TECHNICAL BROCHURE

Environmentally Harmful Subsidies In Germany

Updated Edition 2014

German Environment Agency

Umwelt Bundesamt

Credits

Published by:
Federal Environment Agency (Umweltbundesamt)
Division I 1.4
PO Box 14 06
D-06813 Dessau-Roßlau
Tel: +49 340-2103-0
info@umweltbundesamt.de
Internet: www.umweltbundesamt.de

/umweltbundesamt.de
/umweltbundesamt

Authors:
Lea Köder
Dr. Andreas Burger
Dr. Frauke Eckermann

Editor:
Lea Köder

Translation:
Terence J. Oliver

Design:
Bernd Kreuscher / Federal Environment Agency
Silke Seider / Federal Environment Agency

Publications as PDF files:
https://www.umweltbundesamt.de/publikationen/environmentally-harmful-subsidies-in-germany-2014

Photos:
Page 1: © Euro_PhotoSG_Fotolia_57659502
Page 6: © electriceye_Fotolia_53536789
Page 14: © Daniel_Prudek_Fotolia_39722204
Page 35: © manfred_steinbach_Fotolia_7188182
Page 43: © Kaarsten_Fotolia_804073
Page 50: © countrypixel_Fotolia_54341974
Page 60: © Picture_Factory_Fotolia_55168811
Page 68: © Eisenhans_Fotolia_46849921

October 2014

ISSN 2363-832X

Contents

List of Figures and Tables

I Introduction

1 Why it is necessary to reduce environmentally harmful subsidies

For many years, the German public has regarded environmental protection as one of the most important issues in Germany[1]. People attach great importance to the quality of environmental assets – such as climate, water, soil or air. This is reflected by public and private expenditure on protection of the environment: in 2010 the state and industry spent a combined total of €35.8 billion on environmental protection measures[2] – including water conservation, waste management, air quality control and noise abatement.

Nevertheless, Germany is still a long way from pursuing a consistent and sustainable budget policy that systematically promotes environmental protection and takes systematic account of environmental interests in all governmental decisions on income and expenditure. One central problem here is Germany's policy on subsidies. As early as 2001 the OECD, in its Environmental Performance Review for Germany, came to the conclusion that about 35% of subsidies in this country were potentially harmful to the environment[3].

There has been no basic change in this situation. In 2010, according to the Federal Environment Agency's calculations in the present report, subsidies in Germany totalling a good €52 billion[4] have to be classified as environmentally harmful. Prominent examples include the exemption of commercial air transport from energy tax, concessions on energy tax for the manufacturing sector and agriculture, and free allocations of CO_2 emission allowances.

The state uses subsidies to intervene in many aspects of the economic production process and in decisions by consumer households. The reasons for this are many and various, ranging from social and cultural factors to promoting future technologies and maintaining the international competitive position of companies. In many cases, however, such interventions are not justified from an economic point of view. As a general rule, subsidies violate the

general principle – which is not only to be understood in environmental terms – that the polluter (or party responsible) pays: a free market system can only function and be "fair" if producers and consumers each bear the full costs of their actions. Subsidies run contrary to this principle[5]. They give rise to a situation where responsible parties do not bear part of the microeconomic costs of production and consumption, but offload them onto society in general. This is in fact a typical feature of environmentally harmful subsidies.

Such subsidies are either directly based on environmentally harmful products, production methods and behaviour patterns, or favour them indirectly. This makes for additional production and consumption at the expense of the environment. In this way environmentally harmful subsidies counteract the great efforts that society is making elsewhere to protect the environment. For example, some subsidies reduce the cost of consuming fossil fuels – such as coal or gas – thereby preventing effective climate change mitigation.

Another reason why some subsidies need to be reduced is that they improve the competitive position of environmentally harmful technologies and at the same time impede the development and dissemination of environmentally sound technologies. For example, the EU Commission points out that only the discontinuation of environmentally harmful subsidies in the energy sector would create equal competitive conditions for the various energy sources[6]. This would in particular improve the market prospects for renewable energy sources. This is also relevant to the promotion of renewable energy sources in Germany, because the need for financial assistance would be considerably lower if there were no environmentally harmful subsidies for fossil fuels.

In association with a reduction in environmentally harmful subsidies, economic change in the direction of environmentally sound production methods would make businesses more competitive in the long term. Furthermore, price signals that created incentives to eco-friendly behaviour would put businesses and households in a position to make timely adjustments to growing shortages of natural resources and rising raw material prices. In the long term this would make businesses more competitive and would tend to reduce household vulnerability to increases in energy and resource prices.

Public-sector finances would benefit very considerably from a reduction in environmentally harmful subsidies, and this would give them greater financial freedom for shaping a sustainable policy. After all, environmentally harmful subsidies place a multiple burden on public-sector finances: today, due to increased state expenditure and reduced state revenue, and tomorrow, due to increased costs for dealing with the harm done to human health and the environment. What is more, the state has to give more support to such environmentally sound technologies and products so that they have a fair chance in competition and can become established on the market. Discontinuing environmentally harmful subsidies should therefore play a central role in the reorientation of financial policy and the budget consolidation process.

However, despite the advantages described and various declarations of intent, no systematic reduction in environmentally harmful subsidies is taking place in Germany. There are a number of reasons for this[7]. Reductions in subsidies frequently affect very well informed and organised groups that engage in successful lobbying to keep the subsidies in place. By contrast, the benefits of reducing subsidies are usually spread over a larger, more heterogeneous and mostly less well organised group – for example the totality of taxpayers whose burden could be cut by reducing environmentally harmful subsidies, or those who would benefit from a reduction in environmental burdens arising from environmentally harmful subsidies. For this reason politicians are often hesitant about carrying through reductions in environmentally harmful subsidies. There are also legal grounds which may militate against reducing subsidies, e.g. regulations at EU level. They may restrict national room to manoeuvre, e.g. in the case of kerosene taxation (cf. Section 2.2.3).

For the most part, current practice with regard to subsidies does not promote sustainable development, either from an environmental or an economic point of view. This is because systematic investigation of impacts on environmental assets such as climate, air, water, soil, landscape, biological diversity, health or resource consumption has so far played little or no role in the design of financial assistance, tax concessions or other forms of preferential treatment[8]. For this reason the reductions in subsidies called for in many quarters should not be made across the

board on the "lawnmower principle", but should specifically target those subsidies which fail to achieve their purpose and/or which have negative environmental effects. This would make a significant contribution to a sustainable financial policy. That is why there is a need for an eco-oriented subsidy controlling system (cf. Part IV) for all subsidies which – as well as reviewing the success of the subsidy – takes a systematic look at any negative impacts on environmental assets.

2 Subsidies and their (close) relatives

There is no unique single definition of the term "subsidy", either in financial literature or in practice. Every definition, every extension or restriction of the definition of subsidies ultimately involves methodological and normative problems. The crucial consideration is the suitability of the chosen definition of subsidies in relation to the specific purpose of the findings in view. To cover all cases of preferential treatment of environmentally harmful economic activities, this study is based on yet another definition of subsidies (cf. Textbox 1). This makes it possible to identify state action deficits and undesirable developments in the environmental sector.

When identifying environmentally harmful subsidies it is necessary to take account of various types of subsidies. Table 1 provides an overview of the types of subsidy covered by the definition used here, and distinguishes it from other definitions of subsidies.

The German Government's definition of subsidies focuses on financial assistance and tax concessions. However, the present study uses a broader definition of tax concessions and also covers tax concessions that are not included in the Federal Government's Subsidies Report.

According to the Subsidies Report, tax concessions are special fiscal exceptions to existing statutory regulations which result in reduced revenue for the public sector. In some cases this definition is too restrictive, since it does not take account of the fact that a subsidy may consist in exempting certain activities from taxation. For example, kerosene consumption is not taxed under the energy tax, although the energy tax is essentially an excise duty which therefore ought to include all sources of energy. This shows that it is not only the wording of an act that is crucial for the existence of a tax concession, but also that it is necessary to examine whether the breadth of the tax assessment basis is in line with the purpose and justification of the tax.

Another example is the energy tax reduction for diesel fuel compared with petrol, which the Subsidies Report also does not list as a subsidy. In this case the preferential treatment does not arise through the exemption of certain circumstances from taxation, but through the choice of an unduly low tax rate – in terms of the energy content of petrol and diesel fuel – which results in distortion of competition and negative impacts on the environment (cf. Section 2.2.1).

On the other hand, not every tax concession is automatically an unjustified subsidy. The eco tax, for example, has created differentiated tax rates linked to the adverse environmental impacts of the individual energy sources, which the legislature deliberately uses to create economic incentives for the benefit of environment and climate.

What are environmentally harmful subsidies?

Subsidies are preferential treatment for enterprises which is provided by the public sector at lower than normal market prices or even free of charge. Furthermore, assistance for private households constitutes a subsidy if it favours specific consumer habits and thereby indirectly influences economic activity. Any list of environmentally harmful subsidies needs to include not only subsidies of potential or direct budget relevance, but also subsidies that occur in concealed form and have no direct budgetary impact.

Subsidies are environmentally harmful if they have adverse impacts on the environmental assets climate, air, soil, water and biodiversity, give rise to environmentally induced health problems or favour the consumption of raw materials

Table 1

Overview of selected subsidy definitions

Subsidy type	Subsidy definition					
	Federal Ministry of Finance (BMF), German Government's Subsidies Report	Organisation for Economic Cooperation and Development (OECD)	Federal Environment Agency (UBA)	Green Budget Germany (FÖS)	Institute for European Environmental Policy (IEEP)	International Monetary Fund (IMF)
Subsidies with direct budgetary impact (explicit subsidies)						
Financial assistance (earmarked grants, debt serviceassistance,loans)	X	X	X	X	X	X
Tax concessions	X	X	X	X	X	X
Sureties and guarantees used		X	X	X	X	X
Subsidies without direct budgetary impact (implicit subsidies)						
Unused sureties and guarantees		X	X	X	X	X
Targeted concessions under state regulations		X	X	X	X	X
State provision or procurement of goods, services and rights at non-market prices		X	X	X	X	X
Incomplete internalisation of environmental costs					(X)[1]	(X)[2]

1 IEEP does not classify external effects per se as subsidies, but permits their inclusion if sensible quantification is possible and politicians fail to react to acknowledged environmental issues.
2 When considering subsidies for fossil energy, the IMF uses among other things a definition of subsidies that takes account of the internalisation of environmental costs (IMF (2013), p. 1).

Source: Own diagram based on IEEP (2007), p. 26f. and Withana, S. et al (2012), p. 6; Definitions of subsidies taken from BMF (2013), OECD (2005), Küchler, S. and Meyer, B. (2012), Valsecchi, C. et al (2009) and IWF (2013)

Not only financial assistance and tax concessions, but also sureties and guarantees may have environmentally harmful effects. For this reason they must also be taken into account when identifying environmentally harmful subsidies. Implicit subsidies, i.e. concessions which occur in concealed form and have no direct budgetary impact, must also be taken into account. These include all sureties and guarantees not taken up, targeted concessions under state regulations, or state provision or procurement of goods, services and rights at prices other than market prices. One example of an environmentally harmful implicit subsidy is the reduced EEG surcharge for electricity-intensive companies and railways ("special compensation provisions", cf. Section 1.2.11).

However, the definition of implicit subsidies should not be extended to include inadequate internalisation of environmental costs. Although the cost of failure to internalise environmental costs – like environmentally harmful subsidies – places a burden on the environment and society as a whole, it is a general

problem of inadequate environmental policy and is not attributable to targeted concessions for specific parties. Internalisation of environmental costs[9] is an overriding maxim which goes beyond subsidy policy. As such, it is not the subject of this study[10].

3 International initiatives for reducing environmentally harmful subsidies

The potential financial and ecological benefits of international reductions in environmentally harmful subsidies are considerable. Studies by the International Energy Agency come to the conclusion that worldwide subsidies for fossil fuels in 2012 amounted to nearly €400 billion, showing a further rise on the year before. The assistance for fossil fuels is thus more than five times as high as for renewable energy sources[11]. Phasing out subsidies for fossil fuels could reduce CO_2 emissions by nearly seven per cent by 2020[12]. This demonstrates the very great importance for environmental and climate protection of reducing environmentally harmful subsidies at international level as well. There are already a number of different approaches:

- The Kyoto Protocol explicitly calls for the abolition of subsidies that present obstacles to the reduction of greenhouse gases[13].
- Among the G20 decisions in Pittsburgh in September 2009, the heads of government undertook to phase out in the medium term subsidies for fossil fuels that encouraged wasteful consumption[14].
- Under its Strategy 2020 for the flagship initiative "Resource-efficient Europe", the EU called upon its member states to phase out environmentally harmful subsidies – except for socially disadvantaged sections of the population – by 2020. This objective is also recorded in the "Roadmap to a resource efficient Europe"[15].
- The closing document of the Rio+20 conference in 2012 also contains a commitment to reducing environmentally harmful and inefficient subsidies for fossil fuels and fisheries[16].

However, there are no binding objectives or roadmaps for implementing the demands and declarations of intent in relation to the reduction of environmentally harmful subsidies. Germany should therefore not only set a good example by reducing environmentally harmful subsidies at national level, but should at the same time take or support initiatives at EU and international level that are aimed at binding reductions in environmentally harmful subsidies. Another reason why this is necessary is the existence of regulations at international and EU level which impede the reduction of environmentally harmful subsidies at national level. This applies, for example, to the exemption from kerosene tax, the EU-wide exemption from VAT for transboundary flights, the energy tax concessions for highly energy-intensive operations, and the environment-oriented reform of EU agricultural policy. Since many states have very high budget deficits as a result of the financial and economic crisis and are pursuing ambitious consolidation targets in the next few years, this is a very favourable time for initiatives to reduce environmentally harmful subsidies at EU and international level.

4 Ways of reducing environmentally harmful subsidies

Successful examples of reducing environmentally harmful subsidies already exist at international and national level:

- In 2011, in view of the difficult budget situation, the German Government introduced an economy package that included a reduction in general electricity and energy tax concessions (cf. Section 1.2.1) and the peak equalisation scheme (cf. Section 1.2.2). This substantially reduced the volume of subsidies for both forms of preferential treatment.
- In the 1980s the government of New Zealand made radical cuts in subsidies for the agricultural sector. Even though this was not the direct intention, the cuts in subsidies brought a marked reduction in adverse environmental impacts, especially on land use and fertiliser application[17].
- The Netherlands have introduced a more eco-friendly form of tax concessions for commuter travel. This has made it distinctly less attractive for commuters to use their own car, while giving preferential treatment to using bicycles or public transport.

The examples show that it is definitely possible to reduce environmentally harmful subsidies. On the whole, the reduction of environmentally harmful subsidies enjoys great support from the general public. About 75% of the population

in Germany are in favour of stricter laws and a reduction in environmentally harmful subsidies by the government[18]. In practice, however, there are numerous obstacles and objections that impede the reduction of environmentally harmful subsidies. It therefore makes sense to address these from the start and to look for solutions to potential conflicts of objectives.

4.1 Improving communication and ensuring extensive public participation

When designing reforms, it is necessary to consider a wide range of divergent interests. It is also important to include those interests that have not yet received adequate attention from lobbying associations, e.g. environmental issues. An example from the Netherlands shows what broad participation can look like in practice. There the government established a structural change network for long-term reorganisation of the energy sector. In addition to various actors from the energy sector, this also involved scientists, environmental associations and the state. It is intended to promote acceptance of the reorganisation of the energy sector, and also of short-term burdens such as those arising from cuts in subsidies. It also enables the companies concerned to make timely preparations for the necessary long-term adjustments[19].
In order to raise general public acceptance of concrete reform measures, it makes sense to improve communication about environmentally harmful subsidies. In the first instance this includes transparent information on existing environmentally harmful subsidies, e.g. by means of regular environment-oriented reporting on subsidies. It should also include effective public communication of the benefits of doing away with environmentally harmful subsidies. This relates to the potential reductions in environmental burdens and the resulting benefits for health and quality of life, and also the fiscal and economic advantages. It would also be helpful to embed the reduction of environmentally harmful subsidies in an overall strategy, e.g. in an eco-oriented financial reform or the national sustainability strategy.

4.2 Supporting eco-oriented structural change and avoiding economic hardship

The abolition of environmentally harmful subsidies creates economic incentives for businesses to make their production more eco-friendly and resource-efficient. The state should support businesses in the process of moving towards a more eco-oriented management approach. This not only improves acceptance by industry, but also increases the positive environmental impacts. At the same time, supporting eco-friendly structural change can have positive effects on employment and international competitiveness (cf. Chapter 1). Here it would be a logical course to finance the assistance measures by using budget funds liberated by the reduction in environmentally harmful subsidies.

To support businesses and eco-friendly structural change, the state can make available funds for research and development of eco-friendly technologies and products, and also provide consulting programmes to assist businesses with eco-friendly reorganisation. Regional structural assistance measures are an option if specific regions are particularly hard hit by the reduction in environmentally harmful subsidies, e.g. in the case of coal subsidies. It also makes sense to run accompanying promotion programmes for improved energy and resource efficiency that cushion price increases resulting from the discontinuation of environmentally harmful subsidies.

In some cases, however, assistance measures are not sufficient to prevent unreasonable economic hardship resulting from the abolition of environmentally harmful subsidies. In such cases it makes sense to apply special hardship arrangements. These, however, should be restricted to companies which are badly affected by rising costs due to the cuts in subsidies and which are prevented by international competition from passing on the rising costs to their customers (cf. Section 1.2.1). Phased reduction of subsidies can also be an important strategy for avoiding economic hardship for companies. It gives companies more time to make the necessary adjustments.

4.3 Avoiding social hardship

Abolition of environmentally harmful subsidies does not necessarily involve adverse social impacts. On the contrary, high-income population groups often derive above-average benefits from such subsidies. This is true, for example, of tax concessions on company cars or the distance-based tax allowance for commuters. It must also be remembered that low-income households suffer especially from environmental impacts, for

example because they often live on busy roads with high noise and air-pollutant levels. To this extent the abolition of environmentally harmful subsidies can bring above-average improvements in the quality of life of these sections of the population.

However, there is no denying that the abolition of environmentally harmful subsidies can also result in social hardship. In such cases there is a need to avoid potential social hardship as far as possible by ensuring appropriate design of the reform and supporting measures. The present study therefore contains a number of reform proposals which explicitly include social aspects as well.

One example is the proposed increase in the energy tax on coal (cf. Section 1.2.6). While this undoubtedly makes sense from an environmental point of view, it can also place heavy burdens on low-income households with coal-fired heating. To avoid social hardship it is therefore advisable to raise the coal tax on private households gradually, and not in a single step, and to support this with a modernisation programme for the – frequently old and inefficient – heating systems. Private households which replace their coal heating with a new and environmentally sound heating system should receive a grant towards the cost of conversion. A reform package of this kind could even reduce the heating costs of the households concerned in the medium and long term, since more efficient heating systems permit considerable savings – especially since there are likely to be further increases in energy prices in the future.

Another example is the reform of the distance-based tax allowance for commuters. This benefits higher-income brackets in particular (cf. Section 2.2.2), but in individual cases its reduction may also give rise to social hardship. To prevent this it would make sense in future if the costs of the journey to work were tax-deductible as "extraordinary expenditure". This would specifically reduce the burden on those employees who had very high travel costs in relation to their income, for example because they have to travel long distances to work for social or work-related reasons. It would also make sense – as a supporting measure – to step up assistance for local public transport.

4.4 Taking advantage of windows of opportunity

Experience shows that it is easier to abolish environmentally harmful subsidies at times when the budget situation is difficult. For example, relieving the burden on the federal budget was a central motive for reducing general concessions on electricity tax and energy tax and the peak equalisation scheme. Other windows of opportunity that can make it easier to reduce subsidies include change in political priorities, e.g due to a change of government, public pressure due to environmental disasters, or the implementation of requirements under EU law[20]. However, initiating a systematic long-term process of reducing environmentally harmful subsidies is at least as important as taking advantage of windows of opportunity.

5 Approach

Subsidies favour economic activities which are capable of affecting the environment in a variety of harmful ways. This report analyses how subsidies have adverse impacts on the environmental assets climate, air, soil, water, biodiversity and landscape, human health and natural resources. In doing so it applies the assessment criteria which are also used as a basis for environmental impact assessment. The report analyses subsidies and their environmental impacts in the fields of energy supply and use, transport, construction and housing, and also agriculture, forestry and fisheries, because these are the fields that cause the greatest environmental problems and derive the greatest benefit from environmentally harmful subsidies. The report focuses on the main federal subsidies, taking only a peripheral look at regional and local assistance programmes.

The analyses make it clear how varied and interlinked the environmental impacts of subsidies are. It is sometimes difficult to establish a direct causal connection between a subsidy and environmental damage. And because the effects – in view of the changes they induce in the behaviour of economic subjects and the large number of boundary conditions – are virtually impossible to isolate, it is even more difficult to quantify the impacts of the individual subsidies on a specific environmental asset such as climate, air, water, soil, biodiversity, landscape, human health and resource consumption. Moreover, the effect of environmentally harmful subsidies is rarely confined to a single environmental asset or to health or resource consumption, but has adverse

impacts on several environmental factors at once. This is due to the complexity of ecological relationships and the interactions between environmental assets, human health and resource consumption.

For example, the distance-based tax allowance for commuters has a traffic-generating effect, resulting in emissions of climate-relevant carbon dioxide (CO_2), atmospheric pollutants and noise. It also creates incentives that tend to increase the sprawl of urban settlement in the countryside, one of the principal causes of the decline in biological diversity. In turn, landscape depletion due to settlement leads indirectly to further traffic-induced environmental burdens – for example because the distances people have to travel are growing, land take for transport infrastructure is increasing, and the basic conditions for public transport are deteriorating.

In view of the difficulty of quantitative assignment of the various adverse environmental effects of the individual subsidies, this report presents a purely qualitative account of the cause-and-effect relationships between the subsidies and their harmful environmental impacts. It nevertheless goes without saying that the subsidies are quantified as far as possible. The standard baseline period used here is 2010, to ensure that the basic data is as complete as possible. To take account of recent developments, however, this report also includes subsidies introduced since 2010 (cf. Section 1.2.10).

The following main part of the study documents the most important environmentally harmful subsidies. It is divided into four chapters:

1. Energy supply and use,
2. Transport,
3. Construction and housing, and
4. Agriculture, forestry and fisheries

Each chapter begins with a section providing an overview of the adverse effects of the subsidies on the environmental assets under consideration and on human health and resource consumption. This is followed by sections describing the main environmentally harmful subsidies in the sector in question. Part IV describes how an eco-oriented subsidy controlling system can contribute to a systematic reduction in environmentally harmful subsidies and to achieving a sustainable policy on subsidies. The appendix presents the individual subsidies in the form of fact sheets providing a rapid overview.

II The main environmentally harmful subsidies

1 Energy supply and use

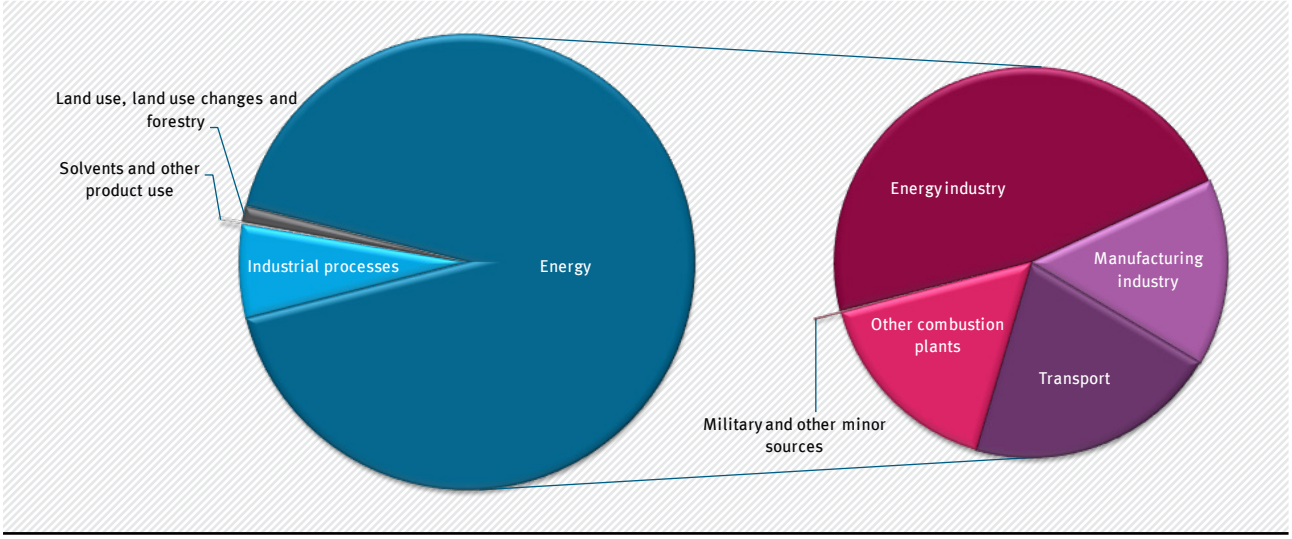
1.1 Impacts on the environment

In spite of the progress made with expanding renewable energy, German energy supplies continue to be based to a large extent on fossil fuels and nuclear energy. In 2011 these sources still accounted for 87.3% of total final energy consumption[21]. This causes considerable environmental impacts and hazards. The exploitation of fossil and nuclear energy sources causes long-term damage, which is sometimes irreversible, in the extraction and production areas. This includes large-scale destruction of the countryside and associated loss of species, surface subsidence and mining damage due to underground coal mining, adverse effects on water resources and drinking water supply, and pollution due to dust (particulates). Moreover, the transportation of fossil and nuclear energy sources involves great environmental hazards. There is the risk of soil, water and coastal pollution along the transport routes and serious impacts as a result of damaged pipelines, gas explosions, and accidents involving oil tankers.

"End-use energy" – primarily electricity, heat, heating fuels and automotive fuels – is mainly produced from the non-renewable primary energy sources coal, oil, gas and uranium. The environmental problems involved in energy supply, conversion and use are many and various. Combustion of fossil fuels to produce electricity, heat for heating and heat for industrial processes gives rise to atmospheric pollutants – such as sulphur dioxide, oxides of nitrogen, carbon monoxide or particulates. Atmospheric pollutants affect human health, lead to acidification and eutrophication of water and soils, and cause damage to nature, buildings and cultural assets, e.g. historic monuments. There are also substantial emissions of the greenhouse gas CO_2, which makes the greatest contribution to the anthropogenic greenhouse gas effect and hence to global climate change. Examples of adverse impacts of climate change include increasing frequency of heat-waves, droughts, intense rain and increasing intensity

Fig. 1:

Emissions in Germany by source groups 2011



Source: Own diagram from UBA (2012a).

of tropical storms, rising sea levels, dwindling ice and snow cover, and acidification of the oceans. Adverse effects on climate have far-reaching worldwide negative impacts on ecosystems, endanger human health, threaten biological diversity, and lead to economic losses in many sectors, e.g. agriculture and forestry or tourism.

Nuclear energy also has substantial disadvantages from an environmental point of view. It may give rise to high radiation exposure and serious health damage. As shown by the Fukushima reactor disaster, power plant operation involves a risk of accidents with unforeseeable impacts on man and the environment. Moreover, the issue of long-term final storage of radioactive waste is still unresolved.

The industrial sector and the energy industry make a considerable contribution to energy-induced pollution (cf. Fig. 1). The energy industry – as defined by the German greenhouse gas inventory – encompasses public power generation, central heat generation (e.g. in heating plants), refineries and coke ovens. In Germany the energy industry was the sector with the highest emissions of sulphur dioxide (53%)[22] and carbon dioxide (43%)[23] in 2011. While the industrial sector also operates power plants for its own supplies, it takes the greater part of its electricity from public power plants.

In addition to the environmental pollution and risks already mentioned, our present use of energy is not sustainable because oil, gas, coal and uranium are not renewable and sooner or later they will run out. Our high resource consumption restricts future generations' opportunities to use these resources, because they will no longer be available.

That is why Germany, with its "*Energiewende*", is seeking to achieve a transition to a sustainable energy supply system. In its "Energy concept for a reliable and affordable eco-friendly energy supply system" of 28 September 2010 the German Government laid down ambitious targets for climate change mitigation and for reducing energy consumption. In 2011 it also decided to phase out nuclear power. Compared with 1990, greenhouse gas emissions are to be down 40% by 2020 and 85-95% by 2050. Furthermore, primary energy consumption is to fall by 20% by 2020 and 50% by 2050 (in each case compared with 2008). In addition to the expansion of renewable energy, increasing energy efficiency is the second pillar of the *Energiewende*.

Individual successes have already been achieved in the transition to a sustainable energy supply system. In particular, the expansion of renewable energy is making rapid progress: in 2012 as much as 12.7% of total final energy consumption was already coming from renewable energy, thereby avoiding 145 million tonnes CO_2 equivalent of greenhouse gas emissions[24].

However, problems are being encountered with the implementation of the *Energiewende*. For example, greenhouse gas emissions in Germany in 2012 were up 1.6% on 2011[25]. One important reason for this is the continuing low cost of allowances under the European emissions trading scheme, which makes it lucrative to generate power from coal – a fuel with very high CO_2 emissions. Furthermore, progress with increasing energy efficiency has fallen short of plans: If the current trend is maintained, the German Government will not achieve its target of increasing final energy productivity by 2.1% a year by 2020[26].

It is therefore important to eliminate distortion of competition that has adverse impacts on renewable energy, and to provide economic incentives to save energy. The abolition of environmentally harmful subsidies plays an important role here. All links in the value-added chain – from production via conversion to use of fuels – are the subject of explicit or implicit subsidies. There are numerous examples of this in the following sections.

Subsidies that lower energy costs for energy consumers – business or private – reduce the economic incentives to make sparing and efficient use of energy, thereby encouraging energy consumption. Examples include numerous exceptions and concessions relating to energy tax and electricity tax for businesses in the manufacturing sector and in agriculture and forestry (cf. Sections 1.2.1 to 1.2.3 and 1.2.6 to 1.2.8).

Subsidies in the energy sector must also be classed as environmentally harmful if they distort competition between energy sources to the benefit of relatively harmful fuels and thereby lead to a non-sustainable energy mix. In many cases these are subsidies for coal and nuclear energy (cf. sections 1.2.4 to 1.2.6, 1.2.16 and 1.2.17). Renewable energy sources have to compete with fossil and nuclear power generation, which have been subsidised for decades and also enjoy advantages due to inadequate internalisation of external environmental costs. The resulting distortion of competition is a major reason for the need to support renewable energy via the Renewable Energy Sources Act (EEG).

It must also be pointed out that in some cases subsidies in the transport and construction sectors have adverse repercussions on energy-induced environmental pollution (cf. Chapters 2 and 3). For example, indirect promotion of urban sprawl – e.g. through the distance-based tax allowance for commuters – gives rise to an increase in the length of infrastructure networks per head of the population. Above all, district and local heating networks will become unprofitable in view of the decrease in settlement density. This undermines the future potential of combined heat-and-power generation and reduces the possibility of cutting CO_2 emissions by using energy efficiently. Thus to reduce CO_2 emissions in the long term it will also be necessary to reduce environmentally harmful subsidies in other fields.

1.2 The main environmentally harmful subsidies in the field of energy supply and use

1.2.1 Reductions in energy tax and electricity tax for the manufacturing industries and for agriculture and forestry

In 2010 enterprises in the manufacturing sector and in agriculture and forestry had to pay only 60% of the standard tax rates for electricity and the heating fuels natural gas and liquefied gas, and only 73% of the standard rate for heating oil. According to the German Government's 23rd Subsidies Report, a total of around 20 000 companies profited from the energy tax reductions and nearly 97 000 companies from the electricity tax reductions[27]. The tax reduction was introduced to avoid endangering the international competitiveness of these companies. However, the beneficiaries include many companies which do not have high specific energy costs and are not exposed to strong international competition, as revealed by the evaluation of this subsidy commissioned by the Federal Ministry of Finance[28]. Although this exemption has been confirmed by the Federal Constitutional Court[29] and approved by the EU Commission under the laws on state aid[30], it goes too far from an environmental and competition point of view. As a result of the tax reductions there is far less incentive to behave in an energy-saving fashion than in other sectors, e.g. the trade and services sector, or in private households. The following trend illustrates the fact that there is a considerable need for action, especially from a climate point of view: from 1993 to 2010 the industrial sector, as the biggest consumer, showed an above-average increase of more than 20% in its electricity consumption[31].

Substantial cuts in the energy consumption and greenhouse gas emissions of the manufacturing sector are possible – by means of energy-efficiency and energy-saving measures and by changing energy sources. There is a lot of catching up to do in the field of improving energy efficiency, especially where cross-sectional technologies – e.g. electric drives, compressed air systems, steam generation, pumps and fans, and lighting – are concerned. One particularly important area is electric drives, which at 68% are responsible for a large proportion of electricity consumption in the industrial sector[32]. Here there are great economic opportunities for saving electricity. In its energy concept, the German Government works on the basis of a substantial economic efficiency potential of €10 billion in the industrial sector[33]. However, there are not sufficient incentives for energy-efficient production in industrial enterprises – partly because of the tax reductions granted.

In 2010 the general tax reduction for the manufacturing sector and for agriculture and forestry totalled

€2.518 billion.

Of this figure, €2.2 billion was due to the electricity tax reduction and €318 million to the energy tax reduction[34].

Until the end of 2006 the 40% tax reduction applied only to the electricity and eco tax rates, which were introduced and increased between 1999 and 2003. However, since 1 January 2007 the reductions have applied to the entire energy tax rates for heating fuels, i.e. including the petroleum excise duty that already existed before 1999. Thus the tax reductions increased considerably, e.g. from nearly 15 to 22 cents/kWh in the case of natural gas.

Under the Budget Accompanying Act 2011 the rules for electricity and energy tax reductions were revised, which represented a first step towards reducing the reductions. Since January 2011 companies in the manufacturing industry and the agriculture and forestry sector have been paying 75% of the standard tax rate instead of 60%. According to the budget adopted by the Bundestag, the tax reductions on electricity tax and energy tax for 2011 still totalled €970 million[35].

To substantially increase the tax incentives for energy-saving behaviour in the manufacturing industry and the agricultural and forestry sector, it would make sense to gradually phase out the tax reductions and raise the tax rates to the same level as for other industries and the household sector. However, the abolition of tax reductions involves a risk that highly energy-intensive enterprises exposed to international competition may have to bear an unreasonable burden of energy taxes, with consequent threats to their existence. This can however be avoided by applying a hardship rule. For example, hardship rules existed in the emissions trading scheme until 2012 and in connection with the "coal pfennig" until the 1990s. In the reform process it is basically important to include other subsidy elements in the electricity and energy tax legislation, and to draw up an overall concept for an eco-friendly design.

If the state continues to grant energy tax reductions, these should only be available to businesses that introduce an energy management system and draw up an energy saving programme within this framework. The companies should be obliged to implement energy-saving measures that are worthwhile from a microeconomic point of view. This would ensure that the enterprises implemented energy savings and energy-efficient production methods in return for the tax reductions.

1.2.2 Peak equalisation scheme for eco tax in the manufacturing industries

In addition to the general electricity and energy tax reduction of 40% of the standard rates (cf. Section 1.2.1), enterprises in the manufacturing sector received a refund of 95% of the remaining eco tax payments that exceeded the accompanying relief on pension scheme contributions[36]. More than 23,000 companies received concessions on electricity tax, and over 11,000 companies on energy tax[37]. The preferential treatment is intended to avoid endangering the international competitive position of energy-intensive companies as a result of the eco tax.

In 2010 the peak equalisation scheme had a volume of

€1.939 billion

and was thus more than one tenth of the total eco tax revenue of €18 billion per annum. The tax shortfall

in 2010 came to €1.766 billion for electricity tax and €173 million for energy tax[38].

The peak equalisation scheme was reduced in 2011 and now provides a tax refund of 90% instead of 95%. Total tax refunds under the peak equalisation scheme in 2012 came to €2.182 billion[39] and were thus considerably higher than in the preceding years. This results from the parallel reduction in the general tax reduction (cf. Section 1.2.1), because the granting of peak equalisation relates to the additional burden resulting from eco tax less the reductions due to the general electricity and energy tax concessions. If the general tax concession is lower, more companies profit from the peak equalisation scheme.

The European Commission's approval of the peak equalisation scheme under state aid law expired at the end of 2012. In return for an extension the European Commission demanded efficiency measures from industry. In 2012 Germany thereupon passed the Second Act amending the Energy Tax Act and the Electricity Tax Act, which reorganised the peak equalisation scheme for companies in the manufacturing sector for the period to 2022.

The act lays down that peak equalisation is only to be granted to companies which introduce an energy or environmental management system in accordance with ISO 50 001 or EMAS. In the case of small and medium enterprises (SMEs), "alternative systems for improving energy efficiency" are permitted if they satisfy the requirements of Energy Audit Standard DIN EN 16247-1. The act also includes an "efficiency pact" between the Federal Government and industry, under which the manufacturing sector undertakes to reduce energy intensity by 1.3%, and from 2016 by 1.35%. Further targets (of not less than 1.35%) will be set under an evaluation in 2017. The 1.3% reduction in energy intensity is not ambitious, since the figure is in line with an EU trend forecast on the development of energy intensity in Germany for the period 2010 to 2020[40] – without any additional measures to improve energy efficiency. Considerable reductions in energy intensity are already taking place merely through structural changes in German industry and the energy sector (nuclear energy phase-out, expansion of renewable energy). Furthermore, the required annual reduction of 1.3% is less than was achieved in the past – during the period 1991 to 2009 energy intensity fell by an average of 1.41% per annum[41].

The peak equalisation scheme very considerably reduces the incentive for the beneficiary enterprises in the manufacturing sector to adopt energy-saving behaviour. In 2010 the marginal tax rates resulting from this rule were only 3% of the normal electricity tax rate for power, and – due to the extension of the general tax reduction in 2007 – even less than 3% of the regular eco tax rates for the eco tax component of natural gas and liquefied gas. In concrete terms this means that the relevant enterprises no longer had to pay around 2 cents of eco tax for each additional kilowatt-hour of electricity consumed, but only about 0.06 cents. The changes in 2011 result in marginal tax rates of only 7.5% of the normal tax rate for electricity and an even lower marginal tax rate for natural gas and liquefied gas.

There is thus a need for fundamental reform of the peak equalisation scheme. 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. Companies that have to bear too great a burden as a result of the abolition of this tax concession should be exempted under the hardship rule (see Section 1.2.1). If the peak equalisation scheme is not abolished, the state should step up its demands for counter-measures in return for the concession. The adopted requirement of an energy or environmental management system is a first step in the right direction. However, the legislature should also oblige companies to implement energy-saving measures that are identified under the management system as economically profitable [42]. This will ensure that companies take steps to improve energy efficiency within the limits of their individual opportunities.

1.2.3 Tax reductions for certain energy-intensive processes and techniques

Since 2006 numerous energy-intensive processes have been completely exempted from electricity and energy tax on the grounds of international competitiveness. Dual-purpose energy products (e.g. fuels for the steel manufacturing sector which are also used there as source material) and energy products for use in mineralogical processes (e.g. in the extractive and building materials industry) are basically exempted from energy taxation. Individual exemptions apply to electrolysis, chemical reduction processes, metal production and processing methods,

and thermal treatment of waste and exhaust gases. Also exempted are processes in the glass, ceramic, brick, cement and lime industry, the production of other building materials – gypsum, sand-lime bricks, aerated concrete products and asphalt – and mineral fertilisers. While permitted under the EC Energy Tax Directive, the tax concessions are not a compulsory requirement[43].

For 2010 the tax concessions totalled

€983 million[44].

As there are no fiscal incentives at all to make economical use of energy in the favoured industrial processes, these blanket exemptions for the specified chemical, metallurgical and mineralogical production methods need to be abolished. For this reason the regular tax rates and the proposed hardship rule should apply[45]. The latter should be used on a targeted basis to support enterprises which cannot pass the additional cost of the energy tax on to their customers in view of the keen international competition, and which therefore run into financial difficulties. To fill the taxation gap, the EU should extend the field of application of the EC Energy Tax Directive to include the stated chemical, metallurgical and mineralogical production methods and the production of basic building materials.

1.2.4 Coal subsidies

In 2010, the German coal mining industry continued to be the biggest recipient of direct financial assistance from the German government, with over €1.4 billion and a share of around 20%. This figure included nearly €1.32 billion in grants in 2010 in respect of sales of German coal for electricity generation, sales to the steel industry and compensation for burdens due to capacity adjustments, plus federal adjustment payments for coal-mining employees totalling nearly €106 million. In North-Rhine/Westphalia a further €492 million was earmarked for coal subsidies[46], taking the volume of subsidies in 2010 to

€1.917 billion

(cf. Fig. 2). The 12.9 million tonnes of coal in 2010 were produced by 24,200 employees in the German coal-mining industry[47] – so a simple calculation shows that the subsidies in 2010 totalled more than €79,215 for each employee.

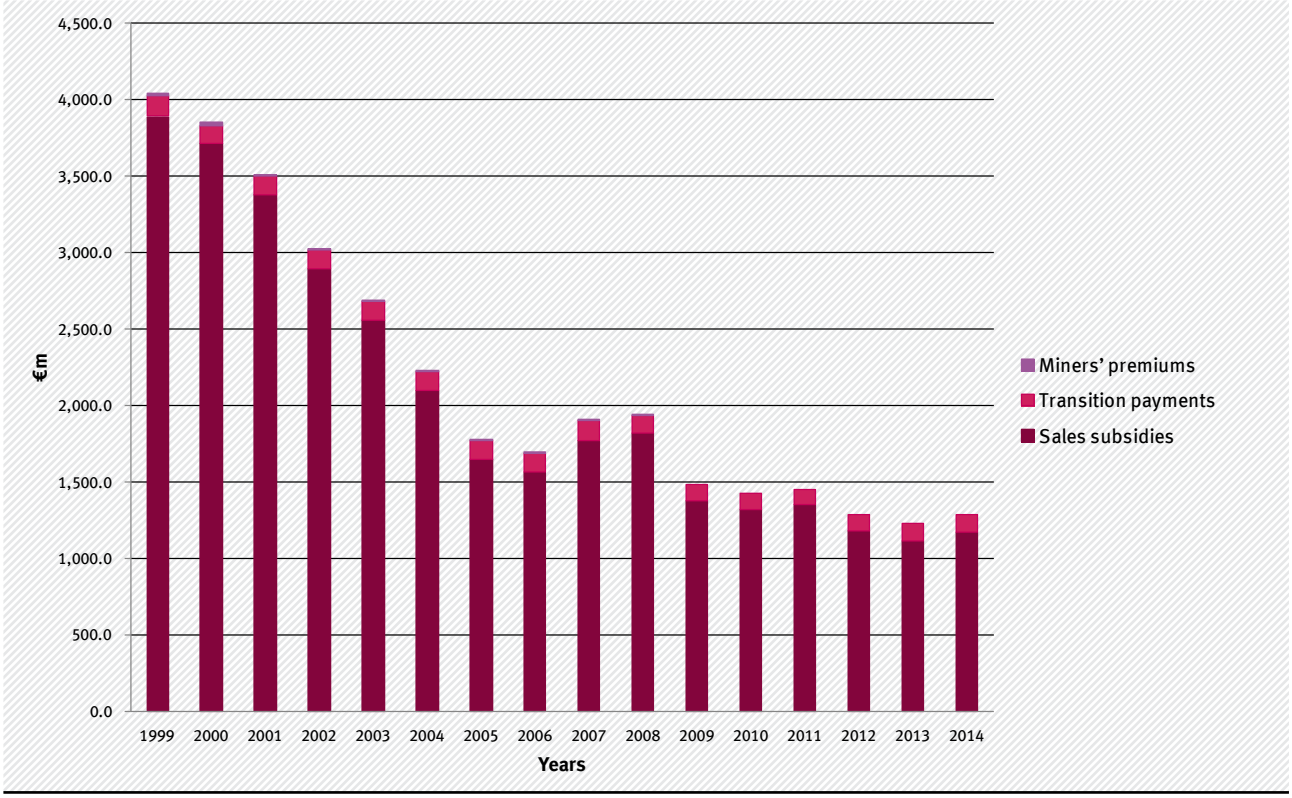
On 7 February 2007 the German government and the Länder North-Rhine/Westphalia and Saar reached a basic agreement with RAG AG and the Mining, Chemical and Energy Trade Union (IG BCE) that coal subsidies be run down and subsidised coal mining be discontinued in a socially acceptable manner by the end of 2018[48]. From 2009 to 2018 the German government and North-Rhine/Westphalia are providing further subsidies of around €15.6bn and €3.9bn respectively, totalling €19.5 billion (without taking account of adjustment payments)[49]. This is laid down in the Coal Financing Act. On 10 December 2010 the EU Council of Ministers decided that the closure of the mines must be completed by the end of 2018.

The cost of coal mining in Germany is so high by comparison with production costs in other countries that coal mining in Germany would not be possible without permanent subsidies. It therefore makes sense to abolish the coal subsidies on economic grounds alone. What is more, coal mining causes serious environmental problems and follow-on costs. The greenhouse gas methane, which has particularly adverse effects on the climate, escapes from coal mines. Mine waste heaps have to be sealed at considerable cost to prevent risks to the groundwater. Mining subsidence causes substantial damage to buildings and transport infrastructure. The fall in ground level gives rise to flood risks, which have to be permanently contained by means of dykes and pumping systems. These factors give rise to "eternal burdens". The parliament of North-Rhine/Westphalia expects the cost of permanent polder water retention for offsetting mining impacts in the Ruhr region to add up to €51 million (plus inflation, base year 2005)[50]. The provisions of the Coal Financing Act[51] on the funding of eternal costs by the RAG Foundation do not exclude the possibility that the German Government and the coal-mining Länder may in future have to bear part of the eternal burdens if the foundation's assets are insufficient.

Generating electricity from coal causes considerable adverse impacts on health and the environment due to pollutant emissions. The health damage alone gives rise to costs running into billions of EUR every year[52]. In Germany the environmental costs (greenhouse gases and air pollutants) of power generation by

Fig. 2:

State assistance for coal from 1999 to 2014



Source: Own diagram based on data from subsidies reports by the Federal Ministry of Finance

coal-fired power stations came to about €10 billion in 2011[53]. Although the end of coal mining in Germany initially only leads to substitution by coal imports, the abolition of coal subsidies is an important signal for a climate-friendly energy policy that is sustainable in the long term. If the German Government's climate objectives[54] are to be achieved, there is a need for an energy source mix that causes considerably lower emissions of CO_2 than in the past.

Certain factors suggest that there is a need to reduce coal subsidies faster than currently planned. This is because the accompanying relief for public budgets would create financial scope for the assistance necessary to implement the *Energiewende*, e.g. energy-saving building refurbishment. Apart from a reduction in greenhouse gas emissions, this would also result in positive effects on employment[55]. A substantial part of the funds liberated by the faster abolition of subsidies should however be used for measures to avoid social hardship for employees in the mining sector and for regional structural assistance measures.

1.2.5 Concessions for the lignite industry

The German lignite industry receives subsidies in various ways. Since these are not direct financial assistance or tax concessions, such cases of preferential treatment are not evident from the German Government's Subsidies Report. They are difficult to identify and quantify[56].

One particularly important example is the exemption of open-cast lignite mining from the production charges for mineral resources. Under the Federal Mining Act, a production charge of 10% of the market price is basically payable on non-mining mineral resources. The Länder are authorised to vary this rate from time to time or to exempt certain raw materials from the production charge, and individual Länder do in fact make use of this facility in various ways. On the basis of ancient rights[57], open-cast lignite mining is completely exempted from this production charge. Some 169.4 million tonnes of lignite were produced in Germany in 2010[58]. Thus a production charge of 10% of the price of €15.31/tonne[59] would come to around €259 million per annum.

A further subsidy consists in the fact that the lignite industry is not required to pay a water abstraction charge. Water abstraction charges are established in 13 out of 16 Länder and are levied in all Länder with lignite mining. They serve to charge the responsible parties for the environmental and resource costs arising from the abstraction of the public good "water"[60]. Thus if the adverse environmental effects due to drainage shafts cannot be fully compensated for by environmental conditions, there would be a residual need to charge the environmental and resource costs to the parties responsible, i.e. in this case the lignite industry. But most of the Länder that levy these charges exempt the drainage of lignite mining sites from this charge – provided the water is not used for other purposes, e.g. cooling power stations – and thereby subsidise the lignite industry. North-Rhine/Westphalia has taken a first step towards reducing this environmentally harmful subsidy: the Act of 25.07.2011 amending the Water Abstraction Charge abolished the special provision for lignite, which means that lignite mining now has to pay a charge for abstracting water.

This subsidising of free water consumption amounts to at least €20 million per annum[61], if one takes the water abstraction charges – which differ from one Land to another – as a guide to the cost of resource consumption.

By waiving the production charge for mineral resources and granting extensive exemption from water abstraction charges, the Länder are implicitly supporting the free or cheap use of resources to the tune of

at least €279 million per annum.

Further subsidies also exist for the lignite industry, e.g. through special provisions in the energy sector. For example, the lignite and coal mining industries received subsidies of €56 million in 2010 and €103 million in 2012 as a result of the special equalisation provision in the EEG (cf. Section 1.2.11)[62].

Lignite is the fossil fuel with the greatest adverse effects on climate, environment and health. The serious consequences of open-cast mining include destruction of the natural groundwater regime, involving damage to drinking-water wells, wetlands and their plant and animal species[63]. One example of the extensive adverse effects of open-cast mining on drinking water quality can currently be observed in the River Spree. Lignite mining in the Lausitz region contaminates the Spree with iron hydroxide and sulphate (also known as "iron clogging"); both substances are harmful in large concentrations[64]. In addition to consequences for flora and fauna, the tourist sector is also affected by the brown discolouration of the Spree. Moreover, the large amounts of land needed for open-cast lignite mining lead to large-scale destruction of landscape and settlements. The land also has to be restored after the end of mining operations in order to make it fit for further use. This calls for considerable financial resources. For the period from 2013 to 2017, the federal and Länder authorities are providing €1.2 billion for the restoration of lignite legacy sites dating from GDR times in the Lausitz region and central eastern Germany – for follow-up water conservation measures alone, since the mining refurbishment operations are largely complete[65]. Furthermore, using lignite for power generation gives rise to the greatest specific climate impact costs, as this is the fossil fuel with the greatest climate-relevant CO_2 emissions per energy unit.

From an environmental protection point of view it is therefore necessary to abolish the implicit assistance for lignite. In the long term this would help to reduce the share of lignite power in the fuel mix, thereby lowering the emissions of pollutants and CO_2 and reducing the other environmental and health impacts of the lignite industry. The production charge of 10% of the market price must be levied on lignite. This would require an amendment to the Federal Mining Act. The charge would then amount to about €1.53 per tonne of lignite. The Länder should – as North-Rhine/Westphalia has already done – levy water abstraction charges. The charge should cover the environmental and resource costs of groundwater abstraction and the rates should be designed to encourage sensible reuse of the water abstracted. New and existing lignite power plants and open-cast mining operations should not receive either explicit or implicit subsidies that run contrary to the "polluter-pays" principle.

1.2.6 Energy tax reduction for coal

For a long time coal – unlike other heating fuels such as heating oil and natural gas – remained untaxed in Germany. This continues to be true of the greater part of the coal used for power generation and steel

production. With effect from 1 August 2006 the German government abolished the taxation of the fossil fuels gas and oil used for power generation, which means that none of the fossil primary fuels in this sector are subject to taxation. However, the Energy Tax Directive continues to permit taxation of energy sources used for power generation on environmental grounds. Steel production plants, for example, which use a substantial proportion of coal, take part in the emissions trading scheme and, as an energy-intensive process, are exempted from energy tax. This tax exemption is an unjustified preferential treatment of steel production, and of coal as its energy source, as long as the emissions trading scheme does not sufficiently internalise the resulting external costs.

Only for coal used for heat generation did the German government introduce taxation under the Energy Tax Act with effect from 1 August 2006, in view of the European Energy Tax Directive. The tax rate is €0.33 per gigajoule (GJ) – based on the calorific value. It corresponds to the minimum rate in the EU Energy Tax Directive for private use of coal. The tax revenue from coal tax in 2010 came to nearly EUR 15 million[66]. This revenue originated entirely from commercial use of coal for heat generation, because coal tax on private households remained suspended until 31 December 2010 for social reasons. Since coal consumption for heating purposes by private households amounted to nearly 2 million tonnes of coal equivalent (TCE) or 58 million GJ in 2010[67], the state was losing more than €19 million per annum as a result of the tax suspension. Since January 2011 private consumers too have been paying the tax rate of €0.33 per GJ.

The tax rate of €0.33/GJ nowhere near reflects the environmental and health impacts of sulphur dioxide, CO_2 emissions and fine particulates. The insufficient tax on coal causes distortion of competition in the heating market at the expense of oil and gas, which are much more heavily taxed despite their lower emissions. This favours the use of coal, although coal is the fossil fuel with the greatest environmental and climate impacts.

To avoid such distortions of competition and ensure a strong environmentally oriented steering effect for energy taxation, the tax rate for all fossil fuels should be made up of two components, 50% based on energy content and 50% based on CO_2 emission relevance. The current tax rate of €61.35 per 1,000 litres for light heating oil could be taken as a reference base for the tax rate in the heating market. On this basis the appropriate tax rate for coal would be around €1.98/GJ (corresponding to 0.715 cents/kWh), which is six times the present rate. On the basis of this tax rate, the annual subsidy for coal used for heating purposes in 2010 amounted to

€190 million,

of which €74.7 million is due to the under-taxed commercial use of coal and €114.8 million to the tax exemption on private consumption which still applied in 2010.

To remedy environmentally harmful preferential treatment of coal on the heating market and to improve the environmental steering effect, the coal tax should gradually be raised to €1.98/GJ. This should apply equally to commercial and private use. To mitigate social hardship, the increase in coal tax for private households should be accompanied by an effective upgrading programme for heating systems, many of which are old and inefficient. Private households which replace their coal heating with a new and environmentally sound heating system should receive a grant towards the cost of conversion.

1.2.7 Manufacturer privilege for producers of energy products

The "manufacturer privilege" under the Energy Tax Act allows enterprises which produce energy products – for example refineries, gas producers and coal plants – to use fuels free of tax for their production. This applies both to energy products produced on their own site and to external purchases – such as petroleum products, gases or coal. In its 23rd Subsidies Report the German Government calculates a tax shortfall for 2010 of

€300 million[68].

Refinery processes and other processes in the creation of energy products are frequently very energy and emission intensive. The manufacturer privilege means that such processes suffer from a lack of fiscal incentives to improve energy efficiency and hence to reduce emissions of greenhouse gases and atmospheric pollutants. There is thus no justification for this preferential treatment of the producers of energy products. Commercially available fuels – such as light heating oil or gas – should be subject to

the normal energy tax rates even if they are used in production operations. Thus refineries, gas producers and coal plants should be governed by the same energy tax arrangements[69] as other energy-intensive enterprises in the manufacturing sector.

By contrast, non-marketable substances such as distillation and conversion residues in refineries should continue to be untaxed. The aim must remain to ensure that such residues are used on the refinery site (or close by) in suitable plants with efficient and comprehensive flue-gas cleaning systems. Taxation would increase the incentive to make uncontrolled use of these residues for other purposes that are particularly undesirable from an environmental point of view – for example as heavy fuel oil.

It should be noted that the manufacturer privilege exists throughout the EU and that the European Energy Tax Directive rules out taxation of self-produced energy sources[70]. At present only taxation of externally purchased energy sources is possible under EU law. Unequal fiscal treatment of self-produced and externally purchased energy sources within a refinery operation may have both positive and negative environmental and climate impacts[71]. Ultimately the positive incentive of taxation with regard to economical and efficient use of energy comes out on top. For this reason – and having regard to the Energy Tax Directive – the short-term demand should be for externally purchased energy in production operations to be made subject to the normal tax on energy. In the medium and long term, however, marketable self-produced energy sources should also be subject to taxation. To this end, efforts should be made to lift the ban on taxation of self-produced energy sources in the EC Energy Tax Directive. However, the 2011 proposals for reform of the EU Energy Tax Directive do not make any provision for this.

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

Energy sources which are not used as heating or automotive fuels are exempted from energy tax (Section 25 Energy Tax Act). For example, petroleum products are used as raw materials in the production of plastics, paints, solvents or fertilisers. Natural gas is a raw material for ammonia production. And there are also refinery products used for non-energy purposes – such as bitumen and lubricants. In 2010 the total volume of non-energy uses of energy sources in Germany came to 1000 petajoules, or 7% of total primary energy consumption[72]. If one takes the light heating oil tax rate of €61.35/1000 litres (corresponding to €1.69 per gigajoule) or the natural gas tax rate of €5.50 per megawatt-hour (corresponding to €1.53 per gigajoule) as the reference base, this results in a annual subsidy volume of €1.66 billion or €1.5 billion. Since the greater part of non-energy uses are accounted for by oil, a conservative estimate of the subsidy volume is

€1.58 billion.

The tax exemption for non-energy uses of fossil raw materials is not justified, because their use as material also depletes finite resources and because waste and greenhouse gas emissions are created in the course of the product life cycle. Even the production and use of chemical and petrochemical products give off greenhouse gases because carbon oxidises and is released in the form of CO_2. These adverse environmental impacts are not reflected in product prices. There is therefore a need to create tax incentives to make more efficient use of fossil fuels for material purposes, replace them by renewable raw materials, and avoid creating waste and greenhouse gas emissions. Energy sources used for non-energy purposes should be taxed in line with their demands on environment and resources. In the interests of effective environmental policy and international competitiveness, such an arrangement should as far as possible be introduced throughout the EU or in a group of pioneer states.

1.2.9 Free allocation of CO_2 emissions trading allowances

Under the European emissions trading scheme, Germany assigned approximately 396 million of the annual CO_2 emission allowances free of charge to installations in the energy industry and the industrial sector in 2010[73]. As a result, the operators of the installations taking part in the emissions trading scheme were able to continue emitting CO_2 free of charge under the allowances allocated to them.

Emission allowances are only available up to an upper limit – the "cap" – but can be traded. This results in a market price for emission allowances[74]. The state can either auction the allowances or allocate them free of

charge to the plant operators, to keep costs down for the economy as a whole or for individual sectors. By allocating them free of charge the state foregoes the relevant revenue. Thus the free allocation of emission allowances satisfies the criteria for an implicit subsidy that are mentioned in Chapter I 2 (indirect budget impact, provision of allowances by the state at prices below the market price).

The size of the subsidy depends on the market prices for emission allowances, which sometimes fluctuate sharply and have fallen substantially since 2010. Whereas the average price of an emission allowance in 2010 was €15.40 per tonne of CO_2, in the third trading period (January 2013 to March 2014) it averaged only around €4.80 per tonne of CO_2[75]. Valued at the average prices for 2010, the volume of subsidy represented by the 396 million emission allowances distributed free of charge to German installation operators in 2010 totalled

€6.098 billion.

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-relevant 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 ("lock-in effects"). This increases the future cost to the economy of achieving the climate objectives.

Free allocation has also led to substantial free-rider effects for the energy supply companies: Many energy suppliers have included the CO_2 price in their production costs as opportunity costs and added them to the electricity price, although they receive the emission allowances free of charge. Particularly in the first trading period (2005-2007), but also to a lesser extent in the second trading period, this led to windfall profits running into billions. In the second trading period (2008-2012) there was a reduction in these windfall profits in Germany, partly because free allocation for electricity generation was reduced by a "selling factor"[76]. The emission allowances liberated, amounting to 40 million allowances per year, were sold or auctioned and the resulting revenues used for budget purposes. Since 2012 the revenue has been paid into the energy and climate fund (EKF) and has been used primarily for climate change mitigation measures in Germany and abroad.

Since free allocation for industrial plants between 2008 and 2012 was based on historical emissions (grandfathering), but industrial emissions during this period fell, partly because of the economic and financial crisis, the industrial sector – especially the steel industry, the mineral processing industry and refineries – received more emission allowances free of charge than they emitted. In 2010 the allocation surplus for German industrial plants came to 17.2 million emission allowances, corresponding to a market value of around €265 million when valued at the average price for the year. The cumulative allocation surplus over the entire second trading period amounted to 101.3 million emission allowances[77]. Thus the incentive to reduce emissions was very low in the second trading period, and this effect is persisting into the present and future, because companies can still use the surplus emission allowances in the current third trading period (2013 – 2020) to satisfy their liability for charges.

Whereas emission allowances were largely allocated free of charge in the first and second trading periods, the greater part of the allowances in the current trading period are to be auctioned. All allowances for emissions from electricity generation must be purchased on the market. Industrial plants are still allocated some of their allowances free of charge, but the figure is reduced every year. This free allocation for industry is based largely on EU-wide product-specific benchmarks on the basis of the most efficient plants in the industry in question. In addition, the allocation is reduced every year by a cross-sectoral correction factor, which averages 11.6% between 2013 and 2020[78]. Furthermore, the entitlement to free allocations for industrial installations is to fall from 80% in 2013 to 30% in 2020. However, installations in industries classified as carbon leakage risks[79] are exempted from this last provision. This is intended to ensure that the emissions trading rules do not result in industrial production and the related emissions being relocated from EU countries to non-EU countries. However; since nearly all the industries under the emissions trading scheme are classified as carbon leakage risks, this provision has had no effect to date and also includes industries that are not really at risk of carbon leakage[80]. Even after the

review of the Carbon Leakage List in 2014, nearly all the industries of relevance to the emissions trading scheme are considered to be carbon leakage risks, since the review used the same calculation methods and adopted disputed assumptions, e.g. a price of €30 Euro per CO_2 allowance.

The allocation rules for the third trading period nevertheless represent a considerable step forward, not only as regards the reduction of free allocations as a whole and hence the extension of the polluter-pays principle, but also in relation to allocation on the basis of ambitious benchmarks with appropriate incentives for more efficient and lower-emission technologies.

In the long-term, however, all emission allowances should be auctioned, since this is the only way of ensuring that the polluter-pays principle is fully observed and the resulting revenue can be used for climate change mitigation measures.

1.2.10 Grants to electricity-intensive enterprises to offset electricity price increases due to emissions trading

Since 2013 EU member states have been able to pay grants to companies in certain industries to offset electricity price increases due to the emissions trading scheme (electricity price compensation)[81]. The relevant electricity-intensive industries exposed to international competition have been identified for this purpose at EU level. At national level, the German Ministry for Economic Affairs has drawn up guidelines on providing compensation for indirect CO_2 costs; these have been approved by the European Commission and have been in force retrospectively since January 2013 [82]. At present a figure of around €350 million[83] is earmarked for electricity price compensation for 2013, but will not impact on the budget until 2014. This is to be funded by the Energy and Climate Fund (EKF) and the federal budget.

The electricity price compensation system runs counter to the emissions trading scheme, because emissions trading is intended to create incentives for improved energy efficiency by setting a price for emission allowances. Electricity price compensation substantially reduces this incentive. It also tends to produce unequal competitive conditions in the EU internal market, since only states with sufficient budgetary scope can finance a compensation system. To date, only the United Kingdom, the Netherlands, Spain, Norway, Flanders and Germany have introduced an electricity price compensation system. The possibility of preferential treatment by means of electricity price compensation should therefore be abolished at EU level. If its abolition at EU level is not politically feasible, at least the national electricity price compensation should be discontinued.

The existing national concession could also be reformed. As in the United Kingdom, the criterion of belonging to a specific sector could be supplemented by an individual obligation to furnish evidence. To profit from the concession[84], companies in the United Kingdom have to provide individual evidence that indirect CO_2 costs due to their products eligible for the concession present a threat because of carbon leakage.

1.2.11 Special compensation provisions under the EEG for electricity-intensive enterprises and railways

The Renewable Energy Sources Act (EEG) promotes the expansion of renewable energy in the interests of climate and environmental protection. The aim is to increase renewable energy to between 40% and 45% of gross electricity consumption by 2025 and at least 80% by 2050 at the latest[85]. The EEG is extremely successful. For example, in recent years renewable energy has shown a marked rise from 6.2% of gross electricity consumption in 2000 to 23.59% in 2012[86].

Financial assistance under the EEG is funded by levying a surcharge on electricity consumption. The size of the EEG surcharge is reset every year. The regular rate rose from 2.047 cents/kWh in 2010 to 6.24 cents/kWh in 2014[87]. Electricity-intensive enterprises in the mining sector and the manufacturing industries only have to pay a much reduced EEG surcharge, because they are covered by the special compensation provisions (BesAR, Section 40 ff. EEG). These are intended to protect electricity-intensive enterprises from threats to their international competitive position.

To be eligible for the special compensation provisions in 2010, companies in the mining sector and the manufacturing industries needed to have an electricity consumption of at least 10 GWh and an electricity intensity[88] of at least 15%. Furthermore, companies with an electricity consumption of 10 GWh or more were required to introduce an energy management

system. The tax concessions were extended in the 2012 revision of the EEG (cf. Table 2). The EEG surcharge for enterprises in the mining sector and the manufacturing industries is scaled according to their electricity consumption and intensity (Section 41 EEG).

Table 2

BesAR privileges for enterprises in the manufacturing and mining sectors under EEG 2012

Electricity consumption and intensity of enterprises	EEC surcharge payable
Up to 1 Gwh	Regular EEG surcharge
1 GWh to 10 GWh and electricity intensity at least 14%	10% of regular EEG surcharge
Over 10 GWh to 100 GWh and electricity intensity at least 14%	1% of regular EEG surcharge
Over 100 GWh and electricity intensity between 14% and under 20%	0.05 €-cent / kWh
At least 100 GWh and electricity intensity at least 20%	0.05 cents/kWh (for entire electricity consumption, no phasing)

Railways with a minimum electricity consumption of 10 GWh for traction power pay a reduced EEG surcharge of only 0.05 cents/kWh. For a 10% retention the full surcharge must be paid (Section 42 EEG). The concession is in the interests of intermodal competitiveness of the railways.

The number of privileged companies has increased considerably in recent years, as has the privileged quantity of electricity (cf. Fig. 3). In 2013 some 1691 enterprises and railways profited from the concession, and the privileged quantity of electricity totalled 94,181 GWh (as of April 2013)[89]. For comparison: in 2010 there were only 566 privileged companies, and the privileged quantity of electricity was around 80,665 GWh. The large increase in the number of privileged companies in 2013 is mainly due to the 2012 revision of the EEG. This reduced the electricity intensity requirement from 15% to 14% and the minimum power consumption from 10 GWh to 1 GWh.

The special compensation provision is a case of targeted preferential treatment by means of governmental regulations and therefore belongs to the class of implicit subsidies without any direct impact on the national budget. In 2010 the relief for electricity-intensive enterprises and railways as a result of the special compensation provision amounted to

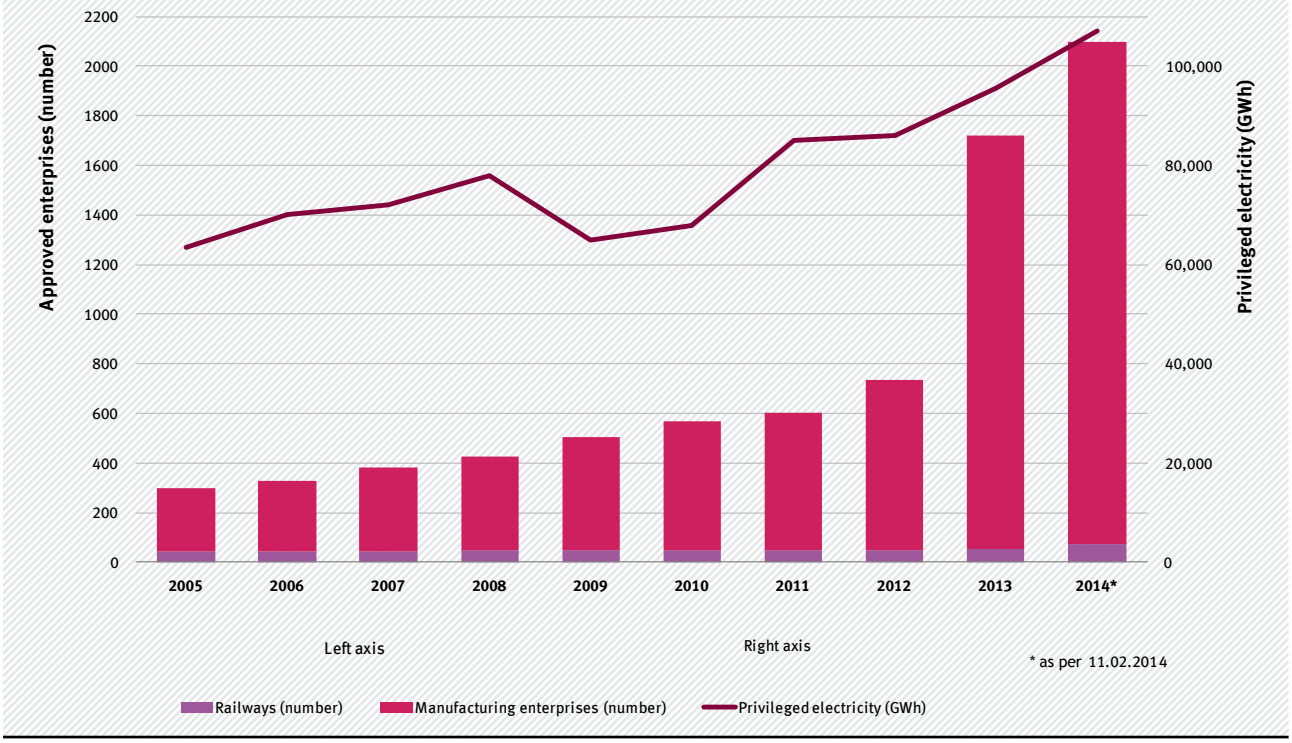
€1.455 billion[90].

This relief for industry and railways substantially reduces the incentive to make efficient use of electricity, resulting in failure to take advantage of potential for reductions. Since the EEG is financed by a surcharge, this relief for industry and railways automatically results in greater burdens on non-privileged consumers[91]. This primarily affects private households, but also companies that do not reach the threshold figures for electricity consumption and intensity. This can result in competition between privileged and non-privileged companies. Furthermore, the unequal burdens on consumers also result in reduced solidarity when it comes to support for financing the *Energiewende*.
Without the special compensation provision the EEG surcharge in 2010 would have been more than 0.39 cents/kWh[92] lower. The increase in the EEG surcharge and the extension of the special compensation provision also resulted in an increase in the concession: in 2012 the relief due to the special compensation provision already amounted to €2.715 billion[93]. Without the special compensation provision the EEG surcharge in 2012 would have been more than 0.63 cents/kWh[94] lower.

The Renewable Energy Sources Act was revised in 2014 to ensure conformity with European law. The revised act was passed in July 2014. It also includes amendments to the special compensation provision and now permits relief for 219 industries. Applications can be submitted by companies whose electricity costs as a percentage of gross value added exceed certain limits. The privileged companies pay the full EEG surcharge for the first gigawatt-hour (retention). For electricity consumption in excess of that figure the levy is limited to 15% of the EEG surcharge. However, it is subject to a cap (of 4% of the company's gross added value for an electricity cost intensity of less than 20% or 0.5% for an electricity cost intensity of at least 20%). Regardless

Fig. 3

Development of number of privileged enterprises and quantities of BesAR electricity between 2005 and 2014



Source: Update based on Reuster, L. and Nestle, U. (2013), p. 10

of this provision, privileged companies have to pay an EEG surcharge of at least 0.1 cents/kWh (at least 0.05 cents/kWh for companies in the nonferrous metals sector). From 2015 onward, companies which are privileged under the special compensation provision in 2014 but are no longer eligible thereafter pay the full EEG surcharge for the first gigawatt-hour and at least 20% of the EEG surcharge for the rest.

Judged by the special compensation provision's objective of maintaining the Germany's competitive position as an economic and industrial location, the list of industries is too generous. It should be confined to industries that do not have adequate means of passing on electricity costs in their product prices. This could be done on the basis of the European Commission's list of industries that are entitled to electricity price compensation under the European emissions trading system (cf. Section 1.2.10).

To ensure that companies make an appropriate contribution to costs, they should have to pay an EEG surcharge that at least corresponds to the merit-order effect. The present version of the special compensation provision takes account of this effect by limiting the reduced EEG surcharge to at least 15% of the regular EEG surcharge. This currently corresponds to the level of the merit-order effect and should therefore be seen in a positive light.

By contrast, the cap on the levy and the reduction in the minimum surcharge for the nonferrous metal industry must be criticised. Another negative aspect is the fact that the privileged companies do not have to do anything else in return. It would make sense to require them to implement the economic energy-saving measures identified with the aid of the energy or environmental management system. Moreover, delivery points taking more than 10 GWh of electricity per annum should have to satisfy the technical, organisational and legal requirements for using demand-side management in the electricity market.

Companies that have so far enjoyed preferential treatment under the special compensation provision but will now lose this status because of the revised requirements should in future pay the full EEG surcharge. A permanent concession of 80% of the EEG surcharge cannot be justified even from the point of view of protecting existing rights (grandfathering). As

a maximum, transitional provisions might be helpful to make it easier for companies to adjust to the higher payments.

1.2.12 Internal power privilege under EEG (industrial sector)

Until the reform of the Renewable Energy Sources Act (EEG) in July 2014, internally generated electricity was completely exempted from the EEG levy, provided it was not fed through public networks or consumed in close spatial connection with the power generation plant (Section 37 EEG). While this primarily applied to industrial power generation, it was equally true of internal power consumption by private households. In 2012 the internal power privilege applied to 53.3 TWh, or nearly 10 % of Germany's net power requirements for that year[95].

Internal power in the industrial sector is largely generated from fossil fuels. The exemption of internally generated power from the EEG surcharge reduces the incentive for exempted companies to save energy. From a climate point of view this has to be regarded in a negative light. Moreover, the regulation distorts investment decisions, shifting them in favour of internal power generation.

The internal power privilege is a case of deliberate preferential treatment through state regulation, and therefore constitutes an implicit subsidy. In 2010 the relief enjoyed by the industrial sector due to the internal power privilege came to

€754 million[96].

The reform of the EEG in 2012 restricted the rules for exemption under the internal power privilege – but maintained the vested rights for power plants that had been registered for internal power generation before September 2011.

The internal power privilege was reorganised as part of the EEG reform of 2014. In future the basic levy payable by all new generators of internal power is 40%. This figure increases to 100% for all plants that are neither a renewable energy system nor a high-efficiency CHP plant. The revised act also provides for a gradually increasing levy (30% in 2015; 35% in 2016; 40% in 2017) and a *de minimis* limit for renewable energy and CHP plants operated by small generators.

The requirement for internal power consumption to contribute to the EEG levy must basically be welcomed, especially because it counteracts the anti-solidarity tendencies in the financing of the EEG and can thereby help to increase acceptance of financial assistance for renewable energy as a whole. What is more, it permits more efficient decisions about the construction and operation of plants using fossil and renewable energy sources on the electricity market. To strengthen these effects it would make sense to increase the compulsory levy. Furthermore, when the EEG surcharge on internal power consumption was revised, over-generous protection was given to acquired rights. Since any increases in the EEG surcharge raise the extent of the internal consumption privilege, applying recent and future increases in the EEG levy to internal power would continue to guarantee protection for acquired rights. For environmental and climate reasons, measures for efficient use of energy, such as power generation from waste heat or energy-rich processes or exhaust gases (e.g. by-product gases), which make sense but are impeded by reorganisation of the exemption provisions in the EEG, should if necessary be promoted by means of supporting instruments outside the EEG.

The proposed *de minimis* limit of 10 kW is intended to ensure the profitability of renewable energy and CHP plants for new, small producers. In view of the planned reduction in renewable energy promotion in many areas this basically makes sense in the first instance. The limit should be checked to see that it is not too low. In general, however, the addition of small plants should be regulated by the amount of financial assistance, and not through exemption from levies. The level of remuneration must therefore be set so that the desired expansion of photovoltaic systems is possible for small and medium-sized systems. Similar arguments apply to CHP plants.

1.2.13 Preferential treatment of grid fees for energy-intensive industries

Transmission system operators charge a fee for using their networks. The size of this fee can vary considerably from region to region. It is calculated on the basis of network costs arising from operation, expansion and renewal. Special rules apply to energy-intensive companies (Section 19(2) Power Grid Charges Ordinance). These have been progressively

expanded since the introduction of the special provisions in 2005. Until July 2009 it was possible to reduce the grid usage fee by 50% for companies drawing power supplies from the public grid for 7,500 hours per year and consuming more than 10 GWh. From August 2009 it became possible to reduce the fee to as little as 20%, and from January 2011 the power consumption level needed to qualify for a reduction was lowered to only 7,000 hours usage per year. In August 2011 total exemption from grid usage fees was introduced.

The reduction in or total exemption from grid usage fees for the industrial sector constitutes deliberate preferential treatment by means of governmental regulation. It is thus an implicit subsidy without any direct impact on the state budget. In 2010 the relief enjoyed by the industrial sector due to reductions in grid usage fees came to

€33 million[97].

This benefited 23 companies or delivery points[98]. Thus in 2010 the special provisions resulted in an average fee for the industrial sector of 1.54 cents/kWh, whereas household customers paid 5.81 cents/kWh (roughly a quarter of the electricity price)[99]. The exempted companies therefore have much less incentive to use electricity efficiently. The gradual increase in the subsidy since 2009 is reflected in an increase in applications, and is along – with grid costs – another factor influencing the size of the subsidy. In 2011 the subsidy had a volume of €220 million[100], and by 2013 it had increased to nearly €643 million[101].

Since August 2011 a special levy has been payable to offset the TSOs' loss of revenue. The "Section 19 levy" passes on the cost of the grid fee reductions to small consumers and households in particular, since the levy payable by major consumers is considerably lower. For 2013 the levy for end consumers consuming less than 100,000 kWh was 0.329 cents/kWh, whereas major consumers using more than 100,000 kWh paid reduced rates of 0.050 or 0.025 cents/kWh[102].

The reason given for this preferential treatment is the "consistently high power consumption", which "makes an important contribution to grid stability"[103]. This raises the question of how far it makes sense to provide incentives for consistently high power consumption. Improved grid stability under conditions of increasingly fluctuating feed-in of renewable energy calls especially for flexible consumers who can cut back their consumption at short notice when supplies are low and step it up again when supplies are high, e.g. from renewable energy[104]. Apart from counter-productive incentives for grid stability through consistently high power consumption, grid fee reductions also reduce the incentive to make efficient use of electricity.

In March 2013 the EU began an investigation to establish whether the exemption from grid fees constituted a case of state aid, and whether this gave rise to competitive advantages for the companies concerned[105]. The Federal Government thereupon decided to revise the Power Grid Charges Ordinance so that energy-intensive electricity consumers would once again be required to make a larger contribution to grid costs. The aim is to introduce phased grid fees instead of the present total exemption[106]. The extent to which the new provisions will help to reduce the subsidy remains to be seen. As a basic principle, companies should pay the full fee for their use of the power grids in order to make an appropriate contribution to the relevant costs. This would also provide greater incentives for energy efficiency measures. Preferential treatment could possibly be given to grid users that provide a social service, e.g. by making a contribution to grid stability. However, it is important that the service goes beyond their mere power consumption and does in fact make a relevant contribution[107]. Furthermore, they should not suffer any disadvantages as a result of providing system services, using surpluses or reducing demand for electricity from renewable sources through demand-side management. A hardship rule should apply to companies that are engaged in international competition and are demonstrably subject to unreasonable burdens, but only if they have no opportunities to use demand-side management.

1.2.14 Privileges for special-contract customers with regard to concession charges for electricity

On the basis of concession agreements, cities and communities can demand a payment – the concession charge – from electricity and gas TSOs for the use[108] of public space. This is an important source of income for cities and communities. The Concession Charges

Ordinance 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) and the annual consumption. In the case of electricity the permitted charges range up to 2.39 cents/kWh (in communities with a population of more than 500,000). In practice the charges vary considerably from one community to another. Under the Concession Charges Ordinance, special-contract customers[109] that consume more than 30,000 kWh of electricity and use more than 30 kW in at least two months have to pay much lower charges. For them, the maximum concession charge for electricity is only 0.11 cents/kWh. In certain circumstances the concession charge may be waived completely[110]. It can be assumed that all electricity-intensive companies are completely exempted from the concession charge[111].

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 household customer who is connected via the low-voltage grid[112]. Even if one takes this into account, complete exemption from the concession charge is in any case a subsidy for the companies concerned. Another question that arises is whether the maximum amount for special-contract customers is determined appropriately.

In 2010 the total relief for industry due to the concession charge rules for electricity came to

€3.5 billion[113].

The privileges for special-contract customers reduce the incentive to improve energy efficiency and thereby lead to adverse environmental and climate impacts. This applies in particular to rules that permit exemption from the concession charge. This is because it gives companies with an electricity consumption just below the threshold figure of 30,000 kWh per annum a massive incentive to increase their electricity consumption. At the same time, companies that are just above the threshold no longer have any incentive to exploit their efficiency potential and reduce their electricity consumption[114].

The legislature should therefore reform the Concession Charges Ordinance. Total exemption from the concession charge should no longer be possible in future. There is also a need to change the eligibility criteria for preferential treatment, so that companies exploit their efficiency potential and have no incentive to increase electricity consumption. Like grid 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. It must also be remembered that the concession charges are an important source of income for communities.

1.2.15 Reduced rates of CHP surcharge for the manufacturing sector and energy-intensive industries

The Combined Heat and Power Act (KWKG)[115] promotes electricity generation from CHP plants. These generate both heat and power from the fuel used, which means that their efficiency is considerably higher than power plants that do not make use of the heat produced. As in the case of the Renewable Energy Sources Act (EEG) (cf. Section 1.2.11), promotion of CHP is by means of compulsory connection, purchase and compensation requirements for CHP power fed into the grid (Section 4 KWKG). The cost is allocated among the consumers; three groups of end consumers are distinguished. In 2010 the levy for all end consumers up to 100,000 kWh was 0.128 cents/kWh (category A). The levy for end consumers in excess of this is a maximum of 0.05 cents/kWh (category B). A company in the manufacturing sector whose electricity costs are more than 4% of its turnover pays a maximum of 0.025 cents/kWh (category C: energy-intensive industry). The reason given for the scaled charge is partly to protect manufacturing-sector companies exposed to international competition from locational disadvantages, and also to ensure that household customers do not bear an unreasonable share of the costs[116]. The reduced rates also apply to rail-bound traffic and railway infrastructure enterprises[117]. Although on the whole the levy has fallen considerably since 2008, the expansion of CHP promotion under the revised CHP Act of 2012 means it can be expected to show a moderate increase in the future[118]. However, the act places a cap of €750 million per annum on this increase (Section 7(7) KWKG).

The reduced CHP levy for companies with high power consumption is a case of targeted preferential treatment by means of state regulation. The reduced levies in categories B and C are thus implicit subsidies without any direct impact on the state budget. In 2010 the relief for companies and railways as a result of the reduced CHP levies amounted to

€103 million.

This figure includes relief of €63 million in category B and €40 million in category C[119]. The reduced cost of electricity compared with households and small companies means there is less incentive to make efficient use of electricity. The reduced surcharges should therefore be discontinued, and all end consumers should pay the same rate of levy. This would reduce the burden on households and small companies.

1.2.16 Subsidies for nuclear power

After the nuclear disaster in Fukushima in March 2011, the German Bundestag decided to phase out nuclear power generation. This cancelled the decision to extend the operating life of nuclear power plants that had been taken in autumn 2010. The Thirteenth Act amending the Atomic Energy Act involved the closure of eight nuclear power plants and the decision to phase out the remaining NPPs by 2022.

In view of the environmental and health issues associated with uranium extraction, the unresolved question of final disposal of nuclear waste, the danger of serious accidents and the potential proliferation of military uses, nuclear power is a technology that is inherently harmful to the environment. From a climate protection point of view too, there are more effective and more efficient ways of reducing CO_2 emissions. For instance, the use of nuclear power to generate electricity – involving, for example, the extraction and enrichment of uranium for fuel elements – gives rise to more greenhouse gases than the use of wind and solar energy and hydro power. Declining uranium stocks result in extraction of this resource even when the ore content is low, and the increased energy requirements for its extraction lead to an increase in CO_2 emissions in the overall balance[120].

The explicit and implicit subsidies for nuclear power make it more cost-effective and result in its being profitable at all at the individual microeconomic level. Particularly at the start of its use for power generation, nuclear energy received large explicit subsidies, especially for research. From the time financial assistance started to 2010, the German government and the Länder spent over €82 billion[121] of public money in the field of nuclear energy. As a result, nuclear energy has received considerably more financial assistance than, for example, the renewable energy sources and energy efficiency, which have received research funding totalling little more than €6 billion since 1974[122].

In 2010 nearly €340 million from the federal budget was available for nuclear energy research and for the disposal of nuclear installations[123]. In addition, nuclear power receives substantial support in the form of implicit subsidies. In particular, the liability arrangements with regard to potential accidents in nuclear power plants and the provisions made by the NPP operators constitute implicit subsidies running into the billions.

On the basis of the polluter-pays principle, the polluter ought to bear full liability for the risks arising from nuclear power. Certainly the operator of a nuclear power plant is liable to the extent of his entire assets in the event of an accident. However, the required provision for cover involves a cash requirement of only €2.5 billion (€256 million from the operator's liability insurance and €2.244 billion from the cover provided by the operator pool). Above and beyond this amount there is no certainty of payment – if the operator becomes insolvent, the state has to bear the remainder of the loss. Insuring a higher sum under liability policies is not possible for economic reasons, since the probability of occurrence and the scale of the accident are virtually incalculable. Moreover, it is difficult to insure such costs, which may be very high. It has been estimated that a nuclear accident could cause a loss of more than €6,090 billion[124]. Thus nuclear disasters are practically uninsurable[125]. The operator bears only a small portion of the risk: the costs of the remaining risk are borne by the state (and hence by society), which is thereby implicitly subsidising nuclear power[126]. It is extremely difficult to quantify this subsidy. Estimates of the preferential treatment represented by the limited insurance requirements for nuclear power plants vary – on the basis of power generation – between €0.139 and €67.3 per kWh[127].

There are also other kinds of preferential treatment in the form of provisions for the subsequent closure and disposal of nuclear power plants. The operators build up the provisions over 25 years, thereby reducing their taxable income. From the 26th year onward,[128] the operating company accumulates interest gains until the time of closure[129]. At present it is impossible to quantify precisely the concession represented by these provisions. On the basis of a simplified model calculation the German Institute for Economic Research (Deutsche Institut für Wirtschaftsforschung – DIW) estimates the benefit resulting from the present provisions system to be at least €175 million per annum[130]. However, the companies can also continue to use the provisions to finance company activities. This creates an additional internal financing benefit, which according to a method devised by Green Budget Germany (FÖS)[131] can be estimated at around €1.8 million in 2010[132]. This practice needs to be changed so that companies which operate nuclear power plants are not favoured by provisions. It is also necessary to ensure that the provisions are indeed available for closure and final disposal, even if the operator should become insolvent.

Although, in view of the problems described, it is not possible to determine the precise extent to which nuclear power as a whole is subsidised, estimates to date indicate that without the high level of implicit subsidies – and especially the limited provision of cover with regard to liability – nuclear power would not be competitive as a source of energy[133].

1.2.17 Export credit guarantees (Hermes cover) for coal-fired and nuclear power plants

The federal export credit guarantees serve to cover the economic and political risks of non-payment for companies and banks that are associated with export transactions. Examples include risks arising from legislative or official measures, acts of war, or bankruptcy of the business partner. In this way the state supports German export transactions on difficult and high-risk markets. The guarantees facilitate not only the development of new markets, but also the maintenance of existing business relations[134].

As a rule the state uses export credit guarantees to cover risks that private-sector insurance companies cannot accept, or at least not on economic terms. The German Government bears budget responsibility and takes decisions in an inter-ministerial committee on cover policy and acceptance of guarantees. Any gains arising from risk premiums received and any losses due to non-payment are posted directly to the federal budget[135]. In 2010 the total authorisation limit amounted to €120 million (2012: €135 million)[136]. This is the maximum annual amount up to which export credit guarantees are given, as laid down by the Budget Committee. In fact, German exports worth €32.5 billion were covered in 2010[137]. The companies charged with implementation are Euler Hermes Deutschland AG[138] and PwC[139].

Export credit guarantees are a subsidy, since the state provides an insurance service that the market does not provide (or at least not at the relevant price). This is also made clear by the fact that about 61% of the companies would not have made the Hermes exports without the guarantee[140]. Additional advantages arise from the fact that companies with the promise of an export credit guarantee obtain more favourable terms for finance.

In addition to the requirements for assistance, such as "reasonableness of risk" and "eligibility for assistance"[141], the Federal Government also considers environmental and social impacts of projects. It applies the rules of the OECD Common Approach on the Environment and Officially Supported Export Credits[142]. But it nevertheless provides assistance for environmentally harmful technologies such as energy generation from coal or, until June 2014, from nuclear power[143]. Quite apart from the direct environmental impacts of increased CO_2 emissions by coal-fired power plants, the power plants also determine energy supplies for decades and thereby present obstacles to the transition to renewable energy sources. In 2010, export credit guarantees came to €1.2 billion for fossil fuel and €35.1 million for nuclear energy. By contrast, export credit guarantees for renewables came to only €531.7 million. In 2011 and 2012, export credit guarantees for renewable energy showed a marked increase, while guarantees for fossil energy fell sharply[144].

It is not possible to quantify the environmentally harmful subsidies provided in the form of Hermes guarantees. For one thing it would be necessary to investigate the environmental impacts of all subsidised exports in order to determine the proportion that was environmentally harmful. For

another, it is difficult to quantify the benefit for companies, since the German Government is

facilitating an insurance service for which no market price exists.

In June 2014 the German Government decided as a basic principle not to give any export credit guarantees for nuclear power generation plants and equipment. With a view to the goal of a sustainable, eco-friendly energy supply system, the German Government should also rule out export credit guarantees for coal-fired power plants[145]. There are also other fields in which the requirements for export credit guarantees should be subjected to a critical review of their environmental impact. For example, export credit guarantees were given for facilities for laying hens in the Ukraine that did not comply with German or EU requirements[146].

2 Transport

2.1 Impacts on the environment

The environmental damage caused by the transport sector is primarily due to traffic-induced emissions and land take. In Germany transport made a substantial contribution to emissions in 2010, namely carbon dioxide (18%)[147], carbon monoxide (31%), oxides of nitrogen (45%), volatile hydrocarbons (12%), particulates (17%), fine particulates (18%)[148] and noise, which result in a variety of environmental and health impacts. Emissions of nitrogen oxides and volatile hydrocarbons by the transport sector play a major part in ozone levels in near-surface layers of the atmosphere. 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 present a considerable threat to human health. For example, elevated concentrations of fine particulates 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. Moreover, traffic gives rise to considerable noise problems. Not only can noise be a great nuisance to people, interfering with their communication and relaxation, but increasing noise levels also increase the risks to health. One of the main problems caused by night-time noise is sleep disorders and 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[149]. Since the volume of traffic will probably continue to grow in future under present conditions, it is all the more important to reduce this growth and increase the share of low-emission modes of transport.

Not only traffic-induced emissions, but also land take and landscape fragmentation resulting from the construction of traffic routes have harmful environmental impacts (cf. Section 3.1). The associated impairment and fragmentation of habitats are a major cause of the ongoing loss of biodiversity[150]. Increasing urban sprawl, which is encouraged by

the development of traffic routes to open up rural areas, also results in a shift towards the use of cars for passenger traffic, since bus and train connections become increasingly unattractive and expensive in areas with low population density[151]. This trend towards the car results in adverse ecological consequences. In this way the transport infrastructure – along with other factors – has a major influence on the total transport volume and the shares carried by the individual means of transport[152].

Subsidies in the transport sector contribute to environmental pollution in various ways. Preferential treatment of fuels or drive systems with comparatively poor environmental properties reduces their cost and thereby increases their share of the overall traffic volume. One example of this is the tax concession for diesel fuel compared with petrol (cf. Section 2.2.1). Another result of low fuel or running costs due to subsidies is that there is little incentive to invest in innovative, efficient drive systems or to buy low-consumption, low-emission vehicles or vessels – for example the inland waterway sector (cf. Section 2.2.5), the flat-rate taxation of private use of company cars (cf. Section 2.2.7), or the energy tax concessions for biofuels (cf. Section 2.2.8).

Subsidising environmentally harmful carriers makes them more competitive, which results in them gaining a growing share of the total transport volume. This is true of the tax concessions for air transport, for example (cf. Section 2.2.3 and 2.2.4). What is more, by reducing the overall cost of transport, subsidies create an incentive to increase the transport volume. One example of this is the distance-based tax allowance for commuters (cf. Section 2.2.2). This indirectly encourages expansion of the transport network and increasing urban sprawl, resulting in longer distances travelled – e.g. between home and work – and further growth in traffic volume.

2.2 The main environmentally harmful subsidies in the transport sector

2.2.1 Energy tax concession for diesel fuel

At 47.04 cents per litre the energy tax rate for diesel fuel is 18.41 cents per litre less than the rate of 65.45 cents per litre for petrol. Including value-added tax, the tax concession for diesel fuel is even higher (21.9 cents per litre).

The lower tax on diesel fuel is an instrument intended to favour commercial road transport, but it also applies to private cars. In order to offset the associated unjustified subsidy for diesel-powered cars, the latter are subject to a higher vehicle road tax. Cars with diesel engines are nevertheless becoming increasingly attractive, as demonstrated by their growing share of the total (in Germany from 14.5% in 2001 to 25.9% in 2010[153]). This is an indication that the higher vehicle road tax does not adequately offset the lower energy tax on diesel fuel.

On the basis of the more than 38 billion litres of diesel taxed in 2010[154], the concession for diesel fuel compared with petrol amounts to an annual tax shortfall of

€7.05 billion[155].

From an environmental point of view, the energy tax concession for diesel fuel should be viewed critically. A diesel car (up to EURO 5) pollutes the air with substantially more nitrogen oxide emissions than a petrol-engined car. This difference becomes minimal with the introduction of the EURO 6 standard. However, the EURO 6 standard does not become compulsory for newly registered cars until September 2015, which means that substantial pollution will be caused by increased nitrogen emissions until all existing diesel cars are replaced. And when it comes to fine particulates, diesel cars which are not yet equipped with a particle filter represent a much greater risk to health than petrol cars because of the harmful effects of fine particulates. Especially from a climate policy point of view, the tax concession of 18.41 cents per litre is not justified because, owing to its greater density, diesel fuel has a higher carbon content than petrol and its combustion gives rise to roughly 13% higher CO_2 emissions. In view of these adverse effects on the environment, the reduced tax rate for diesel should gradually be phased out and the diesel tax rate brought up to the same level as for petrol[156]. In fact, since diesel fuel has a higher energy content than petrol and therefore emits more CO_2 per litre, it would really be appropriate to set the diesel tax rate higher than the rate for petrol. If 50% of the energy tax were based on energy content and 50% on CO_2 emissions, this would result in a tax rate of 65.45 cents per litre for petrol and 73.28 cents per litre for diesel. If the energy tax concession for diesel were abolished, there would no longer be any

reason for a higher rate of vehicle road tax for diesel vehicles. In parallel with the increase in energy tax on diesel fuel, the vehicle road tax for diesel cars should therefore be reduced to the same level as for petrol cars. As a result, diesel and petrol cars would be subject to identical criteria for vehicle road tax and energy tax.

2.2.2 Distance-based tax allowance for commuters

By taking advantage of the distance-based tax allowance, employees can set off expenditure on journeys to and from work against income tax as a business expense. The allowance is 30 cents per kilometre one-way distance between home and workplace. This reduces the tax burden once the individual flat-rate allowance of €1000 (2010: €920) per annum is exceeded. Most other EU countries do not have a comparable tax concession.

The distance-based tax allowance supports the increase in traffic and the trend to urban sprawl and long distances to work. Above all, it favours car traffic because public transport is very limited, especially in areas with low settlement densities, and is therefore not a viable alternative for many employees. Thus the distance-based tax allowance runs contrary to climate change mitigation and contributes to atmospheric pollution and noise. Land take as a result of urban sprawl processes is also an important factor responsible for loss of biodiversity and has other environmentally harmful impacts (cf. Section 3.1).

According to estimates by the Federal Economics Ministry, the tax shortfall due to the distance based tax allowance in 2010 came to

€5 billion.

The distance-based tax allowance tends to favour high-income households considerably more than earners of low incomes. This is firstly because high-income households have a higher (marginal) tax rate, and secondly because they often have additional income-related expenses, which puts them in a position to exceed the individual flat-rate allowance with these tax-deductible travel costs.

In 2007 a rule was introduced under which the distance-based tax allowance was only granted for one-way distances exceeding 20 kilometres. However, the Federal Constitutional Court ruled that this was unconstitutional, since the budget consolidation grounds cited by the legislature were insufficient for constitutional justification of the new provision. The federal legislature thereupon rescinded this rule and restored the legal position that had applied until 2007. Following the decision by the Federal Constitutional Court, it was – and still is – possible to redesign the distance-based tax in some other way. The court expressly pointed out that it would be possible to redesign the distance-based tax allowance from an environmental point of view in a way that would satisfy the constitutional justification requirements.

From an environmental point of view, the withdrawal of the new rule introduced in 2007, together with the reintroduction of tax deductibility for the cost of travel to work right from the first kilometre is a retrograde step. To remove the incentives to environmentally harmful behaviour, the distance-based tax allowance should be abolished completely. The legislature could avoid any unreasonable hardship for employees whose travel costs from home to work accounted for a very large proportion of their income by recognising costs for the journey between home and work as extraordinary expenses deductible for income tax purposes. This kind of hardship rule should take effect once expenditure on travel to work – on its own or together with other extraordinary expenditure – exceeds the relevant maximum reasonable burden[157]. This would specifically reduce the burden on those employees who had very high travel costs in relation to their income, e.g. because they have to travel long distances to work for social or work-related reasons.

If total abolition of the distance-based tax allowance and a changeover to recognition of journey costs as extraordinary expenses deductible from income tax were not possible, other options could be considered. For example, the legislature could substantially reduce the rate of 30 cents per kilometre and set a maximum limit for total deductible journey costs.

Model calculations indicate that abolition of the distance-based allowance could cut CO_2 emissions by more than 1.8 million tonnes per year by 2015 and 2.6 million tonnes per year by 2030[158]. In order to avoid increasing the overall tax burden, income tax rates could be reduced. This would relieve the burden

on taxpayers, while largely retaining the positive effects for climate protection[159].

2.2.3 Energy tax exemption for kerosene

Unlike the fuels used by motor vehicles and the railways, the kerosene used in commercial air transport is exempted from energy tax[160]. However, owing to the altitude at which they are emitted, air transport emissions have at least twice the climate impact of ground-level emissions[161]. This is due in particular to water vapour and nitrogen oxides, which – if they enter the atmosphere at great heights – have a much greater climate impact than at ground level. What is more, emission-reducing advances in aircraft and propulsion technology are not keeping pace with the passenger-kilometres travelled. For this reason the foreseeable technical measures will be nowhere near sufficient to maintain or reduce present emission levels.

The introduction of a kerosene tax is therefore not only necessary to ensure equal fiscal treatment for the individual modes of transport and thereby avoid distortion of competition, but is also important as an environmental protection measure. This would make it possible to emit 20 million tonnes of CO_2 less in 2020[162]. Kerosene should basically be taxed at the rate of €65.45 cents per litre that is set out in the Energy Tax Act[163]. According to the German Government's Subsidies Report, tax exemption of kerosene led to a tax shortfall of €680 million in 2010[164]. This only takes account of fuel consumption for domestic flights, which are the only flights that are taxable at present under European and international law. From an economic point of view, however, even the energy tax exemption for kerosene used for flights to foreign destinations constitutes a subsidy. When calculating the volume of the subsidy, therefore, it makes sense to take the total amount of kerosene sold in Germany for commercial aviation as a basis[165].

In view of domestic sales of 8.45 million tonnes of kerosene to the civil aviation sector in 2010[166], the exemption of this sector from energy tax resulted in a tax shortfall of

€6.915 billion.

For a long time there was a ban on taxation of kerosene throughout the EU. Today the EU Energy Tax Directive of 2003[167] permits taxation of kerosene for domestic flights and for flights between member states, provided relevant bilateral agreements exist. This means that an EU-wide kerosene tax is basically possible. However, there is strong resistance on the part of several member states, so it will be difficult – especially in view of the principle of unanimity on tax issues – to gain acceptance for the introduction of an EU-wide tax.

Furthermore, at international level the Chicago Convention restricts the taxation of fuels in the aviation sector, since it bans the taxation of kerosene that is already on board and which serves the purpose of onward international flights. It is however basically possible – even outside the EU – to introduce a kerosene tax by amending bilateral air transport agreements. In the interests of equal fiscal treatment of the different means of transport, efforts should be made, despite the existing difficulties, to agree on a kerosene tax for as large an area as possible – at least EU-wide. If it proves impossible to levy the excise duty rate of 65.45 cents/litre included in the German tax rate for kerosene, the minimum tax rate of 30.2 cents/litre laid down in the EC Energy Tax Directive should be levied.

Taxation of kerosene should be pursued in addition to the inclusion of the aviation sector in the EU Emissions Trading Scheme. Whereas emissions trading exclusively serves climate interests, the kerosene tax is primarily an excise duty justified entirely on fiscal grounds. It also makes sense to levy eco tax on kerosene consumption as well: this is because the EU emissions trading scheme in the air transport sector is based entirely on CO_2 emissions and does not take account of any other adverse climate impacts of air transport such as changes in natural cloud formation. Moreover, in view of the fact that its goal is confined to climate protection, the emissions trading scheme does not make any contribution to internalising external costs that arise as a result of other negative impacts of air transport (impairment of air quality due to emission of nitrogen oxides, stress due to air traffic noise).

The introduction of the air transport tax on 1 January 2011 was a first step towards taxation of air transport and hence towards harmonising the competition situation between the various modes of transport. A tax of 8, 25 or 45 euros per ticket, depending on the distance travelled, was levied in 2011. The level of air transport tax is linked to the auction revenue of

the EU emissions trading scheme. The rates are reset every year to ensure that the air transport contribution to budget consolidation does not exceed €1 billion. The tax rates were therefore reduced in 2012, the first year of the inclusion of air transport in the emissions trading scheme. Germany's revenue from air transport tax in 2011 came to roughly €959 million[168].

2.2.4 VAT exemption for international flights

Transboundary commercial air transport is exempt from value-added tax (VAT) in Germany; only domestic flights are subject to VAT. 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 (see Section 2.2.3).

Subsidies for the air transport sector in 2010 as a result of VAT exemption amounted to

€3.49 billion[169].

An EU-wide solution for VAT exemption of international air transport would make sense, to create a uniform framework of conditions and to prevent distortion of competition through an exodus of passengers to other countries. This would be possible by reforming the EU directive on value-added tax. 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 within the European region. In view of the existing legal restrictions, a possible second-best solution for the short term would be to levy VAT only on the portion of transboundary flights that was consumed in Germany.

2.2.5 Energy tax exemption for inland waterway transport

The diesel fuel used in commercial inland waterway transportation is tax-free[170]. Commercial fishing boats also profit from this tax exemption. Although assistance for inland waterway traffic is desirable from a transport policy point of view, it should not be provided at the price of doing without appropriate cost allocation to the responsible party and incentives to make efficient and low-emission use of energy. The fuel available for inland waterway shipping in Germany today is similar to diesel fuel for road vehicles. However, fuels taken on board in other countries may have a higher sulphur content, in which case their combustion causes higher sulphur dioxide and particulate emissions. These emissions increase atmospheric pollution and acidification of soils and water. Pollutant emissions by inland waterway vessels are currently too high, and various measures need to be taken to reduce them in future.

In 2010 this subsidy resulted in a tax shortfall of

€166 million[171].

To harmonise the competition situation between the various modes of transport – especially between goods traffic via inland waterways, road and rail – marine diesel should be taxed at the same rate as diesel fuel in the road transport sector (48.57 cents per litre). This would create incentives to increase energy efficiency. Changes should be made to European and international law so that tax exemption is abolished throughout Europe, and especially for shipping on the Rhine. In addition, accompanying measures – such as investment bonuses for more efficient and more eco-friendly engines – would make sense in order to simplify adjustments to inland waterway traffic. For example, financial assistance has been available since 2007 for modernising inland waterway shipping by giving financial incentives to buy lower-emission diesel engines and emission reduction systems. Other examples of ways to encourage improvements to the environmental properties of inland waterway vessels, especially as regards their pollutant emissions, would be toll or canal charges scaled on the basis of environmental properties.

2.2.6 Energy tax concessions for mobile machinery and vehicles used exclusively for goods handling in seaports

Machinery and vehicles used exclusively for goods handling in seaports have been favoured by an energy tax concession since April 2008 (Section 3a Energy Tax Act). Instead of the tax rate for motor fuels, only the lower tax rate for heating fuels is applied (Section 2(3) Energy Tax Act). For example, diesel fuel is not taxed at around 47 cents per litre, but only about 6.1 cents

per litre. The energy tax concession is intended to help reduce competitive disadvantages for German seaports compared with their European competitors.

According to the German Government's Subsidies Report, the subsidy for 2010 amounts to

€25 million[172]**.**

From an environmental point of view the energy tax concession is counter-productive, because it considerably reduces the incentive to use energy efficiently. 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 would also be desirable to prevent carriers switching to other ports and giving rise to possible increases in overland transport. There is also a need to investigate whether it makes sense in the medium or long term to provide assistance for the electrification of machinery and vehicles on environmental grounds. There are potential environmental benefits due to reduced greenhouse gas and pollutant emissions, assuming generation of electricity from renewable energy sources; also lower noise levels and energy efficiency benefits, if motors do not have to be running permanently to be operational.

2.2.7 Flat-rate taxation of privately used company cars

Company cars are employers' cars that can also be used for private purposes. When company cars are used for private purposes, the user has to pay income tax in respect of this "payment in kind", on the basis of 1% per month of the vehicle's list price at the time of first registration.

This low flat-rate taxation encourages companies to pay employees part of their salary in the form of a company car. Company cars account for a large proportion of cars on the road. In 2010 some 57.4% of new cars were registered by business owners[173]. Company cars tend to be fairly large cars with above-average fuel consumption. For example, 88% of top-end vehicles were used for business purposes[174]. Thus the company car privilege promotes the car as a means of transport and contributes to environmental pollution by the road transport sector (cf. Section 2.1).

Private use of company cars should therefore be taxed at a higher rate and – as in the United Kingdom, for example – differentiated by CO_2 emissions. The legislature should reduce this rate for vehicles with low CO_2 emissions (e.g. up to 100 g/km), and raise it in stages for vehicles with higher emissions (e.g. over 100 g/km). It would be necessary to lower the threshold to keep pace with technical progress in the course of time. In the United Kingdom, phased taxation of private use of company cars on the basis of CO_2 emissions, which was introduced in 2002, has resulted in a significant reduction in CO_2 emissions[175].

The additional tax revenue resulting from an increase in taxation of private use of company cars is difficult to quantify. A study of company car taxation in Germany by the Research Institute for Public Finance at the University of Cologne estimates the tax increase due to increasing the non-cash benefit from 1% to 1.5% of the list price at

at least €500 million per annum[176]**.**

Regardless of the taxation of private use – which applies to the employee – there is a need for general eco-oriented reform of company car taxation to give companies an incentive to buy vehicles with low consumption and emissions[177]. The legislature should scale the deductibility of purchase and running costs on the basis of greenhouse gas emissions or the fuel consumption of the vehicles. For example, the purchase cost of low-emission vehicles (e.g up to 100 g CO_2/km) should be fully deductible, whereas vehicles with CO_2 emissions in excess of this threshold should be only partially deductible. The higher the vehicle's emissions, the smaller the deductible portion of costs should be. It would also make sense to reduce the threshold in the course of time.

2.2.8 Biofuels

Biofuels are liquid or gaseous motor fuels obtained from biomass. They can be produced from a variety of regrowable raw materials such as oil-bearing plants, grain, sugar beet or wood, and also from waste. The market is currently dominated by "first-generation" fuels; these are obtained from arable crops rich in oil, starch or sugar that are also suitable for human nutrition or for feeding livestock.

The general increase in demand for agricultural products, which has been boosted by political incentives to produce biofuels, involves a variety of risks to man and the environment. The impacts of biofuels on climate and the environment are greatly dependent on the biomass used and the growing conditions. As a rule, intensive cultivation of rapeseed, maize, sugar beet, sugar cane, soya beans and other agricultural products used for production of biofuels involves greenhouse gas emissions from soil cultivation, pollution of soil, water and air with fertiliser and pesticide residues, and adverse impacts on biodiversity (cf. Section 4.1). Moreover, the global expansion of arable land leads to the conversion of valuable near-natural areas and habitats, resulting in substantial releases of greenhouse gases and a considerable loss of biodiversity (direct land use change). If existing forms of land use are displaced, there is a risk that these in turn will penetrate into land and habitats that are worth conserving. This "indirect land use effect" is not covered by current sustainability requirements (Biofuels Sustainability Ordinance (Biokraft-NachV), in force since 01.01.2011), but are at the focus of current political debate at EU level. The German Government also recognises the danger that "the use of biomass for energy purposes could, via indirect land use changes, indirectly cause greenhouse gas emissions and put environmentally valuable areas at risk"[178]. From a climate point of view, the present assistance for first-generation biofuels is relatively ineffective compared with other transport-related measures[179]. This is because the minimum savings in greenhouse gases compared with fossil fuels, as laid down in the Biofuels Sustainability Ordinance, are largely achieved by first-generation biofuels only if the indirect greenhouse gas emissions are not taken into account[180].

By contrast, the use of various residual and waste substances is considerably more favourable, but their contribution is currently marginal. If it becomes possible in future to use raw materials containing lignocellulose, e.g. wood and grasses, for producing biofuels, the spectrum of raw materials could be expanded to take in more eco-friendly materials. Here too, however, it must be remembered that environmental considerations prevent the area under cultivation from being expanded indefinitely. Second-generation biofuels are currently at the research and development stage, however, and it is not possible as yet to say when they will be ready for marketing.

Subsidisation of biofuels in Germany began in 2004 as a contribution to climate change mitigation, and to boost rural development by creating new sources of income. At first this assistance took the form of a tax concession, which initially covered both pure biofuels and the biogenic component in blends with fossil fuels. Since 2007 the biofuels quota has been the central support instrument, and at the same time it was decided to gradually reduce the tax concession. A tax concession for biofuels especially deserving of promotion[181] continues to be granted until 2015 at the latest, whereas for pure biodiesel and pure vegetable-oil fuels the tax concession was largely discontinued in 2012[182].

Assistance under the newly introduced biofuel admixture quota requires a minimum biofuel energy component in the total amount of motor fuels sold; for the years 2010 to 2014 this is 6.25%. The motor fuel suppliers are responsible for complying with this quota. As from 2015, the quantity quota will be replaced by a greenhouse gas quota. This means that the regulations will no longer require an energy-related minimum content of biofuel in relation to the total fuel sold, but a gradually increasing greenhouse gas reduction due to the use of biofuels. The reference value is calculated from the greenhouse gas emissions that would arise if the total quantity of motor fuels was produced from fossil fuels.

Biofuels intended to satisfy the requirements of both the present and future quotas must demonstrate compliance with the sustainability criteria laid down in the European Renewable Energy Directive 2009/28/EC and the Fuel Quality Directive 2009/70/EC. For example, biofuels must not come from land that was previously covered by forest or species-rich pasture. This should also exclude the drainage of peaty soils to grow the raw materials. Biofuels must also be rated 35% better than the fossil reference fuel, taking account of the (direct) greenhouse gas emitted during the production process. These criteria were transposed into national law in the Biofuels Sustainability Ordinance (Biokraft-NachV) and have been in force since 1.1.2011. These provisions offer good protection against relevant environmental risks arising directly from biofuel production, but not

against impacts arising indirectly from the relocation and displacement effects.

Owing to the lack of differentiation in the biofuel subsidy, the assistance provided in 2010 was largely for first-generation biofuels that originated from regular agricultural production and therefore contributed to or exacerbated the existing environmental problems in that sector[183]. The tax concession for biofuels is thus an environmentally harmful subsidy. In 2010 revenue totalling €125 million was lost to the public budget as a result of the tax concessions for biofuels[184]. Compared with the tax shortfall of €580 million in 2008 this clearly indicates the gradual reduction of this direct subsidy.

The change in the tax concession to the biofuel quota shifted the additional cost of biofuel production onto fuel producers and consumers. An implicit subsidy thus continues to exist as a result of the targeted tax concession under state regulations. In 2010 the additional costs for fuel producers and consumers due to the quota totalled around €897 million[185].

As a result, biofuel subsidies by the state (tax concessions) and by producers and consumers (biofuel quota) in 2010 amounted to

€1.022 billion.

The extensive reduction in tax concessions for biofuels is a first step towards abolishing the environmentally harmful subsidies for biofuels. As a short-term measure, the national biofuel quota should also be frozen at – or preferably below – the present admixture level. In the medium term it will be necessary to abolish the biofuel quota or replace it, either by a quota for the share of renewable energy as a whole or by a minimum greenhouse gas reduction quota (technology unspecified) in the transport sector, which should then be achieved by other renewable energy technologies in the individual areas. The greenhouse gas reduction quota prescribed by the EU or the prescribed minimum share of renewable energy in the transport sector cannot and should not be achieved by an absolute increase in the quantity of biofuels, but by a reduction in the total consumption of energy, e.g. through more efficient vehicles, and through shifting and avoiding transport. This would raise the relative share of biofuels (and other renewable energy technologies) while the absolute quantity stagnated. In addition, compliance with the minimum share of renewable energy could also be achieved by electric mobility.

3 Construction and housing

3.1 Impacts on the environment

Construction activities involve very high consumption of resources. They entail substantial expenditure of materials and energy, and are undertaken at the expense of a limited natural resource: land and soil. All in all, the land covered by settlement and transport infrastructure in 2011 comprised 13.4% of the total area of Germany[186]. The surface of nearly half this area is sealed[187]. Reducing land take is a goal of fundamental importance for sustainable settlement development. Despite a decline in the growth of the land area taken (from 120 ha per day in 1996 to 77 ha per day in 2010 and 74 ha per day in 2011[188]), the present trend is still far from the goal of the German sustainability strategy, namely to reduce additional land take for settlement and transport to 30 ha per day by 2020. The German Advisory Council on the Environment (SRU)[189] and the Parliamentary Advisory Council on Sustainable Development (PBNE)[190] also recommend that in the long term appropriation of new areas of land be discontinued in favour of re-use of waste land (zero-hectare target). The economic crisis in 2009 and 2010 contributed to a temporary lull in land take by producing a dip in construction activity and associated land take in those years[191]. However, in the wake of the economic recovery and the low-interest policy, there has been a revival in construction activity since 2011 as regards both house building and apartment blocks.

To achieve the 30-hectare target, the goal of saving land must be systematically taken into account in all state regulations that influence demand for land for settlement and infrastructure purposes. It is also necessary to give priority to using waste land within settlement areas rather than unused areas outside them, as this offers considerable potential for reducing land take. The total area of unused land is estimated at between 150,000 hectares[192] and 176,000 hectares[193], i.e. approx. 20 m² per head of the population[194]. In rural areas and regions where the

population is shrinking due to demographic change, the total area of unused or partially used land may amount to between 10% and 30% of urban building land.

Consumption of land and increasing urban sprawl lead directly and indirectly to a wide variety of adverse environmental effects. Land take results not only in loss of habitats, but also in loss of the finite natural resource "soil" for agricultural use. Other consequences of urban sprawl are traffic generation, landscape fragmentation and surface sealing. These consequences in their turn contribute to increased pollution of various environmental assets – such as climate, water, soil, air and biodiversity – and also human health.

Destruction and fragmentation of habitats as a result of the expansion of settlement and infrastructure areas are important contributory factors to the decline in biological diversity[195]. Surface sealing also results in far-reaching restrictions in natural soil functions and has adverse impacts on the water regime. Faster rainfall runoff is detrimental to groundwater recharge and increases flood risks.

Increasing urban sprawl generates additional traffic and thereby leads to rising emissions of pollutants and noise (cf. Section 2.1). The large volume of traffic is also the reason for the comparatively high energy consumption in areas of low settlement density[196]. The steady decrease in settlement density (users per km² of settlement area) also reduces the profitability of district and local heating networks and hence the potential for future use of combined heat-and-power generation, because it increases network length per user and hence the per capita costs of building and maintaining the infrastructures. This reduces the medium-term climate options for cutting CO_2 emissions. Thus urban sprawl also has indirect adverse impacts on climate protection.

The growth of settlement and transport areas takes place mainly at the expense of agricultural land. This means there is a permanent change in land use which cannot be reversed, or only at great cost. The loss of fertile soils reduces the potential for organic food production and for environmentally sound production of renewable raw materials. In many cases, failure to make adequate use of waste land also has adverse impacts on environmental assets. As a result of former commercial use, waste land often displays a high degree of surface sealing. Sealed land prevents rainwater from seeping away into the ground, and therefore – as already mentioned – has harmful impacts on the water regime. Another common characteristic of waste land is soil contamination, which would have to be remedied in the event of development for commercial or housing purposes. Thus the adverse effects on environmental assets arise not only from the use of new land, but also from failure to clean up contaminated waste land.

Substantial quantities of material are needed for the construction of residential and commercial buildings and transport infrastructures. In 2010 some 489 million tonnes of mineral construction materials were used in Germany (about 82% of the mineral resources used in Germany)[197]. In addition to mineral resources such lime, gypsum, shale, gravel or sand, the construction industry also uses considerable amounts of metals. Of the 3.5 million tonnes of aluminium used in Germany, 14% were used in the construction sector, and for copper the share was around 15%[198]. This 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 requirements, substantial movements of mass resources, consumption of material and energy, and pollutant inputs into soil, water and air. Mining sector activities change landscapes, ecosystems and the water regime[199]. In Germany around 4 hectares per day have been denatured in recent years for the production of mineral resources for the construction sector[200]. The stock of existing buildings and infrastructures is a sizeable indirect materials depot that is growing year by year.

The subsidies described below actually or potentially favour the expansion of construction activities for settlement purposes, land take, and progressive destruction of the landscape by urban sprawl. This is because subsidies reduce the cost of building new housing (cf. Sections 3.2.1 and 3.2.2) or of developing new industrial, commercial and transport areas (cf. Section 3.2.4). While state funds for housing construction favour construction activities, they do not differentiate between re-use of waste land of a residential or commercial nature and fresh appropriation of open spaces. They generally increase

the incentive to build – including on "greenfields" sites. In fact, subsidies for new development of industrial estates directly promote land take (cf. Section 3.2.4). From an environmental point of view, however, priority should be given to supporting investment in existing buildings and the use of waste land and vacant city-centre sites for settlement purposes.

3.2 The main environmentally harmful subsidies in the construction and housing sector

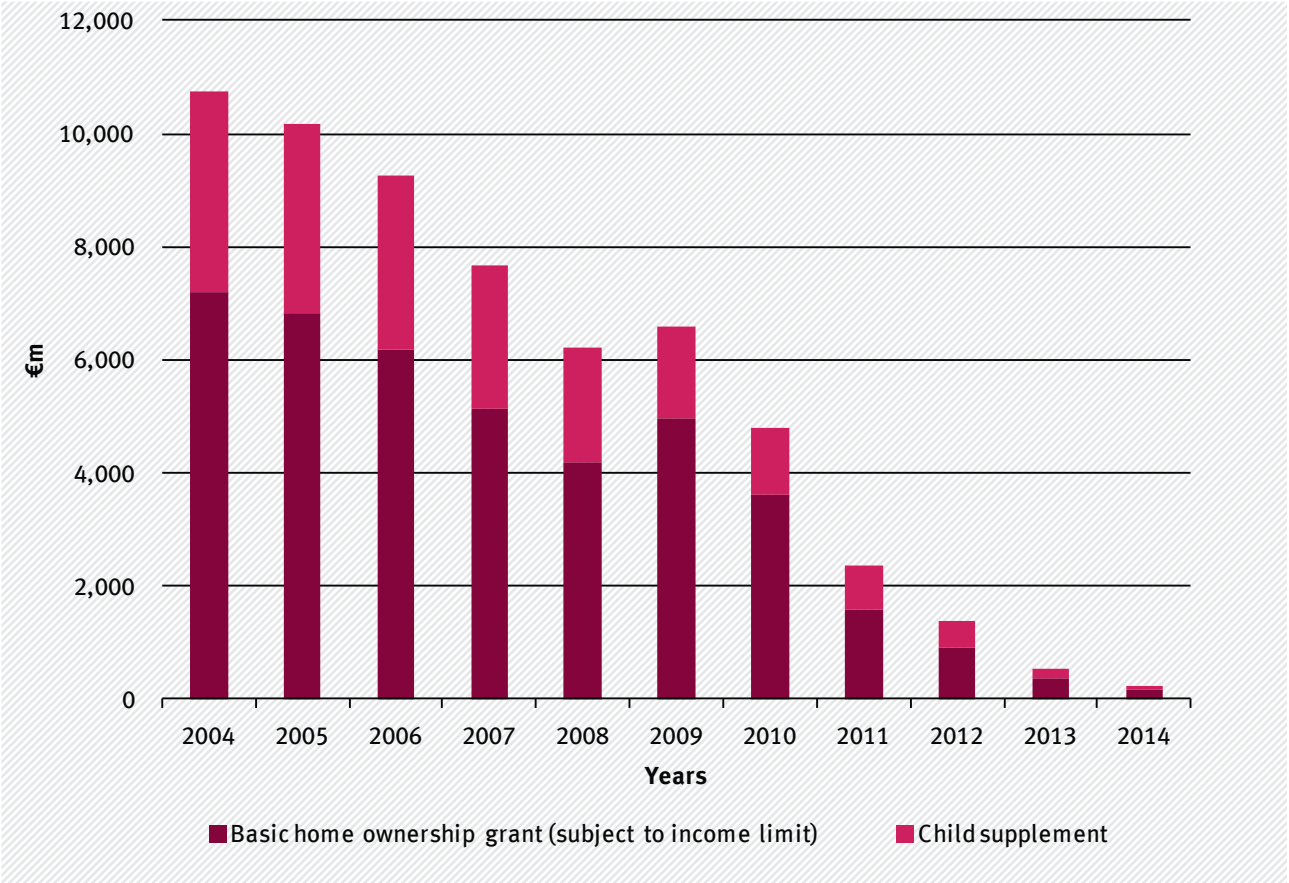
3.2.1 Home ownership grant

The home ownership grant introduced in 1995 is an instrument for promoting housing construction – especially with regard to social and family policy objectives. As far as the abolition of environmentally harmful subsidies is concerned, it is a success that this subsidy has not been available since 1 January 2006. However, existing cases (building permit application or purchase agreement before 31 December 2005) can continue to claim the full assistance for a maximum period of eight years (cf. Fig. 4). As a result, the home ownership grant continued to be paid until at least 2013. The assistance is a maximum of €1,250 a year (depending on the cost of production or acquisition), plus €800 for each child. From 1996 to 2000 nearly half the basic subsidy went to new buildings. The child supplement gave more support to new building than to purchases of existing buildings[201].

Although the continuing trend to house building, especially detached and semi-detached houses, is easing off in rural areas as well, more new buildings per head of the population are still being constructed in rural areas than in metropolitan areas. In addition to other factors, the frequently low level of land prices in rural areas encourages new building. The home ownership grant reinforced this trend[202]. The result is an increase in land take and consumption of natural resources, and a rise in traffic-induced environmental pollution. The home ownership grant is not compatible with the German sustainability strategy's objective of reducing land take for settlement

Fig. 4:

Development of home ownership grant from 2004 to 2014



Source: Own diagram based on data from subsidies reports by the Federal Ministry olf Finance

and transport to 30 hectares per day by 2020. Its abolition was therefore an important step towards an environmentally sound housing policy. Partly in view of the surplus of housing in shrinking regions and the growing need for vocational mobility, the home ownership grant is no longer in keeping with the times. Moreover, in view of the long-term demographic trend (declining population, increasing average age), the number of young people potentially interested in home ownership will tend to fall rather than rise.

The growing demand for living accommodation in regions that have long been economically strong and have growing populations should not be counteracted by nationwide subsidies on the "watering can principle", but by targeted measures to promote social housing construction at regional or local level (cf. Section 3.2.3).

In 2010 the home ownership grant – despite its abolition in 2006 – was still one of the biggest tax concessions in Germany, with a total volume of

€4.803 billion[203]**.**

By abolishing the home ownership grant, the German government has made an important contribution to sustainable development. To reduce land take as a consequence of housing construction, future housing policy should focus on making existing buildings and city-centre areas more attractive, especially for older people and families. Above all, there is an urgent need for energy-saving refurbishment of post-war and other existing buildings in the interests of climate protection[204].

3.2.2 Promotion of saving for building purposes

The state promotes saving for building purposes by means of the housing construction premium (Wohnungsbauprämie), the employee savings allowance (Arbeitnehmer-Sparzulage) and the Home Ownership Pensions Act (Eigenheimrentengesetz).

The housing construction premium is available to all building society savers whose taxable annual income does not exceed €25,600 (married couples €51,200). The premium amounts to 8.8% of the eligible deposits paid in, up to a maximum of €512 per annum (married couples €1,024). Thus the housing bonus is up to €45.06 a year (or €90.11 for married couples).

The employee savings allowance serves the interests of state promotion of private wealth formation, and consists of two separate assistance channels. As well as promoting participation in productive assets, the state also supports investment in building society savings schemes. Employees whose taxable annual income does not exceed €17,900 (or €35,800 for married couples) are eligible for the employee savings allowance if they arrange to have part of their salary – often in combination with employer contributions to the employee's capital formation savings scheme – transferred to their building society account. In that case the state grants a bonus of 9% of the deposits paid in up to maximum of €470, so the employee savings allowance for building society savers comes to €42.30 a year.

It is doubtful whether the housing construction premium and the employee savings allowance for building society savings plans effectively serve their real purpose of promoting home ownership. After all, there are considerable free-rider effects. At any rate the support for saving for building purposes potentially increases the incentive to build individual homes and hence increases land take. In this respect it is not compatible with the German sustainability strategy's 30-hectare goal. Furthermore, in view of the housing surplus in many regions, the increasing need for vocational mobility and the long-term demographic trend, both the housing construction premium and the employee savings allowance are no longer in keeping with the times.

The Home Ownership Pensions Act (Eigenheimrentengesetz), which includes owner-occupied homes in the "Riester Pension" scheme with effect from 2008, promotes the purchase, construction or paying-off of a house or apartment and the acquisition of shares in housing cooperatives. Thus the "home ownership pension" provides undifferentiated incentives nationwide for housing construction, and may thereby contribute to further urban sprawl. Modernisation, refurbishment or energy-saving measures are not eligible for assistance.

According to calculations by the German Government, support for building society saving in 2010 came to €515 million under the Housing Construction Premium Act (Wohnungsbauprämien-Gesetz)[205] and €41 million under the Home Ownership Pensions

Act (Eigenheimrentengesetz)[206]. The total volume of subsidies thus came to

€556 million.

In addition, the state promotes building society savings schemes by means of the employee savings bonus (Arbeitnehmer-Sparzulage). The federal and regional authorities spent a total of €132 million on the employee savings bonus, of which €56 million was contributed at federal level[207]. However, it is not known what share of this is due to building society savings as a form of investment, which means that this cannot be quantified. The extent to which abolition of the employee savings allowance for building society savings plans would lead to an increase in tax revenue remains an open question, since employees could switch to other wealth formation options that continued to be subsidised.

In future, support for wealth formation for households with small and medium incomes – such as the housing construction premium, the employee savings allowance and the home ownership pension – should no longer favour building society savings. The state should not provide any regionally undifferentiated incentives to build additional homes. This also applies to the design of new forms of assistance in the construction and housing sector. Instead, housing subsidies by the federal and regional authorities should in future be confined to modernisation and energy-saving refurbishment of existing buildings, regardless of capital formation and property acquisition, e.g. under the KfW assistance programmes[208].

The instrument of the home ownership pension should be used only for existing buildings and energy-efficient refurbishment of buildings, or for energy-saving measures. Particularly with a view to viable long-term provision for old age, support for home ownership should be the subject of a critical re-examination. Against the background of the changing demographic trend and the long-term decline in population numbers, it is in any case doubtful whether home ownership will always be a safe and stable investment for old age. As the demand for property declines, many owner-occupied homes are threatened by a substantial loss in value, and in some structurally weak areas this can already be observed today.

3.2.3 Promotion of social housing

In 2002, in view of the good average supply of housing, the German government used the Housing Assistance Act (Wohnraumförderungsgesetz) to develop traditional social housing activities into a social housing assistance scheme. Since then the assistance provided has been geared much more to refurbishment of existing housing. This development is to be welcomed. Nevertheless, assisted housing continued to account for around 11 to 12% of the new homes built in 2006[209]. In 2010 some 70% of promotion funds were devoted to assistance for new buildings[210]. Thus social housing assistance still made a sizeable contribution to increased land take and the resulting environmental damage (cf. Section 3.1).

As part of the reform of the federal system, responsibility for legislation on social housing assistance was transferred from the federal to the regional authorities on 1 September 2006. Thus since 2007 the German government has no longer played a direct part in social housing assistance. Until 2013, however, the Länder are entitled to compensation of

€518 million per annum

from the federal budget[211]. The Länder have to use this money for promoting social housing.

Housing construction in Germany has fallen off considerably in recent years, which means that social housing assistance as a whole is probably supporting a much smaller number of new buildings. The reorientation of the assistance in favour of existing buildings is also to be welcomed. The public sector should continue to pursue this reorientation and set clear priorities for housing creation. Here the first step should be to exploit opportunities for creating residential accommodation by refurbishing and by converting attics in existing buildings, followed by making use of vacant sites, industrial and commercial waste land and converted land. Only if there is an urgent need for residential accommodation over and above this level should new open spaces be developed. In that 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 concerned (assistance for subjects).

The Federal Environment Agency therefore recommends making greater use of the instrument of housing benefits. 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 needy households. University cities with temporary housing shortages due to double school-leaver numbers should also consider using temporary solutions to create more dwellings, as the demand here will fall off again in a few years' time.

3.2.4 Joint Agreement for the Improvement of Regional Economic Structures

The purpose of the Joint Agreement for the Improvement of Regional Economic Structures (GRW) is 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 reducing development differences. Here there is a special focus on promoting investment by trade and industry to create and safeguard jobs[212]. Implementing these assistance measures is the responsibility of the Länder. However, the German government plays a part in framework planning and financing. The federal and regional authorities each provide 50% of the money. To this must be added assistance from the EU structural funds[213] – especially the European Regional Development Fund (ERDF). For the year 2010, GRW assistance amounting to nearly €2 billion (including ERDF) was approved. Of this, nearly three quarters went to trade and industry and over a quarter to infrastructure[214].

Improving and expanding industry-oriented infrastructure is a central area for assistance in the Joint Agreement. This also includes the development of new industrial estates. According to the Federal Ministry of Economics and Technology (BMWi), 30% of all money approved for infrastructure assistance between 1991 and 2010 was used to develop trade and industry sites, whereas only 8% went into the restoration of waste land[215]. Even in the assistance period from 2007 to 2013, the assistance criteria of the Joint Task continued to support the development of new sites.

In view of the continuing rapid growth of land used for settlement and infrastructure, new development of areas for trade and industry as a measure of regional structural policy must be seen in a critical light. Especially in those regions which are key assistance areas of the EU and the federal and regional authorities, there is a risk of the area under settlement growing faster than the population. At the same time the intensity of utilisation of newly developed areas is frequently low, and the number of vacant lots in newly developed trading and industrial estates is growing. Investigations of the existing industrial sites in the New Länder show that the existing supply will be able to meet the predicted demand for industrial sites in the decades ahead[216].

The development of new industrial land – especially in non-built-up areas – makes a direct contribution to land take and hence to harmful impacts on various environmental assets (cf. Section 3.1). Thus uncritical promotion of such projects is not compatible with Germany's land-saving objectives. As a rule, new development for industrial purposes also entails the expansion of transport infrastructure, which – as well as additional land take – results in further traffic-induced environmental pollution (cf. Section 2.1).

The GRW is also used to support other promotion measures that favour environmentally harmful activities, e.g for regional airports as outlined in Section 3.2.2[217]. For example, Schleswig Holstein provided assistance for 27 measures in the period 2000 - 2008[218]. Between 1991 and 2010, Mecklenburg-West Pomerania supported the expansion of nine airports and airfields from GRW funds to the tune of €107.4 million. According to the Land Court of Audit, this investment was far in excess of the Land's own needs – today all airports in the Land are running at a loss[219]. Similar problem situations are known in other Länder. The revision of the EU provisions on state aid in the field of public assistance for airports is therefore to be welcomed. A first draft envisages approving state aid for investments in airport infrastructure only if "there is a genuine need" and introducing upper limits for investment assistance[220].

In view of the large number of eligible measures it is not possible to quantify the environmentally harmful percentage of GRW subsidies. Not only environmentally harmful infrastructure measures – such as development of new industrial sites – are eligible for assistance under the Joint Agreement, but also ecologically desirable investments such as wastewater treatment plants.

Structural assistance instruments – like the GRW – could be used to give an important boost to economical use of land[221]. If structural policy were rigorously geared to the sustainability objectives, the German and EU regional assistance activities could be important instruments for curbing the growing use of the countryside for settlement purposes. To this end the assistance rules of the GRW will have to be supplemented by environment-oriented assistance criteria which give clear priority to recycling of waste land rather than development of new industrial sites. Structural assistance measures should serve the internal development and refurbishment of existing settlements and infrastructures, especially since long-term funding of the maintenance of existing public infrastructures is in any case subject to great risks in structurally weak regions. One assistance requirement should be that the applicant must first present an inventory of vacant lots in settlement areas and of existing trade and industry sites. Additional land development should only be undertaken if the available reserves of land are exhausted and advantage is taken of opportunities for land-saving construction methods.

Furthermore, the GWR should aim not so much at promoting construction measures, but rather at promoting human capital and environmental innovations and strengthening regional management 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. Thus forward-looking orientation of the GWR calls for a definition of investment that does not consist solely of investment in real capital.

4 Agriculture and forestry, fisheries

4.1 Impacts on the environment

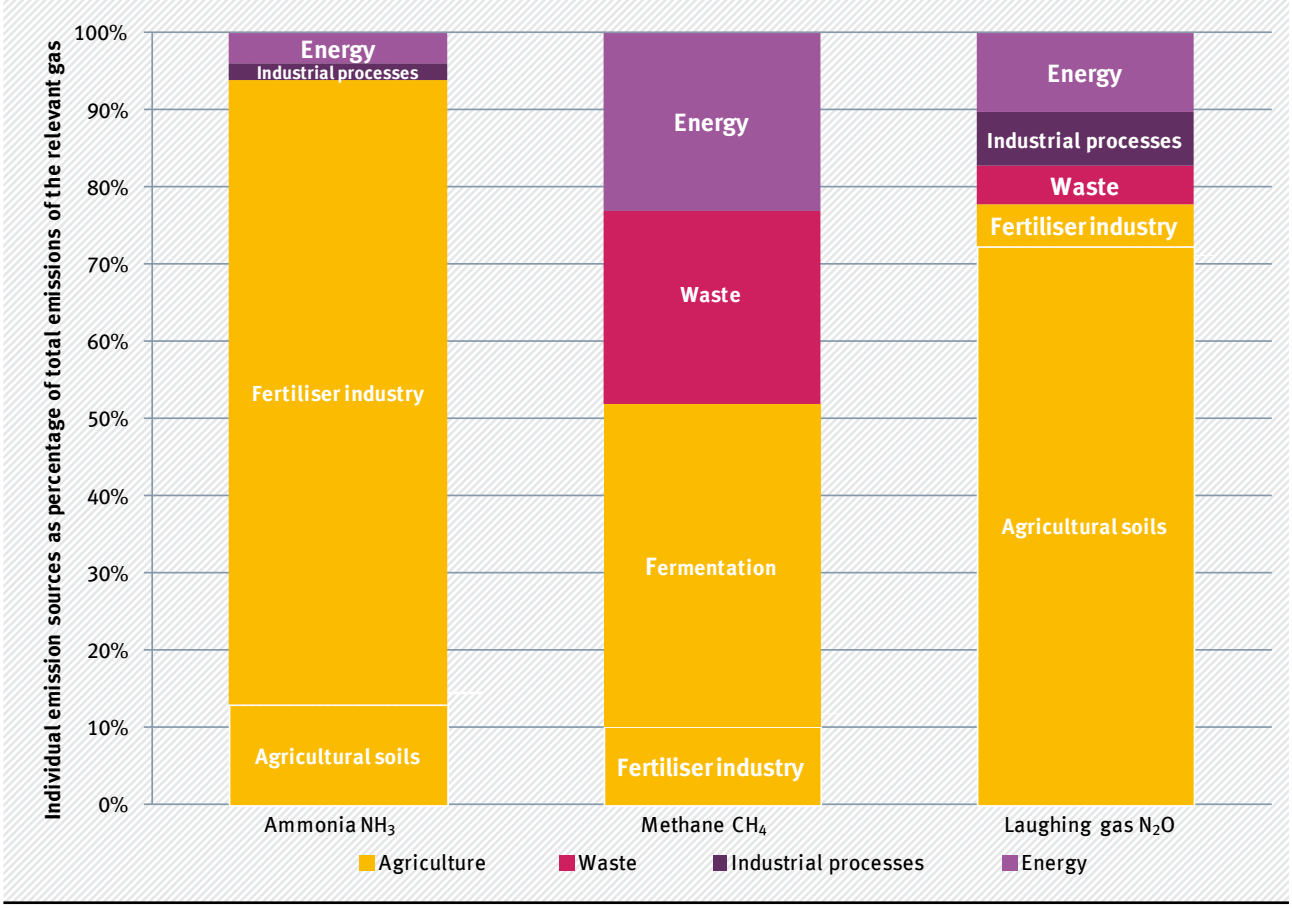
With more than 50% of the total area, agriculture is the most important sector of the German economy when it comes to use of land[222]. Extensive agricultural use performs important ecological functions by maintaining the cultural landscape and keeping it open. Among other things it it contributes to the maintenance of biological diversity and supports both soil and water conservation and groundwater recharge.

In recent years, however, agricultural land use has been characterised by increasing intensification and specialisation. Intensive agricultural production is one of the main causes of excessive nutrient concentrations (eutrophication) in the environment (especially soil and water), declining biodiversity, and impairment of natural soil functions[223]. The agricultural sector is the main source of emissions of ammonia (94%)[224], methane (54%) and nitrous oxide (76%)[225] (cf. Fig. 5). In 2010 a total of nearly 7% of all greenhouse gas emissions originated from agricultural sources. This means that agriculture gives rise to more greenhouse gases than the "trade, industry, services" sector, for example[226]. If one also includes all emissions indirectly connected with agriculture (e.g. intermediate products, fuel consumption and land use changes), this share increases to 12.9%[227]. On the basis of this extended approach, livestock farming in Germany results in 95 million tonnes of greenhouse gas emissions. This is more than 70% of greenhouse gas emissions by the agricultural sector, and nearly 10% of Germany's total emissions of greenhouse gases[228].

Environmental assets are subject to special effects arising from the nutrient surpluses and pollutant inputs in the agricultural sector and their direct and indirect impacts on biodiversity. Excess nutrients find their way into the air (especially as ammonia and nitrous oxide) and water (above all as nitrate). These have far-reaching adverse impacts on the natural

Fig. 5

Emission sources of ammonia, methane and laughing gas



Source: Own diagram based on data from UBA (2012) and UBA (2012a).

regime – such as 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 plays a major role here. From the 1990s until 2009 the annual nitrogen surplus in German agriculture was over 100 kg/ha (national farm-gate balance), and since 2010 it has been around 96 kg/ha. In other words it considerably exceeds the German Sustainability Strategy's target of 80 kg/ha for 2010[229].

The continuing high sales of pesticides must also be seen in a critical light from the point of view of environmental protection. Every pesticide used in Germany undergoes a stringent approval procedure designed to ensure adequate protection of the environment, including biodiversity, from adverse impacts due to pesticides. In practice, however, the application conditions that are essential from an environmental point of view are not always complied with. This applies in particular to requirements regarding distance from water or adjacent fringe biotopes, which farmers often regard as unreasonable. This results in infringements of environmental quality standards and non-compliance with pesticide concentrations acceptable under the regulations; these are no exception, as is clear from water studies in small bodies of water in farming country. Another major problem, frequently overlooked, lies in the indirect environmental impacts of intensive use of pesticides: The use of broad-band herbicides and insecticides results in the destruction not only of "weeds" and harmful insects, but also of other wild field plants and insects. Combinations of several products and their use in series spraying have the result that a large number of animal species occurring in agricultural landscapes – e.g. the partridge – are being deprived of their nutrition and hence of a vital resource. The outcome is a risk of a decline in or even total loss of local populations, as shown by the trends for many typical species of field birds. Only an

environmentally "healthy" agricultural landscape can compensate for such unavoidable indirect impacts of the use of pesticides, i.e. there must be a sufficiently large share of environmental compensatory areas available. The decline in set-asides as a result of increasing cultivation of energy plants and the subsequent total abolition of compulsory set-asides in 2007 have further reinforced the observed trends for a number of species[230]. The priority areas established under the reform of the CAP (cf. Section 4.2.1) offer a chance of reducing the indirect adverse environmental impacts. However, they will not be sufficient to provide the necessary compensation for these effects.

In addition to pollution by substances, soil destruction or impairment may also result from agricultural production. Such impacts are largely due to the use of heavy machinery in arable farming and in the construction of roads and tracks in the farming and forestry sector.

Financial assistance und tax reductions have always have been – and still are – a central instrument of agricultural policy. Depending on how they are designed, they can increase or reduce environmental pollution by agriculture. Subsidies that support prices and are coupled to production – which until 2003 were the central instrument of EU agricultural policy – increase the pressure on environmental assets by creating production incentives and reinforcing intensification trends (cf. Sections 4.2.1 and 4.2.5) [231]. A subsidy policy of this kind encourages farming of monocultures, increased use of pesticides and fertilisers, and the cultivation of environmentally sensitive land, all of which is accompanied by an increase in environmental impacts due to production. By contrast, decoupled direct payments of the kind introduced by the EU agricultural reform of 2003 do not have direct impacts of an environmentally harmful nature (cf. Section 4.2.1). Because the payments are tied to environmental standards (cross compliance) they could theoretically even help to improve the quality of the environment. However, the existing cross-compliance rules are not sufficient to achieve important environmental protection objectives such as maintaining biodiversity[232].

Not only subsidies coupled to production, but also subsidies for agricultural production factors may contribute to impairment of environmental assets by creating incentives to make excessive use of the factors in question. Examples include the reduced rate of energy tax on agricultural diesel fuel (cf. Section 4.2.3) or the exemption of tractors from vehicle road tax (cf. Section 4.2.4).

The examples show that some agricultural subsidies can considerably increase harmful impacts on the environment. However, total discontinuation of the agricultural subsidies makes neither economic nor environmental sense, for example because low-yield areas, which are for the most part extensively farmed using traditional methods, would become unprofitable, with the result that they would increasingly lie fallow and some valuable habitats would be lost[233].

The state should therefore provide targeted rewards for environmental services by the agricultural sector on the principle of "public money for public goods", e.g. by promoting agri-environmental and climate change measures or supporting the transition to organic farming. Moreover, direct payments should be coupled to compliance with ambitious environmental standards.

4.2 The main environmentally harmful subsidies in the agricultural and fisheries sector

4.2.1 European Union agricultural subsidies

The Common Agricultural Policy (CAP) of the European Union largely determines the economic framework conditions for agriculture in Germany. The CAP is based on two pillars. The first pillar is the market and price policy, which is intended to stabilise the prices of agricultural products and safeguard farmers' earnings. The second pillar of the CAP consists of measures to promote rural development. These are intended to improve the competitiveness of the agricultural sector, raise the quality of life and the environment in rural areas, and open up opportunities for earning outside the farming sector[234]. Compared with the first pillar, it offers the Member States considerably more scope in the design of instruments and measures. On the other hand, measures under the first pillar are fully financed by the EU, whereas measures under the second pillar have to be co-financed by the Member State in question.

For a long time the central instrument of the first pillar of the CAP was guaranteed minimum prices for agricultural products. This policy led to considerable

over-production ("butter mountains" or "milk lakes")[235]. To reduce the artificial incentives for production and relieve the pressure on the market, the EU has increasingly cut back price-support measures in favour of direct payments since the early 1990s (McSharry reform 1992). However, the coupling of the direct payments to production essentially continued, since they were tied to specific crops/products. Ecologically advantageous forms of farming, such as extensive use of grassland, were often not eligible for direct payments.

Environmentalists have long been critical of the first pillar of the CAP, because it contributed to the growth and expansion of intensive production, for example by promoting specific crops – e.g. maize. This trend considerably increased the pressure exerted on the environment by the agricultural sector (cf. Section 4.1)[236]. Thus the former market and price policy definitely had environmentally harmful impacts.

It was not until the Luxembourg decisions of June 2003 that the CAP was fundamentally reformed. The direct payments have been largely decoupled from production since 2005. Germany initially implemented this decoupling by means of a "combination model". Accordingly, the payment a farm was entitled to claim was based on the amount of direct payments received in the past (average of the years 2000 to 2002) and the size of the area eligible for assistance[237]. From 2009 to 2013 the combination model underwent a gradual change to a purely regional model: All claims to payment by a farm in a given region are based entirely on farm area (uniform area-based premium for the region), regardless of agricultural use.

The direct payments are also conditional upon the farm complying with the standards for the environment, animal feed safety and food safety, and veterinary health and animal protection ("cross compliance"). As far as the environment is concerned, this essentially means observing good professional practice. Farmers are also obliged to keep their land in "good environmental and agricultural condition". Furthermore, permanent pasture must largely be preserved, in other words farmers may only change a very small portion of it to other forms of use.

As well as cross compliance and the decoupling of direct payments from production, another core element of the reform is "obligatory modulation". Obligatory modulation requires the Member States to cut direct payments to farmers under the first pillar in favour of promoting rural development (second pillar). Thus since the year 2007 direct payments under the first pillar in excess of a basic allowance of €5000 to farmers (farm owners) in Germany have been reduced by 5% a year.

The CAP's medium-term financial forecast for the years 2007 to 2013 resulted in second-pillar funds for rural development in Germany being cut by 11%. In particular, this affected the assistance for changing over to organic farming. Although individual Länder have raised assistance for organic farming again out of their own budget resources, this was a setback with regard to an eco-oriented subsidies policy.

In 2008 the European Council decided that the cuts in direct payments under the first pillar should be offset by gradually increasing the second pillar by a further 5-10% during the period 2009 to 2012[238]. However, Germany managed to persuade the European Commission that the additional funds should be used to promote not only climate protection, biodiversity, water management and renewable energy sources, but also dairy farming[239].

The reform of 2003 also provided an opportunity to use up to 10% of the direct payment volume for promoting special forms of agricultural activity and quality production. For example, this enables the Member States to give special treatment to particularly eco-friendly extensive forms of farming, without having to make money available from the second pillar or provide national co-financing. However, Germany also applies this option to intensive farming operations in the dairy sector.
The complete decoupling of direct payments from production (including the abolition of the former livestock premiums and integration of the payments into the area-based premium) means that direct payments are having less and less influence on the intensity of agricultural production. Thus they are not environmentally harmful *per se* like the previous payments that were coupled to production. However, direct payments should only be granted if the farmers comply with adequate standards of agricultural production in return. In all efforts

to reduce bureaucracy, it is therefore essential to ensure that the environmental standards of cross compliance are rigorously applied and continuously developed. Special exceptions favouring small farms ("new *de minimis* rules") are not justified from an environmental protection point of view and put the achievement of environmental objectives at risk.

The second pillar of the CAP must be given a positive rating from an environmental point of view. Agri-environmental programmes – including promotion of organic farming – are an important part of the second pillar. Compliance with good professional practice forms the starting point for rewarding ecological achievements that go beyond this level. So far, however, measures belonging to the second pillar have on the whole only been able to mitigate the negative environmental impacts that were supported rather than prevented by the first pillar – but not to offset them entirely[240]. This is because the first pillar has a much greater influence on the development of agriculture than the second pillar[241]. For example, the volume of funding available for price support and direct payments is far greater than for rural development measures. In 2009 Germany had €6.4 billion[242] in the first pillar, but only €1.16 billion[243] in the second pillar[244]. Thus even including national aid, an average of only €928 million per year is left for the focus area "environment and landscape" in the second pillar[245].

Moreover, as a result of the co-financing requirement for measures under the second pillar, there are cases where money for agri-environmental measures is not being taken up, because the Länder are unable or unwilling to contribute the co-financing. This leads to a lack of certainty for farmers trying to plan, and makes it more difficult to implement agri-environmental measures.

Since the environmentally harmful portion of the total EU assistance for agriculture is difficult to identify, this subsidy is reported as unquantifiable.

During 2013 the European Commission, the Council of Ministers and the European Parliament reached agreement on a reform of the Common Agricultural Policy. One objective of the reform is to make the first pillar of the CAP "greener". It is therefore proposed to tie 30% of the direct payments to three environmental measures[246]:

- Farms over 30 hectares must grow at least three different crops, of which one crop may account for up to 70% of the arable area; farms over 20 ha must grow two crops.
- Permanent pasture must remain preserved at farm level (instead of Land level, as in the past), and
- 5% of the arable area (later 7%) of a farm must be managed as a priority ecological area.

Moreover, Germany plans to give greater assistance for the first hectares per farm. This is the Commission's reaction to criticism that it is primarily large farms that profit from direct payments. The reform also provides that in future subsidies will only be paid to "active" farmers – at present direct payments are also made for recultivated open-cast lignite mining areas or areas within airports.

To ensure the "greening" of European agriculture, the UBA recommends that the environmental measures be introduced as a compulsory requirement for direct payments as a whole, not merely for the 30% greening component. This means that successful implementation of the greening component would be a condition for receiving any money at all from the first pillar[247]. Under the present decisions, however, direct payments will also be made to farms that do not implement environmental measures. There is however the possibility of cutting more than just the 30% greening component.

To ensure an effective greening component, the Agricultural Commission at the UBA (KLU) recommends stricter requirements for the environmental measures as follows:

- Crop diversity: No crop may account for more than 45% of the arable area of a farm. Perennial crops should be calculated separately for each growth year.
- Preservation of permanent pasture: There should be an absolute ban on ploughing up pasture. To prevent anticipatory reactions to the announcement, 2011 should be taken as the reference year.
- Ecological priority areas: The environmental interest should focus on the priority areas. This means the priority areas do not automatically result in set-asides, but can be used in eco-friendly ways. The share due to ecological priority areas should in each case be 10% of the arable and pasture areas eligible for assistance. The 5% of arable land currently approved cannot be more than a first step.

The reform of the CAP completely ignored the serious environmental impacts caused by the agricultural sector as a result of high nitrogen surpluses and excessive livestock densities. In addition to the measures already mentioned, the UBA therefore recommends imposing requirements with regard to the nitrogen balance and restrictions on livestock densities. A half-time review of the reformed CAP is scheduled for 2017. The European Commission should take this opportunity to remedy the cited deficits in the agricultural reform.

4.2.2 Joint Agreement for the Improvement of Agricultural Structures and Coastal Protection

The purpose of the Joint Agreement for the Improvement of Agricultural Structures and Coastal Protection (GAK) is to[248]:

- ensure an efficient agricultural and forestry sector geared towards future requirements,
- facilitate competitiveness of the agriculture and forestry sector on a European comparison, and
- improve coastal protection.

The objectives of environmental protection and animal welfare and of market-appropriate and site-appropriate agriculture must be observed here.

The annually updated GAK framework plan is the central instrument for applying the second pillar of EU agricultural policy in Germany, as described in the "Federal Republic of Germany's National Strategic Plan for Rural Development 2007-2013". The GAK serves as a content-oriented and financial basis for Länder programmes and ensuring the obligatory co-financing of the relevant EU resources[249]. The amount of co-financing depends on the specific project, the region and the parties receiving the grant[250]. Some 60-80% of the GAK (depending on the task) is financed from the federal budget and 20-40% from the Länder budgets, with the co-financing of the EU resources being funded by the federal component[251]. In 2010 expenditure by the GAK came to over €1 billion[252]. The fields assisted by the GAK include "Improving rural structures", "Improving production and marketing structures", "Sustainable land management" and "Forests".

Originally the assistance was aimed primarily at measures to increase productivity. This led to more intensive farming and thereby increased the environmental impacts due to agriculture. In the GAK realignment process in recent years, the federal and regional authorities have already made significant changes in the objectives and content of individual assisted fields. This has made it possible to substantially reduce negative environmental impacts and transform them into effects that are ecologically neutral, or even positive[253]. The GAK nevertheless continues to support measures that can have adverse impacts on the environment[254], for example by assisting certain measures in the fields of water resource management and crop growing, and the creation and development of new capacities in the fishing industry [255] (€3.9 million in 2010[256]).

Furthermore, the broad freedom enjoyed and variously exploited by the Länder in their implementation of the GAP results in conflicting developments within national agricultural policy which are not only at the expense of the taxpayer, but also at the expense of the environment. For example, the southern Länder promote dairy farming on grassland in upland and mountain areas, not only to secure the economic livelihood of the various farms, but also to preserve the landscape (for leisure, recreation and tourism) and to conserve the diversity of species on the mountain pastures and meadows (implementation of the Convention on Biological Diversity). At the same time, for example, funds from the GAK are used in Lower Saxony to assist cattle farming in cowsheds on the basis of maize and imported feeds. Because of the more economic production conditions on the north German plain this leads (via competition on the market) to a creeping shift of milk production from south to north, which tends to frustrate the above-mentioned environmental objectives associated with conserving the agricultural economy of the central upland and mountain areas. Here there is a need for better coherence of the objectives and measures of the GAK, to be achieved by strengthening the competence of the federal level.

To a certain extent, the promotion of integrated rural development and forestry measures by means of infrastructure measures is also negative from an environmental point of view. This applies for example to the development of farm and forestry tracks and the surfacing of existing tracks with asphalt or concrete. The growth of areas used for roads and tracks is more than 6 hectares per day, of which approximately 1.2

hectares per day are directly due to the development of forestry tracks under the GAK. In 2006 some €14 million was spent on about 1000 km of roads and tracks[257]. Other assistance programmes also subsidise farm and forestry track construction, especially the European Agricultural Fund for Rural Development (EAFRD).

The GAK must therefore be developed continuously in accordance with environmental criteria. Reducing environmentally harmful subsidies creates financial scope for other, eco-friendly promotion measures.

4.2.3 Tax rebate for agricultural diesel fuel

The German government pays 21.48 cents per litre towards diesel fuel for agriculture and forestry[258]. In this way, farm diesel enjoys a reduced tax rate of 25.56 cents per litre compared with the standard rate of 47.04 cents per litre. The Budget Accompanying Act 2005 [259] restricted this tax rebate to 10,000 litres a year per farm and also deducted a lump sum (so-called excess) of €350 from the refund. The Act of 2009 amending the Energy Tax Act (Gesetz zur Änderung des Energiesteuergesetzes) suspended these restrictions on the tax concession for the years 2008 and 2009. As a result the amount of subsidy rose by €287 million per year. From a budget point of view, however, this did not take effect until 2009 and 2010. The time limit for the excess and the maximum quantity limit were removed by the Act of March 2011 amending the Energy Tax and Electricity Tax Act. The abolition of the time limit – and hence the extension of the subsidy – was approved by the European Commission under the legislation on state aid until the end of 2016.

According to the German government's 23rd Subsidies Report, the agricultural diesel refund is intended to reduce competitive disadvantages suffered by German agriculture with regard to diesel costs. However, the fuel price subsidy reduces the incentive to make efficient use of the fuel. From an environmental and climate point of view, the tax concession on agricultural diesel thus has harmful impacts and is therefore not a suitable means of supporting agriculture and forestry. Agricultural diesel should therefore be subject to the standard tax rate.

In 2010 the tax concession for agricultural diesel resulted in a tax shortfall of

€395 million[260]**.**

Instead of the tax rebate on agricultural diesel, this money could be used to strengthen the competitive position of the agricultural sector in ways that were environmentally sounder and more efficient. The additional tax revenue resulting from the abolition of this tax concession could be used for rural development (second pillar) – and especially the agri-environmental programmes – and could thus remain largely within the agricultural sector. If the subsidy for agricultural diesel were not done away with entirely, the second-best solution would be to provide the tax rebate on a flat-rate basis[261]. Here the legislature would presume a specific diesel consumption per hectare of land and would refund the tax partly on the basis of farm size. In that case the refund would have the effect of a flat-rate area-based premium. Since the actual fuel consumption would no longer play any role in the tax rebate – because the agricultural diesel would be taxed at the standard rate of 47.04 cents per litre – the economic incentive to save fuel would be fully maintained.

4.2.4 Exemption of agricultural vehicles from vehicle road tax

Agricultural vehicles are exempted from vehicle road tax[262]. This tax exemption goes back to 1922, when it was intended to promote the motorisation of agriculture and forestry. This objective is now out of date. The trend to increasingly heavy machines in agriculture results in increasing damage to agricultural soils through compaction. Such damage is often irreversible and restricts the natural functions of the soil. Since the tax rebate encourages this trend, it must be classified as environmentally harmful. It also contributes to the fact that farms have an excess of machinery, instead of making adequate use of potential efficiency improvements – such as "machinery rings".

In 2010 the exemption from vehicle road tax for tractors etc. in the agricultural sector resulted in a loss of tax revenue for the federal authorities totalling

€60 million[263]**.**

Here too the assistance for the agricultural sector is focusing on the wrong aspect. As an alternative, one could use the money to strengthen rural development or to provide direct rewards for environmental services (e.g. maintenance of ecologically valuable

land by means of extensive use, or care of landscape elements).

4.2.5 Subsidies for production of spirits

The subsidy is intended to safeguard sales of agricultural alcohol, which is produced mainly in small and medium distilleries. Owing to their unfavourable production conditions these are at a competitive disadvantage compared with large distilleries in other European Member States. It is thus designed to ensure that German distilleries derive adequate earnings from this activity. Since 2000 the German market for agricultural alcohol has basically been deregulated. Nevertheless, large agricultural distilleries (until 2013) and small distilleries and fruit distilleries (until 2017) can continue to produce subsidised agricultural alcohol within the limits of their quota and market it through the federal monopoly administration. To this end a final extension of the special exception under the laws on state aid was approved by the EU in 2010. Depending on their original production volume, and on the basis thereof, a compensation payment is made for five operating years after they have left the spirits monopoly.

The production methods of the approximately 28,000 distilleries differ very widely, ranging from environmentally sound (e.g. based on extensive fruit orchards) to environmentally dubious (e.g. based on intensive potato growing)[264]. Since this subsidy is coupled to production, it creates an incentive to intensify farming methods. In 2010 the German government supported the production of agricultural alcohol to the tune of

€75 million[265]**.**

Instead of continuing the subsidy in its present form, the state should in future grant direct assistance for eco-friendly production methods such as extensive fruit orchards, but the amount of assistance should be independent of production volumes.

4.2.6 European Union fisheries subsidies

Fishery operations are one of the greatest impact factors for ocean ecosystems. Large-scale damage to habitats is caused above all by bottom-scouring fishing gear such as bottom trawls. In addition to the quantity of unused rejects of commercially used species that are thrown overboard (an estimated 40% of the total worldwide catch), the by-catch levels of non-target species are also a problem. According to the International Whaling Commission (IWC), up to 650,000 seals and whales are killed in this way every year, with bottom-set gillnets being responsible for most by-catches[266].

According to information supplied by the European Commission in 2014, only 22% of the regulated stocks in European waters are classified as not overfished[267]. The escalation of the fish stocks crisis is largely due to short-term profit orientation, oversized fishing fleets, decades of setting excessive catch quotas and ignoring scientific recommendations, and environmentally harmful subsidies for the fisheries sector. The European Commission reports that parts of the EU fishing fleet have catch capacities that are two to three times the sustainable level. Other factors are the use of environmentally harmful fishing methods with adverse effects on stocks, inadequate control of fishing operations, and illegal fishing. Aquaculture as currently practised also contributes to overfishing of the oceans. For example, up to four kilograms of fish caught in the wild are fed to obtain one kilo of aquaculture salmon or cod, and for tuna as much as 20 kilos of protein is needed per kilo of fish produced. The focus on carnivorous species means that aquaculture operations worldwide use 50% of the fish meal produced by the industrial fishing sector and 80% of the fish oil. In addition, open aquaculture systems can present a threat to the surrounding water owing to excessive supplies of nutrients from food residues and excrement, and also the use of pharmaceuticals and antifouling agents. Moreover, escaped broodfish can prevail over and adversely affect natural stocks.

As a reaction to the negative effects of fishing operations, the reform of the Common Fisheries Policy of the EU which came into force in 2014 (CFP)[268] includes requirements for sustainable and eco-friendly management of commercially used fish stocks. As well as a ban on discards and an associated requirement to land commercially used species, the management of all stocks used is to be implemented on the basis of the maximum possible long-term yield until 2020. While these reform proposals are a step in the right direction, some of them should be more ambitious. For example, a general ban on discards

should be introduced with immediate effect for non-commercially used fish species and for seabirds and marine mammals, and technical requirements for eco-friendly fishing methods should be drawn up and implemented.

Initially the CFP was supported by payments from the European Agricultural Fund, but in 1993 the European Union created a separate fisheries fund (known since 2003 as the European Fisheries Fund (EFF). For the period 2007 to 2013, EFF subsidies totalling €247 million (including the national contribution) were earmarked for the German fisheries sector. In fact, according to the Federal Institute for Food and Agriculture (BLE) subsidies totalling only €35 million are documented for the German fisheries sector for that period[269]. The BLE publications merely list the project titles. The precise purpose of the projects subsidised by the EEF is not published, and it is therefore not possible to quantify accurately the environmentally harmful portion of this subsidy. In addition to the direct payments from the European Fisheries Fund and comparable aid schemes at national level, the fishing industry receives numerous indirect subsidies, the most important of which is complete exemption from fuel taxes (cf. Section 2.2.5). Estimates indicate that in several Member States the total value of catches fails to cover the costs borne by the state as a result of the fishing industry[270].

In May 2014 a redesigned fishery fund was set up under the reformed CFP (European Maritime and Fisheries Fund[271], EMFF). Until 2020 EU assistance totalling about €800 million[272] will be available to the fisheries sector every year. The EMFF has earmarked financial assistance of up to €220 million for the period 2014 – 2020.

The new orientation of the fund since May 2014 is intended to assist European companies with the transition to sustainable fisheries, help coastal communities to develop new business activities, and promote projects that create new jobs and improve the quality of life in Europe's coastal regions.

It is interesting to note that the EMFF sets out as an objective the development of an environmentally sustainable, resource-efficient, innovative, competitive and knowledge-based aquaculture. A trend-setting approach would be the expansion of ecological closed-cycle aquaculture with a focus on herbivorous fish, in order to minimise the pressures on wild fish stocks and the environment in general.

The increase in financial resources for capturing data on fish stocks to €520 million and for fisheries surveillance to €580 million is an important signal for the development and implementation of sustainable fisheries. In the past the biggest beneficiaries of EU subsidies for building new vessels have always been the largest fishing vessels that operate on the world's oceans and make a large contribution to the excessive exploitation of fish stocks. The reorientation of the CFP, by contrast, is intended to raise the accountability of member states whose fishing fleets have surplus capacity, while providing assistance for measures to modify fleets with the aim of achieving a balanced relationship with the available catch potential and for small-scale coastal fishing within the framework of sustainable fisheries. No further funds should be provided for the construction of new fishing vessels or for other initiatives that would contribute to increasing catch capacity. Furthermore, greater transparency is sought regarding the payments received from the EMFF, in the interests of better information for the potential beneficiaries and the general public[273].

It is not possible at present to assess the implementation and effects of the EMFF at the level of the member states. Consequently it is not yet possible to estimate the extent to which the EMFF also subsidises environmentally harmful measures. However, there is reason to expect greater transparency regarding the payments received from the EMFF. This will permit a better assessment of subsidies and their environmental impacts.

4.2.7 Environmentally harmful VAT concessions

The standard rate of value-added tax (VAT) in Germany is 19%. For certain groups of products there is a reduced tax rate of 7%[274]. This applies primarily to food, but also to printed products, animal feeds or local public transport[275]. The VAT concessions have taken shape over the years. In some cases reduced tax rates have also been introduced in recent years, with the result that the present system as a whole is not consistent. The Federal Court of Audit criticises the fact that in many cases the reasons for concessions are not objectively justified and are used to exploit free-rider effects and opportunities for abuse. It therefore

calls for the tax concessions to be individually examined, and for a fundamental revision of the entire list of reductions[276]. In its report dated 30 October 2007 the Federal Finance Ministry classifies a large number of the provisions on the reduced tax rate as rules with a pronounced subsidy character[277].

The products benefiting from the reduced tax rate also include products with adverse effects on the environment. This applies, for example, to meat and dairy products, the production of which gives rise to substantial climate impacts and is also associated with other negative environmental effects due to nutrient surpluses and water pollution. Moreover, fodder growing uses large areas and is often associated with adverse impacts due to intensive arable farming. The German Advisory Council on the Environment therefore recommends discontinuing the reduced value-added tax rate on animal products[278]. The increase in the price of animal foods due to applying the full rate of value-added tax could motivate consumers to reduce their consumption of animal products and replace them with vegetable products[279]. Delicatessen products such as goose liver, frogs' legs and turtle meat also profit from the reduced value-added tax rates. These concessions should be abolished for environmental reasons – especially since they are luxury goods which are not necessary for basic supplies of foodstuffs.

It is beyond the scope of this report to quantify the total subsidies for environmentally harmful products due to the value-added tax reductions. This would require an examination of the environmental impacts of all these special provisions. However, for individual product groups there are estimates of the amount of subsidies due to the reduced rate of value-added tax. For example, estimates put the subsidies due to the reduced VAT rate on meat products at around €2.5 billion[280].

For environmental reasons it basically makes sense to discontinue the reduced VAT rate for environmentally harmful products. However, social impacts must be taken into account as well. To avoid a higher tax burden on consumers, the state could, for example, use the additional tax revenue to reduce both the standard and the reduced rates of VAT.

There is also a need for reform at EU level, as the present value-added tax directive lays down the legislative framework for national regulations and also fails to take environmental aspects into account. In this respect it is to be welcomed that the EU is currently working on a reform of the VAT system which will also take account of environmental aspects. For example, the European Commission has advocated that in future the reduced rate of VAT should no longer be used for goods and services that have adverse impacts on the environment, human health and public welfare[281].

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

1 Environmentally harmful subsidies in 2010 and an overview of their impacts

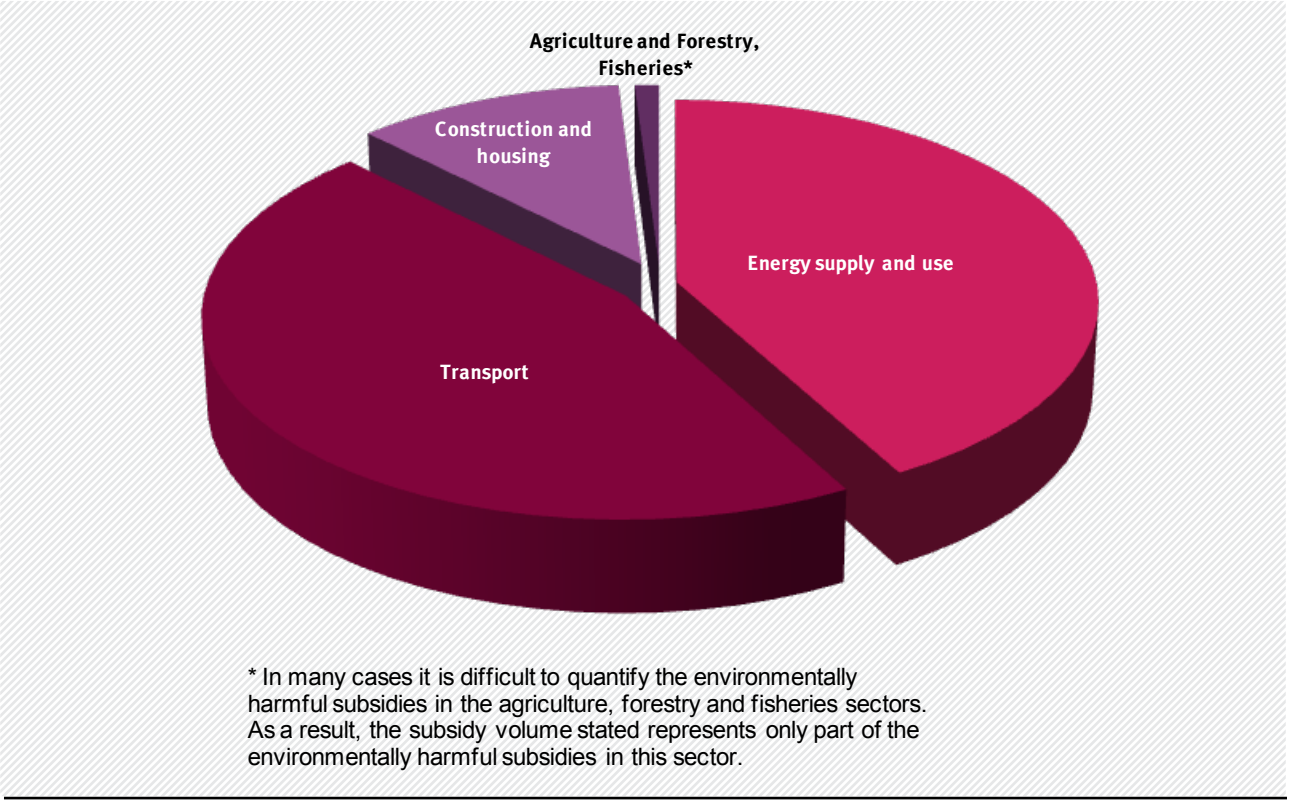
In 2010 environmentally harmful subsidies in Germany amounted to **more than €52 billion** (cf. Table 3). Since the report only gives an overview of the main federal subsidies and takes almost no account of assistance programmes at regional and local levels, the picture is not complete, and the actual volume of environmentally harmful subsidies in Germany was higher. Furthermore, in some cases it has not been possible to quantify the environmentally harmful component of the subsidies, for example in the field of regional assistance, which means that for this reason too the total volume shown in the table only indicates a lower limit.

Looking at how the environmentally harmful subsidies analysed break down among the individual sectors, we find that in 2010 the transport sector – especially because of the tax exemptions for aviation – ranks first with €24.2 billion, followed by energy with €21.6 billion and the construction and housing sector with €5.9 billion. Figure 6 provides an overview of the volume of subsidies in the individual sectors in 2010.

Environmentally harmful subsidies are also an indirect burden on public finances, since they give rise to additional (follow-on) costs for the state due to the damage caused to health and the environment. Also, environmentally harmful subsidies distort competition at the expense of environmentally sound technologies and products. This in turn results in a situation where the state has to give more support to such environmentally sound technologies and products so that they have a fair chance in competition and can become established on the market. Reducing environmentally harmful subsidies eases the pressure on public-sector funds in several respects.

Fig. 6:

Breakdown of subsidy volume by sectors



Source: Own diagram

In some cases, however, there are legal reasons why immediate and total abolition of the environmentally harmful subsidies identified is not possible, as the example of the home ownership grant shows. Thus in many cases they will continue to be a considerable burden on public-sector budgets, and hence on the taxpayer too, for years to come. For this reason too it is important, before introducing a subsidy, to check carefully whether it makes sense and what long-term impacts it has on public-sector finances.

Subsidies can adversely affect the environment in a variety of complex ways, making it difficult to quantify the resulting environmental impact. Another aspect is that there are interactions between the various environmental assets. This report therefore takes only a qualitative look at the damage caused to the environmental assets climate, air, water, soil, biodiversity and landscape by subsidies, and also the resulting adverse impacts on human health and resource consumption. Table 3 provides an overview of the adverse effects of the individual subsidies. It shows that subsidies, via primary and secondary effects, put at risk or adversely affect human health and all environmental assets considered, and/or encourage resource consumption[282].

Subsidies of €21.6 billion are provided to assist the **energy supply and use** sector. This applies not only to extraction of the energy sources (e.g. coal and lignite), but also to energy generation. Subsidies that lower the price of energy reduce the incentive to make economical and efficient use of energy. This results in higher energy consumption, combined with greater energy-induced environmental pollution. Examples include tax reductions and exemptions in the field of energy tax and electricity tax for companies in the manufacturing industry and the agricultural sector.

Subsidies in the energy sector must also be classed as environmentally harmful if they distort competition between energy sources to the benefit of relatively harmful fuels and thereby lead to a non-sustainable energy mix. This applies to the free allocation of CO_2 emission allowances in the emissions trading scheme, and the preferential treatment of biofuels. Preferential treatment of fuels lowers their cost, thereby reducing the economic incentive to acquire low-consumption

Table 3

Environmentally harmful subsidies in Germany in 2010

Environmentally harmful subsidies by sector	€m (2010)	Adverse impacts on environment, health and resource consumption						
		Climate	Air	Water	Soil	Biodiversity and landscape	Health	Resources
1 Energy supply and use	21,649							
Reduction on electricity tax and energy tax for the manufacturing industries and for agriculture and forestry	2,518							
Peak equalisation scheme for eco tax in the manufacturing industries	1,939							
Tax reduction for certain energy-intensive processes and techniques	983							
Coal subsidies	1,917							
Privileges for the lignite industry	min. 279							
Energy tax reductions for coal	190							
Manufacturer privilege for producers of energy products	300							
Energy tax exemption for non-energy uses of fossil fuels	min.1,580							
Free allocation of CO_2 emissions trading allowances	6,098							
Grants to electricity-intensive enterprises to offset electricity price increases due to emissions trading	-							
Special compensation provisions under the EEG for electricity-intensive enterprises and railways	1,455							
Internal power privilege under EEG (industrial sector)	754							
Preferential treatment of grid fees for energy-intensive industries	33							
Privileges for special-contract customers with regard to concession charges for electricity	3,500							
Reduced rates of CHP surcharge for the manufacturing sector and energy-intensive industries	103							
Subsidies for nuclear power	n.q.							
Export credit guarantees (Hermes cover) for coal-fired and nuclear power plants	n.q.							

2 Transport	24,168
Energy tax reduction for diesel fuel	7,050
Distance-based income tax allowance for commuters	5,000
Exemption of kerosene from energy tax	6,915
VAT exemption for international flights	3,490
Energy tax exemption for inland waterway transportation	166
Energy tax concessions for mobile machinery and vehicles used exclusively for goods handling in seaports	25
Flat-rate taxation of privately used company cars	min. 500
Biofuels	1,022
3 Construction and housing	5,877
Home ownership grant	4,803
Promotion of saving for building purposes	556
Promotion of social housing	518
Joint Agreement for the Improvement of Regional Economic Structures	n.q.
4 Agriculture and forestry, fisheries	530
Agricultural subsidies of the European Union	n.q.
Joint Agreement for the Improvement of Agricultural Structures and Coastal Protection	n.q.
Tax rebate for agricultural diesel	395
Exemption of agricultural vehicles from vehicle road tax	60
Subsidies for production of spirits	75
Fisheries subsidies of the European Union	n.q.
Environmentally harmful VAT concessions	n.q.
TOTAL	52,224

n.q. = not quantifiable

Primary effects

Secondary effects

vehicles and reduce fuel consumption by changing driving habits, e.g. by driving differently or stepping up use of other, eco-friendly means of transport. One example of this is the concessions for the lignite industry, the energy tax concessions for coal, and the explicit and implicit subsidies for nuclear energy that make it at all profitable for individual operators in the first place. These subsidies tend to increase the need for assistance for renewable energy sources.

In the **transport sector** subsidies amounting to €24.2 billion contributed to environmental pollution in 2010. Nearly half the environmentally harmful transport subsidies, approximately €10.4 billion, were due to air transport. Other major items of quantitative significance are the energy tax reductions for diesel fuel, the distance-based income tax allowance, and the tax concession for diesel fuel compared with petrol. Low fuel or running costs due to subsidies also reduce the incentive to invest in innovative and efficient drive technologies or vehicles.

Preferential treatment for environmentally harmful carriers makes them more competitive, which results in their gaining a growing share of the total transport volume. One particularly telling example is the tax concessions for air transport. What is more, by reducing the overall cost of transport, subsidies create an incentive to increase the transport volume. This is the case, for example, with the distance-based tax allowance for commuters, which also contributes to urban sprawl. Subsidies for biofuels also have a variety of harmful effects on the environment, for example due to intensive agricultural production methods or land-use changes due to imported biofuels.

The **construction and housing** sector received environmentally harmful subsidies totalling €5.9 billion in 2010. The subsidies reduce the cost of building new housing or developing new industrial, commercial and transport areas. The state funds tend to strengthen the incentive to build, and in most cases they do not differentiate between previously used land and newly developed "greenfields" sites. Subsidies of this kind favour increasing land take for settlement and transport, the progressive sprawl of settlement in the countryside, rising energy consumption, growing traffic flows and high demand for raw materials. The largest share of these subsidies is still due to the home ownership grant, though this was discontinued for new applications in 2006 and is therefore running out.

There are also numerous environmentally harmful subsidies in the **agriculture, forestry and fisheries** sector. In many cases it is difficult to quantify them, which means that the total volume of €530 million shown in the table for environmentally harmful subsidies is only the tip of the iceberg. Items of particular relevance from an environmental point of view are the EU assistance for agriculture and the measures under the Joint Agreement for the Improvement of Agricultural Structures and Coastal Protection, and also the EU fisheries policy, which has made a major contribution to overfishing in recent years.

In general, agricultural subsidies that support producer prices or are coupled to production quantities, e.g. in the case of agricultural alcohol, must be classified as environmentally harmful. They create incentives to increase agricultural production, reinforce trends to intensification and thereby increase the pressure on the environment. But even subsidies for agricultural production factors have adverse environmental effects by creating incentives to step up use of the individual production factors. The reduced energy tax rate for agricultural diesel and the exemption of agricultural vehicles from vehicle road tax are therefore harmful from an environmental and climate point of view.

Another problem is VAT concessions for products that have environmental impacts. This applies, for example, to meat and dairy products, the production of which gives rise to substantial climate impacts and is also associated with other negative environmental effects due to nutrient surpluses and water pollution. The European Commission has come out in favour of no longer applying the reduced rate of value-added tax to goods and services that have harmful impacts on the environment, human health and public welfare. To avoid a higher tax burden on consumers, the state could, for example, reduce both the standard and reduced rates of value-added tax in return.

It is also interesting to consider the vertical aspect of Table 3. For example, it is evident that in Germany one quarter of the environmentally harmful subsidies in 2010 – more than €12 billion – have harmful primary effects on biological diversity and the landscape. Subsidies in Germany also have serious adverse effects on the climate. Nearly 90% of the environmentally harmful subsidies are at the expense of the climate. In most cases this is accompanied by harmful primary effects on air quality and human health.

2 Development of environmentally harmful subsidies

The Federal Environment Agency last analysed the environmentally harmful subsidies for the year 2008[283] in a study published four years ago. A number of environmentally harmful subsidies have been newly included in the update of the study for 2010. For this reason the totals for environmentally harmful subsidies for the years 2006 (nearly €42 billion) and 2008 (over €48 billion) are not directly comparable with the subsidy volume for 2010 (over €52 billion). When interpreting the subsidy volume, it should also be remembered that changes in the subsidy volume are not always due to political measures. For example, the increased amount of the energy tax concession for diesel fuel is due to an absolute increase in diesel

consumption, and the lower subsidy volume for free allocation of CO_2 emission allowances is largely due to the lower average price per tonne of CO_2 in 2010.

An analysis of subsidies policy in recent years shows a very mixed development. Some environmentally harmful subsidies are due to run out in the next few years or have been reduced or abolished. These include the general energy tax reduction for the manufacturing and agricultural sectors, the coal subsidies, the home ownership grant and the subsidies for the production of spirits. At the same time, however, the German Government has also introduced new environmentally harmful subsidies or expanded existing environmentally harmful subsidies. This applies, for example, to the tax concession for agricultural diesel, the energy tax concessions for mobile machinery and vehicles used exclusively for goods handling in seaports, and the grants to electricity-intensive enterprises to offset electricity price increases due to emissions trading. This means that in recent years there has been no recognisable sign of a systematic reduction in environmentally harmful subsidies.

The following outline provides an overview of the main developments in recent years and their causes.

Since 2006 the **energy supply and use** sector has shown a marked rise in environmentally harmful subsidies from €11.6 billion (2006) to €17.7 billion (2008) and €21.6 billion in 2010. The rise between 2008 and 2010 is due to the new environmentally harmful subsidies. Here the main factor is the tax concessions relating to the EEG surcharge: in 2010 the special compensation provisions for electricity-intensive enterprises and railways and the internal power privilege accounted for a combined total of €2.2 billion (cf. Fig 7). In 2008 the concession was only a good half of this figure[284]. During this period the special compensation provisions were not subject to any relevant legal changes, but there was a steady increase in the number of exempted companies, and also in the privileged quantity of electricity (with the exception of 2009). Since the EEG surcharge was increased during these years, the amount of concessions was also higher. In addition to the increasing EEG surcharge, legal changes also led to a further expansion of the concessions. In 2012 the EEG surcharge concessions totalled €4.3 billion. A large proportion of the subsidies in the energy sector, namely €3.5 billion, was due to the privileges for special-contract customers with regard to concession charges for electricity. In 2010 this environmentally harmful subsidy also showed a marked rise on 2009.

The electricity and energy tax concessions remained at a similarly high level of €7.5 billion (2008: €7.3 billion)[285]. One positive aspect is the fact that in 2011 the electricity and energy tax reduction for the manufacturing sector and the agricultural and forestry sector were reduced, as was the peak equalisation scheme. This reduced the volume of subsidies in 2011 by about €1.7 billion.

In the emissions trading scheme, the quantity of emissions allowances allocated free of charge remained largely stable, whereas the average allowance price fell from €20.00 in 2008 to €15.40 in 2010. As a result the amount of the subsidy went down by nearly €1.7 billion, without there being any change in the environmentally harmful subsidy as such.

In the **transport** sector, the volume of environmentally harmful subsidies increased from €19.6 billion (2006) to €23.1 billion (2008) and €24.2 billion (2010). However, the increase between 2006 and 2010 is also partly due to the fact that 2010 was the first year in which it was possible to quantify the subsidies for biofuels[286]. There was a further marked rise in the energy tax exemption for diesel fuel. From 2006 to 2008 the increase was nearly €500 million. This tendency continued from 2008 to 2010 with a rise of over €400 million, and was due to higher absolute consumption of diesel fuel. In the air transport sector, by contrast, kerosene sales fell slightly, resulting in a decrease in the amount due to energy tax exemption for kerosene. The subsidies due to value-added tax exemption for international flights were also down considerably.

In the **construction and housing** sector environmentally harmful subsidies showed a marked drop, from €10.3 billion (2006) to €7.2 billion (2008) and €5.9 billion (2010). This trend is largely due to the discontinuation of the home ownership grant, which fell by around €4.4 billion between 2006 and 2010 – but still amounted to €4.8 billion in 2010 despite its abolition for new cases.

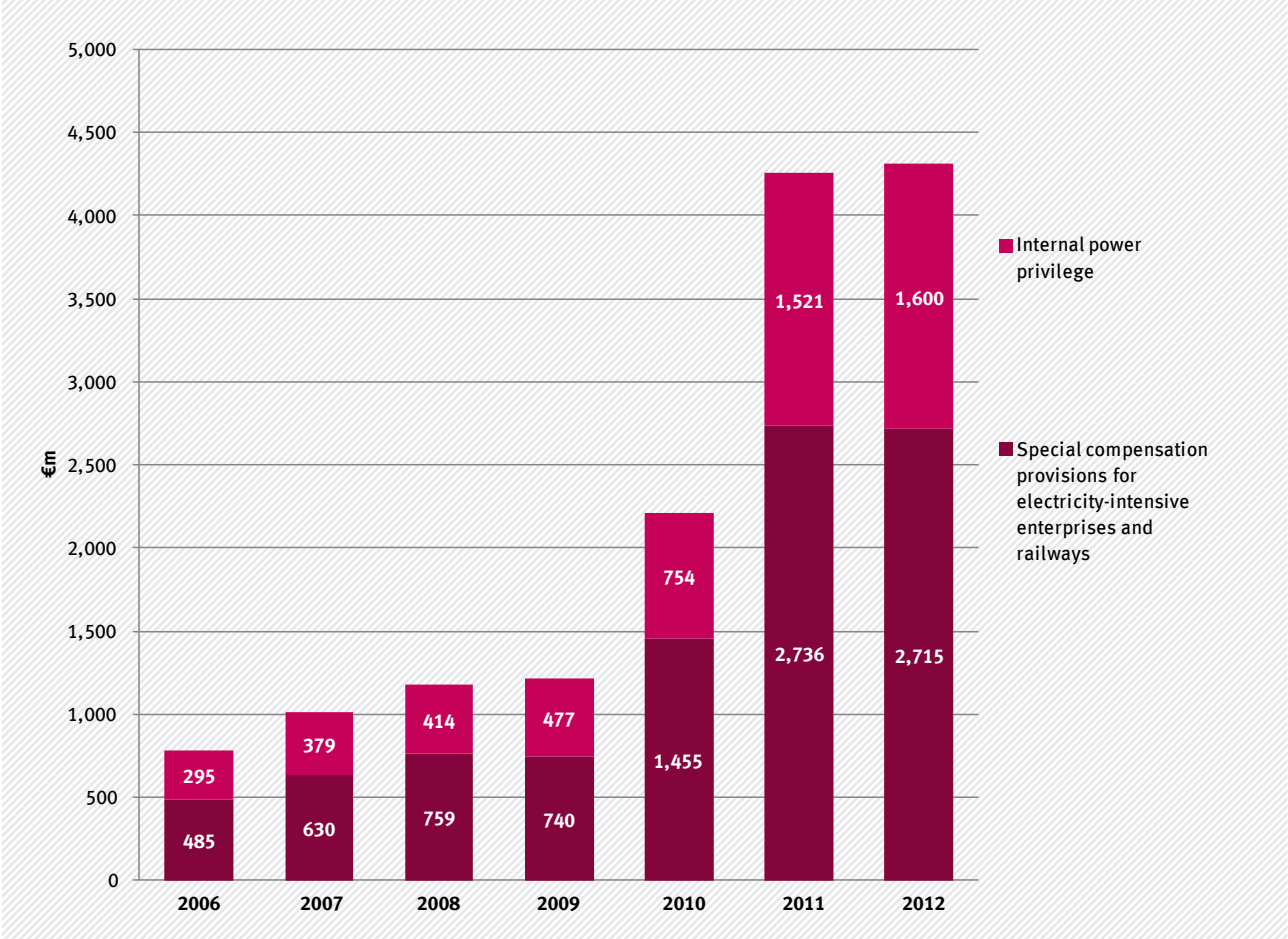
In the field of **agriculture, forestry and fisheries**, the greater part of the environmentally harmful subsidies

cannot be precisely quantified. The quantifiable volume of subsidies came to €321 million in 2006, €270 million in 2008 and €530 million in 2010. These changes are largely due to changes in the agricultural diesel refund for farmers. Here there was a marked step backwards, because the legislature first of all suspended the tax concession restrictions which were decided in the Budget Accompanying Act 2005, and then finally repealed them again in the Act of March 2011 amending the Energy Tax and Electricity Tax Act. By contrast, positive developments can be seen at European level. The revision of the agricultural and fisheries policies takes greater account of environmental concerns, albeit not to an adequate extent from an environmental point of view.

To ensure that environmentally harmful subsidies are systematically reduced in future, there is a need for eco-oriented controlling of all existing and new subsidies. A detailed description of the methodology for such a procedure can be found in Part IV "Eco-oriented subsidy controlling: The environmental check for subsidies". Moreover, a binding roadmap should be drawn up for the reduction or abolition of environmentally harmful subsidies.

Fig. 7:

Concessions for industry due to the EEG surcharge (special compensation provisions and internal power privilege)



Source: Own diagram based on data from Federal Government (2012), p. 96

IV Eco-oriented subsidy controlling: The "environmental check" for subsidies

1 Importance of eco-oriented subsidy controlling

The long list of environmentally harmful subsidies demonstrates that it is not a question of individual cases, but a wide-ranging problem which can only be solved by systematic consideration of the various environmental protection aspects in the context of subsidy policy. This would not only relieve the pressure on the environment, but would also help to remedy a number of other problems of subsidy policy. Many subsidies have been in existence for decades – numerous tax concessions date from the time before 1940. As a consequence, the objectives of many of these subsidies are out of date. Moreover some subsidies are not only environmentally harmful, but actually miss their main target or are inefficient in the way they achieve it, which means these subsidies are in need of reform for that reason alone. One example of this is the energy tax concession for diesel fuel, which was originally designed to favour commercial road transport, but also applies to private cars (cf. 2.2.1).

Against this background, environment-oriented subsidy controlling has the function of

- identifying environmentally harmful (side) effects of subsidies,
- reviewing the effectiveness and efficiency of environmentally harmful subsidies in the light of their principal objective, and
- making a critical review of the objectives of environmentally harmful subsidies.

This forms the basis for developing and implementing reforms. Thus a controlling system of this kind is an important basic requirement for an effective, efficient and environmentally sound subsidy policy. Experience shows that once subsidies exist, it is very difficult to abolish or reform them. Obstacles exist which are rooted in lack of transparency and in the political process. Frequently there is a lack of

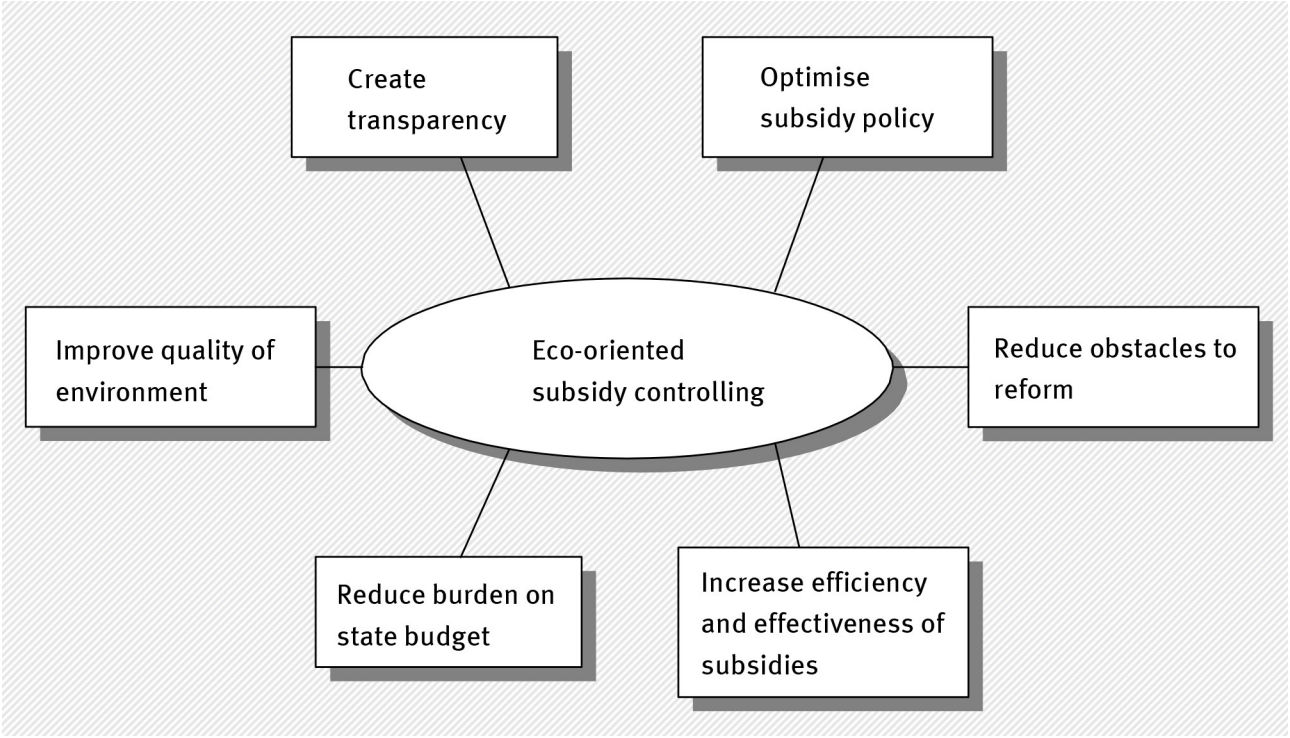
detailed information about how the subsidies work and who benefits from them, or such information is asymmetrically distributed among the actors. As a rule, those receiving the subsidy are a homogeneous group who are often well informed and organised, and who know how to safeguard their advantages in the political process. Those financing the subsidy, as taxpayers and electors, are a very large and heterogeneous group; this means they are difficult to organise and are not particularly interested in or dedicated to the abolition of an individual subsidy. Thus for political decision makers it is often advantageous to retain or expand subsidies with a view to securing votes. Another factor in the case of environmentally harmful subsidies is the fact that the additional environmental costs are borne by the general public, i.e. the groups receiving the subsidies do not have to bear these costs.

To reduce the obstacles to reforming subsidies, it is crucial to expose the deficits mentioned, create transparency and thereby step up the pressure to reform. One suitable method is a systematic and regular check on impacts and results for all subsidies. This goes far beyond the German Government's present subsidies report. An environment-oriented subsidy controlling system would perform two essential functions: creating transparency (subsidy assessment) and on this basis preparing decisions for an effective, efficient and environmental sound subsidy policy (subsidy steering).

To achieve the goal of a sustainable financial policy, environmental impact should as a general long-term principle be made a central criterion in all state decisions on income and expenditure. For this reason, an environment-oriented subsidy controlling system must be introduced as an "environment check" not only for existing subsidies, but also for all new subsidies. Such a system not only eases the burden on the environment, but also offers a number of other benefits (cf. Fig. 8). Not least, it is also an important lever for making efficient use of the taxpayers' money.

Fig. 8:

Benefits of eco-oriented subsidy controlling



The eco-oriented subsidy control system should comprise three phases[287]:

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.

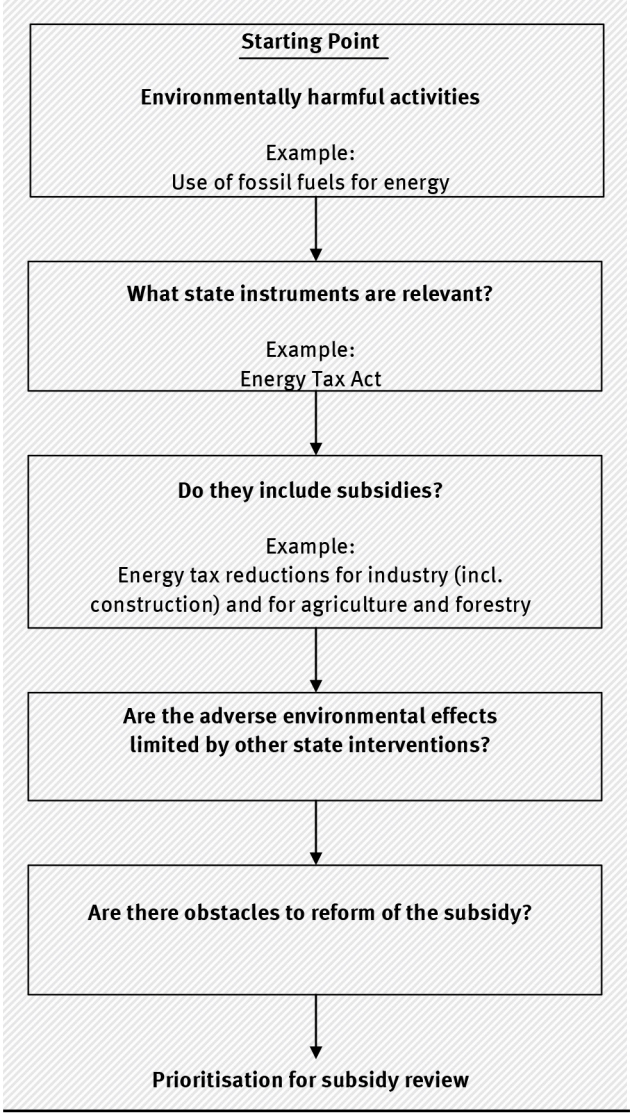
2. Subsidy assessment: This phase of subsidy controlling is concerned with in-depth analysis of subsidies which are potentially harmful to the environment – with regard to their environmental impacts and the question of whether their main purpose is still up to date and whether the relevant subsidy achieves this purpose efficiently.

3. Subsidy steering: 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.

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 with which they achieve their individual purposes.

Fig. 9:

Structure of a screening system for environmentally harmful subsidies



2 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 state intervention so as to cover implicit subsidies as well, i.e. concealed concessions (cf. Part I, Chapter 2).

On the basis of 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 promises the greatest environmental benefits. Setting priorities enables efficient use to be made 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 make an in-depth scrutiny of 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 a state 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?

Item 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. Fig. 9). These could, for example, be use of fossil fuels for energy, intensive use of fertilisers in arable farming, or building on open land. It makes sense here to determine the environmental relevance with the aid of specific criteria. These could be indicators, e.g. greenhouse gas emissions, nitrogen surpluses in agriculture, or the increase in land used for settlement and transport infrastructure. If the economic activity in question conflicts with 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 state instruments which can be expected to foster the relevant economic activity. In the case of fossil fuels, for example, this includes state regulations on the production, trading and use of fossil fuels.

Item 2: The screening process also clarifies whether the instrument in question is indeed a subsidy. The crucial issue here is how broad a definition of subsidies one uses. To make it possible for subsidy analysis to fully identify all state action deficits and undesirable developments in the environmental sector, it is advisable here to use a broad definition of subsidies (cf. Part I, Chapter 2). If on this basis the instrument proves not to be a subsidy, it should not be investigated in the subsidy assessment, but possibly in an alternative approach.

Item 3: If it is a subsidy, the next step is to investigate whether there are any factors which initially argue against an intensive subsidy assessment. 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[288], because abolishing the subsidy would hold little or no promise of improvement in the environmental situation.

Item 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.

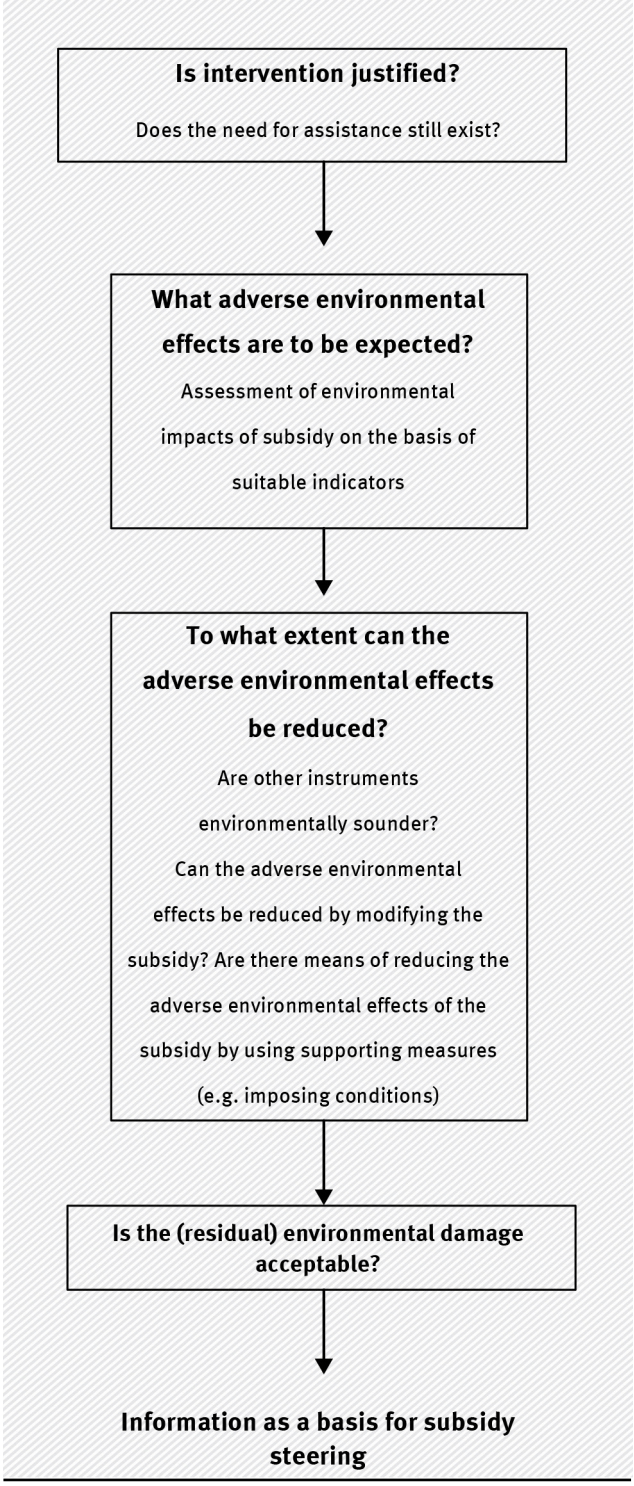
3 Second phase: Eco-oriented subsidy assessment

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 (cf. Section 4). 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

Fig. 10:

Structure of environmental assessment of subsidies



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 of avoiding or at least reducing 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 this, because the legislature 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 state 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 this instrument. A good example of this is the exemption of agricultural tractors from vehicle road tax. 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. Fig. 10) 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 assets 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 of the kind found in the National Sustainability Strategy. 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.

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, one should also investigate 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 state expenditure policy, even under changed economic conditions and political objectives.

4 Third phase: Eco-oriented subsidy steering

On the basis of the information yielded by 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. Text box 2 sets out the basic principles of an effective, efficient and environmentally sound subsidy policy which have to be observed when reforming existing subsidies and introducing new ones.

In subsidy steering it is important to weigh up all positive and negative aspects of subsidies. There may often be a conflict between the subsidy's promotion objectives and environmental objectives, a conflict that has to be resolved by 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 and can be resolved or at least mitigated by modifying the subsidy. One example of this is the reform of the Common Agricultural Policy of the EU, which decouples direct payments from production and transforms them into uniform regional area-based premiums (cf. Section II). 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. An eco-oriented subsidy controlling system 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 state abolishes environmentally harmful subsidies, the less it needs to provide assistance for environmentally sound products and production methods.

Text box 2:
Principles of an effective, efficient and environmentally sound subsidy policy

1. **Detailed investigation of justification for 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 – it no longer exists. This creates periodic pressure to justify the state intervention once again.

2. **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.

3. **Time limit**
   Placing a time limit on subsidies prevents beneficiaries from getting used to them and ensures timely adjustment to changed economic conditions. Limited-term subsidies can expire without the need for a fresh political decision. It would then be necessary to justify any extension of the subsidy.

4. **Declining benefits**
   Subsidies that decline as time goes on give the beneficiaries an incentive to gradually become independent of the assistance and adapt to changing circumstances. For example, assistance designed to provide declining benefits is needed when dealing with crisis situations in individual industries or when launching new technologies on the market. The declining scale makes it clear that the subsidy is not a permanent solution, and simplifies its complete abolition.

5. **Own contribution by subsidy recipient**
   If subsidy recipients did not receive total funding, but had to bear a portion themselves, this would maintain an incentive to make careful use of the money. Beneficiaries would not become so accustomed to the state aid and would remain more independent.

6. **Cut back tax concessions, replace by other kinds of subsidy**
   Tax concessions are relatively opaque, difficult 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 eliminate these disadvantages, and in the interests of simpler taxation, preference should be given to more transparent types of subsidy – such as direct financial assistance.

7. **Assistance for subject, not object**
   Instead of subsidising production methods or consumer habits (objects) that have harmful environmental impacts, it is more accurate to provide direct assistance for the subsidy recipients (subjects) identified as worthy of support. One example of this is the direct payments to farmers, which have been decoupled from production. These direct payments prevent free-rider effects and seepage losses.

8. **Subsidies independent of quantities**
   Subsidies that are tied to quantities further stimulate production and consumption and thereby encourage their consumption of environment and resources. Instead the beneficiaries should receive lump-sum subsidies appropriate to their eligibility for assistance.

9. **Environmentally beneficial inputs by recipients, environmental requirements**
   Subsidies tied to conditions or environmental requirements ensure that beneficiaries do in fact pursue activities beneficial to the environment and do not use the assistance for other purposes. This is a good way of achieving environmental standards.

10. **Consistency with other subsidies and state 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 state measures, and synchronised with them if necessary.

Bibliography

AGEB – Arbeitsgemeinschaft Energiebilanzen e.V. (2013): Stromerzeugung nach Energieträgern, http://www.ag-energiebilanzen.de/index.php?article_id=4&clang=0, accessed October 2013

AGEB – Arbeitsgemeinschaft Energiebilanzen e.V. (2013a): Energiebilanz der Bundesrepublik Deutschland 2010 (natürliche Einheiten), http://www.ag-energiebilanzen.de/index.php?article_id=7&clang=0, accessed November 2013

AGEB – Arbeitsgemeinschaft Energiebilanzen e.V. (2012): Ausgewählte Effizienzindikatoren zur Energiebilanz Deutschland - Daten für die Jahre von 1990 bis 2011, Berlin

AGEB – Arbeitsgemeinschaft Energiebilanzen e.V. (2011): Auswertungstabellen zur Energiebilanz für die Bundesrepublik Deutschland von 1990 bis 2010, http://www.ag-energiebilanzen.de/10-0-Auswertungstabellen.html, accessed August 2012

BAFA – Bundesamt für Wirtschaft und Ausfuhrkontrolle (2013): Statistische Auswertungen zur "Besonderen Ausgleichsregelung", Stand: April 2013, http://www.bafa.de/bafa/de/energie/besondere_ausgleichsregelung_eeg/publikationen/statistische_auswertungen/index.html, accessed January 2014

BAFA – Bundesamt für Wirtschaft und Ausfuhrkontrolle (2011): Amtliche Mineralöldaten für die Bundesrepublik Deutschland, Dezember und das Jahr 2010, http://www.bafa.de/bafa/de/energie/mineraloel_rohoel/amtliche_mineraloeldaten/2010/index.html, accessed August 2013

BAFA – Bundesamt für Wirtschaft und Ausfuhrkontrolle (2011a): Gemeinschaftsaufgabe (GRW) Mittel nach Jahren 1991 bis 2010, Eschborn

Bär, H.; Jacob, K.; Meyer, E. und Schlegelmilch, K. (2011): Wege zum Abbau umweltschädlicher Subventionen, Friedrich Ebert Stiftung, Bonn

BBR – Bundesamt für Bauwesen und Raumordnung (2002): Bericht zur Inanspruchnahme der Eigenheimzulage in den Jahren 1996 – 2000, Arbeitsgruppe "Wirkungsanalyse Eigenheim-zulage" des Ausschusses für Wohnungswesen der ARGEBAU, Bonn

BBR/BBSR – Bundesamt für Bauwesen und Raumordnung/Bundesinstitut für Bau-, Stadt- und Raumforschung (2013): Innenentwicklungspotentiale in Deutschland – Ergebnisse einer bundesweiten Abfrage und Möglichkeiten einer automatisierten Abschätzung, Bonn, http://www.bbsr.bund.de/BBSR/DE/Veroeffentlichungen/Sonderveroeffentlichungen/2014/Innenentwicklungspotenziale_D.html?nn=424178, accessed August 2014

BBR/BBSR – Bundesamt für Bauwesen und Raumordnung/Bundesinstitut für Bau-, Stadt- und Raumforschung (2011): Fortführung der Kompensationsmittel für die Wohnraumförderung, Endbericht, http://www.bbsr.bund.de/nn_821088/BBSR/DE/WohnenImmobilien/RahmenbedInstrumente/ProjekteFachbeitraege/Wohnraumfoerderung/wohnraumfoerderung.html, accessed January 2014

BfN – Bundesamt für Naturschutz (2011): Wiedervernetzung ist von zentraler Bedeutung für die Erhaltung der biologischen Vielfalt, Pressemitteilung vom 23.11.2011, Bonn, http://www.bfn.de/0401_pm.html?&cHash=2a071bdb02&tx_ttnews[backPid]=1&tx_ttnews[tt_news]=4050, accessed September 2012

BfN – Bundesamt für Naturschutz (2005): Daten zur Natur 2004, Münster

BGR – Bundesanstalt für Geowissenschaften und Rohstoffe (2009): Rohstoffwirtschaftliche Länderstudien Heft XXXVIII, Hannover

BMBF – Bundesministerium für Bildung und Forschung (2010): Bundesbericht Forschung und Innovation 2010, Bonn/Berlin

BMELV – Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (2011): Nationaler Strategieplan der Bundesrepublik Deutschland für die Entwicklung ländlicher Räume 2007-2013, Bonn/Berlin

BMELV – Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (2010): Maßnahmenprogramm der Bundesregierung zur Bewältigung der Krise in der Landwirtschaft, Bonn

BMELV – Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (2010a): Ausgewählte Daten und Fakten der Agrarwirtschaft 2010, http://berichte.bmelv-statistik.de/DFB-0010000-2010.pdf, accessed April 2013

BMELV – Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (2010b): Rahmenplan der Gemeinschaftsaufgabe "Verbesserung der Agrarstruktur und des Küstenschutzes " für den Zeitraum 2010-2013, Bonn, http://berichte.bmelv-statistik.de/GAB-0002000-2010.pdf, accessed June 2013

BMELV – Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (2009): Waldbericht der Bundesregierung 2009, Bonn, http://www.bmel.de/SharedDocs/Downloads/Broschueren/Waldbericht2009.pdf?__blob=-publicationFile

BMELV – Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (2007): Gemeinschaftsaufgabe "Verbesserung der Agrarstruktur und des Küstenschutzes" (GAK) – Erläuterungen zu den Rechtsgrundlagen und zur Funktionsweise, https://www.bmel.de/DE/Landwirtschaft/Foerderung-Agrarsozialpolitik/GAK/_Texte/Erlaeuterungen.html;jsessionid=9566A8AE750073E416DC9D3CF-1C4F55E.2_cid376, accessed June 2013

BMELV – Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz (2006): Die EU-Agrarreform – Umsetzung in Deutschland, Ausgabe 2006, Berlin

BMF – Bundesministerium der Finanzen (2013): Vierundzwanzigster Subventionsbericht – Bericht der Bundesregierung über die Entwicklung der Finanzhilfen des Bundes und der Steuervergünstigungen für die Jahre 2011 – 2014, Berlin

BMF – Bundesministerium der Finanzen (2012): Finanzierung der Braunkohlesanierung ab 2013 steht – 1,2 Milliarden Euro von Bund und Ländern bis 2017, Pressemitteilung 73 vom 06.11.2012, Berlin http://www.bundesfinanzministerium.de/Content/DE/Pressemitteilungen/Finanzpolitik/2012/10/2012-11-06-PM73.html?source=stdNewsletter, accessed January 2014

BMF – Bundesministerium der Finanzen (2011): Dreiundzwanzigster Subventionsbericht – Bericht der Bundesregierung über die Entwicklung der Finanzhilfen des Bundes und der Steuervergünstigungen für die Jahre 2009 – 2012, Berlin

BMF – Bundesministerium der Finanzen (2010): Zweiundzwanzigster Subventionsbericht – Bericht der Bundesregierung über die Entwicklung der Finanzhilfen des Bundes und der Steuervergünstigungen für die Jahre 2007 – 2010, Berlin

BMF – Bundesministerium der Finanzen (2007): Einundzwanzigster Subventionsbericht – Bericht der Bundesregierung über die Entwicklung der Finanzhilfen des Bundes und der Steuervergünstigungen für die Jahre 2005 – 2008, Berlin

BMF – Bundesministerium der Finanzen (2007a): Anwendung des ermäßigten Umsatzsteuersatzes, Bericht vom 30.10.2007, Berlin

BMF – Bundesministerium der Finanzen (2006): Zwanzigster Subventionsbericht – Bericht der Bundesregierung über die Entwicklung der Finanzhilfen des Bundes und der Steuervergünstigungen für die Jahre 2003 – 2006, Berlin

BMU – Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (2013): Erneuerbare Energien in Zahlen, Nationale und internationale Entwicklung, Berlin

BMU/UBA – Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit/Umweltbundesamt (2013): Treibhausgasausstoß im Jahr 2012 um 1,6 % gestiegen, gemeinsame Pressemitteilung BMU/UBA vom 25.02.2013, Berlin, http://www.bmu.de/bmu/presse-reden/pressemitteilungen/pm/artikel/treibhausgasausstoss-im-jahr-2012-um-16-prozent-gestiegen/, accessed December 2013

BMWi – Bundesministerium für Wirtschaft und Technologie (2013): Rösler: Bundesregierung schafft Planungs- und Rechtssicherheit bei Netzentgelten, Pressemitteilung vom 31.07.2013, Berlin http://www.bmwi.de/DE/Presse/pressemitteilungen,did=587264.html, accessed January 2014

BMWi – Bundesministerium für Wirtschaft und Technologie (2013a): Gemeinschaftsaufgabe "Verbesserung der regionalen Wirtschaftsstruktur" (GRW), statistischer Überblick zur Regionalförderung, Stand: April 2013, http://www.bmwi.de/DE/Themen/Wirtschaft/Regionalpolitik/gemeinschaftsaufgabe,did=151116.html, accessed January 2014

BMWi – Bundesministerium für Wirtschaft und Technologie (2012): Energiedaten, http://www.bmwi.de/DE/Themen/Energie/Energiedaten/gesamtausgabe.html, accessed July 2012

BMWi – Bundesministerium für Wirtschaft und Technologie (2012a): Hintergrundpapier zur sog. Strompreiskompensation, Stand: Dezember 2012, https://www.bmwi.de/BMWi/Redaktion/PDF/S-T/strompreiskompensation-hintergrundpapier,property=pdf,bereich=bmwi2012,sprache=de,rwb=true.pdf, accessed October 2013

BMWi – Bundesministerium für Wirtschaft und Technologie (2010): Erhöhung Gemeinschaftsaufgabe Regionale Wirtschaftsstruktur, http://www.bmwi.de/BMWi/Navigation/Wirtschaft/Konjunktur/konjunkturpaket-1,did=278926.html, accessed May 2010

BMWi – Bundesministerium für Wirtschaft und Technologie (2007): Entwurf eines Gesetzes zur Finanzierung der Beendigung des subventionierten Steinkohlenbergbaus zum Jahr 2018, http://bmwi.de/BMWi/Redaktion/PDF/Gesetz/steinkohlefinanzierungsgesetz-entwurf,property=pdf,bereich=bmwi,sprache=de,rwb=true.pdf, accessed May 2010

BMWi/BMU – Bundesministerium für Wirtschaft und Technologie/Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (2012): Erster Monitoring-Bericht "Energie der Zukunft", Kurzfassung, Berlin

Bonny, H. W. und Glaser, J. (2005): Standort- und Gewerbeflächenmonitoring – Ein Instrument zur Beobachtung und zum Management der regionalen Gewerbeflächenentwicklung, In: disP 161 2/2005, p. 28-39

Bundesnetzagentur/ Bundeskartellamt (2013): Monitoringbericht 2012, Bonn

Bundesrechnungshof (2010): Bericht nach § 99 BHO über den ermäßigten Umsatzsteuersatz, Vorschläge für eine künftige Ausgestaltung der Steuerermäßigung vom 28.06.2010, Bonn

Bundesregierung (2013): Projektionsbericht 2013 gemäß Entscheidung 280/2004/EG, übermittelt an die EU-KOM am 23.04.2013

Bundesregierung (2012): Erster Monitoring-Bericht "Energie der Zukunft", Unterrichtung durch die Bundesregierung vom 20.12.2012, Drucksache 17/11958, Berlin

Bundesregierung (2010): Energiekonzept für eine umweltschonende, zuverlässige und bezahlbare Energieversorgung, Beschluss des Bundeskabinett vom 28.09.2010, Berlin

Bundesregierung (2008): Fortschrittsbericht 2008 zur nationalen Nachhaltigkeitsstrategie, Berlin

Burdick, B. und Lange, U. (2003): Berücksichtigung von Umweltgesichtspunkten bei Subventionen – Sektorstudie Agrarwirtschaft, UBA Texte 32/03, Berlin

Buschmann, S. und Meyer, E. (2013): Ökonomische Instrumente für eine Senkung des Fleischkonsums in Deutschland. Beiträge zu einer klima- und umweltgerechteren Landwirtschaft, FÖS, Berlin

DBV – Deutscher Bauernverband (2010): Situationsbericht 2010, Berlin

DBV – Deutscher Bauernverband (2009): Situationsbericht 2009, Berlin

De Bruyn, S.; Nelissen, D. und Koopmann, M. (2013): Carbon leakage and the future of the EU ETS market, Delft

Department for Business Innovation & Skills, Department of Energy & Climate Change (2013): Compensation for the indirect costs of EU Emissions tradingsystem in 2013/14 and 2014/15, Guidance for applicants, London

DERA – Deutsche Rohstoffagentur der Bundesanstalt für Geowissenschaften und Rohstoffe (2012): Deutschland – Rohstoffsituation 2011, Berlin

Deutscher Bundestag (2013): Schriftliche Fragen mit den in der Woche vom 10.06.2013 eingegangenen Antworten der Bundesregierung vom 14.06.2013, Drucksache 17/13991, Berlin

Deutscher Bundestag (2013a): Bericht zur Steuerbegünstigung für Biokraftstoffe 2012. Unterrichtung durch die Bundesregierung vom 26.08.2013, Drucksache 17/14641, Berlin

Deutscher Bundestag (2012): Rechtliche Ausgleichsregelungen im Kohlebergbau, Antwort der Bundesregierung auf die Kleine Anfrage der Abgeordneten Oliver Krischer, Hans-Josef Fell, Bärbel Höhn, weiterer Abgeordneter und der Fraktion BÜNDNIS 90/DIE GRÜNEN vom Federal Court of Audit 02.02.2012, Drucksache 17/8533, Berlin

Deutscher Bundestag (2012a): Gewässerqualität der Spree, Antwort der Bundesregierung auf die Kleine Anfrage der Abgeordneten Cornelia Behm, Harald Ebner, Hans-Josef Fell, weiterer Abgeordneter und der Fraktion BÜNDNIS 90/DIE GRÜNEN vom 27.09.2012, Drucksache 17/10868, Berlin

Deutscher Bundestag (2012b): Netznutzungsentgelte für Höchststromverbraucher, Antwort der Bundesregierung auf die Kleine Anfrage der Abgeordneten Ingrid Nestle, Bärbel Höhn, Hans-Josef Fell, weiterer Abgeordneter und der Fraktion BÜNDNIS 90/DIE GRÜNEN vom 11.04.2012, Drucksache 17/9279, Berlin

Deutscher Bundestag (2012c): Hermesbürgschaften für Legehennenfabriken in der Ukraine, Antwort der Bundesregierung auf die Kleine Anfrage der Abgeordneten Friedrich Ostendorff, Harald Ebner, Hans-Josef Fell, weiterer Abgeordneter und der Fraktion BÜNDNIS 90/DIE GRÜNEN vom 10.09.2012, Drucksache 17/10626, Berlin

Deutscher Bundestag (2012d): Auswirkungen der Einführung der Einführung des Luftverkehrssteuergesetzes auf den Luftverkehrssektor und die Entwicklung der Steuereinnahmen aus der Luftverkehrssteuer, Unterrichtung durch die Bundesregierung vom 29.06.2012, Drucksache 17/10225, Berlin

Deutscher Bundestag (2012e): Fortschrittsbericht 2012 zur nationalen Nachhaltigkeitsstrategie, Unterrichtung durch den Parlamentarischen Beirat für nachhaltige Entwicklung vom 29.11.2012, Drucksache 17/11670, Berlin

Deutscher Bundestag (2011): Förderung der Kernenergie im Ausland durch Hermesbürgschaften der Bundesregierung, Antwort der Bundesregierung auf eine Kleine Anfrage der Abgeordneten Niema Movassat, Dr. Dietmar Bartsch, Jan van Aken, weiterer Abgeordneter und der Fraktion DIELINKE vom 13.04.2011, Drucksache 17/5532, Berlin

Deutscher Bundestag (2011a): Bericht zur Steuerbegünstigung für Biokraftstoffe 2010, Unterrichtung durch die Bundesregierung vom 02.09.2011, Drucksache 17/6928, Berlin

Deutscher Bundestag (2010): Pumpkosten im Stein- und Braunkohlebergbau, Antwort der Bundesregierung auf die Kleine Anfrage der Abgeordneten Oliver Krischer, Cornelia Behm, Hans-Josef Fell, weiterer Abgeordneter und der Fraktion BÜNDNIS 90/DIE GRÜNEN vom 24.02.2010, Drucksache 17/787, Berlin

Deutscher Bundestag (2009): Koordinierungsrahmen der Gemeinschaftsaufgabe "Verbesserung der regionalen Wirtschaftsstruktur" ab 2009, Unterrichtung durch die Bundesregierung vom 08.09.2009, Drucksache 16/13950, Berlin

Deutscher Bundestag (2008): Beschlussempfehlung des Finanzausschusses zum Entwurf eines Gesetzes zur verbesserten Einbeziehung der selbstgenutzten Wohnimmobilie in die geförderte Altersvorsorge (Eigenheimrentengesetz – EigRentG) vom 18.06.2008, Drucksache 16/9641, Berlin

Deutscher Bundestag (2007): Sechsunddreißigster Rahmenplan der Gemeinschaftsaufgabe "Verbesserung der regionalen Wirtschaftsstruktur" für den Zeitraum 2007 bis 2010, Unterrichtung durch die Bundesregierung vom 27.04.2007, Drucksache 16/5215, Berlin

Deutscher Bundestag (2006): Fünfunddreißigster Rahmenplan der Gemeinschaftsaufgabe "Verbesserung der regionalen Wirtschaftsstruktur" für den Zeitraum 2006 bis 2009, Unterrichtung durch die Bundesregierung vom 07.06.2006, Drucksache 16/1790, Berlin

Deutscher Bundestag (2002): Beschlussempfehlung und Bericht des Ausschusses für Wirtschaft und Technologie (9. Ausschuss) zu dem Gesetzentwurf der Bundesregierung vom 23.01.2002, Drucksache 14/8059, Berlin

Diekmann, L.; Gerhards, E.; Klinski, S.; Meyer, B.; Schmidt, S. und Thöne, M. (2011): Steuerliche Behandlung von Firmenwagen in Deutschland. Analyse von Handlungsoptionen zur Novellierung, Endbericht des Fifo Köln mit Prof. Dr. jur. Stefan Klinski und FÖS e.V. für das BMU, Cologne/Berlin

Distelkamp, M.; Lutz, C.; Meyer, B. und Wolter, M.I. (2004): Schätzung der Wirkung umweltpolitischer Maßnahmen im Verkehrssektor unter Nutzung der Datenbasis der Gesamtrechnungen des Statistischen Bundesamtes, GWS Discussion Paper 2004/5, Osnabrück

DIW - Deutsches Institut für Wirtschaftsforschung (2007): Bericht zum Vorhaben "Fachgespräch zur Bestandsaufnahme und methodischen Bewertung vorliegender Ansätze zur Quantifizierung der Förderung erneuerbarer Energien im Vergleich zur Förderung der Atomenergie in Deutschland", Bericht im Auftrag des BMU, Berlin

EEA – Europäische Umweltagentur (2007): Size, structure and distribution of transport subsidies in Europe, technical report, Copenhagen

EEA – Europäische Umweltagentur (2006): Urban Sprawl – The ignored challenge, EEA-report, Copenhagen

EnergieAgentur.NRW (2007): Ministerin Thoben: Gebäudesanierung boomt: 1 Milliarde Euro an KfW-Krediten flossen 2006 nach NRW / Mein Haus spart unterstützt Hausbesitzer von der Planung bis zur Umsetzung, Presseinfo vom 15.03.2007, http://www.energieagentur.nrw.de/presse/ministerin-thoben-gebaeudesanierung-boomt-1-milliarde-euro-an-kfw-krediten-flossen-2006-nach-nrw-mein-haus-spart-unterstuetzt-hausbesitzer-von-der-planung-bis-zur-umsetzung-6204.asp?find=2007, accessed May 2010

EU-KOM – Europäische Kommission (2013): Staatliche Beihilfen: Kommission leitet eingehende Prüfung potenzieller Beihilfen für von Netzentgelten befreite große Stromverbraucher in Deutschland ein, Pressemitteilung vom 06.03.2013, Brüssel, http://europa.eu/rapid/press-release_IP-13-191_de.htm, accessed November 2013

EU-KOM – Europäische Kommission (2013a): Staatliche Beihilfen: Kommission startet Konsultation zu neuen Beihilfevorschriften für Flughäfen und Luftverkehrsgesellschaften, Pressemitteilung vom 3. 07.2013, Brüssel, http://europa.eu/rapid/press-release_IP-13-644_de.htm, accessed January 2014

EU-KOM – Europäische Kommission (2013b): Mitteilung der Kommission an den Rat, Konsultation zu den Fangmöglichkeiten 2014 vom 30.05.2013, Brussels

EU-KOM – Europäische Kommission (2011): Roadmap to a resource efficient Europe, Communication from the Commission to the European Parliament, the council, the European economic and social committee and the committee of the regions vom 20.08.2011, COM(2011) 571, Brussels

EU-KOM – Europäische Kommission (2011a): Mitteilung der Kommission an das europäische Parlament, den Rat und den europäischen Wirtschafts- und Sozialausschuss zur Zukunft der Mehrwertsteuer, Wege zu einem einfacheren, robusteren und effizienteren MwSt-System, das auf den Binnenmarkt zugeschnitten ist, vom 06.12.2011, KOM(2011) 851, Brussels

EU-KOM – Europäische Kommission (2010): Europa 2020, Eine Strategie für ein intelligentes, nachhaltiges und integratives Wachstum, Mitteilung der Kommission vom 03.03.2010, KOM(2010) 2020, Brussels

EU-KOM – Europäische Kommission - DG Energy (2010a): EU energy trends to 2030 – update 2009, Luxembourg, http://ec.europa.eu/energy/observatory/trends_2030/doc/trends_to_2030_update_2009.pdf, accessed January 2014

EU-KOM – Europäische Kommission (2010b): Themendossier Ländliche Entwicklung, http://europaeische-vision.de/typo/index.php?id=90#c839, accessed May 2010

EU-KOM – Europäische Kommission (2009): Grünbuch zur Reform der Gemeinsamen Fischereipolitik vom 22.04.2009, KOM(2009) 163, Brüssel, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0163:FIN:DE:PDF, accessed August 2010

EU-KOM – Europäische Kommission, Generaldirektion Regionalpolitik (2006): Inforegio fact sheet Germany, Oktober 2006, http://ec.europa.eu/regional_policy/atlas2007/fiche/de_en.pdf, accessed June 2010

EU-KOM – Europäische Kommission (2005): Winning the Battle Against Global Climate Change, Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions vom 09.02.2005, COM(2005)35, Brussels

Euler Hermes Deutschland AG (ohne Jahr): Exportförderung mit Hermesdeckung, Informationsbroschüre, Hamburg, http://www.agaportal.de/pages/aga/index.html, accessed September 2013

Euler Hermes Deutschland AG (2012): Hermesdeckungen Spezial – Regelungen der OECD Common Approaches für die Umweltprüfung von gedeckten Exportgeschäften. Praktische Informationen, Hamburg

FAO – Food and Agriculture Organization of the United Nations (2006): Livestock's long shadow – environmental issues and options, Rome

Felbemayr, G.; Heiland, I. und Yalcin, E. (2012): Beschäftigungseffekte der Exportkreditgarantien der Bundesrepublik Deutschland "Hermesdeckungen", In: ifo Schnelldienst 1/2012, 65. Jahrgang, p. 20 – 30

Felbemayr, G.; Heiland, I. und Yalcin, E. (2011): Beschäftigungseffekte der Exportkreditgarantien der Bundesrepublik Deutschland "Hermesdeckungen", Endbericht des ifo Institut für das BMWi, Munich

Fouquet, D. und von Uexküll, O. (2003): Der Beihilfecharakter der steuerlichen Freistellung von Rückstellungen der deutschen Atomindustrie, In: ZNER, Vol. 7.2003, Heft 4, p. 310 – 319

Frohn, J.; Chen, P.; Hillebrand, B.; Lemke, W.; Lutz, C.; Meyer, B. und Pullen, M. (2003): Wirkungen umweltpolitischer Maßnahmen – Abschätzungen mit zwei ökonometrischen Modellen, Heidelberg

Gesamtverband Steinkohle e.V. (2011): Jahresbericht Steinkohle 2010, Herne, http://www.gvst.de/site/steinkohle/archiv/GVSt_JB_2010.pdf, accessed August 2012

G20 Leaders (2009): G20 Leaders' Statement - The Pittsburgh Summit 2009, September 2009, Pittsburgh

Hausner, K. H. und Simon, S. (2006): Ökonomische Aspekte der Energiepolitik, In: Wirtschaftsdienst, 12/2006, p. 769-777

HEAL – Health and Environment Alliance (2013): Was Kohlestrom wirklich kostet – Gesundheitsfolgen und externe Kosten durch Schadstoffemissionen, Brüssel, http://www.env-health.org/IMG/pdf/heal_coal_report_de.pdf, accessed January 2014

Her Majesty's Revenue & Customs (2006): Report on the Evaluation of the Company Car Tax Reform: Stage 2, vom 22.03.2006, http://webarchive.nationalarchives.gov.uk/20091222074811/http:/www.hmrc.gov.uk/cars/stage-2-evaluation.pdf, accessed June 2010

Hermann, H.; Graichen, V.; Gammelin, C. und Matthes, F. (2010): Kostenlose CO_2-Zertifikate und CDM/JI im EU-Emissionshandel. Analyse von ausgewählten Branchen und Unternehmen in Deutschland, Berlin

Hermann, H.; Matthes, F.; Emele, L. und Jung, F. (2012): Strompreisentwicklungen im Spannungsfeld von Energiewende, Energiemärkten und Industriepolitik: Der Energiewende-Kosten-Index (EKX), Kurzstudie, Öko-Institut, Berlin

Hermes Deutschland AG (2012): Jahresbericht 2012, Hamburg

Hermes Deutschland AG (2010): Jahresbericht 2010, Hamburg

Hirschfeld, J.; Weiß, J.; Preidl, M. und Korbun, T. (2008): Klimawirkungen der Landwirtschaft, Institut für ökologische Wirtschaftsforschung (IÖW), Berlin

IEA – International Energy Agency (2013): World Energy Outlook 2013, Paris

IEA – International Energy Agency (2010): Energy Subsidies - Getting the Prices Right, Paris

IEEP – Institute for European Environmental Policy (2007): Reforming environmentally harmful subsidies, a report to the European Commission's DG Environment, London/Brussels

IPCC – Intergovernmental Panel on Climate Change (2007): Fourth Assessment Report, Working Group III, Cambridge/ New York

Irrek, W. (2007): Rückstellungen im Kernenergiebereich: Ein Subventionstatbestand? DIW-Fachgespräch, Vortrag vom 27.02.2007, Wuppertalinstitut

IWF – Internationaler Währungsfonds (2013): Energy Subsidy Reform: Lessons and Implications, https://www.imf.org/external/np/pp/eng/2013/012813.pdf , accessed March 2014

IZES – Institut für ZunkunftsEnergieSysteme (2009): Kurzstudie zur Bedeutung des Strompreises für den Erhalt und die Entwicklung stromintensiver Industrien in Deutschland, Abschlussbericht, Hans-Böckler-Stifung, Saarbrücken

Jahn, T.; Hötker, H.; Oppermann, R.; Bleil, R. und Vele, L. (2013): Protection of biodiversity of free living birds and mammals in respect of the effects of pesticides, Abschlussbericht im Auftrag des Umweltbundesamtes, Dessau-Roßlau

KBA – Kraftfahrt-Bundesamt (2012): Statistik zum Bestand der Fahrzeuge, https://web.archive.org/web/20120119012109/http://www.kba.de/nn_269000/DE/Statistik/Fahrzeuge/Bestand/EmissionenKraftstoffe/b__emi__z__teil__2.html, accessed November 2012

KBA – Kraftfahrt-Bundesamt (2012a): Statistik zu den Neuzulassungen der Fahrzeuge, http://www.kba.de/cln_033/nn_191100/DE/Statistik/Fahrzeuge/Neuzulassungen/Halter/2010/2010_n_halter_dusl_absolut.html, accessed December 2012

KBA – Kraftfahrt-Bundesamt (2011): Neuzulassungen von Personenkraftwagen nach Segmenten und Modellreihen 2010 (Dezember 2010) http://www.kba.de/cln_031/nn_232002/DE/Presse/Presseportal/N_Segmente_Modellreihen_FZ11/N_Segmente2010/neuzulassungen_segmente_2010_inhalt.html, accessed August 2013

Küchler, S. und Meyer, B. (2012): Was Strom wirklich kostet. Vergleich der staatlichen Förderungen und gesamtgesellschaftlichen Kosten konventioneller und erneuerbarer Energien, Langfassung, Berlin

Landtag Mecklenburg Vorpommern (2010): Jahresbericht des Landesrechnungshofes 2010, Unterrichtung durch den Landesrechnungshof vom 09.12.2010, Drucksache 5/3996, Schwerin

Landtag Nordrhein-Westfahlen (2010): Steinkohlenbergbau in Nordrhein-Westfahlen, Antwort der Landesregierung auf die Große Anfrage 43 der Fraktion Bündnis 90/Die Grünen vom 14.01.2010, Drucksache 14/10541, Düsseldorf, http://oliver-krischer.eu/fileadmin/user_upload/gruene_btf_krischer/2010/Gro%C3%9FeAnfrageSteinkohle14-10541.pdf, accessed January 2014

Landtag Nordrhein-Westfalen (2009): Finanzplanung 2009 bis 2013 mit Finanzbericht 2010 des Landes NRW vom 01.09.2009, Drucksache 14/9701, Düsseldorf

Lechtenböhmer, S.; Kristof, K. und Irrek, W. (2004): Braunkohle – ein subventionsfreier Energieträger?, Kurzstudie im Auftrag des Umweltbundesamtes, Wuppertal

Maibach, M.; Sieber, N.; Bertenrath, R.; Ewringmann, D.; Koch, L.; Thöne, M. und Bickel, P. (2007): Praktische Anwendung der Methodenkonvention: Möglichkeiten der Berücksichtigung externer Umweltkosten bei Wirtschaftlichkeitsrechnungen von öffentlichen Investitionen, Forschungsprojekt im Auftrag des Umweltbundesamtes, Dessau-Roßlau

Matthes, F.; Gores, S.; Harthan, R.O.; Mohr, L.; Penninger, G.; Markewitz, P.; Hansen, P.; Martinsen, D.; Diekmann, J.; Horn, M.; Eichhammer, W.; Fleiter, T.; Köhler, J.; Schade, W.; Schlomann, B.; Sensfuß, F. und Ziesing, H.-J. (2009): Politikszenarien V – auf dem Weg zum Strukturwandel. Treibhausgas-Emissionsszenarien bis zum Jahr 2030. Forschungsprojekt im Auftrag des Umweltbundesamtes, UBA-Climate Change 16/2009, Dessau-Roßlau

Matthes, F.; Gores, S.; Graichen, V.; Harthan, R.O.; Markewitz, P.; Hansen, P.; Kleemann, M.; Krey, V.; Martinsen, D.; Diekmann, J.; Horn, M.; Ziesing, H.-J.; Eichhammer, W.; Doll, C.; Helfrich, N.; Müller, L.; Schade, W. und Schlomann, B. (2008): Politikszenarien für den Klimaschutz IV - Szenarien bis 2030, Forschungsprojekt im Auftrag des Umweltbundesamtes, UBA-Texte 01/08, Dessau-Roßlau

Meyer, B. u. Küchler, S. (2010): Staatliche Förderungen der Atomenergie im Zeitraum 1950-2010, FÖS-Studie im Auftrag von Greenpeace, 2. Auflage, Berlin

Meyer, B.; Schmidt, S. und Eidems, V. (2009): Staatliche Förderungen der Atomenergie im Zeitraum 1950-2008, FÖS-Studie im Auftrag von Greenpeace, Hamburg

Ministerium für Wirtschaft, Mittelstand und Energie des Landes NRW (2008): Presseinfo vom 04.08.2008, http://www.wirtschaft.nrw.de/2000/2100/2120/200808/080804/index.php, accessed May 2010

Ministerium für Wirtschaft, Mittelstand und Energie des Landes NRW u.a. (2007): Eckpunkte einer kohlepolitischen Verständigung von Bund, Land Nordrhein-Westfalen (NRW) und Saarland, RAG AG und IGBCE vom 07.02.2007, Berlin

Monopolkommission (2013): Energie 2013: Wettbewerb in Zeiten der Energiewende, Sondergutachten 65, Bonn

OECD – Organisation for Economic Co-operation and Development (2012): OECD-Wirtschaftsberichte: Deutschland 2012, Paris

OECD – Organisation for Economic Co-operation and Development (2008): Biofuel Support Policies – An Economic Assessment, Paris

OECD – Organisation for Economic Co-operation and Development (2005): Environmentally Harmful Subsidies – Challenges for Reform, Paris

OECD – Organisation for Economic Co-operation and Development (2002): Agricultural Policies in OECD Countries: Monitoring and Evaluation, Paris

OECD – Organisation for Economic Co-operation and Development (2001): Deutschland, OECD Environmental Performance Reviews, Paris

Öko-Institut/IFEU (2010): Entwicklung von Strategien und Nachhaltigkeitsstandards zur Zertifizierung von Biomasse für den internationalen Handel, Forschungsprojekt im Auftrag des Umweltbundesamtes, UBA Texte 48/2010, Dessau-Roßlau

Peichl, A. und Schaefer, T. (2006): Documentation FiFoSiM: Integrated tax benefit microsimulation and CGE model, FiFo-CPE Finanzwissenschaftliche Diskussionsbeiträge, No. 06-10, Cologne

Prognos (2012): Letztverbrauch bis 2017. Planungsprämissen für die EEG-Mittelfristprognose, Berlin, https://www.netztransparenz.de/de/file/Letztverbrauch_2017_121113_fuer_UeNB_Veroeffentlichung.pdf, accessed November 2013

Rauch, A. und Thöne, M. (2012): Biofuels – at what costs? Mandating ethanol and biodiesel consumption in Germany, Geneva

Raue LLP (2013): Reform des Konzessionsabgabenrechts, Gutachten im Auftrag von Agora Energiewende, Berlin

Reuster, L. und Nestle, U. (2013): Reform der Begünstigung der Industrie bei der EEG-Umlage, FÖS, Berlin

Rückert-John, J.; Bormann I. und John, R. (2013): Repräsentativumfrage zu Umweltbewusstsein und Umweltverhalten im Jahr 2012, Forschungsprojekt im Auftrag des Bundesministeriums für Umwelt, Naturschutz und Reaktorsicherheit und des Umweltbundesamtes, Berlin/Marburg

Sprenger, R.-U. und Rave, T. (2003): Berücksichtigung von Umweltgesichtspunkten bei Subventionen – Bestandsaufnahme und Reformansätze, Forschungsprojekt im Auftrag des Umweltbundesamtes, UBA-Texte 30/03, Berlin

Sprenger, R.-U. und Triebwetter, U. (2003): Berücksichtigung von Umweltgesichtspunkten bei Subventionen – Sektorstudie Wohnungsbau, Forschungsprojekt im Auftrag des Umweltbundesamtes, UBA-Texte 31/03, Berlin

SRU – Sachverständigenrat für Umweltfragen (2013): Die Reform der europäischen Agrarpolitik: Chancen für eine Neuausrichtung nutzen, Kommentar zur Umweltpolitik, Nr. 11, Berlin

SRU – Sachverständigenrat für Umweltfragen (2012): Umweltgutachten 2012, Verantwortung in einer begrenzten Welt, Berlin

SRU – Sachverständigenrat für Umweltfragen (2009): Für eine zeitgemäße Gemeinsame Agrarpolitik (GAP), Stellungnahme, Nr. 14, Berlin

SRU – Sachverständigenrat für Umweltfragen (2005): Umwelt und Straßenverkehr, Sondergutachten, Berlin

SRU – Sachverständigenrat für Umweltfragen (2004): Umweltgutachten 2004, Langfassung, Berlin

Statistische Ämter der Länder (2011): Umweltökonomische Gesamtrechnung der Länder. Inanspruchnahme der Umwelt durch Produktion und Konsum in den Bundesländern. Ausgewählte Indikatoren und Kennzahlen, Düsseldorf

Statistisches Bundesamt (2013): Ausgaben des Produzierenden Gewerbes, des Staates und der privatisierten öffentlichen Unternehmen für Umweltschutz nach Umweltbereichen, https://www.destatis.de/DE/ZahlenFakten/GesamtwirtschaftUmwelt/Umwelt/UmweltoekonomischeGesamtrechnungen/Umweltschutzmassnahmen/Tabellen/AusgabenBereiche.html, accessed November 2013

Statistisches Bundesamt (2013a): Land- und Forstwirtschaft, Fischerei, Bodenfläche nach Art der tatsächlichen Nutzung, Fachserie 3, Reihe 5.1, Wiesbaden

Statistisches Bundesamt (2013b): Umweltökonomische Gesamtrechnung, nachhaltige Entwicklung in Deutschland, Indikatoren zu Umwelt und Ökonomie, Wiesbaden

Statistisches Bundesamt (2013c): Finanzen und Steuern, Steuerhaushalt 2012, Fachserie 14, Reihe 4, Wiesbaden

Statistisches Bundesamt (2012): Umsatzsteuerstatistik 2010, Wiesbaden

Statistisches Bundesamt (2012a): Bautätigkeit und Wohnungen 2011 (Bautätigkeit), Fachserie 5, Reihe 1, Wiesbaden

Statistisches Bundesamt (2012b): Umweltnutzung und Wirtschaft, Tabellen zur umweltökonomischen Gesamtrechnungen, Teil 4: Rohstoffe, Wassereinsatz, Abwasser, Abfall, Wiesbaden

Statistisches Bundesamt (2011): Finanzen und Steuern – Energiesteuer 2010, Fachserie 14, Reihe 9.3, Wiesbaden

Statistisches Bundesamt (2011a): Verkehr, Luftverkehr auf allen Flugplätzen, Wiesbaden

Thöne, M.; Naess-Schmidt, S. und Heinemann, F. (2010): Evaluierung von Steuervergünstigungen, Band 2, FiFo Köln, Copenhagen Economics, ZEW, Köln/Copenhagen/Mannheim

UBA – Umweltbundesamt (2014): Treibhausgasemissionen der emissionshandelspflichtigen stationären Anlagen in Deutschland im Jahr 2013, Berlin

UBA – Umweltbundesamt (2014a): Ergebnisse der kostenlosen Zuteilung von Emissionsberechtigungen an Bestandsanlagen für die 3. Handelsperiode, Berlin, http://www.dehst.de/SharedDocs/Downloads/DE/Publikationen/Zuteilungsbericht.pdf?__blob=publicationFile, accessed August 2014

UBA – Umweltbundesamt (2013): Treibhausgasausstoß in Deutschland 2012 – vorläufige Zahlen aufgrund erster Berechnungen und Schätzungen des Umweltbundesamtes, Hintergrundpapier, Dessau-Roßlau

UBA – Umweltbundesamt (2013a): Best-Practice-Kostensätze für Luftschadstoffe, Verkehr, Strom- und Wärmeerzeugung, Anhang B der Methodenkonvention 2.0 zur Schätzung von Umweltkosten, Forschungsprojekt im Auftrag des Umweltbundesamtes, Dessau-Roßlau

UBA – Umweltbundesamt (2013b): Kohlendioxidemissionen der emissionshandelspflichtigen stationären Anlagen und im Luftverkehr in Deutschland im Jahr 2012, Berlin

UBA – Umweltbundesamt (2013c): Schwerpunkte 2013, Dessau-Roßlau

UBA – Umweltbundesamt (2013d): Klimaschutz und Emissionshandel in der Landwirtschaft, Dessau-Roßlau

UBA – Umweltbundesamt (2013e): Daten zur Umwelt, http://www.umweltbundesamt-daten-zur-umwelt.de/umweltdaten/public/theme.do?nodeIdent=2879, accessed April 2013

UBA – Umweltbundesamt (2013f): Die Reform der Gemeinsamen Agrarpolitik braucht eine verbindliche und wirkungsvolle Ökologisierung der ersten Säule, Stellungnahme der Kommission Landwirtschaft am Umweltbundesamt, Dessau-Roßlau

UBA – Umweltbundesamt (2012): Emissionsentwicklung 1990-2010, klassische Luftschadstoffe (Nationale Trendtabellen für die deutsche Berichterstattung atmosphärischer Emissionen seit 1990), http://www.umweltbundesamt.de/emissionen/publikationen.htm, accessed November 2012

UBA – Umweltbundesamt (2012a): Emissionsentwicklung 1990-2010, Treibhausgase, inkl. Erweiterte Auswertung und Äquivalentemissionen der Treibhausgase (Nationale Trendtabellen für die deutsche Berichterstattung atmosphärischer Emissionen seit 1990), http://www.umweltbundesamt.de/themen/klima-energie/klimaschutz-energiepolitik-in-deutschland/treibhausgas-emissionen, accessed November 2012

UBA – Umweltbundesamt (2012b): Klimawirksamkeit des Flugverkehrs - Aktueller wissenschaftlicher Kenntnisstand über die Effekte des Flugverkehrs, Hintergrund- Papier, Dessau-Roßlau, http://www.umweltbundesamt.de/sites/default/files/medien/377/dokumente/klimawirksamkeit_des_flugverkehrs.pdf, accessed January 2014

UBA – Umweltbundesamt (2012c): Globale Landflächen und Biomasse nachhaltig und ressourcenschonend nutzen, Dessau-Roßlau

UBA – Umweltbundesamt (2011): Kohlendioxidemissionen der emissionshandelspflichtigen Anlagen im Jahr 2010, Dessau-Roßlau

UBA – Umweltbundesamt (2011a): Umweltwirtschaftsbericht 2011 – Daten und Fakten für Deutschland, Dessau-Roßlau

UBA – Umweltbundesamt (2010): CO_2-Emissionsminderung im Verkehr in Deutschland – Mögliche Maßnahmen und ihre Minderungspotenziale – Ein Sachstandsbericht des Umweltbundesamtes, Dessau-Roßlau

UBA – Umweltbundesamt (2010a): Umweltschädliche Subventionen in Deutschland, Dessau-Roßlau, http://www.umweltbundesamt.de/sites/default/files/medien/publikation/long/4048.pdf, accessed January 2014

UBA – Umweltbundesamt (2008): Schutz der biologischen Vielfalt und Schonung von Ressourcen - Warum wir mit Flächen sorgsam und intelligent umgehen müssen, Dessau-Roßlau

UBA – Umweltbundesamt (2007): Ökonomische Bewertung von Umweltschäden – Methodenkonvention zur Schätzung externer Umweltkosten, Dessau-Roßlau

UBA – Umweltbundesamt (2004): Bundesratsinitiative des Landes Baden-Württemberg – Initiative zum Bürokratieabbau, Bericht an das BMU vom Oktober 2004, Berlin

UN – United Nations (2012): The future we want, Resolution adopted by the General Assemly vom 27.07.2012, Rio de Janeiro

UNFCCC – Rahmenübereinkommen der Vereinten Nationen über Klimaänderungen (2007): Das Protokoll von Kyoto, http://unfccc.int/resource/docs/convkp/kpger.pdf, accessed June 2007

Valsecchi, C.; ten Brink, P.; Bassi, S.; Withana, S.; Lewis, M.; Best, A.; Oosterhuis, F.; Dias Soares, C.; Rogers-Ganter, H. und Kaphengst, T. (2009): Environmentally Harmful Subsidies: Identification and Assessment, Final report for the European Commission's DG Environment, London/Brussels

VDE – Verband der Elektrotechnik (2012): Ein notwendiger Baustein der Energiewende: Demand Side Integration, Lastverschiebungspotentiale in Deutschland, Frankfurt am Main

Versicherungsforen Leipzig (2011): Berechnung einer risikoadäquaten Versicherungsprämie zur Deckung der Haftpflichtrisiken, die aus dem Betrieb von Kernkraftwerken resultieren, Leipzig

Wallner, A. (2011): Energiebilanz der Nuklearindustrie. Analyse von Energiebilanz und CO_2-Emissionen der Nuklearindustrie über den Lebenszyklus, Zusammenfassung, Vienna

Wietschel, M.; Arens, M.; Dötsch, C. und Herkel, S. (2010): Energietechnologien 2050 – Schwerpunkte für Forschung und Entwicklung, Technologiebericht, Fraunhofer Irb, Stuttgart

Withana, S., ten Brink, P., Franckx, L., Hirschnitz-Garbers, M., Mayeres, I., Oosterhuis, F. and Porsch, L. (2012): Study supporting the phasing out of environmentally harmful subsidies, A report by the Institute for European Environmental Policy (IEEP), Institute for Environmental Studies – Vrije Universiteit (IVM), Ecologic Institute and Vision on Technology (VITO) for the European Commission – DG Environment, Final Report, Brussels

WVM – Wirtschaftsvereinigung Metalle (2012): Metallstatistik 2011, Berlin

Annex: Fact sheets on environmentally harmful subsidies

1 Energy supply and use

Subsidy	Electricity tax and energy tax reductions for the manufacturing sector and for agriculture and forestry
Description	In 2010 enterprises in the manufacturing sector and the agricultural and forestry sector were charged only 60% of the standard energy tax rate for heating fuels, to avoid endangering their international competitiveness. This exemption goes too far from an environmental and competition point of view. There is far less incentive to save energy than in other sectors of the economy or in private households. Under the 2011 Economy Package the rules for electricity and energy tax reductions were revised, which represented a first step towards decreasing the reductions. Since January 2011 companies in the manufacturing industry and the agriculture and forestry sector have been paying 75% of the standard tax rate instead of 60%. At present, however, no further reductions in this subsidy are planned.
Environmental impact	The energy consumption and greenhouse gas emissions caused by the manufacturing sector and the agricultural and forestry sector could be reduced considerably – for example, by changing fuels or using energy-saving cross-sectional technologies. However, there are not sufficient fiscal incentives for energy-efficient production in industrial enterprises or in the agricultural and forestry sector.
Financial volume/ Savings potential	2006: €2.163 billion 2008: €2.415 billion 2010: €2.518 billion (€2.2 billion electricity tax plus €318 million energy tax).
Specific proposal	There should be further cuts in the granting of reduced tax rates. Certain companies which are in international competition and which would have to bear an unreasonable burden of energy tax that threatened their existence should be afforded relief via a hardship rule. Where the state grants a tax reduction, it should at least tie the tax reduction to the successful introduction of energy management systems. This ensures that in return for the energy tax reductions, enterprises also implement energy savings and energy-efficient production methods.

Subsidy	Peak equalisation scheme for eco tax in the manufacturing industries
Description	In 2010 enterprises in the manufacturing sector received a refund of 95% of those eco tax payments (at 60% of the standard energy tax rates) that exceeded the relief on pension scheme contributions. This is intended to prevent significant eco tax burdens for comparatively energy-intensive companies in international competition. As far as eco tax is concerned, the marginal tax rates resulting from this rule are only 3% or less of the standard eco tax rates. Like the general tax concessions, the peak equalisation scheme was reduced from 2011 onwards and now provides for a refund of 90% instead of 95%.
Environmental impact	The peak equalisation scheme very considerably reduces the incentive for the beneficiary enterprises to adopt energy-saving behaviour and ensure energy-efficient production. There is scope for further reductions in the energy consumption and greenhouse gas emissions of energy-intensive enterprises.

Financial volume/ Savings potential	2006: €1.94 billion 2008: €1.962 billion 2010: €1.939 billion (€1.766 billion electricity tax plus €173 million energy tax).
Specific 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 proposed hardship rule should be used to cushion unreasonable hardship for energy-intensive enterprises in international competition.

Subsidy	**Tax reduction for certain energy-intensive processes and techniques**
Description	Energy products with two different uses and energy-intensive processes, such as chemical, metallurgical and mineralogical production processes, and the production of basic construction materials are exempted from energy tax on the grounds of international competitiveness.
Environmental impact	There are no fiscal incentives to make economical use of energy in the favoured industrial processes.
Financial volume/ Savings potential	2006-2007: €322 million for a full year 2008: €886 million 2010: €983 million
Specific proposal	Abolish the blanket tax exemptions for the favoured chemical, metallurgical and mineralogical production processes. The regular energy tax rates and the proposed hardship rule should apply. The EU should extend the field of application of the EC Energy Tax Directive to include the production processes currently favoured.

Subsidy	**Coal subsidies**
Description	Mining of (hard) coal in Germany is not internationally competitive. The German government and North-Rhine/Westphalia make substantial grants in respect of sales of German coal for electricity generation, sales to the steel industry, and compensation for burdens due to capacity adjustments. These are to run out in 2018.
Environmental impact	Prevents the development of sustainable energy supply, causes methane gas emissions, mining damage, flood risks, groundwater hazards.
Financial volume/ Savings potential	2006: €2.285 billion 2008: €2.454 billion 2010: €1.917 billion
Specific proposal	Certain factors suggest that there is a need to reduce coal subsidies faster than currently planned. This would reduce the burden on public budgets and create financial scope for promoting investments needed to implement the energy transition, e.g in energy-saving building refurbishment. Apart from a reduction in greenhouse gas emissions, this would also result in positive effects on employment. A substantial part of the funds liberated by the faster abolition of subsidies should however be used for measures to avoid social hardship for employees in the mining sector and for regional structural assistance measures.

Subsidy	Concessions for lignite industry
Description	According to the Federal Mining Act, a production charge of 10% of the market price is payable on non-mining mineral resources. The Länder do not levy this charge on lignite mining. In 2010 the Länder concerned also waived the water abstraction charges for the drainage of open-cast mining sites. These subsidies for lignite result in distortion of competition on the energy market.
Environmental impact	Lignite is the fossil fuel with the greatest adverse effects on climate, environment and health. The serious consequences of open-cast mining include impairment of the natural groundwater regime and large-scale destruction of landscape and settlements. Lignite, which is used mainly for power generation, is the fossil fuel with the greatest climate-relevant CO_2 emissions per unit of energy.
Financial volume/ Savings potential	2006: at least €196 million 2008: at least €195 million 2010: at least €279 million (exemption from production charge approx. €258 million, plus at least €20 million a year due to exemption from Land-specific water abstraction charges)
Specific proposal	The Länder should demand the lignite production charge of 10% of the market price, approx. €1.531 per tonne. The Länder should also levy water abstraction charges on lignite mining at a rate that covers the environmental and resource costs of the groundwater abstraction. In 2011 North-Rhine/Westphalia took a step towards reducing the subsidy: a charge was imposed on drainage of lignite mining sites.

Subsidy	Energy tax reductions for coal
Description	Since August 2006, coal used for heating purposes has been taxed in Germany. In view of the adverse environmental effects of coal compared with heating oil and natural gas, the tax rate of €0.33 per gigajoule (GJ) is much too low. Until the end of 2010 private households were actually exempted from coal tax completely.
Environmental impact	Coal is the fossil fuel with the greatest environmental and climate impacts.
Financial volume/ Savings potential	2006-2007: €157 million for a full year 2008: €154 million 2010: EUR €190 million
Specific proposal	Gradually raise coal tax rate to a level of €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 assistance programmes for the installation of new heating systems.

Subsidy	Manufacturer privilege for producers of energy products
Description	The "manufacturer privilege" under the Energy Tax Act allows enterprises which produce energy products – for example, refineries, gas producers and coal plants – to use fuels free of tax for their production. This applies both to energy products produced on their own site and to external purchases of energy such as petroleum products, gases or coal.
Environmental impact	Refinery processes and other processes in the creation of energy products are frequently very energy and emission intensive. The manufacturer privilege means that such processes suffer from a lack of fiscal incentives to improve energy efficiency and hence to reduce emissions of greenhouse gases and atmospheric pollutants.
Financial volume/ Savings potential	2006: €400 million 2008: €270 million 2010: €300 million

Specific proposal	Refineries, gas producers and coal plants should be governed by the same energy tax arrangements as for other energy-intensive enterprises in the manufacturing sector. Having regard to the EC Energy Tax Directive, the short-term demand should be for externally purchased energy in production operations to be made subject to the normal tax on energy. In the medium and long term, however, marketable self-produced fuels should also be subject to normal taxation. To this end, efforts should be made to lift the ban on taxation of self-produced energy sources in the EC Energy Tax Directive. However, the 2011 proposals for reform do not make any provision for this.

Subsidy	**Energy tax exemption for non-energy uses of fossil fuels**
Description	Energy sources which are not used as heating or automotive fuels are exempted from energy tax. This applies primarily to petroleum products, natural gas and refinery products that are used as basic materials by the chemical and petrochemical industry. There is a lack of incentives to make more efficient use of fossil fuels as basic materials and to replace them by renewable raw materials.
Environmental impact	The use of fossil energy products for material purposes also depletes finite resources and causes waste in the course of product life cycles. Also, it is not free from CO_2 emissions.
Financial volume/ Savings potential	2006: €1.6 billion 2008: €1.6 billion 2010: €1.6 billion
Specific proposal	Energy sources used for non-energy purposes should be taxed – throughout the EU if possible – in line with their demands on environment and resources.

Subsidy	**Free allocation of CO_2 emissions trading allowances**
Description	Under the European emissions trading scheme, Germany assigned approximately 396 million of the annual CO_2 emission allowances free of charge to installations in the energy industry and the industrial sector in 2010. Free allocations constitute a subsidy for plant operators. Since the emission allowances are both scarce and tradeable, they command a price on the market. For the companies, it means that the state makes them a present of a saleable asset in the form of a pollution right. At the same time the state has lost considerable revenue as a result of the free allocation of emission allowances. Since the beginning of the third trading period in 2013, emission allowances have mostly been auctioned. Industrial plants continue to receive free allocations for a transitional period, but the size of these diminishes in the course of time.
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-relevant 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 ("lock-in effects"). This increases the future cost to the economy of achieving the climate objectives.
Financial volume/ Savings potential	2006: €2.5 billion (different method of calculation) 2008: €7.8 billion 2010: €6.1 billion
Specific proposal	Even if emission allowances continue to be allocated free of charge on a large scale, the allocation rules for the third trading period represent a considerable step forward. In the long-term all emission allowances should be auctioned, since this is the only way of ensuring that the polluter-pays principle is fully observed and the resulting revenue can be used for climate change mitigation measures.

Subsidy	Grants to electricity-intensive enterprises to offset electricity price increases due to emissions trading
Description	Since 2013 electricity-intensive enterprises have received grants to offset electricity price increases due to emissions trading (electricity price compensation).
Environmental impact	The electricity price compensation system runs counter to the emissions trading scheme, because emissions trading is intended to create incentives for improved energy efficiency by setting a price for emission allowances. Electricity price compensation substantially reduces this incentive.
Financial volume/ Savings potential	Subsidy only started in 2013.
Specific proposal	The possibility of preferential treatment by means of electricity price compensation should be abolished at EU level. If its abolition at EU level is not politically feasible, at least the national electricity price compensation should be discontinued. If its abolition in Germany is not possible, the national provisions should at least be reformed. In particular, there is a need to reform the flat-rate compensation by industry, since it does not reflect the actual burden on companies due to indirect electricity costs. It should therefore be replaced by an individual obligation to furnish evidence.

Subsidy	Special compensation provisions under the EEG for electricity-intensive enterprises and railways
Description	Electricity-intensive enterprises and railways pay only a reduced EEG surcharge. For companies, this is scaled by electricity consumption and intensity. This concession was expanded by the revision of the EEG in 2012. The EEG reform 2014 permits relief for 219 industries. Applications can be submitted by companies whose electricity costs as a percentage of gross value added exceed certain limits.
Environmental impact	The reduced surcharge provides less incentive to make efficient use of energy than in the case of non-privileged consumers. Since even energy-intensive enterprises have potential for reducing their electricity consumption and hence – given the present energy mix – their greenhouse gases as well, the special compensation provision has a negative effect on the climate.
Financial volume/ Savings potential	2006: €485 million 2008: €759 million 2010: €1.455 billion
Specific proposal	The list of industries is too generous. It should be confined to industries that do not have adequate means of passing on electricity costs in their product prices. This could be done on the basis of the European Commission's list of industries that are entitled to electricity price compensation (cf. Section 1.2.10). The cap on the levy and the reduction in the minimum surcharge for the non-ferrous metal industry must be criticised. Another negative aspect is the fact that the privileged companies do not have to do anything else in return. It would make sense to require them to implement the economic energy-saving measures identified with the aid of the energy or environmental management system. Moreover, delivery points taking more than 10 GWh of electricity per annum should have to satisfy the technical, organisational and legal requirements for using demand-side management in the electricity market. Companies that have so far enjoyed preferential treatment under the special compensation provision but will now lose this status because of the revised requirements should in future pay the full EEG surcharge. A permanent concession of 80% of the EEG surcharge cannot be justified even from the point of view of protecting existing rights. As a maximum, transitional provisions might be helpful to make it easier for companies to adjust to the higher payments.

Subsidy	Internal power privilege under EEG (industrial sector)
Description	Until the EEG reform 2014, internally generated electricity was exempted from the EEG surcharge (Section 37 EEG). While this primarily applies to industrial power generation, it is equally true of internal power consumption by private households. The internal power privilege was reorganised as part of the EEG reform of 2014. In future the basic levy payable by all new generators of internal power is 40%. This figure increases to 100% for all plants that are neither a renewable energy system nor a high-efficiency CHP plant. The threshold for compulsory payment of the surcharge gradually increases (30% 2015; 35% 2016; 40% 2017), and there is a *de minimis* limit for small producers.
Environmental impact	Complete exemption from the EEG surcharge reduces the incentive for enterprises and households that generate and/or use internally produced electricity to make more efficient use of energy. This means that potential for reducing greenhouse gases is not exploited.
Financial volume/ Savings potential	2006: €295 million 2008: €414 million 2010: €754 million
Specific proposal	Including internal power consumption in the EEG is basically to be welcomed, but it would make sense to have a higher rate of surcharge for existing plants. The proposed *de minimis* limit of 10 kW is intended to ensure the profitability of new, small producers. In view of the planned reduction in renewable energy promotion in many areas this basically makes sense in the first instance. The limit should however be checked to see that it is not too low. In general, however, the addition of small plants should be regulated by the amount of financial assistance, and not through exemption from levies. The level of remuneration must therefore be set so that the desired expansion of photovoltaic systems is possible for small and medium-sized systems. Similar arguments apply to CHP plants.

Subsidy	Preferential treatment of grid fees for energy-intensive industries
Description	Transmission system operators levy a charge for grid use, but special provisions apply to energy-intensive enterprises (Section 19(2), StromNEV). These have been successively expanded since the introduction of the special provisions in 2005. Since 2011 a concession has applied to electricity use of more than 7,000 per annum and since August 2011 it has been possible to obtain complete exemption from grid fees.
Environmental impact	The grid fee concessions offer less incentive for energy-intensive enterprises to use energy efficiently. Energy-intensive enterprises still have potential for improving efficiency, which means that potential for reducing greenhouse gases is not being exploited.
Financial volume/ Savings potential	2007: €34 million 2008: €26 million 2010: €33 million
Specific proposal	As a basic principle, companies should pay the full fee for their use of the power grids in order to make an appropriate contribution to the relevant costs. Preferential treatment could possibly be given to grid users that provide a social service, e.g. by making a contribution to grid stability. However, it is important that the service goes beyond their mere power consumption and does in fact make a relevant contribution. Furthermore, they should not suffer any disadvantages as a result of providing system services, using surpluses or reducing demand for electricity from renewable sources through demand-side management. A hardship rule should apply to companies that are engaged in international competition and are demonstrably subject to unreasonable burdens, but only if they have no opportunities to use demand-side management.

Subsidy	Privileges for special-contract customers with regard to concession charges for electricity
Description	On the basis of concession agreements, cities and communities can demand a payment – the concession charge – from electricity and gas TSOs for the use of public space. Under the Concession Charges Ordinance, special-contract customers that consume more than 30,000 kWh of electricity and use more than 30 kW in at least two months have to pay much lower charges. In certain circumstances the concession charge may be waived completely. It can be assumed that all electricity-intensive companies are completely exempted from the concession charge.
Environmental impact	The privileges for special-contract customers reduce the incentive to improve energy efficiency and thereby lead to adverse environmental and climate impacts.
Financial volume/ Savings potential	2010: €3.5 billion
Specific proposal	The legislature should therefore reform the Concession Charges Ordinance. Total exemption from the concession charge should no longer be possible in future. There is also a need to change the eligibility criteria for preferential treatment, so that companies exploit their efficiency potential and have no incentive to increase electricity consumption. Like grid 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 CHP surcharge for the manufacturing sector and energy-intensive industries
Description	As in the case of the Renewable Energy Sources Act (EEG), promotion of co-generation of heat and power is by means of compulsory connection, purchase and compensation requirements for CHP power fed into the grid (Section 4 KWKG). The cost is allocated among the consumers; three groups of end consumers are distinguished. In 2010 the levy for all end consumers up to 100,000 kWh was 0.128 cents/kWh (category A). The levy for end consumers in excess of this is a maximum of 0.05 cents/kWh (category B). A company in the manufacturing sector whose electricity costs are more than 4% of its turnover pays a maximum of 0.025 cents/kWh (category C: energy-intensive industry). The reduced rates also apply to rail-bound traffic and railway infrastructure enterprises.
Environmental impact	The reduced cost of electricity compared with households and small companies means there is less incentive to make efficient use of electricity.
Financial volume/ Savings potential	2006: €327 million 2008: €178 million 2010: €103 million
Specific proposal	The reduced surcharges should be discontinued and the same rate should apply to all final consumers. This would reduce the burden on households and small companies.

Subsidy	Subsidies for nuclear power
Description	Particularly at the start of its use for power generation, nuclear energy received large explicit subsidies, especially for research. From the time financial assistance started to the present day, over €82 billion of public money has been spent in the field of nuclear energy. As a result, nuclear energy has received considerably more financial assistance than, for example, renewable energy sources 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 provisions made by the NPP operators constitute benefits of a subsidy character running into the billions. In March 2011 the Bundestag decided to end the use of nuclear power by 2022.

Environmental impact	In view of the environmental and health issues associated with uranium extraction, the unresolved question of 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. For instance, the use of nuclear power to generate electricity – involving, for example, the extraction and enrichment of uranium for fuel elements – gives rise to more greenhouse gases than the use of wind and solar energy and hydro power. Declining uranium stocks result in extraction of this resource even when the ore content is low, and the increased energy requirements for its extraction lead to an increase in CO_2 emissions in the overall balance.
Financial volume/ Savings potential	It is not possible to quantify accurately the total amount of environmentally harmful subsidies. Estimates to date indicate that without the high level of implicit subsidies – and especially the limited provision of cover with regard to liability – nuclear power would not be competitive as a source of energy.
Specific proposal	The practice regarding provisions must be changed so that companies which operate nuclear power plants are not favoured by provisions. It is also necessary to ensure that the provisions are indeed available for closure and final disposal, even if the operator should become insolvent.

Subsidy	**Export credit guarantees (Hermes cover) for coal-fired and nuclear power plants**
Description	The federal export credit guarantees serve to cover the economic and political risks of non-payment for companies and banks that are associated with export transactions. As a rule the state uses export credit guarantees to cover risks that private-sector insurance companies cannot accept, or at least not on economic terms.
Environmental impact	Even if the rules of the OECD Common Approach to environmental impact assessment of covered export transactions are applied, the cover also includes technologies that are clearly environmentally harmful, such as energy production from coal or (until June 2014) from nuclear power.
Financial volume/ Savings potential	It is not possible to quantify accurately the total amount of environmentally harmful subsidies.
Specific proposal	In June 2014 the German Government decided as a basic principle not to give any export credit guarantees for nuclear power generation plants and equipment. With a view to the goal of a sustainable, eco-friendly energy supply system, the German Government should also rule out export credit guarantees for coal-fired power plants. There are also other fields in which the requirements for export credit guarantees should be subjected to a critical review of their environmental impact.

2 Transport

Subsidy	Energy tax reduction for diesel fuel
Description	At 47.04 cents per litre the energy tax rate for zero-sulphur diesel fuel is 18.41 cents per litre less than the rate of 65.45 cents per litre for petrol. Including value-added tax, the difference in taxation is even higher (21.9 cents per litre). The lower tax on diesel fuel is an instrument intended to favour commercial road transport, but it also applies to private cars.
Environmental impact	A diesel car (up to EURO 5) pollutes the air with substantially more nitrogen oxide emissions than a petrol-engined car. This difference will become minimal with the introduction of the EURO 6 standard. However, the EURO 6 standard does not become compulsory for newly registered cars until September 2015, which means that substantial pollution will be caused by increased nitrogen emissions until all existing diesel cars are replaced. And when it comes to fine particulates, diesel cars which are not yet equipped with a particle filter represent a much greater risk to health than petrol cars because of the harmful effects of fine particulates. Particularly from a climate policy point of view, the tax concession of 18.41 cents per litre is not justified because, owing to its greater density, diesel fuel has a higher carbon content than petrol and its combustion gives rise to roughly 13% higher CO_2 emissions.
Financial volume/ Savings potential	2006: €6.15 billion 2008: €6.63 billion 2010: €7.05 billion
Specific proposal	The diesel tax rate should at least be raised to the same level as the petrol tax rate. At the same time, the vehicle road tax for diesel cars should be brought into line with the rate for petrol cars.

Subsidy	Distance-based income tax allowance for commuters
Description	Employed persons can set off expenditure on journeys to and from work against income tax as an income-related expense. The rate is 30 cents per kilometre one-way distance between home and work. This reduces the tax burden once the individual flat-rate allowance is exceeded. From the beginning of 2007 this concession was restricted to distances in excess of 20 kilometres, but after the Federal Constitutional Court had held that this was not compatible with the Basic Law, the German Government restored the legal situation which had been in force until 2007. Following the decision by the Federal Constitutional Court, it was – and still is – possible to redesign the distance-based tax in some other way. The court expressly pointed out that it would be possible to redesign the distance-based tax allowance from an environmental point of view in a way that would satisfy the constitutional justification requirements.
Environmental impact	The distance-based tax allowance supports the increase in traffic and the trend to urban sprawl and long distances to work. Above all, it favours car traffic because public transport is very limited, especially in areas with low settlement densities, and is therefore not a viable alternative for many employees. Thus the distance-based tax allowance runs contrary to climate change mitigation and contributes to atmospheric pollution and noise. Land take as a result of urban sprawl processes is also an important factor responsible for loss of biodiversity. Model calculations indicate that abolition of the distance-based allowance could cut CO_2 emissions by more than 1.8 million tonnes per year by 2015 and 2.6 million tonnes per year by 2030.
Financial volume/ Savings potential	2006: €4.35 billion 2008: €4.35 billion 2010: €5.0 billion

Specific proposal	To eliminate the adverse ecological incentives and effects of the distance-based allowance, it should be abolished completely. The legislature could avoid unreasonable hardship for employees with very long distances from home to work by recognising very high costs for the journey between home and work as extraordinary expenses deductible for income tax purposes. If these steps were not possible, the legislature could considerably reduce the rate of 30 cents per kilometre and put a ceiling on the maximum allowance payable.

Subsidy	**Exemption of kerosene from energy tax**
Description	Unlike the fuels used by motor vehicles and the railways, the kerosene used in commercial air transport is exempted from energy tax .
Environmental impact	Owing to the altitude at which they are emitted, air transport emissions have at least twice the climate impact of ground-level emissions. What is more, advances in engine technology are not keeping pace with the passenger-kilometres travelled. For this reason the foreseeable technical measures will be nowhere near sufficient to maintain or reduce present emission levels.
Financial volume/ Savings potential	2006: €6.9 billion 2008: €7.23 billion 2010: €6.92 billion
Specific proposal	Basically kerosene should be taxed at the rate of €654.50 per 1000 litres that is set out in the Energy Tax Act. In the interests of equal fiscal treatment of the different means of transport, efforts should be made to agree on a kerosene tax covering as large an area as possible – at least EU wide. However, this requires changes in European and international law.

Subsidy	**VAT exemption for international flights**
Description	Transboundary air transport is exempt from value-added tax (VAT) in Germany; only domestic flights are subject to VAT.
Environmental impact	Owing to the altitude at which they are emitted, air transport emissions have at least twice the climate impact of ground-level emissions. Advances in engine technology are not keeping pace with the passenger-kilometres travelled. For this reason technical measures will be nowhere near sufficient to maintain or reduce present emission levels.
Financial volume/ Savings potential	2006: €1.56 billion 2008: €4.23 billion 2010: €3.49 billion
Specific proposal	An EU-wide solution for VAT exemption of international air transport would make sense to create a uniform framework of conditions and to prevent distortion of competition through an exodus of passengers to other countries. This would be possible by reforming the EU directive on value-added tax. In view of the existing legal restrictions, a possible second-best solution for the short term would be to levy VAT only on that portion of transboundary flights which was consumed in Germany.

Subsidy	Energy tax exemption for inland waterway transportation
Description	The diesel fuel used in commercial inland waterway transportation is tax-free (Section 27(1) Energy Tax Act).
Environmental impact	The fuel available for inland waterway shipping in Germany today is similar to diesel fuel for road vehicles. However, fuels taken on board in other countries may have a higher sulphur content, in which case their combustion causes higher sulphur dioxide and particulate emissions. These emissions increase atmospheric pollution and acidification of soils and water. At present the level of pollutant emissions by inland waterway shipping is too high.
Financial volume/ Savings potential	2006: €129 million 2008: €118 million 2010: €166 million
Specific proposal	To harmonise the competition situation between the various modes of transport – especially between goods traffic via inland waterways, road and rail – marine diesel should, like diesel fuel containing sulphur in the road transport sector, be taxed at the rate of 47.04 cents per litre. This would create incentives to increase energy efficiency. Changes should be made to European and international law so that tax exemption is abolished throughout Europe, and especially for shipping on the Rhine. In addition, accompanying measures – such as investment bonuses for more efficient, more eco-friendly engines – would make sense in order to simplify modifications to inland waterway traffic. For example, financial assistance has been available since 2007 for modernising inland waterway shipping by giving financial incentives to buy lower-emission diesel engines and emission reduction systems.

Subsidy	Energy tax concessions for mobile machinery and vehicles used exclusively for goods handling in seaports
Description	Machinery and vehicles used exclusively for goods handling in seaports have been favoured by an energy tax concession since April 2008 (Section 3a Energy Tax Act). Instead of the tax rate for motor fuels, only the lower tax rate for heating fuels is applied (Section 2(3) Energy Tax Act). For example, diesel fuel is not taxed at around 47 cents per litre, but only about 6.1 cents per litre.
Environmental impact	The energy tax concession is counter-productive, as it substantially reduces the incentive to make efficient use of energy in mobile machinery and vehicles used for goods handling in seaports.
Financial volume/ Savings potential	2009: €25 million 2010: €25 million
Specific proposal	Basically, therefore, it makes 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 would also be desirable to prevent carriers switching to other ports and giving rise to possible increases in overland transport. There is also a need to investigate whether it makes sense in the medium or long term to provide assistance for the electrification of machinery and vehicles on environmental grounds.

Subsidy	Flat-rate taxation of privately used company cars
Description	Company cars are employers' cars that can also be used for private purposes. When company cars are used for private purposes, the user has to pay income tax in respect of this "payment in kind", on the basis of 1% per month of the vehicle's list price at the time of first registration.
Environmental impact	This flat-rate taxation is an incentive for companies to pay employees part of their salary in the form of a company car. Company cars account for a large proportion of cars on the road. In 2010 some 57.4% of new cars were registered by business owners. Company cars tend to be fairly large cars with above-average fuel consumption. For example, 88% of high-end vehicles were used for business purposes. Thus the company car privilege promotes the car as a means of transport and contributes to environmental pollution by the road transport sector.
Financial volume/ Savings potential	2006: €500 million 2008: €500 million 2010, at least €500 million
Specific proposal	Private use of company cars should therefore be taxed at a higher rate and differentiated by CO_2 emissions. Regardless of the taxation of private use, there is a need for a general eco-oriented reform of company car taxation in order to give companies an incentive to buy vehicles with low consumption and low emissions. The legislature should scale the deductibility of purchase and running costs on the basis of greenhouse gas emissions or the fuel consumption of the vehicles. For example, the purchase costs of low-emission vehicles (e.g up to 100 g CO_2/km) should be fully deductible, while vehicles with CO_2 emissions in excess of this threshold should be only partially deductible. The higher the vehicle's emissions, the smaller the deductible portion of costs should be. It would also make sense to reduce the threshold in the course of time.

Subsidy	Energy tax reduction for biofuels
Description	Subsidisation of biofuels in Germany began in 2004 as a contribution to climate change mitigation, and to boost rural development by creating new sources of income. At first this assistance took the form of a tax concession, which initially covered both pure biofuels and the biogenic component in blends with fossil fuels. Since 2007 the biofuels quota has been the central support instrument, and at the same time it was decided to gradually reduce the tax concession. A tax concession for biofuels especially deserving of promotion continues to be granted until 2015 at the latest, whereas for pure biodiesel and pure vegetable-oil fuels the tax concession was largely discontinued in 2012.
Environmental impact	The impacts of biofuels on climate and the environment are greatly dependent on the biomass used and the growing conditions. As a rule, intensive cultivation of rapeseed, maize, sugar beet, sugar cane, soya beans and other agricultural products used for production of biofuels involves greenhouse gas emissions from soil cultivation, pollution of soil, water and air with fertiliser and pesticide residues, and adverse impacts on biodiversity. Moreover, the global expansion of arable land leads to the conversion of valuable areas and habitats, resulting in substantial releases of greenhouse gases and a considerable loss of biodiversity (direct land use change). If existing forms of land use are displaced, there is a risk that these in turn will penetrate into habitats that are worth conserving (indirect land-use effect). From a climate point of view, the present assistance for first-generation biofuels is relatively ineffective compared with other transport-related measures. This is because the minimum savings in greenhouse gases compared with fossil fuels, as laid down in the Biofuels Sustainability Ordinance, are largely achieved by first-generation biofuels only if the indirect greenhouse gas emissions are not taken into account.
Financial volume/ Savings potential	2008: n.q. 2010: €1.022 billion

Specific proposal	The extensive reduction in tax concessions for biofuels is a first step towards abolishing the environmentally harmful subsidies for biofuels. As a short-term measure, the national biofuel quota should also be frozen at – or preferably below – the present admixture level. In the medium term it will be necessary to abolish the biofuel quota or replace it, either by a quota for the share of renewable energy as a whole or by a minimum greenhouse gas reduction quota (technology unspecified) in the transport sector, which should then be achieved by other renewable energy technologies in the individual areas. The greenhouse gas reduction quota prescribed by the EU or the prescribed minimum share of renewable energy in the transport sector cannot and should not be achieved by an absolute increase in the quantity of biofuels, but by a reduction in the total consumption of energy, e.g. through more efficient vehicles, and through shifting and avoiding transport. In addition, compliance with the minimum share of renewable energy could also be achieved by electric mobility.

3 Construction and housing

Subsidy	Home ownership grant
Description	The home ownership grant is still the largest financial assistance instrument in Germany. It was introduced in 1995 as an instrument for promoting home ownership – with special regard to aspects of social and family policy. It was discontinued on 1January 2006. However, existing cases (building permit application or purchase agreement before 31 December 2005) can continue to claim the full assistance for a maximum period of eight years. This means the home ownership grant will continue to be paid until at least 2013.
Environmental impact	Although the continuing trend to house building, especially detached and semi-detached houses, is easing off in rural areas as well, more new buildings per head of the population are still being constructed in rural areas than in metropolitan areas. In addition to other factors, the frequently low level of land prices in rural areas encourages new building. The home ownership grant reinforced this trend. The result is an increase in land take and consumption of natural resources, and a rise in traffic-induced environmental pollution. The home ownership grant is not compatible with the German sustainability strategy's objective of reducing land take for settlement and transport to 30 hectares per day by 2020.
Financial volume/ Savings potential	2006: €9.244 billion 2008: €6.223 billion 2010: €4.803 billion
Specific proposal	By abolishing the home ownership grant, the German government has made an important contribution to sustainable development.

Subsidy	Promotion of saving for building purposes
Description	The state promotes saving for building purposes by means of the housing construction premium and the employee savings allowance, provided the individual saver does not exceed certain income limits. The housing construction premium on deposits paid into building society plans is up to €45.06 (or €90.11 for married couples). The employee savings allowance for building society savings plans serves the interests of state promotion of private wealth formation, and may reach up to €42.30 a year. For this purpose, employees must have part of their salary – often in combination with employer contributions to the tax-deductible employee savings scheme – transferred to their building society account. In addition, the Home Ownership Pensions Act supports retirement provision plans that are invested in home ownership. In 2010 the federal share came to around €41 million. However, in 2012 it will rise to €56 million.
Environmental impact	The support for savings for building purposes potentially increases the incentive to build individual homes, and hence to increase land take. In this respect it is not compatible with the German sustainability strategy's 30-hectare goal. Furthermore, in view of the housing surplus in many regions, the increasing need for vocational mobility and the long-term demographic trend, both the housing construction premium and the employee savings allowance are no longer in keeping with the times.
Financial volume/ Savings potential	2006: €500.3 million (housing construction premium only) 2008: €467.1 million (housing construction premium and Home Ownership Pensions Act) 2010: €555.5 million (housing construction premium and Home Ownership Pensions Act)

Specific proposal	In future, support for wealth formation for households with small and medium incomes – such as the housing construction premium, the employee savings allowance and the home ownership pension – should no longer favour building society savings. The state should not provide any regionally undifferentiated incentives to build additional homes. This also applies to the design of new forms of assistance in the construction and housing sector. Instead, housing subsidies by the federal and regional authorities should in future be confined to modernisation and energy-saving refurbishment of existing buildings, regardless of capital formation and property acquisition, e.g. under the KfW assistance programmes. The instrument of the home ownership pension should be used only for existing buildings and energy-efficient refurbishment of buildings, or for energy-saving measures.

Subsidy	**Promotion of social housing**
Description	In 2002, in view of the good average supply of housing, the German government used the Housing Assistance Act (Wohnraumförderungsgesetz) to develop traditional social housing activities into a social housing assistance scheme. Since then the assistance provided has been geared much more to refurbishment of existing housing. This development is to be welcomed. Nevertheless, assisted housing continues to account for around 11 to 12% of the new homes built every year. In 2010 some 70% of promotion funds were devoted to assistance for new buildings. As part of the reform of the federal system, responsibility for legislation on social housing assistance was transferred from the federal to the regional authorities on 1 September 2006. Thus since 2007 the German government has no longer played a direct part in social housing assistance. The Länder receive a lump sum of €518 million a year from the German government as financial compensation until 2013.
Environmental impact	Social housing assistance still makes a sizeable contribution to increased land take and the resulting environmental damage.
Financial volume/ Savings potential	2006: €588 million 2008: €518 million (federal level only) 2010: €518 million (federal level only)
Specific proposal	The public sector should continue to pursue this reorientation and set clear priorities for housing creation. Here the first step should be to exploit opportunities for creating residential accommodation by converting attics and refurbishing existing buildings, followed by developing vacant sites, industrial and commercial waste land and converted land. Only if there is an urgent need for residential accommodation over and above this level should new open spaces be developed. In that case the main focus should be on space-saving apartment blocks. The assistance should focus more on households that do not have the resources of their own to find appropriate accommodation on the housing market. The Federal Environment Agency therefore recommends that greater use be made of the instrument of rent subsidies and municipal acquisition of occupancy rights in existing buildings for needy households.

Subsidy	Joint Agreement for the Improvement of Regional Economic Structures
Description	The purpose of the Joint Agreement for the Improvement of Regional Economic Structures (GRW) is 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 reducing development differences. Here there is a special focus on promoting investment by trade and industry to create and safeguard jobs. Implementing these assistance measures is the responsibility of the Länder. However, the German Government plays a part in framework planning and financing. The federal and regional authorities each provide 50% of the money. To this must be added assistance from the EU structural funds – especially the European Regional Development Fund (ERDF). For the year 2010, GRW assistance amounting to nearly €2 billion (including ERDF) was approved. Of this, nearly three quarters went to trade and industry and over a quarter to infrastructure.
Environmental impact	In view of the continuing rapid growth of land used for settlement and infrastructure, new development of areas for trade and industry as a measure of regional structural policy must be seen in a critical light. At the same time the intensity of utilisation of newly developed areas is frequently low, and the number of vacant lots in newly developed trading and industrial estates is growing. The development of new industrial land – especially in non-built-up areas – makes a direct contribution to land take and hence to harmful impacts on various environmental assets. Thus uncritical promotion of such projects is not compatible with Germany's land-saving objectives. As a rule, new development for industrial purposes also entails the expansion of transport infrastructure, which – as well as additional land take – results in further traffic-induced environmental pollution.
Financial volume/ Savings potential	No clear quantification of the environmentally harmful portion of the subsidies provided is possible.
Specific proposal	The assistance rules of the GRW will have to be supplemented by environment-oriented assistance criteria which give clear priority to recycling of waste land rather than development of new industrial sites. Structural assistance measures should serve the internal development and refurbishment of existing settlements and infrastructures, especially since long-term funding of the maintenance of existing public infrastructures is in any case subject to great risks in structurally weak regions. One requirement for assistance should be that the applicant must first present an inventory of vacant lots in settlement areas and of existing trade and industry sites. Additional land development should only be undertaken if the available reserves of land are exhausted and advantage is taken of opportunities for land-saving construction methods. Furthermore, the GWR should aim not so much at promoting construction measures, but rather at promoting human capital and environmental innovations and strengthening regional management cycles.

4 Agriculture and forestry, fisheries

Subsidy	Agricultural subsidies of the European Union
Description	The Common Agricultural Policy (CAP) of the European Union largely determines the political framework conditions for agriculture in Germany. The CAP is based on two pillars: The first pillar is the market and price policy, which is intended to safeguard farmers' earnings. The second pillar of the CAP consists of measures to promote rural development. These are intended to improve the competitiveness of the agricultural sector, raise the quality of life and the environment in rural areas, and promote opportunities for earning outside the farming sector in rural areas. Since 2005 the direct payments have been largely decoupled from production. They are also conditional upon the farm complying with the standards in the fields of environment, animal feed safety and food safety, and veterinary health and animal protection (Cross Compliance). Measures under the first pillar are fully financed by the EU, whereas measures under the second pillar have to be co-financed by the member state in question. During 2013 the European Commission, the Council of Ministers and the European Parliament reached agreement on a reform of the Common Agricultural Policy. One objective of the reform is to make the first pillar of the CAP "greener".
Environmental impact	Since the decoupling of direct payments (under the first pillar) from production, these payments have ceased to have any influence on production intensity. This means they are not in themselves environmentally harmful like the earlier payments which were coupled to production. However, the environmental requirements attached to direct payments are not sufficient. There are also deficits in implementation. One negative point from an environmental point of view is the fact that as a result of the co-financing requirement for measures under the second pillar, there are cases where the Länder are not claiming money for agri-environmental measures because they are unable or unwilling to contribute the co-financing This leads for example to a lack of certainty for farmers trying to plan, and makes it more difficult to implement agri-environmental measures.
Financial volume/ Savings potential	The volume of funding available for price support and direct payments is far greater than for rural development measures. In 2009 Germany had over €6.4 billion at its disposal in the first pillar, but only €1.16 billion in the second pillar. For the reasons mentioned above, the direct payments cannot be pronounced definitely harmful to the environment.

Specific proposal	The environmental measures should be introduced on a compulsory basis in the interests of a marked "greening" of European agriculture from 2014 onwards. This means that successful implementation of the greening component would be a condition for receiving any money at all from the first pillar. To ensure an effective greening component the requirements should also be extended as follows: • Crop diversity: No crop may account for more than 45% of the arable area of a farm. Perennial crops are calculated separately for each growth year. • Preservation of permanent pasture: The UBA recommends an absolute ban on ploughing up pasture. To prevent anticipatory reactions to the announcement, 2011 should be taken as the reference year. • Ecological priority areas: These are not set-asides, but are available for use, albeit with a focus on environmental interests. The share due to ecological priority areas should in each case be 10% of the arable and pasture areas eligible for assistance. The European Commission's proposal of 7% is an absolute minimum. In addition to the measures cited, there should also be requirements limiting the nitrogen balance and restrictions on livestock densities. The European Commission should use the half-time evaluation of the reformed CAP in 2017 to remedy the deficits in the agricultural reform.

Subsidy	**Joint Agreement for the Improvement of Agricultural Structures and Coastal Protection**
Description	The purpose of the Joint Agreement for the Improvement of Agricultural Structures and Coastal Protection (GAK) is to • ensure an efficient agricultural and forestry sector geared towards future requirements, • facilitate competitiveness of the agriculture and forestry sector on a European comparison, and • improve coastal protection. ´The annually updated GAK framework plan is the central instrument for applying the second pillar of EU agricultural policy in Germany, as described in the "Federal Republic of Germany's National Strategic Plan for Rural Development 2007-2013". In 2010 the financial volume was over €1 billion (federal funds €670 million).
Environmental impact	In the GAK realignment process in recent years, the federal and regional authorities have already made significant changes in the objectives and content of individual assisted fields. This has made it possible to substantially reduce negative environmental impacts and transform them into effects that are ecologically neutral, or even positive. The GAK nevertheless continues to support measures that may have adverse impacts on the environment, for example by assisting measures in the fields of water resource management and crop growing. The assistance for integrated rural development and forestry measures also includes infrastructure measures – such as developing farm and forest roads and tracks, and surfacing existing routes with asphalt or concrete.
Financial volume/ Savings potential	No clear quantification of the environmentally harmful portion is possible.
Specific proposal	The GAK needs ongoing development based on environmental criteria, and the assistance for environmentally harmful measures needs to be reduced as far as possible.

Subsidy	Tax rebate for agricultural diesel
Description	The German government pays 21.48 cents per litre towards diesel fuel for agriculture and forestry. In this way, farm diesel enjoys a reduced tax rate of 25.56 cents per litre compared with the standard rate of 47.04 cents per litre. The ceiling on the tax concession and a retention dating from 2005 were lifted in March 2011 and approved by the European Commission under the legislation on state aid until the end of 2016.
Environmental impact	The distortion of fuel prices means there is less incentive to make efficient use of fuel than in other sectors, with corresponding adverse effects on the climate and air quality.
Financial volume/ Savings potential	2006: €180 million 2008: €135 million 2010: €395 million
Specific proposal	The subsidy for agricultural diesel should be abolished. The resulting additional tax revenue could be used for rural development (second pillar) – and especially the agri-environmental programmes – and could thus remain largely within the agricultural sector. If the subsidy for agricultural diesel were not done away with entirely, the second-best solution would be to refund the tax on a flat-rate basis . Here the legislature would presume a specific diesel consumption per hectare of land and would refund the tax partly on the basis of farm size. In that case the refund would have the effect of a flat-rate area-based premium. Since the actual fuel consumption would no longer play any role in the tax rebate – because the agricultural diesel would be taxed at the standard rate of 47.04 cents per litre – the economic incentive to save fuel would be fully maintained.

Subsidy	Exemption of agricultural vehicles from vehicle road tax
Description	Agricultural vehicles are exempted from vehicle road tax . This tax exemption goes back to 1922, when it was intended to promote the motorisation of agriculture and forestry.
Environmental impact	This concession supports an over-dimensioned inventory of machinery. The trend to increasingly heavy machines in agriculture results in increasing damage to agricultural soils through compaction. Compaction damage is often irreversible and restricts the natural functions of the soil.
Financial volume/ Savings potential	2006: €55 million 2008: €55 million 2010: €60 million
Specific proposal	The exemption of agricultural vehicles from vehicle road tax should be abolished. Alternatively, one could use the money to strengthen rural development or to provide direct rewards for environmental achievements (e.g. maintenance of ecologically valuable land by means of extensive use, or care of landscape elements).

Subsidy	Subsidies for production of spirits
Description	The subsidy is intended to safeguard sales of agricultural alcohol. This is produced mainly in small and medium distilleries which owing to their unfavourable production conditions are at a competitive disadvantage compared with large distilleries in other European member states. Since 2000 the German market for agricultural alcohol has basically been deregulated. Nevertheless, large agricultural distilleries (until 2013) and small distilleries and fruit distilleries (until 2017) can continue to produce subsidised agricultural alcohol within the limits of their quota and market it through the federal monopoly administration.
Environmental impact	The production methods of the approximately 10,000 farm-based distilleries differ very widely, ranging from environmentally sound (e.g. based on extensive fruit orchards) to environmentally dubious (e.g. based on intensive potato growing). Since this subsidy is coupled to production, in principle it creates an incentive to intensify farming methods.
Financial volume/ Savings potential	2006: €86 million 2008: €80 million 2010: €75 million
Specific proposal	Instead of continuing the subsidy in its present form, the state should in future grant direct assistance for eco-friendly production methods such as extensive fruit orchards, but the amount of assistance should be independent of production volumes.

Subsidy	Common Fisheries Policy (CFP)
Description	Since 1993 the Common Fisheries Policy of the European Union has been subsidised by a fisheries fund of its own. Since 2003 this has been known as the European Fisheries Fund (EFF). In May 2014 a redesigned fisheries fund was set up under the reformed CFP (European Maritime and Fisheries Fund, EMFF).
Environmental impact	According to information supplied by the European Commission in 2014, only 22% of the regulated stocks in European waters are classified as not overfished. The escalation of the fish stocks crisis is largely due to short-term profit orientation, oversized fishing fleets, decades of setting excessive catch quotas and ignoring scientific recommendations, and environmentally harmful subsidies for the fisheries sector.
Financial volume/ Savings potential	The subsidies made available to the German fisheries sector by the EFF during the period 2007 to 2013 totalled €247 million (including the national contribution). According to the Federal Institute for Food and Agriculture (BLE), subsidies totalling only €35 million are documented for the German fisheries sector for that period. The BLE publications only list the project titles, making it impossible to quantify an environmentally harmful component of this subsidy. In addition to the direct assistance from the European Fisheries Fund and comparable national aid schemes, the fisheries sector also receives numerous implicit subsidies.
Specific proposal	The new orientation of the fund since May 2014 is intended to assist European companies with the changeover to sustainable fisheries and aquaculture, thereby setting a course that should be welcomed. At present it is impossible to foresee the extent to which potential for improvement exists when implementing the EMFF at the level of the member states, so no specific proposals exist here. However, there is reason to expect greater transparency regarding the payments received from the EMFF. This will permit better assessment of subsidies and their environmental impacts.

Subsidy	Environmentally harmful VAT concessions
Description	The standard rate of value-added tax (VAT) in Germany is 19%. For social, cultural, agricultural and transport-related reasons, certain groups of products are subject to a reduced tax rate of 7%. This applies primarily to food, but also to printed products, animal feeds or local public transport. The VAT concessions have taken shape over the years. In some cases reduced tax rates have also been introduced in recent years, with the result that the present system as a whole is not consistent.
Environmental impact	The products benefiting from the reduced tax rate also include products with adverse effects on the environment. This applies, for example, to meat and dairy products, the production of which gives rise to substantial climate impacts and is also associated with other negative environmental effects due to nutrient surpluses and water pollution. Moreover, the cultivation of fodder uses large areas and is often associated with adverse impacts due to intensive arable farming. Delicatessen products such as goose liver, frogs' legs and turtle meat also profit from the reduced VAT rates. These concessions should be abolished for environmental reasons – especially since they are luxury goods which are not necessary for basic supplies of foodstuffs.
Financial volume/ Savings potential	It is beyond the scope of this report to quantify the subsidies for environmentally harmful products as a result of the reduced rate of VAT.
Specific proposal	The reduced rate of VAT should be discontinued. However, social impacts must be taken into account as well. Work is in progress on reforming the VAT system at EU level as well. One important focus here is consistency with other EU measures, e.g. environmental protection. The reduced rate of VAT should not be applied to goods and services that have adverse impacts on the environment, human health or public welfare.

End notes

1 Rückert-John, J. et al (2013), p. 19.

2 Statistisches Bundesamt (2013).

3 OECD (2001), p. 129. The percentage of subsidies potentially harmful to the environment is based on the financial assistance and tax concessions described in the German Government's 17th Subsidies Report (1999). The figure relates to the volume of subsidies.

4 This sum consists largely of federal subsidies. It also includes subsidies granted jointly by the German government and the Länder – in the context of Community taxes and co-financing – or in which it participates under framework legislation. The environmentally harmful parts of the following subsidies are not quantifiable in this report and are therefore not included in the total of over €52 billion (cf. Table 3).

5 This also applies to the inadequate internalisation of environmental costs, since not all costs of production and consumption are taken into account.

6 EU-KOM (2005), p. 6.

7 Cf. OECD (2005), p. 59 ff.; Withana, S. et al (2012), p. 44 ff.

8 The Federal Government's subsidies policy guidelines lay down that subsidies policy shall take account of environmental impacts as well as growth, allocation and competition aspects.

9 Cf. UBA (2007) and Maibach, M. et al (2007)

10 However, when examining other issues it may make sense to look at external costs as well as subsidies, e.g. where it is a matter of designing measures intended to reduce distortion of competition between energy sources.

11 IEA (2013), p. 25. Figures in US dollars, exchange rate as per 17.02.2014.

12 IEA (2010). Seven percent of global CO_2 emissions corresponds to the total emissions of France, Germany, Italy, Spain and the United Kingdom.

13 UNFCCC (2007), Article 2 (1), a) v).

14 G20 Leaders (2009).

15 EU-KOM (2010), p. 19; EU-KOM (2011), p. 10.

16 UN (2012), paragraphs 173 (p. 33) and 225 (p. 43).

17 Bär, H. et al (2011), p. 27ff.

18 OECD (2012), p. 99f.

19 Bär, H. et al (2011), p. 31 f.

20 Withana, S. et al (2012), p. 32 ff.

21 BMU (2013), p. 13.

22 Calculations for 2011 based on data from UBA (2012).

23 Calculations for 2011 based on data from UBA (2012a).

24 BMU (2013), p. 10.

25 UBA (2013), p. 1; BMU/UBA (2013).

26 BMWi/BMU (2012), p. 5.

27 BMF (2011), p. 64.

28 Thöne, M. et al (2010), p. 224.

29 Federal Constitutional Court 1 BvR 1748/99 of 20.4.2004 - Judgement on "Eco Tax"

30 State aid No. N 449/2001 – Germany ("Continuation of ecological tax reform after 31 March 2002"), OJ C 137, 8.6.2002, and repeated approval of the modified arrangements in European Commission letter of 13.06.2007 (state aid N 775/2006).

31 BMWi (2010a), calculated from Table 6a

32 Wietschel, M. et al (2010), p. 821.

33 Bundesregierung (2010), p. 14.

34 BMF (2011), p. 240 and p. 235.

35 Op. cit., p. 209 and p. 212.

36 Most of the "eco tax" revenue goes to the pension fund. This reduces the employer and employee contributions.

37 BMF (2011), p. 64f.

38 Op. cit., p. 210 and p. 214.

39 BMF (2013), p. 258 and p. 263.

40 EU-KOM (2010a), p. 87.

41 AGEB (2012), p. 13.

42 The task of assessing the efficiency of energy-saving measures should not be left to the companies, but should be based on criteria such as proven payback period and return on investment.

43 Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity, Art. 2 (4) b).

44 BMF (2011), p. 207 and p. 213.

45 Cf. preceding sections 1.2.1 and 1.2.2.

46 Parlament Nordrhein-Westfalen (2009).

47 Gesamtverband Steinkohle e.V. (2011), p. 60.

48 NRW Ministry for Economics, SMEs and Energy et al (2007).

49 BMWi (2007).

50 Parlament Nordrhein-Westfalen (2010) p. 20.

51 Coal Financing Act (Steinkohlefinanzierungsgesetz) of 20.12.2007.

52 HEAL (2013), p. 5.

53 Calculated on the basis of cost rates according to UBA Methodological Convention (2013a), p. 29) and the AGEB data on gross power generation (2013).

54 The Federal Government's energy concept (2010) states that climate-relevant greenhouse gas emissions are to be reduced by 40% by 2020, 55% by 2030, 70% by 2040 and between 80 and 95% by 2050 (in each case compared with 1990).

55 Frohn, J. et al (2003). North-Rhine/Westphalia – which is particularly affected by any reduction in coal subsidies – planned in 2007 to treble the refurbishment rate to 3% of existing buildings per year, and for this purpose it had made money available – in addition to the nationwide building refurbishment programme of the KfW Banking Group. The Land government expected the energy-saving building refurbishment programme to result in up to 100,000 additional jobs (EnergieAgentur, NRW 2007). In 2008 the refurbishment rate was still around 1% (Ministry for Economics, SMEs and Energy of NRW 2008).

56 Lechtenböhmer, S. et al (2004).

57 Cf. Art. 151(2) No. 2 Federal Mining Act.

58 AGEB (2013a), natural units.

59 Own calculations, based on costs of €6.1 per MWh (Federal Government (2013), p. 45 f.) and a figure of 2.5 MWh (rounded) for 1kg lignite (AG Energiebilanzen, unit converter).

60 Water Framework Directive, Article 9.

61 Lechtenböhmer, S. et al (2004), p. 43.

62 Deutscher Bundestag (2012), p. 3. Data situation does not permit separate presentation of lignite and coal.

63 Apart from the adverse effects on the natural regime, the lowering of the water table results in higher energy requirements. In 2008 the German lignite mining areas needed 1098 GWh of electricity for operating pumps (Deutscher Bundestag (2010), p. 4).

64 Deutscher Bundestag (2012a).

65 BMF (2012).

66 Statistisches Bundesamt (2011), p. 12.

67 AGEB (2011), Table 4.2.1.

68 BMF (2011), p. 205.

69 Cf. reform proposals in sections 1.2.1 and 1.2.2.

70 Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity, Art. 21 (3), first sentence.

71 From a climate point of view the fiscal incentives for energy-efficient design of production processes have a basically positive impact. However, the tax could encourage replacement of a relatively climate-friendly fuel (e.g. natural gas) by a relatively harmful fuel (e.g. heating oil) and thereby have negative environmental impacts.

72 AGEB (2011), Table 1. Structure of energy consumption in Germany by sectors.

73 UBA (2011).

74 Emission allowances are traded on the European Energy Exchange (EEX), for example.

75 UBA (2013b); UBA (2014), p. 65.

76 The free-rider effects in 2010 were estimated at around €6 billion (Herrmann, H. et al (2010), p. 21).

77 This corresponds to a calculated average market value in the second trading period of around €1.4 billion, which is still around €400 million at average prices for April 2013; cf. UBA (2013b).

78 UBA (2014a), p. 26.

79 Carbon Leakage denotes the relocation of production in response to higher CO_2 emission prices, e.g. due to emissions trading.

80 De Bruyn, S. et al (2013).

81 Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive/87/EC so as to improve and extend the EU greenhouse gas emission allowance trading system. Art.10a. Paragraph 6

82 Announcement of 23 July 2013 by the Federal Ministry of Economics and Technology regarding the change in the guidelines for state aid to enterprises in sectors or sub-sectors for which it may be assumed that there is a substantial risk of relocation of CO2 emissions (state aid for indirect CO2 costs) in view of the costs associated with the EU ETS allowances, which are passed on in electricity prices.

83 BMWi (2012a).

84 Department for Business Innovation & Skills, Department of Energy & Climate Change (2013), p. 5f.

85 Section 1 of the Renewable Energy Sources Act (EEG 2014) of 21 July 2014 (BGBl. I 1066

86 BMU (2013), p. 13.

87 The reasons for the increase in the EEG surcharge are complex. The main driving forces are the additional costs of renewable energy, the decline in electricity exchange prices, and the special provisions for industry. For the reasons for the rise in the EEG surcharge, cf.. http://www.umweltbundesamt.de/themen/klima-energie/erneuerbare-energien/erneuerbare-energien-gesetz (15.10.2013).

88 Ratio of electricity prices payable by companies to gross value added.

89 BAFA 2013).

90 Bundesregierung (2012), p. 96.

91 The higher charges for non-privileged consumers increase their incentive to make efficient use of electricity. However, this does not result in a cost-effective improvement in energy efficiency.

92 Bundesregierung (2012), p. 97.

93 Op. cit., p. 96.

94 Op. cit., p. 97.

95 Prognos (2012), p. 17.

96 Bundesregierung (2012), p. 96.

97 Bundesregierung (2012), p. 96.

98 Deutscher Bundestag (2012b), p. 2.

99 The average figures are calculated on the basis of the following assumptions: Domestic customers are households with an annual consumption of 3,500 kWh p.a. and low-voltage supply (0.4 kV). Industrial customers have an annual consumption of 24 GWh p.a., an annual peak load of 4,000 kW and an annual usage time of 6,000 hours, medium-voltage supply (10 or 20 kV) (Federal Network Agency/ Federal Cartel Office (2013), 63ff).

100 Bundesregierung (2012), p. 96.

101 Information from transmission system operators in October 2012: https://www.netztransparenz.de/de/umlage_19-2.htm (August 2013).

102 TSO information on determining the Section 19 levy https://www.netztransparenz.de/de/umlage_19-2.htm (August 2013).

103 Deutscher Bundestag (2012b), p. 14.

104 VDE (2012), p. 57.

105 EU-KOM (2013).

106 BMWi (2013).

107 A first step in this direction might be the “physical component” introduced in the revision of the Power Grid Charges Ordinance

(StromNEV), which is intended to take account of the relevant energy-intensive consumers' reduction contribution when calculating the grid usage fee. However, since the detailed provisions are still not clear, it is not yet possible to make a final assessment.

108 Usage consists in the laying and operation of energy supply lines.

109 Special-contract customers do not have a contract with the basic supplier under the general connection and supply requirements.

110 The concession charge is waived completely if the average price for special-contract customers is lower than the calculated threshold price. For this purpose the average price for the individual special-contract customer is calculated including electricity tax, EEG and CHP surcharges, without value-added tax and concession charge, but including the remuneration under Section 10 of the Electricity Tax Act. The Federal Statistical Office calculates the threshold price as the average price per kilowatt-hour for the supply of electricity to all special-contract customers in the calendar year before last, excluding value-added tax. Supply companies and municipalities can agree higher threshold prices (Section 2(4) KAV).

111 IZES (2009), p. 89.

112 Monopolies Commission (2013), p. 231.

113 Bundesregierung (2012), p. 96.

114 Raue LLP (2013), p. 18.

115 Full title: Act on the maintenance, modernisation and expansion of combined heat-and-power generation (CHP Act).

116 Deutscher Bundestag (2002), p. 15.

117 TSO annual accounts 2010, p. 2. https://www.netztransparenz.de/de/EEG_Jahresabrechnungen.htm.

118 Hermann, H. et al (2012), p. 16.

119 Bundesregierung (2012), p. 96.

120 Depending on the study and its assumptions regarding ore content, the range of greenhouse gas intensity figures for nuclear power is very great and varies between 2 and 288 g CO2/kWh. However, the climate balance of nuclear power can be expected to deteriorate as a result of falling ore content (Wallner, A. (2011), p. 2ff.).

121 Including tax concessions and implicit subsidies, FÖS calculates that subsidies to date total more than €200 billion (based on 2010 prices) (Meyer, B. and Küchler, S. (2010), p.5).

122 DIW (2007), p. 53. Base prices 2006. Before 1974 public financial assistance for research into renewable energy sources and energy efficiency was negligible.

123 The sum quoted is made up of the key assistance areas "Nuclear Energy Research" and "Disposal of Nuclear Installations" (BMBF (2010), p. 429).

124 Versicherungsforen Leipzig (2011), p. 94 f.

125 Op. cit., p. 103.

126 Hausner and Simon (2006).

127 The additional cost for an appropriate insurance premium – purely notional, because the damage as described is uninsurable – depends greatly on the period over which the money is assumed to be made available (10 to 100 years) and the number of NPPs insured individually or within a pool (Versicherungsforen Leipzig (2011), p. 103).

128 For the first 25 years the provisions are subject to a discounting requirement.

129 Fouquet, D. and von Uexküll, O. (2003); Meyer, B. and Küchler, S. (2010), p. 72.

130 DIW (2007), p. 39.

131 Meyer, B. et al (2009), p. 52ff.; Meyer, B. and Küchler, S. (2010), based on figures from Bundesdrucksache 17/5322, p. 16.

132 FÖS bases the calculation of the internal finance component on an interest rate of 7.8%.

133 Irrek (2007).

134 Euler Hermes Deutschland AG (no year), p. 4 f.

135 Felbemayr, G. et al (2012), p. 20.

136 Hermes Deutschland AG (2012), p. 2; Hermes Deutschland AG (2010), p. 2.

137 Hermes Deutschland AG (2010), p. 10.

138 Hence the term "Hermes cover".

139 Felbemayr, G. et al (2012), p. 20.

140 Felbemayr, G. et al (2011), p. 23.

141 In addition to a general export interest, e.g. safeguarding jobs, this is due to structural policy considerations or foreign policy objectives.

142 Euler Hermes Deutschland AG (2012), p. 2.

143 From 2001 to 2009 the national Hermes environmental guidelines applied alongside the OECD environmental guidelines. These ruled out export assistance for nuclear technologies (Deutscher Bundestag (2011), p. 2).

144 Deutscher Bundestag (2013), p. 38.

145 In the meantime, national and international assistance banks also rule out the financing of coal-fired power plants for environmental, health and climate reasons or only permit it subject to restrictive conditions. For example, the European Investment Bank will only participate in financing power plants with a maximum emission of 550 grams of carbon dioxide per kilowatt-hour. In practice this means the end of financing for coal-fired power stations, unless CCS technology – which has controversial environmental impacts – is used.

146 Deutscher Bundestag (2012c), p. 5.

147 Calculations after UBA (2012a).

148 Calculations after UBA (2012).

149 UBA (2013c), p. 48.

150 BfN (2005); BfN (2011).

151 UBA (2010), p. 10.

152 EEA (2007), p. 12/13. In its latest report on transport subsidies in Europe, the European Environment Agency comes to the conclusion that, in particular, road traffic in the EU profits from publicly financed transport routes to the tune of three-digit billions.

153 KBA (2012).

154 Statistisches Bundesamt (2011), Table 1.1.

155 The calculation of the subsidy amount is based on the current tax rate for petrol, and this is also applied to diesel fuel. Thus the taxation is based on the principle that the same tax rate applies to one litre of fuel. This figure does not take account of the additional loss of value-added tax revenue.

156 Reducing the energy tax rate for petrol to the same level as the diesel tax rate would reduce the economic incentive to adopt energy-saving driving habits and buy low-consumption cars, which would make it an unfavourable option from a climate point of view.

157 The maximum reasonable burden is calculated individually on the basis of income and family situation. It is currently between 1% and 7% of total earnings.

158 Matthes, F. et al (2008), p. 269ff.

159 Distelkamp, M. et al (2004), p. 89/90.

160 Section 27 (2) Energy Tax Act (EnergieStG).

161 UBA (2012b).

162 Matthes, F. et al (2009), p. 269ff.

163 Energy Tax Act (EnergieStG), Section 2 (1), No. 3. The tax rate is made up of 50.11 cents per litre excise duty component and 15.34 cents per litre eco tax component.

164 BMF (2011), p. 226.

165 In the practical implementation of kerosene tax, the basis – as in the case of diesel and petrol – should be the fuel sold within Germany. This avoids complicated allocation of the share consumed within Germany and the share consumed abroad. If all countries took the same approach, this would also ensure that there was no double taxation.

166 BAFA (2011), Table 7j.

167 Art. 14, 2003/96/EC.

168 Deutscher Bundestag (2012d), p. 9.

169 The amount of the subsidy is calculated on the basis of the sales tax payments in Statistisches Bundesamt (2012) and the total sales by air transport companies in Statistisches Bundesamt (2011a), Table 10.1. To avoid complicated allocation procedures, there is no breakdown into various national air spaces overflown – unlike the calculation of value-added tax for rail transport, for example.

170 Section 27 (1) Energy Tax Act (EnergieStG) (until August 2006 Section 4 (1) No. 4 Petroleum Excise Duty Act (MinöStG).

171 BMF (2011), p. 227.

172 Op. cit., p. 225.

173 KBA (2012a).

174 KBA (2011).

175 Her Majesty's Revenue & Customs (2006). By this means emissions were reduced by between 0.2 and 0.3 million t CO_2 in 2005.

176 Diekmann, L. et al (2011), p. 152.

177 Incentives to buy low-consumption, low-emission vehicles should also exist for company cars that are not used privately.

178 Deutscher Bundestag (2013a), p. 6.

179 OECD (2008).

180 Öko-Institut/IFEU 2010)

181 Under Section 50 (4) of the Energy Tax Act, biofuels especially deserving of assistance include biomethane, BtL (Biomass-to-Liquid) fuels and cellulose-ethanol.

182 Deutscher Bundestag (2011a).

183 In 2010 the sustainability criteria of the Biofuels Sustainability Ordinance (Biokraft-NachV) did not yet apply to biofuels, and it cannot therefore be assumed that these minimum standards were complied with.

184 According to the German Government's Subsidies Report, the subsidy relates to both biofuels and heating bioliquids. Assistance for heating bioliquids expired in 2009, but the figures for 2010 may still include subsidies for heating bioliquids as a result of subsequent tax refunds. Since the environmental impacts of heating bioliquid production are similar to those of biofuels, assistance for heating bioliquids is also an environmentally harmful subsidy and adds to the figures. Federal Finance Ministry (BMF 2011), p. 208.

185 The calculations are based on the quantity of biofuels needed to meet the quota, and data on price differences according to Rauch, A. and Thöne, M. (2012), p. 35.

186 Statistisches Bundesamt (2013a), Table 2.2.

187 Statistical Offices of the Länder (2011), Table 10.7.

188 Statistisches Bundesamt (2013b), p. 10.

189 SRU (2005), p. 113.

190 Deutscher Bundestag (2012e), p. 7.

191 For example, the number of construction permits for residential buildings declined by nearly 35% between 2006 and 2010 (Statistisches Bundesamt 2012a), but revived again in 2011.

192 Bundesregierung (2008), p. 145.

193 UBA (2008), p. 9.

194 BBSR (2013), p. 3.

195 BfN (2005).

196 EEA (2006), p. 29/30.

197 Calculated from basic data in Statistisches Bundesamt (2012b).

198 WVM (2012), p. 7.

199 UBA (2011a), p. 164.

200 Own calculations, after BGR (2009), p. 86 and DERA (2012), p. 147.

201 BMF (2002), p. 7 and p. 10.

202 Sprenger, R.-U. and Triebwetter, U. (2003), p. 44.

203 BMF (2011), p. 234 and p. 236. The figure is made up of €3.616 billion basic allowance and €1.187 billion child supplement; it comprises the payments for new and existing homes.

204 According to the German Government's energy concept of 2010, the energy-saving refurbishment rate of about 1% will have to be roughly doubled to 2% to ensure a nearly climate-neutral building situation by 2050. Despite existing assistance programmes, this target is still a long way off. In 2009, in view of the great demand, the funds for promoting the CO2 building refurbishment programme were stepped up from €1.4 billion to €2.25 billion. However, only €1.35 billion was provided for 2010 and only €0.9 billion for 2011, though the assistance funds were to be increased to €1.5 billion per annum for 2012 to 2014.

205 BMF (2011), p. 165.

206 Deutscher Bundestag (2008), p. 3.

207 BMF (2011), p. 239.

208 The Kreditanstalt für Wiederaufbau (KfW) is a national development bank, and the credits it gives include loans for energy-efficient refurbishment of existing buildings.

209 BMF (2006), p. 40.

210 BBR/BBSR (2011).

211 BMF (2011), p. 30.

212 Deutscher Bundestag (2006), p. 8/9.

213 For the current assistance period 2007 to 2013, Germany is to receive for the three goals "Convergence", "Regional Competitiveness and Employment" and "European territorial cooperation" a total of €26.3 billion, i.e. an average of €3.8 billion a year (EU-KOM 2006). Money from the EU structural funds frequently serves as co-financing for the Joint Agreement money. The exact share of the EU structure fund payments in combination with the GRW that is due to the environmentally harmful subsidies has yet to be determined.

214 BAFA (2011a). For 2009 the German government, in its Economic Package I, increased the GA funds once by a further €200 million (BMWi 2010).

215 BMWi (2013a).

216 Bonny, H. W. and Glaser, J. (2005).

217 Deutscher Bundestag (2007). Projects eligible for assistance are the construction, expansion and modernisation of regional airports and airfields in the structurally weak assistance areas, which as a rule are under public ownership (municipalities, local authority associations or rural districts). The assistance covers only airport infrastructure that serves the general public interest and is open to all interested users on a non-discriminatory basis within the capacities created. Infrastructure for the use of one enterprise only is excluded from assistance.

218 Deutscher Bundestag (2009), p. 101.

219 Landtag Mecklenburg Vorpommern (2010), p. 234 ff.

220 EU-KOM (2013a).

221 Cf. EEA (2006), p. 7.

222 Statistisches Bundesamt (2013a), Table 1.2.

223 SRU (2009), p. 10.

224 UBA (2012).

225 UBA (2012a)

226 UBA (2012a)
The "trade, industry, services" sector produced nearly 4% of all greenhouse gas emissions. On a worldwide scale, the agricultural sector is responsible for as much as 10 to 12% of greenhouse gas emissions (based on 2006) (IPCC 2007).

227 UBA (2013d), p. 2.

228 Hirschfeld, J. et al (2008). The figures relate to 2006. They also include indirect emissions, e.g. from fodder cultivation. The UN Food and Agricultural Organisation FAO estimates that livestock farming accounts for 18% of worldwide greenhouse gas emissions (FAO 2006).

229 UBA (2013e).

230 Jahn, T. et al (2013).

231 Cf. OECD (2002).

232 SRU (2009), p. 16 and 19f.

233 SRU (2013).

234 Moreover, certain innovative activities in rural areas are promoted and interlinked (LEADER).

235 In addition to guaranteed minimum prices, the EU also paid export refunds for agricultural products, in order to be competitive on the international market. Even if the export refunds have been almost completely abolished under the CAP, the large subsidies within the EU lead to distortion of competition on the world market.

236 SRU (2004), p. 173.

237 BMELV (2006), p. 11 and p. 15/16.

238 For farms with direct payments in excess of €300,000 the direct payments are also reduced by an additional four percent.

239 DBV (2010), p. 118f. There are also numerous other subsidies for dairy farming, for example the special programme of €750 million, which from 2010 onwards includes the grassland premium (€113 million) and the cow premium (€85 million) (BMELV 2010).

240 SRU (2009), p. 12.

241 At a regional level, however, second-pillar measures certainly play an important role (e.g. in low-yield and ecologically sensitive upland areas in Bavaria, Baden-Württemberg and Saxony).

242 BMELV (2010a), Fig. 9 - Balance of member states' return flows and in-payments in the EGFL.

243 DBV (2009), p. 154. Annual average in 2007-2013.

244 Funds from the second pillar were co-financed with approx. €5.1 billion of national resources in 2007-2013. Furthermore, each federal Land makes additional funds for individual measures available from its own resources to provide targeted support for individual topics. In this way a further €3.2 billion of "top-ups" find their way into assistance for rural areas. Thus during the assistance phase 2007-2013, some €16.4 billion of national and EU funds are available under the second pillar for financing measures and projects (European Commission 2010a), or an average of €2.3 billion per year.

245 DBV (2009), p. 157. Annual average in 2007-2013.

246 The remaining 70% of direct payments are known as basic premium. As in the past, they are linked to cross compliance (compliance with legislation in force and maintenance of land in good agricultural and good ecological status).

247 UBA (2013f).

248 Joint Agreement Act (GAK-Gesetz – GAKG), Section 2.

249 BMELV (2007); BMELV (2011).

250 BMELV (2010b), p. 15f.

251 Op. cit., p. 6.

252 Op. cit., p. 87.

253 Burdick, B. and Lange, U. (2003), p. 49.

254 BMELV (2010b).

255 Op. cit., p. 41f.

256 Op. cit., p. 91.

257 BMELV (2009), p. 69

258 Section 57 Energy Tax Act (until 01.08.2006: Section 25b Petroleum Excise Duty Act).

259 Federal Law Gazette, Vol. 2004, Part I, No. 73; Bonn, 28.12.2004

260 BMF (2011), p. 180.

261 UBA (2004), p. 17ff.

262 Section 3 No. 7 Vehicle Road Tax Act (KraftStG).

263 BMF (2011), p. 179.

264 Burdick, B. and Lange, U. (2003), p. 41.

265 BMF (2011), p. 105.

266 This figure is based on a calculation which compared the by-catch of marine mammals in US maritime waters during the period 1990-1994 with data from the UN Food and Agricultural Organisation (FAO) on worldwide fishing catches and revealed a by-catch range of 570,000-649,000 marine mammals per year.

267 EU-KOM (2013b).

268 Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC.

269 Data on the recipients of funds from the EFF according to BLE, http://www.agrar-fischerei-zahlungen.de/Fischerei_empfaenger, accessed August 2014.

270 EU-KOM (2009), p. 8.

271 Regulation (EU) No. 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund, amending Council Regulations (EC) No. 2328/2003, (EC) No. 861/2006, (EC) No. 1198/2006 and (EC) No. 791/2007 and Regulation (EU) No. 1255/2011 of the European Parliament and of the Council.

272 Implementation decision by the Commission of 11 June 2014 determining the breakdown per member state for the European Maritime and Fisheries Fund under the shared administration of funds for the period 2014-2020 (announced under C(2014) 3781), 2014/372/EU.

273 Regulation (EU) No. 508/2014 of the European Parliament and of the Council of 15 May 2014 on the European Maritime and Fisheries Fund, amending Council Regulations (EC) No. 2328/2003, (EC) No. 861/2006, (EC) No. 1198/2006

and (EC) No. 791/2007 and Regulation (EU) No. 1255/2011 of the European Parliament and of the Council.

274 Value-added tax is one of the state's most important sources of income. In 2012 it amounted to over €140 billion (Statistisches Bundesamt (2013c), p. 10).

275 Since the largest share of products bearing the reduced rate of value-added tax is accounted for by food, the topic is discussed in this chapter.

276 Bundesrechnungshof (2010), p. 5f.

277 BMF (2007a), p. 13.

278 SRU (2012), p. 118.

279 UBA (2012c), p. 65.

280 Buschmann, S. and Meyer, E. (2013), p. 51.

281 EU-KOM (2011a), p. 13.

282 Primary effects are harmful environmental impacts which are direct consequences of the subsidy, i.e. the subsidy favours activities which directly trigger the environmental damage. Secondary effects are harmful environmental effects which the subsidy triggers indirectly via cause-and-effect chains. These are "second-round" effects or feedback effects which the environmental assets suffering the primary damage transmit to other environmental assets.

▸ **Download this brochure**
[Kurzlink: https://www.uba.de/subsidies-2014]

www.facebook.com/umweltbundesamt.de
www.twitter.com/umweltbundesamt