying the subsidy, using a different instrument or employing accompanying instruments.

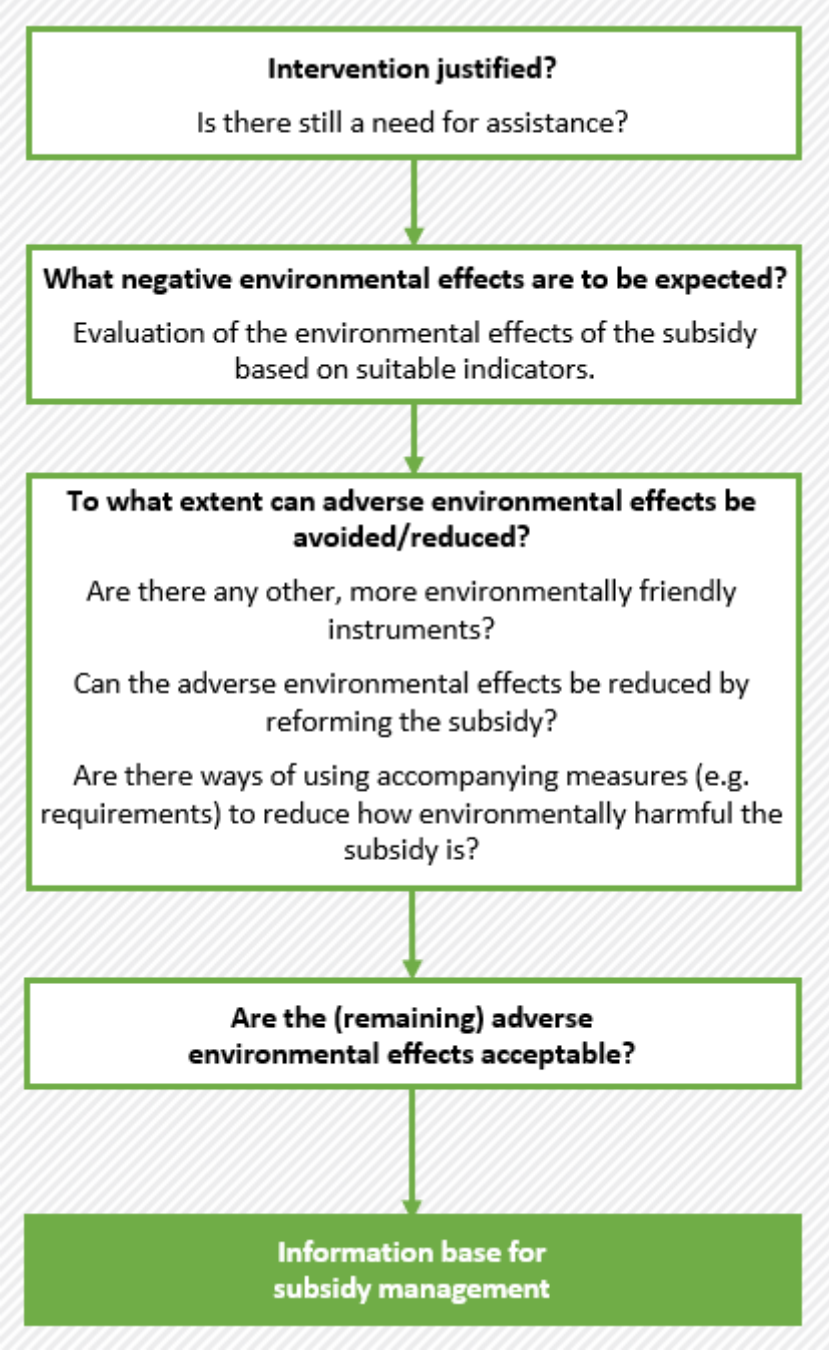
To determine whether a subsidy is justified, it is first necessary to investigate whether and to what extent there is still a need to promote the goal it pursues. It is not always possible to give a clear answer to these questions, because the legislator frequently describes the goals in vague terms, or in some cases the goals are conflicting. Since many subsidies are not subject to time limits, it frequently happens that the government continues to pay subsidies even though the relevant political goal has long since been achieved or it has become apparent that the goal cannot be achieved at all with a specific instrument. A good example of this is the exemption of agricultural tractors from vehicle excise duty. This tax exemption applies for an indefinite period; it was originally introduced in 1922 to promote motorisation and efficiency improvements in the agricultural and forestry sectors. This goal has long been achieved, but the subsidy continues to exist.

If the need for assistance no longer exists, the subsidy is no longer justified and must therefore be abolished. However, if the subsidy is (still) basically justified from an economic and political point of view, then the effectiveness and efficiency of the subsidy must be investigated with regard to the promotion objective and the environmental impacts. The investigation of these two dimensions should be interlinked to simplify the review process and minimise the work involved.

The environmental assessment of the subsidy (cf. Figure 20) ascertains as far as possible what adverse effects the subsidy has on the environment. The environmental impacts of the subsidy must be systematically analysed in the light of various environmental dimensions and criteria. This presupposes that the environmental goods affected and the type of impacts are known, so that suitable indicators, e.g. of the kind defined for environmental quality objectives, can be used

to estimate the subsidy's harmful effects on the environment. Here one could, for example, make use of assessment criteria that are taken as a basis for environmental impact assessment. It is also possible to use sectoral indicators or productivity indicators such as those found in the National Sustainability Strategy, for example. If it proves impossible to quantify the harmful environmental effects, a qualitative description of the environmental impact should be prepared with the maximum possible detail to provide adequate information for subsidy steering. It is then necessary to examine whether the adverse environmental effects can be reduced, for example by employing alternative means of assistance, modifying the subsidy, or making use of supporting instruments. The environmental assessment ends with a judgement as to whether the remaining adverse environmental effects are acceptable.

Figure 20: Design of environmental assessments for subsidies



Source: Own illustration, UBA.

When examining the effects on the promotion objective it is necessary to ascertain how suitable the subsidy is as an instrument for achieving the promotion objective, or whether there might be more practical alternatives — e.g. regulatory instruments. If a subsidy is the most suitable instrument, it also has to be investigated what particular form of subsidy — e.g. financial assistance — makes the most sense. If the subsidy is found to be suitable, its effectiveness and efficiency must be assessed — in other words it is necessary to determine the extent to which the defined objectives could be achieved and the cost of doing so.

Subsidies must be subjected to an eco-oriented subsidy assessment at regular intervals to ensure that they remain part of an efficient and effective government expenditure policy, even under changed economic conditions and political objectives.

4.2.3 Third phase: Eco-oriented subsidy steering

Based on the information gained from the subsidy assessment, it is the task of those responsible for eco-oriented subsidy steering to prepare decisions for an effective, efficient and environmentally sound subsidy policy. This can be done in various ways, by developing proposals for

- the abolition of environmentally harmful subsidies,
- the modification of environmentally harmful subsidies, and/or
- the use of alternative instruments.

Here it is particularly important to discontinue or modify subsidies which conflict with an efficient, environmentally sound subsidy policy because they fail to achieve the main purpose of the subsidy, are inefficient or do not satisfy the requirements of sustainable, environmentally sound development.

In subsidy steering it is important to weigh up all positive and negative aspects of subsidies. There may often be a conflict of objectives between the subsidy's promotion goals and environmental targets which requires a political decision. Environmental objectives should always be given at least equal weight.

Also, it frequently happens that conflicts between the promotion objective and environmental objectives are only superficial. In such cases, these can be resolved or at least mitigated by modifying the subsidy. One example of this is the advantage granted for agricultural diesel. If the assistance were paid at a fixed rate per hectare of land, farmers would have a stronger incentive to save diesel fuel and, at the same time, their earnings would not deteriorate either.[446] A redesign of this kind may also improve the effectiveness and efficiency of the subsidy.

Under the present economic framework conditions, subsidies often systematically distort competition in favour of environmentally harmful products and production methods. In some cases it may therefore be necessary — having regard to the design principles for subsidies — to provide targeted assistance for sustainable production methods and consumer behaviour. Environment-related subsidy controlling is useful here in two respects. Firstly, the financial resources released by the abolition of environmentally harmful subsidies create financial scope for the ecological modernisation of the economy. And secondly, the more the government reduces environmentally harmful subsidies, the less it needs to provide assistance for environmentally sound products and production methods.

[446] Cf. section 2.4.2.

4.3 Sustainability impact assessments by the Federal Government: an initial step towards environment-related subsidy controlling?

Every two years, the Federal Government publishes its Subsidies Report, which illustrates the existing financial assistance and tax concessions. Since the 25th Subsidies Report (2015), the financial assistance and tax concessions included have undergone a sustainability impact assessment[447] based on the objectives and indicators of the National Sustainability Strategy.

The sustainability impact assessment on subsidies is a positive development in principle because it creates more transparency. However, it is still far away from being a comprehensive, effective method of subsidy controlling. The benefit gained from the current treatment is that conflicts of objectives between the different dimensions of sustainability (social, economic, environmental) are highlighted. This particularly applies when subsidies lead to negative environmental impacts.[448] However, this treatment is confined to conveying a general picture. There are no analyses as regards the purpose of the subsidy, an adequately differentiated account of the environmental impacts, an examination of the scope of the subsidy (amount of the assistance granted and range of recipients) and a comparison with alternative instruments for the subsidy purpose under consideration.

It is therefore necessary to improve the method and the process of sustainability impact assessments. The following points are of central importance:

- The funding objective of the subsidy should be critically examined and it should be determined whether it should still be pursued.
- All negative environmental impacts should be determined on a scientifically sound basis and described in the Subsidies Report. The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety should take charge of this due to the technical experts there.
- A comparison of the instruments is also required (is there a better alternative instrument for achieving the subsidy objective?) because the relationship between the different sustainability targets (conflict, congruence and neutrality of targets) does not depend on the targets but on the chosen instrument.
- In addition, the design of the subsidy has to be justified (amount of subsidy and range of recipients). This applies in the case of environmentally harmful subsidies in particular because they should not be bigger than absolutely necessary.
- And finally, it would also be necessary to take another subsidy concept as a basis (cf. section 1.2). For example, neither the company car privilege nor the commuting tax allowance or the kerosene tax exemption for international flights are currently assessed in the Federal Government's Subsidies Report.

The opportunities for the reform of environmentally harmful subsidies identified during a methodologically improved sustainability impact assessment could make tax and financial policy more efficient and environmentally friendly. Significant budget savings and additional tax revenue could also be attained, which could be used for tax relief in other areas or to finance important future tasks. It is therefore worthwhile seizing this opportunity and implementing the reform of environmentally harmful subsidies with binding effect.

[447] BMF (2015), p. 47; also, in BMF (2017), (2019a) and (2021).

[448] This is not carried out consistently, however. In the case of the peak equalisation scheme, for example, the conflict between environmental goals is not illustrated, cf. BMF (2019a), p. 390.

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A Annex: Profiles

A.1 Energy supply and use

Subsidy	Electricity and energy tax reductions for the manufacturing industry and for agriculture and forestry
Description	Companies in the manufacturing sector, agriculture and forestry are granted an electricity and energy tax reduction. Companies qualifying for the relief only pay 75% of the standard tax rates for electricity and heating fuels. Legal regulation: Paragraph 9b StromStG and paragraph 54 EnergieStG. Subsidy purpose: Ensuring the international competitiveness of companies and preventing the relocation of production abroad, as this could lead on one hand to job losses and on the other hand to a negative climate balance (due to lower climate policy standards in other countries).
Environmental impact	To decrease energy consumption and increase energy efficiency, a functioning tax/levy environment is necessary to provide appropriate incentives. Exemptions decrease this incentive. With regard to the subsidy purpose (international competitiveness), these exemptions are far too comprehensive (‘shotgun approach’). The energy consumption and the greenhouse gases caused by the manufacturing industry and agriculture and forestry could be significantly decreased, e.g. by switching energy sources or using energy-saving cross-cutting technologies. Development opportunities in this regard are reduced by the subsidy.
Subsidy volumes	2006: EUR 2.163 billion 2008: EUR 2.415 billion 2010: EUR 2.518 billion (EUR 2.2 billion electricity tax, EUR 318 million energy tax) 2012: EUR 1.178 billion (EUR 994 million electricity tax, EUR 184 million energy tax) 2014: EUR 1.191 billion (EUR 1,038 billion electricity tax, EUR 153 million energy tax) 2016: EUR 1.205 billion (EUR 1,052 billion electricity tax, EUR 153 billion energy tax) 2018: EUR 1.144 billion (EUR 990 billion electricity tax, EUR 154 billion energy tax)
Concrete proposal	There should be further cuts in the granting of reduced tax rates. The use of equalisation measures is preferable. If tax concessions are still to be used as an instrument, they should be staggered based on trade and energy intensity. Concessions, if they are maintained, should also be linked to environmental improvements in return.

Subsidy	Peak equalisation on environmental tax for the manufacturing sector
Description	In addition to the general electricity and energy tax reduction, companies in the manufacturing sector benefit from the so-called peak equalisation. This means that companies are reimbursed for up to 90% of the eco-tax payments (electricity tax and energy tax) which exceed the relief associated with the environmental tax reform of 1999 for pension contributions (employer contribution). Legal regulation: Paragraph 10 StromStG and paragraph 55 EnergieStG. Subsidy purpose: Ensuring the international competitiveness of companies and preventing the relocation of production abroad, as this could lead on one hand to job losses and on the other hand to a negative climate balance (due to lower climate policy standards in other countries).
Environmental impact	The peak equalisation scheme strongly diminishes the incentive for energy-saving behaviour and energy-efficient production in the privileged companies. However, there is still potential for further reducing energy consumption and greenhouse gas emissions of energy-intensive companies.
Subsidy volumes	2006: EUR 1.94 billion 2008: EUR 1.962 billion 2010: EUR 1.939 billion (EUR 1.766 billion electricity tax, EUR 173 billion energy tax) 2012: EUR 2.182 billion (EUR 2.008 billion electricity tax, EUR 174 billion energy tax) 2014: EUR 2.108 billion (EUR 1,911 billion electricity tax, EUR 197 billion energy tax) 2016: EUR 1.786 billion (EUR 1,614 billion electricity tax, EUR 172 billion energy tax) 2018: EUR 1.720 billion (EUR 1,561 billion electricity tax, EUR 159 billion energy tax)
Concrete proposal	From an environmental point of view, it makes sense to abolish the peak equalisation scheme, in order to increase the incentive to reduce energy consumption and greenhouse gas emissions. The preferred option would be a border adjustment scheme. If a concession is upheld, it should be staggered based on trade and electricity intensity. Additionally, the assistance should be granted in the form of a partial tax refund based on product benchmarks. The state should also require environmental improvements to a greater extent. The aforementioned staggered concession could be supplemented by a hardship regulation.

Subsidy	Relief from electricity and energy taxes for certain energy-intensive processes and procedures
Description	Energy products with two different purposes and energy-intensive processes, e.g. chemical, metallurgical and mineral production processes and the manufacture of building materials, are granted relief on energy and electricity taxes. Legal regulation: Paragraph 9a StromStG and paragraphs 37, 51 EnergieStG. Subsidy purpose: Ensuring international competitiveness.
Environmental impact	Among the privileged industrial processes, there are no tax incentives to use energy economically at all.
Subsidy volumes	2006-2007: EUR 322 billion on a yearly basis 2008: EUR 0.886 billion 2010: EUR 0.983 billion 2012: EUR 1.333 billion 2014: EUR 1.327 billion 2016: EUR 1.389 billion 2018: EUR 1.290 billion
Concrete proposal	The flat-rate tax exemptions for the privileged chemical, metallurgical and mineral production methods should be abolished. If the concession is upheld then it should be staggered based on electricity and trade intensity.

Subsidy	Energy tax concession for electricity generation
Description	For energy products that are used for electricity generation in fixed installations with a nominal electrical capacity of more than two megawatts (MW), an application for exemption from energy tax can be made. In the case of coal, full tax exemption can be applied for. Legal regulation: Paragraphs 37, 53 EnergieStG. Subsidy purpose: Avoidance of double taxation on electricity generation
Environmental impact	This subsidy grants an advantage for electricity generation using fossil fuels.

Subsidy	Energy tax concession for electricity generation
Subsidy volumes	2006: EUR 1.329 billion 2008: EUR 2.196 billion 2010: EUR 2.300 billion 2012: EUR 2.200 billion 2014: EUR 1.800 billion 2016: EUR 1.700 billion 2018: EUR 2.003 billion
Concrete proposal	The subsidy should be abolished. At the same time, however, the tax rates on different energy sources should also be adjusted. This would otherwise lead to a unilateral increase in the price of gas and the relative advantage of coal.

Subsidy	Hard coal subsidies
Description	Domestic hard coal mining ceased at the end of 2018 with the closure of the last two mines, Prosper-Haniel and Ibbenbüren. This is a positive development from an environmental perspective. This meant the end of the subsidisation of the sale of hard coal, although payments in arrears were still incurred after 2018.
Environmental impact	There is still long-term damage such as mining damage, flood risks and groundwater hazards.
Subsidy volumes	2006: EUR 2.285 billion 2008: EUR 2.454 billion 2010: EUR 1.917 billion 2012: EUR 1.732 billion 2014: n.q. 2016: n.q. 2018: EUR 1.263 billion

Subsidy	Concessions for the lignite industry
Description	**Exemption from the extraction charge** 10% of the market price is payable in principle as a charge on the extraction of mineral resources classified as '*bergfrei*' (free for mining) The Länder do not levy this charge on lignite mining. Legal regulation: Paragraph 151(2), no. 2 BbergG. **Exemption from the Länder's water abstraction charges** Brandenburg, Lower Saxony, Saxony and Saxony-Anhalt grant the lignite industry an exemption from the water abstraction charge. Legal regulation: Paragraph 40(4), no. 7 BbgWG; paragraph 21(2), no. 12 NWG; paragraph 23(4), no. 6 SächsWG; paragraph 105(1), 3rd sentence of the Water Act for the Land of Saxony-Anhalt (*Wassergesetz für das Land Sachsen-Anhalt*, WG LSA) and paragraph 1(3), no. 7 of the Regulation on a charge for the abstraction of water from bodies of water for the Land of Saxony-Anhalt (*Verordnung über die Erhebung eines*
Environmental impact	The subsidies on lignite lead to distortions of competition on the energy market. Lignite is the fossil fuel with the greatest impact on the climate, the environment and health. The serious consequences of open-cast mining include impairment of the natural groundwater regime and large-scale destruction of landscape and communities. Lignite, which is used mainly for power generation, is the fossil fuel with the greatest climate-relevant CO_2 emissions per unit of energy.
Subsidy volumes	2006: min. EUR 196 million 2008: min. EUR 195 million 2010: min. EUR 279 million 2012: min. EUR 304 million 2014: n.q. 2016: n.q. 2018: min. EUR 287 million
Concrete proposal	The lignite industry should also be subject to the extraction charge of 10% of the market value, which is currently approx. EUR 1.6 per ton. The Länder concerned should also charge water abstraction charges for lignite extraction. Overall, lignite-fired power plants and open-cast lignite mines should receive neither explicit nor implicit subsidies that conflict with the polluter pays principle.

Subsidy	Energy tax concessions for coal
Description	The energy tax rate for coal is EUR 0.33 per GJ. From an environmental perspective, the tax rate for heating oil (EUR 1.98 per GJ) is a sensible reference value. This results in a tax rate difference of EUR 1.65 per GJ, which is used to subsidise coal. Legal regulation: Paragraph 2(1), no. 9 EnergieStG.
Environmental impact	Coal is the fossil fuel with the greatest environmental and climate impacts.
Subsidy volumes	2006-2007: EUR 157 billion on a yearly basis 2008: EUR 154 million 2010: EUR 190 million 2012: EUR 100 million 2014: EUR 108 million 2016: EUR 137 million 2018: EUR 85 million
Concrete proposal	The coal tax rate should gradually be raised to a level of EUR 1.98 per GJ, which is comparable to that of heating oil. This would result in uniform taxation of coal used for heating purposes in the commercial and private sectors. Social hardships could be cushioned by means of support schemes for the installation of new heating systems.

Subsidy	Manufacturer privilege for producers of energy products
Description	According to the 'manufacturer privilege' provided for in the Energy Tax Act, companies that produce energy products — e.g. refineries, and gas production and coal plants — do not pay tax on energy sources used in their production processes. This concerns both energy sources produced on their own premises and those that are procured externally, such as mineral oils, gases or coal. Legal regulation: Paragraphs 26, 37, 44, 47a EnergieStG. Subsidy purpose: Protect the competitiveness of production operations
Environmental impact	Refinery processes and other processes involved in the manufacture of energy products are often very energy- and emission-intensive. Given the manufacturer privilege, there are no tax incentives to improve the energy efficiency of such processes and consequently to reduce greenhouse gas and air pollutant emissions.

Subsidy	Manufacturer privilege for producers of energy products
Subsidy volumes	2006: EUR 400 million 2008: EUR 270 million 2010: EUR 300 million 2012: EUR 300 million 2014: EUR 350 million 2016: EUR 350 million 2018: EUR 342 million
Concrete proposal	Refineries and gas production and coal plants should be subject to the same energy tax regulations as other energy-intensive companies in the manufacturing industry. According to the EU Energy Taxation Directive, externally purchased energy in production operations should be made subject to the normal tax on energy in the short term. However, marketable self-produced fuels must also be subject to the usual taxation in the medium and long term. For this reason, efforts should be made to lift the ban on taxation for self-generated energy sources in the EU Energy Taxation Directive.

Subsidy	Energy tax exemption for non-energy uses of fossil fuels
Description	Energy products that are not used for heating or fuel are exempt from energy taxation (primarily mineral oils, gas and refinery products). Legal regulation: Paragraph 25(1) EnergieStG.
Environmental impact	The use of fossil energy products as feedstock also depletes finite resources and causes waste in the course of product life cycles. It is not free from CO_2 emission either. There is a lack of tax incentives to encourage fossil fuels to be used as raw materials more efficiently and replaced by renewable materials.
Subsidy volumes	2006: min. EUR 1.6 billion 2008: min. EUR 1.6 billion 2010: min. EUR 1.6 billion 2012: min. EUR 1.57 billion 2014: min. EUR 1.594 billion 2016: min. EUR 1.552 billion 2018: min. EUR 1.299 billion
Concrete proposal	Energy sources that are not used for energy purposes should be taxed based on their impact on the environment and on resources, EU-wide if possible.

Subsidy	Free allocation of CO_2 emissions trading allowances
Description	Since the beginning of the third trading period (2013-2020), emission allowances have predominantly been auctioned through the European Emissions Trading System. All allowances for emissions from electricity generation must therefore be purchased on the market. For the manufacturing industry and heat production, a decreasing number of allowances per year are granted for free on the basis of strict and EU wide consistent benchmarks. Legal regulation: Paragraph 9 TEHG Subsidy purpose: Protect the competitiveness of European energy-intensive industries; protection against carbon leakage
Environmental impact	Even if the fixed upper limit for emissions is not affected by the way the allowances are allocated, this free allocation reduces the incentive to avoid or decrease emissions. This favours the use of climate-damaging fuels or technologies. There is also a risk that companies may invest in emission-intensive processes and technologies that have a long operating life and are not compatible with Germany's or the EU's long-term climate objectives (so-called 'lock-in effects'). This increases the future cost to the economy of achieving the climate objectives.
Subsidy volumes	2006: EUR 2.5 billion (different method of calculation) 2008: EUR 7.8 billion (with an allowance price for emissions of EUR 20.00 per ton of CO_2) 2010: EUR 6.1 billion (with an allowance price for emissions of EUR 15.40 per ton of CO_2) 2012: EUR 3.124 billion (with an allowance price for emissions of EUR 7.51 per ton of CO_2) 2014: n.q. 2016: n.q. 2018: EUR 2.134 billion
Concrete proposal	In principle, all emission allowances should be auctioned in the future because this is the only way in which the polluter pays principle can be fully taken into account and the proceeds thereof can be used for climate protection measures. If competing companies abroad are subject to fewer climate protection requirements or CO_2 prices, however, measures to protect against carbon leakage are required.

Subsidy	Grants for electricity-intensive companies to compensate for the rise in electricity prices due to emissions trading
Description	Since 2013, EU Member States have been able to pay grants to companies in certain sectors to compensate for the rise in electricity prices due to emissions trading (electricity price compensation). For this purpose, the particularly electricity-intensive sectors that are in international competition were identified at EU level. At national level, the Federal Ministry for Economic Affairs has drawn up guidelines on providing compensation for indirect CO_2 costs that have been approved by the European Commission and have been in force retrospectively since January 2013. Legal regulations: Article 10a(6) of Directive 2003/87/EC with regard to the improvement and expansion of the Community scheme for greenhouse gas emission allowance trading, as well as announcement by the Federal Ministry for Economic Affairs on the amendment of the directive for subsidies for companies in sectors or sub-sectors in which it is assumed that, in light of the costs associated with the EU ETS allowances, which can be passed on to the price of electricity, there is a substantial risk of the relocation of CO_2 emissions (subsidies for indirect CO_2 costs) of 23 July 2013 (BAnz AT 06/08/2013 B2), last amended by the second amendment to the directive (BAnz AT 28/08/2017 B1). Subsidy purpose: Protect the competitiveness of European energy-intensive industries; protection against carbon leakage
Environmental impact	The electricity price compensation system contradicts the emissions trading scheme: The price of emission allowances under the EU emissions trading system is also reflected in electricity prices and thus provides incentives to improve energy efficiency. The electricity price compensation system significantly decreases these incentives.
Subsidy volumes	2014: n.q. 2016: n.q. 2018: EUR 219 million.
Concrete proposal	The advantage provided through electricity price compensation should in principle be abolished. However, while the direct CO_2 costs of emissions trading are compensated for by free allocation to avoid carbon leakage, it is difficult to justify why there should be no compensation for indirect CO_2 costs. It applies for both the free allocation of emission allowances in emissions trading and for electricity price compensation that the advantages granted should only apply for those companies that are actually at risk of carbon leakage, however. Alternatives and supplements to free allocation are currently being discussed at European level in order to prevent carbon leakage. Depending on the structure, the introduction of certain instruments would have effects on the structure of the electricity price compensation scheme too.

Subsidy	EEG Special Compensation Scheme for electricity-intensive companies and railways
Description	Electricity-intensive companies and railways only pay a reduced EEG surcharge. Legal regulation: Paragraphs 63 et seq. EEG 2021. Subsidy purpose: Protect international competitiveness (energy cost-intensive companies) and intermodal competitiveness (railways)
Environmental impact	Due to the reduced levy, privileged consumers have less incentive to use energy efficiently than non-privileged consumers. As there is still potential for energy-intensive companies to reduce their electricity consumption and thus — given the present energy mix — their greenhouse gases, the Special Compensation Scheme has a negative effect on the climate.
Subsidy volumes	2006: EUR 0.485 billion 2008: EUR 0.759 billion 2010: EUR 1.455 billion 2012: EUR 2.7 billion 2014: EUR 5.10 billion 2016: EUR 5.10 billion 2018: EUR 5.40 billion
Concrete proposal	The list of industries should be more limited. The list drawn up by the European Commission of the sectors that are entitled to electricity price compensation can be taken as the basis for such limitation of the list of eligible industries. Companies that have previously benefited from the BesAR but have lost their status as a result of the revised regulation should pay the full EEG surcharge in future. Transition regulations may be helpful as a means of helping companies adjust to the higher surcharge payments. The extent of environmental improvements required by the state in return should also be increased. Currently, they only have to operate a certified energy or environmental management system. If they have consumed less than 5 GWh electricity in the last financial year, even the so-called alternative system for improving energy efficiency in accordance with paragraph 3 of the Peak Equalisation Efficiency System Regulation is sufficient. It would make sense to require them to take the economic energy-saving measures identified within the context of the energy or environmental management system. Delivery points with more than 10 GWh of electricity procured per year should also fulfil the technical, organisational and legal conditions for use of load management on the electricity market.

Subsidy	Self-consumption privilege under the EEG (industrial sector)
Description	Since EEG 2014, internal power generation is also subject to the surcharge in principle. For plants that were commissioned prior to August 2014 (existing plants), however, full exemption from the surcharge continues to apply. Legal regulation: Paragraphs 61 et seq. EEG 2021. Subsidy purpose: Ensure predictability in respect of investments within the context of the original self-consumption privilege.
Environmental impact	Full exemption from the EEG surcharge gives companies and households that generate and/or use internal power less of an incentive to use energy efficiently. This means that the potential to reduce greenhouse gases is not exploited.
Subsidy volumes	2006: EUR 0.295 billion 2008: EUR 0.414 billion 2010: EUR 0.754 billion 2012: EUR 1.6 billion 2014: n.q. 2016: n.q. 2018: EUR 3.66 billion
Concrete proposal	The integration of internally generated power in the EEG surcharge is a positive development, particularly because it counteracts the deconsolidation in respect of the financing of the EEG. The grandfathering should be brought to an end.

Subsidy	Concessions for energy-intensive industry with regard to electricity grid fees
Description	Electricity grid operators charge a fee for using their networks. There is an exemption for energy-intensive users (companies), however. When both at least 7,000 operating hours and an electricity consumption of more than 10 GWh are attained per delivery point and calendar year, the consumer should be offered an 'individual network fee'. In this case, the user may receive reductions of up to 90% against the regular network fee. Legal regulation: Paragraph 19(2), 2nd sentence StromNEV. Subsidy purpose: Ensuring international competitiveness of energy-intensive industries.
Environmental impact	The exemption provides beneficiary companies significantly less of an incentive to use electricity efficiently. The regulation also creates an incentive for continuous power consumption and high power consumption. There is still potential to increase efficiency in energy-intensive companies. Because of the advantage granted, this potential to reduce greenhouse gases is not exploited.
Subsidy volumes	2007: EUR 34 million 2008: EUR 26 million 2010: EUR 33 million 2012: EUR 300 million 2014: EUR 272 million

Subsidy	Concessions for energy-intensive industry with regard to electricity grid fees
	2016: EUR 388 million 2018: EUR 611 million
Concrete proposal	In principle, companies should pay the full fee to use the electricity grids so that they bear their fair share of the costs of the grid. It should be possible to grant benefits to grid users who provide a service to society, for example by contributing to grid stability. However, it is important here that the contribution consists of more than simply the consumption of electricity and actually constitutes a relevant input. In addition, they should not suffer any disadvantages by providing system services or by using surpluses or reducing the demand for electricity from renewable energies through load management. If there are also demonstrable and unreasonable disadvantages for companies that are engaged in international competition, a hardship regulation should apply.

Subsidy	Privileges for special-contract customers with regard to concession charges for electricity and gas
Description	On the basis of concession agreements, cities and communities can demand a payment — the concession charge — from electricity and gas network operators for the use of public space. The permitted maximum charge rate for electricity is 2.39 cents per kWh and for gas 0.93 cents per kWh. By contrast, when supplying so-called special-contract customers, the maximum concession charge is 0.11 cents per kWh for electricity and 0.03 cents per kWh for gas. Such classification can result in savings of up to 95%. Under certain circumstances, the concession charge is even waived completely. It can be assumed that all electricity-intensive companies are fully exempt from the concession charge. Legal regulation: Paragraph 2(3), (4) and (5) KAV. Subsidy purpose: Ensuring international competitiveness of energy-intensive industries.
Environmental impact	The privileges for special-contract customers reduce the incentive to improve energy efficiency and thus lead to adverse environmental and climate impacts.
Subsidy volumes	2010: EUR 3.5 billion 2012: EUR 3.9 billion 2014: EUR 3.9 billion 2916: EUR 3.6 billion 2018: EUR 3.6 billion
Concrete proposal	Complete exemption from the concession charge should no longer be possible in future. In addition, changes in the eligibility criteria must be permitted to ensure that there are no incentives for increased electricity consumption and that efficiency potentials are utilised. Like network fees, concession charges should also be designed to be compatible with the electricity market so that, for example, plants for internal consumption are not operated against the electricity market.

Subsidy	Reduced rates of cogeneration surcharge for the manufacturing sector and energy-intensive industries
Description	There are reduced surcharge rates, particularly for electricity cost-intensive companies. Legal regulation: Paragraphs 27 et seq. KWKG Subsidy purpose: Ensuring international competitiveness.
Environmental impact	As a result of the lower costs, there is less of an incentive for companies to use electricity efficiently.
Subsidy volumes	2006: EUR 327 million 2008: EUR 178 million 2010: EUR 103 million 2012: EUR 24 million 2014: n.q. 2016: n.q. 2018: EUR 316 million
Concrete proposal	The reduced surcharges should be abolished and the same amount of surcharge should apply for all end users. This way, the surcharge would decrease for households and small businesses.

Subsidy	Subsidies for nuclear power
Description	Germany will cease to generate nuclear power by the end of 2022 at the latest. Especially when it first began to be used for generating electricity, nuclear energy received high explicit subsidies, particularly for research. Nuclear energy was overall subsidised to a considerably greater extent than, for example, measures in the areas of renewable energies and energy efficiency. Direct state subsidies for nuclear power are currently relatively low. A large proportion continues to benefit the research sector. However, nuclear power still receives substantial support in the form of implicit subsidies. In particular, the present liability arrangements with regard to potential accidents in nuclear power plants and the possibility for NPP operators to create provisions constitute benefits of a subsidy character amounting to billions of euros.
Environmental impact	Due to the health risks and environmental pollution resulting from uranium mining, the unresolved question of the final disposal of nuclear waste, the danger of serious accidents and the potential military uses, nuclear power is a technology that is inherently harmful to the environment. There are more effective and more efficient ways of protecting the climate. During nuclear power generation — for example, during the mining and enrichment of uranium for fuel elements — more greenhouse gases are produced than when using wind power, hydropower or solar power. Increasingly scarce uranium reserves mean that the commodity is being mined even when the ore content is low and, due to the increased energy consumption for the mining activities, the CO_2 emissions in the overall balance increase.

Subsidy	Export credit guarantees ('Hermes guarantees') for coal-fired power plants
Description	The Federal Government's export credit guarantees serve to safeguard companies and banks against the economic and political risks of default in export transactions. As a rule, the state uses export credit guarantees to cover risks that private-sector insurance companies cannot accept, at least not on economic terms. In 2014 the Federal Government decided as a basic principle not to give any export credit guarantees for nuclear power generation plants and equipment. However, they continue to be granted for coal-fired power plants. In 2015 the Member States of the OECD agreed on conditions and requirements specific to assistance for coal-fired power stations, which must be met in order for export credit guarantees to be granted. Now, requirements can be placed on the climate-friendliness and efficiency of the technology used. However, exceptions can be made by prioritising other political goals.
Environmental impact	Despite the efforts made by the OECD (lending requirements), export credit guarantees for coal-fired power plants have a negative environmental impact. Despite the direct environmental impacts resulting from increased CO_2 emissions by coal-fired power plants, for example, coal-fired power plants will continue to shape energy supply for decades to come and will therefore render the transition to renewable energies more difficult.
Subsidy volumes	2012: EUR 79 million 2014: EUR 57 million 2016: EUR 123 million 2018: EUR 1 million

A.2 Transport

Subsidy	Energy tax concessions for diesel fuel
Description	The energy tax rate for zero-sulphur diesel fuel (47.04 cents per litre) is significantly lower than the tax rate for petrol (65.45 cents per litre). The difference is 18.41 cents per litre or even 21.9 cents per litre if VAT is taken into account. Legal regulation: Paragraph 2(1), no. 4b EnergieStG (tax rate for diesel) compared with paragraph 2(1), no. 1b EnergieStG (tax rate for petrol) Subsidy purpose: Historical — promotion of commercial road transport of goods
Environmental impact	Reduction of the incentive to purchase fuel-efficient cars and drive in a fuel-efficient way However, diesel leads to higher CO_2, nitrogen oxide and particulate emissions per litre than petrol.
Subsidy volumes	2006: EUR 6.15 billion 2008: EUR 6.63 billion 2010: EUR 7.05 billion 2012: EUR 7.35 billion 2014: EUR 7.76 billion 2016: EUR 8.15 billion

Subsidy	Energy tax concessions for diesel fuel
	2018: EUR 8.20 billion
Concrete proposal	The diesel tax rate should be increased to the same level as the petrol tax rate at least. At the same time, the vehicle excise duty on diesel and petrol cars should be harmonised. The calculation for taxation on cars in respect of vehicle excise duty should be based on realistic CO_2 emissions in future. Type test values for CO_2 emissions from cars determined under test conditions differ substantially from the actual values in the field. The discrepancy has increased significantly in just a few years. The unrealistic consumption data has resulted in revenue shortfalls for vehicle excise duty. Vehicle excise duty should therefore at least be calculated based on a realistic measurement cycle (WLTP/WLTC) in future. For the same reason, the German Environmental Agency recommends using the RDE measurement technique to calculate air pollutants in future.

Subsidy	Commuting tax allowance
Description	Employees can deduct expenses they incur commuting to work as income-related expenditure against their income tax. Amount: 30 cents per kilometre for the one-way distance between the place of residence and the place of work; also, from 2021 to 2023, 35 cents per kilometre from the 21st kilometre; from 2024 to 2026 38 cents per kilometre from the 21st kilometre. Maximum amount: EUR 4,500 per calendar year, but this does not apply when using a car. This regulation reduces the tax burden once the deduction for professional expenditures of EUR 1,000 has been exceeded. Legal regulation: Paragraph 9(1), no. 4 EstG. Implicit subsidy, added as commuting expenses for work-related expenses (professional expenditures)
Environmental impact	Growth in the volume of traffic and trend towards long commutes. It is primarily cars that benefit because there is no annual maximum amount in respect of them and because the range of public transport is very limited, particularly in regions with lower population densities. This results in a promotion of road transport despite all its environmental impacts, both in respect of emissions (climate impact, air pollution, noise pollution) and in respect of land take as a result of urban sprawl (contribution to loss of biodiversity).
Subsidy volumes	2006: EUR 4.35 billion 2008: EUR 4.35 billion 2010: EUR 5.0 billion 2012: EUR 5.1 billion 2014: EUR 5.3 billion 2016: EUR 5.6 billion 2018: EUR 6.0 billion

Subsidy	Commuting tax allowance
Concrete proposal	In light of the negative environmental impacts, the commuting tax allowance should be abolished. In future the costs of travelling to work should instead only be tax-deductible within the context of a hardship regulation, e.g. through the possibility of deducting travel costs as an extraordinary expense for tax purposes. This would specifically provide relief for those employees that have to pay very high travel costs relative to their income, e.g. because they have to put up with long work commutes for social or professional reasons. The government could also use the extra tax revenue gained by abolishing the commuting tax allowance to provide greater support for public transport or to increase the deduction for professional expenditures. If abolition of the commuting tax allowance cannot be achieved in political terms, second-best solutions should at least be implemented. The legislator could do so by significantly reducing the commuting tax allowance and setting a maximum total amount for deductible work-related travel costs, for example.

Subsidy	Flat-rate taxation of privately used company cars
Description	Company cars are owned by employers and then provided to employees who can also use them for private purposes. To separate private use from company use in respect of tax, a flat rate is predominantly applied: For private use, 1% of the list price of the vehicle at the time of initial registration monthly is to be taxed as a non-cash benefit when calculating income tax. This flat rate clearly constitutes an advantage for the private use of a company car over a corresponding increase in salary or the use of a private car. Legal regulation: Paragraph 6(1), no. 4, 2nd sentence EstG Implicit subsidy in the form of flat rate provision under income tax legislation. The subsidisation nature is unmistakeable, however. Since 1 January 2020, only 0.25% of the gross list price has to be applied for vehicles with electric motors. This applies for fully electric cars without any carbon dioxide emissions with a gross list price of no more than EUR 60,000. For more expensive electric cars and plug-in hybrids, 0.5% of the gross list price is subject to tax.
Environmental impact	The regulation leads to a higher volume of road traffic. It therefore contributes to the environmental impacts of road transport, both in respect of emissions (climate impact, air pollution, noise pollution) and in respect of land take as a result of urban sprawl (contribution to loss of biodiversity).
Subsidy volumes	2006: EUR 500 million 2008: EUR 500 million 2010: min. EUR 500 million 2012: min. EUR 3.1 billion (better calculation methodology) 2014: min. EUR 3.1 billion 2016: min. EUR 3.1 billion 2018: min. EUR 3.1 billion

Subsidy	Flat-rate taxation of privately used company cars
Concrete proposal	The aim should be a reform in which it makes no economic difference to the user whether a vehicle is private or provided as a company car. A reform should take into account both acquisition costs and the scale of private use. The non-cash benefit provided through the provision of fuel free of charge should also be taxed. A CO_2 component should also be factored into company car taxation to provide incentives to purchase lower emission vehicles. When doing so, a distinction should be made within the group of cars with combustion engines and the group of hybrid cars, each based on CO_2emissions. The advantage granted to plug-in hybrids (0.5% rule) should also be promptly abolished, because large hybrid vehicles with relatively inefficient combustion engines and low levels of electric mode actually have a worse CO_2 balance than pure combustion engines. Finally, the subsidisation of electric cars should only be carried out for a limited period of time until market diffusion has been achieved and it should be considered a second-best instrument, not least because the associated political distribution problems remain. Besides the abolition of company car privilege, a general, environment-orientated reform of the treatment of company cars for tax purposes is required to create incentives to purchase fuel-efficient, low-emission vehicles among companies too. When doing so, the legislator should stagger the deductibility of acquisition and operating costs based on vehicles' greenhouse gas emissions or fuel consumption. For example, the acquisition costs of low-emission vehicles (maximum of 50g CO_2 per kilometre) could be fully tax-deductible; however, vehicles with CO_2 emissions above this threshold should still only be partly deductible. The deductible proportion of costs should decrease on a staggered basis as a vehicle's volume of emissions increases. It would also be worthwhile decreasing the threshold over time.

Subsidy	Biofuels
Description	Distributors of fossil fuels must ensure that the fuels' greenhouse gas emissions per year remain 6% below a reference value, which is based on the exclusive use of diesel and petrol as fossil fuels (greenhouse gas reduction quota). This effectively promotes the use of biofuels. Legal regulation: Paragraph 37a(1) and (4) BImSchG.
Environmental impact	The environmental impacts are greatly dependent on the biomass used. Cultivated biomass (particularly rapeseed, maize, sugar beet, sugar cane and soya) is usually associated with soil, water and air pollution from residues of fertilisers and pesticides, greenhouse gas emissions from soil cultivation and damage to biodiversity. In addition, the cultivation of biomass leads to the global expansion of cropland. This often entails the conversion of valuable natural areas and habitats, which causes the significant release of greenhouse gases and a considerable loss of biodiversity. If existing forms of land use are displaced, there is a risk that these in turn will penetrate into areas and habitats that should be protected. Biofuels based on biogenic residues and waste are preferable in terms of their ecological balance, whereby there are significant distinctions between the different ecological balances.
Subsidy volumes	2008: n.q.

Subsidy	Biofuels
	2010: EUR 1.022 billion 2012: EUR 1.047 billion 2014: n.q. 2016: n.q. 2018: EUR 0.96 billion
Concrete proposal	In order for the greenhouse gas reductions system to be fully effective, the calculation of greenhouse gas emissions must be expanded to include indirect emissions (i.e. ILUC-induced emissions). The proportion of fuels made from cultivated biomass should be reduced further and brought to an end in the medium term. The greenhouse gas reduction required by the EU and the required minimum proportion of renewable energies in the transport sector, together with the still outstanding national implementation of RED II (the second Renewable Energy Directive) by 2030, could not and should not be achieved by an absolute increase in the volume of biofuel but instead by a reduction in end energy consumption, e.g. through more efficient vehicles, shifting and avoiding transportation, and a market increase in electromobility in road transport. This would result in a decrease in the absolute demand for biofuels, while limited quantities of advanced alternative fuels could cover a large proportion. The use of electricity in road transport is already counted towards the minimum greenhouse gas reduction. The role of electricity is reinforced further by the implementation of RED II.

Subsidy	Energy tax exemption for inland waterway transport
Description	Diesel fuel used in commercial inland waterway transport is exempted from taxation. Legal regulation: Paragraph 27(1) EnergieStG. Subsidy purpose: 'Harmonisation of the competition situation for waterway transportation on other waterways with the concession exemption applicable for the Rhine region on the basis of international agreements.' And also: 'The measure should help to maintain the level of inland waterway transport in total transport, to relieve the burden on rail and road infrastructure, and to reduce emissions in freight transport.' (BMF 2019, p. 417)
Environmental impact	The fuel available for inland waterway transport in Germany is similar to diesel fuel for road vehicles. The tax exemption diminishes the incentive to use fuel economically and efficiently. This applies even though inland waterway transport is a relatively environmentally friendly mode of transport. The emissions have a detrimental effect on the climate and promote air pollution, as well as the acidification of soil and water.
Subsidy volumes	2006: EUR 129 million 2008: EUR 118 million 2010: EUR 166 million 2012: EUR 170 million 2014: min. EUR 160 million

Subsidy	Energy tax exemption for inland waterway transport
	2016: min. EUR 160 million 2018: min. EUR 141 million
Concrete proposal	To harmonise competitive conditions between modes of transport — particularly between inland waterway transport, road transport with HGVs and rail freight transport — marine diesel oil should be subject to tax in the same way as diesel fuel for commercial road transport (currently 47.04 cents per litre). European and international regulations should be amended so that the tax exemption is abolished Europe-wide, particularly for international navigation on the Rhine, and a European minimum tax rate is introduced. When abolishing tax concessions, it would be worthwhile using the additional tax revenue for the environmental modernisation of inland waterway transport. For example, the support scheme 'Sustainable Modernisation of Inland Waterway Vessels' (*Nachhaltige Modernisierung von Binnenschiffen*) could in particular be consolidated and expanded to promote the conversion to battery drives. The additional tax revenue could also be used for the development and market launch of new vessel concepts. The promotion of smaller, highly automated and battery-driven inland waterway vessels would be conceivable here. To create further impetus to improve the environmental properties of inland waterway vessels, particularly in respect of pollutant emissions, staggered tolls and canal fees (i.e. based on environmental properties) should be introduced.

Subsidy	Financing of cruise ships using KfW IPEX loans
Description	The KfW subsidiary IPEX provides low-interest financing for orders to build cruise ships in German shipyards. The possibility of loan default is covered by Hermes guarantees from the Federal Government. Subsidy purpose: Protecting Germany as a shipyard location, employment in structurally weak regions.
Environmental impact	If they run on fossil fuels, cruise ships are detrimental to the environment. In addition, nitrogen oxides, soot and sulphur are emitted.
Subsidy volumes	n.q.
Concrete proposal	Assistance for the building of cruise ships should be brought to an end. In the affected regions, greater structural change should be promoted more actively and in particular be cushioned by social policy.

Subsidy	Energy tax exemption for machinery and vehicles used exclusively for the movement of goods in seaports
Description	Machinery and vehicles used exclusively for the movement of goods in seaports have benefited from an energy tax concession. Instead of the tax rate for motor fuels, only the lower tax rate for heating fuels in accordance with paragraph 2(3) EnergieStG is applied. For example, diesel fuel is not taxed at around 47 cents per litre, but at only about 6.1 cents per litre. Legal regulation: Paragraph 3a EnergieStG.

Subsidy	Energy tax exemption for machinery and vehicles used exclusively for the movement of goods in seaports
	Subsidy purpose: Elimination of competitive disadvantages for German seaports compared with their European competitors.
Environmental impact	The concession diminishes the incentive to increase the energy efficiency of machinery and vehicles for the movement of goods in seaports.
Subsidy volumes	2009: EUR 25 million 2010: EUR 25 million 2012: EUR 25 million 2014: EUR 25 million 2016: EUR 25 million 2018: EUR 25 million
Concrete proposal	In principle, it would make sense to discontinue the energy tax allowance and apply the regular tax rate. An EU-wide approach would be desirable here. If a coordinated EU-wide approach is not possible, assistance should be provided in the form of financial assistance instead of tax concessions on production factors with negative environmental impacts. This concerns assistance for the direct electrification of machinery and vehicles in particular.

Subsidy	Energy tax exemption for kerosene
Description	The use of kerosene in commercial aviation is exempt from energy tax. Legal regulation: Paragraph 27(2) EnergieStG. Subsidy purpose: Protect the competitiveness of domestic aviation
Environmental impact	The tax exemption promotes aviation consuming fossil fuels and diminishes the economic incentive to develop and use low-emission aircraft. Owing to the altitude at which they are emitted, emissions from air transport are considerably more detrimental to the climate than ground-level emissions. Moreover, the number of passenger-kilometres travelled is growing significantly faster than technical progress in engine development. The foreseeable technical measures will therefore be far from sufficient to maintain or reduce the current level of emissions.
Subsidy volumes	2006: EUR 6.9 billion 2008: EUR 7.23 billion 2010: EUR 6.92 billion 2012: EUR 7.08 billion 2014: EUR 6.92 billion 2016: EUR 7.44 billion 2018: EUR 8.36 billion

Subsidy	Energy tax exemption for kerosene
Concrete proposal	The aim should be to apply a tax rate of 65.45 cents per litre for kerosene use in aviation too. How the taxation of paraffin is going to develop at the European level will depend on the current reform of the Energy Tax Directive.

Subsidy	VAT exemption for international flights
Description	Transboundary air transport is exempt from value-added tax (VAT) in Germany and only domestic flights are subject to VAT. Legal regulation: Paragraph 4, no. 2 in conjunction with paragraph 8(2), no. 1 UStG.
Environmental impact	The tax exemption promotes the growth of aviation, which still uses fossil fuels. Owing to the altitude at which they are emitted, emissions from air transport are considerably more detrimental to the climate than ground-level emissions.
Subsidy volumes	2006: 1.56 billion euros 2008: 4.23 billion euros 2010: 3.91 billion euros 2012: 4.763 billion euros 2014: n.q. 2016: n.q. 2018: EUR 3.997 billion
Concrete proposal	The VAT exemption on international aviation should be abolished. An EU-wide solution does make sense in order to create uniform framework conditions for cross-border flights and to prevent distortion of competition and an exodus of passengers. In order to enable this, the EU VAT Directive could be reformed. If the legal situation were changed so that the VAT for the entire flight could be levied in the country of departure, this would have a considerable environmental steering effect while requiring little administrative input. It would rule out double taxation in Europe. In view of the existing legal restrictions, a possible second-best solution for the short term would be to levy VAT only on the domestic part of the flight routes. Another short-term solution would be to at least double the aviation tax and, by 2030, to increase it so far that the aforementioned tax losses resulting from the VAT exemption are compensated for by cross-border flights.

Subsidy	Reduction of air traffic control charges
Description	In 2016, the Federal Ministry of Transport and Digital Infrastructure decided to reduce air traffic control charges. Subsidy purpose: Strengthen aviation companies in international competition
Environmental impact	The reduction of the air traffic control charges promotes the growth of aviation, which still uses fossil fuels.

Subsidy	Reduction of air traffic control charges
	And owing to the altitude at which they are emitted, emissions from air transport are considerably more detrimental to the climate than ground-level emissions.
Concrete proposal	The reduction in air traffic control charges that was enacted in 2016 should be reversed.

Subsidy	Funding of regional airports
Description	Regional airports have been supported by public money in recent years on the grounds that transport accessibility would be improved. From purely economic perspectives, however, they are already an unprofitable business model.
Environmental impact	The charge reduction promotes aviation, which still uses fossil fuels. And owing to the altitude at which they are emitted, emissions from air transport are considerably more detrimental to the climate than ground-level emissions.
Subsidy volumes	2018: min. EUR 40 million
Concrete proposal	The funding of regional airports should cease. This is also required by 2024 at the latest in accordance with EU state aid rules. The support should be with-drawn earlier than this, however.

A.3 Construction and housing

Subsidy	Housing premium
Description	The state supports building society savers whose taxable annual income does not exceed EUR 35,600 (married couples: EUR 70,000). Legal regulation: Housing Premium Act (*Wohnungsbau-Prämiengesetz*, WoPG) Subsidy purpose: The goal is the 'acquisition of home ownership on a greater scale, earlier and in a more stable way and the functional integrity thereof in the sense of rent-free and qualitatively satisfactory housing into retirement age', cf. BMF (2019a), p. 310.
Environmental impact	Insofar as this concerns new-builds 'in the open countryside', i.e. outside of towns and communities, the premium also promotes land take. This conflicts with the aim of the German Sustainable Development Strategy of lowering land usage (i.e. the increased land take for human settlements and the transport infrastructure) to below 30 ha per day by 2030. It is also associated with extra commutes that have further negative effects on the environment and the climate.
Financial volume/ savings potential	2006: EUR 500 million 2008: EUR 458 million 2010: EUR 515 million 2012: EUR 386 million

Subsidy	Housing premium
	2014: EUR 342 million 2016: EUR 223 million 2018: EUR 162 million (50% classified as environmentally harmful: EUR 81 million).
Concrete proposal	It is recommended that support for new builds on the outskirts of communities be excluded from the housing premium. The support should be focused on the acquisition of existing building stock, the extension of attics and (primarily energy-efficient) renovations.

Subsidy	Home ownership pensions ('Wohn-Riester')
Description	The government promotes the purchase, the construction or the repayment of debt on a home or a house as well as the acquisition of shares in housing cooperatives. Legal regulation: Paragraph 92a EStG Subsidy purpose: Socio-political aim (ensuring housing, particularly in old age)
Environmental impact	Insofar as this concerns new-builds 'in the open countryside', i.e. outside of towns and communities, the premium also promotes land take. This conflicts with the aim of the German Sustainable Development Strategy of lowering land usage (i.e. the increased land take for human settlements and the transport infrastructure) to below 30 ha per day by 2030. It is also associated with extra commutes that have further negative effects on the environment and the climate.
Financial volume/ savings potential	2006: n.q. 2008: EUR 9 million 2010: EUR 40 million 2012: EUR 56 million 2014: n.q. 2016: n.q. 2018: EUR 91 million (50% classified as environmentally harmful: EUR 46 million).
Concrete proposal	As with the subsidies for savings with building societies, it is recommended that support for new builds on the outskirts of communities be excluded from the support. The support should be focused on the acquisition of existing building stock, the extension of attics and (primarily energy-efficient) renovations.

Subsidy	Employee savings allowance
Description	The employee savings allowance (*Arbeitnehmer-Sparzulage*) is intended to provide a financial incentive to build up capital. In addition to other forms of building capital, the government also uses this to promote investment in

Subsidy	Employee savings allowance
	saving schemes with building societies. The employee allowance for savings with building societies ranges from 9% up to maximum savings of EUR 470 per year, which means that, for example, savers with building societies can receive support of EUR 42.30 per year. Legal regulations: paragraph 13 et seq. Fifth Act on the Promotion of Wealth Formation by Employees/the Fifth Wealth Formation Act VermBG (*Fünftes Gesetz zur Förderung der Vermögensbildung der Arbeitnehmer / Fünftes Vermögensbildungsgesetz*, VermBG). Subsidy purpose: Socio-political aim (ensuring housing conditions)
Environmental impact	Insofar as this concerns new-builds 'in the open countryside', i.e. outside of towns and communities, the premium also promotes land take. This conflicts with the aim of the German Sustainable Development Strategy of lowering land usage (i.e. the increased land take for human settlements and the transport infrastructure) to below 30 ha per day by 2030. It is also associated with extra commutes that have further negative effects on the environment and the climate.
Concrete proposal	It is also recommended here that support for new builds on the outskirts of settlement areas be excluded and that the support should be limited to more environmentally friendly forms of wealth formation.

Subsidy	Funding of social housing
Description	The construction, modernisation and purchase of housing and the acquisition of occupancy rights are promoted by granting funds, giving sureties, guarantees and other indemnities, and providing land for construction. The support is aimed at households for which the market does not provide adequate housing. Legal regulation: Act on Social Housing Promotion (*Wohnraumförderungsgesetz*, WoFG). Subsidy purpose: To support households with rental housing (including cooperative housing) and with the creation of owner-occupied home ownership.
Environmental impact	From an environmental perspective, the funding of social housing is problematic when housing is predominantly supplied in the form of new builds and this in turn leads to excessively high consumption of resources and land.
Financial volume/ savings potential	2006: EUR 588 million 2008: EUR 518 million (federal level only) 2010: EUR 518 million (federal level only) 2012: max. EUR 528 million (federal level and Länder) 2014: n.q. 2016: n.q. 2018: EUR 1,191 million
Concrete proposal	The public sector should continue to pursue the fundamental reorientation of recent years — away from new builds — and set clear priorities in respect of housing provision. Opportunities to provide housing by renovating and

Subsidy	Funding of social housing
	converting existing attic spaces or by adding additional storeys should primarily be exploited. If such opportunities have been exhausted, then gaps between buildings and unused industrial and commercial sites and converted land should be taken into account. Only if there is an urgent need for residential accommodation over and above this level should new open spaces be developed. In this case, the main focus should be on space-saving apartment blocks. To provide more targeted support for those who do not have the resources of their own to find appropriate accommodation on the housing market, the assistance should focus more on the households actually affected (subject-related assistance). The German Environment Agency therefore recommends that the instrument of housing subsidies be used to a greater extent. Also, in growth regions where the market suffers from a shortage of housing for low-income households, local authorities should expand municipal acquisition of occupancy rights in existing buildings for households in need.

Subsidy	Joint Task for Improving the Regional Economic Structure
Description	It is a central instrument of regional economic policy in Germany. A distinction is made between support for trade and industry and support for 'industry-orientated infrastructure'. Legal regulation: Act on the Joint Task for Improving the Regional Economic Structure (*Gesetz über die Gemeinschaftsaufgabe 'Verbesserung der regionalen Wirtschaftsstruktur*', GRW-Gesetz/GRWG). Subsidy purpose: To compensate for the locational disadvantages of structurally weak regions, to give them a chance of getting in line with the general economic situation and reduce development differences.
Environmental impact	Subsidising the development of new industrial and commercial spaces as a regional structural policy measure is seen as a negative development in light of the still strongly increasing land take for human settlements and transport infrastructure. At the same time, the intensity of use of newly developed areas is frequently low, and the number of vacant lots in newly developed industrial and commercial areas is growing. The development of new commercial spaces — particularly in unused areas — directly contributes to land take and thus to damage to various environmental goods. The uncritical funding of such projects conflicts with German land-saving objectives. The development of land for industry and commerce usually also entails the expansion of transport infrastructures, which — besides additional land take — leads to more traffic-related environmental pollution.
Financial volume/ savings potential	The environmentally harmful proportion of the subsidies granted cannot be clearly quantified.
Concrete proposal	The funding guidelines of the Joint Task should be expanded to include environment-orientated assistance criteria, e.g. giving brownfield site recycling and the development of existing space clear priority over the development of new commercial spaces. Structural assistance measures should serve the internal development and refurbishment of existing settlement areas and infrastructures, especially since long-term funding of the maintenance of existing public infrastructures is subject to great risks in structurally weak regions. One precondition for support

Subsidy	Joint Task for Improving the Regional Economic Structure
	should be that the applicant must first present an inventory of potential vacant lots and of unused former commercial and industrial sites. Additional land development should only be undertaken if the available reserves of land are exhausted and opportunities for land-saving building methods are exploited. Furthermore, instead of aiming at promoting construction measures, the Joint Task should instead be aimed at promoting human capital and environmental innovations and strengthening regional economic cycles. Another factor of central importance for improving regional economic structure is sustainable and efficient management of natural resources in the region in order to maintain and develop the natural capital.

Subsidy	Family housing grant
Description	Families receive EUR 1,200 per year and child over a period of ten years. This applies for the purchase or construction of properties between 1 January 2018 and 31 March 2021 (funding period). The support is subject to an income threshold of EUR 75,000 (taxable household income) plus EUR 15,000 per child. Legal regulation: none, assistance in line with the KfW funding guidelines (KfW grant no. 424) Subsidy purpose: Strengthening of home ownership among families
Environmental impact	From an environmental perspective, however, it is land take — which, under social aspects, is excessive and thus inefficient — that must be taken into account. Because of the fixed amount, for which no differentiation is made by region, the effect in rural areas is likely to be even significantly greater than in urban areas. As a result, the family housing grant incentivises in particular new builds in regions in which there is only little need for construction. This in turn intensifies property vacancies in these regions.
Financial volume/ savings potential	2018: EUR 6 million
Concrete proposal	Ending the support scheme is a positive development for both environmental reasons and fiscal reasons.

Subsidy	KfW Home Ownership Programme
Description	The KfW Home Ownership Programme provides very low-interest loans for the purchase or construction of owner-occupied apartments and homes. The level of assistance is capped (at EUR 100,000). Legal regulation: none, assistance in line with the KfW funding guidelines (KfW loan no. 124) Subsidy purpose: Housing policy / socio-political goal of maximum possible home ownership rate
Environmental impact	This programme is considered environmentally harmful because it promotes new builds and therefore land take. In this regard, the instrument thus does not provide for a differentiation of funding according to ecological criteria.

Subsidy	KfW Home Ownership Programme
Financial volume/ savings potential	2018: EUR 1,726 million
Concrete proposal	Various regulations might be considered in order to make environmental distinctions. It is therefore conceivable that a distinction could be made between the credit terms for new builds and existing buildings and that housing on the outskirts of communities could be excluded from the support. It also appears to be worthwhile making a distinction in respect of the support for new builds based on various climate protection factors. In principle, support should only be provided for new builds if they are in line with climate protection targets.

A.4 Agriculture, forestry and fishing

Subsidy	European Union agricultural subsidies
Description	In accordance with the TFEU, the EU can provide aid for agricultural undertakings to promote economic development or compensate for structural or natural conditions. In the current funding period (from 2014), both area-based direct payments ('first pillar payments') and measures for promoting agricultural development, including agri-environmental measures ('second pillar payments'), were granted. Legal regulation: Article 42 TFEU, EU Regulations 1307/2013 and 1305/2013. Subsidy purpose: Promotion of economic development and compensation for structural or natural conditions.
Environmental impact	Environmental requirements are indeed laid down in the first pillar (Cross Compliance, GAEC, Greening). The agricultural industry continues to cause environmental problems in respect of the condition of water, soil and the air, biodiversity and greenhouse gas emissions, however. 'DPS [direct payments] have been shown to be ineffective toward all dimensions of sustainability.' (Pe'er et al. 2019, p. 450) The second pillar consists of targeted support schemes for sustainable and environmentally friendly farming and rural development. However, there are a few measures that can have detrimental effects on the environment, however, such as the funding for certain water management measures or the funding for agricultural and forestry road construction.
Financial volume/ savings potential	In the funding period from 2014 onwards, Germany was provided with more than EUR 6.2 billion per year. The environmentally harmful proportion of this cannot be meaningfully quantified.
Concrete proposal	In Germany, the new CAP funding period should be used to move away from flat-rate area-based direct payments towards payment for general interest services such as environmental and climate protection. This means that environmental and climate protection may also be financially worthwhile for farms in regions characterised by intensive agricultural use. For this reason, it makes sense to shift financial support away from the first pillar to the second pillar as much as possible and to use it for agri-environmental and climate measures. It is also important to equip the eco-schemes as a new instrument in the CAP architecture with a growing budget in order to press on with the necessary restructuring of agricultural support beyond the first pillar too.

Subsidy	Tax concession for agricultural diesel fuel
Description	Agricultural and forestry undertakings can apply for a refund of part of the energy tax paid on their fuel consumption. Agricultural diesel fuel is therefore subject to a reduced tax rate of 25.56 cents per litre compared with the regular tax rate of 47.04 cents per litre. The tax relief granted therefore amounts to 21.48 cents per litre. Legal regulation: Paragraph 57 EnergieStG. Subsidy purpose: To ensure that agricultural and forestry undertakings remain competitive.
Environmental impact	The distortion of fuel prices means that incentives to use fuel efficiently in the agricultural sector are weaker than in other economic sectors, with the corresponding negative effects on climate protection and air quality.
Financial volume/ savings potential	2006: EUR 180 million 2008: EUR 135 million 2010: EUR 395 million 2012: EUR 430 million 2014: EUR 400 million 2016: EUR 450 million 2018: EUR 467 million
Concrete proposal	The agricultural diesel fuel concession should be abolished. A reform in Germany will also be determined by a reform of the EU Energy Taxation Directive in this respect. Abolishing the agricultural diesel fuel concession would free up a considerable amount of public funds. They could be used to strengthen the competitiveness of the agricultural industry and agricultural income in a more efficient, environmentally friendly way. The use of revenue to increase the payments made for environmental services and the proportion of other sustainable sources of income for the agricultural industry, for example, might be considered. Concessions relating to the production factor 'work' are also conceivable.

Subsidy	Exemption of agricultural vehicles from vehicle excise duty
Description	Agricultural vehicles are exempted from vehicle excise duty. Legal regulation: Paragraph 3, no. 7 KraftStG. Subsidy purpose: Historical — motorisation of agriculture and forestry.
Environmental impact	This concession encourages the excessive holding of machinery. The trend of employing increasingly heavy machinery in the agricultural sector results in greater damage to land used for agricultural purposes through compaction. Damage from compaction is often irreversible and restricts the natural functions of the soil.

Subsidy	Exemption of agricultural vehicles from vehicle excise duty
Financial volume/ savings potential	2006: EUR 55 million 2008: EUR 55 million 2010: EUR 60 million 2012: EUR 60 million 2014: EUR 260 million 2016: EUR 260 million 2018: EUR 470 million Note: There are conceptual reasons behind both of these stark increases (2012/2014 and 2016/2018). On one hand, prior to the Federal Government's 24th Subsidies Report (BMF 2013), this was based solely on the proportion attributed to the use of public roads, (BMF 2015, p. 2015). On the other hand, customs redeveloped statistical evaluation when it took over the management of vehicle excise duty.
Concrete proposal	For the reasons stated, the exemption of agricultural vehicles from vehicle excise duty should be abolished. One alternative to this subsidy would be the use of funds by the government to reinforce rural development or to directly pay for environmental services, for example, for the conservation of environmentally valuable spaces through extensive use or by landscape management services.

Subsidy	European Union fisheries subsidies
Description	Since 1993, the EU Common Fisheries Policy (CFP) has provided subsidies through its own fisheries fund. As regulating sustainability is particularly challenging in fisheries policy, the purpose for which funds are used makes a crucial difference for the preservation of ecosystems. The literature considers so-called capacity-enhancing subsidies to be environmentally harmful here. Legal regulation: EU Regulation No 508/2014 of 15 May 2014 on the European Maritime and Fisheries Fund (EMMF) applicable from 2014 to 2020, enactment of the Regulation on the new European Maritime, Fisheries and Aquaculture Fund (EMFAF, 2021 to 2027) is pending. Subsidy purpose: According to Article 5 (Objectives) of EU Regulation No 508/2014, the aims are as follows: (a) promoting competitive, environmentally sustainable, economically viable and socially responsible fisheries and aquaculture; (b) fostering the implementation of the CFP; (c) promoting a balanced and inclusive territorial development of fisheries and aquaculture areas; and (d) fostering the development and implementation of the Union's IMP in a manner complementary to cohesion policy and to the CFP.
Environmental impact	Unfavourable use of the funds exacerbates the environmental problems besetting the oceans. The most well-known problem is over-fishing. Approximately 38% of the fish stocks in the North-East Atlantic and the Baltic Sea are currently considered to be overfished in the EU. Aquaculture as currently practised also contributes to overfishing of the oceans, as every sixth wild fish is caught to provide aquaculture feed. By-catches of non-target species and

Subsidy	European Union fisheries subsidies
	large-scale damage to habitats by bottom-scouring fishing gear such as bottom trawls are some of the negative effects of fishing on marine ecosystems. According to the regular condition assessments carried out by the Member States within the context of the EU Marine Strategy Framework Directive (MSFD), the biodiversity and the environment in European oceans are not in good condition. Reports on the state of the North Sea and the Baltic Sea are compiled by Germany as well. The effects of greenhouse gases on the atmosphere also change the physical and chemical conditions of the oceans. This means that marine organisms that are affected by fishing, e.g. by climate change-related marine heatwaves, oxygen depletion or ocean acidification, face potential impact on growth, reproduction and survival.
Concrete proposal	Capacity-enhancing subsidies should be consistently reduced further, both at EU and national level. With regard to the strategic and content-related orientation of the EMFAF support, it must therefore be ensured that the fishery and marine conservation-specific support needs are adequately taken into account and reflected in the distribution of the funds. This applies in particular for the definition of the distribution of funds in national EMFAF programmes.

Subsidy	Environmentally harmful VAT allowances
Description	The reduced VAT rate of 7% (instead of 19%) applies for meat and dairy products and firewood. Legal regulation: Paragraph 12(2) and Annex 2, no. 2 et seq., 48a) UStG Subsidy purpose: Not designated.
Environmental impact	The production of animal products is detrimental to the environment and the climate. In Germany, livestock farming contributes to more than 60% of the greenhouse gas emissions emitted in agriculture. It is also associated with other negative environmental impacts, such as the loss of biodiversity and water pollution. The cultivation of feed requires large areas and is often associated with negative effects due to intensive arable farming. There are also negative environmental and climate impacts abroad, as a considerable proportion of feed is imported. This exacerbates, among other things, the destruction of rainforests through land-use changes. Per calorie and kilogram, animal products have a significantly higher environmental footprint than plant products.
Financial volume/ savings potential	2010: n.q. 2012: EUR 5.2 billion 2014: EUR 5.2 billion 2016: EUR 5.2 billion 2018: EUR 5.2 billion
Concrete proposal	In the interest of protecting environment, climate and health, it makes sense to tax the consumption of animal products at the regular VAT rate of 19%. To guarantee socio-political compatibility and acceptance, the government should invest the additional tax revenue to further lower the reduced VAT rate for plant-based foods and public transport. The recommendation made by the scientific advisory boards on agricultural policy at the Federal Ministry of Food and Agriculture that the budget for food in social transfers should be adjusted,

Subsidy	Environmentally harmful VAT allowances
	particularly the standard rates for ensuring subsistence, should also be followed. It would also make sense to use the freed-up funds for free meals which meet the standards of the German Nutrition Society in childcare facilities and schools.