



REFORMING ENVIRONMENTALLY HARMFUL SUBSIDIES

A report to the European Commission's DG Environment¹

by

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19 March 2007

¹ This report was requested by the European Commission's DG Environment under a Framework Contract to undertake 'Economic analysis in the context of environmental policies and of sustainable development' led by IVM.

Citation and disclaimer

This report should be quoted as follows:

IEEP et al (2007) *Reforming environmentally harmful subsidies* Final report to the European Commission's DG Environment, March 2007.

The authors would like to thank the following experts for their assistance and comments in the course of this project: Stephen Perkins, Nadia Caid and Michael James Donohue (all from the OECD), Dr Cees van Beers (Delft University of Technology), Dr Regine Gerike and Professor Udo Becker (Technical University of Dresden) and Jan Pieters of the Dutch Environment Ministry (VROM). Additionally, we would like to thank those who provided us with comments on the report in the course of, and after, the first meeting of the Ad Hoc Group on 'Environmentally Harmful Subsidies' on 7 December 2006 in Brussels, notably Bettina Meyer and Claudia Dias Soares. The contents and views contained in this report are, however, those of the authors, and do not necessarily represent those of the European Commission or any of the experts mentioned above.

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REFORMING ENVIRONMENTALLY HARMFUL SUBSIDIES (EHS)

1 INTRODUCTION

1.1 Background to the report

The importance of the review and potential reform of environmentally harmful subsidies (EHS) has been underlined in numerous policy documents and statements from the EU institutions. For example, the 6th Environmental Action Programme recognised that the identification and, where possible, removal of environmentally harmful subsidies is a first step towards correcting prices and reducing subsidies' potential negative effects on the environment. The 2006 Spring European Council 'endorsed (...) further exploration of appropriate incentives and disincentives, and the reform of subsidies that have considerable negative effects on the environment and are incompatible with sustainable development, with a view of gradually eliminating them.' In 2004, the Environmental Technologies Action Plan² (ETAP) adopted by the Commission also included a review of environmentally harmful subsidies as one of its priority actions, as it was argued that the removal of these should support the competitiveness of the EU. In response to such concerns, the revised EU's Sustainable Development Strategy (2006) calls on the European Commission to produce a road map by 2008, for each of the relevant sectors, on the removal of environmentally harmful subsidies (EHS). It is also worth noting that some countries have begun discussing the reform of environmentally harmful subsidies in the broader context of a general ecological fiscal reform, whereby the tax burden is shifted from such things as income to pollution and resource use, and environmentally adverse incentives, such as subsidies, are removed.

More broadly, the need to examine the links between energy, industrial and environmental policies to ensure that they are coherent and contribute to improving both the sustainability and the competitiveness of the EU, was identified in the Commission's Communication on implementing the Lisbon Programme³. In order to facilitate this, the Commission set up a High Level Group (HLG) on Energy, Competitiveness and the Environment⁴, supported *inter alia* by the work of various *ad hoc* groups set up to examine particular topics of relevance. One of these *ad hoc* groups is on *Environmentally harmful subsidies*⁵ and the 7 December 2006 meeting focused on energy subsidies⁶.

² Communication from the Commission to the Council and the European Parliament *Stimulating Technologies for Sustainable Development: An Environmental Technologies Action Plan for the European Union* - COM(2004)38, 20.01.2004

³ *Implementing the Community Lisbon Programme: a policy framework to strengthen EU manufacturing – towards a more integrated approach for industrial policy* COM(2005)474, Brussels, 5.10.2005, see http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/com/2005/com2005_0474en01.pdf

⁴ Commission Decision of 23 December 2005 (OJL 36/43, 8.2.2006) gives the group a mandate for two years. See http://ec.europa.eu/enterprise/environment/hlg/docs/terms_mandate_hlg.pdf

⁵ Ad-hoc Group 8

⁶ The December 2006 version of this report, that focused on energy subsidies, was to provide background information for the discussions of this *ad hoc* group. It was used as one basis of European Commission's input into the discussions of the *ad hoc* group.

This report focuses on presenting information relating to definition of subsidies, the quantification of subsidies, arguments for the reform of EHS, as well as identifying practical lessons for taking the reform of EHS forward.

1.2 Approach taken

This report was commissioned by the European Commission's DG Environment under a framework contract, which is led by IVM of the Netherlands. The work underlying the report was led by IEEP (UK and Belgium) and supported by experts from Ecologic (Germany), FEEM (Italy) and IVM (the Netherlands).

In recent years, there has been a lot of attention paid to the issue of subsidy reform (e.g. OECD, 1998, 2003, 2005 and 2006; UNEP/IEA, 2002; EEA, 2004). In particular the OECD has led work on this issue over the past decade. Consequently, a lot of intellectual effort has already been focused on subsidies, their definition and quantification, adverse economic and environmental impacts and the potential for reform. Hence, this report draws heavily on existing sources. However, much of the literature takes a theoretical perspective to subsidies and their reform, so this report also attempts to offer practical insights into subsidy reform, drawing on the knowledge and expertise of the contributors.

In particular, a number of case studies were selected and studied (as given in Chapter 4 to 6). These were:

In the Energy Sector (Chapter 4)

- Reform of VAT, i.e. removal of reduced rates for energy, focusing on Poland;
- Eco-tax reform in Germany, i.e. reform of exemptions for energy-intensive industries;
- Coal subsidy reform in Germany, Poland and the UK.

For transport (Chapter 5)

- Aviation subsidies in the EU and in the Netherlands;
- Road infrastructure cost recovery in Switzerland, Germany and Austria;
- Commuter subsidies in Germany and the Netherlands;
- Company car tax reform in the UK; and
- Subsidies for biofuels in the EU, Italy, UK and Czech Republic.

Other subsidies (Chapter 6)

- Home buying subsidies in Germany;
- Water pricing in the Czech Republic; and
- Hungarian EHS Reform

Subsidies in other areas – fisheries, agriculture etc – were not the specific focus of this report, and are already well explored. However, some relevant elements have been included in Chapter 2 and 3.

Insights on what are the priorities for reform, what drives and hinders reform, what makes it successful or where a failure are built on the case studies and a wider literature review, complemented by insights gleaned in the December 2006 EHS ad hoc group meeting.

1.3 Format and structure of this report

The report is structured as follows:

- Chapter 2 presents and discusses various definitions, beginning with the definition of subsidies, generally, before moving on to the definition of energy and transport subsidies and looking at environmental harmful subsidies (EHS), in particular;
- Chapter 3 presents information relating to the quantification of subsidies, beginning with a discussion of the difficulties of quantifying followed by a review of the quantification of environmentally harmful subsidies, where possible;
- Chapters 4 to 6 present key results from the case study analysis on environmentally harmful subsidies reform in the energy sector (Chapter 4), transport (Chapter 5) and other areas with particular focus on full cost recovery and water pricing (Chapter 6);
- Chapter 7 looks at practical guidelines for the reform of EHS and includes a review of the OECD's checklist for prioritising subsidy reform;
- Chapter 8 discusses the lessons from subsidies and their reform;
- Chapter 9 examines the arguments against reform, debunking some of the myths;
- Chapter 10 presents a vision as to what the EU could do to support EHS reform processes; and
- Chapter 11 presents a summary of conclusions and a recommendations section.

2 DEFINITION OF ENVIRONMENTALLY HARMFUL SUBSIDIES

In this section we set out the commonly used definitions of, respectively, subsidies, energy and transport subsidies, subsidies in other sectors and environmentally harmful subsidies (EHS). As the OECD (2006) notes, there is no universally accepted definition of subsidy, rather there are several definitions and the one that a particular report uses is dependent on the perspective from which it is written and on the purpose of the analysis contained therein. The first part of the present Chapter illustrates various definitions of subsidies and their limitations, which are going to be reflected in the difficulties of quantification illustrated in Chapter 3. In detail, the first part of Chapter 2 will discuss definitions of subsidies and sectoral definitions of subsidies:

- Definition of Subsidies
- Sectoral definitions of subsidy:
 - Definition of energy subsidies
 - Definition of transport subsidies
 - Definition of subsidies in other sectors

The second part of the Chapter will discuss the OECD definition of environmentally harmful subsidies. From a rather generic definition of environmentally harmful subsidies, the OECD developed a sectoral definition which defines as ‘environmentally harmful’ a subsidy that encourages more environmental damage to take place than what would occur without the subsidy (OECD, 1998). However, through an analysis of case studies, the OECD found that what actually qualifies as an environmentally harmful subsidy varies over time and place. The OECD has therefore produced a ‘quick scan’ model (OECD 1998) which should enable governments to assess the environmental impacts of subsidies given the circumstances in which it is set. The model shows, among other things, that there is not necessarily a direct linkage between the volume and nature of the subsidy and the environmental impact as this depends not just on the subsidy but also on the other conditions (e.g. environmental filters) in place. The ‘quick scan’, considered not-so-easy-to-apply, has been developed into a ‘checklist’, a tool which would enable governments to assess whether the removal of a subsidy would benefit the environment. The ‘quick scan’ model is here analysed in detail, the ‘checklist’ is analysed in Chapter 7.1. The second part of this Chapter analytically develops the OECD work on environmentally harmful subsidies; here we use the ‘quick scan’ model, which should be used for their identification and assessment, for further defining what environmentally harmful subsidies are. In particular, we analyse in detail the discussion on the linkages between subsidies and: the economic context they are set in, the policy filters in place and the absorption capacity of the environment. The Chapter develops as follows:

- Definition of environmentally harmful subsidies
- Assessing the context to determine the subsidy’s harm to the environment
 - a) Linkages between support measures and their environmental effects: economic links
 - b) Linkages between support measures and their environmental effects: environmental policy and absorption capacity of the environment

Through the development of this last part of the Chapter, it should become clear that the OECD, rather than focusing on refining the definition of subsidy, has chosen to concentrate its current work on identifying practical ways in which reform can be achieved. This is partly based on a recognition of the need to make reform happen and partly because, even though the definition may be in need of refining, the types of subsidy that need reforming, at least in the first instance, are already known (for a discussion on priorities for action see Chapter 7.4).⁷

2.1 Definition of Subsidies

As the OECD (2006) notes, there is no universally accepted definition of a subsidy, rather there are several definitions and the one that a particular report uses is dependent on the perspective from which it is written and on the purpose of the analysis contained therein. However, it is possible to identify three main definitions that are used for the following purposes:

- Accounting, as defined by the European system of accounts (ESA);
- Trade, as defined by the WTO; and
- Research and policy analysis, as defined by the OECD.

The **ESA definition** is one of the narrowest used in that it covers only budgetary payments and only those to producers. This means that, for example, transfers, such as investment subsidies or support paid from government to regional agencies, are excluded, as are transfers from the government to households. The ESA defines a subsidy as follows:

“...current unrequited⁸ payments from government to producers with the objective of influencing their levels of production, their prices or the remuneration of the factors of production”
(Eurostat, 200)

This definition is often used as the basis of calculating environmental subsidies for the purposes of environmental accounts, even though it excludes payments that some would consider being a subsidy, as noted above (Statistiska centralbyrån, 2003).

The only international definition of a subsidy that is both legally binding and agreed across sectors and countries, is the definition the **WTO** established in the ‘Agreement on Subsidies and Countervailing Measures’ (**SCM Agreement**⁹).

‘For the purpose of this [SCM] Agreement, a subsidy shall be deemed to exist if:

⁷ This point was also supported in the December ad hoc group meeting on EHS.

⁸ In other words, the producer does not have to repay the payment to the government.

⁹ See, for example, http://www.wto.org/english/tratop_e/scm_e/subs_e.htm

- a. *there is a financial contribution by a government or any public body within the territory of a Member (referred to in this Agreement as “government”), i.e. where:*
- (i) *a government practice involves a direct transfer of funds (e.g. grants, loans, and equity infusion), potential direct transfers of funds or liabilities (e.g. loan guarantees);*
 - (ii) *government revenue that is otherwise due is foregone or not collected (e.g. fiscal incentives such as tax credits);¹⁰*
 - (iii) *a government provides goods or services other than general infrastructure, or purchases goods;*
 - (iv) *a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out one or more of the type of functions illustrated in (i) to (iii) above which would normally be vested in the government and the practice, in no real sense, differs from practices normally followed by governments; or*
- b. *there is any form of income or price support in the sense of Article XVI of GATT 1994; and*
- c. *a benefit is thereby conferred.’*

The WTO definition is relatively comprehensive and includes the direct transfers of funds, fiscal incentives and the provision of goods and services other than general infrastructure. This definition also serves as a starting point for many sectoral definitions used in practice. However, the SCM Agreement is an instrument of international trade law and, as such, is arguably unduly restrictive in terms of defining all subsidies which may, for example, be environmentally harmful.

The definition that is most widely used in the policy context, probably because of its broad scope, is that of the **OECD** (2005), which defines subsidies as:

‘a result of a government action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs’

This definition allows several government support measures to be considered as subsidies, including policies such as tax exemptions and rebates, preferential market access, limited liabilities, accelerated depreciation allowances, and selective exemptions from government standards.

In the EU, the application of some subsidies to industry, such as direct grants, cash injections, loans, tax deferrals or exemptions, is governed by **EU State aid** rules. These aim to ensure that no Member State supports its own industries to the potential detriment of those in other Member States. According to the Treaty of Rome, assistance is classified as a State aid if it:

- Is funded by the State or from State resources;

¹⁰ In accordance with the provisions of Article XVI of GATT 1994 (Note to Article XVI) and the provisions of Annexes I through III of this Agreement, the exemption of an exported product from duties or taxes borne by the like product when destined for domestic consumption, or the remission of such duties or taxes in amounts not in excess of those which have accrued, shall not be deemed to be a subsidy (World Trade Organisation, 1999).

- Favours certain undertakings or the production of certain goods;
- Distorts, or has the potential to distort, competition; and
- Relates to an activity that is tradable between Member States (EEA, 2005).

However, as can be seen in Section 3.2, Member States are allowed to support their industries as long as the Commission has approved the support, even though some would consider that these subsidies are potentially environmentally harmful. See also Chapter 5.

None of the three definitions of a subsidy mentioned above consider the absence of either full cost or external cost pricing as being an implicit subsidy. **Pieters (1997)** proposed a slightly broader definition of subsidy that addresses this by defining subsidies as ‘deviations from full costing’, which include:

- Income transfers such as those that exist through the fiscal system — for example, grants, but also tax exemptions. This is in line with the narrower definitions of subsidies, noted above.
- Implicit income transfers resulting from non-internalisation of externalities or lack of full cost pricing — if there are activities that lead to a burden elsewhere (e.g. pollution damage) and this burden is not paid for (i.e. there is no compensation), then the activity is implicitly subsidised, although such subsidies are not included in the definitions mentioned above.
- Direct price support for producers and consumers — for example, guaranteeing higher prices than would be on offer in a free market or guaranteeing lower prices to consumers. Such subsidies are covered by some of the definitions, above.

While the identification of circumstances where there is a deviation from full cost pricing may not be that difficult, the definition of subsidies as ‘deviations from full costing’ is clearly normative and difficult to measure. The measurement of the extent of this subsidy requires that we know with some precision how to account for externalities and therefore that we know exactly where to draw the baseline against which a subsidy is measured. Consequently, the lack of internalisation of external costs is generally not considered being a subsidy by economists for two main reasons:

- 1) externalities stem from a lack of government action, whereas subsidies are the results of a policy intervention, and
- 2) externalities are difficult to measure due to the assumptions, uncertainties, and significant economic modelling required (Honkatukia, 2002).

While a broad definition including full cost pricing is operationally difficult, it is important to recognise that such implicit subsidies exist and that there is need for action to ‘get the prices right’. The non-internalisation of externalities is indeed an important issue: this was also recognised at the ad hoc group meeting on EHS on 7 December 2007, where it was agreed that this report would take a wide focus on subsidies and include the non-internalisation of externalities.

In this perspective, for instance, the lack of full pricing through the non-auctioning of emissions credits in the ETS could be considered a subsidy (recognised as an important one in the ad hoc group). However, the non-auctioning of credits is, strictly speaking, not obviously a subsidy. It depends on *how* property rights for these credits are defined and

assigned. Arguably the rights belong to existing emitters, though this is also seen as a historic *de facto* subsidy by others. Also, this recognition is in contradiction with the polluter pays principle (PPP), as according to the latter, the right belongs to society not to the polluter that has to pay for the damage it causes to a good (the environment and its components) over which it has no ownership. Generally, we can argue that, to the extent that there is a move towards allocation by auctioning, there is some internalisation of external costs of carbon¹¹ and a reform of this subsidy *de facto* (the current rate of free allocation equals 100% in most countries).

However, we have to bear in mind that, even if this logic is accepted, the EU ETS would have never got off the ground had there been a major auctioning share; a step wise move towards auctioning will be necessary. This consideration also argues for the endorsement of a long term objective of full auctioning at some stage by the EU. It is also important to note here that the existence of non-internalised externalities leads to a distorted playing field that makes, for example, pro-energy saving and pro-renewable energy policies less effective/efficient alternatives and hence supports a lock-in to the existing technology mix and slows innovation (for further discussion see Chapter 2.1.3).

¹¹ To the extent that the price reflect the external costs – though of course cost of carbon is but one externality and important not to forget local air pollution impacts.

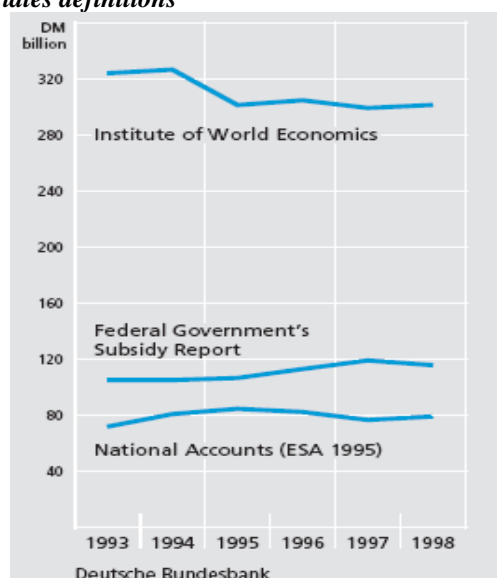
Box 1: An application at the national level (Germany): results of different subsidies definitions

A rather narrow definition is used in national **Subsidy Reports**.¹² The German Subsidy Report, for example, which is one of the most complete, concentrates on measures affecting its budget: in particular, special concessions which the Federal Government grants to sectors or regions in order to influence their economic activity. For example, tax grant for home owners is included, but housing allowances, considered to be a social benefit, are not. The definition of subsidy used for reporting under the German Subsidy report includes only grants and tax concessions. It does not include instead soft loans, other revenue forgone, guarantees and regulatory measures and State shareholdings in enterprises (where the government forgoes a customary market return on its invested capital).¹³ In 1998 total subsidies as defined here amounted to just over DM 117 billion (€59.8 billion), or 3.1% of GDP.

Even narrower is the definition of subsidy used by the **ESA National Accounts** (Eurostat). Only current unrequited payments which general government or the Institutions of the European Union make to resident producers are recorded. However, tax concessions and benefits paid to individuals are not taken into account.¹⁴ The exclusion of investment grants as capital transfers (DM 54 billion. Or €27.6 billion) is also significant. Also loans, which are recorded in the national accounts as financial transactions instead of as expenditure, are not considered subsidies. The total volume of subsidies so defined amounted to DM 80.8 billion (€41.3 billion), or 2.1% of GDP, in 1998.

Finally, for comparison, the **Kiel Institute of World Economics** uses the term subsidy in the widest sense of all. It defines as subsidy recipients not only those recipients included in the Federal Government's Subsidy Reports. It also includes state-owned service providers (ranging from the railways to hospitals) which do not cover their expenditure fully by charging specific fees. Moreover it considers the labour market policy of the Federal Labour Office and housing allowances. In 1998 using this broad definition, came to DM 303 billion (€155 billion), or 8% of GDP.

Figure 1: Quantification of different subsidies definitions



Source: Deutsche Bundesbank, 2000

¹² Member States have to publish national Subsidy Reports every two years in accordance with section 12 of the Stability and Growth Act.

¹³ The EC regards State capital injections as aid when monitoring subsidies in accordance with the EU Treaty.

¹⁴ For example, tax grant for home buyers, which benefits persons who are building or purchasing accommodation for their own use, are not included. This shows that the distinction between subsidies and other forms of expenditure, such as payments for social purposes, is not clear-cut.

In summary, therefore, the main definitions identified in this Chapter are those given in **Box 2**, below.

Box 2: Definitions of a subsidy

As used in accounting (ESA), subsidies are:

‘(...) current unrequited payments from government to producers with the objective of influencing their levels of production, their prices or the remuneration of the factors of production.’

As used in trade (WTO), a subsidy exists if:

- b) ‘There is a financial contribution by a government or any public body within the territory of a Member (referred to in this Agreement as “government”)(...);*
- c) there is any form of income or price support in the sense of Article XVI of GATT 1994; and*
- d) a benefit is thereby conferred.’*

As used in policy analysis (OECD), subsidies are:

‘A result of a government action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs.’

In the most recent OECD report (2006), Cox and Larsson argue that the work on subsidy reform should now focus on fully understanding and evaluating the impact of subsidies on the economy and environment. Hence, the OECD is now turning its attention away from the issue of a definition to focus on more practical considerations, such as the analysis of the decision making processes of subsidy reform and on the political economy of its implementation. These issues will be addressed later in this report.

2.1.1 Definition of energy subsidies

As with subsidies in general, there is no agreed definition of what constitutes an energy subsidy. Additionally, it is worth noting that the dividing line between what constitutes an energy subsidy and subsidies in other sectors is vague, e.g. a subsidy to transport fuels can be regarded as an energy subsidy but also as a transport subsidy. The most common definition is that adopted by the IEA (2002) and the OECD (2005), which defines an energy subsidy as:

‘any government action that concerns primarily the energy sector that lowers the cost of energy production, raises the price received by energy producers or lowers the price paid by energy consumers’

The above definition, used widely within the international literature (UNEP, IEA, OECD and EC, 2002) applies a wide coverage which includes, among other things, regulations that favour certain energy sources granted ‘off-budget’.

In its 2004 report on energy subsidies in the EU, the European Environment Agency used defined a subsidy as being either ‘on-budget’ or ‘off-budget’, as follows:

- **On-budget subsidies** are payments that appear on national balance sheets as government expenditure and include cash transfers paid directly to industrial producers, consumers and other related bodies, such as research institutes. They also include low interest or reduced-rate loans, administered by government or directly by banks with state interest rate subsidy.
- **Off-budget subsidies** are transfers that typically do not appear on national accounts as government expenditure. Such transfers are mainly directed to energy producers and consumers and include tax exemptions, credits, deferrals, rebates and other forms of preferential tax treatment (e.g. the case with lower-than-standard VAT on electricity in many countries). Additionally, they may include market access restrictions, regulatory support mechanisms (e.g. feed-in tariffs, demand quotas for specific energy sources), border measures, preferential planning consent and access to natural resources.

However, as previously noted, there is no harmonized definition of energy subsidies and no harmonized reporting structure (see Chapter 2). Off-budget subsidies (and especially indirect subsidies and cross-subsidies) are not accounted for in National Subsidy Reports. Off budget subsidies often require that the benefit be calculated on the basis of differential treatment against a norm or baseline (see Chapter 3.2 for further discussion). It is necessary to undertake more research on hidden indirect support mechanisms, as off-budget subsidies are a very common area of public subsidies and regulations, as it is illustrated in the case study on subsidies for hard coal in Germany (see Chapter 4.3).

Given the difficulties in defining subsidies, Pieters (2003) argues that the discussion on the definition of subsidies is not necessarily the priority as ‘governments have already a list of subsidies according to whatever definition(s) they consider to be appropriate’. With respect to energy subsidies, such a list is given by UNEP/IEA (see the Table 1).

2.1.2 Definition of transport subsidies

For transport subsidies, as for energy subsidies and subsidies in general, it is difficult to capture the meaning of subsidies in a single definition, and no single or agreed definition therefore exists. Different attempts have been made, that lead to a quite wide interpretation of what transport subsidies are. Furthermore – and contrary to subsidies in the other sectors – there are several attempts to include the lack of full cost pricing of transport’s externalities in the definition of a subsidy, and to quantify the magnitude of these external costs.

For instance, in the attempt to take into consideration external costs (e.g. the costs of congestion, scarcity, accidents, noise, air pollution, climate change and so on), the OECD (2005) used a broad definition of transport subsidy which compares total revenue of the

sector with the *total social cost* of each transport mode. Another approach illustrated by the OECD compares the price paid for using transport infrastructure and the *marginal social cost* associated with a specific transport mode.

It is also useful to distinguish between explicit and implicit transport subsidies.

- **Explicit subsidies** are for instance direct payments, low interest loans, favourable tax treatment and under-pricing of access to infrastructure. In general, these subsidies tend to promote more environmentally friendly modes of transport, such as public passenger transport and rail freight. (OECD 2005)
- **Implicit subsidies** arise from failing to fully charge for the external costs of private cars, road freight transport and air transport. They tend to be provided on modes that are potentially more environmentally harmful, such as private cars, road haulage and air transport. (OECD 2005)

A good example of the latter is the non taxation of kerosene used in civil aviation, in spite of the large external costs of aviation. However, implicit subsidies are arguably not confined to incomplete coverage of externalities. For example, favourable tax treatment of private use of company cars can also lead to subsidisation of direct costs (for further discussion on this see specific case study).

However, in general, it can be difficult to monetise the value of all externalities related to transport, and therefore to calculate the amount of subsidies in a broad sense (i.e. internalising external costs). External costs are generally not considered subsidies by economists for two main reasons: 1) externalities stem from a lack of government action, whereas subsidies are the results of a policy intervention, and 2) externalities are difficult to measure due to the assumptions, uncertainties, and significant economic modelling required (Honkatukia, 2002).

Therefore a narrower definition has often been used in past studies assessing the size of transport subsidies. For instance, in OECD sectoral analysis transport subsidies are measured on a purely financial basis as:

‘the gap between government expenditures on transport systems and the revenues collected from those systems’.

However measurement on an economic basis has also been attempted, on the basis of the *‘deficit or surplus of revenues produced by current taxes and charges compared with those that would pertain in an optimum where all transport services are priced at their marginal social costs (including the external costs of congestion, scarcity, accidents, noise, air pollution, climate change and so on)’* (OECD 2005).

Examples of data collected in the OECD sectoral analysis are provided in Chapter 3.

Recent studies (EEA, 2005; EEA, 2007) also refer to the more general and far broader OECD (2005) definition of subsidies as ‘a result of a government action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs’ and do not take into consideration external costs (or ‘uncorrected market failures’). This definition includes:

- **On-budget subsidies:** payments that appear on national balance sheets as government expenditure (see Chapter 2.1.1);
- **Off-budget subsidies:** such as tax exemptions and rebates, preferential market access, etc (see Chapter 2.1.1);
- **Infrastructures:** they are frequently regarded as public goods, and therefore require government provision. Despite this there is a broad disagreement about whether or not to consider all government payments for transport infrastructure as subsidies, the EEA included them among subsidies, due to the critical importance of transport infrastructure costs to the level playing field. Importantly, these are subsidies only if the excise taxes on fuel are not counted as covering the cost of infrastructure provision (i.e. if taxes on fuel are considered as an implicit payment for the infrastructure, then subsidy for infrastructure is much smaller).

The EEA usually does not include among subsidies those payments made to service providers to guarantee service when it would not otherwise be profitable to do so (e.g., to sparsely populated regions or late at night). These payments are rather seen as **Public service obligations (PSO)**, as they are considered to provide a real value of service for the money.

Other definitions of transport subsidies can be found in the existing literature. Some examples are provided below (EEA 2004):

- Rothengatter starts with the definition of subsidies as ‘payments by public institutions to individuals or companies, for which the state or other institutions receive no goods or service in return’ (in Schreyer, 2004). He then discusses the pros and cons of a broader understanding of subsidies in the transport sector and suggests that transport subsidies be categorised as follows:
 - Subsidies for the transport sector as defined in SNA statistics;
 - Further direct and open financial support from the state to the transport sector – this includes items which are reported in statistics but not defined as subsidies’ (Rothengatter 2001), such as investments in public transport infrastructure, dedicated aids paid to the railway sector and payments to support regional and local public transport;
 - Indirect and hidden subsidies (Rothengatter, 2001) – these include costs which are incomplete in statistical reporting such as overhead costs for public administrations, external costs of transport infrastructure and infrastructure use.
- For Laaser (2001), subsidies are defined by asking ‘whether the financial transfer is necessary to prevent market failures’. Public goods (defence, infrastructure) though do not fall under this definition, and therefore this approach does not apply to road transport but it does apply, for example, to subsidies for privately financed *maglev*¹⁵ transport.
- In Nash, et al. (2002) transport subsidies are defined via two methods. The first compares total social costs with total revenues (including taxes on fuels, vehicles etc.), including infrastructure costs for each transport mode. This method indicates whether the “user pays principle” is being met and quantifies subsidies as the

¹⁵ Magnetic levitation

value of total costs above total revenues. A second method quantifies subsidies as the value of marginal social costs above the prices paid.

2.1.3 Definition of subsidies in other sectors

The agriculture sector is the only one for which there is a widely accepted definition of subsidy. The OECD produces on an annual basis the total producer support estimate (PSE) which provides a measure of subsidies comparable across countries. The PSE measures the annual monetary value of gross transfers from consumers and taxpayers to support agricultural producers, measured at the farm-gate level. Within agricultural subsidies, market price support, output payments and input subsidies, accounted for 76% of the total support to the sector in OECD countries: these are considered the most harmful forms of subsidies for the environment (OECD, 2005). Irrigation subsidies are included in the figures for agricultural subsidies, although the information on these is often patchy and data gaps remain, while there are only anecdotal estimates on subsidies in the **water** sector (OECD,2005).

Analysts working on subsidies to marine capture **fisheries** adopted the GFT (governmental financial transfers) as the default measure for subsidies to fisheries, even if difficulties remain in assessing their size. This is due to the dissemination of subsidies awarded by at different levels of government (national, regional or local), or because some transfers are not posted as expenditure (i.e. off-budget), or because the amounts involved are relatively small. Three categories of GFTs are identified: direct payments; cost-reducing transfers; and general services. For this sector, no comprehensive or detailed assessment has been undertaken of what constitutes an environmentally harmful subsidy (OECD,2005).

As the manufacturing sector is concerned, the OECD work on environmentally harmful subsidies has focused its attention on two specific sectors, that of shipbuilding and the steel industry. The OECD Council Working Party on Shipbuilding has taken a relatively broad definition of support measures provided by governments to the **shipbuilding** industry, which include: direct grants and subsidies (including export credits and export subsidies); loans and loan guarantees at better than commercial terms; forgiveness of debt and provision of equity capital inconsistent with commercial terms; provision of goods and services on non-commercial terms; tax credits and other preferential tax arrangements; R&D assistance; home credits linked to contract values; administrative actions or practices that confer a commercial advantage on the industry; and domestic build or content requirements, whether by law or administrative practice (OECD,2005).

Support to the **steel** industry in the EU is monitored by State aid Scoreboards. State aid to steel include grants, interest subsidies, tax exemptions, equity participation, soft loans, tax deferrals and loan guarantees, converted into cash grant equivalents (OECD, 2005).

See Chapter 3 for estimates of the above defined subsidies.

2.2 Definition of environmentally harmful subsidies

The OECD (1998) defines environmentally harmful subsidies as:

'all kinds of financial supports and regulations that are put in place to enhance the competitiveness of certain products, processes or regions, and that, together with the prevailing taxation regime, (unintentionally) discriminate against sound environmental practices.'

It is worth noting that this definition is potentially broader than most of the sectoral definitions proposed above in that, as a result of its reference to the prevailing tax regime, it could be interpreted as including the absence of full cost and external cost pricing. Alternatively, one could view the definition as focusing on the interaction of subsidies with the tax regime, rather than the operation of the tax regime, itself, in which case it would not include the absence of full or external cost pricing. Hence, the definition is ambiguous in this context, as to whether or not the lack of full and external cost pricing should be considered to be an EHS.

We will start with assessing here the OECD definitions of environmentally harmful subsidy per sector. In doing this, the OECD adopts a similar structure for each sector. The first step is that of isolating the subsidy from the circumstances in which it is awarded (i.e. *all other things being equal*), and to assess how the subsidy increases the level of output/use of a natural resource, and therefore the level of waste, pollution and natural resources exploitation to those connected. In other words, for the OECD (1998), a subsidy *'discriminates against the environment'* if it encourages more environmental damage to take place than what would occur without the subsidy (OECD, 1998).

Starting with the energy sector, the OECD (2005) suggests that, in order to define what an environmentally harmful subsidy is, we should consider primarily the **energy** source targeted by the subsidy:

'All else being equal, a subsidy's targeted fuel or energy source is the principal indication of whether reforming the subsidy would be environmentally beneficial.'

And:

'In many cases the relevant question is not whether a subsidy causes harm, but whether the energy source it supports causes more or less harm than an alternative energy source.'

Following the OECD definition of considering *'all else being equal'*, it follows that subsidies that support **fossil fuels**, particularly coal and oil, represent greater threats to the environment than those that aid renewable energy sources. However, it needs to be said that subsidies to **renewables** are not necessarily good *a priori* and further discussion will be done in this report for example on the controversial environmental impacts of biofuels – as not all biofuels are equally positive in terms of CO₂ reductions and can have many other environmental impacts (see Chapter 5.5. for dedicated case study). In a similar vein support to **nuclear power** is somewhat more difficult to assess – as there are different subsidy types in terms of direct subsidies (funding, debt write offs) as well as indirect support (e.g. via supporting downstream waste processing or storage facilities) and support via guarantees for nuclear accidents and limitations on liability to companies for

accidents¹⁶. On the environmental harmful aspects, in terms of greenhouse gas emissions, nuclear power could be considered to be a relatively clean source of energy, as it does not emit greenhouse gases as a by-product of electricity production. However, the nuclear energy industry has potentially broader environmental impacts (e.g. in relation to its waste products and the potential environmental impact of a nuclear accident), thus many do not consider nuclear power to be an environmentally beneficial form of energy. It is also important to recognise that, while the production of energy from nuclear energy sources is largely CO₂-free, there are some (relatively small) CO₂ impacts from the construction of the installations and the extraction of uranium, for example.

The OECD (2005) argues that subsidies to *infrastructure* (which target both current and future production) lead to a certain degree of technology/fuel lock-in and affect markets, and therefore impact on the environment, long after the aid ceases. The impact on the market and the environment of aid to future production, in the form of support for *R&D*, is less clear in its effects – some R&D spending will result in commercially viable technologies and others will not. For R&D that leads to the development of commercially-viable technology, the market potency (impacts per amount of money spent) could be very high, whereas the environmental impact cannot be assessed *a priori*.

A controversial issue is that of *carbon capture and storage* (CCS) and *clean coal technologies*. In this case, the existence of the technologies mean that ‘all else is *not* equal’ (in this case for coal). The end use technology introduces a new condition for which, in principle, there might be a much smaller environmental harm from the subsidisation of these technologies. However, it is important not to forget here both the liability issue (e.g. in case of potential accidental release of CO₂) and the environmental impact of coal extraction and transport. A debate is currently undergoing within the EU, as the EU is assessing the feasibility, also on economic grounds of these technologies. If these are going to become a core future technology, that would require significant subsidy, either by Member States or by R&D funds by the EU. Should these subsidies be treated as EHS? The difficulty is that CCS and clean carbon are potentially cleaner than some other options, but also still have both an impact and a risk of impact. The final assessment will depend on the alternatives. If the same subsidies were allocated to energy efficiency, then it is clear that reforming these subsidies would be pro-environmental and hence this would mean that these subsidies are environmentally harmful. Potential unintended effects for CCS in particular still need to be carefully understood and managed, while it is very important to ensure that subsidies given to these technologies, really fall on technologies and not onto the source.

As for the **agriculture** sector, the OECD (2005) suggests that, *all other things being equal*, the harm of subsidies to the environment depends on the extent to which these encourage an increased intensity in farming practices and farming on environmentally sensitive land. However, working through the step-by-step process of the checklist provided by the OECD (2005), it is evident that a number of other factors are also instrumental in shaping environmental outcomes. In particular the OECD highlights the following circumstances:

¹⁶ Though some do have funds set up to help address these (Eg Sweden) with Nuclear company contributions much like the oil fund for oil spill liabilities. This is more the exception than the rule. Also of course companies in general are under limited liability so this liability limitations is not unique to the nuclear industry, however, the scale of the ‘beyond-the-limit’ is clearly more for certain technologies (nuclear) than others (eg renewables such as wind).

- 1) in some cases subsidies may generate both positive and negative environmental effects over different dimensions of the environment, thus the net environmental impact cannot be determined *a priori*, but through empirical study;
- 2) environmental issues associated with farming are often site-specific; and
- 3) environmental effects are determined by a multitude of influences – including market developments, policies and other (exogenous) factors such as climatic events. Disentangling the influence these various factors have on environmental outcomes raises well-documented problems of identification and measurement.

The potential environmental effects of removing subsidies at the various stages of the **water** cycle are generally positive, particularly at the early stages (OECD, 2005). For example, removing subsidies for water abstraction will decrease water use but may also reduce investment in infrastructure. Proper pricing of water to end-users will improve price signals and encourage increased efficiency in water use. As a chain effect, less energy use might follow from the reduction of pumping and treatment (see Chapter 6 for dedicated case study).

No comprehensive or detailed assessment of what constitutes an environmentally harmful subsidy has instead been undertaken for the **fisheries** sector. The OECD (2005) states, that the environmental impact of transfers will be positive, neutral or negative depending on the circumstances under which the transfer is provided, how they are implemented and how they interact with other government policies. However, subsidies in this sector, also those aimed at ensuring the sustainable use of fish stocks and the aquatic ecosystem, have contributed to over-capacity in fishing fleets and to overfishing of some fisheries. As a consequence of this, in recent years, OECD countries have increasingly been directing transfers towards removing capacity (OECD, 2005).

There have been so far no systematic efforts to define and assess the environmental impacts of **manufacturing** subsidies. The extent of environmental damage caused by industrial subsidies is difficult to determine, as in this sector there are many circumstances that determine the impact of the activity on the environment. The OECD (2005) focused its work on sector-specific supports, which benefit particular firms and sectors that maintain industries on the market despite their inefficiency and drive the sectors to overcapacity (i.e. **shipbuilding** industry, principally by encouraging the construction of new facilities and preventing the closure of efficient (*however politically important*) yards and the **steel** industry).

Consistent with the above reported sectoral definitions and taking forward that set out at the beginning of this paragraph, the OECD therefore offers another general definition of environmental harmful subsidies, which includes an explanation of how '*a subsidy discriminates against the environment*':

'all other things being equal, the subsidy increases the level of output/use of a natural resource, and therefore increases the level of waste, pollution and natural resources exploitation to those connected'

The *first condition* for the OECD sectoral definitions on environmental harmful subsidies is that the context is invariable (i.e. *all other things being equal*). Given the 'invariability'

of the context in which a subsidy is set, what causes environmental degradation is the increased level of output or use of inputs. However, taking further the analysis, the OECD found that what actually qualifies as an environmentally harmful subsidy will vary over time and place.

The above definition serves as a simplification for the purpose of finding a generally valid definition for environmentally harmful subsidies, where in reality the environmental impacts of subsidies are circumstance-specific. Therefore, the OECD (1998, 2005) has developed a qualitative model for the assessment of specific circumstances which mitigate, or have rebound effects, on the environmental harmfulness of a subsidy. The model shows, among other things, that *there is no direct linkage between the volume and nature of the subsidy and the environmental impact* (Pieters, 2003). This initial analysis has been developed further with the ‘checklist’ (OECD 2003; 2005), an instrument that should enable governments to assess whether, given the circumstances, the removal of the subsidy is going to benefit the environment. The latter is discussed in Chapter 7 on criteria to prioritise subsidies reform. In the next section we go on to discuss the qualitative model mentioned above. This, as well as the checklist, does not give additional guidance as to *how to define subsidies*, as from here the OECD work moves to identifying practical ways for EHS identification and removal.

2.3 Assessing the context to determine the subsidy’s harm to the environment

An important motivating factor behind the work of the OECD on subsidies has been concerns about the economic inefficiency caused by the existence of such subsidies. These derived by a mandate given in 1995 by the once G7 Ministers, who requested the OECD to carry out a study on the costs and benefits of eliminating, or reforming, subsidies and tax disincentives with adverse consequences to the environment. This project resulted in a major report, *Improving the Environment through Reducing Subsidies* (OECD, 1998, 1999), and in the development of a rudimentary and not-so-easy-to-apply ‘quick scan’ (Pieters, 2003). This model would allow for selecting those subsidies that had more than others have adverse environmental effects (it was Pieters in 2003 that had taken forward this model and made it more applicable by governments through a ‘checklist for subsidy reform’ (Pieters, 2003; OECD, 2005), discussed in Chapter 7).

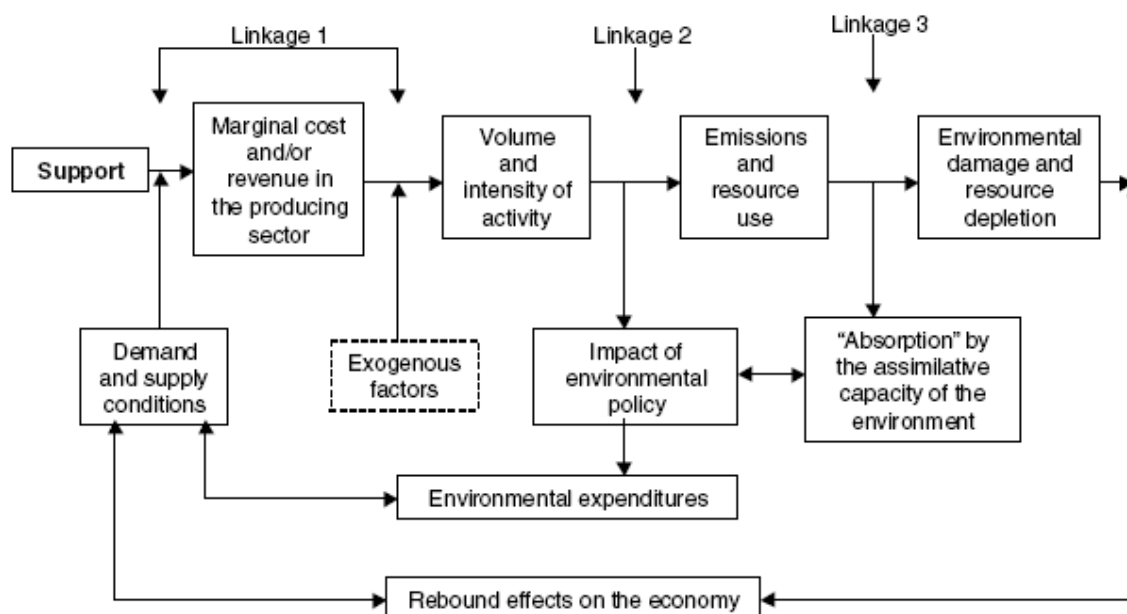
The OECD ‘quick scan’ model highlights the linkages between the type and level of subsidies and the economic characteristics of the sector (marginal cost and/or revenue in the producing sector; volume and intensity of activity), with the policy circumstances (environmental policies in place or countermeasures) and the absorption capacity of the environment. Figure 2 demonstrates that their impacts are complex.

The ‘quick scan’ model is based on the concept that the effects of support on the environment are not determined solely by the effects on the levels and composition of output. Instead, there are three main linkages (see Figure 2) between support measures and their ultimate environmental effects:

- Linkage 1: the impact of the support on the volume and composition of output in the economy;
- Linkage 2: the mitigating environmental policies in place; and

- Linkage 3: the assimilative capacity of the affected environment.

Figure 2: Quick scan model: linkages between support measures and environmental effects



Source: OECD (2005)

These linkages interact as set out in Figure 2 (reproduced from OECD, 2005). A detailed discussion of the first linkage – the impact on production levels – can be found in Chapter 2.3.1, while the two environmental linkages are considered in more detail in Section 2.3.2.

2.3.1 Linkages between support measures and their environmental effects: economic links

The first linkage (*Linkage 1*) describes the extent to which the support measure affects production levels in the economy. The existence of a subsidy is usually linked to a point of impact, (e.g. output, input, profits and income), which impact to a higher or lesser extent on the levels of production. This is usually referred to as **support conditionality**, which corresponds to the point of impact of the support measure. It has been noted by the OECD (Pieters, 2003) that subsidies to inputs (i.e. energy carriers or materials, including water), which directly impact material flows, are more likely to have a stronger impact on the economy and the environment, than other subsidies for two reasons. Subsidies to inputs:

1. Have more direct effects on forward linkages than subsidies to output or profits and income;
2. leave fewer options for more benign modes of production to be employed than subsidies to output or income; and
3. will discourage materials and energy saving, on which the success of environmental policy is highly dependent.

We will discuss further the conditionality of the subsidy (and in particular subsidies to inputs) in Chapter 7. For the purposes of examining the impact of subsidies on production levels, OECD (1998) distinguishes between the types of support. For the energy sector, for instance, different **types of subsidy** impact differently on costs of energy production and prices of consumption (see Table 1). Some have a direct effect on price, like grants and tax exemptions, while others act indirectly, such as regulations that skew the market in favour of a particular fuel or government-sponsored technology research and development (UNEP, 2002). Ultimately, however, the impacts – both economic and environmental – of subsidies are linked to the supply and demand elasticities associated with the subsidised activities.

Table 1: Types of energy subsidy and their effects on production costs and consumer prices

Government intervention	Example	How the subsidy usually works		
		lowers cost of production	raises cost of production	lowers price to consumer
Direct financial transfer	Grants to producers	•		
	Grants to consumers			•
Preferential tax treatment	Low-interest or preferential loans to producers	•		
	Rebates or exemptions on royalties, duties, producer levies and tariffs	•		
	Tax credit	•		•
	Accelerated depreciation allowances on energy-supply equipment	•		
Trade restrictions	Quotas, technical restrictions and trade embargoes		•	
Energy-related services provided directly by government at less than full cost	Direct investment in energy infrastructure	•		
	Public research and development	•		
Regulation of the energy sector	Demand guarantees and mandated deployment rates	•	•	
	Price controls		•	•
	Market-access restrictions		•	

Source: UNEP/ IEA, 2002

As Table 1 illustrates, subsidies that **lower the absolute costs of production and consumption** (including subsidies to renewable energy sources) lower the overall cost of energy use, thus leading to a higher level of energy consumption than would otherwise

have been the case¹⁷. However, this is *assuming a negative price elasticity of demand for energy*: indeed, the OECD (1998) distinguishes between types of support, but underlines that the extent of the effect on the economy will depend on the *price and cost elasticities* associated with the activities.

In detail, **price support mechanisms** are measures that either support producers' incomes or fix production levels and represent a very big part of subsidies granted (e.g. to coal, agriculture and fisheries). The impacts of market price support on production levels include:

- *Higher domestic production* than the market alone would dictate, thus potentially higher environmental damage and resource use.
- Higher levels of domestic production can *impact on international trade* by blocking cheaper imports or leading to excess production, which is sold on international markets.
- The higher prices at which products are sold risk putting *downstream markets at a competitive disadvantage*, which are, therefore, often also supported as a result.
- Higher production levels impact on *upstream markets* as higher levels of input are needed than would be the case if the market was left to operate properly.
- The additional demand for more inputs can put up the *prices of these inputs*.
- As a result, some of the subsidy actually *'leaks' away to the input suppliers*, rather than remaining in the targeted industry (OECD, 1998).

The impacts on production levels of **conditional support** (e.g. support linked to the purchase of a product or the use of a process), include:

- In terms of *downstream effects*:
 - The subsidy could enable the product to be sold at a lower price than would otherwise be the case, and thus buyers will generally purchase more than they would otherwise have done.
 - Alternatively, the producer could produce more of the product, thus impacting on imports.
- In terms of *upstream effects*:
 - Increased downstream demand will increase production and thus the demand for inputs.
 - Supported inputs might also replace non-supported inputs, which are less cost-efficient.
 - The sales price of inputs is likely to increase, as a result of these two factors, thus counteracting the reduced input prices resulting from the support.
- When support is linked to the use of a particular product, then the benefits of the support are *shared by the supplier of the input with the producer and the consumer* of the finished product (OECD, 1998).

¹⁷ Subsidies should be always calculated to the net of special taxes and duties that increase the final end use price, more than offsetting the subsidy (UNEP, 2002).

Support that is **not conditional on production or input levels** does not directly encourage additional production. However, as the income of the recipient sector is increased, increased consumption of production expenditures may result, but there will be no ‘lock-in’ to use of particular inputs, for example (OECD, 1998).

In the case of energy subsidies, UNEP/IEA (2002) take the perspective that energy subsidies result in a loss of economic efficiency, which can occur in a number of ways, for example:

- **Lower end use prices**, thus resulting in higher energy use and less incentives to conserve energy¹⁸.
- **Protect producers**, if they are the recipients of the subsidy, **from competitive pressures** and thus reducing incentives to minimise costs potentially leading to inefficient operations and investments. This can lead to a dependency on, and a potential demand for further subsidy, as competitors increase their efficiency compared to the subsidised industry. Additionally, the protection from competitive pressures can reduce the incentive for innovation.
- Direct subsidies act as a **drain on government finances** and this reduces its ability to spend on other policy areas, e.g. on health and education. In addition, the existence of a subsidy leads to inefficient pricing of resources and therefore to an inefficient allocation of resources from the perspective of the economy as a whole.
- Price caps below market levels **may lead to shortages**, which require administratively costly rationing.
- Subsidies on consumption can boost energy use and thus **increase the demand for imports** or reduce the potential available for export.
- Subsidies to particular energy technologies undermine the development and commercialisation of other technologies, which, in the long-run, might become more economically efficient and better for the environment. This is known as **technological ‘lock-in’** (as regards those technologies already there) and **‘lock-out’** (for the new technologies). It is often argued that subsidies to fossil fuels and nuclear energy lock-out renewable energy sources, for example. There is thus a lack of a ‘level playing field’, and alternative – often more environmental friendly and innovative – technologies face unwarranted barriers to entry.

It has to be noted that the level and composition of output is already in a state of flux due to other technological and economic developments which are independent from the subsidy existence (e.g. economic conjunctures, world prices, political economy factors, **exogenous factors** in Figure 2). Analytically, the OECD (1998) found that these pose difficult disentangling problems for any examination of the environmental effects of support, the different interpretation of which might take to considerable variations in the case studies results.

Other exogenous factors are entrenched in the **political economy of EHS**, which the OECD 2005 study discusses in detail. Here,¹⁹ Damania argues that the nature of subsidies compared to broader programmes of State support, such as that given to education or

¹⁸ There is a direct loss of welfare from over production/over consumption which is measured in terms of loss of consumer and producer surplus.

¹⁹ Chapter 3 of the report

health, means that opposition to their existence is often limited while support for their continuation is strong. In terms of opposition to subsidies, he argues that the economic impact on those who effectively pay the subsidy, i.e. tax payers, is relatively small compared to amounts they pay for more general programmes of State funding. In addition, the adverse environmental impacts of subsidies are spread widely across society. Hence, there is comparatively little electoral or other pressure for their removal. However, for the recipients of the subsidy, the benefits of retaining the subsidy are significant, and thus they can arrange themselves into well-organised and vocal lobby groups arguing for the retention of the subsidy. Evidence from the agriculture sector suggests that it is not necessary to have a large, homogeneous group to lobby successfully for the retention of subsidies. Rather, the greater the (one-sided) benefits accrued from the subsidy, the greater the willingness of the recipient to fight to retain it.

The German Federal Environment Agency (UBA, 2003) and the Institute for Applied Ecology (Bauknecht and Buerger, 2005) argue that if the money spent on coal subsidies in Germany were shifted instead to subsidising renewable energy or energy efficiency, this would lead to more innovation and a higher level of economic efficiency.

Within the EU, the existence of subsidies in any country creates obstacles elsewhere for the removal of subsidies, and even pressure to introduce subsidies. Hence, the unilateral removal of subsidies is opposed in the UK, for example, as other EU countries – notably Germany – still have very high subsidies in absolute terms per ton, thus UK industry argues that they enjoy an unfair advantage. Over the last few years, the UK coal industry has moved from receiving no State subsidies to one of modest investment aid averaging £1/tonne, which is significantly below the £60/tonne in Germany, where the coal industry is of similar size to the UK, from both the energy and social perspective (RAG Aktiengesellschaft, 2003).

2.3.2 Linkages between support measures and their environmental effects: environmental policy and absorption capacity of the environment

Because of the complexity and data requirement difficulties associated with establishing Linkage 2, ‘environmental policies in place’, and Linkage 3, ‘absorption capacity of the environment’, the OECD (1998) limited its analysis to the detailed study of linkage 1, while it just draw some general comments on linkages 2 and 3.

Linkage 2 serves at measuring the emissions that result from a volume of activity, excluding the impact of environmental policies. If a subsidy leads to the expansion of sectors in which total emissions are kept within strict limits by environmental policy, the actual emissions may increase by only a small amount, if at all.

Linkage 3 accounts for the assimilative capacity of the environment. It represents the dose-response relationship describing the extent to which the increased emission levels or resource depletion lead to actual environmental damage. This might be highly site-specific factor, particularly when the emissions have predominantly local or regional effects. However, in the case of pollutants that have global effects (like CO₂ emissions or CFCs) effects are not site-specific and general conclusions can be drawn.

As a consequence of this, the OECD (1998) noted that analysis of the environmental impacts of energy subsidies, for instance, tends to focus primarily on the impact on greenhouse gas and other air pollution emissions, therefore failing to give a complete picture of the extensive impacts that energy production and usage have on the environment. These can be summarised as follows:

- Impact on air quality, including the release of pollutants that lower local ambient air quality and the emission of greenhouse gases which contribute to global climate change.
- Impacts on water systems, including through the deposition of acid rain and hazardous air pollutants, accidental oil spills, potential nuclear waste leakages, the development of dams for hydro-electric power generation, and the pollution of water used in the processes of energy production and refining.
- Impacts on land use and soil pollution, including through the siting of mines and energy-related facilities, the deposition of acid rain and hazardous air pollutants, the disposal of large amounts of solid waste from some of the production processes, and potential nuclear waste leakages.

Environmental degradation and over-use of natural resources might also have ‘rebound’ effects on the economy by **changing demand and supply conditions**. An example here is open-access fisheries, where overfishing can lead to a decline in the viability of the sector itself. In these cases policies such as Total Allowable Catch (TACs) for fish species can mitigate its effects. However, overcapacity pushes to export unsustainable fishing practices to ‘unregulated waters’, contributing to the expansion of the problem to unspoiled areas. Another example is that of subsidies to the water sector, where water is priced below the full cost recovery. Here the inefficient levels of demand for water have rebound effects on the use of more energy to process (e.g. preparing it for consumption) and to distribute the water (e.g. pumping). Energy subsidies to production and consumption can also have significant downstream effects on the structure of consuming industries. In particular, governments can and do attract energy-intensive industries through the supply of subsidised energy. For example, the OECD reports the case of primary aluminium manufacturers, for whom electricity represents almost one-third of total production costs, which have been found to cluster around government supported energy sources (Koplow, 1996). This support has a positive effect on the viability of primary aluminium relative to secondary aluminium, the production of which requires 95% less energy.

There have been several attempts to estimate the environmental effects of certain energy subsidies. In Germany, one of the negative impacts of coal subsidies has been estimated against a hypothetical alternative use of the same amounts of money to support more climate-friendly energy carriers or a more rational use of energy. UBA (2003) analysed the effects of two such options: shifting subsidies to heat production from renewable energies; and subsidising energy retrofits of buildings. The former was estimated to reduce CO₂ emissions by nearly 50 million tons (5.6% of total CO₂ emissions), while the latter would save 6 million tons (0.7% of CO₂ emissions). According to Michaelis (1996), the removal of subsidies to the coal industry in Europe and Japan would lead to a reduction of 10 to 50 million tonnes of CO₂. In a later study, Michaelis (1997) estimated that reforming and removing the subsidies to the coal and nuclear energy sector in the UK would lead to a decrease of CO₂ emissions by up to 8% by the year 2010.

In addition, the direct environmental consequences of coal mining, along with damages to buildings and infrastructure and their associated costs, also need to be taken into account. An economic research institute has estimated that damages caused by mining activities amounted to several billion Euros²⁰.

In estimating the environmental benefits of coal subsidy removal, one should take into account the effect on the redistribution of production, the world price effect and the long term effects of fuel substitution. According to Anderson and McKibbin (1997), coal subsidy removal would increase the level of coal imports in response to more expensive domestic coal, raising world prices and lowering world wide consumption through substitution and energy efficiency. The finding that the removal of subsidies would lead consumers to switch to imported coal, rather than another fuel, in the short term, at least, is also supported by other studies (e.g. IEA, 2000; Mountford, 2000).

The OECD (2004) stresses that knowledge of the cross-elasticities of coal and of competing fuels is crucial to the calculation of the benefits from reforming the sector: it is the substitution effect from coal to less polluting fuels that would represent the greatest gain in reduced emissions. It has been argued that in the medium and longer term, as the markets react to the ensuing higher coal prices, there would probably be increased use of gas and renewable energies.

In the area of **transport**, it should be noted that while subsidies can be very large, they are not all equally harmful, and some can even be environmental friendly or neutral. For example, much of the operating subsidy goes to rail and public road transport, which to a first approximation could be taken to be less harmful than private road transport of people or goods. Also, transport by definition provides a service at point of use, and this is socially necessary so the benefits should be set against the costs. The concept of PSO in particular recognises the specific need to provide a social benefit in certain contexts, and the exclusion of PSO from some definitions of subsidy explicitly recognises this. Similarly, while provision of all new transport infrastructure is likely to be damaging to the environment it would be artificial to regard all infrastructure subsidies as environmentally-damaging (in the sense that they might best be eliminated) as some provision of transport infrastructure, and its maintenance, is essential for society to operate. Therefore the removal of transport subsidies can have very different effect on the environment.

The OECD (2005) observes that explicit subsidies such as direct payments, low interest loans, favourable tax treatment and under pricing of access to infrastructure, tends to encourage more environmentally friendly modes of transport, such as public passenger transport and rail freight. Implicit subsidies instead, which arise from the failure to fully charge for negative externalities, tend to be provided on modes that are potentially more environmentally harmful, such as private cars, road haulage and air transport.

The OECD (2005) therefore observes that:

- the removal of subsidies to *public passenger transport* could have a net negative environmental effect. It is true though that not all subsidies to public transport are effective in practice, e.g. if they are awarded to public or private monopolies rather than by competitive tender – as this may hamper free

²⁰ Frondel, Kambeck and Schmidt (2006)

competition and therefore efficiency. Also, subsidies may also promote additional or longer trips, or may discourage ‘cleaner’ alternatives like walking and cycling. Nevertheless, by reducing the use of private cars, and provided that reasonable load factors are achieved, subsidies to public transport are considered environmentally beneficial.

- The removal of subsidies to *rail freight* is also considered negative for the environment, given that they encourage traffic to use rail rather than more environmentally damaging mode of transport. This aspect is the main justification for their existence, despite there can be some drawbacks. For instance, large and long standing subsidies – such as those for railways – are usually tied to fixed assets, or to specific locations, sources of supply and distribution systems, and therefore may induce potential technology lock-in.
- Subsidies to *private motoring* is seen as the most harmful type of subsidy. Despite the use of private cars is usually taxed – and therefore the amount explicit subsidies is generally modest – cars are usually not charged fully for the external costs they impose, which is relatively high compared to more environmental friendly modes of transportation. The failure to internalise external costs arise implicit subsidies, the removal of which has the potential to bring significant environmental benefits.

2.4 Summary

In summary, definitions of ‘subsidy’ exist for the purposes of accounting, trade and policy analysis, with the most relevant one for the latter purpose being that proposed by the OECD. The coverage of these definitions, as well as that proposed by Pieters, is compared in the Table, below. The types of subsidy listed in the Table can be found in the energy sector, as well as in other sectors of the economy.

Table 2: Mapping types of subsidy to definitions

Type of Subsidy	Definitions of a subsidy			
	ESA	WTO	OECD	Pieters
On-budget subsidies				
Direct transfer of funds, e.g. grants	X	X	X	X
Potential direct transfers of funds, e.g. covering liabilities		X	X	X
Government provides goods or services other than general infrastructure		X	X	X
Government directs other bodies to do any of the above		X	X	X
Off-budget subsidies				
Income or price support		X	X	X
Government revenues due are foregone or not collected, e.g. tax credits*		X	X	X
Tax exemptions and rebates*		X	X	X
Preferential market access		X	X	X
Accelerated depreciation allowances*			X	X
Regulatory support mechanisms, e.g.			X	X

feed-in tariffs, demand quotas				
Selective exemptions from government standards			X	X
Resource rent for foregone natural resources			X	X
Implicit subsidies, e.g. resulting from the provision of infrastructure				X
Implicit income transfers resulting from non-internalisation of externalities				X
Implicit income transfers resulting from a lack of full cost pricing				X

*The OECD (1998), p. 21, lists as on-budget accelerated depreciation allowances (if selective), preferential sales tax and VAST rates, income tax concessions (if selective), concessional credit and debt write off.

The OECD definition of an environmentally harmful subsidy is potentially ambiguous, so an alternative definition, which draws on the OECD's 1998 and 2005 definitions discussed above, might define an environmentally harmful subsidy as:

a result of a government action or inaction that confers an advantage on consumers or producers, in order to supplement their income or lower their costs, but in doing so, discriminates against sound environmental practices.

Adapted by the authors from OECD (1998 and 2005)

This definition, proposed by the authors of this report, has the advantage that it could encompass a potentially broad range of subsidies, including implicit ones, such as the absence of full cost pricing. The above definition has, however, the limitation that it only talks of action, rather than non-action. In some cases non-action (e.g. not applying road pricing to cover costs of roads, or not applying VAT or excise taxes on certain fuels, or not internalising externalities) also lead to prices not reflecting environmental and social costs and hence creating implicit subsidies.

In a further effort to identify environmentally harmful subsidies in the different sectors (energy, agriculture, water, fisheries, shipbuilding and steel) the OECD refines the above definition to include an explanation of how a subsidy discriminates against the environment. The *first condition* for the OECD sectoral definitions on environmental harmful subsidies is that the context is invariable (i.e. *all other things being equal*). Given the 'invariability' of the context in which a subsidy is set, what causes environmental degradation is the increase level of output or use of inputs:

'all other things being equal, the subsidy increases the level of output/use of a natural resource, and therefore increases the level of waste, pollution and natural resources exploitation to those connected'

In other words, a subsidy can be defined as 'environmentally harmful' if it encourages more environmental damage to take place than what would occur without the subsidy (OECD, 1998). However, the first condition as to '*all other things being equal*' is simply not realistic enough. Taking further the analysis, the OECD found that what actually qualifies as an environmentally harmful subsidy will vary over time and place.

The OECD (1998, 2005) has therefore developed a qualitative assessment model, or ‘quick scan’, for the identification of circumstances which might mitigate or have a rebound effect on the environmental harmfulness of a subsidy. The ‘quick scan’ model is based on the concept that the effects on the environment are not determined solely by the effects on the levels and composition of output. Instead, there are three main contextual linkages (see *Figure 2*) between support measures and their ultimate environmental effects:

- Linkage 1: the impact of the support on the volume and composition of output in the economy;
- Linkage 2: the mitigating effect of environmental policies in place; and
- Linkage 3: the assimilative capacity of the affected environment.

As noted above, the quick scan model shows that there is not necessarily a direct linkage between the volume and nature of the subsidy and its environmental impact. The directness of the link between the environment (exploitation rates of resources or emissions, or both) and the subsidized activity depends on the linkages listed above. The ‘quick scan’ could therefore help governments in identifying which subsidies to remove, given the economic circumstances, exogenous factors, environmental policies in place and the absorption capacity of the environment. Some brief lessons have been extrapolated by the OECD as to which subsidies should be removed or not removed given the circumstances they are set in. These aspects are further developed in the ‘checklist’ for subsidies removal developed to help governments in assessing whether, given the circumstances, the removal of the subsidy is going to benefit the environment (Pieters 2003; 2005). The latter will be discussed in Chapter 7.1.

From the qualitative model approach developed, here it is clear that the OECD analysis on environmentally harmful subsidies has reached a point where, rather than further refining the definition of subsidy, the current work is projected towards identifying practical ways in which reform can be achieved. This is partly based on recognition of the need to make reform happen and partly because, even though the definition may be in need of refining, the types of subsidy that need reforming, at least in the first instance, are already known (see Chapter 7.4 for further discussion).

3 QUANTIFICATION OF ENVIRONMENTALLY HARMFUL SUBSIDIES

The problem with quantifying subsidies is closely linked to the lacking of an agreed and widely used definition as to what a subsidy is. This is reflected in the inconsistent definitions used across sectors and countries, which lead to very different results in the quantification efforts. That is why this Chapter should be consulted in close relation to the previous Chapter on definitions, which should provide with the necessary support to the understanding of the present Chapter.

The absence of an agreed upon definition among sectors and among countries, and the variety of results from the different interpretation of what a subsidy entails, hinders subsidy reform and gives an easy hook for those who act against it. So, Steenblik (2003) argues that it would be pointless to argue for a conceptually perfect definition of a subsidy; rather it is more useful to outline practical criteria to allow their quantification. As noted in the previous section, the more rigorous definitions of subsidies are used for accounting or trade purposes. Systems of national accounts are the only basis of economy-wide data, but, as noted above for the ESA, this definition is narrow, and such data do not exist for all countries. On the other hand, some more detailed sectoral subsidy accounts have been developed, but the data are not readily comparable on account of differences in coverage and methods of calculation and classification, because they have typically been generated within distinct policy communities.

The OECD has attempted to undertake a stocktaking of sectoral support and has identified five main approaches to subsidy measurement for the different sectors. So far, the only sector for which the OECD has succeeded in developing a comprehensive estimate of support is the agriculture sector. In this only case, owing to the fact that the estimates are produced by a single international organisation, the total producer support estimate for one commodity can be compared with that of another. However, for other products or industries, such as energy, no single dominant indicator or framework has emerged. To overcome these limits, that hinder subsidy reform, the OECD is currently working on the development of a common reporting framework, organised in such a way as to enable aggregate indicators useful for monitoring to be produced. It is suggested (OECD, 2005) that a framework structured around the data requirements necessary to build the Effective Rate of Assistance (ERA) could serve this purpose, even though the data available now wouldn't permit it.

As for environmentally harmful subsidies, these are quantifiable only through the previous assessment of the linkages between the subsidy and the context in which it is set. Subsidies given to input materials are environmentally more damaging as they potentially lock-in technologies and incentive more use of natural resources. In this Chapter we provide an extensive review of the attempts of quantification in the energy, transport, agriculture, fisheries, water and manufacturing sectors, focusing, in qualitative terms, on the environmental impact of these. Quantification of externalities and off-budget subsidies are those that give more of a gist of the financial support given to polluting activities.

There is the need of more research on off-budget subsidies and cross subsidies in the EU. Off-budget would show the big amount of resources given to certain sectors, sources or uses. In this Chapter we will provide and confront the following quantification efforts:

Energy

- Quantification and methodological comparison of energy subsidy at the OECD (OECD, 2005), European (EEA, 2004) and national (Meyer, 2004) levels.
- Energy subsidies per energy sources (coal, oil, gas, nuclear, renewables) and R&D, at the EU level, including on-budget and off-budget subsidies (excluding externalities, EEA, 2004)
- Focus on coal subsidies (EEA, 2004; EU State aid Scoreboards, 2005, 2006)
- Estimates of VAT reduced rates for households fuels in the EU (our elaboration on Eurostat and Energy Yearly Statistics, 2004)
- External costs of electricity production in the EU (Extern-E, 1997)

Other sectors

- *Transport subsidies in the EU*: estimates done by the OECD (1998, 2005); Nash at al. (2002); EEA (2007) and the EU State aid Scoreboards (EC, 2006).
- *Other sectors (agriculture, fisheries, water and manufacturing)* in OECD countries and in the EU: quantifications developed using the OECD sectoral definitions (OECD, 2005; Cox, 2002; Lee, 2002) and using State aid definitions (EU State aid Scoreboards (EC, 2006).

All the quantification estimates here reported refer back to the definitions provided in the previous Chapter. The structure of the present Chapter is the following:

- The problem of quantifying subsidies
- Quantifying energy subsidies
- Quantifying transport subsidies
- Quantifying subsidies in other sectors

3.1 The problem of quantifying subsidies

Steenblik (2003) argues that it would be pointless to argue for a conceptually perfect definition of a subsidy; rather it is more useful to outline practical criteria to allow their quantification. Bruce (1990) argues that whatever definition is used it should be implementable with the available, or expected to become available, data, and consistent with the inferences that one wants to be able to draw from the assembled information. As noted in the previous section, the more rigorous definitions of subsidies are used for accounting or trade purposes. Steenblik notes that the frameworks provided by the systems of national accounts are the only basis of economy-wide data, but, as noted above for the ESA, this definition is narrow, and such data do not exist for all countries. On the other hand, some more detailed sectoral subsidy accounts have been developed, but the data resulting from these are not readily comparable on account of differences in coverage and methods of calculation and classification, because they have typically been generated within distinct policy communities.

The OECD has attempted to undertake a stocktaking of sectoral support and has identified five main approaches to subsidy measurement, only some of which overlap (OECD, 2005):

- **Programme aggregation:** adding up the budgetary transfers of relevant government programmes; in most cases data are at the national, rather than the sub-national, level.
- **Price-gap:** measuring the difference between the world and domestic market prices of the product in question.
- **Producer/consumer support estimate:** measuring the budgetary transfers and price gaps under relevant government programmes affecting production and consumption alike.
- **Resource rent:** measuring the resource rent foregone for natural resources.
- **Marginal social cost:** measuring the difference between the price actually charged and the marginal social cost.

However, because most subsidy data are compiled for other reasons, the categories into which they have been aggregated may not facilitate the analysis of their environmental effects (see Steenblik, 2003). To address this, the OECD has been working on the adoption of a common reporting framework, organised in such a way as to enable aggregate indicators useful for monitoring to be produced. This framework would ideally be structured around the data requirements for an Effective Rate of Assistance (ERA)²¹, even if the available data do not currently permit the calculation of an ERA itself (see Steenblik, 2003; OECD 2005). Such a development would improve consistency and comparability across sectors and countries. It would also significantly increase the transparency of the way in which the subsidy data are compiled and reported.

So far, the only sector for which a comprehensive estimate of support is possible is the agriculture sector. This is because there has been an extensive effort by the OECD to calculate, on an annual basis, the producer support estimate²², which is an estimate of total support that includes market price support, budgetary payments and support for general services. Owing to the fact that the estimates are produced by a single organisation, the total producer support estimate for one commodity can be compared with that of another. However, for other products or industries, such as energy, no single dominant indicator or framework has emerged.

²¹ The ERA (a derivative method of Effective Rate of Protection) measures net government assistance to an industry by comparing the difference between the value-added by the assisted sector to the value-added generated by the same, but unassisted sector (at the world or reference price). It takes into account not only support directed at an industry but the amount of support indirectly received or the tax paid by the industry because the government has subsidised or taxed a supply industry. The main difference between the PSE and the ERA is in the way input factors are treated: the real or effective assistance given to producers also depends on the level of protection or taxation applying to inputs. If, for example, there are measures that increase the price of inputs, the level of assistance enjoyed by producers will be reduced. This method has been adopted by the Australian Industries Assistance Commission which has published a number of studies on this subject. Taken from OECD, Various methods for measuring and analysing economic assistance, available at <http://www.oecd.org/dataoecd/37/61/2349013.pdf>

²² The OECD's Producer Support Estimate (PSE) for agriculture measures the annual monetary value of gross transfers from consumers and taxpayers to support agricultural producers, measured at the farm-gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income (OECD, 2005).

Instead, estimates of support to energy consumption and production in the OECD are either incomplete or very approximate. They are given in snapshot studies from the IEA, World Bank and individual researchers (e.g. van Beers and de Moor, 2001). Only for coal production has the IEA published annual figures (currently until 2002) of the financial assistance to indigenous coal producers using the producer subsidy equivalent²³. This measures the budgetary transfers and price gaps under relevant government programmes affecting production. These are the only data on energy subsidies collected on a regular basis at an international level.

3.2 Quantifying energy subsidies

For OECD countries, the most recent data on support for energy production estimated by the IEA suggested that this amounted to US\$20-30 billion a year in 2001 (about €15.1 billion, OECD, 2005). This figure, however, is not comparable with other researchers' estimates that suggest the actual number may be closer to US\$80 billion a year (€60.6 billion, see van Beers and de Moor, 2001). These data are both reported by the OECD (2005) to give an idea of the inconsistent and incomplete estimates available on energy subsidies.

In general, the OECD estimates that a third of energy subsidies support coal production, although support has declined from US\$11.4 billion (about €8.6 billion) in 1990 to US\$5.4 billion (about €4 billion) in 2000 (OECD, 2005). However, coal production has also decreased dramatically in OECD countries, so despite the decline in overall support figures, coal subsidies per tonne of coal produced have not seen any major reductions during the 1990s. The OECD affirms that subsidised production is expected to decline further over the next few years, as several OECD countries are planning to phase out their remaining subsidies. Having said that, concerns over security of supply are, on the other hand, pushing highly energy dependent countries to increase their coal consumption (e.g. Italy is planning to increase its number of coal-fired power stations).

As far as the European Union is concerned, the most comprehensive estimate of energy subsidies is that presented by the European Environment Agency (EEA, 2004). The EEA's analysis drew on many sources to create a detailed picture of energy subsidies for 2001 for the then EU 15 (see Table 3). The EEA estimates that the *total on- and off-budget energy subsidies (excluding external costs)* in the EU-15 were in the order of €29 billion in 2001. It underlines that these figures should be regarded as indicative due to the lack of consistent data throughout EU countries and the assumptions that had to be made.

The quantification of off-budget subsidies is complex and, in some cases, impossible, as it often requires that the benefit be calculated on the basis of differential treatment against a norm or baseline, which is a subjective decision.²⁴ Whether off-budget subsidies should

²³ The Producer Subsidy Equivalent for coal as calculated by the IEA includes budgetary transfers including tax expenditures and market price support arising from price regulations and trade restrictions (EEA, 2004).

²⁴ This difficulty has also explained the non quantification of tax subsidies in public budgets until the middle of last century. However, since then, because it was acknowledged the amounts of tax waived compared to the baseline represented an extra tax burden on the other tax payers, almost all OECD countries quantify these implicit subsidies on an yearly base in their public accounts. For the majority of them such quantification is even compulsory. Generally, as far as energy is concerned, the IEA advises

be considered as an energy subsidy remains an area of contention, hence the distinction that the EEA makes between on- and off-budget subsidies.

It has been argued (Meyer, 2004) that there is a need for more research in order to collect information on off-budget subsidies, especially on implicit and cross subsidies in the EU, where reporting is incomplete and non harmonised. For instance, as debated in Chapter 1, national subsidies accounts do not include many of the subsidies included in the OECD (2005), IEA/UNEP (2002) and EC (2002) broader definitions. An application of these definitions to the quantification of energy subsidies in Germany has been attempted by Meyer (2004) (see Box 3). The case study by Meyer aims at illustrating the wide gap between the available quantification of on-budget transfers (through the National Subsidy Report) and the value of off-budget subsidies, such as tax exemptions, subsidies by regulation and external costs.

Box 3: An attempt to calculate off-budget subsidies at the national level

As discussed in Chapter 2, national subsidies accounts do not include many of the subsidies included in the OECD (2005), IEA/UNEP (2002) and EC (2002) definitions. One application of these definitions to the quantification of national energy subsidies has been attempted by Meyer (2004) for Germany²⁵.

As Meyer (2004) points out, the German Subsidy Report is useful and better than most international assessments: however for the energy sector it shows incomplete data. Meyer considers as subsidies not only those that account for financial transfers, but also for tax exemptions, subsidies by regulation and external costs. The difference between the value of these and that included in the German Subsidy Report (note that EEA quantification mainly relies on this kind of published data), is illustrated in Graph 1.

Meyer accounts for the following energy subsidies that are not considered German Subsidy Report:

- Lower taxation of diesel compared to unleaded gasoline;
- non-taxation of coal and nuclear energy (only indirectly; electricity tax);
- non-taxation of non-energetic use of fossil fuels;
- exemption of tickets for international flights from the value added tax;
- deductibility of cost of commuting from the income tax (is defined as cost for earning income, not as a support of a certain use of income); and
- subsidy value of (very high) reserves/provisions for decommissioning of nuclear power plants.

Other tax relieves are underestimated in their fiscal relevance (e.g. exemption of kerosene, shipping fuels and internal consumption of refineries) due to differences concerning reference tax

the calculation of the externalities when there is a common agreement concerning the measurement methods.

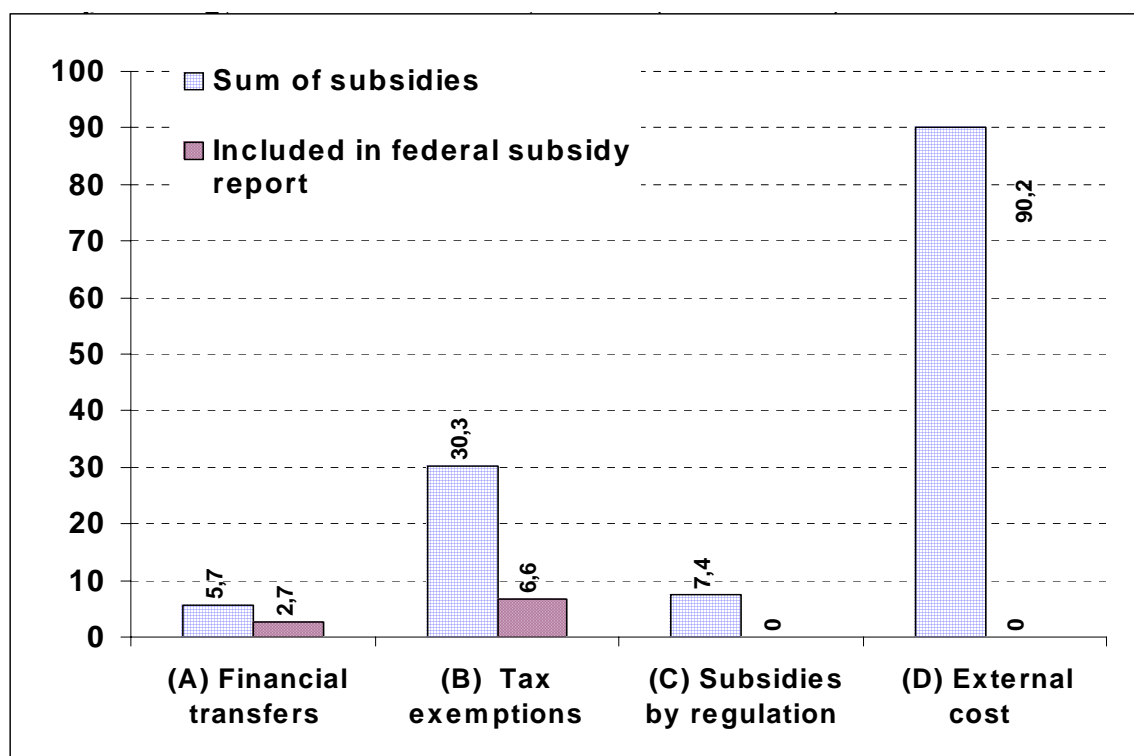
²⁵ We ought to thank especially Bettina Meyer for sharing her *estimates* with the authors and for agreeing to include them in this report intending in this way to help advance the discussion on the development of methodologies for the quantification of energy subsidies.

rate and tax base. Moreover, the national Subsidy report does not consider the following:

- Subsidies of international and regional public institutions
- Subsidies by regulation and non-internalised externalities

If these are included, as the broad definition of energy subsidies was applied, then the value of public subsidies would be much higher than accounted by the structure of national subsidies reports (see figure below – for a discussion of the following see case study on hard coal in Germany in Chapter 4.3.) This study is discussed further in the case study on German support to hard coal in Chapter 4.

Figure 3: Energy Subsidies in Germany in 2003 (billion Euro)



Source: Meyer (2004)

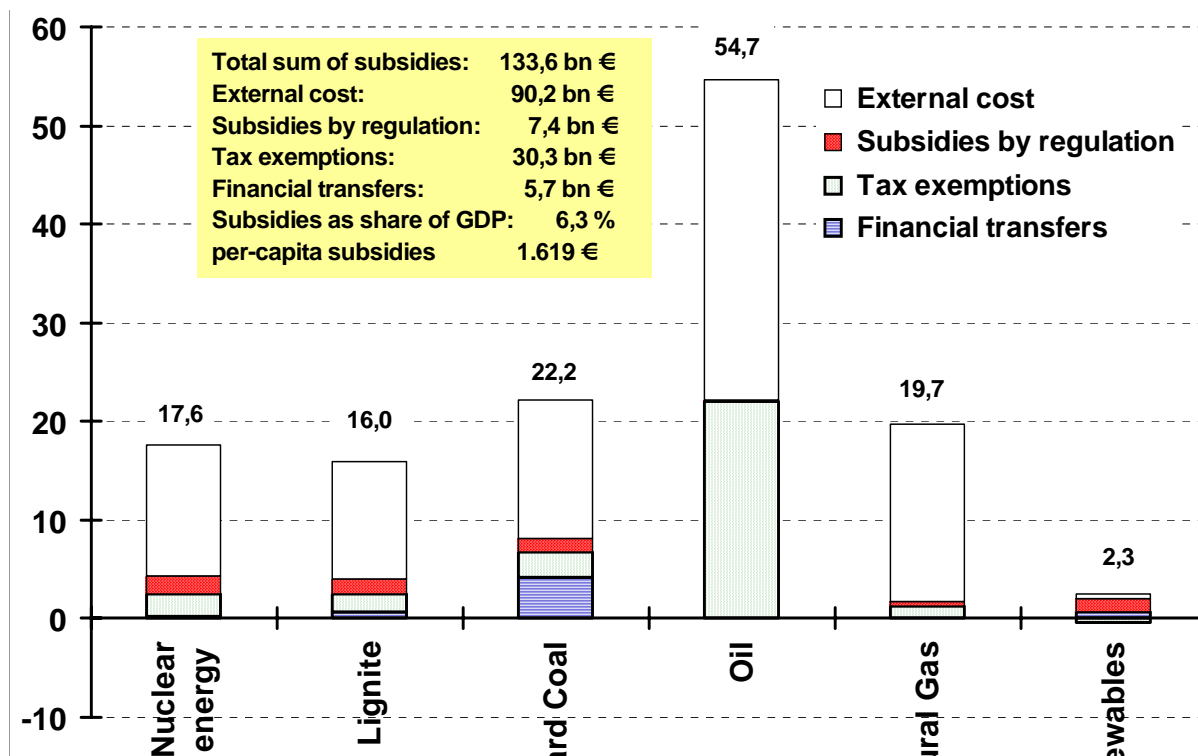
The study shows effectively how the application of a broad definition of energy subsidy gives much bigger numbers. The estimates include indirect subsidisation (e.g. deductibility of cost of commuting), tax exemptions, subsidies by regulation and external costs. Compared to the €9.3 billion accounted for energy subsidies in the National Subsidy Report (which include €2.7 billion for financial transfers and €6.6 for tax exemptions), Meyer estimates energy subsidies to equal €130.2 billion. These include: subsidy by regulation (€7.4 billion), externalities (€90 billion), other tax exemptions (€30.3 billion) and financial transfers not accounted for (€5,7 billion).

The study includes external costs and subsidies by regulation. The latter includes the value of missing competition (and high electricity prices, at least 1 ct/kWh) in the electricity sector, as the allocation of the subsidy value to the energy sources based on their shares in electricity production. It considers also additional tax exemptions and financial transfers (as noted above).

From the data shown in Figure 4 we can see that **oil** is by far the energy source that receives

more support in Germany. Meyer calculates subsidies to oil to be equal to €54.7 billion. There are several reasons why absolute subsidies to oil are so high: oil has the highest share of primary energy consumption (36%); it has a high reference tax rate for untaxed uses (tax rate on gasoline); the kilometre flat rate for commuters (deductible from income tax) is considered here as favouring oil as the dominating fuel in transport sector. It receives more than €20 billion in tax exemptions. These include all deviations of current energy tax rates from reference tax rates (e.g. non-taxation of kerosene, shipping fuels, internal consumption of refineries, non-energetic use, lower taxation of diesel fuel compared to gasoline, tax relief for energy intensive firms and for public transport).

Figure 4: Energy subsidies in Germany for the year 2003 (billion Euro)



Source: Meyer (2004)

Hard coal, lignite and nuclear energy benefit from no, or lower, energy taxation (these are taxed only indirectly by the electricity tax), while the rest of their subsidisation is mainly represented by external costs. Financial transfers are mainly directed to coal (around €4 billions), and to a lesser extent to renewables (feed-in-tariffs), lignite and nuclear energy (R&D). Subsidies by regulation are another important voice, accounting for almost €2 billion for nuclear, lignite, hard coal and renewables, to a lesser extent to natural gas.

The study reported here by Meyer is country specific. More research is needed to identify and quantify off-budget subsidies in other countries and possibly estimate their amount at EU level. So far, the EEA (2004), as we suggested is the only comprehensive, EU level quantification of energy subsidies.

The EEA’s estimates suggest that EU average annual subsidies for **fossil fuels** accounted for almost 75% of total EU energy subsidies and of these, coal is the largest recipient (see Table 3).

Table 3: 2001 Indicative estimates of total energy subsidies, EU 15, billion Euro

	Solid fuel	Oil and gas	Nuclear	Renewables	Total
2001 On- budget	> 6.4	> 0.2	> 1.0	> 0.6	> 8.2
2001 Off- budget	> 6.6	> 8.5	> 1.2	> 4.7	> 21.0
Total	> 13.0	> 8.7	> 2.2	> 5.3	> 29.2

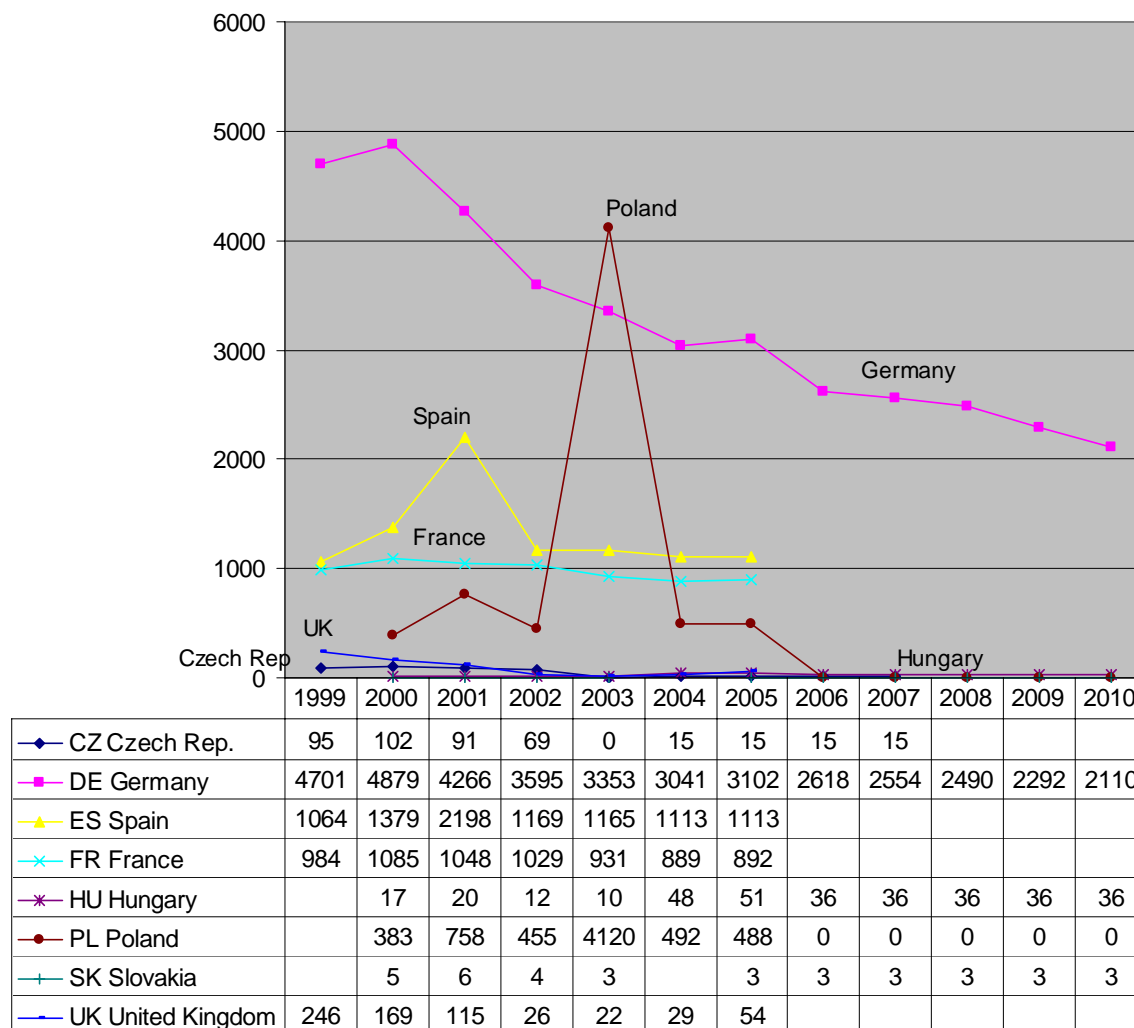
Note: Electricity subsidies allocated to fuels on basis of generation inputs. Excludes external costs.

Source: EEA (2004); for information on sources and types of subsidy included in these estimates, see the footnote²⁶

In the EEA estimation **coal** received approximately €6,4 billion of on-budget subsidies and €6.6 billion off-budget, for a total of €13 billion subsidies in the EU 15, in 2001. compared to this data, the amount calculated under State aid for hard coal production was €8.5 billion in 2001 (IEA, 2003). State aid considers however only a part of on-budget transfers, (see Chapter 2 for further discussion).

As we can see from Figure 5, since 2001, State aid for coal has decreased in every country, although it remains high for Germany, Spain, France and Poland (for further discussion see also the case studies on hard coal in Chapter 4.3.). However, for the latter, there is an abnormal observation for 2003. Belgium, Ireland, the Netherlands, and Portugal have more or less ceased their State support to the industry. Data for State aid to hard coal equalled €3,1 billion in Germany, over €1 billion in Spain, almost €0,9 billion in France, €0,4 in Poland and in the UK approximately €0.1 billion, in 2005.

²⁶ Coal subsidies are taken from the European State aid Scorecard (2003) and from the Commission staff working paper on energy subsidies (European Commission, 2003a). Aid to the oil and gas, and nuclear sectors is based primarily on the European Commission (2003a) and Oosterhuis (2001) reports. Renewables data on direct price support are taken primarily from Eurelectric (2004), supported by data from EREF (2002) and Irish Government (2003). Data on renewables capital investment, taxation support and other aid to related sources is taken from European Commission (2003a) and Oosterhuis (2001). Research and development subsidies paid by Member States to all fuel sources are taken from the IEA R&D database (2004), while those paid by the European Community are taken from European Commission (2003a) and Oosterhuis (2001). Fuel taxation exemptions/differentials represent an updated version of Oosterhuis (2001) and are calculated using IEA (2003b) energy prices and tax data, and consumption/production figures from Eurostat (2001). Data on preferential tax treatment for medium and large users of gas and electricity in the Netherlands is taken from Van Beers *et al* (2002). Electricity consumption subsidies represent updated versions of Oosterhuis (2001) using more recent taxation and consumption data, and are allocated to individual fuels on the basis of Eurostat (2001) data on primary energy inputs in the generating mix.

Figure 5: State aid granted to coal production in million Euros (1999 – 2010)²⁷

Sources: IEA (2003), State aid Scoreboard (2006), EC Decisions under Regulation (EC) No 1407/2002 on State aid to the coal industry. Note: for data 2005 onwards, the values are uncertain, as they are based on the values of aid accepted by the Commission in the framework of the State Aid Regulation for the Coal Industry under Council Regulation (EC) No 1407/2002 of 23 July 2002 on State aid to the coal industry- pleas3 note that for Hungary, Poland and Slovakia we have averaged the total on an annual basis.²⁸

In June 2005, the European Commission authorised the Polish, German and Hungarian coal industries to continue to grant State aid until 2010.²⁹ The UK's 'initial investment' State aid was approved by the Commission in 2003, but will expire in 2008, while the Czech Republic and Slovakia grant aid to their coal industry only for financing inherited

²⁷ Data 1999: the International Energy Agency (IEA) calculates the amount of financial assistance to indigenous hard coal production using the producer subsidy equivalent (PSE) measure. Data 2000 – 2005: State aid scoreboard. Data 2005 onwards : the values of aid accepted (so far) by the Commission in the framework of the State Aid Regulation for the Coal Industry under Council Regulation (EC) No 1407/2002 of 23 July 2002 on State aid to the coal industry- pleas note that for Hungary, Poland and Slovakia we have averaged the total on an annual basis: http://ec.europa.eu/energy/coal/state_aid/2010/index_en.htm

²⁸ Available at: http://ec.europa.eu/energy/coal/state_aid/2010/index_en.htm, accessed in August 2006.

²⁹ MEMO/05/217 Date 22/06/2005

liabilities under Article 7 of Council Regulation (EC) No 1407/2002³⁰. The EC decisions on national State aid programmes up to 2010³¹ show that the amounts of aid approved will still be high in 2010 in Germany, (€2.1 billion).

The EEA (2004) analysis found that there is little direct financial support in the EU for the **oil** sector, due primarily to the fact that most of the investment in exploiting oil reserves currently takes place elsewhere in the world. Moreover, the industry in the EU is largely privatised and receives no on-budget aid for oil production, transport or storage. There are however tax exemptions and cross subsidies to oil (which are clear in the case study for Germany reported in Chapter 4.2.), which are not always accounted for. An overview of where **differential rates of VAT** exist – or have existed – for energy for households in the EU, is given in Table 10, Chapter 4. Here we have attempted to put a value on this subsidy (see Table 4) by quantifying the loss of revenue resulting from the fact that households' energy use is taxed at a reduced rate rather than at each country's full rate of VAT. The authors estimated the subsidy arising from VAT exemptions on energy for households in the EU in 2004 as €7.3 billion, with €5 billion for electricity, €2.1 billion for natural gas, 114.1€ million for fuel oil and €65.6 million for solid fuels (estimate based on Eurostat, 2004 and OECD, 2004). In particular, the UK provides a significant level of support for the use of gas in households through VAT reduced rates (5%) (the subsidy amounts to around €1.9 billion). The UK is at the forefront for VAT tax exemptions to households not only for oil and gas but also for electricity (€2.4 billion annual subsidy), and is the country that grants the highest amount of subsidies through VAT low rates to solid fuels (€54 million). As for VAT reduced rates to electricity, the UK is followed by Italy, which grants €1.5 million in VAT reduced rates to households.

Table 4: Annual subsidy amounts implicit in VAT reductions for energy use in households in EU countries

		VAT rate (%)	Standard VAT rate (%)	Subsidy (€million)
Belgium	Solid fuels	12	21	6.7
Estonia	Solid fuels	5	18	0.5
Greece	Natural gas	9	19	4.3
	Electricity	9	19	239.0
	TOTAL			243.2
Hungary	Solid fuels	15	20	1.2
Ireland	Solid fuels	13.5	21	11.5
	Fuel oil	13.5	21	30.6
	Natural gas	13.5	21	52.9
	Electricity	13.5	21	152.1
	TOTAL			247.1

³⁰ Council Regulation (EC) No 1407/2002 of 23 July 2002 on State aid to the coal industry, OJ L.205, 2.8.2002.

³¹ This is the State aid accepted (so far) by the Commission in the framework of the State aid Regulation for the Coal Industry under Council Regulation (EC) No 1407/2002 of 23 July 2002 on State aid to the coal industry.

Italy	Solid fuels	10	20	0.3
	Natural gas (1)	10	20	114.2
	Electricity	10	20	1532.9
	TOTAL			1647.4
Luxembourg	Solid fuels	12	15	0.0
	Fuel oil	12	15	2.7
	Natural gas	6	15	12.5
	Electricity	6	15	25.9
	TOTAL			41.1
Malta	Electricity	5	18	10.5
Portugal	Fuel oil	12	21	26.5
	Natural gas	5	21	39.0
	Electricity	5	21	556.7
	TOTAL			622.3
United Kingdom	Solid fuels	5	17.5	45.3
	Fuel oil	5	17.5	54.4
	Natural gas	5	17.5	1907.8
	Electricity	5	17.5	2491.6
	TOTAL			4499.0
TOTAL EU	Solid fuels			65.6
	Fuel oil			114.1
	Natural gas			2130.7
	Electricity			5008.7
	TOTAL			7319.0

Data sources:

Energy use: Eurostat, Energy: Yearly Statistics 2004

Natural gas and electricity prices: Eurostat, database energy prices (average for 2004).

Fuel oil and coal prices: OECD, Energy prices and taxes; data for 2004.

Assumptions:

- Calculations used figures for energy use relating to households plus the services sector. As VAT is deductible for part of the services sector, this gives a slight overestimation.
- Calculations used prices based on unweighted averages for all household user categories.
- In the case of natural gas and electricity prices, where national data is lacking, the EU average was used.
- In the case of fuel oil and coal prices, where national data was missing, the prices of nearest EU country for which data were available were used (i.e. Poland in case of Estonia; UK in case of Ireland; Austria in case of Italy).

Note:

(1) Reduced VAT rate applies only to natural gas for cooking and water heating in the southern part of Italy; it was estimated that this is 10% of total natural gas use in Italy by households and services.

During the period 1990-2002, the amount spent on **R&D** associated with fossil fuel production declined by almost 56%. Most R&D associated with fossil fuel production was spent on coal production, but this share is slowly decreasing and the proportion spent on oil and gas has increased (EEA, 2004).

In 2001, the EEA analysis states that **nuclear power** was the least subsidised form of energy, accounting for 8% of total subsidy support. The biggest on-budget support to nuclear energy comes from R&D grants by Member States (mainly France, Germany and Italy) and the European Community. In 2002, nuclear R&D expenditure still accounted for approximately 45% of EU total energy R&D spending, despite a substantial decline since 1990 (when it accounted for 53%).

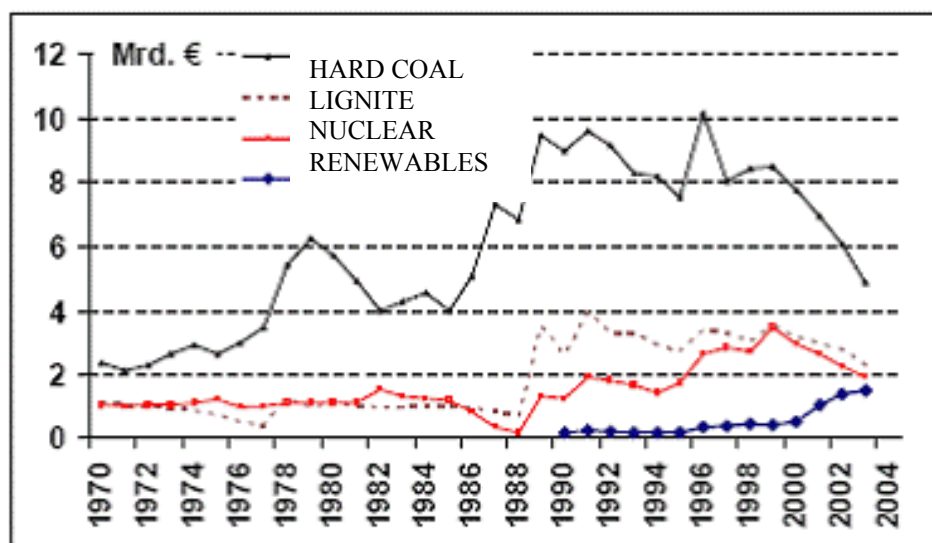
It should be noted that the figures for nuclear exclude the benefits from not having to pay for full-liability insurance cover for a critical nuclear accident or fuel incident. National laws limit liability for nuclear accidents to thresholds that are far below the expected damage since such risks are too large to be commercially insurable. For example, in Germany, the liability is limited to €2.5 billion, which is about 0.1% of the expected damage if a major nuclear accident occurs (EEB, 2004; BUND/Friends of the Earth Germany, 2003). However, there are difficulties with producing an estimate that accurately reflects the risks associated with nuclear power.

Additionally, the nuclear industry can also benefit significantly from one-off payments. For example, in 2002 nuclear energy company British Energy ran into financial difficulties, narrowly avoiding bankruptcy through an emergency loan from the UK government. The State aid amounted to approximately €6 billion, some of which took the form of a loan to cover ongoing operating costs (which has since been repaid), with the remainder going towards ‘restructuring’ the company – a proposal that was approved by the European Commission (EEB, 2004). Also, in some Member States (e.g. Germany) utilities are allowed to invest their accumulated decommissioning funds in other areas of their businesses, thus allowing them to self-finance business growth and acquisition, whereas firms without nuclear in their power portfolio must access capital at market rates (see Tchappa, 2003).

Support for **renewable energy**, which is on balance considered environmentally beneficial, has increased steadily between 1990 and 2001, through the introduction of regulatory support mechanisms, such as fixed feed-in tariffs, competitive tenders and purchase obligations. The overall share for renewables of R&D expenditure in energy was still relatively small in 2002 (19%, excluding EU level funding), but it has been increasing significantly (EEA, 2004).

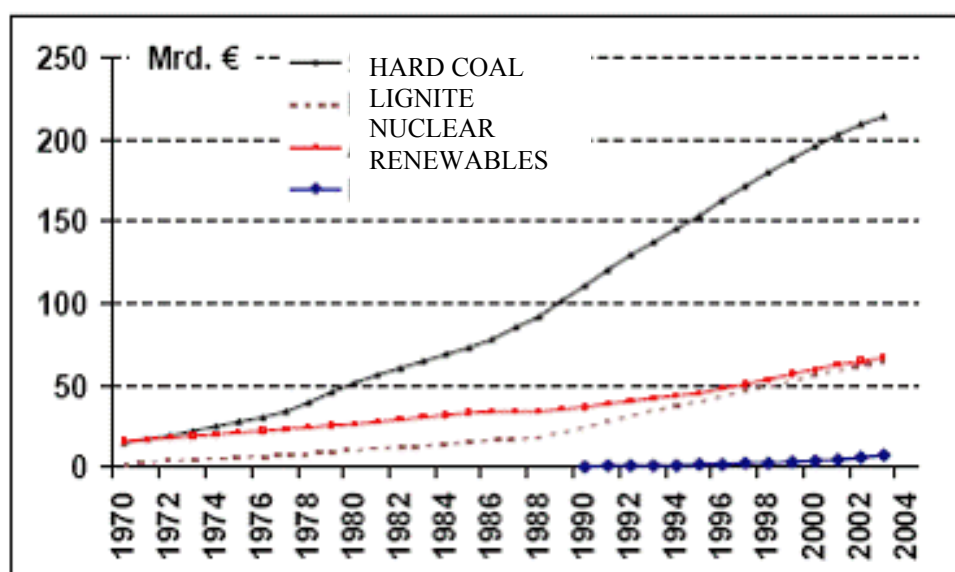
It is important to underline that a ‘snapshot’ of current subsidy levels does not give a sufficiently full picture of the situation, as historic subsidies also play a role not just for the past but also for viability of a sector or technology today (as subsidies have become assets etc). Again the analysis from Germany is helpful here. The figures below give the annual subsidies (Figure 6) and the cumulative subsidies (Figure 7). It is clear to see that while renewables subsidies have been rising and are now on a par with some other subsidies, when taking a cumulative perspective, the picture is very different, underlining the predominance of subsidies for fossil fuels over time.

Figure 6: Yearly subsidies in billion Euros (2003 prices)



Source: Meyer, 2004

Figure 7: Cumulative energy subsidies in billion Euros (2003 prices)



Source: Meyer, 2004

It is difficult to quantify other types of subsidy, for the reasons stated above. The EEA’s analysis excluded the consideration of **external costs**, which, in this context, arise from a market failure or lack of government intervention to ensure that costs and benefits are fully reflected in prices. Also, as noted above, such costs are often not included in definitions of subsidy, primarily because of the difficulty in measuring them, but the lack of external cost pricing still amounts to a subsidy, as these costs are not borne by producers, but by society more generally. However, a European Commission-funded project (ExternE) has attempted to calculate the external costs associated with energy production (see Table 5). According to this study, the cost of generating electricity from

solid fuels (coal, lignite, peat) or oil could double the present price if external costs were taken into account.

Table 5: External costs for electricity production in the EU (cent/kWh)

Country	Coal & lignite	Peat	Crude oil	Gas	Nuclear energy	Biomass	Hydro-electricity	PV	Wind energy
Austria				1-3		2-3	0.1		
Belgium	4-15			1-2	0.5				
Germany	3-6		5-8	1-2	0.2	3		0.6	0.05
Denmark	4-7			2-3		1			0.1
Spain	5-8			1-2		3-5			0.2
Finland	2-4	2-5				1			
France	7-10		8-11	2-4	0.3	1	1		
Greece	5-8		3-5	1		0-0.8	1		0.25
Ireland	6-8	3-4							
Italy			3-6	2-3			0.3		
Netherlands	3-4			1-2	0.7	0.5			
Norway				1-2		0.2	0.2		0-0.25
Portugal	4-7			1-2		1-2	0.03		
Sweden	2-4					0.3	0-0.7		
UK	4-7		3-5	1-2	0.25	1			0.15

Source: European Commission (2002)³²

As a point of detail, but an important one, the external costs of nuclear are seen by some as an underestimate; this reflects the problem of getting an agreement of magnitude of events / risks with the result that only a small probability of accidents was used in the calculations³³. Another problem deals with what discount rate is used as discounting future cashflows (liabilities for waste storage) reduces their 'present value' and hence the estimate of the future external costs and hence the subsidy³⁴.

3.3 Quantifying transport subsidies

The quantification of transport subsidies is generally a quite difficult exercise. This is because many indirect subsidies are associated with the transport sector, and measuring the cost of the externalities is often subjected to a high degree of uncertainty. Results may vary sensibly in different reports, depending on the data taken into account. Often negative externalities from transport are not considered as subsidies, and therefore estimates can be very conservative.

The present work focuses on OECD and EEA findings. When inclusion of external costs has been possible it has been noted.

³² European Commission, 'Inventory of public aid granted to different energy sources', 2002

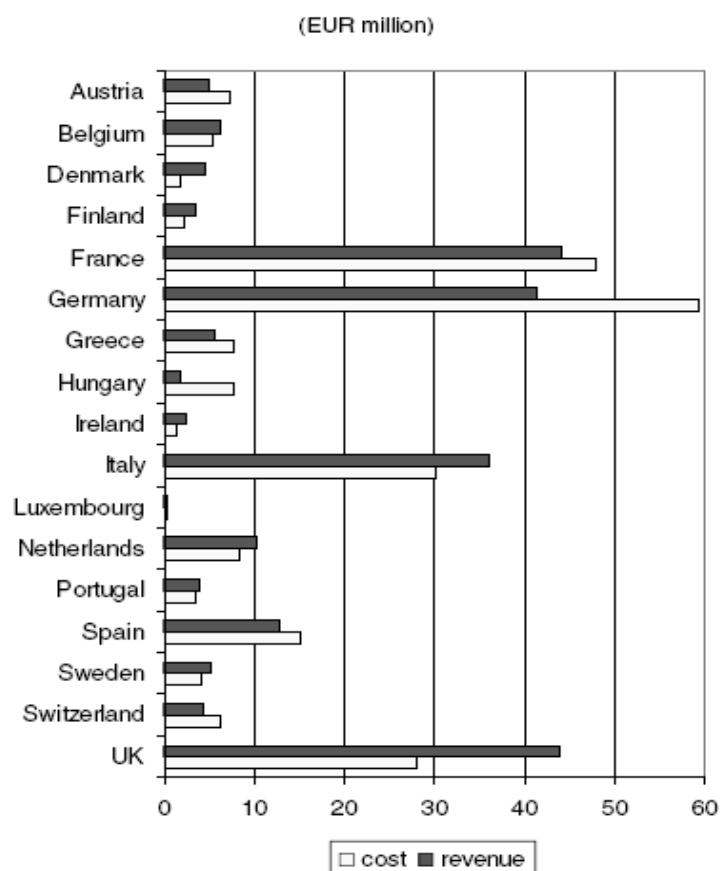
³³ The experts final assessment / consensus was that they were low, and lay people see as higher.

³⁴ If sufficient monies were to be set aside and grow at the discount rate and kept for the waste liabilities then there would be fewer problems with the discounting aspect. But in practice this does not happen. The monies are often not ring fenced and invested with a view of creating this fund..

Research recently published by Kjellingbro and Skotte (2005) made a very rough estimate ('guesstimated') the level of subsidisation to road transportation. Data suggest that transport subsidies amount to roughly 225 to 300 billion USD (approximately €170-230 billion³⁵) worldwide. Of these, about 110 to 150 billion USD per year (approximately €130-175 billion³⁵), are considered to be 'perverse subsidies' - i.e. subsidies that are harmful to the environment and to the economy (EEA 2005b).

According to OECD estimates (OECD 2005) support for road and rail transport in the European Union, Hungary and Switzerland amounted to about USD 40 billion (about €30 billion³⁵) in 1998. This figure is based on a broad definition of subsidies, calculated as the difference between total revenues and total social costs, and includes externalities.

Figure 8: Road transport: total social cost and revenue, 1998



Source: Nash et al. (2002)

The OECD observed that, in the countries analysed, revenues from road transport covered for most of the social costs (which do not include externalities): in 6 countries total social costs were higher than total revenues, however mostly covered by revenues; while in 9 total revenue was higher than social costs (Figure 8). The road sector therefore appears to be less subsidised than other modes of transport. The difference is significant if compared with rail, for instance, where passenger and freight revenues cover, on average, only 36% of rail system costs (Nash et al 2000).

³⁵ Exchange rate 3 March 2007: 1 USD = 0.758585 EUR

Table 6: Road transport cost coverage for selected OECD countries (1991)- with and without externalities

	France		Japan	USA
Revenues	Urban	Rural	Total	Total
Revenues - as % of costs	129%	164%	82%	80%
Revenues - as % of costs <i>including externalities</i>	42- 57%	92- 105%	66%	64%

Source: OECD 1998

However, if we add to the total social cost of road transport externalities such as health problems caused by pollution from cars, waste of time caused by congestion and so on, the overall cost of road transportation increases quite substantially. Indeed, another study by OECD (1998) assessed the monetary value of road transport subsidies in three OECD countries before and after including externalities among the costs Table 6 shows the percentage of cost coverage in the two cases: in France, if externalities are included, total revenues from road transport in urban areas decrease from 129% of social costs, to 42-57% of costs; in Japan total revenues decrease from 82% to 66% of total costs; similarly, in the US, from 80% to 64%.

Therefore, while costs seem largely covered by revenues when externalities are not accounted for, the figures change quite significantly when external costs are included. As it turns out, when externalities come into the picture revenues are not enough to cover costs. This may indicate the existence of substantial implicit subsidies.

An updated calculation of level of annual transport subsidisation in Europe has been estimated by a recent study made for the EEA (EEA, 2007). The study identified about € 240 billion spent in transport subsidies in the EU 15. A summary Table and the main findings are provided below.

Table 7: Overview of total annual subsidies found, by incidence and mode (billion 2005 EUR) – EU 15

	Total	Type of subsidies	Observations
Road	128	Infrastructure: 113 On-budget (excl. PSO): 6 Fuel-tax exemptions ³⁶ : 0 VAT exemptions ³⁷ : 9	Road subsidies are mainly for infrastructure (almost 90% of total subsidies for road)
Rail	72	Infrastructure: 37 On-budget (excl. PSO): 33 Fuel-tax exemptions ³⁶ : 0 VAT exemptions ³⁷ : 3	On-budget very relevant - almost as large as infrastructure. Funding found for PSO—not included among on-budget subsidies—is even larger at €42 billion per year.
Air	26	Infrastructure: -1 On-budget (excl. PSO): 1 Fuel-tax exemptions ³⁶ : 8 VAT exemptions ³⁷ : 18	Mostly off-budget—in the form of exemptions from fuel taxes as well as VAT on international flights
Water	14	Infrastructure: 10 On-budget (excl. PSO): 1 Fuel-tax exemptions ³⁶ : 3 VAT exemptions ³⁷ : 0	Amount of subsidies considerably lower compared to other modes (10% of those for roads). Mostly infrastructure (70% of total subsidies for water)
Total	241	Infrastructure: 159 On-budget (excl. PSO): 42 Fuel-tax exemptions ³⁶ : 11 VAT exemptions ³⁷ : 29	Infrastructure subsidies are the most relevant part (more than 65% of total subsidies)

Source: IEEP elaboration of data from EEA, 2007

Note: This Table is based on incomplete data; the total value of transport subsidies remains unknown. This note must accompany any use of this Table. Infrastructure subsidies equal infrastructure costs minus infrastructure charges (thus negative values are possible). Numbers may not add due to rounding.

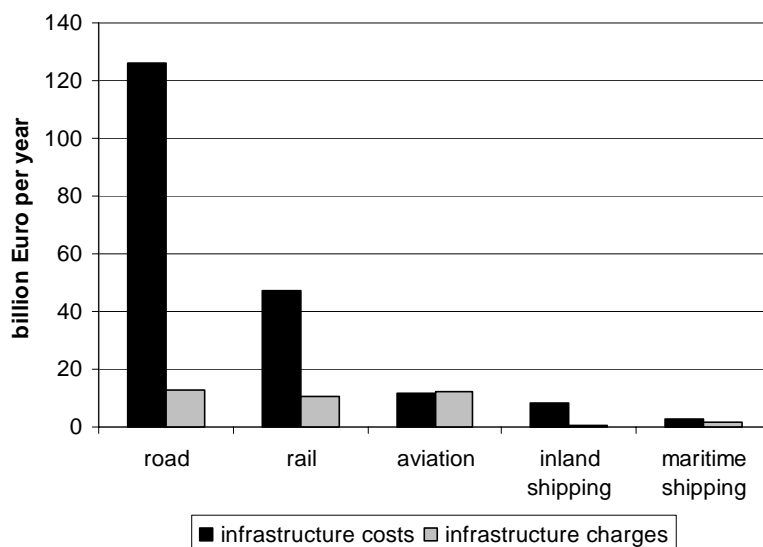
The figure should be considered as a lower bound, due to missing data. However, these estimates are based on a much higher range of subsidies than that suggested by the OECD (see above), namely they include infrastructure subsidies, on-budget subsidies, and off-budget subsidies (i.e. charges, exemption for fuel excise taxes and VAT exemption on passenger services).

Infrastructure subsidies. State provision of infrastructure is the largest source of subsidy, and this goes predominantly and increasingly to roads, with less to rail and relatively little to sea and air. The figure below shows the annual infrastructure costs per mode, compared to the collected charges. It can be observed that, for both road and rail, infrastructure charges are much lower than the infrastructure costs, yielding to a high level of subsidies. Importantly, these should however be counted as subsidies only where excise taxes on fuel are not counted as the covering the cost of infrastructure provision.

³⁶ETS CO2 price as reference.

³⁷ VAT exemptions on passenger transport services

Figure 9: Annual infrastructure costs and charges, EU-15 plus Hungary (billion 2005 EUR)



Source: UNITE (note that UNITE data for aviation and waterborne transport are limited and unreliable).

The majority of the infrastructures subsidies go to the road sector. In the EU-15, for example, motorway length has tripled while the size of the rail network has declined by 19,000 km from 1970 to 2001 (Madarassy, 2004 in EEA, 2007).

These figures witness a considerable environmental impact, as construction of new infrastructure can make significant demands upon non-renewable resources, notably mineral resources, including concrete, aggregates, and steel. It also leads to fragmentation of habitats and significant impacts on viability of ecosystems and species populations.

Funding of new roads, especially motorways, is likely to be the most damaging of all forms of infrastructure subsidy, as motorways have many technical requirements such as grade-separated junctions that require very large areas of land. Still much of this is argued by many to be essential to facilitate economic growth and alternatives may be limited, but there are certainly examples of new roads that are extremely damaging environmentally and may not be essential either. This argues not for the elimination of road funding, but arguably for better scrutiny of the costs and benefits of major schemes, especially where EU funds are being provided. As a general rule, therefore, subsidies for repairs and maintenance of existing infrastructure is far less harmful than provision of new infrastructure, and can actually help to improve the utilisation, and hence the environmental ‘efficiency’ of the use of transport.

Similarly, the repair and maintenance of transport infrastructure can also lead to significant amounts of waste arising, for example, in resurfacing of roads and reballasting of railway lines. Land transport infrastructure is mostly linear in nature, and as such, can significantly fragment natural habitats. Roads, and to a lesser extent railways, can act as a significant barrier to the movement of small animals, while noise and other impacts of transport activities can drive away wild creatures. In urban areas, heavily-used new infrastructure can also have a similar impact on the mobility of people within cities. In

this context, it is worth noting that roads require significantly more land area to provide the same capacity as railway lines, while air and water transport make far smaller demands upon land area. This indicates that roads have the greatest impacts on nature and biodiversity.

On-budget subsidies On-budget subsidies (whether or not PSO is included) apply mainly to rail and buses. EEA (2007) did not consider PSO as subsidies, and therefore data do not include this source. Nevertheless it may be interesting to note that **PSO** amounts to €51 billion per year, and that the vast bulk of them (€ 42 billion) went to rail. By way of comparison, €7 billion went to road, while air and water modes each received € 1 billion (EEA, 2007).

Although on-budget subsidies (whether including PSO or not) may encourage inefficiency in some areas, they are to a first approximation to the ‘environmentally friendlier’ transport modes, and to this extent can be regarded as environmentally benign and socially useful. In particular insofar as they encourage modal shift away from more damaging modes of transport (primarily private road transport) they result in less environmental damage. However, insofar as they encourage additional or unnecessary travel, they can still be regarded as environmentally harmful.

Box 4: European State aid for the transport sector

The Commission’s report on State aid (2006) provides some information on on-budget subsidies from EU-15. It should be noted that the definition of State aid may be somewhat more restricted than that of general on-budget subsidies, since it generally refers to sectoral subsidies distorting competition, on the basis of the legal framework laid down in Article 87 and 88 of the EC Treaty. Therefore, it can be argued that not all on-budget subsidies to transport are portrayed in the State aid report. The document can though provide some useful information on trends and relative size of subsidies.

According to the Commission’s report, subsidies to the rail sector are the most conspicuous, as railway received almost €40 billion of State aids in 2005 (see Table below). Much of public financing of the railways though is not notified to the Commission, due to the fact that the sector is often not liberalised and therefore it is not considered subsidised, or because its financing represents compensation for public services³⁸.

Table 8: (Cumulative) subsidies to the railway sector, 2000-2005, in m EUR (1)

Railways State aid	2000	2001	2002	2003	2004	2005
EU 15	33,259	41,951	40,695	38,605	39,051	38,708
EU 25	33,259	41,951	40,695	38,605	39,051	38,708

Source: European Commission Report - State aid Scoreboard- autumn 2006 update. COM(2006) 761 final

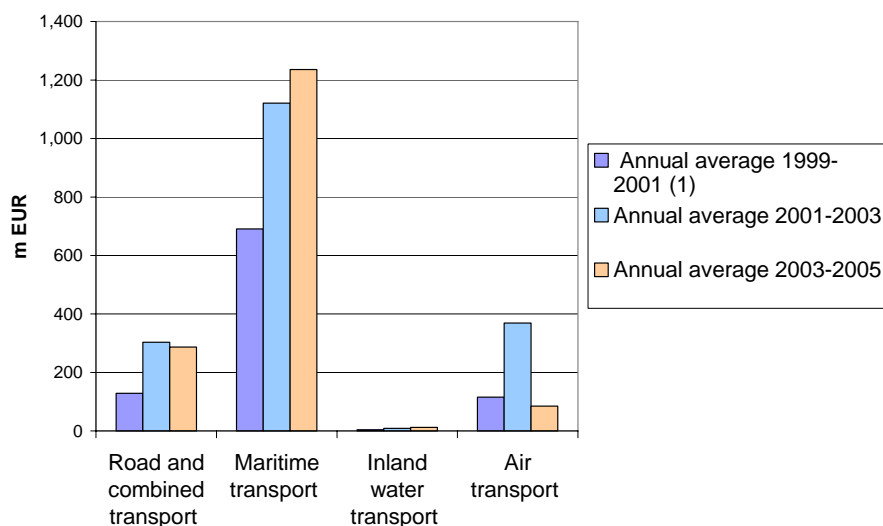
(1) Includes all public subsidies that have been communicated to the Commission as well as subsidies that have been notified and authorised by the Commission under relevant State aid rules. However the figures exclude compensation for services of general economic interest. Source: DG Energy and Transport.

Road, water and air transport State aid account for about € 1.6 billion in (average 2003-2005), with maritime transport being the most relevant sector (more than 76%) among them.

³⁸ In accordance with regulation 1191/69

The level of subsidisation for airlines has fallen considerably since 1997, after the liberalisation of the sector. Data for the period 1999-2005 are shown below:

Figure 10: State aid to the transport sector (excluding railways), EU -15, 1999-2005



Source: IEEP elaboration of data from European Commission Report - State aid Scoreboard- autumn 2006 update. COM(2006) 761 final. Beside (1): European Commission Report - State aid Scoreboard- spring 2005 update. COM(2005) 147 final.

Off-budget subsidies. The EEA study (EEA, 2007) considered as off-budget subsidies exemptions from fuel excise taxes and VAT exemptions on passenger services. Off-budget subsidies turned out to be more significant in the aviation sector- where exemptions from fuel excise taxes and VAT amounted to approximately € 26 billion per year.

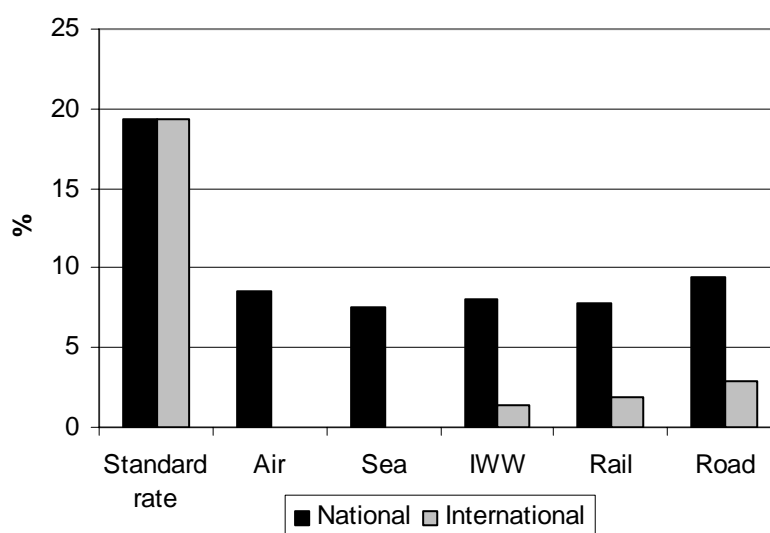
Fuel tax exemptions apply primarily in the aviation and maritime sectors, although this assumption depends critically on what methodology is used to define the level of subsidy. Certainly road fuels bear by far the highest levels of tax, and by many standards are judged to cover their externalities on average. The exemptions on aviation and shipping fuels are particularly damaging as they relate directly to the amount of carbon dioxide emitted. There are also other associated environmental impacts: shipping fuels are by far the ‘dirtiest’ of transport fuels on average, while aviation fuel burn results in other emissions that lead to additional global warming impacts significantly greater than those of the CO₂ itself. The absence of taxation of these externalities leads to greater consumption of these fuels than would otherwise be the case, and they are arguably the highest priorities for removal.

Tax exemptions for the aviation and maritime sectors arise in part from international agreements not to tax international transport services. This is an obstacle but not an insurmountable one. Also, they do not in fact completely preclude action. For example, it is quite legal to tax fuel on domestic trips, and possibly also on flights between two countries that agree to do so.

Similar comments can be applied to **exemption from VAT**, which applies not only to fuel used, but also to other aspects of value added, and hence encourages greater use of such services. In some countries the hidden subsidy of VAT is accentuated because the operators are zero-rated, which means that not only do they not have to charge VAT on their value added, but can at the same time reclaim the VAT that has already been paid on their own inputs.

Subsidies related to *exemption from VAT* on passenger services can be calculated (EEA, 2007) as the difference between VAT rates for domestic and international passenger transport services. For instance, the air travel is completely exempt from VAT on international flights, and it therefore receives off-budget subsidies worth about €18 billion annually. VAT exemptions generate over € 8 billion subsidies for the road sector and over €2 billion for rail. VAT applies only to a very small portion of shipping. It should be noted that here is a great variability among Member States as well. The results are shown below:

Figure 11: Average VAT rates passenger transport in EU-25



Source: EEA, 2007

3.4 Quantifying subsidies in other sectors

According to data held by the OECD, the bulk of the support provided in OECD countries goes to the **agriculture** sector. The OECD calculates on an annual basis the total producer support estimate (PSE), which measures the annual monetary value of gross transfers from consumers and taxpayers to support agricultural producers, measured at the farm-gate level. In 2002, the total support estimate for agriculture amounted to USD 318 billion (about €243 billion³⁹), which represents about 1.2% of GDP in OECD countries.

³⁹ Exchange rate 5 March 2007: 1 USD = 0.763198 EUR

Of that total, USD 235 billion (about € 180 billion⁴⁰) goes to producers (OECD 2005). In 2002, €106 billion were paid in the EU 15 (OECD, 2003b). Market price support, output payments and input subsidies, which accounted for 76% of the total support to the sector in OECD countries, are considered the most harmful forms of subsidies for the environment.

Quite smaller are the estimates for State aid in the agriculture sector in the EU⁴¹, where the total amount of State aid awarded to the agricultural sector by the EU-25 in 2004 was estimated at just over €14 billion: France (€2.3 billion), Germany (€2 billion) and Italy (€1.1 billion) reported the highest figures. The data are based on a new annual reporting exercise introduced for the first time in 2004 (EC, 2006).

Table 9: Quantification of subsidies using OECD definitions in Million € (latest data available)

Member State	Agriculture			Fisheries	Shipbuilding		Steel Industry	
	2000	2001	2002	1999	1999	2000	1999	2000
AT Austria	:	:	:	:	:	:	2,9	1,8
CZ Czech Rep.	599	984	1.152	:	:	:	:	:
DE Germany	:	:	:	52,2	33,4	35,3	:	:
DK Denmark	:	:	:	26,5	81,7	53,8	:	:
EL Greece	:	:	:	34,3	:	:	:	:
ES Spain	:	:	:	208,1	:	:	25,0	:
FI Finland	:	:	:	20,3	17,3	42,1	:	:
FR France	:	:	:	56,1	126,6	155,7	:	:
HU Hungary	1.134	1.127	1.645	:	:	:	:	:
IE Ireland	:	:	:	89,6	:	:	:	:
IT Italy	:	:	:	113,0	167,7	142,6	:	:
NL Netherlands	:	:	:	21,0	24,9	73,5	:	:
PL Poland	2.014	2.165	2.087	:	0,4	0,7	:	:
PT Portugal	:	:	:	21,0	:	:	0,2	0,9
SE Sweden	:	:	:	21,0	:	:	:	:
UK United Kingdom	:	:	:	59,2	4,9	5,0	:	:
EU 15	96.146	97.963	106.689	:	:	:	:	:

Sources: Agriculture, OECD (2003b); Fisheries, Cox (2002); Shipbuilding and Steel, Lee 2002.

Although OECD work highlights agriculture as the sector with the largest support in absolute terms, it is likely that support for the other sectors is underestimated. In addition, the sectoral coverage is very patchy (see Table 9) with little or no subsidy data available for large parts of the energy and manufacturing sectors and for other environmentally significant sectors such as mining and forestry.

⁴⁰ Exchange rate 5 March 2007: 1 USD = 0.763198 EUR

⁴¹ State aid consist of: On-farm investment measures (11%); Processing & market investments (7%); Producer group start up (3%); Technical support (21%); Crisis management (29%); Research & development (5%); Promotion & advertising (6%); Other (18%).

Financial transfers to **fisheries** appear very small in comparison to the agriculture sector amounting at around USD 6 billion a year (approximately €4.5 billion³⁵) (OECD, 2005). The measure adopted is the GFT (governmental financial transfers), which includes three categories: direct payments; cost-reducing transfers; and general services. There are no aggregate data for the EU using the GFT, however there are some estimates for individual Member States (see Table 9). The highest subsidies among Member States are from Spain, which in 1999 granted €208 million to the fishing industry; Italy is the second highest, €113 million; Ireland grants €89 and the UK €59 million (Cox, 2002). For this sector, no comprehensive or detailed assessment has been undertaken of what constitutes an environmentally harmful subsidy.

The total amount of awarded under the State aid regulations to the fisheries sector by the EU-25 Member States was estimated at around €500 million of which Italy and the United Kingdom each accounted for €120 million and Spain €100 million (EC, 2006).

Data on support to the **manufacturing** sector are very dated, with the last available figures being an estimate of USD 44 billion in 1993 (about € 33.5 billion³⁹) (OECD, 2005). In the EU 25, State aid to the overall manufacturing sector amounted to €36.3 billion in 2004, corresponding to 59% of total State aid (EC, 2006), this includes the steel and shipbuilding sectors.⁴² More recent OECD data are available for the shipbuilding and steel sectors.

For those countries that made available their data, the OECD (2005) has calculated grants and subsidies to **shipbuilding** for the cumulative value of USD 2.6 billion (about €2 billion³⁹) in the period 1998 - 2000. Within the EU, Table 9 shows a wide range in the amounts provided by reporting countries to their shipbuilding sector (Lee 2002). These range from Sweden which reported no support measures whatsoever, to Italy which provided €142 million in 2000 (Lee 2002) and US 973 million in the period 1998 – 2002 (OECD, 2005).

According to EU State aid Scoreboard estimates, the amount of State aid awarded to the shipbuilding sector fell from an annual average of €1,1 billion for the period 2000-2002 to €688 million for the period 2002-2004. In 2004, an estimated €540 million was granted to the EU-25 shipbuilding sector mainly by Germany (27% of the EU total), Italy (24%) and Poland (22%) (EC, 2006).

State aid to steel has decreased dramatically in the last years in the EU-15 from an annual average of around €2 billion in the mid-nineties to €58 million in 1998, after which it has remained relatively stable. A total of €12 million was awarded in 2004 almost exclusively for environmental purposes (EC, 2006). Of the new Member States, the Czech Republic (€177 million in 2003), Slovakia (€74 million) and Poland (€500 million in 2003 though none in 2004) continue to award significant amounts of aid (EC, 2006).

⁴² For the purposes of the Scoreboard, the manufacturing sector includes aid for steel, shipbuilding, other manufacturing sectors, aid for general economic development and aid for horizontal objectives including research and development, SMEs, environment, energy saving, employment and training for which the specific sector is not always known. As a result, data on aid to manufacturing may be overestimated. It includes, Grants Tax 48.1%; Exemptions 48.1%; Equity participations 1.3%; Soft loans 5%; Tax deferrals 3.1%; Guarantees 10.2% (EC, 2005).

There are only anecdotal estimates on subsidies in the **water** sector. Water subsidies in the OECD countries are estimated to be around USD 10 billion (about € 7.6 billion³⁹) (Myers and Kent, 1998, 2001, in OECD 2005). Irrigation subsidies are included in the figures for agricultural subsidies gathered by the OECD under PSE definition, although the information on these is often patchy and data gaps remain.

3.5 Summary

The quantification of subsidies is not straight forward. Notwithstanding the lack of an agreed definition of what a subsidy entails, there have been few systematic attempts to quantify subsidies across sectors and countries. Where attempts have been made, e.g. for the purposes of national accounts, these tend to focus on on-budget subsidies and, therefore, result in an under-estimation of the total value of the subsidies that exist.

An attempt at the national level has been made by Meyer (2004) using the broad definition of energy subsidies given and adopted by international institutions (OECD, IEA and UNEP). This has been done for the purpose of contrasting these estimates with the National Subsidy Report. The estimates by Meyer include indirect subsidisation (e.g. deductibility of cost of commuting), tax exemptions, subsidies by regulations and external costs. Compared to the €9.3 billion accounted for in the National Subsidy Report, Meyer estimates €130.2 billion of subsidies granted to the energy sector as subsidy by regulation (€7.4 billion), externalities (€90 billion), tax exemptions (€30.3 billion) and financial transfers not accounted for (€5.7 billion).

The above estimates for Germany demonstrate how on the basis of different definitions and their different levels of inclusiveness, amounts can vary widely. For example, in relation to energy subsidies, a report from the EEA (2004) estimated that these amounted to around €29.1 billion for the EU-15 in 2001. This included direct support, as well as support for investment and research and development and tax exemptions. The EEA included off-budget subsidies but did not include externalities. Nevertheless, it appears reasonable to assume that the level of subsidies in the EU energy sector is high.

Other examples of quantification of subsidies include those carried out by the authors regarding VAT reduced rates for household in the EU amounting to €7.3 billion, with €5 billion for electricity, €2 billion for natural gas, €114.1 million for fuel oil and €65.6 million for solid fuels (based on Eurostat, OECD data, 2004).

Furthermore, estimation of transport subsidies often fails to capture the cost of externalities, and therefore the full scale of subsidies. Data suggest that transport subsidies amount to roughly 225 to 300 billion USD worldwide (about € 179-230 billion³⁵). Of these, about 110 to 150 billion USD per year (€130-275 billion³⁵) are considered to be ‘perverse subsidies’ (i.e. subsidies that are harmful to the environment and to the economy (EEA 2005b and Kjellingbro and Skotte (2005)⁴³). A good approximation of the value of transport subsidies in the EU has been calculated by a recent study for the EEA (EEA, 2007). Transport subsidies, including infrastructure, on budget and off-budget subsidies, amounted to approximately €240 billion in the EU 15 in

⁴³ The authors recognise that this is a very rough estimate (‘guesstimate’).

2005. The figure is extremely large compared to direct energy subsidies, although it should be considered that the cost of infrastructures is obviously high and accounts for more than 65% of the total value of transport subsidies. Note that transport subsidies are also an indirect subsidy for transport fuels, and hence energy.

For the agriculture sector OECD estimates for the EU 15 account for €106 billion (2002), while State aid Scoreboards estimates for the EU 25 account just for €14 billion (2004). These are based again on different definitions of subsidies. For fisheries, there is no comprehensive data gathered by the OECD, while EU25 State aid Scoreboard accounts for €500 million.

Data on support to the **manufacturing** sector are very dated, with the last available figures being an estimate of USD 44 billion (approximately € 7.6 billion³⁵) in 1993 (OECD, 2005). In the EU 25, State aid to the overall manufacturing sector amounted to €36,3 billion in 2004, corresponding to 59% of total State aid (EC, 2006), this includes the steel and shipbuilding sectors, which are energy intensive industries driven by subsidy to huge overcapacity issues.

There are only anecdotal estimates on subsidies in the **water** sector. Water subsidies in the OECD countries are estimated to be around USD 10 billion (about € 33.6 billion³⁵) (Myers and Kent, 1998, 2001, in OECD 2005). Irrigation subsidies are included in the figures for agricultural subsidies gathered by the OECD under the PSE definition. While there is no documented estimate, it is clear that for water supply/waste water services, the level of subsidies have historically been very significant, especially in light of a lack of full cost recovery. The Czech Republic was not atypical in its *de facto* free water supply. Now the average per capita expenditure on water and wastewater is around 25 EUR/year. Applying this across the 100 million people in the new Member States alone, the authors estimate that this represents a historical subsidy of approximately €2.5 billion per year.

Environmental considerations are noted qualitatively throughout the Chapter. Whereas we have discussed in the previous Chapter that subsidies often lead to market distortions, which in turn lead to inefficiencies, it is not easy to quantify these, given that systems of accounts are so patchy and not consistent. It is therefore difficult to quantify subsidies in themselves, even before trying to make an assessment of the value of their environmental harmfulness. Moreover, whereas estimates on externalities have been attempted, these are controversial, given the subjective assumptions on the baseline for calculations. It is therefore more than welcome and necessary the work done by the OECD, which is trying to develop a common framework for countries to fill in, in order to have comparable, transparent and consistent estimates of subsidies level. Being this the necessary step for public opinion engagement and successful reform processes.

4 CASE STUDIES OF REFORM IN THE ENERGY SECTOR

This Chapter sets out a series of case studies on the reform of environmentally harmful subsidies in the energy sector. This section will give more insight on the drivers of reform, the obstacles and the lessons to be learned by success or failure stories, and many cases drawing examples from several different countries. The main case studies in this Chapter focus on:

- Reduced VAT rates on energy products in the household sector
- Ecotax exemptions for energy intensive industry
- Reform of subsidies to hard coal mining

Chapter 7 further develops the issues examined in detail here with a discussion on the benefits of reform developing guidelines for the reform of environmentally harmful subsidies, while Chapter 8 extracts lessons for reform, building partially on the case studies below and on the results of OECD analysis of case studies. Finally, Chapter 9 analyses the arguments of those that oppose reform in the light of the case studies.

4.1 Reduced VAT rates for energy products in households⁴⁴

4.1.1 Background and Introduction

Several EU Member States apply reduced VAT rates to energy products such as coal, heating oil, natural gas and electricity. Such schemes imply a subsidy to the final users of these products, as they effectively lower the price of energy (assuming that the energy supplier does not have the market power to prevent this).⁴⁵

Generally, low VAT on energy has been motivated by social considerations, just like the usual low VAT on other 'basic needs' such as food.

A number of EU countries have abolished VAT reduction for energy products in the past, for various reasons. The Table below provides an overview of VAT reduction schemes for energy products that have been removed and others that still exist.

⁴⁴ This builds on the IVM case study contributions.

⁴⁵ The case study contained in this report focuses on energy use by households. For companies (to the extent that they are VAT-registered) the VAT rate on the energy they use is irrelevant, as they can deduct any VAT paid on their inputs from the VAT due on their sales.

Table 10: Reduced VAT rates for energy products in EU Member States – past and present (households only)

Schemes that have been removed					
Member State	Reduced rate applied to:				Year of removal / remarks
	Coal	Fuel Oil	Natural Gas	Electricity	
Austria	X	x	x	x	1983
Belgium		x	x	x	1980-1983. A slightly reduced 'parking rate' (17 instead of 19%) continued to exist until 1992.
Czech Republic	X	x	x	x	1994-1997
Greece	X	x	x		1992. For natural gas, the reduced rate was re-introduced in 1998.
Hungary		x	x	x	2003-2005
Italy		x	x		1984-1988. Reduced rate for natural gas for cooking and water heating continues to apply to southern Italy.
Poland	X	x	x	x	1998
Portugal		x			1996. Reduced rate was re-introduced in 2001.
Slovakia	X	x	x	x	2003
Schemes that continue to exist					
Member State	Reduced rate applied to:				Remarks
	Coal	Fuel Oil	Natural Gas	Electricity	
Belgium	x				
Cyprus			x		
Estonia	x				
France			x	x	Only on standing charge
Greece			x	x	
Hungary	x				Allowed until end of 2007
Ireland	x	x	x	x	'Parking rate' (13.5%)
Italy	x		x	x	Natural gas: only for cooking and water heating in southern Italy
Luxembourg	x	x	x	x	Coal and fuel oil: 'parking rate' (12%)
Malta				x	
Portugal		x	x	x	
United Kingdom	x	x	x	x	

Source: OECD: Energy Prices and Taxes (various issues); European Commission (2006); Speck et al. (2001); Cnossen (1998).

The authors estimated the subsidies due to VAT reduced rates for EU households to be amounting to €7.3 billion, so distributed: €65.6 billion for solid fuels, €114.1 billion for fuel oil, €2130.7 billion for natural gas and €5008.7 billion for electricity (estimates based on Eurostat and OECD data, 2004). For the estimation of each Member State contribution see Table 4, in Chapter 3.

4.1.2 Structured analysis of reform of VAT rates for energy products in households in Poland

Country study Poland

Sector	Energy consumption in households
Nature of subsidy	VAT was introduced in Poland on 5 July 1993, replacing a system of sales taxes and bringing Poland in to line with future EU requirements. The basic rate of VAT was set at 22%. However, a reduced VAT rate (7% instead of 22%) for energy products was included at the initiative of the Parliament.
Nature and scale of environmental problem caused	Domestic energy use in Poland is relatively pollution-intensive. For example, the share of solid fuels (mainly hard coal) in final energy use by households and the services sector is still 20%, even though it is decreasing. Moreover, most heating and power plants are still fuelled by hard coal.
Original rationale of subsidy	In its initial proposals for the introduction of VAT in Poland, the government had not provided for a reduced rate on energy. However, the reduced rates were included in the law by Parliament, in response to growing public concern about rising energy prices.
Was the rationale still valid?	<p>The original rationale was determined by social considerations. However, an interesting finding by Freund and Wallich (1997), demonstrated that poor households in Poland benefited much less from energy subsidies than the richer ones. This is because, not only did the richer ones use more energy in absolute terms, but also in relative terms (in other words, the demand for energy has an income elasticity of more than 1). The poorest 20% of the population spent 7.4% of their total expenditures on energy, and the richest 40% more than 10%.</p> <p>This case study demonstrates that the original objectives of the energy subsidies (protecting poor households) were achieved by general income growth as well as by specific compensatory measures.</p>
Year of reform	1996-1998
Detail of reform	Government proposals to increase the reduced VAT rate for electricity already to the standard level of 22% in 1995 were shelved at the end of 1994, as part of a package of measures to curb inflation. In June 1995, the Finance Ministry presented a new proposal, in which the 22% would be reached by

1998, with intermediate rates of 12% in 1996 and 17% in 1997. In the end, the VAT increase took place as scheduled, in three stages, reaching the 22% level in 1998.

- Main driver of reform** There was no analysis of the economic or environmental impacts of the subsidy. The main drivers of Poland's decision to move energy from the reduced to the standard VAT rate category and to relax energy price controls were economic and budgetary ones, reinforced by external actors eg the IMF. Also, at the time of VAT introduction, energy consumption in Poland was still heavily subsidized through price controls. The Ministry of Finance pursued a policy aimed at reducing these subsidies. In addition to its own budget concerns, this policy was needed to comply with conditions imposed by external financial institutions such as the IMF and the World Bank (the latter having invested in Poland's natural gas industry on the condition that gas prices would reach Western European levels by 1996). Internally, apart from the Finance Ministry there were no major Polish stakeholders supporting the reform.
- Obstacles to reform** Given the existence of price controls, the energy producers and suppliers were not much in favour of VAT rate increases, as these implied lower net sales price increases for them. They urgently needed additional revenues to be able to invest in refurbishment and modernisation of outdated plants and infrastructure. In addition, the power companies were confronted with pressure from the powerful mining sector to pay higher coal prices. However, by 1998, some liberalisation of energy prices took place, enabling energy suppliers to have their revenues at least keeping pace with inflation, despite the VAT increase.
- The opponents did not focus on the VAT on energy, but protested against higher prices for energy (and other basic needs) in general. Protests and strikes against higher energy prices, and against consumer price increases in general, were widespread in Poland during the 1990s. Nevertheless, the trade unions did not object against the raises in VAT as such, but they sought for compensation of the energy price increases. The Polish government tried to appease them with the reassurance that excessive price hikes would not be allowed.
- Was there any compensatory measure?** To appease protesters, some compensatory measures were taken for those poor families and pensioners that were hit hardest by the higher energy prices. These measures included direct allowances as well as cheap credit from the National Housing Fund to finance the modernisation of local heating sources. The amounts budgeted for direct compensation payments were generally modest (in 1998: PLN 70 million or € 17 million from the budget of the Ministry of Labour) and pertained only to 1% of all households.
- Was the reform achieved?** In the end, the VAT increase took place as scheduled, in three stages, reaching the 22% level in 1998.

Impact of reform	Compared to other factors influencing end user energy prices, the role of removing reduced VAT rates has been relatively small. For example, in 1992 the price paid by Polish consumers for natural gas was 89% of the OECD Europe average (expressed in purchasing power parities), whereas in 2000 this had increased to 146%. During the period of reform, however, the increase was relatively modest (from 110 to 122%). Similarly, the electricity price for Polish households increased from 85% of the OECD- Europe average in 1992 to 136% in 2004, whereas the increase in the period 1996-1998 was relatively small: from 100 to 104%.
Factors influencing success / failure of reform	A favourable circumstance for the VAT and energy price reform was the fact that inflation in Poland was falling continuously. During the 1990s, every single year showed a lower increase of the consumer price index than the previous one (from 586% in 1990 to 7% in 1999). Moreover, real disposable household income showed a remarkable growth. As a result, the share of expenditure on energy in household consumption did not increase over the 1990s despite the real energy price increases. This share amounted to 6.7% in 1991 (Pałaszewska-Reindl, 1998) and to 9.5% in 1993 (Freund and Wallich, 1997). In 2005, it was estimated at 7.2% (Fankhauser and Tepic, 2005).
Lessons learned	Apparently, market fluctuations and the relaxation of price controls have been more important determinants of consumer prices for energy than VAT rates. Even if the case study present some specific features (see below), it clearly shows that such a reform can be realised quite smoothly, even in a country where household income is much lower than in most EU member states, and with limited need for compensatory payments. Obviously, a period of favourable economic conditions during which real incomes are increasing is the best time for such an operation. However, another example, that of the Czech Republic, shows that it can even be done in times of economic hardship. In that country, VAT on energy rose from 5 to 22% in 1998, in the midst of a recession (Czech GDP grew by 0.3% in 1997 and shrunk by 2.3% in 1998).
Is the reform transferable?	The Polish case has some unique features that would limit its applicability to other countries seeking to do away with reduced VAT rates on energy.
Sources of information	See references.

4.1.3 Additional considerations

On the validity of the initial rationale:

- Generally, reduced VAT rates find their initial rationale in social considerations and in response to growing public concern about rising energy prices. However, this case study demonstrates that the initial rationale does not necessarily justify the subsidy, also it shows that poor households are not going to benefit as much as rich ones from this measure.

- The original objectives of energy subsidies (protecting poor households) can be achieved by general income growth as well as by specific compensatory measures. Apparently, market fluctuations and the relaxation of price controls have been more important determinants of consumer prices for energy than VAT rates. Rather, compared to other factors influencing end user energy prices, the role of removing reduced VAT rates has been relatively small. For example, in 1992 the price paid by Polish consumers for natural gas was 89% of the OECD-Europe average (expressed in purchasing power parities), whereas in 2000 this had increased to 146%.

Overcoming interest groups obstacles

- Obstacles from interest groups can be overcome through compensation or other specific measure. For example, some liberalisation of energy prices (previously controlled) appeased energy producers and suppliers, who were not much in favour of VAT rate increases, as these implied lower net sales price increases for them. Also, some compensatory measures were taken for those poor families and pensioners that were hit hardest by the higher energy prices. These measures included direct allowances as well as cheap credit from the National Housing Fund to finance the modernisation of local heating sources.

4.1.4 Key lessons

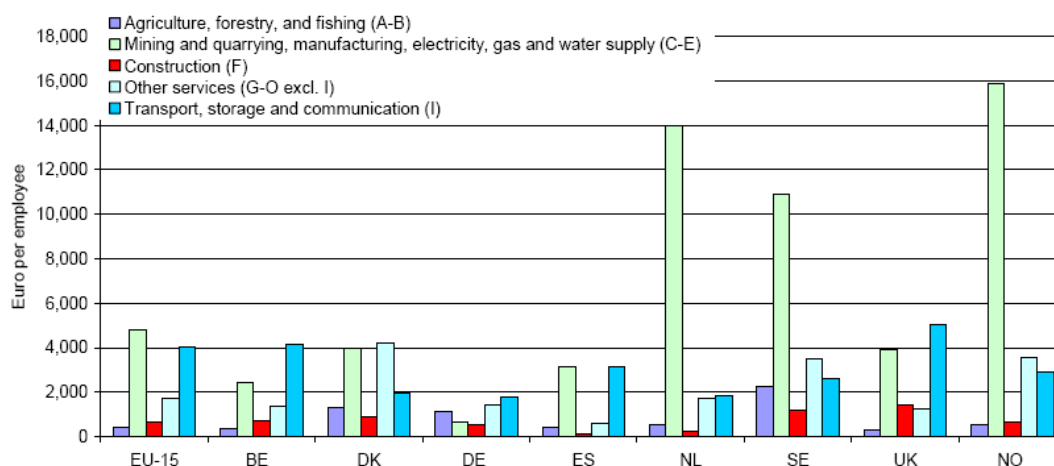
- The original rationale for the subsidy (to help poor households) was found not to be fully valid
- A powerful external rationale – the need to curb budget deficits – can have environmental benefits
- Change can be achieved in spite of a lack of public support if the need is strong enough
- Improving economic conditions ease the pain of such changes, but are not essential
- Compensatory measures are thought to have helped with acceptance of the measure, even though they were very small in relation to the potential scale of the economic impact

4.2 Ecotax exemptions for businesses

4.2.1 Background and introduction

- In the early 1990's, ecotaxes have been introduced in many countries, as a shift from conventional taxing goods or labour, to taxing 'environmental bads'. However many Member States have used the flexibility allowed by the energy taxation Directive(2003/96/EC – see 'Additional Considerations' to the case study), introducing exemptions to ecotaxes for energy intensive industries.
- Energy taxes vary quite substantially between sectors and among member States: each industry contributed from €5,000 to just €400 per employee on energy taxes. For the mining, quarrying, manufacturing and electricity, gas and water supply industries, for instance, the Netherlands, Sweden and Norway are far above the EU average. In Norway they pay from € 16,000 per employee and in Sweden € 11,000 per employee. In other countries, such as for Germany, Belgium and Spain in particular, there are lower than average taxes.

Figure 12: Energy taxes, Euro per employee, by industry (2003)



Source: reproduced from Eurostat, 2007.

Note: BE 2002, BG 2001, NO preliminary data 2001, DE include energy taxes for transport purposes only 1999. 2003 Final energy consumption is provisional for the EU-15, DE and ES. The statistics on final energy consumption group a range of NACE sectors.

Ecotaxes exemptions introduce a 'special regime' for an industry. There are arguments in favour and against setting special taxation treatments to industries. Some of the arguments presented in favour or against special regimes for energy intensive are listed below (Dias Soares, 2006).⁴⁶

The elements that are usually used to support especial regimes for energy intensive users can be summarised as it follows:

⁴⁶ Taken from Claudia Dias Soares' (Portuguese Catholic University) presentation to the Ad Hoc Working Group on Environmentally Harmful Subsidies (7 December 2006). We would like to thank for her valuable contribution.

- Mitigation of competitive disadvantages induced by the introduction of energy related taxes;
- feasibility of ecotax systems (ETRs) (e.g. as an option to mitigate disagreement from big players);
- the burden to improve national energy performance should be shared considering costs necessary to improve;
- *consequently*, taxes should be raised in accordance with energy efficiency levels and not mere absolute value of consumption;
- exemptions will be defensible as long as there is no space for improvement – taken with some caution and assessed globally, to avoid hindering the potential benefit of dynamic efficiency associated to energy taxes; and
- it might be acceptable based on the principles of proportionality.

On the other hand, there are other elements that should be raised against special regimes for energy intensive users:

- Exemptions and rebates create inefficiencies in pollution abatement. This is the most powerful argument here energy intensive sectors have the potential to intervene at low costs. Therefore exemptions can ‘lock in’ polluting technologies and paradoxically block low cost options. If bigger polluters are exempted from complying with environmental policy measures, it is estimated that costs in meeting an environmental goal can raise by 20%;
- the kind of tax proposal may fail to capture enough support to get through the legislative process, since they tend to raise equity issues;
- might undermine the application of the polluter pay principle (PPP), which non application shall be a means to reach its full application in the long term and not a permanent restriction;
- lack of harmonization has effects on EU competitiveness (e.g. several rates in different countries makes it more difficult to remove them); and
- more exemptions for fossil fuels use, leaves less space for renewables, delaying the level-playing field aimed at by the Environmental State Aid Guidelines and the several support measures for renewables in place at the Member States level.

Therefore, exemptions to ecotaxes should:

- Be justified by effective and relevant public interests - be necessary, adequate and proportional to those interests;
- be selective, transitory, applied within clearly defined periods and conditional to the adoption of some kind of effort by the beneficiaries to comply with the principles (efficient mitigation measures);
- only partially cover the costs caused by the polluter (i.e. tax reductions rather than tax exemptions); and
- be periodically reviewed and not unnecessarily prolonged (e.g., some have been kept for quite a long time; beyond the facts which have initially justified their assignment).

4.2.2 Structured analysis of reform of Ecotax exemptions for businesses in Germany⁴⁷

Country study	Germany
Sector	Energy; Certain industries (classified by sector ⁴⁸ rather than actual energy intensity)
Nature of subsidy	<p>This subsidy provides partial exemptions on ecotaxes (<i>fuel-excise duties and electricity tax</i>).</p> <p>The ecotax was implemented in 1999 and contained exemptions for certain industries, which required qualifying businesses to pay only 20% of the standard rate and also provided a tax cap—the so-called <i>Spitzenausgleich</i>—that further limited their overall ecotaxation. Ecological tax reform (ETR) was designed as a revenue-neutral reform that simultaneously increased energy taxes and lowered payroll taxes. The <i>Spitzenausgleich</i> is a mechanism in the law that allows certain firms, whose individual tax burden has increased due to ETR, to reclaim a portion of these increased payments back from the government.</p>
Nature and scale of environmental problem caused	These exemptions from the ecotax reduced economic incentives to conserve energy, thus leading to higher CO ₂ emissions and other energy-related pollution.
Original rationale of subsidy	These exemptions were granted for competitiveness reasons.
Economic impact	They are among the largest tax exemptions granted by the federal government, amounting to around €6 billion each year from 2003-2006 (electricity tax); € 4.8 billion (energy taxes on heating fuels) (BMU, 2006).
Was the rationale still valid?	The competitiveness argument in favour of ecotax exemptions is still considered valid, although industry's overall tax burden has been reduced significantly in recent years.
Year of reform	2003
Detail of reform	In 2003, the reduced ecotax rates for businesses were increased from 20 % to 60 % of the full rate and the tax-cap provision was also modified.

⁴⁷ This builds on the Ecologic case study contributions.

⁴⁸ Industry classification: *Produzierendes Gewerbe*, as well as enterprises in the agriculture and forestry sectors.

Under the initial tax-cap provision, enterprises whose ecotax payments are more than 1.2 times higher than their relief from social security contributions got the full excess payments reimbursed. Since the reform of the ecotax, only 95% of excess payments are reimbursed, but the reimbursement threshold was lowered to an amount equal to their social security contributions.

Main driver of reform	<p>The Green party appears to have been a major driving force for reform, together with environmental NGOs. Environmental NGOs have long been advocating a reform of ecotax exemptions and presented elaborated concepts on this matter (see also Highlights).</p> <p>Ongoing pressure from the European Commission on competition grounds is also important. The European Commission was a driver of reform, as ecotax exemptions are under scrutiny as State aid that is potentially distorting competition. The Commission generally allowed reduced industry ecotax rates to be continued until 2012, but approved the tax cap only under the condition that the German industry meets its voluntary commitment targets.⁴⁹ Current approval of the tax-cap provision is valid until the end of 2006.</p>
Obstacles to reform	<p>Concerns about competitiveness continue to be a popular argument against applying ecotaxes on industry. A related argument is the burden imposed on industry by the introduction of the Emissions Trading System. Also, increased energy prices have contributed to the perception that there is already a heavy burden on industry.</p> <p>Industry associations have been, and continue to be, proponents of the preservation of ecotax exemptions and even the complete abolition of ecotaxes.</p>
Was the reform achieved?	<p>Yes, although it has undergone recent setbacks.</p>
Impact of reform	<p>Increasing the industrial ecotax rates and modifying the tax cap increased the incentive to save energy. These changes were estimated to have led to an increase in ecotax revenue of around €380 million per year.</p> <p>In a 2005 study, modelling results by the German Institute for Economic Research (DIW), showed that reform of the ecotax would result in a slight reduction of CO₂ emissions by 0.04 % (or 350.000 tons) by 2010. DIW concluded that the reform did little to reconcile environmental and competitiveness objectives.</p>
Factors influencing success / failure of reform	<p><i>The reform has recently undergone setbacks:</i> the 2006 Energy Taxation Law created new exemptions, including the total exemption of certain energy-intensive processes from energy taxation.</p> <p>Also, in September 2006, Germany's Social Democratic Party, under whose leadership the ETR was introduced in 1999, tabled a draft legislation with the</p>

⁴⁹ Industry committed to CO₂ reductions to obtain ecotax exemptions. This refers to the agreement between the federal government and industry associations on global warming, complemented by the 2001 CHP agreement. The agreement provides for overall CO₂ reductions of "up to" 45 mill. t annual CO₂ emissions between 1998 and 2010; however, the agreement makes mandatory only 20 mill. t of CO₂ reduction. The degree of achievement of the objectives is being monitored, but no recent figures are available although a monitoring report had been announced for late 2005.

purpose of not only maintaining the tax cap after 2006, but reducing industry's energy tax burden to 1998 levels, which would severely undercut the ETR. The Green Party, which has always been the main proponent of ETR, criticised this approach for creating new exemptions and the failure to connect ETR and emissions trading in a sound manner.

Is the reform transferable ?

Ecotaxes and related exemption rules also exist in some other states. Even if transferability is limited, the case touches upon questions that are relevant for the whole EU. The reform of ETR exemptions to industry relates to the question of setting incentives for industry to reduce its energy consumption without harming its competitiveness. Another question – non resolved - is to find suitable ways to combine the economic instruments of energy taxation and emissions trading.

Lessons learned

The difficulties and setbacks of ecotax reform illustrate the difficulty of defending the general concept of environmental tax reform to the public and stakeholders. The difficulties of reforming ecotax are also related to the slow process of harmonising energy taxes in the EU, as well as worldwide differences in energy taxation, which provide the rationale for granting energy-tax exemptions to domestic industries.

Sources of information

See references.

4.2.3 Additional considerations

Is the original rationale of the subsidy valid? (Competitiveness concerns)

- The short time over which the reform took place, provides us with an insufficient time span and data to conclude what the impact of reform were is on energy use. The following Table provides energy statistics for Germany industry over two consecutive three-year periods, the first of which extends from the introduction of the ecotax (including the exemptions) (1999) to the year before the reform of ecotax exemptions (2002), and the second from 2002 to 2005. The trend is the opposite of what one would expect from removal of the exemptions (i.e. after 2002, energy consumption and intensity both climbed, whereas they had been dropping prior to this period). Given that many factors influence energy use in industry, it is not possible to quantify what the effects of exemption reform on energy use have been. However, if taxing energy consumption hampers competitiveness (supposedly forcing industry to consume less or pay more) then we would see this reflected in smaller energy consumption after the reform of ecotax exemptions. This is not happening here. Changes in energy consumption are more likely correlated to the increase in crude oil prices between May 2000 and 2001 (EEA, 2005).

Table 11: Energy consumption before and after exemptions reform

	Ecotax exemptions (1999-2002)	Ecotax exemptions lifting (2002-2005)
Change in total end-use energy consumption (%) *	-2,60	+5,94
Change in energy-intensity of production (%) **	-4,40	+0,76

* “Other mining and manufacturing sector”; relative to first year of each three year period

** Based on overall gross value added in the sector category of ‘*Produzierendes Gewerbe*’ (not adjusted to changes of price levels) and relative to first year of each three-year period.

State aid regimes in the Energy Taxation Directive

- The Directive on energy taxation (2003/96/EC) provided for a framework on the harmonization on minimum energy taxes in Member States. However, Art. 2/4 leaves out of the scope of the Directive some energy products among which electricity where this accounts for more than 50% of the cost of product intensive industries, without counterpart measures. Under Art. 17, energy intensive industries can be exempted by energy taxes if involved in environmentally friendly measures (e.g. through agreements or tradable permits schemes). However, it seems that Art. 2.4 could in fact nullify those requirements under Art. 17 that allow energy intensive industries to benefit from energy taxes exemptions, therefore making it easier to get tax exemptions. Both Art. 2.4 and Art. 17 leave under the discretion of Member States whether they decide to tax energy intensive industries or not. However, these allowances have to be in any case notified under the rules of the common market.

Budget impacts

- Ecotax exemptions are among the largest tax exemptions granted by the Federal government, amounting to around €6 billion each year from 2003-2006 (electricity tax); €4.8 billion (energy taxes on heating fuels) (BMU, 2006).

Subsidy design

- Also the German Ministry of Finance criticised tax reductions as they were very high and not well designed (EEB, 2004). The classification of companies on which the exemption is based did not insure that these were directed only at energy intensive industries and those included in the ETS (eg Art. 18 of Directive 2003/96/EC). Rather, the tax relief was given as long as a minimum consumption of 50 000 kWh per energy source was exceeded (from not more than two different energy sources). However, eligibility for tax relief is based on statistical categories (i.e. whether a company belongs to an economic sector that is entitled to the tax relief). This classification, however, does not take into account the energy intensities of companies, leading to the paradox that companies could be included in the tax exemption category even if not energy intensive at all (EEA, 2005). This factor contributed to make the ecotax system flawed, expensive and unpopular among many.

Bipartisan support for reform

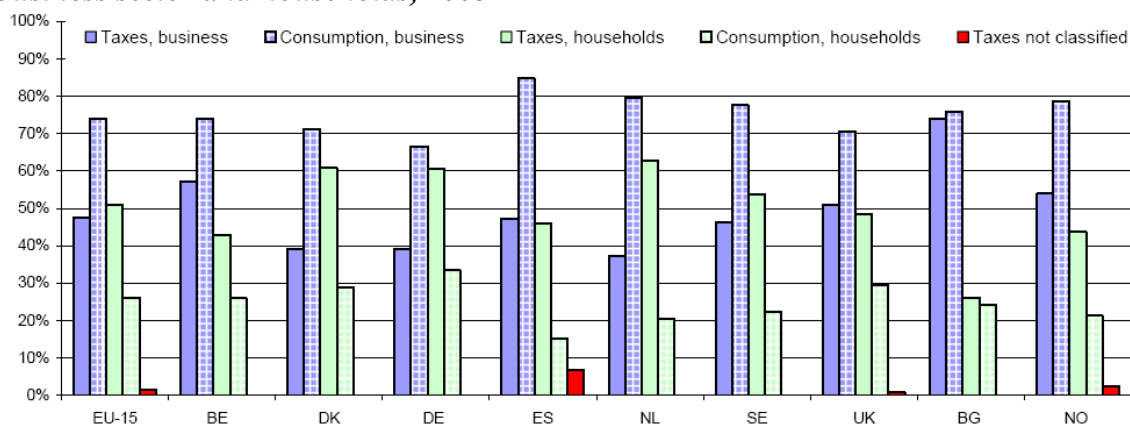
- As will be discussed further in Chapter 5 (Section 5.2.3), strong leadership on its own it is not a sufficient condition for the reform to happen, or, as this case shows, to endure. A broad coalition supporting the reform is preferable to avoid setbacks. In this case, the government that brought about ecotaxes in 1999 in Germany was represented by the SPD and the Green party. The reform reducing ecotax exemptions was drafted and implemented after the re-election of the red-green federal government coalition in autumn 2002; it is likely that the re-election gave momentum to reform plans that already existed earlier. Likewise, after the formation of the ‘grand coalition’ (which included the SPD, but not the Greens) in 2005, overall exemptions increased once again (Energy taxation law of August 2006 and law on biofuels quota, which also includes a re-consideration of ecotax exemptions, adopted in October 2006). Most likely, these exemptions probably would not have been adopted in this form had the Green party still been part of the government.

A consideration on distributional issues: households vs. business energy taxes

- A question of transparency should be raised in relation to transport taxes. Indeed, it has been noted that a major factor in the push for reform of environmentally harmful subsidies is increased transparency. Transparency can stimulate voter opposition to subsidies and make subsidy reform less politically damaging for governments (OECD, 2005). A recent study by Eurostat found out that there are considerable distributional issues related to transport taxes.⁵⁰ In particular, it appears that there is a quite big discrepancy between levels of consumption and taxes paid by the business community and household. In the EU-15 households account for just over 50% of energy taxes paid but their final energy consumption account for just above 26% of total energy consumption.

⁵⁰ Transport taxes account for about 5% of total taxes and social contributions collected. Energy taxes are made up of for example excise duties on mineral oils, duties on electricity, coal tax and taxes on gas.

Figure 13: Share of total energy taxes and share of final energy consumption for business sector and households, 2003



Source: reproduced from Eurostat, 2007⁵¹

Note: BE 2002, BG 2001, NO preliminary data 2001, DE include energy taxes for transport purposes only 1999. 2003 Final energy consumption is provisional for the EU-15, DE and ES. The statistics on final energy consumption group a range of NACE sectors.

⁵¹ Eurostat (2007), Statistics in focus, Energy and the environment, 1/2007, Author: Nancy Steinbach.

4.3 Subsidies to hard coal mining

4.3.1 Background and introduction

State aid for coal production was banned starting from the 1952 European Coal and Steel Community (ECSC). From 1965 onwards, however, several Community legal instruments have allowed multiple exceptions to the general ban.

The original rationale for this support was based on the need to rationalise the coal industry in Europe, against increasing competition from less expensive imports, or less expensive alternatives (e.g. gas).

After the introduction of Council Regulation 2002/1047 on State aid to European coal producers (the Coal Regulation), direct state support to coal production was banned in the EU. The Coal Regulation is set to last until 2010. The Coal Regulation allows for exceptions to the ban of State aid to coal production. In particular:

- (i) Article 4 grants State aid for the reduction of activities. This grant cannot continue after December 2007 ;
- (ii) Article 5: allows for state grants to new production facilities (5.2), to cover part of the initial investment costs. This subsidy clearly distorts the market, especially with respect to alternative sources of energy (i.e. support for current production or accessing new reserves – *degressive*⁵² €16.3 billion – this is the most important as regards EHS; it has been increasing over the past few years)⁵³;
- (iii) Article 7 implicitly subsidises the industry, effectively covering additional exceptional costs, or inherited liabilities (this amounts to € 24.5 billion - equivalent to approximately € 8 billion annually). To the extent that state funds are used for the cleaning-up of formerly production or coal mining sites, for which an owner no longer exist, the subsidy may be considered under the heading of environmental protection.

It would seem not appropriate to extend these after the expiry of the regulation, with the years until 2010 used to restructure the industry. The Coal Regulation needs to be revised according to the principles of environmental sustainability.

Currently, eight of the 25 Member states of the European Union produce coal: besides Poland, Germany and Hungary, the list includes the UK, Spain, Czech Republic, Slovakia and Greece (lignite). France closed its last mine in 2004. Only countries intending to grant aid under Article 5 of the Coal Regulation need to notify restructuring plans to the European Commission. These restructuring plans contain a detailed planning for the period 2003 to 2010, and serve the Commission as a basis for approving the annual aid payments of the Member states. Poland, Germany, Hungary and Spain are now the only countries granting aid under Article 5 of the Coal Regulation.

⁵² Degressive or gradually decreasing in rate on sums below a certain amount.

⁵³ Data in this section is taken from presentation by Jonathan Green, Europe Economics, at the ad hoc meeting group on EHS (7 December 2006).

In June 2005, the EC has approved a coal package that authorises restructuring plans for the Polish, German and Hungarian coal industry until 2010 (MEMO/05/217 Date 22/06/2005), considering that the plans presented by the three governments are in line with European rules on State aid for the coal industry and are compatible with the proper functioning of the common market.

Subsidies to coal extraction or production have several impacts and distortions. First of all, they lead to overproduction of coal – and, in so far as energy is produced through fossil fuel burning, energy consumption. As such, GHGs emissions are increased. According to Michaelis (1996), the removal of subsidies to the coal industry in Europe and Japan would lead to a reduction of 10 to 50 million tonnes of CO₂. The OECD estimates that removing coal producers' grants and price supports could save 100 million tonnes of CO₂ per year by 2010 in OECD countries, and also reduce acid gas emissions.

Secondly, subsidies play a role in inhibiting changes in the industry. In the case of the UK, for instance, subsidies to the coal industry are thought to have slowed down the transition to renewable and low pollution energy sources, and of removing the incentives to develop technologies that lower the pollution content of the fuels in questions.

In 2002, Council Regulation 2002/1047 on State aid to European coal producers (the Coal Regulation) was introduced, which led to a decrease in subsidies for the coal industry. For instance, France ceased coal extraction in 2005. The UK has reduced its subsidies, both per ton of coal and in absolute terms. Germany has reduced its subsidies, but they are still very high both in absolute terms and per ton.

The case of Germany is often used by other countries as an argument to maintain subsidies to domestic coal industry. The restructuring of the UK coal sector is deemed an example of successful reform, which enabled the country to maintain a more or less competitive coal industry, even though at the cost of extensive mine closures (EC, 2002). Among new Member States, Poland has a very high extraction rate of hard coal combined with a complex system of export and restructuring subsidies. We therefore concentrate our analysis on these three countries through case studies.

4.3.2 Structured analysis of subsidies to hard coal mining industry reform in Germany⁵⁴, Poland and the UK

Country study	Germany - Federal Government and Federal State of North Rhine-Westphalia
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Sector	Hard coal mining industry
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Nature of subsidy	Direct subsidies from the German Federal Government and the Federal State of North Rhine-Westphalia to support <i>coal exports</i> (covering the difference between production cost and world market price) <i>and social adjustment support related to the closure of mines</i> .
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⁵⁴ This builds on the Ecologic case study contributions.

Nature and scale of environmental problem caused	<p>Regarding climate change effects, the negative impact of coal subsidies can be estimated against a hypothetical alternative use of the same amounts of money to support more climate-friendly energy carriers or a more rational use of energy. UBA (2003) analysed the effects of two such options: Shifting subsidies to heat production from renewable energies would reduce CO₂ emissions by nearly 50 million tons, (5.6% of CO₂ emissions); subsidising energy retrofits of buildings would save 6 million tons (0.7% of CO₂ emissions). CO₂ savings for a no-subsidies scenario have not been identified. In addition to climate change effects, the direct environmental consequences of coal mining, along with damages to buildings and infrastructure and their associated costs, also need to be taken into account. For one mining site, a citizens' initiative calculated that the necessity of pumping groundwater over a period of many years would use up more energy than the associated coal production could deliver.⁵⁵ A regional institute for economic research estimated that damages caused by mining activities amounted to several billion Euros.⁵⁶</p> <p>There are also important impacts on air pollution which are estimated as an externality by Externe (see Table 5).</p>
Original rationale of subsidy	<p>The official purpose is to secure an adequate contribution of German hard coal to electricity and heat production, as well as coke sales to the steel industry.</p> <p>In addition, subsidies are granted to support the closure of mines.</p>
Budget impact	<p>In 2005, €2.7 billion (equivalent to €75,000 per mining job) of coal subsidies were spent in Germany. Hard coal subsidies continue to lead the list of the biggest individual subsidies granted by the Federal Government, as well as those by the State of North Rhine-Westphalia. Coal mining subsidies made up 28.5% of the direct subsidies granted by the Federal Government in 2006.</p>
Was the rationale still valid?	<p>Decreasing price competitiveness has been the reason for the introduction of coal subsidies in Germany.</p> <p>While the security of energy supply remains a valid argument and its importance may even increase in the future (see below, obstacles to reform), coal subsidisation has become a heavy economic burden, which leads to the perception that the goal in this case does not justify the means. In addition, the climate change problem induces a pressure to substitute coal—both domestic or imported—with other energy sources.</p>
Year of reform	<p>1997; 2003; 2007</p>
Detail of reform	<p>One turning point in coal subsidisation was the decision of the German Constitutional Court in 1994 which declared the 'coal penny' — a surcharge on the electricity price introduced in 1974 to support domestic coal — as unconstitutional. This decision required the shift of the subsidy to the Budget. This led to a shift towards direct subsidisation from the state budget. In 1997,</p>

⁵⁵ UBA 2003 and <http://www.bergschaden-kohlebergbau.de/schwarz/Resolde.htm>

⁵⁶ Frondel, Kambeck and Schmidt 2006.

the “coal compromise” provided for a gradual reduction of these subsidies. The main stages of the reform process are the following:

- 1997 ‘Coal compromise’: Reduction of subsidies from €4.73 billion (1998) to €2.71 billion (2005);
- 2003 Follow-up decision: Further reduction in the period of 2006-2012; degression from €2.5 billion (2006) to €2.38 billion (2008);
- 2005 Coalition treaty: Intention to further reduce subsidies after 2008; no legal claim on further support after 2008.
- 2007 (January): Phase-out agreed by 2018, with revision procedure to take place in 2012

Main driver of reform	At the origin of reform was a legal decision. The German Constitutional Court in 1994 declared the “coal penny” unconstitutional, and required the shift the subsidy to the Budget. Other drivers were: European competition legislation; domestic budgetary and environmental considerations, and a new government in the federal state of North-Rhine Westphalia
Obstacles to reform	The principal obstacles were (and still are): particular interests, connected with electoral power; social stability considerations; desire to keep associated technological know-how alive. The main actors for preservation of subsidies are: Social democratic party, coal mining industry’s associations, and workers’ unions.
Was there any compensatory measure?	It is worth noting that a portion of the subsidies is specifically considered social adjustment support related to the closure of mines (see ‘Nature of subsidy’).
Was the reform achieved?	Subsidies have consistently been in decline. However, the phasing out subsidies has been incomplete. The long timeline agreed for a complete phase-out may have eased agreement and acceptance, but can be viewed critically from an economic and environmental perspectives. It is worth noting that, after months of negotiations, in January 2007 politicians and leaders from the German coal industry made a breakthrough. Government subsidies – not jobs - are to be cut drastically. Though no official deadline was set, 2018 was mentioned as the year the last payment would arrive. The situation, however, will be subject to re-evaluation in 2012, according to the wishes of the Social Democratic Party, the junior party in the ruling grand coalition of Christian and Social Democrats. Traditionally, the party has staunchly opposed cutting coal subsidies.
Impact of reform	The impacts of reform have been the following: <ul style="list-style-type: none"> • Number of mines was reduced: from 19 (1997) to 8 (2006); the closure of three additional mines until 2012 envisaged • Coal production declined from 46 million tons (1997) to 26 million tons (2005) • Number of employees reduced from 78,101 (1997) to 38,528 (2005). However, the decline in production and workplace numbers is also part of a long-term development caused by other factors, most importantly, the general

deterioration of economic conditions for German coal mining in relation to international competitors, which has had its effects despite the heavy subsidisation.

Since 1997 the share of hard coal in primary energy production, has significantly declined, not so much instead in primary energy consumption. This implies that domestic coal has mainly been replaced with imported coal. Here are some details from the statistics :

- Hard coal share in primary energy production in 1997 was 34%, in 2005 it declined to 19.9%. While this was associated with a general decline in domestic primary energy production (7% reduction between 1997 and 2005), the energy carriers whose share increased were in this period were: lignite (from 38.4% to 42.3%), hydro and wind power (from 1.9% to 4.5%) and “other energy carriers” (mainly fuel wood, peat, organic waste, and waste heat: from 6.2% to 12.2%).
- The share of imports in total use of primary energy from hard coal doubled from 30.2% in 1997 to 60.8% in 2005.
- The share of hard coal in total primary energy consumed decreased from 14.1% in 1997 to 12.9% in 2005. The share of mineral oil also decreased (from 39.4% to 35.9%), while the share of natural gas increased (from 20.7% to 23.3%), as well as the share of “other energy carriers” (from 1.7% to 3.3%). Other energy sources’ shares changed by each less than 1% in this period.
- Unsubsidised, German coal cannot compete on the world market. In early 2007, the market price for a ton of coal averaged about 60 Euro. In contrast, the extraction cost for a ton of German coal equals approximately 190 Euro per ton.⁵⁷

**Factors
influencing
success /
failure of
reform**

The European Commission, the German Federal Environment Ministry and environmental NGOs have been positive drivers for reform. Also, in support of reform, there is a widespread public awareness that coal subsidies run counter to economic sense.

However, against this is the debate on energy security of supply and on domestic production alternatives. The debate on hard coal subsidies in Germany focuses more on maintaining or abandoning domestic energy sources rather than on the share of hard coal in the energy mix. The debate on security of supply and on the availability of alternatives are also important. In the short to medium term, natural gas (currently ca. 80% imported) is seen as the main substitute for coal. The extension of energy production from (domestic) renewable sources has had a prominent role in the energy debate from the environmental side, but figures show that significant coal substitution by these energy sources cannot be expected in the short to medium term. Nuclear energy (uranium 100% imported), following the 2000 phase-out agreement, is clearly not regarded by the official government as a potential substitute to coal; however, a reconsideration of the nuclear option is not excluded in the event of future political changes. The obvious trade-off between nuclear phase-out and the reduction of CO₂ emissions can be turned

⁵⁷ Deutsche Welle. 2007. “Germany’s coal industry faces closure and job losses”. 22 January. <http://www.dw-world.de/dw/article/0,2144,2320970,00.html>

in two ways: 1) climate protection may be used as an argument for a nuclear revival, as in other countries; 2) currently, however, the argument is the other way round: because of the nuclear phase-out, Germany needs to maintain a high share of coal in power generation.

Is the reform transferable?	While circumstances are specific to the country and the sector, comparisons to other coal-producing states and, more generally, other support measures for “old” industries, could be made. Also, EU pressure on subsidies exerted on competition grounds might have environmentally beneficial side-effects also in other cases.
Lessons learned	A few key lessons can be extracted from the German experience with reform of coal subsidies: <ul style="list-style-type: none"> • Path dependency was created by the introduction of subsidies, especially when their purpose is to support non-competitive (old) industries for which there is no prospect to become competitive. • Strong links between particular interests and political parties makes it difficult to introduce reform. Conversely, shifts in political power (such as in North-Rhine Westphalia when the conservative-liberal government came into power in 2005 after decades of social-democrat rule) open up new opportunities • EU legislation and policies have a critical role and potential to help overcome domestic lock-in. • Public support for the sector has decreased over time, driven by tight budgets, the decreasing reliance on coal, the decreasing number of jobs involved and a growing public concern about the environment and climate change.
Sources of information	See references

Country study **Poland**

Sector	Hard coal mining industry
Nature of subsidy	The Polish coal mining sector before 1990 was state owned. Coal output was expanded irrespective of costs, and inefficient mines were heavily subsidized, with, in addition, a very high ratio of waste (about 24% of output) as well as heavy environmental damage. In contrast with the prevailing bias in the Western world of providing direct subsidies to coal producers, coal production was not run for a profit. Rather, local policies have kept coal prices below international levels, with perhaps even worse economic and environmental consequences. For example, it created an over-dependence on this single fuel, which was part of the rationale for the reorganisation of the sector.
Nature and	Hard coal mining, irrespective of applied coal extraction technologies, exerts

scale of environmental problem caused	<p>a negative impact upon the natural environment.</p> <p>The basic ecological problems of hard coal mining include: salinated waters, mining waste, reclamation of waste stock-piles and industrial lands, and mining damage to buildings, roads, farmlands, forest areas and hydro-technical conditions as well as underground infrastructure. These problems are even more serious in Poland since they affect a very densely populated and built-up area.</p> <p>Some data will help to visualise the problems associated with waste management in 1998: 47.5 Mt of waste were produced in total by the mines. More than 91% of the waste came from coal washing in coal preparation plants. About 3.6 Mt were stored in underground workings of the mines, while 12.2 Mt were stored at the surface. The remaining 31.6 Mt were economically utilised, that is 66% of the waste produced by the mines (Z. Smolec, 2004).</p> <p>Furthermore – and in more general terms – coal mining and coal burning contribute significantly to greenhouse gases emissions and air pollution. Coal mining has local negative environmental impacts – which include not only the visual eyesore of holes in the ground in the case of open-cut mines or of mine overburden, but also run-off and leaching from tailings and coal washeries can pollute rivers and lakes. And of significance internationally are the contributions to global warming from methane (CH₄) from the mine, which increase with mine depth. Coal mining contributed 13% of global methane emissions in the early 1990s (World Resources Institute, 1996). As it happens, many of the mines in Europe are now extremely deep, and are providing coal with relatively high sulphur content. Moreover, once pit mines are exhausted, problems continue. During normal working of a mine, water is pumped out virtually as soon as it enters, which prevents it being contaminated by soluble minerals; but if that pumping is not continued after the mine closes, unpumped water gradually builds up and eventually contaminates groundwater (Steenblik and Coroyannakis, 1995).</p>
Original rationale of subsidy	<p>In contrast with other countries, where coal mining in its traditional form was subject to modernisation since the early 70s, the Polish Government, the only owner of coal mines, took an entrenched approach until the early 90s. Coal mines were owned by the State, and the need to keep employment high, and the costs of coal low, provided the basic rationale for government aid to the sector – both direct to state-owned enterprises, and indirect through reduced market price and import barriers.</p> <p>The political and economic earthquake in 1989 led to the necessity to restructure the mining sector, which was by then too obsolete and inefficient when compared to other countries.</p>
Budget impact	<p>Up to 2001, the mining industry absorbed about €3.3 billion in direct subsidies alone. For the years 2004 to 2006 Poland had planned to spend €1.4 billion in restructuring the coal industry; for the years 2007-2010, Poland plans to reduce financial supports to coal industry to about €36 million.</p>
Was the rationale still valid?	<p>As the result of many unfavourable factors such as excessive production potential, over-employment at the mines, reduced coal demand and prices, the majority of coal mines became unprofitable and the hard coal mining</p>

industry as a whole generated losses from 1990 onwards. In 1990, the inherited production capacity reaching 180 Mt per annum, a visible drop in coal demand had taken place in the home market, reducing sales to about 100 Mt in 1994. At the same time, prices for coal in domestic and foreign markets maintained a decreasing trend.

Furthermore, the transition to a market economy and the subsequent privatisation of state-owned enterprises remove some of the rationale underlying state subsidies.

Year of reform

1990 – ongoing

Detail of reform

In 1990, the government abolished centralised planning and established 70 individual coal mines as independent enterprises with the right to market their output independently, both domestically and abroad. This system did not work, as there was large overcapacity due to stiff competition and falling prices. This threatened the financial viability of the enterprises. The current system groups the remaining 54 mines into seven joint stock companies owned by the State Treasury. These seven companies are independent enterprises. It is likely that the structure will change shortly. One liquidation company is to be established and take over all mines that will be closed from the other companies. It is possible that the remaining viable mines will be grouped into two enterprises to be privatised in full.

Subsidies reform - a chronology:

1990-1993: Attempt to adapt to free market economy. Subsidies from the national budget remained high. Extraction was markedly reduced as a consequence of lower demand. The subsidies, however, were taking their toll on the finances of the state.

1993-1996: Adoption of the 'Hard coal mining restructuring in Poland', which provided for the closure of a number of unprofitable mines, the adaptation of extraction levels to the ever-falling domestic demand, a strong emphasis on environmental protection, and improved working efficiency. In 1995, however, execution of the programme was halted.

1996-1997: Adoption of a new restructuring programme *Hard coal mining. State and sector policy for the years 1996-2000. A programme for adapting hard coal mining to market economy conditions and to international competition* by the ruling coalition (Democratic Left Alliance (SLD) and Polish People's Party (*Polskie Stronnictwo Ludowe* (PSL))). This programme adopted a conservative stance, providing for substantial social cover for the sector's employees (an avoidance of collective redundancies included), technical modernisation (paid for largely by the state), financial restructuring (through debt forgiveness), and export incentives. As implementation of this programme proceeded, extraction fell and employment levels were reduced, also, the industry's debts continued to rise

1998-2002: Adoption of *Hard coal mining reform in Poland for 1998-*

2002 by the conservative government of the time of Electoral Action Solidarity (*Akcja Wyborcza Solidarność*, AWS) and the Freedom Union (*Unia Wolności*, UW). This new programme envisaged a determined reduction of employment, the liquidation of consistently unprofitable mines, and the privatisation of those which turned a profit or at least presented perspectives of doing so in the future. A generous ‘social package’ for miners leaving work in the industry was provided for. The original premises of this programme underwent adjustment in late 1999. In the space of three years, this reform programme consumed more than PLN 6 billion.

2002-present: Adoption of a new programme by the SLD, *Reform of hard coal mining in Poland in 2003-6*. This provided for radical organisational changes, with the existing coal companies to be replaced by three extraction holding groups. Other programme premises included: continued employment reductions; writing off some of the industry’s massive debt; a freeze on remuneration until the programme’s conclusion; privatisation of the more profitable mines and closure of the loss-making ones; and the introduction of a six-day working week. The key components of this programme met with strong criticism from the trade unions in the mining industry. (see obstacles to reform)

Main driver of reform

Reform of the Polish coal mining sector was wanted by the Government, with however the broad agreement of unions and the companies’ management, in order to transit the coal mining sector to privatisation. A key objective of the Government's announced restructuring was to liberalise coal prices so that they are determined by market forces.⁵⁸

The progress of structural changes in mining is also being influenced by external pressures, such as the need for Poland to adapt to EU rules. The expiry in 2002 of the European Coal and Steel Community Treaty marked the symbolic end of the 'coal era' in the EU. From Poland’s accession to the EU in 2004, its collieries no longer benefit from the current protection of the domestic market against imports, as EU anti-dumping and anti-subsidy instruments will become binding.

Obstacles to reform

It is claimed that all the actors representing the mining industry – miners, their unions and the governing bodies of various mining entities – assiduously seek patronage at various levels of the state administration and among political parties and politicians, in the hope that they can secure more favourable restructuring terms, higher subsidies, debt relief etc in return for political support or guarantees of social peace.

Clientelism prevailing between the mining industry and political power has been seen as a major obstacle to reform. The Polish coal mining industry is

⁵⁸ Currently, coal prices are partly controlled but mines negotiate sales independently. Following restructuring in 1990, the government calculated the price of coal through a complex formula. The formula is based on a reference price, adding to or subtracting from it depending on the quality of coal mined. In 1991, the prices set by the government were not obligatory and price changes have been, in principle, at the discretion of the company. Most companies, however, continue to use the formula system for contracted sales. Due to a huge oversupply spot market, prices for coal in Poland have dropped substantially and are well below world prices and costs of production.

characterised by relatively strong unions: there are 13 active unions, and both large and small ones play an active role in influencing government policies. The lobbying power of unions is also enhanced by their connections with political groups, a result of Poland's political history. Authors of all restructuring programmes have had no choice but take into account the opinions of the mining unions. In Poland, there is also a strong tie between workers and employees in the industry: when faced with imminent restructuring programmes, they have put up a united front against the government. Mining remains the most important source of income in regions like Silesia, and the social costs of restructuring the sector have been considerable – and remain high.

In 2002, the overwhelming majority of the people opposed the proposed changes. After complex negotiations, a compromise agreement was reached among the government, trade union representatives and employers organisations on 11 December 2002. (see compensatory measures).

In 2003, however, the reform plans of the Polish government encountered again the opposition of workers and trade unions. The 2003 programme included the closure of four mines in the Silesia region and fears of job loss mounted. Protests reached a head in September with a violent demonstration in Warsaw.

Was there any compensatory measure?

In general, the reform of the sector in Poland was carried out without major social conflicts, despite the significant employment losses. This was the result, first and foremost, of relatively generous severance packages provided to miners leaving work, based on individual arrangements. According to research, miners who have accepted a one-off severance payment in return for an undertaking never again to seek employment in the mining sector have received an average payment of PLN 50,000 (€12,000 to €14,000).

The 1996 – 1997 restructuring programme adopted a conservative stance, providing for substantial social cover for the sector's employees (an avoidance of collective redundancies included), technical modernisation (paid for largely by the state), financial restructuring (through debt forgiveness), and export incentives.

1998 -2002 restructuring programme provided a generous 'social packet' for miners leaving work in the industry was provided for.

2002 – Onwards: after major public protests, a compromise agreement was reached among the government, trade union representatives and employers organisations on 11 December 2002. This agreement provided that the government would suspend its execution of the programme until a team of experts completed additional analyses measuring the actual demand for coal, thus providing a basis for deciding how many coal pits should be closed. It was also decided to establish *Kompania Weglowa SA* (KW), incorporating four mining companies and the five entities grouped within *Bytomska Grupa Kapitalowa*, and to guarantee to the employees of the liquidated mines indefinite employment in other mining operations.

Was the

Restructuring the sector entailed and still is asking for a continuous flow of

reform achieved?

financial resources. According to specialists from within the industry, the State subsidised the mining sector to the tune of over PLN 5 billion over 1990-5, while, at the same time, depriving it of PLN 17.7 billion through various misguided decisions.

Also, despite a decade of attempts to restructure the sector and transit it to market economy, the Polish mining industry continues to benefit from special privileges, large state subsidies and high wages. This is believed to be a result of 'clientelist' mechanisms in operation.

Moreover, reported State aid constitutes only a share of the subsidisation which exists in the sector. Coal quotas for foreign coal as well as subsidies for coal exports enable domestic mines to increase extraction. Thanks to export subsidies, Polish mines were able to sell coal on foreign markets for less than the cost of extraction. The annual value of export subsidies for hard coal was 350-450 million USD (about €267-343 million³⁹) at the end of the nineties (Fiedor and Graczyk, 2000). Coal is Poland's most important export and has become the main source of foreign exchange. Coal accounts for two-thirds of Poland's total energy production and a significant share of its GDP and exports. The markets for Polish coal are Western Europe, Eastern Europe and Central Asia and the Transcaucuses. Poland exports roughly 20-25% of its total coal produced; however, high transportation costs and prices 20% lower than those earned domestically makes this a largely profitable venture. Export limits were removed in July 1992 and licenses have been abolished more recently.

The reform of the highly unviable coal sector thus entailed both the phasing out of direct subsidies and the removal of trade barriers or preferential treatment for domestic coal that caused severe distortions in the market and the resulting over-production of coal.

The reform was not painless, nor smooth, with several set-backs and problems emerging which slowed it down. The budgetary costs of the reform were substantial – and perhaps a more cost-effective way of restructuring the sector could have been identified. Nonetheless, the social consequences of mines' closing down (in terms of job losses) were costly, and particularly felt by the local population. After protests from coal unions in December 2002, the government toned down initial restructuring plans. The government changed the total employment reduction to 27,200; gave workers job placement guarantees in surviving mines, if their own unit goes under; and required KW to be responsible for 24 mines held by the country's five worst mining firms.

In conclusion, although governmental aid is helping in restructuring the mining sector, the complete 'renewal' of the sector has yet to be achieved. This can be partly attributed to the social unrest and opposition encountered by the government's ambitious reform plans.

Impact of reform

In the mid-1980s, Polish extraction of hard coal stood at approximately 190 million tonnes per year, and this had fallen to some 100 million tonnes by 2000. Over the 14 years of transformation since 1989, employment levels in the mining industry have been reduced significantly. This major cut in coal output was achieved under conditions of relative industrial peace, though at great cost to the national budget. However, it should be recalled that, to date, efforts at attracting foreign investors to Upper Silesia have produced

approximately 18,000 jobs – a small number compared with the 300,000 jobs shed by the mining industry.

Subsidies were eliminated in 1993 resulting in large financial losses to companies and huge debt burdens, a portion of which the Government recently agreed to write off. Poland has launched an ambitious restructuring programme for its coal mines, which foresees the cancellation of an important part of the inherited liabilities, the close-down of unprofitable mines, a reduction of the work force through early retirement and retraining, and the privatisation of the still state-owned mines.

In July 1998, the Government agreed to a five-year programme to restructure the industry, at an estimated cost of US\$2 billion. Highlights include closing 24 mines, reducing employment from 240,000 to 105,000, reducing output, and writing off more than half of the sector's US\$4 billion in debt.

Up to 2001, the mining industry absorbed PLN 13.2 billion (€3.3 billion) in direct subsidies alone. According to Supreme Chamber of Control (*Najwyższa Izba Kontroli*, NIK), the Polish state auditor's office, the combined cost incurred by the state in relation to restructuring of the mining sector approached PLN 40 billion (€10 billion).

For the years 2004 to 2006, Poland intends to spend 6.2 billion Polish Zloty (€1.4 billion) in restructuring its coal industry. Out of this, the Commission considers that 18 million Polish Zloty do not constitute State aid, as they are paid out to a public entity in charge of administrating the close-down of mines, which does not perform an economic activity. The remainder of the aid is compatible with the common market, as it serves for financing inherited liabilities. For the years 2007 to 2010, the Polish state plans to reduce its support to the coal industry to 160 million Polish Zloty per year, supporting mainly so-called initial investments.

The incidence of State aid on the Polish budget is quite important, but the effectiveness of such a financial support is proven. Locally, the negative consequences of mine closures have been mitigated, and the environmental impacts of coal extractions decreased. Securing closed mines is still problematic in some areas (groundwater contamination is an issue), but progress can be made. Even though regulations and legislation governing oil and gas development, as well as coal mining, have been upgraded to include better environmental protection measures, there is still room for improvement. In Poland, funding aimed at improving coal quality and addressing the environmental legacy is considered inefficient. At the global level, it is expected that the reform of such a highly inefficient sector yields benefits in terms of reducing GHGs and sulphur emissions.

Factors influencing success / failure of reform

The recent favourable situation in the world coal market has improved the economic situation of some coal mines, raising questions about the rationale for maintenance of state support for profitable companies. The Ministry of Economy and Labour is considering the withdrawal of financial support for selected mines but faces strong resistance. According to the Ministry, state support should not be consumed by an increase in miners' wages.

For the first time in years, there has been positive feedback from the general public to the idea of questioning the rationality behind earmarking considerable public funds for the mining sector. This has been facilitated by the intensity of current discussions on the efficiency of the sector. However,

environmental considerations are still underestimated.

Is the reform transferable?

The process of sector restructuring was very country specific to Poland. However, according to an in depth analysis of coal industry reconstructing in other CEE and CIS countries (World Energy Council, 2000), Poland shared with these countries difficulties over reform (see below).

This case study can have some interesting parallels with other EU countries, as in many cases subsidies to energy sector derive from a legacy of state ownership of public services, in particular in showing the difficulties of restructuring a sector where public government have indulged in subsidising for a long time.

Furthermore, several lessons can be learned from the reform of the Polish coal sector (see above), which can be useful for other reforms – not only of the coal sector in other countries, but of other sectors as well.

Lessons learned

Decades of subsidisation are difficult to overcome, especially as clientelism becomes rooted in politics.

Almost all CEE and CIS took the same process of reform. they followed the process with ‘gradualism’ , delaying energy reforms compared to general reforms (anti-inflationary, employment, social, budgetary reform): it was believed that the salutary power of market forces on energy efficiency was limited as long as energy markets were imperfect, as they are in CEE/CIS. This argumentation tended to prolong the top heaviness of the CEE/CIS energy sector, inherited supply systems, established management and workforce attitudes; and to protect vested interests.

Also, governments made energy reforms were to meet several goals at a time:

- to integrate the national energy economies into the European and world mainstream
- to protect large segments of the population from the consequences of energy reform
- to enhance the international competitiveness of the manufacturing industry by maintaining low energy costs
- to preserve integrated energy complexes, infrastructure and systems
- to maintain a steady flow of hard currency from energy exports
- to reduce import dependence
- to cater to sensitivities associated with foreign access to resources or ownership of land or with "strategic" industries
- to enhance protection against energy-related pollution and health hazards
- to temper the need for regional/industrial conversion.

As a result, energy reforms lacked focus and had to pass through several stages or reformulation, further prolonging transition.

Several conclusions can be drawn from the Polish experience: first of all, reforming heavily subsidised sectors weights heavily on state budgets, as generous severance packages are needed for buying support to the reform; such costs are however experienced in the short to medium term, until completion of the reform, while subsidies would continue in the long term. Secondly, it is easier to implement a reform when the economic outlook is not grim, as there is more confidence of the markets and the public in new

economic activities. As a consequence, the rationale for the maintenance of inefficient subsidies and industries is weaker. Thirdly, environmental considerations can play a major role in determining the success of reform: in particular, any efforts directed towards the reduction of GHGs emissions is now likely to be met with more tolerance by the public, given the high political priority that climate change is receiving. Fourthly, reforms need to be focused, and analyse the potential cascade impacts on the whole economy. And finally, reforms are not environmental-neutral, and environmental impact assessments need to be carried out. In the case of mines, for instance, the risks associated with unprotected and contaminate mining sites – which can cause significant water contamination – have not been taken into account to a sufficient degree in Poland.

Sources of information See references.

Country study UK

Sector Hard coal mining industry

Nature of subsidy

For political and social reasons the coal industry in the UK continued to be largely subsidised, through agreements which ensured the purchasing of domestic coal at above world market rates, additional costs that were ultimately borne by consumers.

Since 1957, electricity generators were required to purchase a given quantity of British coal at set prices, but were allowed to pass on these higher prices to consumers. The British coal industry was effectively maintained by electricity generators – and ultimately by the British taxpayers.

Nature and scale of environmental problem caused

The UK has some 900 abandoned coal mines, around 400 of which are leaking methane in the atmosphere. Just a part of emissions is capable to be controlled. They estimate that 52 ktonnes of methane are emitted from abandoned mine sites; this is equivalent to about 1MtCO₂; these emissions represent 1.7% of total GHG produced by the UK.

31 ktonnes of methane are already captured and used in CMM industry; the remaining 21ktonnes are not able to be captured and represent 0.07% of UK's GHG emissions, approximately 0.5% of the reduction needed to meet the UK's Kyoto target.

Original rationale of subsidy

The 1980s and 1990s saw many changes in the coal industry within the UK, with the industry contracting, in some areas quite drastically. Many pits were 'uneconomic' to work at current wage rates compared to 'cheap' North Sea oil and gas, and in comparison to subsidy levels in Europe. The Miners' Strike in 1984 and subsequent helped shrink the industry.

Yet, critics point out that mining productivity was higher in Britain than anywhere else in Europe or America and that the industry was only troubled because other governments subsidised their coal industries by much more

than Britain did.

The National Coal Board (by then British Coal), was privatized by selling off a large number of pits to private concerns through the mid 1990s.

Budget impact Current UK's support to coal mining industry takes the form of both on- as well as off-budget subsidies; in the EEA's report on energy subsidies (2004) UK's on-budget subsidy to coal mining sector was quantified around €0.1 billion, while it is more difficult to identify and quantify off-budget support.

Was the rationale still valid? By the 1970s, the United Kingdom experienced several economic setbacks, many of which were attributed to an excessive state role in the economy. In 1979, the election of the Thatcher government marked a major change in British politics and economic policy, with the privatisation of (inefficient) state owned companies being pushed through by the new government. As a consequence, the government initiated the process of limiting its role in the economy – pushing through a number of reforms. The rationale for state owned enterprises ceased to exist in the government's view; similarly, State aid to private companies was no longer deemed as a feasible option.

Year of reform 1990s

Detail of reform In the 1960s and 1970s, several attempts by the government at reforming the electricity industry were made. However, due to both a lack of commitment and to political turnover, these efforts largely proved unsuccessful.

In 1990 (during the creation of National Power and PowerGen), the UK government renegotiated its contract with British Coal, introducing the gradual decline in both guaranteed price and quantity over a period of three years. As the deadline for the first three-year contract approached, the government initially recommended even greater reductions in electricity industry coal purchases from British Coal than those negotiated for in the first three-year contract. Large reductions in prices were also expected (Parker, 1996). It soon became clear, however, that these proposals would result in massive coal employment losses, together with a reduction in coal production – which the government was able to handle, thus pushing through most of its earlier proposals. The resulting coal contracts required National Power and PowerGen to purchase 40 million tons of coal in the first year of the contract and only 30 million tons in each of the four years that followed. Furthermore, when British Coal was privatised in 1994, it was done so with government expectations that it would eventually operate as a competitive company and not be dependent upon government subsidy (Robinson, 1996).

Main driver of reform For roughly forty years, the British government had sustained its national coal industry – which by the early 1990s had grown very inefficient by world standards (although not, as noted elsewhere, by European standards). The election of the Thatcher government in 1979 marked a major change in British politics and economic policy, with the privatisation of (inefficient) state owned companies being pushed through by the new government.

Obstacles to reform

Since the abolition of subsidies, the indigenous coal industry has been putting pressure on the UK government to reintroduced subsidies to the industry. The rationale is based on several arguments:

- (i) bridge the gap between domestically produced and (cheaper) imported coal;
- (ii) alignment with the current subsidies being paid by the German and Spanish government to their coal industry. The UK industry has also filed complaints against Germany and Spain and was in the process of filing complaints against Poland to the EU on the specific grounds of excess production and export dumping of surplus coal.

The government is however encouraging a shift to more environmental friendly energy production sources and renewables. This is a problem for the British coal industry, as it relies almost exclusively on power stations for its businesses. Power generating companies, facing new emissions constraints, may be faced with the need to close down their coal-fired plants (BBC News), slow down production, and/or shift to imported coal, which has lower sulphur content. According to Nigel Yaxley, chairman of the Confederation of UK Coal Producers (COALPRO)⁵⁹, the consequences could be disastrous, leading to up to 15,000 jobs lost (BBC News).

COALPRO calls for the UK government to maintain open the options offered by the EU Coal Regulation in terms of investment aid, operating aid and closure aid, with the purpose of maintaining a secure base for indigenous coal production.

In the UK, about 17% of electricity demand (which is equivalent to over 230 million tonnes of oil) is supplied by coal. Coal underpins 35% of total generation, and over half of the coal is supplied by local coal producers, ensuring supply security and price stability to the energy market (COALPRO).

According to the COALPRO, there is a need for continue support of the industry on behalf of government – a need that is also warranted because of: (i) the relatively small budgetary cost of supporting coal production, which would allow UK electricity generators to benefit from long term price stability, reducing the risks of relying on the more volatile international market for coal. (ii) indigenous production allows the security of energy supply, a positive contribution to the UK balance of payments, the creation of well-paid jobs and other inputs necessary for the economy. In situations when the costs of production do not coincide with high coal price, the government should intervene to prevent closure of mines and the permanent loss of valuable reserve. COALPRO calls for the UK government to keep the options open.

Was there any compensatory measure?

After the failure of the Miners' Strike of 1984-5, the way was open to rapid restructuring of the industry and large scale job losses. This led to severe unemployment in many coalmining areas. Aside from social security

⁵⁹ COALPRO represents the interests of the UK coal mining companies who together mined around 90% of the 28 million tonnes of coal produced in the UK in 2003.

payments payable to the unemployed, the central government adopted a *laissez faire* approach to the problems that resulted. Local authorities in the affected areas, however, which tended to be of a more left-wing persuasion, made what efforts they could to restructure local economies and attract new inward investment. This approach gathered momentum over time and some areas have recovered significantly, but many problems of unemployment and poor health remain even now.

Over the last few years, the UK coal industry has moved from receiving no state subsidies to one of modest investment aid averaging GBP1/tonne – significantly below the GBP60/tonne in Germany, where the coal industry is of similar size to the UK, for energy and social reasons.

The British coal industry is on the verge of extinction due to the ‘dash to gas’ by electricity generators. The government imposed a moratorium on the construction of new gas-fired power stations in 1999 in order to protect the coal industry. In April 2000, the moratorium was replaced with a direct subsidy of £100 million per annum for the next two years. In 2002, the UK government agreed to an aid package for Britain’s remaining coal mines, in a bid to allow Britain's coal industry to compete in the reformed electricity market.

The UK provided operating support through its Coal Operating Aid Scheme since 2000 and until 2002. This scheme aimed to allow those elements of the UK coal industry with a viable future without aid to overcome short-term market problems (in particular, low world coal prices and the lifting of the stricter gas consent policy) and to prevent a sudden and sharp decline in the size of the coal industry.

The UK Government foresees the maintenance of State aid to the coal industry under the Coal Investment Aid, which will be provided as “aid for initial investment” under Article 5(2) of the European Council Regulation No. 1407/2002 on State aid to the coal industry (“the Regulation”). Up to £60 million was made available to reimburse up to 30% of eligible investment in approved mining projects. The aim of Coal Investment Aid is to create or safeguard jobs in the UK coal industry within socially and economically disadvantaged areas by encouraging coal producers to enter into commercially realistic investment projects that maintain access to coal reserves; would not otherwise go ahead; and will ensure the medium-term economic viability of the relevant mines. The rationale for this State aid is that the closure of most of the mines would have dire consequences for the local communities, the majority of which perform below the national average across a broad range of social and economic indicators.

The reform in the UK seems to have followed a different path from that adopted elsewhere, with less emphasis being given to severance packages for former mine workers, and more to creating an enabling environment for the development of alternative economic activities in the mining areas.

Was the reform achieved?

Among EU coal producing countries, the UK is the only one which successfully maintained a more or less competitive coal industry, at the cost of extensive mine closures (EC, 2002).

Impact of reform

Coal production at British mines fell from 84 million tons in 1988 to 35 million tons in 1995. In 1988, coal (on a crude oil equivalent basis)

accounted for 66% of fuel use at UK electric utilities, but by 1995 this share had fallen to 48%. By 2010, coal's share of electricity production is expected to fall to 31% (Organization of Economic Cooperation and Development (OECD), Country Annexes, p. 297).

Much of the reduction in coal consumption has been made up for by a greater dependence on natural gas. In fact, the demise of the British coal industry is closely interlinked with both the privatisation of electricity and the developments in the UK's natural gas industry, coupled with the phasing out of subsidies to the industry – in terms of guaranteed quantity and purchasing price. The switch to gas has also raised questions about security of supply, when demand for both gas and electricity tends to peak at the same time, and because it has raised strategic questions about the need to rely increasingly on imported gas for domestic consumption.

Regional electricity companies were allowed to enter into the power business, and increased competition provided incentives for technological development – encouraging businesses to find quick power generation alternatives to the electricity pool. Combined cycle natural gas turbines provided the quickest means of entry into the generation market due to their low construction costs and short lead times. Due to efficiency improvements and the start-up of a new reactor, nuclear power has also partly displaced coal. Between 1988 and 1995, nuclear energy's share of generation rose from 22% to 28%.

There has been an increase in coal fired electricity generation on the part of the three largest coal fired power stations (under American ownership), whose coal needs have however been increasingly met by imported coal from USA, Columbia and South Africa, as the cost of domestic coal to electric utilities far exceeded the cost of coal traded in international markets.

The reform of the industry has thus had far-reaching consequences, and cannot be seen in isolation from the prevailing world market conditions. Furthermore, the trends observed in the UK – and in fact throughout Europe – seem to indicate that subsidies to the coal industry would not have been effective for long at protecting domestic production, in the face of growing competition.

Factors influencing success / failure of reform

The miner's strike of 1984–1985 was a major industrial action affecting the British coal industry. It was a defining moment in British industrial relations, and significantly weakened the British trade union movement. Coal was a nationalised industry and, as in most of Europe, was heavily subsidised. The strike was however not effective at stopping the government plan to reform the sector, which was rested also on the rationale by supporters of the government who claimed that coal was a dying industry that could not be supported indefinitely, in particular in the face of growing world competition.

Is the reform transferable?

The reform in the UK was brought about by a very strong political will, even in the face of social opposition. The 'UK model' may therefore not easily be exported to other countries or other sectors.

Lessons learned

Despite the peculiarities of the UK case, one important lesson can be learned from the experience: the government can increase support to the reform and foster economic growth at the same time if the reform is coupled with

measures to stimulate economic development in the areas where industrial activities are to be scaled down or closed. In this way, new job opportunities are created.

Sources of information See references

4.3.3 Additional considerations

Drivers for reform: the call for a sustainable, competitive and secure energy for Europe

- *Sustainable energy*: Coal is one of the most polluting and least efficient fuel for energy production. Subsidies to hard coal production run counter the aim of reducing greenhouse gases emissions and the Emission Trading Scheme (ETS) system. The current emphasis on tackling climate change may provide support to even drastic reforms of energy (and transport) sectors. The continuation of State aid to coal mining and production systems in some EU Member States, which is facilitated at the moment by Coal Regulation (2002/1047), needs to be revised. In addition, there is a need to modify the pricing system for coal, to fully reflect the environmental and social costs associated with its use.
- Another argument used to stimulate debate on the undesirability of maintaining the current system of State aid to coal production is budgetary. The efficiency of subsidising coal mining is questionable in the face of financial constraints faced by public authorities: it is vital to prioritise the allocation of resources in such a way as to get the most benefit from the best options. In the energy sector, these options are rather the effective management of energy demand and the further expansion of renewable energy sources.
- *Competitiveness of the energy sector*: the EC current State aid Action Plan aims at reviewing State aid control, and calls for less and better targeted aid in member states. Importantly for the reform of environmentally harmful subsidies in EU member states is the recommendation that sectoral objectives – e.g. coal production – to horizontal objectives – e.g. environmental protection, fostering renewables. This approach is in line with the call for environmental policy integration in sectoral plans and strategies, as required by Article 6 of the EC Treaty, which requires that environmental protection requirements are integrated into “the definition and implementation” of all other policies and activities. The sectoral approach highlights the perverse effect of, on the one hand, supporting coal production through State aid and, on the other hand, calling for GHGs emissions reduction through, for instance, the EU Emission Trading Scheme.
Past and current energy policies, which have favoured more traditional (and dirty) energy sources, such as coal and nuclear, have distorted the incentives for cleaner, renewable, energy sources. The ending of State aid for coal thus removes one important market distortion.
- *Secure energy*: Since the oil crisis of the 1970s, governments have used subsidies to ensure adequate domestic supply, support the domestic fuel production, and reduce import dependency. Often, the need to ensure member states have some degree of independence with respect to energy production has constituted an argument for continued support to the energy industry. It is however widely recognised that, with respect to coal, market conditions are unlikely to change in the decades ahead, and there is no ‘insecurity of supply’ regarding coal into the community, nor any likely

future interruptions. Thus, granting financial support to domestic coal production on the basis of maintaining security of supply, or hedging against future insecurity, is not warranted, and seems more a form of hidden protectionism.

Obstacles to reform

- *Lobbies:* The main obstacle to the removal of subsidies is political, as the beneficiaries are usually organised in strong lobbies, capable of influencing government policies and strategies. This is true, for instance, in the case of the Polish industry. Here, clientelism led to lavish spending with little thought for the long-term rationale.
- *Foreign imports:* On the environment side, European coal lobbies argue that national coal will just be replaced by foreign imports, thus with no effect on pollution. A better allocation of resources resulting from subsidy removal will boost growth and eventually compensate for some short term sector losses.
- *Employment:* Arguments against removing subsidies to the coal industry also cite the problem of employment and social benefits: coal subsidies – and energy subsidies in general – are often used to maintain local employment, especially in periods of economic transition. The political imperative to protect jobs has been a major factor in the aid provided to the German and Spanish coal industries (European Environment Agency, 2004).
- *Security of supply:* In the UK, energy security is used as an argument for maintaining state support to the industry. This argument, that became prominent in the 1970s but lost relevance since, is now high up in the agenda of the EU and members states. The situation of insecurity in many areas of the world – and especially in the ‘strategic ellipse’ that encompasses the middle East and Russia – is often used to claim that future energy supply can no longer be taken for granted, with the consequent need to maintain a healthy indigenous coal industry to reduce dependency on imported gas and oil.
- *The ‘If Germany can’ argument:* Another argument that was often used by the coal industry against the unilateral removal of subsidies in the UK is that other EU producing countries – notably Germany – have very high subsidies in absolute term per ton, thus enjoying an unfair advantage. This argument is used, for instance, by the UK coal lobby.

Overcapacity

- Overcapacity in Poland has been one of the basic problems requiring solution in the process of the coal industry's reforming, the overcoming of which required a very heavy financial contribution by the public government. Indeed to adjust the coal industry to economically effective units functioning in a market economy, the reform programme envisaged among other strategies:
 - liquidation of less effective production potential (liquidation of production in 15 mines, partial liquidation or merger of 9 mines, reduction of production potential by 25 Mt);
 - reduction of coal sales (from 132 Mt in 1997 to 110 Mt in 2002);
 - reduction of coal exports (from 30.6 Mt in 1997 to 10 Mt in 2007);
 - restructuring and reduction of employment (from 243 000 in 1997 to 138 000 in 2002)
 - re-qualification and creation of new workplaces;
 - economic activation of mining settlements (the so-called *gminas*);
 - environmental protection: rectification of mining damages; and

- debt settlement for coal companies with liabilities to the State budget, National Insurance Fund, environmental protection fund, or mining *gminas*.

It has been noted (Smolec, 2004) that the financial support of the programme is a key problem for the success of the coal industry's restructuring process. Financial support for restructuring is very high. Total needs with respect to state support for financing of basic spheres are presented in the Table below. Total State aid allocated to settle coal companies' outdated liabilities in 1998-2002 amounted to 6.9 billion ZL.

Table 12: Investment needs for coal mining restructuring (M ZL) ⁶⁰

Specification	Years					Total
	1998	1999	2000	2001	2002	
Total	754.4	1792	1814.1	1372	1458	7180.5
of which for:						
Mines closure	211.4	413	462	225	176	1487.4
employment restructuring	505	1044	1017.1	812	947	4325.1
rehiring for environmental rectification	28	35	35	35	35	168
refunding of extra benefits to old age pensions paid by ZUS (equivalent for in kind (coal) contribution)	-	250	250	250	250	1000
creation of new jobs in mining gminas	-	50	50	50	50	200

Source: Smolec, WEC, 2004

For the years 2004 to 2006, Poland intends to spend 6.2 billion Polish Zloty (€1.4 billion) in restructuring its coal industry. Out of this, the Commission considers that 18 million Polish Zloty do not constitute State aid, as they are paid out to a public entity in charge of administrating the close-down of mines, which does not perform an economic activity. The remainder of the aid is compatible with the common market, as it serves for financing inherited liabilities. For the years 2007 to 2010, the Polish state plans to reduce its support to the coal industry to 160 million Polish Zloty per year, supporting mainly so-called initial investments.

This Polish case is a complex one where the government is aiding the industry in the transition while reducing some subsidies. WE should expect a very different profile for the phase out than in the UK or Germany.

Tax exemptions, subsidies by regulation and external costs

In 2005, €2.7 billion (equivalent to €75,000 per mining job) of coal subsidies were spent in Germany. Support has already declined since 2003, where State aid accounted for €3.3 billion (DG Competition, State aid Scoreboard). However, hard coal subsidies continue to

⁶⁰ In final draft this will be in Euros

lead the list of the biggest individual subsidies granted by the Federal Government; coal mining subsidies made up 28.5% of the direct subsidies granted by the Federal Government in 2006. If a wide definition of subsidies is applied (such as that used by international agencies such as the OECD, IEA and UNEP) the value of subsidies changes quite radically.

Figure 14 (a,b,c): Energy subsidies in Germany

Figure: Energy subsidies in Germany in 2003 (bn €)

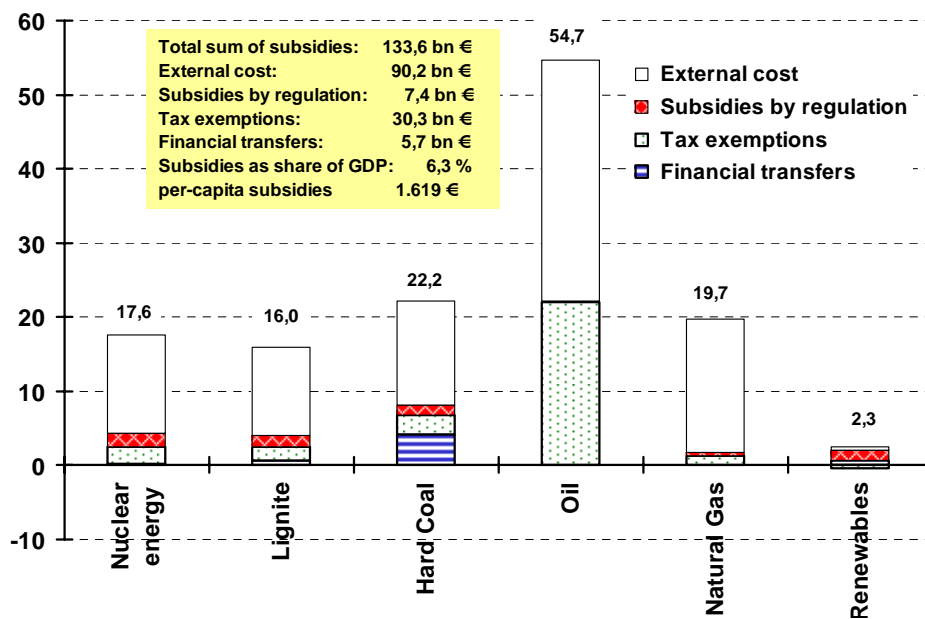


Figure: Energy subsidies in Germany in 2003 (€GJ)

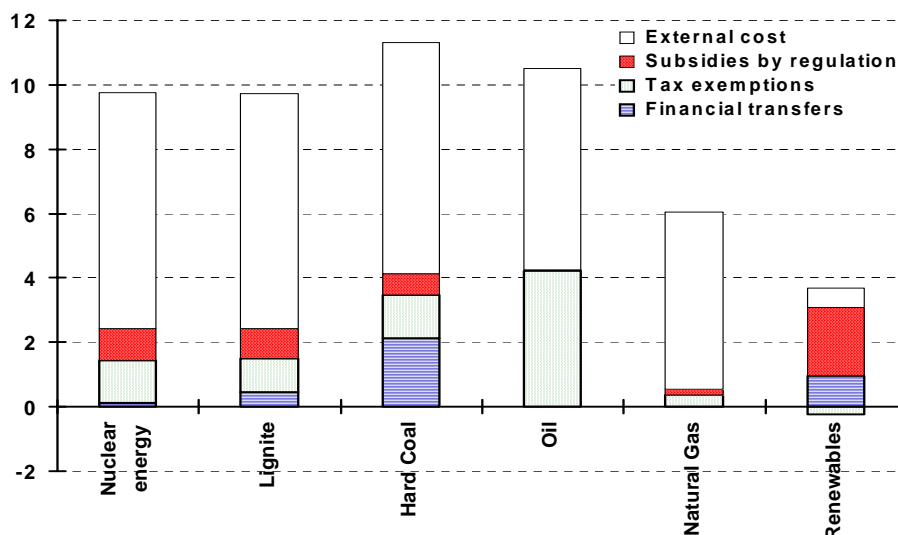
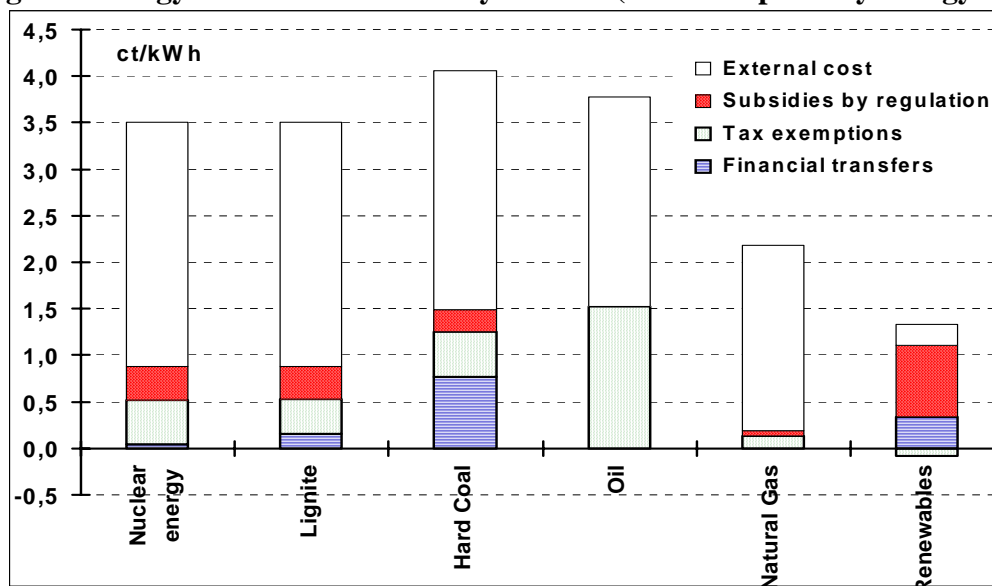


Figure: Energy subsidies in Germany in 2003 (ct/kWh - primary energy use)



Source: Meyer , 2004.

Therefore, if we take into consideration external costs, subsidies by regulation, as well as tax exemptions and financial transfers, hard coal in Germany was subsidized by €22.2 billion, rather than the €3.3 billion in 2003.

Hard coal, however, is not the source that gets most subsidies: oil accounts for slightly more onerous external costs (around €32 billion), while tax exemptions (around €22 billion) count for almost three times the financial transfers received by hard coal. Hard coal is nonetheless the source of primary energy that gets more per unit support in Germany: approximately €11/GJ and 4€ cents/kWh.

Some Lessons learned in Germany

- An important factor that will determine success or failure of the reform is the involvement of actors from the early stage, and their support or consensus. A strategy to ensure buy-in for the reform could be the diversion of funds previously used to subsidise the coal industry to social and economic programmes, or business tax incentives to attract investment, in the areas such as coal mining regions, that may suffer from subsidy removal. Funds can also be used towards a restructuring of the energy market (shift to cleaner fuels, renewable energies, etc.) that will decrease dependency on carbon intensive fuels, reduce pollution, and counter-act the coal lobby argument of the non-effect on pollution.
- The reform of the coal industry has generally led to lower production of coal itself. As in the case of the UK, however, removing subsidies domestically has led to a shift from indigenous coal to imported, cheaper (and sometimes cleaner in terms of sulphur content) coal. Thus, the expected environmental benefits have not materialised to the desired degree, and the reform has come at substantial social costs in terms of job losses and negative impacts on the local economy. In the longer term, however, changes in the relative costs and different energy sources are expected to lead to structural changes in the energy market. It is too early to assess the structural impact of reforms of the coal mining sector, and the interlinkages among technologies and sectors, energy demands and prices are difficult to model.

4.3.4 Key lessons

- The original rationale of preserving jobs, maintaining low fuel prices and securing energy supply does still persist, at least in a limited sense
- However, the scale of economic pressures that result can eventually force reform
- The objective of preserving jobs is often popular
 - And mining interests are effective at making political alliances
- Hence changes to more right wing governments can spark changes
 - By overturning traditional political consensus
 - And by reframing the economic logic of subsidy
- Compensation packages can help greatly to facilitate reform
 - But are not essential
- Gradual removal of subsidy also helps to minimise damaging dislocation

5 CASE STUDIES OF ENVIRONMENTALLY HARMFUL SUBSIDY REFORM IN THE TRANSPORT SECTOR

This Chapter 6 sets out a series of case studies on the reform of environmentally harmful subsidies in the transport sector. This section will give more insight on the drivers of reform, the obstacles and the lessons to be learned by success or failure stories, and many cases drawing examples from several different countries. The main case studies in this Chapter are:

- Aviation
- Road infrastructure cost recovery
- Commuter subsidies
- Company car tax reform
- Subsidies to biofuels

Chapter 7 further develops the issues examined in detail here with a discussion on the benefits of reform developing guidelines for the reform of environmentally harmful subsidies, while Chapter 8 extracts lessons for reform, building partially on the case studies below and on the results of OECD analysis of case studies. Finally, Chapter 9 analyses the arguments of those that oppose reform in the light of the case studies.

5.1 Aviation subsidies⁶¹

5.1.1 Background and Introduction

Since the Chicago Convention of 1944, the aviation industry worldwide has enjoyed several benefits that, proponents of subsidy reform claim, have distorted the market in favour of this transport means, with heavy social and environmental costs. In particular, financial support to the aviation industry includes:

- fuel tax exemption;
- VAT exemption on international tickets; and
- duty free sales on non-EU flights and on board

The issues of whether the tax exemption should be removed or not, and whether a unilateral action may be effective or not, have been hotly debated over the last decade and in the last few years especially, with rising concerns over the contribution of the industry to climate change. The main arguments for reform are the following:

- create level playing field (distorted market *vis à vis* other means of transport, e.g. trains);
- internalise external costs of aviation; and
- help meet CO₂ reduction targets.

For instance, the costs of UK aviation industry contribution to climate change have been estimated at over £2 billion in 2001 (Green Party). Unless action is taken now, CO₂ emissions are expected to increase by 588% between 1992 and 2050. The overall hidden

⁶¹ Based on case study contributions by FEEM.

economic costs of the EU aviations sector are now estimated at GBP 14.3 billion a year (3.7 from the UK). These estimates exclude the costs of aviation accidents and accidents services. (Green Party document)

Both the European Commission and several individual countries (e.g. the UK, Germany) have been considering the removal of the tax exemption on aviation fuel, but they have backed off, as this would entail the re-negotiation of hundreds of bilateral aviation service agreement treaties (ASAs) implementing Article 24 of the Chicago Convention. (BBC News, Why can't you fill your car on tax-free aviation fuel?). Reforming the sector is thus legally difficult, in addition to being opposed by the strong lobbying industry.

The UK government, for instance, has been investigating whether the tax exemption could be removed, but no conclusion has been reached. In Germany, a study commissioned by the Federal Environmental Agency in 2005 (Pearce, 2005) reached the conclusion that unilaterally removing the tax break on aviation fuel would not have any benefits for the environment, nor reduce the kerosene used by the industry, unless a way could be devised to tax the kerosene used in Germany, regardless of where the planes refuelled. Otherwise, airlines would refuel in tax free countries.

At the EU level, however, the reform of the sector has been made easier by the introduction of Single European Aviation Market, which supersedes individual ASAs between member states. Those that remain with third party countries are likely to be substituted with agreements negotiated at EU level. Furthermore, the Energy Products Directive (2003/96/EC) changed the legal environment, allowing Members States to enter into bilateral fuel tax agreements. There is also increasing pressure from other transport subsectors for the removal of what they perceive as an unfair advantage to the aviation industry.

In a non-binding July 2006 report (European Parliament resolution on reducing the climate change impact of aviation (2005/2249(INI))), the European Parliament endorsed the idea of introducing a kerosene tax and eliminating current tax exemptions which give airlines an unfair advantage over other transport sectors. Airlines are firmly against such a move, as they claim it would divert needed funds away from efforts to renew fleets and improve the energy efficiency of planes. Indeed IATA (the airline operators federation) is working tirelessly to promote the abolition of all fuel charges, on grounds that these are equivalent to taxes, in accordance with ICAO resolutions and bilateral Air Service Agreements. According to the aviation industry, the fuel tax exemption is not an unfair subsidy, but rather it is based on the international legal principle of "reciprocity" whereby States agree to mutual tax exemption in order to avoid unilateral imposition of fiscal measures.

In conclusion, there has not yet been an EU-wide reform of the tax exemption of aviation fuel; evidence emerging from the case study shows that, as a consequence, the unilateral attempts at removing this implicit subsidy have encountered several difficulties, and have not generally been successful. Only the Netherlands have successfully introduced a kerosene tax, where other countries have attempted its introduction, but backed away and abolished it. The following case study does not focus on one country in particular: it is thought to be particularly useful in comparing and contrasting the experiences of successful and unsuccessful attempts at removing the implicit subsidy to the aviation industry. The comparison would allow the identification of best practices and errors to

avoid, both structural and procedural, thus enabling a more informed debate to take place at the EU-wide level.

From the case study emerges the need to tackle this issue at the EU level; a result of the evidence and the studies considered, is that there is a need for coordinated and central actions on aviation taxes in order for individual Member States to be able to achieve successfully reform.

5.1.2 *Structured analysis of aviation fuel implicit subsidy reform in the EU and the Netherlands*

Country study EU; the Netherlands

Sector	Transport
Recipient	Directly, the EU's airline industry and fuel suppliers, and, ultimately, airline users – both passengers and freight.
Country (region or city)	The case study on aviation fuel (implicit) subsidies will be developed at the EU wide level: Netherlands as successful example; Switzerland and Denmark as examples of failure of this kind of policy.
Nature of subsidy	<p>Aviation fuel taxes exemptions are implicit subsidies. Aviation fuel is virtually untaxed compared to other petroleum products, an exemption that can be considered as a form of implicit subsidy. VAT tax exemption for aviation fuel can be considered as a fiscal incentive.</p> <p>Kerosene used for commercial aviation is exempt both from excise duties and from energy taxes in almost all EU countries. Also, there are many cases of direct subsidies to aviation, e.g. in the form of investment aid for airports. In addition, intra-Community and international flight-tickets are exempt from VAT in the whole EU, and domestic flights are taxed with reduced VAT rates in most Member States. Indeed, in many cases the airlines are zero-rated, meaning that they not only pay no VAT, but they can also reclaim the VAT on their own inputs.</p>
Nature and scale of environmental problem caused	<p>Although road transport remains the largest contributor to CO₂ emissions in the transport sector, aviation is a rapidly growing source of CO₂, in addition to having other environmental externalities (e.g. noise). Commercial aviation releases more than 500 million tonnes of CO₂ annually, equivalent to approximately 2.5% of global greenhouse gas emissions and representing 12.4% of transport emissions of CO₂ (OECD 2001). And these figures are likely to increase significantly in the future, as the industry continues to grow. Matters are likely to get worse as “no-frills” companies continue to expand.</p> <p>In addition to CO₂, aviation is unique in injecting a number of other exhaust gases into the upper atmosphere, and these on balance increase the warming effect relative to that of CO₂ alone. Although the science remains uncertain, the Intergovernmental Panel on Climate Change estimated in 1999 that this multiplier effect – known as the radiative forcing index – would be</p>

approximately 2.7 currently, and rising in future years⁶². More recently the UK's Royal Commission on Environmental Pollution has suggested that this now seems more likely to be an underestimate than an overestimate⁶³.

Clearly, an implicit subsidy on fuel used in the aviation industry through the failure to internalise these major externalities, has the effect of artificially reducing the cost of air transport, leading to an excess supply and demand, thus further exacerbating the ensuing environmental problems.

The scale of the implicit subsidy to the aviation industry is not clear, but could be calculated in two ways:

- (i) By looking at taxes on similar fuels in the system, one could estimate what would be the tax on aviation fuel, if it was imposed along the same lines. The analysis would then look at how much of the tax would be borne by suppliers and how much by consumers, using partial equilibrium tools for this purpose.
- (ii) By looking at the full social cost of the use of aviation fuel, i.e. including external costs, and comparing it with the consumer price. The difference is in effect a subsidy on the full cost of fuel, which is environmentally harmful. This subsidy can be compared with that to other fuels and its incidence assessed using the same tools as for the non-externality case.

Original rationale of subsidy

In 1944 (when the Chicago Convention was signed) the civil aviation industry was in its infancy, and there was a strong concern in the US in particular that multiple taxation should not stifle the development of the industry. More recently, as a major multinational industry has developed, competitiveness concerns are more often cited as a reason to avoid unilateral action on taxes.

Economic impact

Indicatively, in the Netherlands the value of missed revenues from kerosene tax exemptions before the reform were approximately €14 Million (this being the value of revenues collected after the reform).

Was the rationale still valid?

The rationale for the subsidy is not considered to be valid insofar as the industry is now extremely well established and does not merit tax breaks on this score. Aviation enjoys an unfair advantage over other forms of transport, in that there is an implicit subsidy in the form of tax exemption of aviation fuel. The artificially low price of fuel may have contributed to the sprawling of no-frills carriers, thus further exacerbating the problems of CO₂ emissions from the aviation industry – which is also expected to triple over the next 15 years. In the light of EU and global efforts to curb GHGs emissions, and given that the subsidy to aviation fuel benefits mostly the richer segment of society, the urgency of the reform is clear.

Competitiveness could be a valid concern if unilateral action were taken in such a way as to disadvantage national carriers or to distort the aviation market. However, the EU is now a very large market and a large geographical area, so

⁶² IPCC (1999) *Aviation and the Global atmosphere: Summary for Policymakers*, Geneva www.grida.no/climate/ipcc/aviation/index.htm

⁶³ RCEP (2002) *The Environmental Effects of Aircraft in Flight*, Special Report of the RCEP, Cm4749. www.rcep.org.uk/pdf/chp4.pdf

distortions (e.g. through tankering of fuel or diversions) would be limited depending on the measure taken.

- Year of reform**
- The Netherlands: kerosene tax for domestic flights in January 2005.
 - Norway, Sweden and Switzerland: kerosene taxes or emission charges in the 1990s – later abolished.

There has not been an EU-wide reform of the tax exemption of aviation fuel. As a consequence, the unilateral attempts at removing this implicit subsidy have encountered several difficulties, and have not always been successful. See under ‘further considerations’ for recent moves to include aviation into the EU Emissions Trading System.

- Detail of reform**
- Successful example: the Netherlands introduced a kerosene tax for domestic flights in January 2005, at a rate of €206.28 per 1000 litres [the Netherlands (2004), *Tweede Kamer der Staten-Generaal (Belastingplan 2005: Wijziging van enkele belastingwetten)*. 29767, Nr. 6. Cited in Stop Subsidies polluting the World].
- Other countries, such as Norway, Sweden and Switzerland, tried to introduce kerosene taxes or emission charges in the 1990s but abolished them because of restrictions from international law on how they were set up.

- Main driver of reform**
- Article 14 of the EU energy tax Directive 2003/96/EC states that kerosene is exempt from excise duties in general. But Member States may introduce a kerosene tax for domestic flights and they may enter into bilateral agreements with other Member States in order to tax intra-Community flights. Unilateral reforms are, however, not easy to be accepted by domestic and international carriers, as shown by the difficulties faced by some European countries. There is strong support for ending fiscal incentives to the aviation sector, but also strong opposition from countries who wish to support their aviation sector (see below).

- Obstacles to reform**
- The main obstacles are represented by the identification of the routes subjected to taxation and the subjects of taxation itself. Furthermore, there is a need for EU wide harmonisation, since unilateral reforms have proven ineffective. Even though there is generally strong support for the removal of this implicit subsidy to the aviation sector, several countries strongly oppose the reform at the EU level (e.g. Ireland, Spain). Therefore it seems unlikely that the necessary unanimity at EU level will be forthcoming for an EU-wide measure, although bilateral agreements remain possible.

- Was there any compensatory measure?**
- No.

- Was the reform achieved?**
- The only country where a kerosene tax was successfully achieved was the Netherlands.

- Impact of**
- According to some estimates, the abolition of excise duty exemption, and

reform	introduction of a kerosene tax of €0.2 per litre, would decrease the emissions from air traffic by 25-30% by 2025 in comparison with a business as-usual scenario (German Advisory Council on Global Change (WBGU), 2002). Given the very limited nature of domestic air traffic in the Netherlands, the impact of the Dutch measure is negligible in global terms.
Factors influencing success / failure of reform	EHS are often in themselves designed in a way that high-income groups benefit more from these subsidies than low-income groups, and the example of the tax exemptions for aviation fall in this category, offering disproportional benefits to high-income groups.
Is the reform transferable?	Clearly there is potential for a comprehensive reform of the aviation sector at EU and global levels.
Lessons learned	<p>The aviation sector is not included in the Kyoto protocol in terms of emission reduction⁶⁴ – in fact, there was no national policy pressure to reduce climate-related emissions (CO₂, NO_x) from aviation. However, the Netherlands has been the first EU country to introduce a kerosene tax on domestic flights: it is the government policy to green the tax system (<i>Ministerie van Financiën</i>, 2005). The <i>political commitment</i> of the government bodies can be considered as a key driver of reform in the Dutch aviation sector. Furthermore, the introduction of the fuel tax allowed the reduction of the <i>budget deficit</i>, generating an estimated €14 million additional revenue.</p> <p>The most important lesson emerging from the various attempts at removing the implicit subsidy to the aviation industry is that beyond this, unilateral actions are unlikely to be successful. There is still strong opposition from interested parties, and consensus needs to be built up at the EU-wide level, in order to ensure coordination and harmonisation of national strategies.</p> <p>Taking this one step further, once EU wide harmonisation is achieved, it will still be necessary to ensure that other national carriers outside Europe do not enjoy unfair advantage: reaching an agreement at the global level will thus be necessary in the long term.</p>
Sources of information	See references

5.1.3 Additional considerations

Rationale of the implicit subsidy - Competitiveness concerns

- The reason for the success of reform in the Netherlands can probably be traced to the structure of the EU market – such that *the introduction of the kerosene tax for internal flights has not created competitive disadvantages for operating carriers*. Interestingly, the market in the EU is such that over 95% of the intra-EU flights are operated by EU

⁶⁴ Domestic aviation is included, but only in terms of CO₂ emission, the emissions of other gases (e.g. NO_x) are not regulated.

carriers – removing the fuel tax exemption for intra-EU flights would therefore not GREATLY affect the relative competitiveness of airlines.

Earmarking

- Opposition to reform may be reduced if the funds generated by the imposition of a kerosene tax are *earmarked for climate policies*. Such a tax has the added benefit of being relatively straightforward instrument for internalising external costs and for stimulating (fuel) efficiency improvements and CO₂ emission reduction from the aviation sector. A tax is also in line with Europe's goal to reduce distortions in competition between different energy products. A charge could furthermore be used to address the non-CO₂ emissions, such as NO_x emissions, possibly complementing fuel taxes and/or CO₂ emissions trading.
- Thus, a *mix of policy tools* is likely to be more effective at implementing reforms in the transport sector, rather than a single policy tool in isolation. This is especially true if the aim is to combat climate change.

Aviation and the EU ETS

The EC has recently released a proposal for including aviation in the EU Emission Trading Scheme (EU ETS)⁶⁵ (COM(2006)818)). The proposal follows the recommendations of the Communication on Reducing the Climate Change Impact of Aviation (27 September 2005), which concluded that innovative, market based instruments were preferable to financial measures such as taxes and subsidies to mitigate the adverse impacts of emissions from the sector.

The requirements to monitor and report emissions will take effect from 2010. The proposed amendment of the EU ETS would entail that, starting in 2011, emissions from the aviation sector will be subject to a cap and aircraft operators will be required to surrender allowances to cover their emissions.

The scheme would cover all flights arriving at or departing from an airport in the EU as of 1 January 2012. Flights between EU airports would be covered from 1 January 2011. Both EU and foreign flight operators would need to participate in the scheme. Airlines would be able to sell surplus quotas.

Other emissions from the aviation industry (e.g. nitrogen oxide) would be included as well and, to this end, by the end of 2008, the Commission will put forward a proposal and carry out an extensive impact assessment exercise.

In order to avoid duplication and an excessive administrative burden on aircraft and foster harmonisation, all operators would be included in the scheme, and each aircraft operator, including operators from third countries, would be administered by one Member State only. To avoid adverse competitiveness effects, and in contrast to the existing scheme, the method of allocating allowances will be harmonised across the Community, while the total number of allowances to be allocated to the aviation sector will be determined at

⁶⁵ The existing Community scheme works by allocating to operators a number of allowances each, with the total number of allowances allocated setting a limit on the overall emissions from participants in the scheme. By 30 April each year operators must surrender allowances to cover their actual emissions. Operators can trade allowances so that emissions reductions can be made where they are most cost-effective.

Community level by reference to average emissions from aviation in the years 2004-2006. A fixed percentage of the total quantity of allowances will be allocated free of charge on the basis of a benchmark to aircraft operators which submit an application (the earliest application relating to 2008 data). For the period 2011-2012 this percentage will correspond to the average percentage proposed by the Member States including auctioning in their national allocation plans. Thereafter this will be reviewed in the light of the results of the general review of the emissions trading scheme. The rest will be auctioned. The details of how *auctioning* will work such as appropriate design and timing will be set out in a Commission Regulation. Auctioning proceeds should be used to mitigate and adapt to the impacts of climate change and to cover administrative costs. Aircraft operators will be able to buy allowances from other sectors in the Community scheme for use to cover their emissions, and use project credits up to a harmonised limit equivalent to the average of the limits prescribed by Member States in their national allocation plans for other sectors in the Community scheme.

It is estimated that by 2020 CO₂ savings of as much as 46%, or 183 million tonnes, could be achieved each year – equivalent for example to twice Austria's annual greenhouse gas emissions from all sources – compared with business as usual.

The Directive is part of a comprehensive approach to addressing aviation emissions which also includes more research into greener technologies and improvements in air traffic management.

In view of the lessons learned from the attempts at reforming the aviation sector, and the concern expressed by the aviation industry towards the inclusion of the sector in a EU-wide emission trading scheme, it could be advisable, in the short to medium term at least, to grandfather emission permits to airlines – as a means to increase the likely acceptance of removing fuel tax exemption. In the longer term, however, permits should be auctioned in large part, with the exception perhaps of those for routes to disadvantaged areas or islands.

5.1.4 Key lessons

- As aviation is an international industry, competitiveness concerns are particularly acute
- The international legal regime further complicates matters, but does not preclude EU action on kerosene taxation, etc
- Bilateral agreements building on the early move in the Netherlands is also possible
- Currently the EU has chosen to pursue an alternative path via the inclusion of aviation in the EU ETS

5.2 Road infrastructure cost recovery

5.2.1 Background and Introduction

Heavy goods vehicles (HGVs) put significant stress on road infrastructure, increasing infrastructure costs. To recover these costs, some countries have implemented HGV charges to capture some of these costs, thereby reducing implicit subsidies to shipping by road. For example, the goal of the German policy is to cause a significant modal shift from road to rail, doubling freight transport by rail. Similar policies have been pursued elsewhere in Switzerland, Austria, Liechtenstein and the UK (being planned).

The case studies of implicit subsidy reform proposed below are an example of a win-win for the economy and the environment. Still, it is not widely implemented in Europe and meets significant industry opposition.

The revised EU Eurovignette Directive on the charging of heavy goods vehicles for the use of certain infrastructures (2006/38/EC) sets new framework conditions for the implementation of HGV charges. In particular, the revised Directive introduces the following relevant changes to the previous text (99/62) (see also, Liechti and Renshaw, 2006 and VCÖ 2006):

- Charges may be applied on all roads, not only on motorways.
- Differentiation on environmental criteria mandatory from 2010 onwards.
- External costs excluded at present from the calculation basis for infrastructure costs. A unified calculation method to be agreed on in the coming years, after which it may become allowable to include them⁶⁶
- Where road charging is applied, it needs to be applied for all vehicles over 3.5 tonnes from 2012 onwards (previously, the limit was 12t).
- Differentiation of the charge according to emission classes will be mandatory from 2010 onwards (only optional according to the former Directive).
- Revenue use is at the discretion of Member States. The Directive sets out the recommendation: ‘To enable the transport network to be developed as a whole, revenue from charges should be used to benefit the transport sector and optimise the entire transport system’. The previous Directive was not explicit on revenue use, but provided that Member States should not be prevented from using “a percentage of the amount” for environmental protection and the balanced development of transport networks.
- The Directive allows for “regulatory charges designed to combat environmental impacts, including poor air quality” to be imposed in addition to the road charge, while the old Directive allowed regulatory charges to be imposed only to combat congestion.

⁶⁶ “No later than 10 June 2008, the Commission shall present, after examining all options including environment, noise, congestion and health-related costs, a generally applicable, transparent and comprehensible model for the assessment of all external costs to serve as the basis for future calculations of infrastructure charges. This model shall be accompanied by an impact analysis of the internalisation of external costs for all modes of transport and a strategy for a stepwise implementation of the model for all modes of transport.”

In Table 13 we summarise the main features of the new distance based road infrastructure cost recovery for heavy good vehicles in the countries assessed within the case studies. These are benchmarked in the last column with the text of the new Eurovignette Directive. This is followed by a Table which summaries the key aspects of subsidy reform in the three country analysed (Switzerland, Germany and Austria) and by individual detailed case study Tables for each country, followed by comments.

Table 13: Summary table of main features of Swiss, German and Austrian systems compared

Characteristics	Austria	Germany	Switzerland	New EU Directive
Introduction	1 January 2004	1 January 2005 (Act: 2002)	1 January 2001 (Act: 1998)	9 June 2006
Vehicles	> 3.5 tonnes	> 12 tonnes	> 3.5 tonnes	> 3.5 tonnes (mandatory from 2012 onwards)
Network	Motorways and expressways	Motorways, extended to some federal roads in 2007	All roads within the country	Motorways and competing main roads, but all roads permitted
Cost categories included in calculation	Infrastructure costs	Actual infrastructure costs, capital costs taking into account investment and current expenditure	Uncovered costs of heavy traffic including external costs such as air pollution, noise and accidents	Infrastructure and external accident costs; Commission in charge of submitting a proposal for the calculation of other external costs within 2 years
Differentiation	Axles; location (higher tolls for sensitive areas); differentiation according to emission classes planned	Axles and emission classes	Maximum laden weight and emission classes	Vehicle type, location, time of day, environmental costs, infrastructure type and speed. Differentiation according to the environmental performance of vehicles mandatory from 2010 onwards
Fee level for 40 t	€ 0.27 at ≥ 4	€ 0.124 per km	€ 0.57 – 0.74 per	Weighted

	axles (average: € 0.22 per km)		km	average fee shall not exceed infrastructure costs, but Directive provides for exceptions
Revenue use	Toll road network	Infrastructure projects for roads (50%), railways and waterways	2/3 spent on the modernisation railway infrastructure, 1/3 on road infrastructure	Road infrastructure projects and transport sector as a whole (but no strictly prescribed use of revenue)
Other policies alongside tolls to ease implementation	Abolition of vignette and road use fee for tolled vehicles; reduction of vehicle tax ⁶⁷	HGV innovation programme, including a lowering of HGV motor-vehicle tax	Increase in permitted gross vehicle weight of lorries on Swiss roads	

Source: based on Liechti/Renshaw (2006) and Nash et al. (2003), complemented with information from other sources.

5.2.2 Structured analysis of road infrastructure cost recovery in Switzerland, Germany and Austria case studies

Basic information

Country study Austria, Germany, Switzerland

Sector Transport

Recipient Operators of heavy goods vehicles (HGVs)

Nature of subsidy Implicit subsidy (non-recovery of infrastructure and environmental costs).

Nature and scale of environmental problem caused Heavy goods vehicles (HGV) put significant stress on road infrastructure, increasing infrastructure costs. Historically, heavy goods vehicles have not paid the full costs of the infrastructure they require. Furthermore, road freight transport has significant environmental externalities.

⁶⁷ Source: http://de.wikipedia.org/wiki/Lkw-Maut_in_%C3%96sterreich

Original rationale of subsidy	Absence of full cost pricing.
Was the rationale still valid?	The polluter pays principle was the main argument against the existence of such an implicit subsidy.
Year of reform	Switzerland (2001), Austria (2004), Germany (2005)
Detail of reform	Austria, Germany and Switzerland have implemented distance-based HGV charges to recover infrastructure costs, thereby reducing implicit subsidies to shipping by road.
Impact of reform	<p>The main benefits have been economic, shifting infrastructure funding to more of a “user pays” model based on distance travelled and type of vehicle.</p> <p>In Germany, the system collects net charges of €2.5 billion. In addition, the haulage load per vehicle has increased, the number of empty trips has decreased (by 6%) and 6% of road freight has shifted to rail. These changes have decreases associated emissions of carbon dioxide and other pollutants in Germany (CIT, 2006).</p> <p>In Switzerland, the policy has noticeably slowed growth in road freight, but has caused little modal shift. However, because the Swiss policy is based on vehicle weight and emissions, there has been a shift to lower-emission vehicles (CIT, 2006).</p>
Issues of interest, e.g. driver, obstacle, lessons learnt	<p>Inter-modal cross subsidisation in Germany (50% of revenue goes to rail and inland waterways).</p> <p>The policies have been successful and are in line with the EU Commission’s policies for infrastructure charging.</p> <p>The use of on-board distance tracking technology and electronic communication systems allows tolls to be collected without any impact on traffic flow.</p>

Case studies

Country study	Switzerland
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Year of reform 2001

Detail of reform It took 20 years for the introduction of the Heavy Vehicle Fee (HVF).⁶⁸ This is a performance-based fee which aims at full cost recovery including external costs, leading to high charging levels. In the beginning, the main argument in favour of this fee was the high uncovered costs of goods transport by road. It was already planned at this early stage to introduce a performance-related fee, differentiated according

⁶⁸ German: LSV (Leistungsabhängige Schwerverkehrsabgabe).

to weight and distance travelled. But it became apparent that it was—mainly due to technical reasons—too early for such a solution. Parliament therefore decided to introduce, as a first step, a flat fee, which was in many ways similar to the original Eurovignette Directive (1999/62/EC).

The Confederation was legitimated by a referendum to collect the charge from 1985 onwards. One year later, a second proposal for a distance-related fee failed. The population clearly rejected a similar initiative by environmental organisations.

The fixed fee had however been conceived from the outset as a transitional solution to a distance-based fee and was therefore limited in time. In the 1990s, the time seemed ripe for the change to a performance-based fee. Extensive studies had proved the substantial external costs of heavy goods traffic on the road and that the technology for the electronic collection of the fee was now available. But decisive for the final breakthrough of the HVF was the key role it played, and still plays, in transit transport policy, on one hand, and the importance of transit traffic on the overall political level, on the other.

Chronology of events:

- 1978 Parliament requires legal bases for a HVF
- 1980 Government suggests a distance related HVF
- 1984 Introduction of a flat fee for HV
- 1986 Initiative for distance related HVF refused in public referendum
- 1994 Constitutional bases for distance related HVF accepted (Art. 85 Cst.)
- 1998 Law for distance related HVF accepted in public referendum
- 2001 Law came into force

Main driver of reform

The Swiss government and Parliament had a strong political will to introduce this fee. The main argument used was the polluters pay principle. The geographical position of the country makes it a transit country and therefore the issue is quite sensitive one for Swiss people.

The Government pursued the following main objectives

- Implementation of the Polluter Pays Principle;
- Promotion of the shift from road to rail; and
- Solution to the transit problem; and
- Improvement of economic situation through successful negotiations of bilateral treaties with the EU.

Obstacles to reform

Hauliers were natural opponents to the fee, however, they backed down after the referendum accepted the final text of the HVF.

Was there any compensatory

Around two-thirds of the revenue are spent on the improvement of railway infrastructure, mainly in the context of the New Alpine Railway

measure?	<i>Transversales</i> (NEAT, also called ‘AlpTransit’) (Rothengatter, no year). The remaining third goes to the cantons where it is used mainly for road purposes (Nash et al. 2003). The commitment to build the NEAT was part of the political deal with the EU which allowed Switzerland to introduce the HVF.
Was the reform achieved?	The reform was achieved and supported by a strong majority in the 1998 referendum (57%).
Impact of reform	The policy has noticeably slowed growth in road freight, but has caused little modal shift. However, because the Swiss policy is based on vehicle weight and emissions, there has been a shift to lower-emission vehicles (CIT, 2006).
Factors influencing success / failure of reform	<p>According to Balmer (1999), before the introduction of the flat fee in 1984, the European Commission ‘afraid that some Member States might follow the Swiss example, was not at all enthusiastic about the Swiss plans’ to introduce a performance-related fee. The introduction of the HVF was largely the result of a political deal with the EU: the negotiation took to an agreement where the introduction of the fee was a trade-off for the acceptance by Switzerland of increasing the weight limit for lorries. Indeed, whereas Switzerland wanted to reduce the number of lorries by shifting goods transport from road to rail (a political goal which was backed in a referendum in 1994) at the same time, the Swiss economy was very interested in bilateral agreements with the EU. The EU requested not only ‘free access’ for the lorries of its member countries to the Swiss Transit routes, but also the increase of the Swiss weight limit from 28 to 40 tons. Although it was clear that such an increase of the weight limit would be a strong impetus for growth in the number and size of lorries on the Swiss roads, Switzerland was too interested at that time to be part of bilateral treaties to decline. The HVF provided a way out of this deadlock. If its rate would be fixed on a level high enough, the HVF would be a sustainable instrument against the avalanche of lorries that people along the transit routes were concerned about. The level of the fee was also a point of lengthy negotiations between Switzerland and the EU.</p> <p>The HVF cleared its final political hurdle in September 1998 with a surprisingly large mandate: after a strong campaign, 57% of Swiss citizens voted in favour of the new fee.</p>
Is the reform transferable?	Yes.
Lessons learned	<p>Balmer (2003) concludes that lessons for successful implementation can be drawn on three levels: the scientific, political and technical levels:</p> <ul style="list-style-type: none"> • Solid scientific basis: solid scientific work was done to define the level of the fee. Without this approach, it is believed that full cost recovery including external costs, leading to high charging levels, would not have been politically accepted. • Policies had clear targets:

- One of the strongest arguments that placed stakeholders in favour of the HVF was its link to the polluter pays principle.
 - A large majority of people agreed that up to 2/3 of the revenue from the HVF should be used for projects in public transport (in particular, rail).
 - The political deal of introducing the HVF to outbalance the negative effects of the higher weight limit, led the project to be on safe political ground.
 - The introduction of the fee had a high political legitimacy, as it was approved not only by the government and the Parliament, but also by the people.
- **Simple implementation system:**
 - Central administration and monitoring: the technical implementation of the system was developed by a highly competent authority, the Swiss Customs Authority. The knowledge of external experts was also integrated.
 - Co-operation with relevant business: even though hauliers were natural opponents to the fee, co-operation between them and the authority in charge developed well, once the last political hurdle of implementation had been taken.

Sources of information

See references

Country study Germany**Year of reform**

2005

Detail of reform

Chronology of events:

- 1995 Federal Transport Minister announces the introduction of a distance-based HGV charge
- 1998 The new “red-green” Federal Government decides to introduce an “anti-congestion programme” financed by a HGV charge; Federal Transport Minister announces introduction of the charge by 2002, supported by Transport Ministers of all Federal States
- 1999 Award procedure for the technical realisation of toll collection starts
- 2001 Federal Government decides to introduce the charge by 2003
- 2002 Contract is awarded to Toll Collect consortium
- 2003 July: Start of the system (planned for August) postponed until November for technical reasons

- October: Start of the system postponed to indefinite date
- 2004 February: After threat by the Federal Government to dissolve the contract, new agreement with Toll Collect for a start in January 2005 under tightened penalty and liability conditions
- 2005 January: Start of the system

The system started operating on 1 January 2005. Lorries pay between €0.09 and €0.14 per kilometre depending on their emission levels and number of axles. The scheme, combines satellite technology with other technologies, and suffered numerous delays before implementation, due to its complex technological features.

Main driver of reform

The main actor in favour of the reform was the Ministry of Finance, supported by environmentalists and others. Their main argument was the ‘polluter pays’ principle.

The main objectives pursued by the reform were the following (Nash at al., 2003):

- More rigorous application of the “user pays” principle;
- More efficient use of transport infrastructure capacity;
- Fairer conditions of competition for road and rail modes, connected with the objective (laid down in the national strategy for sustainable development) to double railway freight transport by 2015 in comparison to 1997 values;
- Financing infrastructure in order to remove bottlenecks and reduce congestion;
- Fair competition between domestic and foreign hauliers;
- Promotion of innovative technologies; and
- Environmental motives are implicit in the objective to shift goods transport from road to rail. However, the goal to eliminate “bottlenecks” (in rail and shipping routes as well as roads) is environmentally ambiguous, as the elimination of bottlenecks often leads to increased traffic (Kossak 2002).

Obstacles to reform

The main opponents of reform were: hauliers’ associations, Chambers of Industry and Commerce, German car manufacturers’ association, German association for the promotion of roads and motorways. Despite the fact that those negatively affected by the measure were relatively few, their protest was powerful and well organised.

Their main argument against reform was that transport is a vital sector for the economy and that it already bears a heavy financial burden from excise duties.

In the German case, the European Commission took a relatively minor role. However, it may be seen as symptomatic that the first German attempt to impose an HGV fee on motorways in 1990 was defeated by the European Court of Justice after only a few weeks, because European legislation did not permit to combine the introduction of the fee with a planned reduction of vehicle taxes (BMVBS, 2007).

The award of the operation of the system to the German-led consortium Toll Collect was suspected not to be in line with EU competition rules and was approved by the Commission under certain conditions in April 2003 (*Frankfurter Rundschau* of 18 February, 2004). Further, in 2003 a dispute with the European Commission occurred over a planned refunding of the charge to German hauliers (*Handelsblatt* of 26 August, 2003). This could have become a reason to delay the start of the system, but actually the start was delayed because of technical problems. While the Commission continuously opposed any rebate scheme for German hauliers as discriminatory, in January 2007 it finally approved an HGV innovation programme for the purchase of low-emission vehicles, which Germany had put forward as an alternative and which included a reduction of the vehicle tax rate.⁶⁹

Was there any compensatory measure?	The net toll revenue is spent exclusively on the improvement of the transportation infrastructure, to be used for anti-congestion measures, improvement of rail and inland waterway networks, as well as extending the motorway network. 50% are earmarked for roads, 38% for the railways and 12% for the waterways (Nash et al. 2003, Kossak 2006).
Was the reform achieved?	Yes.
Impact of reform	The haulage load per vehicle has increased, the number of empty trips has decreased (by 6%) and 6% of road freight has shifted to rail. These changes have brought associated decreases in emissions of carbon dioxide and other pollutants in Germany (CIT, 2006).
Factors influencing success / failure of reform	<p>The debate on the introduction of a HGV charge has been on the agenda for decades.</p> <p>It is not easy, if possible at all, to identify where the shift in favour of the measure had been, as there were a number of moments where certain arguments more than others became prominent and received support in the political discussion. In this context, scientific studies existed, but it was not necessarily the most important scientific studies that became most visible to the public.</p> <p>Instead, in this case the turning point was the creation of a specific public <i>forum</i> which highlighted arguments that already existed before. A very important driver was the establishment of the Pällmann Commission on road infrastructure financing, in 1999, which released its report in 2000. <i>Important to note, its remit covered only infrastructure financing, not environmental and social external costs.</i></p>
Lessons learned	See comments.

⁶⁹ http://www.bmvbs.de/Verkehr/Strasse/Pressemeldungen-,1815.985072/Tiefensee-Bruessel-gibt-gruene.htm?global.back=/Verkehr/Strasse/-%2c1815%2c0/Pressemeldungen.htm%3fmlink%3dbmv_liste%26link.sKategorie%3d

Sources of information See references

Country study **Austria**

Year of reform 2004

Detail of reform Already in 1996, a law for the introduction of an *LKW-Maut* was decided, with the aim of introducing a *Maut* in 1998. However, there were important delays and political controversies. It was only after further debate and the introduction of a new law that a call for tender for the technical implementation of the road charging system could be launched in 2001. In 1997, the Vignette was introduced as a transitional solution. Until 2003, the vignette was applied for all vehicles below or equal to 12 tonnes, while a user fee was to be paid by vehicles over 12 tonnes. At present, the vignette still applies for vehicles below or equal to 3.5 tonnes, while the distance-based toll is applied for vehicles above 3.5 tonnes. At the start of the system in January 2004 there were some, mostly minor, organisational and technical problems. Main arguments for the reform were: financing the motorway network and slowing down the growth of road freight-traffic.

Main driver of reform The Austrian association for sustainable mobility (VCÖ) has been, and continues to be, a strong supporter of the distance-based HGV charge. It argues in favour of extending the charge to all roads, extending its calculation basis to cover external costs, and using part of the revenue for railways instead of roads. Acute road financing and debt problems were at the origin of plans to introduce the charge. The construction of motorways was financed by credits, which imposed an increasing debt burden on the state budget. In the early nineties, therefore, suggestions were raised for a further implementation of tolls on the entire motorway network. In the end, it was Austria's membership of the European Union which started in 1995 and the coming currency union that made it necessary to find acceptable solutions to reduce the debts in the state budget. The strategy was to transfer the entire high-level road network including the debts into the private sector. For that reason, the existing state-owned financing company ASFINAG, a stock company, received by law the responsibilities for the whole motorway sector (design, construction, maintenance, operation and financing). The company took over from the state the financial obligations concerning motorways (5.7 billion Euro) and received by contract the right to collect toll and user charges on the entire motorway and express road network in its own name. (Schwarz-Herda 2005)

Obstacles to A prominent opponent against the charging scheme was the Austrian Federal

reform	<p>Economic Chamber, through the Austrian hauliers' association as its member. In addition, the Austrian Camping Association protested because camping mobiles were also to be charged. The protests were supported by German camping tourists.</p> <p>One point of controversy, which caused considerable delay of the system, was the question of whether to introduce a "dual" system (a combination of manual and electronic control) or fully electronic system. VCÖ lobbied in favour of the fully electronic solution, calling the dual system an outdated and expensive technology which in addition would contribute to congestion, reduce road safety and destroy the landscape.</p>
Was there any compensatory measure?	The state-owned company ASFINAG, which is responsible for the design, construction, maintenance and operation of motorways and express roads, is entitled to use the entire net toll revenue for its statutory purposes. Toll revenues are its only source of finance; it does not receive budgetary support.
Was the reform achieved?	Yes.
Impact of reform	n/a
Factors influencing success / failure of reform	<p>A licensing system of "Eco-points" was introduced in 1993 as a part of the transit agreement between Austria and the EU. The main goal was to reduce NOx emissions from transit transport (HGVs from EU states) to 60% of 1991 values by 2003. In addition, the agreement limited the maximum allowed number of transit trips to 108% of 1991 values. Eco-points were distributed according to NOx emissions (lorries emitting more NOx needed more ecopoints to pass through Austria). Eco-points were to be distributed among EU Member States by the European Commission, while the total number of trips was limited to 108% of the 1991 value. From 2000 onwards, the agreement led to tensions between Austria and the European Commission over the exact number of trips to be allowed (differences based on counting issues) with involvement of the European Court of Justice.</p> <p>The controversy with the European Commission about Eco-points was one argument for Austrian supporters of the distance-based road pricing scheme (notably, the association for sustainable mobility VCÖ) to press for a rapid introduction of that scheme. The expiration of the transit agreement in the end of 2003 made a follow-up solution necessary in order to prevent a further increase in HGV transit and associated damage.</p> <p>After the implementation of the new road pricing scheme, there was a dispute with the European Commission on the basis of Directive 99/62 because Austria imposed higher toll rates for the Brenner motorway, which in the view of the Commission exceeded the actual infrastructure costs. The purpose of the higher local charge was indeed to limit transit traffic for environmental protection reasons, especially in a situation where Switzerland had imposed far higher fees on alternative transit routes.</p>
Is the reform	Yes.

transferable?**Lessons learned**

The toll system was implemented in spite of strong opposition at the beginning; however it is now well accepted because of experienced technology and a simple and understandable system with low equipment costs for the users. Because of the user friendliness of the system, user acceptance is high, although there are some problems with local traffic diversion to parallel non-tolled roads.

Further, Schwarz-Herda (2005) lists the following factors of success:

- Exact definition what the objectives and goals of the system should be;
- Serious and detailed preparation of the design and the tendering procedure;
- Necessary political support for all stages of implementation;
- Balanced mix of experts experienced in the subject of charging or toll collection;
- Choice of a system that is easy understandable for the users;
- Early information and integration of representatives of the upcoming users; and
- Decision of a realistic schedule for planning and realisation of the system in the context of political time pressure.

Sources of information

See references

5.2.3 Additional Considerations*Potential extension of road pricing to private cars*

- As we gather from public debates in Germany and from the literature (Baum, 2005) on the issue of road pricing, public acceptance could become a big problem, were the charge to be extended to private cars. There is a general suspicion that there will be additional charges instead of a revenue-neutral shift from taxes (e.g. excise duties) to user charges. It is likely that a shift of the taxation burden, rather than a net increase in charges, would be key to public acceptance. On the other hand, this could diminish the environmental effectiveness of the system. Importantly, supporters and opponents of road pricing ('*PKW-maut*') are spread across the usual political fields. As a tendency, the conservative party (which is usually a firm part of the pro-automobile lobby) supports the idea but not unanimously, while there is more opposition than support from the Social Democrats, including the present as well as the former federal transport minister. In Autumn 2005, there was a narrow vote of *Länder* transport ministers against the introduction of *Pkw-Maut*, with particularly the ministers from northern states against. Opinions about the *Pkw-Maut* are divided as well in the field of environmentalists. Some leading German transport experts believe that it is, however, very likely that the *Pkw-Maut* will be introduced within 15 or 20 years.

Arguments in favour of road pricing:

- Making costs more transparent to users would constitute a progress in the incentive structure of pricing;

- differentiation of charges according to time and location would contribute to a more efficient use of existing infrastructure;
- increase foreign car drivers' contribution to maintenance of German roads (although questionable for various statistical and economic reasons (Baum, 2005), this argument is likely to increase popular support).

Arguments against road pricing include the following:

- There should be no more financial burden on car drivers; it cannot be ensured that gas prices go down when other charges go up (populist argument of ADAC, which is the German equivalent of the American Automobile Association)⁷⁰;
- data safety issues;
- on the other hand, environmentalists are against private car road pricing if it was to replace other charges which have an important incentive function as well, or if it was introduced in a time-based (as opposed to distance-based) form which would not provide any incentive to drive less.

The role of transparency for public acceptance

- While there is the view that it is not environmentally sound to spend a significant part of the revenue on the improvement of road infrastructure, on the other hand the view was expressed that using revenue from road user charges for the improvement of railway and shipping infrastructure constitutes a distortion of competition in favour of non-road infrastructure. The state-owned company responsible for the distribution of funds for infrastructure seeks to avoid criticism by maintaining a high degree of transparency in its documentation of revenue and expenditure.
- Transparency of external costs generally promotes public acceptance, but it is also an important factor for public acceptance that if charges are raised, other fiscal burdens (vehicle taxes or excise duties) are lowered. The internalisation of external costs requires a thoroughly developed and implemented communication concept. If this condition is fulfilled, there is a good chance for cost-internalisation measures to be accepted. For instance, the department of Traffic and Transportation Psychology at Dresden University developed a communication concept for the state of Saxony.
- It has to be taken into account, however, that in Germany, opposition against full-cost pricing in the transport sector often does not rely on sound arguments, but on public sentiment reinforced by certain media and exploited by certain political parties. Therefore it is not assured that sound information alone will change voters' minds. It also needs to be taken into account that car drivers make up a big proportion of German population, thus their interests are not necessarily perceived as particular interests but as common interest of the "ordinary people". The plans to extend road user charges to private cars will provide the test case of whether, and under what terms, road pricing will be feasible even when a majority of voters is affected.
- The importance of a sound scientific basis was specifically highlighted in the Swiss case, where the rate of the fee was fixed after an extensive investigation into external costs. In both Germany and Austria, studies were carried out to calculate infrastructure costs as a basis of the fee rate. However, at least in the German case, the

⁷⁰ ADAC website: <http://www.adac.de/Default.asp?TL=2>

main stated purpose of this study was compliance with EU legislation (which limited charging to the actual infrastructure costs) while it is not likely that the exact calculation was needed to convince the German public. In general, however, scientific studies certainly had a role in backing arguments of the supporters of the charge.

- From economic theory, earmarking the revenue for certain purposes is generally not the most efficient way of spending. However, it is recognised that public acceptance is more likely if revenue from road charges is spent within the transport sector. Although a cross-subsidisation of non-road infrastructure (in particular, the railway network) may be, and has been, viewed by some as a non-justified and distorting form of revenue use, the Swiss example shows that this need not be a major obstacle to acceptance; on the contrary, if the goal of a modal shift is widely supported, then a corresponding use of the revenue will be supported as well.

Subsidy reform does not happen in isolation

- Connection with transit problems in Switzerland and Austria and with transit agreements with the EU.
- Context of policies to shift from road to rail: More pronounced/consequently applied in Switzerland, less consequently applied in Germany. The observation has been that improved efficiency of road transport (induced by the user charges) strengthens its competition position, which to some degree outweighs the support that charging and revenue use policies are supposed to give to railway transport. As a consequence, complementary measures need to be taken to strengthen railways' competitive positions in turn.

The need for strong leadership and a broad coalition

- In all three cases, the process from initial discussion to final implementation was a matter of decades. Although technological process also had a role in the finally successful implementation, history shows that above all, patience was needed in the political process. In none of the three cases could a single leading figure be identified.⁷¹ Rather, it seems that certain groups (among politicians, supported by economic scientists and environmentalists) had a leading role in highlighting the idea again and again. In terms of coalitions, there was an alliance of motives from fiscal and environmental policy, supported by economic theory. An important political economy fact is that the group of those negatively affected by the measure (notably, hauliers) was relatively small: So, even though they strongly protested, the measure could finally be installed against their opposition.

The need for a well-managed process that takes advantage of any beneficial economic circumstances

- Stepwise introduction of the fee in parallel with the increase of the weight limit proved to be very important for public opinion acceptance in Switzerland.
- Role of technology: This was successful in the Swiss case and, besides some starting problems, in the Austrian case. User-friendly technology was highlighted as one

⁷¹ For Switzerland, Balmer (2005) suggests a prominent role of transport minister Moritz Leuenberger in paving the way for public acceptance. For Germany, which had five different Federal Transport Ministers in the five years from 1998 to 2002, no clear leadership can be identified at the ministerial level.

important factor of acceptance. In the German case, technological realisation was obviously poorly managed as the Federal government trusted the private operator's unrealistic timelines and signed an unfavourable contract in terms of liability. However, this drew criticism about the form of implementation rather than about the measure itself; and once the technology came into operation with a delay of 16 months, it worked well.

- Beneficial circumstances: Switzerland made use of a “window of opportunity” (Balmer 2005) related to the negotiations with the EU.
- In the case of Austria, another driving force was the obligation to reduce state debt in order to meet the stability criteria of the European monetary union. This led to debts from infrastructure construction being assigned to a private company with the right to recover costs via road tolling.

The role of the European Commission and Community Legislation

- One key difference to the energy sector may be that the EU / European Commission plays a more ambiguous role in the promotion of subsidy reform. While in the energy sector, the European Commission has often been a driver of reform in the context of competition arguments, in the transport sector, it has occasionally posed obstacles to environmentally motivated reforms on the grounds of arguments related to the free movement of goods in the internal market, which becomes particularly visible in the cases of Austria and Switzerland as Alpine transit countries. As part of this ambiguous role of the Commission, it can be observed that Commission pressure for free HGV transit was a major catalyst for the introduction of distance-based charging in Switzerland and Austria.
- The old and new Eurovignette Directives also have an ambiguous role, in that in practice, they set maximum levels for charges by limiting their calculation basis and largely excluding externality costs. According to Nash et al. (2003), the Eurovignette Directive's main purpose was to set a limit for the maximum infrastructure access charges payable as a general supplementary licence for heavy goods vehicles, on the basis of average infrastructure costs, with non-discrimination between goods vehicle operators of different nationalities. Environmental NGOs such as T&E criticise the fact that the application of external cost pricing by Member States has in fact been postponed for several years because agreement on the basis for the calculation of external costs is still to be reached.
- Rothengatter (2004), when comparing the Swiss, Austrian and German systems, states that all in all, “only the Swiss electronic charging system is a success story” and suggests that the fact that Switzerland was not obliged to follow the EU Directive put the country “in a position to develop an efficient solution consisting of a comparably simple technology, which works reliably and cost effectively”. Although he does not elaborate on the linkage between EU obligations and technology, this probably refers to the former Eurovignette Directive limiting charging systems to motorways. The fact that Switzerland was not prevented from including external cost can also be seen as an advantage over EU countries: Besides the internalisation of external costs as a policy goal in itself, together with the cheaper technology, the higher fee rates in Switzerland led to operation costs only consuming 5% of the revenue, compared to 20-22% in Germany with the most expensive technology and the lowest rates⁷².

⁷² Figures from Liechti / Renshaw 2006.

5.2.4 *Key lessons from road charging*

- A strong external pressure on environment and economy (in this case, transit traffic) was a key driver of the countries leading on road pricing.
- Although not the most economically efficient solution, earmarking of revenues can greatly improve public acceptance.
- Imposing such a system can be a long and imperfect process
 - Less-than-ideal interim measures may be needed
 - Political opportunism was also a factor in several cases
- The right political conditions are needed
 - Strong leadership
 - Cross-party consensus
 - Broad public acceptance to overcome sectoral opposition
- A strong evidence base was a key requirement of public acceptance
- Clarity of aims and transparency in implementation are also important.

5.3 Commuter subsidies⁷³

5.3.1 Background and Introduction

Commuters' subsidies are often given in the form of deductions for travelling expenses from their income taxes (e.g. Germany). Income taxation is almost exclusively the domain of the Member States, provided it does not affect the free movement of persons, workers, capital, goods and services. The European Commission could however call for some common features that would reduce the environmental harm of such subsidies, including commuter subsidies (EEB, 2004):

- The tax credit should be limited to a maximum commuting distance, above which there is no further increase;
- Tax credit should not be higher for the use of private cars than for public transport;
- Tax deduction should be substantially decreased within five years;
- The amount of the tax credit should not depend on the individual income of the commuter.

Commuters' subsidies are in place in many countries. In a recent project for the EEA, Ecologic found €4,865 billion go in annual commuter-tax deductions in Germany, Austria, and Sweden; countries that have this subsidy but for which total figures were not found are: Belgium, Denmark, Finland, Ireland, and the Netherlands. Italy, UK, Spain, Greece and Portugal do not offer this subsidy (as of 2000). The situation in Germany is an interesting political case study, because the commuter tax subsidy was actually increased after the ecological tax reform (see energy case study) had been passed (and in some ways as a response to the increased costs of ETR). This case study tries to assess the difficulties, if any, of reforming a relatively newly increased subsidy.

5.3.2 Structured analysis of commuter subsidies reform in Germany and the Netherlands

Country study Germany and the Netherlands

Sector Transport (Recipient: commuters)

Nature of subsidy *Germany:* the Germany commuter tax deduction (referred to as the *Entfernungspauschale* or *Pendlerpauschale*) offsets the cost of commuting through tax deductions.

The Netherlands: all Dutch employees living more than 10 km from their work could deduct an amount of travel costs from their taxable income. This amount was related to the distance from home to work and it clearly was a subsidy on commuter traffic, including by car.

Nature and The environmental effects of subsidising commuters stem from increased

⁷³ Based on case study contributions by Ecologic.

scale of environmental problem caused	<p>energy use, additional need for transportation infrastructure, and additional urban sprawl. According to EEB (2004) this gives a high incentive for employed people to move out of cities and to commute long distances from suburban areas. Also, until 2001 the allowance was higher for commuters with private cars than for those using public transport, therefore favouring the individual use of cars.</p> <p>The tax was also criticised for being regressive in nature, as car commuters are, on average, wealthier than those using public transit.</p>
Original rationale of subsidy	<p>The original rationale for the subsidy was to increase access to job markets for people living in rural areas. This rationale is still a key motivator for opponents to removal of the subsidy.</p>
Budget impact	<p>In a recent project for the EEA, Ecologic found €4,865 billion in annual commuter-tax deductions in Germany, Austria, and Sweden (EEA, 2007). In Germany, initially, the <i>Entfernungspauschale</i> caused foregone revenues of €5.8 billion (Innovations Report, 2005). Countries that have this subsidy but for which total figures were not found: Belgium, Denmark, Finland, Ireland, the Netherlands. Italy, UK, Spain, Greece and Portugal do not offer this subsidy (as of 2000).</p>
Was the rationale still valid?	<p>The original rationale is still a key motivator for opponents to removal of the subsidy.</p> <p>In Germany, the reform embodied a change in philosophy: a commuting trip is no longer considered a purely work-related (and therefore, tax-deductible) activity. Rather it is a personal lifestyle choice regarding where to live in relation to one's place of work.</p>
Year of reform	<p>2001, 2004, 2006</p>
Detail of reform	<p><i>Germany:</i> in 2006, Germany reformed its mileage allowance for commuters that allowed commuters to deduct the expense of travelling to and from work from their income taxes (the <i>Entfernungspauschale</i>).</p> <p>Before 2000, the <i>Entfernungspauschale</i> was strictly an income tax deduction for automobiles. In 2000, the law was reformed to be independent of transport mode—an improvement from an environmental perspective because public transport users also benefitted. However, at the same time, the per-kilometre rate was actually increased in 2000 (from 36 cents per kilometre) to offset sharp spikes in market prices for fuel, as well as cost increases stemming from ecological tax reform (Agenda 21, 2000). From 2001, commuters could deduct 36 cents up to the 11th kilometre and 40 cents for each additional kilometre, a policy that mainly benefited automobile drivers with long commutes (Agenda 21, 2004).</p> <p>Effective in 2004, the rate was reduced to 30 cents per kilometre (FOE, BUND, Innovations Report). In 2006, opponents to the subsidy only succeeded in getting the subsidy further reduced (rather than abolished). Beginning in January 2007, the subsidy (30 cents per kilometre per day) is limited to travel exceeding 20 kilometres to work (i.e. commuters can only</p>

claim tax credit beginning with the 21st kilometre travelled each day).⁷⁴

Netherlands: in 2001, in the Netherlands, the travel cost deduction has been restricted to commuters travelling by public transport (and, until 2003, for those travelling by bicycle).

Main driver of reform	Sustainability advocates (e.g. German Council for Sustainable Development), environmentalists and those seeking to reduce budget deficits called for its reform.
Obstacles to reform	The main opponents of reform were commuters who benefited from the tax deductions. Reform is made difficult by the trade-off between environmental and social considerations, with only the pressing need to close large budget deficits providing sufficient political will to reduce the subsidy.
Was there any compensatory measure?	No.
Was the reform achieved?	<i>Germany:</i> the 2004 reform reduced the subsidy by 30% to €4 billion. The 2006 reform achieved further reductions. The reformers praised the 2006 reduction in subsidies, but criticised the fact that by allowing the subsidy only for trips over 21 km per day, the end result was a subsidy even more heavily tilted to those living far away from their places of work. <i>Netherlands:</i> Yes (see detail of reform).
Impact of reform	Since the brief increase in the <i>Pendlerpauschale</i> subsidy in 2000, the subsidy has been cut almost in half from historical levels. The tax deduction is typically one of the largest for German taxpayers, who will first be faced with the change in their 2006 tax returns.
Factors influencing success / failure of reform	Budget and environmental concerns were a main motivating factor. A key legal issue: the reform redefined the legal definition of commuter costs as being private costs, thus exempting them from deduction as business expenses. As of February 2007, this redefinition is under legal review and could affect the success of the reform.
Is the reform transferable?	The reform is transferable, as commuter tax deductions are used in several countries. However, ongoing legal issues related to the German case are relatively unique (the question of whether the costs of going to work are private or business related costs).
Lessons	Environmentally harmful subsidies (in the form of the <i>Pendlerpauschale</i>)

⁷⁴ Finanztip (2006) “Steueränderungen 2006”. Available at <http://www.finanztip.de/recht/steuerrecht/steueraenderungen-2006.htm>. See also <http://www.steuer.bayern.de/faq/alle/5-entfernungspauschale.htm#tz5.1> for details on stepwise reform. More on 2006 reform here: http://www.bundestag.de/aktuell/hib/2006/2006_157/04.html

learned were increased in Germany in 2000 despite the passage of ecological tax reform in 1999—a contradiction, but one that speaks to the importance of short-term politics (in this case, broad public concern over rapidly increasing fuel prices). Some key lessons from this case: political parties have several policy priorities, some of which can contradict each other; setbacks in the reform process can be expected; accomplishments in reform can be undone; core legal issues may come into play.

Sources of information See references

5.3.3 *Additional considerations*

Insights on environmental and social effects of different options

- Here are some of the environmental and social considerations to take into account for some types of tax reductions. These are far from exhaustive as there are different provisions in EU Member States, depending on other factors such as the availability of public transports, or the existence of minimum or maximum distances for which the provision applies.

Table 14: Environmental and social effects associated to tax reductions

Type of tax reduction	Environmental and social effect
(Part of) commuter cost deductible from income tax	Environmentally negative, because it creates incentive to commute long distances.
(Part of) commuter cost deductible from taxable income	Socially negative, also, because those with high income receive high tax deduction.
Similar tax rebate for all means of transport	May create a positive incentive to use public transport, because the costs of private cars are normally higher. May also be an incentive to cycle or walk.
Differentiated tax rebate depending on means of transport	If car users are allowed to deduct higher costs from their taxable income than commuters who use public transport, this creates a negative incentive to using public transport.

Source: EEB, 2004

5.3.4 *Key lessons*

- Different environmental tax reforms can sometimes come into contradiction
 - In Germany, commuter subsidies were increased in order to offset the impacts of Ecotax reform
- A gradual approach to reform can be effective and more easily accepted
- Budgetary difficulties can be a motivating force for tax or subsidy reform

5.4 Company car tax reforms⁷⁵

5.4.1 Background and introduction

As company cars are assets of a company and provide non-monetary benefits to those employees who use them, company cars and their use is subject to tax. To reflect the business use of the car, corporate tax arrangements will typically allow the company's purchase and running costs to be reflected in the calculation of company profits as with other equipment and costs, and hence to count against corporation tax liabilities. In addition, to reflect the private benefit to the user, national taxation and social insurance systems are likely to be adapted in some way to tax the private use as a 'benefit in kind' (from ABRL, 2006).

The company car taxes 'special treatment' to employees is based on the principle of reimbursement of costs to drivers on company business, but also as a benefit (or a bonus) to employees. Company car use has been widely used as a way of providing non-taxable fringe benefits to employees. This encouraged longer drives for private purposes, transforming the allowance in an implicit subsidy to drive farther.

In terms of the usage level of company cars, the treatment of usage elements of the taxation structure have been proven to result in a perverse environmental incentive in respect of vehicle usage. The case study reported here is of the reform of such implicit subsidy with perverse environmental impacts. It is a success story, as we found evidence that the reform brought along behavioural changes in company cars managers and drivers.

Box 5: Use of private car for business purposes

A related issue is that of use of private car for business purposes. The principle here is very similar, although separate from that of company cars. Where an employee uses their own vehicle for company purposes, they are entitled to claim back the expenses incurred for the journey (i.e fuel, depreciation, vehicle wear etc). The total amount reimbursed is set as a function of the total distance travelled. This system is in place in many Member States, including the UK. In the UK, for example, a system of statutory mileage allowances still exists, with the level currently set at £0.40 (€0.58) per mile up to 10,000 and £0.25 (€0.36) per mile above 10,000 miles (ABRL, 2006). In Italy, the present fiscal law incentivises the reimbursement of company trips made in private cars. Where the fiscal power of such vehicles is up to 17kW for petrol and 20 kW for diesel, the costs are totally deductible. The difficulty in this case is the fact that there is no mechanism to check on the actual fiscal power of the private car making the trip and employees can claim to be below these thresholds, thereby receiving the cost deductions without validation. The example of Hungary is useful as it provides a monetary figure of what this entails: employees that use company cars for private use, 'evading' the payment of personal income tax and social security tax lead to are total revenue loss of at least HUF 600 billion each year (Lukács 2004). This, according to Lukács (2004), exceeds all State revenues from yearly fuel and car taxes.

⁷⁵ Based on case study contributions by IEEP.

5.4.2 Structured analysis of company car tax reform in the UK

Country study	UK
Sector	Energy/transport/other
Recipient	Company car drivers
Nature of subsidy	<p>The subsidy was implicit, as it effectively rewarded company car drivers for driving further. The system had three tax bands based on annual mileage, and a declining percentage tax rate applied to the band of drivers who drove the most. In detail, tax breaks were available at the 2,500 and 18,000 annual mile thresholds, giving a strong incentive to drivers who were approaching these mileages to cover the additional miles to secure the tax benefits. In addition, once the vehicle was over four years old, the tax liability was reduced by 25%.</p> <p>In 2005 in the UK there are 1,363,204 company cars, which represent 5% of the total numbers of registered cars.</p>
Nature and scale of environmental problem caused	<p>There was an incentive to drive more to be classified in a higher mileage, but lower tax, band, thus resulting in additional driving and the additional fuel use and emissions that resulted. Also many company car drivers receive all their fuel for free and pay only a fixed tax charge irrespective of how much they use. Hence their marginal cost of driving is zero, and there is no incentive to economise on fuel.</p> <p>Also, evidence from a study conducted by ABRL (2006) suggests that 'non-private' cars generally have larger engines, are more likely to be diesel, and are heavier than private cars. For EU countries for which data is available, it is generally the case that the proportion of private cars that are categorised as small is larger than the equivalent proportion of 'non-private' cars by around 10%. On the other hand, the proportion of 'non-private' cars that are large exceeds the proportion of private cars that are large by typically between 8 and 10%. The data also shows that a far higher proportion of 'non-private' cars tend to be diesel than is the case with private cars.</p>
Original rationale of subsidy	<p>As company cars are assets of a company and provide non-monetary benefits to those employees who use them, company cars and their use is subject to tax. To reflect the business use of the car, corporate tax arrangements will typically allow the company's purchase and running costs to be reflected in the calculation of company profits as with other equipment and costs, and hence to count against its tax liabilities. In addition, to reflect the private benefit to the user, national taxation and social insurance systems are likely to be adapted in some way to tax the private use as a 'benefit in kind', but such arrangements are generally rather simplified, and do not reflect actual levels of use.</p>

Economic impact	Originally intended as a non-income benefit for employees, company cars are still regarded as a valuable ‘perk’ by many. This can lead to excessive and unnecessary trips, and to a car stock that is larger and less fuel-efficient than most motorists would choose.
Was the rationale still valid?	Yes - it was an unintended consequence of the design of the taxation that led to perverse environmental effects.
Year of reform	April 2002
Detail of reform	The UK system has now been amended to be based on a combination of list price and CO ₂ emissions, with the result that CO ₂ emissions from company cars are now, on average, lower than those of private cars. In detail, on April 2002 (ACEA, 2006) company car taxation was fundamentally changed. The new company car tax uses a tax base of 35% of the tax inclusive list price of a car, including extras, accessories or options. Discounts are applied from the standard 35% according to the car CO ₂ emissions (gCO ₂ /km) and fuel type (petrol, diesel, alternative fuels).
Main driver of reform	NGOs campaigned against this system for many years, and increasingly their arguments were accepted by more enlightened companies who saw the problems of the system. Environmental parameters are increasingly being introduced in company car taxation systems, with the UK and France adjusting their taxation to reflect CO ₂ emissions, whilst Poland introduced a company car fee for environmental pollution in 2000, which is linked to fuel consumption. Company cars are particularly important drivers of the whole fleet – although only a few percent of total, half of new cars are bought by companies.
Obstacles to reform	Vested interests in status quo. Also drivers who manipulated the system for high personal mileage.
Was there any compensatory measure?	No – intended to be revenue neutral. A study was also undertaken to ensure that there would be no adverse impacts on social equity.
Was the reform achieved?	Yes. The mileage-based approach has now been eliminated from the company car regime, but pence per mile schemes which reimburse drivers using their private car on company business still incentivise travel by car. The private scheme would need to mirror the company car scheme to remove this incentive completely (ABRL, 2006).
Impact of reform	The result now is that CO ₂ emissions from company cars is, on average, lower than those of private cars. It has been estimated that the reduction in business mileage, following the tax reform, was between 300 and 400 million miles or 25,000 to 35,000 tonnes of carbon every year (IR, 2004). In general, the overall UK regime has improved significantly in reducing

perverse incentives, particularly environment-related ones (ABRL, 2006).

Factors influencing success / failure of reform	In general, the linking of Benefit in Kind, employer-provided fuel and vehicle excise duty (VED) to CO ₂ emissions does appear to be driving company car drivers towards lower-emitting vehicles, and the relative CO ₂ emissions performance of different models increasingly features in a company car driver or fleet manager's decision-making process.
Is the reform transferable?	<p>The reform has proved successful and it could be transferred to an extent to other countries, depending on the exact design of their company car taxation system.</p> <p>It is worth noting that in many new Member States and candidate/applicant countries for which information is available, many did not tax company cars differently from private cars (apart from in respect of reclaiming expenses), e.g. Cyprus, Latvia and Turkey and Croatia. This possibly reflects the fact that company cars appear not to be as common in these countries. (ABRL, 2006)</p>
Lessons learned	<p>Reform was strongly resisted until a clear evidence base was established by new research.</p> <p>Also progressive elements in government and industry were prepared to help and champion change.</p> <p>It took over 10 years to affect change.</p>
Sources of information	See references

5.4.3 Additional considerations

Positive behavioural changes brought about by company car tax reform in the UK

- The Inland Revenue's own analysis of the changes (IR, 2004) found that over half of the employers surveyed were actively encouraging a switch to lower emissions cars; while 59% had changed their policies towards emissions and 36% had changed their policy towards car list prices (IR, 2004). Given the findings of the Lex (2001) study, this appears to suggest that company car tax reform has had an impact on the environmental policy of fleets in the intervening period.
- Average CO₂ emissions from new company cars have also fallen in the UK from around 199gCO₂/km in 1999 to 182gCO₂/km in 2002. This reduction has been estimated to have saved between 0.15 and 0.2 million tonnes of carbon in 2003 (IR, 2004). Further analysis (Fergusson and Skinner (2004) also indicated that company cars in the UK are now more CO₂-efficient on average than those bought by private buyers, which is a radical reversal of past trends
- The UK tax reform itself, however, also appears to be having some further influences on the company car market, and these were not necessarily desirable. In the first two years following its introduction, the number of company cars in the UK fell by 250,000 (IR, 2004). A number of factors are believed to have contributed to this including an increase in the cash out option, increase in personal leasing and employee car ownership schemes and employees switching

from vehicles taxed under company car tax to those taxed under company van rules (IR, 2004). The possible implications of this reduction are that those opting out do so in order to continue to purchase and drive vehicles which would otherwise be subject to high charges under the company car tax scheme i.e. those that have higher fuel consumption and CO₂ emissions levels. This effectively dilutes the positive environmental impact of the tax reform.

- Another potential influence of the reform of company car tax in the UK is in the increase in dieselisation of the company car fleet. While the increase in diesel share has been growing across the UK vehicle fleet in recent years anyway, this has been largely ascribed to the rising fuel prices at the pumps and the greater fuel efficiency achieved by diesel vehicles. The fact that diesel vehicles have lower CO₂ emissions in general than their petrol equivalent, is likely to be a positive factor in the influence of fuel type when selecting a company car based on the CO₂ band system, although a separate banding system is intended to limit this effect. The findings of the Inland Revenue study confirm this, suggesting that company car tax does play a role, with both employers and employees surveyed indicating that the reform has led to a petrol – diesel switch (IR, 2004). For the environment, the trade-off is between lower carbon monoxide (CO) and CO₂ emissions from diesels, and higher emissions of other local air quality pollutants such as particulates and oxides of nitrogen (NO_x).

5.4.4 Key lessons

- It took a long time to achieve consensus that reform was needed
- A strong evidence base was needed to convince doubters that change was needed
- NGOs campaigned on this for many years, but only when several government departments and progressive companies had been persuaded was it possible to make real progress

5.5 Environmental subsidies for biofuels

5.5.1 Background and introduction

In the past nine years the popularity of biofuel has grown rapidly on a global scale. Biodiesel has been researched in over 28 countries worldwide, and there is currently large-scale production in 21 of these. The European Commission started in 2001 to consider the use of more biofuels for transport. In its Communication on alternative fuels for road transport (COM(2001)547), it identified biofuels, natural gas and hydrogen as possible future energy sources for transport. In 2003, the EU adopted Directive 2003/30 EC on the promotion of the use of biofuels. The ‘Biofuels Directive’ urges Member States to set indicative targets for a minimum proportion of biofuels to be placed on the market. These targets were set at 2% in 2005 and 5.75% in 2010.

The aim of Directive 2003/30/EC is to promote the use of biofuels or other renewable fuels to replace diesel or petrol for transport purposes in Member State, with a view to contributing to objectives such as meeting climate change commitments and promoting renewable energy sources.

In order to achieve these aims, the EU allows Member States to apply a total or partial exemption of taxation for biofuels (Directive 2003/96 EC). Member States are “free” to set strategies to encourage production and use of biofuels deciding the nature and the dimension of the support to biofuels diffusion. In particular, financial support to biofuels production and use includes:

- fuel duty;
- enhanced capital allowances; and
- ‘bio-credit’

In late 2005, the EC presented a Biomass Action Plan, while the following year the Communication on a EU strategy for biofuels (COM(2006)340 prepared the ground for a review of the biofuels Directive by the end of 2006. In 2007 the EU published its Biofuels progress report, which shows that, by 2005, biofuels reached only 1% of the market – far below the EU set targets of 5.75% by 2010. Only Sweden and Germany had achieved a higher (2%) target.

This case study shows how a subsidy which is, apparently, pro-environment can have unintended negative consequence on the environment itself. In fact, the issue of whether financial supports to biofuels production and use should be removed is still widely discussed. The most severe critics to this subsidy come from environmental NGOs, as will be discussed more in detail within the comments paragraph. However this is not straightforward as some NGOs are supportive of biofuels; the problems arise because there are major variations between different biofuels as to the actual levels of benefit in terms of greenhouse gas savings that they bring. There are also concerns that pressure to grow additional energy crops, including novel crops, could have a negative impact on biodiversity within Europe, and draw in feedstocks grown in tropical areas that contribute to deforestation and other land use changes there. Also, we will illustrate how is the EU responding to this debate.

The case studies below illustrate biofuels subsidies given by individual Member States in the framework of the EU biofuels policy: we analyse Italy, the UK and the Czech Republic.

5.5.2 *Structured analysis of environmental subsidies for biofuels in the EU, UK, Italy and the Czech Republic*

Country study EU, UK, Italy, Czech Republic

Sector Transport, energy and agriculture

Recipient Biofuel companies; indirectly, crop-producers.

Nature of subsidy Environmental subsidy.

The EU allows Member States to apply a total or partial exemption of taxation for biofuels (Directive 2003/96 EC). The biofuels Directive let Member States are ‘free’ to set strategies to encourage production and use of biofuels deciding the nature and the dimension of the support to biofuels diffusion. In particular, financial support to biofuels production and use includes: fuel duty; enhanced capital allowances; and ‘bio-credit’.

Moreover, since the beginning of 2005, 13 Member States have received State aid approval for new biofuel tax exemptions (Austria, Belgium, Czech Republic, Denmark, Estonia, Hungary, Ireland, Italy, Latvia, Lithuania, Netherlands, Sweden and UK). At least 8 Member States have brought biofuel obligations into force or announced plans to do so.

Nature and scale of environmental problem caused

The drive for green energy in the developed world is in danger of having perverse effects: on one hand, the use of biofuels is supposed to reduce CO₂ emissions, but the benefits vary significantly from one to another and are not great in the worst cases; on the other hand, use of biofuel encourages the conversion and the exploitation of wider agricultural areas, both in Europe and further afield.

Encouraging the production of biofuels’ crops can lead to loss of agricultural biodiversity and forest cover and biodiversity, and to a negative impact on the carbon cycle through the destruction of rainforests and other green areas to grow palm oil and soybeans to fuel cars and power stations in Europe and North America.

Original rationale of subsidy

The aim of the biofuels Directive is to encourage the use of biofuels and other renewable fuels as substitute of diesel and petrol for transport purposes in each Member State.

In many Member States, bioenergy development programs are granted under the rationale of decreasing of fossil fuel imports and fulfilling the commitment, undertaken within the Kyoto Protocol.

Agricultural interests are also keen to open up new markets for their products, and [potentially additional subsidies for these.

Economic impact	Boost to agriculture sector and new fuel chain operators; additional markets created for Brazilian ethanol, palm and soya oil, etc.
Is the rationale still valid?	<p>The promotion of biofuels as opposed to more traditional fuels rested on the belief that biofuels are more environmental-friendly in terms of greenhouse gas emissions – and that greater reliance on biofuels could increase fuel security. However, there are concerns that the drive for green energy in the developed world is having the perverse effect as noted above.</p> <p>The validity of national and regional legislation still remains as subsidies are still granted on the grounds of climate policy and fuel diversification. It is however becoming clear that there are unintended negative consequences, and a formal way to reduce the negative effects associated to this kind of policy has to be found. More research and more science informed based policies are needed, followed by concerted efforts to ensure that subsidies favour the ‘good’ biofuels, eg through certification.</p>
Year of introduction	<p>EU: 2003 (Directive 2003/30/EC).</p> <p>UK: 2002</p> <p>Czech Republic: 1991-1995</p> <p>Italy: 2001</p>
Detail of subsidy	<p><i>EU:</i> The EC directive sets out key principles for the promotion of biofuels, leaving it to individual Member States the freedom to decide how to encourage them. Thus, the Directive does not concern directly subsidies and tax exemptions for the production of biofuels; the binding legislation dealing with taxation is country specific and approved by the European Commission.</p> <p><i>UK:</i> Up to the Directive 2003/30/EC, the main support to the exploitation of biofuels has been through duty incentives; since July 2002, a 20 pence per litre duty incentive on biodiesel has been in place and a similar duty incentive on bioethanol has been introduced from 1 January 2005; industry called for higher incentives that have not been provided since the existing ones were considered to outweigh the monetised carbon benefit.</p> <p>Moreover, budget 2004 confirmed Government’s intention to explore new taxation methods to make possible the direct processing of bio-materials into mainstream conventional refinery processes. The “input taxation” is, hence, a duty concession, linked to the bio input through a “bio-credit” concept (i.e. a tax-credit allowed on bio input materials).</p> <p>Amongst the measures the United Kingdom has taken to promote the use of biofuels, in accordance to Directive 2003/30/EC, is the introduction of Enhanced Capital Allowances (ECAs). Enhanced capital allowances schemes offer companies an extra tax-incentive for investing in biofuels processing plants. The 2004 as well as 2005 Budget announced that the Government would discuss with stakeholders the application of ECAs to support investments in biofuels processing plants; in 2006 Report Budget envisaged to put ECAs scheme in place early in 2007.</p> <p>On 10 November 2005 the announcement of the introduction of the Renewable Transport Fuel Obligation (RTFO) was made. In practice, RTFO is a requirement on transport fuel suppliers to ensure that, by 2010, 5% of all road vehicle fuel is supplied from sustainable renewable sources. The RTFO</p>

would be the primary UK's mechanism to deliver the objectives of the Directive. The RTFO is expected to come into force in April 2008. It is envisaged that greenhouse gas reductions and sustainability will be monitored through certification, but it is unlikely that any system for this will be in place in the initial stages.

Czech Republic: After the Directive 2003/30/EC, in line with other Member States, the Czech Government applied a reduced rate of excise duty to pure biofuels or to biofuels blended with mineral oils used as motor fuel.

Evidence of previous attempts to boost biofuels production can be found in Czech energetic history; in the years 1991-1995 the Government allocated almost CZK 773 millions (about €27.5 millions⁷⁶) as refundable grants to establish manufacturing capacity for rapeseed methyl ester (RME); between 1999-2001 governmental aids were allocated under the form of direct subsidies to manufacturers of RME and blended fuels in order to cover the higher costs and the lower energy efficiency of blended biofuels. From 2001 to 2004, compensation took the form of price rebates for the raw materials grown on set-aside land and the limit on the production of rapeseed methyl ester was increased; additionally, RME producers received a direct aid for processing rapeseed oil for non-food uses; this financial support took the form of a State aid in a framework of compensation aid and aid for set-aside.

Another way to support biofuels production is represented by a reduction of the excise duty in blended fuel/biodiesel. The excise duty on blended fuel/biodiesel amounts to CZK 6866 (about €244) per thousand litres, representing the 70% of the excise duty on traditional fuel and diesel (CZK 9950 – ie € 353.5).

Reductions in taxation and aid schemes have been applied to encourage production and use of bioethanol too. In 1999, a direct non-recoverable grant of CZK 15 (€0.5) per litre made the use of bioethanol possible; in 2000, aids for an amount of CZK 40 millions (about € 1.4 millions) have been allocated, with a direct subsidy of CZK 3.5 (€ 0.12) per litre of fermented de-watered alcohol. In 2001, the use of fermented de-watered alcohol in the production of blended fuels was envisaged and, hence, subsidized again. Between 2002-2003 aids have been allocated in a minimum quantity.

In April 2005, the Czech government approved an Order (No. 148/2005 Coll.) to determine the conditions to grant subsidies for the non-food use of rapeseed for the production of RME; they moved in the same direction to encourage the use of bioethanol.

In May 2005, the Government notified to the European Commission the intention to amend Czech biodiesel promotion schemes and to raise the direct support from CZK 700 millions (approximately €25 millions) originally thought to CZK 821 millions (€ 29 millions). In response to the notification, the European Commission stated the modification of Czech subsidy schemes, in 5 July 2005.

Italy: the 2001 Financial Law (L388/2000) introduced a 3-year study in excise tax reduction on some products for the purpose of safeguarding the

⁷⁶ Exchange rate on March 2007: 1 CZK = 0.0355439 EUR

environment. Ethanol and ETBE (ethyl-tertiary-butyl ether) obtained from agricultural sources are given a reduction in excise tax of 29 eurocents per litre. The available budget for this tax reduction is about €15.5 million. This law also increased the amount of excise free biodiesel from 125,000 tons to 300,000 tons. The Ministry of Industry is authorized to start a pilot project, to promote the use of pure biodiesel in the motor transport system.

For the year 2003, Italy applied the following tariffs:

- Bioethanol, €289.22 per 1000 litres;
- ETBE, €289.22 per 1000 litres;
- Blended fuels:
 - Unleaded gasoline, €289.22 per 1000 litres;
 - “green” diesel, €245.32 per 1000 litres.

The reduction in taxes is considerable if compared to tariffs applied to diesel and gasoline, on national territory, equal to €403.21 and €558.64 per 1000 litres, respectively, in 2003 and 2004; €413 and €564.00 per 1000 litres, in 2005.

Regarding biodiesel, the Government decided for the excise duty exemption, for a three-years period, for an amount of 300,000 tons per year; this amount has been reduced to 200,000 tons in 2005. Similar measures have been applied to ethanol.

Directive 2003/30/EC in Italy has been definitively taken into account only in 2005, by means of legislative decree 30.05.2005, n.128. This measure counts for a national target, in terms of an increase in biofuels and other renewable fuels consumption, of 1%. In order to promote such an increase, some fiscal measures have been evaluated; in particular, these measures turn attention to biodiesel and ethanol, as direct substitutes for diesel and gasoline.

**Main driver
for the
subsidy**

See original rationale for the subsidy.

**Obstacles to
reform the
subsidy**

Agricultural interests; parts of the biofuels industry.

**Was there any
compensatory
measure?**

At present, there is some evidence of official attempts to fix problems deriving from increases in production and use of biofuels in Member States. The UK and Dutch governments are leading efforts to develop certification systems, and an EU system may well follow.

**Was the
reform
achieved?**

n/a

**Impact of
subsidy**

Exemptions and subsidies set out to encourage the production and the use of biofuels, in order to reduce GHG emissions, can generate the effect of augmenting the destruction of green areas to grow palm oil and soybeans,

ultimately impacting negatively on carbon cycle. There are also widespread concerns about the consequent reduction of biodiversity and negative impact on carbon cycle.

In the UK, for instance, duty incentives alone have not been sufficiently large to stimulate an increase of investments in production capacity and infrastructures in the biofuels industry. That is why the RTFO obligatory targets were introduced. It is expected that the introduction of the obligation will cut annual carbon emissions in the transport sector by between 2% and 3%.

Lessons learned

The need to encourage biofuels production, through subsidies and exemptions, in order to help the reduction of GHG emissions can lead to an undesirable situation, producing perverse effects in terms of neglecting other possible renewable energy sources. For example, biofuels may be produced where biomass for heat and power might be a preferable solution.

The key lesson is thus that subsidies and reforms cannot be undertaken in isolation, but there is a need to explore the indirect and multiplier impacts that they may have on other sectors and economies. There is a good area for development for the design of environmental subsidies, for the development of guidelines for granting incentives only if certain conditions are respected (see in comments for strategies to mitigate the adverse effects of biofuels subsidies).

Sources of information

See references.

5.5.3 Additional considerations

Problems related to subsidies for biofuels: NGOs arguments for subsidy reform

A recent report published by the French national Institute for Agriculture research (INRA, 2006) highlights how:

- biofuels can make only a modest contribution to energy security;
- to meet the biofuels needs, land devoted to rapeseed production would need to increase six-fold, thus entering in competition with land devoted to food production; and
- biofuels can only compete with oil when the price of the latter is very high – even in the face of the exemption from the domestic tax on petroleum products.

For instance, the Indonesian government is planning the conversion of some 20 million hectares to oil palm plantations, largely to serve the European biofuel market. This is likely to destroy most of the remaining peatlands and rainforests and lead to the emission of as much as 50 billion tonnes of carbon.

Biofuels may also enter into competition with food production in European countries, leading to environmental and social negative consequences not only in the developing world. However, the Common Agricultural Policy (CAP) supports the objectives of the biofuels Directive. In particular, farmers are allowed to cultivate biofuels crops in set-aside land – whereas they are not allowed to cultivate food crops. Furthermore, an energy-crop credit is available for biofuels.

The EU response: Communication on the progress of biofuels

The recent Communication on the progress of biofuels (COM(2006)845) does not adequately address these concerns. The Communication emphasises the unique role that biofuels can play in the EU energy policy, as they are the only viable alternative to fossil fuels in transport (hydrogen being far from large-scale viability in the short run). Thus, the role of biofuels in ensuring energy security is once again stressed. The Communication maintains that biofuels lead to a reduction in greenhouse gases: it does recognise that it is possible to produce biofuels in ways that do not deliver greenhouse gas savings or that cause significant environmental damage – but does not elaborate on this issue. Interestingly, the Communication maintains that biofuels are the only short term strategy, together with improving vehicle energy efficiency, to reduce GHGs emissions from the transport sector. This is clearly neglecting the need to decouple transport sector growth from emissions, and somewhat in contrast to the EU Sustainable Development Strategy.

The progress report focuses above all on the likelihood of the EU to achieve the 2010 targets on biofuels. Several examples of countries' policies to promote biofuels (e.g. tax exemption, biofuels obligations) are discussed in the report, which also stresses that “commitment to the promotion of biofuels is a means of insuring against high oil prices and reduces the consequences of supply disruptions. It is also a way to reduce the likelihood of oil prices staying as high as they are today – by showing actors in the oil market that oil-consuming countries have the will to develop a real alternative.” Finally, the following questions are addressed: Does biofuel use really lead to a reduction in greenhouse gas emissions? Will biofuels ever be commercially viable? Is biofuel promotion compatible with protection of the environment, including biodiversity, soil conservation, water quality and air quality? The likely unintended consequences – and potentially limited benefits of biofuels in terms of reducing GHGs emissions – are therefore recognised to this extent.

The review however concludes that increased biofuel use will bring substantial security of supply and greenhouse gas benefits, and it is the only means at present available to reduce the transport sector's near-complete dependence on oil, and one of the few ways to make a significant impact on transport's greenhouse gas emissions. It concluded that the EU should thus send a clear signal of its plans to reduce dependency on foreign oil, and further promote biofuel production and use.

In terms of mitigating the negative impacts of the EU biofuel policy, the report suggests the implementation of a “simple system of incentives/support that, for instance, discourages the conversion of land with high biodiversity value for the purpose of cultivating biofuel feedstocks; discourages the use of bad systems for biofuel production; and encourages the use of second-generation production processes. The system should be designed to avoid any discrimination between domestic production and imports and should not act as a barrier to trade.” Furthermore, the system should not reduce the security of supply – by, for instance, discriminating between different types of crops. Instead, “it should encourage environmentally benign biofuel production practice across all biofuel types and crops, including in third countries.” The report falls short of suggesting how this is to be achieved, however.

Strategies for biofuels subsidies reform

Sustainability certification is being proposed as a way of addressing many of the problems outlined above. According to this strategy, biofuels will be classified according to their carbon-intensity, their production cycles, etc. Biofuels which come from sustainable productions and have lower carbon intensity will receive a higher price in the market thus, it is argued, incentivising their production as opposed to the production of less environmental-friendly biofuels.

Mandatory, legally binding, environmental certification for both imported and domestically produced biofuels are therefore called for. The current European Commission energy package, despite recognising the importance of mitigating the environmental impacts of biofuel production, does not provide clarity on whether a certification scheme for biofuels will be introduced, and if so, whether it would be voluntary or mandatory. The recent report on the progress with the biofuels targets does suggest the implementation of measures “to guarantee the environmental credentials of biofuels, including discouraging the use of biofuels that create more greenhouse gas emissions than they save or lead to major biodiversity loss; regular monitoring and reporting, by the Commission, of the well-to-wheel environmental impact of biofuels' production and use.” But again how these should be designed, and whether they should be mandatory or not, is not yet clear. The report states that the Commission will investigate these issues in the course of 2007.

Previous certification initiatives suggest that certification processes by themselves cannot address most of the environmental and social ‘problems’, particularly in countries with poor human rights records or weak enforcement of environmental and labour legislation.

5.5.4 Key lessons

- Even where new subsidies are well-intentioned in environmental terms, they run the risk of perverse consequences
 - Output-oriented subsidies run the risk of poor environmental quality
 - Safeguards such as certification schemes are needed to guard against this
- It is important that subsidies also be designed in order to avoid lock-in to immediately-available technologies, and hence of lock-out of potentially more advantageous technologies in the future

6 CASE STUDIES OF ENVIRONMENTALLY HARMFUL SUBSIDIES REFORM IN OTHER SECTORS

This Chapter includes some diverse examples of EHS reform in other sectors. However, the focus of report remains on energy and transport sectors; this section is not intended to be comprehensive.

6.1 Owner-occupied homes premium⁷⁷

6.1.1 Background and introduction

Prior to 2006, federal subsidies were provided in Germany to homebuyers buying a house for their own use. For years, the *Eigenheimzulage* — home buying premium — encouraged sprawl and excessive land use by lowering the cost of buying a home and by providing higher rates of subsidies for the purchase of new homes as compared to existing ones. Prior to its termination in 2006 as part of a large scale tax-reform package, the home-buying subsidy was one of the largest subsidies in Germany, costing taxpayers €9.4 billion in 2003.

Due to the financial size, environmental importance and political profile of the case we illustrate this case study below, even though the specific subsidy does not seem to be widespread in the EU.

6.1.2 Structured analysis of owner-occupied homes premium (*Eigenheimzulage*) in Germany

Country study	Germany
Sector	Housing (indirect relationship to energy and transport issues). Recipient: Buyers of owner-occupied homes
Nature of subsidy	This subsidy is a tax concession granted upon application to those intending to acquire a home. From 2003 to 2006, the premium was worth €1,250 per year for a period of eight years. Prior to 2003, the subsidy differentiated between old and new houses, with buyers of new houses receiving €2,556 compared to €1,227 for buyers of old houses.
Nature and scale of environmental problem caused	For years, the owner-occupied homes premium encouraged suburban sprawl and excessive land use by lowering the cost of buying a home and by providing higher rates of subsidies for the purchase of new homes as compared to existing ones. In 2004, EEB (2004, p. 25) reported that 97 hectares of land are developed each day in Germany, well in excess of the goal of 30 hectares per day stated in the government's sustainability strategy.

⁷⁷ Based on case study information from Ecologic.

Original rationale of subsidy	The purpose was to allow larger parts of the population to own a home than could afford it otherwise. In the decades after the Second World War, this was intended to contribute to social peace and overall well-being of the population.
Budget impact	In the past few years, the owner-occupied homes premium was the largest subsidy in Germany. In 2006, it led to revenue shortfalls of €3.9 billion for the Federal Government and €9.2 billion for all public budgets in Germany.
Was the rationale still valid?	The subsidy runs counter to the German government's objective to substantially reduce the rate of land development in the country. Critics found that money spent on buildings and infrastructure could be better spent on more innovative and ecologically-beneficial actions (such as urban regeneration projects and refurbishment of old buildings). In addition, there is excess housing supply in many regions, especially eastern Germany.
Year of reform	2004, 2006
Detail of reform	<p>In 2004, the overall rates of this premium were reduced by 30%. In addition, the rates for the purchase of an existing home were set equal to those for newly-built homes.</p> <p>Since the beginning of the 2006, the tax allowance for buying homes has been abolished as part of a large scale fiscal reform package.</p>
Main driver of reform	Both environmental and budgetary concerns were drivers for the reform. Environmental NGOs and the German Council for Sustainable Development advocated the abolition of the premium. The "red-green" government already made an attempt to abolish it in 2003 but was not successful against the <i>Bundesrat</i> (the chamber of Federal States' representatives), where the political opposition held the majority. Under the new "grand" coalition, budgetary pressure led the former opposition to agree with the reform.
Obstacles to reform	An obstacle lay in the fact that a considerable part of the population, with corresponding electoral power, directly benefited from the subsidy. This led the Christian Democrat Party to oppose the abolition of the subsidy as long as it was in the opposition. However, the owner-occupied houses premium has never been as politically sensitive among the population as the issue of fuel prices.
Was there any compensatory measure?	No – but the measure was phased in in two stages.
Was the reform achieved?	New applications for the housing subsidy stopped being accepted on 1 January 2006. Those applying for the housing subsidy prior to this date will receive it for the full term of eight years. The last subsidies will be

paid out at the end of 2012.

Impact of reform	The 2004 reform reduced the incentive to build new houses instead of occupying existing buildings, thereby diminishing the induction of further sprawl. The 2006 reform will phase out the new-house incentive completely. As the reforms are quite recent and subsidies are still in the process of being phased out, it is difficult to assess the effects of reform.
Factors influencing success / failure of reform	Budget constraints were a key factor in removing the subsidy. Environmental groups were active on the issue, but this was not the main concern presented to the public.
Is the reform transferable?	The owner-occupied homes premium was a subsidy specific to Germany, but in cases where other EU countries offer subsidies for buying a home, the German reform experience is directly relevant and transferable.
Lessons learned	The circumstances under which the owner-occupied homes premium was abolished show the importance of political power constellations in allowing for reforms or blocking them, even where the necessity for reform is acknowledged by all major political forces. In addition, as the abolition of the premium was explained to the public only on budgetary grounds, the case shows the failure of government policy to present the reduction of environmentally harmful subsidies as a win-win situation beneficial to both the state budget and the environment.
Source of information	See references

6.1.3 Key lessons

- This is a good example of a subsidy that had outlived its usefulness and become environmentally harmful.
- As there were many individual beneficiaries, it proved politically difficult to reform
- Reform took place in 2 stages, and existing payment commitments were honoured
- Costs had escalated over time, so budgetary pressure was a big driver of change
- The reforms were not well presented as a ‘win-win’ removal of an EHS

6.2 Water pricing - a move towards full cost recovery in the CR⁷⁸

6.2.1 Background and introduction

In some countries water charges have historically been and in some cases still are very low, reflecting the view that the provision of basic services, such as water, is seen as a duty of government and the access to them is considered a right. Hence, in many cases final users often paid less than the full costs, or general tax contributions were seen as covering water supply.

Water though is a scarce resource, the price of which is given by the cost of its abstraction and supply and the value of the resource itself. Failing to price it properly is a *de facto* subsidy which may lead to overexploitation.

Historically in the pre-market economies of central and eastern Europe, it was common practice not to have full cost recovery and there was no control over water use, with water use often being significantly higher than would be the case were the resource priced at the cost of providing that resource.

Proper pricing of water to end-users can improve price signals and encourage increased efficiency in water use (OECD 2005). Reduced subsidies may also lead to reduced investment needs for infrastructure (both water supply and downstream waste water treatment), and hence to lower overall costs. Both of these effects can reduce environmental pressures significantly.

One way to assess a more efficient pricing of water is through the full cost recovery principle. This principle can require all the capital and operating costs of the provision of environmental goods and services to be fully recovered from the entity benefiting from the service (GHK, Ecolas and IEEP, 2007).

In the case of drinking water, under this principle users should pay for the full cost of water abstraction and supply infrastructure. The full cost recovery principle though deals with the cost of the service provision and less with the value of the resource itself. Therefore it does not take entirely into account the scarcity of the resource or its depletion, and it may not be sufficient to internalise all externalities. A more efficient use of resources could be pursued by introducing additional charges, eg on top of infrastructure cost repayment fees. However, in practice even securing full financial cost recovery represents a major challenge. Furthermore, the rate of movement towards full cost recovery is a sensitive issue and needs to reflect affordability. If the move is too swift, there can be problems of too high burdens on low income households and incentives for non-payment of services (GHK, Ecolas and IEEP, 2007).

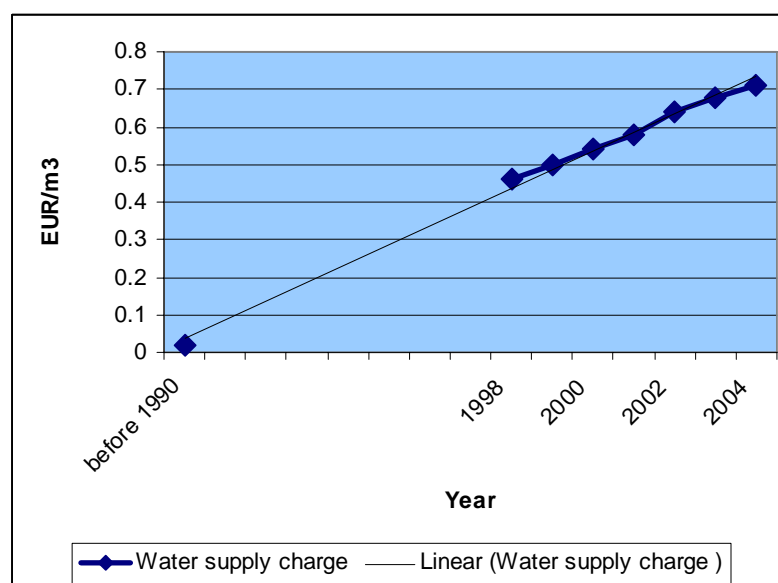
Many European countries, such as the UK and the NL, have moved towards full cost recovery for water and most new Member States also had significant changes in water pricing – from being near free to nearing full cost recovery pricing. The case study below presents the example of the Czech Republic.

⁷⁸ Based on case study contributions by IEEP.

6.2.2 *Water pricing - a move towards full cost recovery in the CR*

Country study **Czech Republic**

Sector	Other – water
Nature of subsidy	The pricing of water only (historically) covered a fraction of its cost.
Recipient	Households (for this case; other sectors also benefited from the subsidy).
Nature and scale of environmental problem caused	A low price for water, well below full cost recovery, led to overexploitation of water resources
Original rationale of subsidy	General policy in the provision of basic goods and services during the pre-market economy
Economic impact	The implementation of the ‘polluter pays’ principle and the subsequent decrease in water consumption led to positive effects on savings of investment and operational costs (UNEP, 2003). The weight of drinking water charges on household income is about 0.8% (2004) , ie more than €50 per households per year (GHK, Ecolas and IEEP, 2007).
Was the rationale still valid?	The opening of the markets and the privatisations that followed the political changes in the late 80s reformed radically the conception of responsibility for provision and payments of goods and services. Therefore it can be argued that the rationale for low water pricing was no longer fully valid – to the extent that households could afford higher water charges. Over time there is a policy of moving towards full cost recovery under open market conditions. It is not guaranteed, given social concerns, that all should pay full cost for water, as this is a basic/vital good.
Year of reform	From 1990 onwards
Detail of reform	<p>After 1990 water pricing in the Czech Republic moved from covering only a fraction of the cost to full cost recovery. Before 1990 the cost of 1m³ was only €0.02. This low price resulted in an actual subsidisation of water extraction, treatment and distribution. This hidden subsidy has been gradually removed, and in 2004 the cost of 1m³ of water was brought up to €0.71 (see Figure 15).</p> <p>The reform also addressed the fees for withdrawal of both surface and ground water, and also the discharge of waste water. For the purpose of this study we will only focus on households’ drinking water. It is interesting although to note that between 1990 and 1999 water withdrawals decreased by 88% in agriculture, by 47% in industry and by 34% in public water mains.</p>

Figure 15: Water supply pricing in Czech Republic

Source: IEEP elaboration of GHK, Ecolas and IEEP(2007)

In the Czech Republic now all houses have been provided with metering to measure drinking water consumption. The volume of water consumed in households decreased by about 40%, from 171 litres per day per capita in 1989 to 103 litres in 2002 (UNDP, 2003). In 2003 it was about 10% below the EU average (Naumann 2003).

Main driver of reform

The early 90s the former Czechoslovakia witnessed a major political change. As noted by UNDP (2003), in that period the country was characterised by exclusive state ownership of assets, lack of environmental values and effective economic instruments, and exemptions from legislative requirements for water protection. With the fall of the Soviet Union and the institution of the independent Czech Republic most of these issues started to be addressed. In the context of these economic and social changes, state subsidies for operation costs decreased, leading to a gradual recognition of environmental values.

Obstacles to reform

It can be argued that, given the historical context, the water pricing reform is likely to have been accepted as part of the wider economic and social reform that followed the fall of pre-market economies. Some issues related to affordability may have risen. Some sources saw the increase of water prices well in excess of the rate of inflation during the 90s, ie three times the rate in one year (Consumers International 2000). The Czech Water Supply and Sewer Association, interviewed by Naumann (2003), regarded water prices as quite high.

Was there any compensatory measure?

No.

Was the

Yes, as the increase of water charges led to a significant reduction of water

reform achieved?	consumption and provided financial resources to cover more broadly investments and operational costs.
Impact of reform	Over the period in question, household water use declined by about 40%, which had knock-on effects for energy use (as water supply requires pumping which requires energy).
Factors influencing success / failure of reform	The gradual rise of water charges may have made the introduction of higher prices less traumatic. Nevertheless, the reform seems to have lacked social consideration, as lower charges were not designed for low income households. This may have raised issues of affordability.
Is the reform transferable?	Yes. Other examples of full cost recovery in water pricing exist. Eg Malta increased water charges and use a rising block system (with low levels for socially disadvantaged groups to address affordability issues).
Lessons learned	A positive example of reform, as a clear example of how full cost recovery pricing can reduce resource use and improved resource management.
Source of information	<p>http://www.oecdobserver.org/news/fullstory.php/aid/939/Pricing_water.html</p> <p>UNDP, 2003: A Case Study on Commitments-Related Best Practice or lessons Learned in Water in the Czech Republic http://europeandcis.undp.org/WaterWiki/images/0/0f/CzechWaterReport.pdf</p> <p>GHK, Ecolas and IEEP, 2007: Strategic evaluation on environment and risk prevention under Structural and Cohesion Funds for the period 2007-2013</p> <p>Naumann, M., 2003: Working Paper Current Status of Water Sector in the Czech Republic</p>

6.2.3 Key lessons

- Affordability issues are in principle important where domestic consumers are concerned – however they were not directly addressed in this case.
- Gradual increase in cost, in step with increasing incomes, nonetheless helped to limit the impact.
- Here reform was introduced as part of the restructuring and shift to a market economy.
- Imposing costs can bring significant cuts in wastage and overall levels of use.
- Pricing provides capital for new investment, but through demand management can also reduce the scale of new investment that is needed.

6.3 The role of NGOs in promoting reform⁷⁹

6.3.1 Background and introduction

As a recent accession country to the EU, the case of Hungary represents an area of the EU that has less research coverage in a European policy context. The case is interesting for the spearheading of the effort within the NGO community. In Hungary environmentally harmful subsidies reform has largely been blocked due to political opposition. It is useful to study more closely the debate and strategies of EHS reform proponents in order to understand how the issue is perceived in a recent accession country to the EU.

6.3.2 Structured analysis of NGOs as reform promoters in Hungary

Country	Hungary
Sector	Transport, Energy
Recipient	Owners of extraction companies, trucking companies, consumers and taxpayers benefiting from subsidies.
Nature of subsidy	Implicit subsidy (non-recovery of infrastructure, production and environmental costs).
Nature and scale of environmental problem caused	Truck transportation increases infrastructure costs through heavy use. Road construction for new highways causes considerable environmental impacts as well. Natural resource extraction stresses the surrounding natural environment.
Original rationale of subsidy	Non application of the ‘polluter pays’ principle.
Economic impact	According to the Clean Air Action Group (CAAG), an environmental NGO in Hungary, state subsidies in the form of uncollected taxes and unpaid environmental damage for the coal-mining sector amount to around HUF 100-150 billion (400-600 million Euro) annually. Petroleum and natural gas sectors receive subsidies between HUF 80-110 billion (320-440 million Euro) individually every year ⁸⁰ . In addition, the transport sector received around HUF 4100 billion (165,8 billion Euro) in subsidies in 2004 (Lukacs, 2004).
Was the	CAAG and local NGO are trying to undermine the rationale for the

⁷⁹ Based on case study contributions by Ecologic.

⁸⁰ Kiss, Karoly. *Environmentally Harmful Subsidies in the Hungarian Economy*. CAAG: Budapest, 2004, p.13-14

rationale still valid? government avoidance of environmental cost recovery, by engaging and educating public opinion to the ‘polluter pays’ principle.

Year of reform On going, but minor.

Detail of reform Currently little reform has occurred. Subsidies for consumers have decreased, as natural gas prices for households have risen to better reflect its ‘true’ price. According to CAAG, EHS reform in Hungary has been at a relative standstill over the past 10 years. Although legislation to improve the situation has been introduced, these legislative acts have been either shelved or voted against, frequently due to political pressure from lobbying organisations.

Politicians, among other reasons, fear that reducing state subsidies could lead to the reduction of subsidies in neighbouring countries for materials (e.g. for construction) that Hungary needs for development.

However, some EHS reform has occurred in recent years. A new energy tax was introduced that was 40% higher than that required by EU law, while VAT rates on electricity were raised from 12% to 25%. The annual car tax was increased by more than 20% and company car taxes were doubled. A new registration tax disfavours the buying of old cars (Szabó, Zoltán. 2004). Currently, there is a kilometre fee plan in debate⁸¹; however, progress on this plan has been slow and some believe that this plan will be shelved as well.

Main driver of reform The effort to reduce environmentally harmful subsidies is being led by the NGO community, with CAAG—a conglomeration of 126 NGOs—spearheading the effort. CAAG has undertaken multiple studies as well as organised conferences to analyse EHS reform in Hungary. In addition, local organisations are entering the debate, especially with respect to transportation. These organisations do not want more high traffic highways built in their communities, as increased traffic reduces the standard of living. By advocating for subsidies reform, these local groups are hoping to minimise road construction in their areas.

There is also support from the EU towards EHS reform. For example, the EU has emphasised the development of rail as well as use of the polluter pays principle. However, see obstacles.

Internally, high budget deficits have helped strengthen the case for the reform of environmental harmful subsidies, as Hungary has a state budget deficit well above the European average of just over 2%.⁸² The 2006 state budget reached 10% of GDP, though budget trends are now improving, with the

⁸¹ This plan aims to require users to pay to use highways.

⁸² Euractiv.com. “Eurozone budget deficit down”. 24 October 2006.
<http://www.euractiv.com/en/euro/eurozone-budget-deficit/article-159063>

deficit for January 2007 at HUF 196 billion (€7.9 billion) (Interfax Information Services, 2007).⁸³

Obstacles to reform	As well as promoting the polluters pays principle, EU transport investment policies have been criticised by the CAAG as actually encouraging further subsidisation of transport (see comments). Internally, there are industry lobbying groups such as the Hungarian Road Transport Association, NIT Hungary, Magyar Autoklub, MOL Oil and Gas, and MVM Electric. These organisations and companies seek to maintain subsidies for transport and energy in order to keep production and extraction prices low. In particular, transport companies oppose additional fees for highway use to be introduced. They support highway construction to improve truck routes. Furthermore, natural resource extraction companies want to keep costs low and, therefore, oppose increases in mining taxes.
Was there any compensatory measure?	n/a
Was the reform achieved?	See detail of reform.
Impact of reform	As EHS reform is limited, impacts are hard to evaluate.
Factors influencing success / failure of reform	There is extensive documentation of EHS and the reform debate in English; this shows that stakeholders in Hungary are working to engage other European countries in this debate.
Is the reform transferable?	Yes. Other countries could also implement measures to increase taxes on environmentally harmful transportation and energy activities to reduce demand and shift it to other less damaging alternatives.
Lessons learned	Since political opposition to reform is strong, stakeholders supporting EHS tend to concentrate on those areas within the transport and energy sectors where reform is possible. Strategies of increasing public awareness and participation are utilised in order to gain wider support for reform.
Sources of information	See references

6.3.3 *Additional considerations*

Public opinion engagement strategies - lessons from Hungary

- In order to combat the lobbying efforts of the transportation and energy sectors, CAAG believes that public awareness and participation need to be raised⁸⁴. Currently, citizens are largely unaware of the subsidies these sectors receive. Most citizens are concerned about increased prices for energy for household use. Furthermore, the average person does not want to see car taxes raised or free parking to be abolished. Therefore, education needs to focus on reforms for production and extraction subsidies, as opposed to increasing prices for the average user.
- Another lesson from the reform debate is the need to focus on fields where immediate success is possible. Reform efforts need to focus on areas where political opposition is not very strong, where NGOs have a chance at influencing the outcome.

EU policies as an obstacle to reform

- Instrument for Structural Policies for Pre-Accession (ISPA)⁸⁵ funds for Hungarian railways have displaced national investment from railways to roadways. In addition, EU-required investments in road strengthening are not being paid for by charges on heavy goods vehicles (Lukács, 2001)⁸⁶. Moreover, politicians, among other reasons, fear that reducing state subsidies could lead to the reduction of subsidies in neighbouring countries for materials (e.g. for construction) that Hungary needs for development.

⁸⁴ Andras Lukacs, President of CAAG, personal interview, 8 February 2007

⁸⁵ ISPA funds, part of the Cohesion Fund, provide assistance for infrastructure projects in the EU priority fields of environment and transport. Its objectives are the following: familiarising the candidate countries with the policies, procedures and the funding principles of the EU; helping them catch up with EU environmental standards; upgrading and expanding links with the trans-European transport networks.

7 PRACTICAL GUIDELINES FOR PRIORITISING THE REFORM OF ENVIRONMENTALLY HARMFUL SUBSIDIES

There is broad agreement that subsidy reform can be beneficial. For instance, the EEA (2004) summarises the benefits of subsidy reform as it follows:

- Fiscal savings, structural adjustment and improved efficiency and productivity in production;
- reduction in environmental damage, such as pollution and the production of waste;
- a more equitable distribution of income; and
- a more level playing field, internationally.

As a conclusion of his extensive work on EHS, Pieters (2003) argues that ‘decoupling subsidies from input use, production and consumption’ would have environmental, economic and social benefits. In the same spirit, the OECD (2005) states that:

‘(...) the removal of harmful subsidies therefore offers the tantalizing prospect of a “win-win” situation, both for the economy and the environment. Yet governments around the world have been reluctant to dismantle perverse subsidies, despite growing environmental awareness and pressures on government budgets (...)’

Therefore, from an economic and an environmental point of view, the removal of harmful subsidies arguably makes sense. While, politically, the two main guiding *principles* for the reform of environmentally harmful subsidies have been accepted and integrated in many policies by the European Union, namely:

- the Polluter pays principle (PPP), and
- the full internalization of external costs as a precondition for undistorted competition within the EU (Thöne, 2006).

Still, environmentally harmful subsidies are not a priority for many Member States, neither from an environmental nor from an economic perspective. Obstacles to reform are certainly the issues of subsidy definition and quantification, and the complex linkages between subsidies and the environment (Chapter 2.3). But arguably a bigger issue is that of transparency and political will, bolstered by resistance from those interested in the maintenance of the subsidy. Governments need to be able to identify the linkages between subsidies and their economic and environmental context in a quite straight-forward way, in order not to be easily hindered by the difficulty of the task and not to be delayed by simplistic mystifications. There is a need for policy makers to have guidance in order to identify the environmental harm of subsidies and to know which ones to prioritise. This Chapter will focus in particular on criteria for prioritising reform, with the following order:

- The OECD’s checklist for prioritising environmentally harmful subsidy reform (Pieters, 2003; OECD 2005, 2006)

- Other criteria on how to prioritise EHS subsidy reform
- Criteria / design insights for future subsidies
- Priorities for action

In the first part of the Chapter, we illustrate the study done by Pieters (2003; OECD 2005, 2006), which develops the qualitative model (i.e. the ‘quick scan’, OECD 1998) illustrated in Chapter 2.5. The checklist so developed is intended to help governments to identify which subsidy schemes to prioritise for the removal or reform of environmentally harmful subsidies.

Importantly, the checklist does not include in the analysis social impacts, or the implications of subsidy removal in social terms (a field where more research is needed, and where there is not as yet agreement on impacts and solutions). Also, the model leaves out considerations about the political economy of subsidies (e.g. exogenous factors; the lobbying of interests groups; leadership and communication) which are going to be discussed in Chapters 9 and 10.

Whilst the OECD criteria are invaluable, it is helpful to add some further simple of rules of thumb to help identify problem areas and whether there is any scope for action in the policy time period available. In this Chapter we summarise other simple criteria for reform prioritisation and some tips on the design of subsidies under Chapter 7.2.

7.1 The OECD’s checklist for prioritising subsidy reform

As noted in Chapter 2, the OECD argues that the focus of current work on subsidy reform should be on practical ways forward rather than on better refining definitions. A key element of this work has been the development of a checklist that can be used as a policy tool to identify whether the removal of a particular subsidy will have an environmentally beneficial impact (Pieters, 2003; OECD, 2005). The checklist is, however, not supposed to replace a thorough analysis of the potential impacts of removing any particular subsidy, which should be pursued through the use of general or at least partial equilibrium models. Rather it can be used as a useful first step to identify the subsidies that, when removed, might yield environmental benefits and identify the key factors that need to be examined further in the course of a more in-depth analysis (OECD, 2005).

The checklist is the natural development of the ‘quick scan’ model (OECD, 1998) presented in Chapter 2.3, and it is intended to be:

‘merely a list of questions that must be answered to decide whether subsidy removal is likely to remedy adverse environmental effects, without, for example, creating other negative environmental impacts’ (Pieters 2003)

The stages of the checklist are presented in the Figure reproduced below (OECD, 2005). The basic line of reasoning is that applied with the use of the *3 linkages already explored through the ‘quick scan’ model* (see Chapter 2.3 for the detailed analysis of the economic and environmental linkages of the effects of a subsidy on the environment). Two new factors, however, have been added with the ‘checklist’ to the linkages identified in the OECD 1998 report, to complete the list of the main factors that determine the

environmental effects of support measures (Pieters, 2003; OECD, 2005). The new factors try to integrate the issue of technological lock-in with the previously identified linkages. As Cox (OECD, 2006) highlights, subsidies have a big role on the innovation and uptake of technologies that may be more environmentally beneficial than currently exist. Governments should identify:

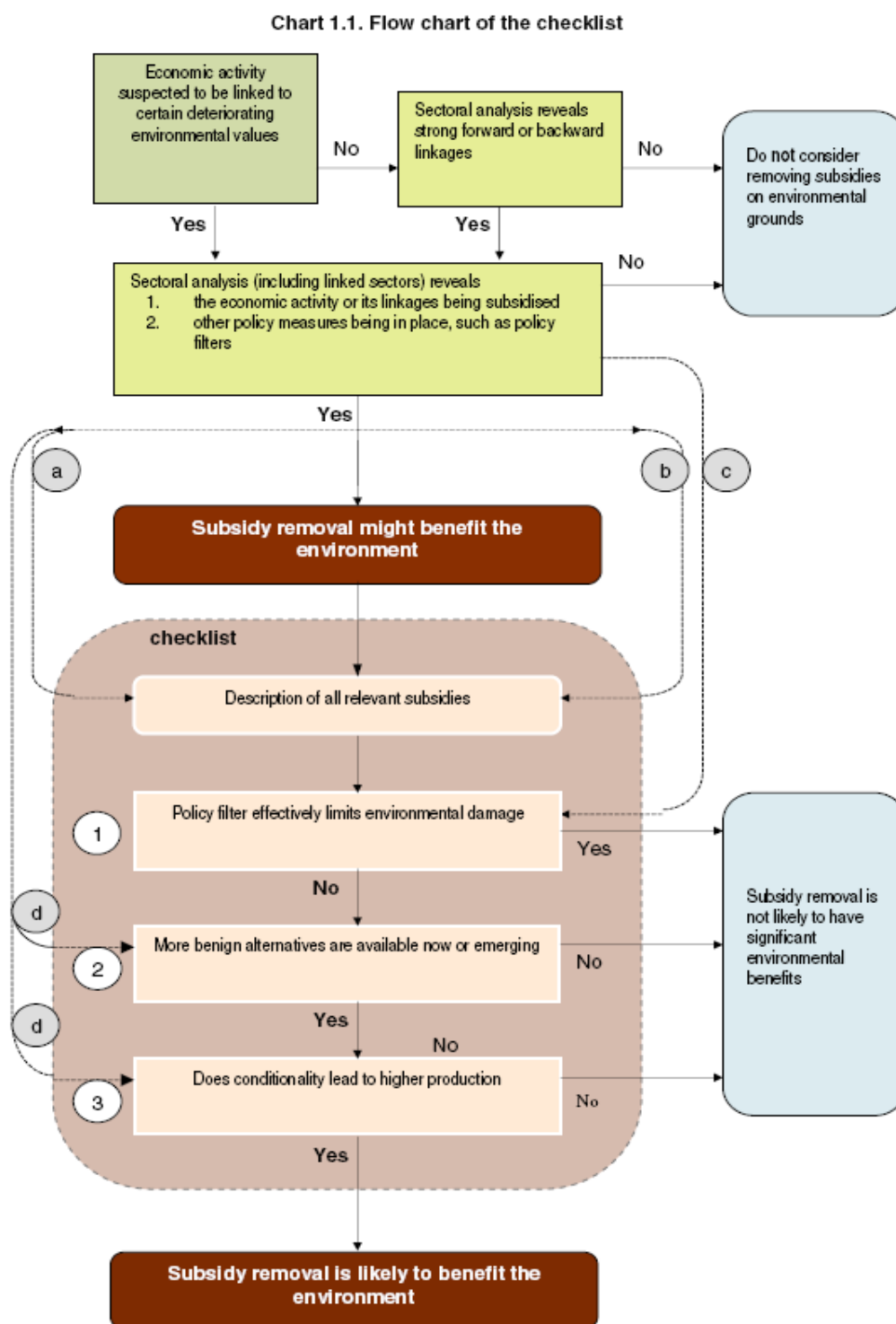
- the level of protection from competition that support measures offer to the recipient sector and the extent to which alternatives to the recipient sector are discouraged as a result;
- the environmental effects of the alternative products or technologies that are discouraged by the support measure, compared with those of the supported sector.

In particular, subsidies directed to reduce specific variable costs (such as energy and materials, including water) are more likely to impact on production (and thus emissions) as they are linked to the adoption of certain technologies. Subsidies to inputs therefore can have lock-in effects, casting technologies in stone. This will have the rebound effect of hindering environmental policies, which greatly depend on the development and deployment of environmentally friendly technologies (Pieters, 2003). Indeed, the effects of these subsidies are aggravated by the delay in the development and dissemination of new technologies that would increase resource productivity while cutting back on environmentally harmful effects. As a consequence, subsidies that repress technological change have negative effects on the environment in the longer term. Also, the longer a subsidy is granted the more it will impact on the lock-in effect and therefore on the environment (see below for further discussion).

Subsidies to fixed capital goods which are narrowly linked to one specific input (e.g. coal-fired plants) act arguably as indirect subsidy to inputs. In fact, subsidising hard coal production is the same as to subsidise coal itself, to the detriment of a cleaner energy source.

The result of the development of the qualitative assessment (OECD, 1998) is a 'simple' flowchart model, reproduced from the OECD (Pieters, 2003; OECD, 2005; OECD, 2006) in Figure 16.

Figure 16: Subsidy removal checklist



Environmentally Harmful Subsidies: Challenges for Reform ISBN-92-64-01204-4 © OECD 2005

Source: taken from OECD, 2005

The stages in the upper part of the diagram are effectively a preliminary analysis that needs to be undertaken to identify whether subsidy removal ‘might benefit the environment’. These stages identify whether subsidies exist, whether there are

environmental concerns associated with the economic activity, and whether there are policies (i.e. a ‘policy filter’) in place to mitigate any environmental impacts (see the Figure). Prior to the stages marked (1) to (3) in the figure, below, which are effectively the three stages of the checklist, the subsidies to be assessed need to be described (for more discussion on this follow to Chapter 7.2.). The key stages of the checklist can be summarised as follows:

1. **Identifying the impact of the policy filter.** If the policy filter adequately addresses the adverse environmental impact resulting from the existence of the subsidy, the removal of the latter might not have any beneficial environmental impact – unless the filter is amended, accordingly. Hence, the restrictions that the policy filter places on the environmental impacts need to be understood, as does the potential impact on the filter of the subsidy removal. Subsidies should always be analysed within the circumstances in which the subsidy is set. In fact, in some cases, subsidies (especially market price support ones) are accompanied by various production limitations such as: exploitation or production quotas (e.g. in agriculture, fisheries, forestry); limitations of the available infrastructure (e.g. in energy and transport); planning and zoning requirements (e.g. in industry, agriculture, energy, transport); pollution limits (all sectors). If those limitations are maintained, it may be them that determine the overall effect of subsidy removal (Pieters, 2003).
2. **Identifying the existence and relative environmental impacts of alternatives.** As noted above, the existence of subsidies can lead to technology lock-in, whereby more environmentally beneficial alternative technologies are unable to compete as a result of the subsidy in place. Hence, in order to determine whether the environmental impact of the subsidy removal would be beneficial, it is important to identify what the alternatives are and their potential impacts. If the input/environment ratio within the *subsidised economic activity* [e.g. (Carbon content of the energy used)/(CO₂-emissions)] and the output/environment ratio are variable (i.e. there are alternatives available within that economic activity), subsidy removal will benefit the environment. Otherwise, other measures of environmental policy would be the preferred option.
3. **Understanding the conditionality of the subsidy.** The existence of a subsidy is usually linked to a point of impact, (e.g. output, input, profits and income), which impact to a higher or lesser extent on the levels of production. Such characterisation, however, is quite theoretical, as real cases are not easily captured in such broad categories. However, the conditionality of a subsidy is particularly important, therefore we analyse below its main elements.

The conditionality of the subsidy is very important. It is important first to determine whether the subsidy to be removed is conditional on input or output levels. If it is not conditional on input or output, then its removal would affect relative incomes, but not have significant environmental impacts. Below we discuss the environmental effects of the removal of subsidies to inputs (variable costs) and outputs (market price support measures and deficiency payments and sales premiums).

The *removal of subsidies to environmentally relevant variable costs* (e.g. energy, water, materials) has a greater and immediate impact on the environmental than the removal of

other subsidies. The main points of argument that support the above assessment can be summarised as it follows:

- From an economic point of view, Pieters (2003) argues that it is more cost-efficient to remove subsidies to inputs (e.g. raw materials, energy, water) because these influence the technology choices. In fact, removing subsidies to inputs or capital goods, so preventing pollution and waste to be generated upstream by increasing resource efficiency, is often **cheaper than the deployment of abatement technologies** (end-of-pipe technologies). Moreover, subsidies to inputs or capital goods that have been in place for a long time have much stronger lock-in effects and long term environmental consequences.
- Here it is important to distinguish between subsidies that lower the cost of industry’s variable costs (e.g. energy and materials) and subsidies that lower the cost of capital (i.e. fixed costs, e.g. low interest loans, capital equipment, costs of buildings and land). The removal of subsidies to industry variable costs **affects day-by-day production decisions**, therefore their removal will spur energy efficiency; its effects will be continuous, encouraging the deployment of efficient transformation technologies. The removal of subsidies to capital goods, would instead influence future investment decisions on assets acquisitions, therefore having effects only in the long term, and their full environmental effects might take ‘even decades to materialise’ (Pieters, 2003). Moreover, while **the removal of subsidies to inputs have always positive effects on the environment**, subsidies to certain fixed costs such as land, building and cost of capital, do not influence modes of production, therefore their removal would not take necessarily environmental positive effects.

The *removal of market price support mechanisms* (e.g. subsidies that ensure certain production levels or that support a price above the market price) will reduce the production and consumption of the output supported. The environmental result of subsidy removal will however depend mainly on the demand and supply elasticities as well as availability of the alternatives (see Chapter 2.3.1.). The removal of *deficiency payments and sales premiums*, also being mechanisms to bridge the gap between a politically determined price and the market price, have similar effects on production volumes as market price support.

The main conclusions of this economic analysis are summarised in Table 15, which serves as a guideline on whether the subsidy should, or should not, be removed. This is done through an analysis of how firms or other actors are likely to respond to the removal of a subsidy, given their point of impact (i.e. their conditionality). The result is the development of simple rule of thumbs rules which help governments in identifying how to prioritise subsidy removal given their economic and environmental effects.

Table 15: Overview of subsidy conditionality and the environmental effects of their removal

Subsidy				Subsidy removal		
Categories of subsidy	Main initial points of impact	Effects on sales, costs and rent	Economic Impacts of subsidy	Economic impacts	Environmental impacts	Benefits to the environment
Key: * variable; ** beneficial; *** strong benefits						

Within the firm							
Subsidy increase that input use	Materials (incl. Water, energy)	Reduces variable costs.	Increases production levels.	Increases variable costs	Effects are immediate and continuous. Remove lock-in effects. Induces resource efficiency.	***	
	Short lived equipment	Reduces variable costs.		Increases variable costs.	Resource efficiency depends on how closely linked they are to specific materials or energy use.	*	
	Access to natural resources below opportunity costs (e.g. exploitation concessions)	Reduces variable or fixed costs, or both.	Increases resource exploitation levels. It will have decisive effects on the continuation of such economic activity.	Increase of costs for firms for acquiring concessions or access to resources.	Decreases the rates of exploitation of a natural resource.	***	
	Low interest loans (i.e. subsidies to capital)	Reduces variable or fixed costs, or both.	Depends on the capital good subsidised.	Minor or none if production level does not depend on that capital good. Very high, if capital good closely linked to input.	Requires more detailed analysis. Depends on the previous assumptions.	*	
	R&D	Is large, they act as operation costs, and reduce variable or fixed costs, or both.	They might postpone the adoption of a cleaner technology or advance it. If large, they can have serious lock in effects.		Requires more detailed analysis. Environmental effects difficult to assess.	*	

Subsidy that increase output	Market price support/ Broader protection/ Market access restrictions/ Government brokered contract/ Deficiency payments/ sales premiums	Creates revenues proportional to actual production volumes.		Consumer prices will drop, in spite of lower production levels. Lower production levels.	Less input requirements may lead to strong environmental effects in production of materials energy phase. Production may shift to areas of low cost production, leading to a possible displacement of environmental burden.	**
Subsidy that increase profits and income	Historical entitlements	Creates revenues irrespective of actual production volumes.	Increases profits. Subsidies are independent on production levels, but are capitalised in the prices of factors of production (e.g. land) where there is inelastic demand.	Might change production modes and levels.	Detailed analysis required.	*
	Preferential low rates of income or capital taxation / Debt write offs	Creates revenues irrespective of actual production volumes.	Improve profitability of a firm. Prolongue life of firms that are not economically viable without subsidies.	Inefficient firms leave the sector. Production levels of the sector decrease.	Detailed research needed. Environmental impact will depend on the available alternative (dirtier or cleaner).	**
	Allowing insufficient provisions for future liabilities Exemptions from environmental standards	Creates revenues irrespective of actual production volumes.	They guarantee the profitability of certain industries that otherwise would have been not economically viable.		Strong beneficial impact on the environment.	***

	Start of an operation (i.e. lump sum)	Creates revenues irrespective of actual production volumes.		Reduce investment in that industry.	Environmental impact depends on the nature and scale of the subsidised operation.	*
	Low rate of return requirements (e.g. typically for state owned utilities)	Reduces fixed costs and revenues, in order to pass on the preferential treatment to consumers	Lowers the discount rate of the operations. Stimulates demand.	Shift to less capital intensive (more flexible) technologies with higher rates of return.	Depends on the environmental characteristics of alternative production processes available.	*
Outside the firm						
Subsidy that increase demand	Preferential low VAT rates/ Provisions on infrastructure / other government services below costs (e.g. product promotion)		Stimulates demand.	Decrease the demand of a product. If supply curve is inelastic this will have little effect.	Depends on the supply curve elasticity. However, some upstream effects might be expected.	*

Source: IEEP elaboration on Pieters (2003)

Key: * variable; ** beneficial; *** strong benefits

The checklist illustrated above, is a qualitative tool, which rests on the idea that decision makers have already access to the relevant data and information in order to assess each linkage therein abstracted. Notably the checklist does not include the so called ‘political economy’ of subsidies. It does not include issues such as social equity. Also, it fails to address key obstacles for reform such as those analysed in Chapter 8 and 9 of this report.

7.2 Other criteria on how to prioritise EHS subsidy reform

Whilst the OECD criteria are very valuable, it is helpful to add some further simple ‘rules of thumb’ to help identifying problem areas and whether there is any scope for action in the policy time period in question. Thus we have produced a first set of simple questions that a policymaker who wants to approach the removal, reform or design of a subsidy should bear in mind.

First, there should be a preliminary assessment: **is there a problem?** This question can be answered by a superficial skimming of the available evidence.

- *Does the subsidy no longer fulfill its original objectives and rationale?*
- Is there a clear and significant environmental impact (i.e. not just appearance of a problem but an actual one)?

- Are the negative impacts (externalities) greater than the benefits (positive externalities)⁸⁷ expected from reform?
- Is there a clear ‘waste of money’ or an inappropriate allocation of government resources?
- Is there an inefficient allocation of resources or does the market not function properly (e.g. were prices to be right)?
- Is the subsidy illegal and/or does it run counter the letter/spirit of State aid policy?
- Does the subsidy run counter objectives and principles committed to (e.g. polluter pays principle)?

If one of the above questions is true then, there is a problem that needs addressing. This might be useful also for raising public opinion support for subsidy reform: evidence gathered from the case studies in this report highlighted that public opinion is more likely to support subsidy reform if the impacts of the subsidy on the environment or the economy is sufficiently clear. This requires good information provision and transparency.

Of the above, one key element to assess whether a subsidy should be removed, is to consider whether it still fulfils its original objectives and rationale. If not, then this in itself is an important sign that the subsidy is misplaced.

Secondly, another question should be addressed: **would reforming the subsidies address the problem?** The OECD checklist illustrated in the previous paragraph provides the appropriate analysis tool to assess whether removing the subsidy would take an environmental benefit.

Importantly, there is a third question to ask: **is there the potential means to address the problem?** For instance:

- Is there sufficient information to allow action?
- Is there a political willingness to act?
- Is there a legal basis upon which to act (EU, national)?
- Is there a champion to make it happen?
- Is there bipartisan support (i.e. removing EHS is a process and ideally requires support from both the government and the opposition as the reform can cover several periods of office)?
- Is the timing right (i.e. is there a potential window for action)?
- Is it understood who the potential opponents to the reform and can their potential opposition be addressed?
- Are there potential (set of) measures that could be taken?⁸⁸
- Would the potential *measures* offer benefits (i.e. environmental improvement)?

⁸⁷ This is a non-trivial question as the expectations of benefits are related to an expectation of development – e.g. baseline scenario. In some cases incentives avoid a deterioration of issues. It is also important to look at whether the scenarios used (explicitly or implicitly) are still valid.

⁸⁸ Note that subsidies do not act in isolation and hence to reform the subsidy may often require a series of issues to be changed.

The Table below offers a summary of the above preliminary test for a long term deployed subsidy (hard coal) and a relatively new subsidy to promote environmental aims (biofuels).

Table 16: Example of preliminary screening of subsidies harmfulness

Relevant questions	Impact of subsidy	Impact of subsidy
	Hard coal *	Biofuels**
Does the subsidy still fulfil its original objective/s?	No, as energy security and the EU no longer rely on German coal	Actually has multiple purposes – climate, agriculture, rural development, and energy security – in some cases (depending on design, crop and process type) it may not achieve the stated objectives.
Is there is a clear environmental impact?	Yes (CO ₂ , air pollution, waste, landscape destruction etc.)	Yes for certain fuels and production methods.
Cost-effectiveness: is there a clear waste of money?	Yes – cheaper to import	For certain cases there is some doubt as to value for money as CO ₂ savings diverge widely across fuels and production techniques
Is there an inefficient allocation of resources / the market does not function properly (e.g. were prices to be right)?	Yes – other fuels would be used (either imported coal or other sources)	Too early at this stage / the market not fully mature - also part of this case is a ‘warning’ about a problem which might arise if wrongly designed - when a sizeable market will be operation.
Is there a conflict with the PPP?	Yes, In some cases the polluter gets paid.	It depends.
Is there a conflict with other policies, policy objectives and (legal) instruments?	Yes, Kyoto targets. Conflicting message with energy efficiency and climate instruments (apart from where linked to clean coal and CCS)	Potential adverse conflict with biodiversity (e.g. due to mono culture), nitrates directive and bathing water quality (due to fertiliser run-off) etc.
Is the subsidy illegal and/or runs counter the letter/spirit of State aid policy?	It is against the spirit; not illegal as negotiated to be not illegal	n/a
Is the subsidy illegal and/or runs counter the letter/spirit of trade and of free circulation of goods?	De facto reduces imports - hence always under scrutiny.	Potential conflict depending on how imports are treated/ constrained – e.g. it depends on how the certification of sources is done.
Working conclusions	There is a problem that needs addressing.	There is a potentially important problem that needs careful attention in the design of subsidies and linked measures (certification etc) so as to avoid it becoming an EHS.

* *Existing long term subsidy*

** *New subsidy*. Also, biofuels can be a pro-environment subsidy or an environmentally harmful subsidy depending on how it is formulated / conditions.

7.3 Criteria / design insights for future subsidies

More attention is needed on the development of guidelines for the design of new subsidies, in order, for instance, to prevent long term subsidisation, lock-in effects and other unintended consequences deriving from the ill targeting of subsidies. Below we

offer some preliminary points which should be addressed when designing a subsidy (mostly built on Steenblick, 2006):

- Designers need to put themselves in the role of the recipient and think through how they would respond to incentives;
- Need to be clear about the goals of the policy, particularly public goals, and build in criteria that reduce the chance of diversion to non-target beneficiaries;
- Need to think in terms of specific environmental and social outcomes, not nebulous (and usually incomplete) objectives, such as ‘renewability’ (biofuels – only the crop is renewable, but a lot of other aspects are not);
- Ensure that subsidies when launched also include an assessment on how they are going to be used and not just on what they are put on;
- Need to think through the demand and supply changes;
- Check that the subsidy is well targeted (this issue is particularly pertinent to biofuels);
- The subsidy should have regular review clauses and potential for revision;
- The subsidy should have a finite lifetime,
- Criteria for qualifying for the subsidy should be clear and transparent;
- Care must be taken as regards subsidies with multiple objectives – ideally focused subsidies will be designed for a specific objective, however, in practice multi objectives tend to play a role (necessary to get agreement for the subsidy);
- Is it a cost-effective choice of allocation of public funds? ⁸⁹
- Is there sufficient and appropriate data available to design the subsidy?

⁸⁹ Cost effectiveness criteria can be difficult to apply globally as there are different motivations and in many cases multiple motivations for subsidies.

7.4 Priorities for action

From the literature, from expert opinion and from the contributions by experts and stakeholders who attended the HGL on energy, competitiveness and the environment, ad hoc group on EHS, on 7 December 2006, it was clear that there should be immediate action to reform environmental harmful subsidies. It is not a matter of doing more research but more a matter of engaging the political commitment and practical commitment to action. In particular, for the following subsidies and circumstances appear ripe for action:

- Subsidies to fossil fuel-based electricity production and use (see dedicated case study);
- subsidies to aviation and road transport (see dedicated case study); and
- subsidies to inputs and outputs in intensive agricultural practices.

The ad hoc working group identified a range of subsidies on which action should be prioritised:

- subsidies to hard coal (see dedicated case study);
- subsidies to nuclear energy – liabilities and waste;
- subsidies to energy intensive industries (see dedicated case study);
- subsidies to company cars (see dedicated case study).

Regarding future subsidies which would have to be properly designed, the working group also noted growing concerns regarding:

- Biofuels – inter alia, to avoid making the mistake of choosing the wrong fuels and source of fuels (see dedicated case study);
- Grandfathering (free allocation) of emissions credits, as opposed to the auctioning, within the EU Emissions trading scheme (ETS) (see case study on aviation Chapter 5.1.);
- Carbon capture and storage (CCS).

This is not an exhaustive list, but certainly a helpful one. As regards what to do, this will have to be assessed case by case.

7.5 Summary

The first key message that comes from the discussion of this Chapter is that subsidies that first appear to be environmentally harmful may not actually harm the environment in their current form, for example, if there are other policy measures in place to mitigate any adverse environmental impact. Consequently, in order to identify which subsidy reform might benefit the environment, the OECD has developed a checklist (Pieters, 2003) that can be used as a first step in identifying subsidies that, when removed, might result in environmental benefits. The key steps in this process are:

- *Detailed description of the subsidy* under consideration (type of subsidy).
- *Identification of policies* that have been put in place to mitigate any adverse impacts of the subsidy.
- *Identification of the alternatives* to the subsidised activity, and the relative environmental impacts of these.
- *Identification of the conditionality of the subsidy*: the existence of a subsidy is usually linked to a point of impact, (e.g. output, input, profits and income), which impact to a higher or lesser extent on the levels of production and different impact on the environment.

Two new factors have been added with the ‘checklist’ since the OECD 1998 report. The new factors try to integrate the issue of technological lock-in with the previously identified linkages between the subsidy and its environmental impact and to analyse further the impact of the conditionality of the subsidy. In particular, which alternatives to the recipient sector are discouraged as a result compared with those of the supported sector.

The other issue that is extensively developed by Pieters in its checklist is that of conditionality of the subsidy. Following its analysis it follows that it is in fact very important to determine, first, whether the subsidy to be removed is conditional on input or output levels; if not, its removal would affect relative incomes, but not having significant environmental impacts. In particular, the *removal of subsidies to environmentally relevant variable costs* (e.g. energy, water, materials) has a greater and immediate impact on the environmental than the removal of subsidies to capital goods. The discussion on this last point can be summarised as it follows:

- From an economic point of view, removing subsidies to inputs or to capital goods (so preventing pollution and waste to be generated upstream by increasing resource efficiency), is often **cheaper than the deployment of abatement technologies** (end-of-pipe technologies).
- **The removal of subsidies that lower the cost of industry’s variable costs** (e.g. energy and materials) affects day-by-day production decisions. Their removal will spur energy efficiency; its effect will be continuous, encouraging the deployment of efficient transformation technologies.
- **The removal of subsidies that lower the cost of capital** (i.e. fixed costs, e.g. low interest loans, capital equipment, costs of buildings and land), would instead influence future investment decisions on assets acquisitions, therefore having effects only in the long term, and their full environmental effects might take ‘even decades to materialise’.
- Finally, while the removal of subsidies to inputs have always positive effects on the environment, subsidies to certain fixed costs such as land, building and cost of capital do not influence modes of production, therefore their removal would not take necessarily environmental positive effects.

The *removal of market price support mechanisms* (e.g. subsidies that ensure certain production levels or that support a price above the market price) will reduce the production and consumption of the output supported. The environmental result however depends mainly on the demand and supply elasticities as well as availability of the alternatives (see Chapter 2.3.1.). The removal of *deficiency payments and sales premiums*, also being mechanisms to bridge the gap between a politically determined

price and the market price, have similar effects on production volumes as market price support.

There are other criteria for assessing priorities for reform, which the authors of this report developed building mainly on the expert brainstorming at the ad hoc meeting on environmentally harmful subsidies hosted by the European Commission in December 2006.

First, there should be a preliminary assessment: **is there a problem?** This question can be answered by a superficial skimming of the available evidence, for example answering the following questions:

- *Does the subsidy no longer fulfil its original objectives and rationale?*
- Is there a clear and significant environmental impact (i.e. not just appearance of a problem but an actual one)?
- Is there an inefficient allocation of resources or does the market does not function properly (e.g. were prices to be right)?
- Is the subsidy illegal and/or does it runs counter the letter/spirit of State aid policy?
- Does the subsidy runs counter objectives and principles committed to (e.g. polluter pays principle)?

If one of the above questions is true then, there is a problem that needs addressing. Of the above, one key element to assess if a subsidy should be removed is to assess whether it still fulfils its original objectives and rationale. If not, then this is an important sign that the subsidy is misplaced.

Secondly, another question should be addressed: **would reforming the subsidies address the problem?** The OECD checklist should help decision makers to answer this question. Importantly, there is a third question to ask: **is there the potential means to address the problem?** For instance:

- Is there sufficient information to allow action?
- Is there a political willingness to act?
- Is there a legal basis upon which to act (EU, national)?
- Is there a champion to make it happen?
- Is there bipartisan support (i.e. removing EHS is a process and ideally requires support from both the government and the opposition as the reform can cover several periods of office)?
- Is the timing right (i.e. is there a potential window for action)?
- Is it understood who the potential opponents to the reform and can their potential opposition be addressed?
- Are there potential (set of) measures that could be taken?
- Would the potential *measures* offer benefits (i.e. environmental improvement)?

Also, more attention is needed on the development of guidelines for the design of new subsidies, in order, for instance, to prevent long term subsidisation, lock-in effects and other unintended consequences deriving from the ill targeting of subsidies. In this Chapter

we offered some preliminary points which should be addressed when designing a subsidy (mostly built on Steenblick, 2006), a selection of which is:

- Designers need to put themselves in the role of the recipient and think through how they would respond to incentives;
- Ensure that subsidies when launched also include an assessment on how they are going to be used and not just on what they are put on;
- Need to think through the demand and supply changes;
- Check that the subsidy is well targeted (this issue is particularly pertinent to biofuels);
- The subsidy should have regular review clauses and potential for revision;
- The subsidy should have a finite lifetime,
- Criteria for qualifying for the subsidy should be clear and transparent;
- Care must be taken as regards subsidies with multiple objectives – ideally focused subsidies will be designed for a specific objective, however, in practice multi objectives tend to play a role (necessary to get agreement for the subsidy).

Ideally the above summarised criteria should work as a complement to the criteria set out on the checklist developed by Pieters for the OECD (2005; 2006).

8 PRACTICAL LESSONS FROM THE REFORM OF ENVIRONMENTALLY HARMFUL SUBSIDIES

The previous Chapter illustrates how to identify whether the removal of a particular subsidy would be environmentally beneficial (via the checklist) and discusses criteria for prioritising the removal of subsidies which harm the environment. This Chapter contributes further to the discussion by setting out the lessons that can be learnt from case studies of EHS reform: some deriving from the ones developed in this report, others deriving from the case study analysis undertaken by the OECD (OECD, 2006). In particular, here we focus on how, practically, such reform might be best taken forward.

The understanding of the political economy of a subsidy is crucial for the success of a reform process; below we illustrate this through the analysis of Demania (OECD, 2005) and through the discussion of evidence coming from the case studies analysed in this report. The Chapter develops the following lessons:

- The need for good quality information and transparency
- Subsidy reform does not happen in isolation
- The need for strong leadership and a broad coalition
- The need for a well-managed process

These are discussed in turn in the sections that follow.

8.1 The need for good quality information and transparency

The first lesson is driven by the insight that *environmental issues are rarely a driving factor behind subsidy reform*. While it is often true that consideration of the adverse environmental impacts of the existing subsidy are often recognised in policy discussions about reform, they are rarely the driver behind reform. On the contrary, reform is often driven by broader economic pressures, such as the burden that supporting a particular industry places on the economy or a need to address a budget deficit (see Box 6). In other cases, reform is driven by external pressures, e.g. EU State aid and energy policy in the case of EU Member States.

Box 6: Driving factors behind subsidy reform

Budgetary considerations. In Germany, the main argument in favour of reducing coal subsidies has been the large economic burden that these currently impose on the German economy. Similarly, in Poland, the main motive for increasing the rate of VAT on energy from 7% to bring it in line with the standard rate of 22%, was financial, but this time to address a budget deficit.

External pressure. In the case of both the reform of VAT on energy in Poland and the reform of coal subsidies in Germany, external pressure also had an influence. In Poland, the reform was also needed to comply with the requirements of institutions, such as the IMF and World Bank, the latter having invested in Poland's natural gas industry on the condition that prices would rise to western European levels. In Germany, pressure from

the European Commission – on the basis of competition concerns – has also been a driver of the reforms. Since joining the EU, Polish coal mining has also had to comply with the requirements of EU competition law.

The second insight behind this lesson comes from the OECD workshop, where it was noted that *the absence of a clear and well-understood justification for reform was sometimes an impediment to reform*. This consideration is implicit in the OECD's checklist, which was discussed in the previous section. At the workshop, it was also suggested that it might have been appropriate in the past for the advocates of reform to focus their efforts on the environmental, economic or trade impacts of subsidies, in order to increase the understanding of these impacts. However, a broader understanding of the impacts and benefits of subsidies and their reform, particularly in relation to the social aspects (e.g. short-term job losses), is needed to enable reform to be taken forward. This is to address the concerns of the opponents of reform that adverse social consequences will result in the event of support being removed (see, for example, the discussion in Chapters 9.2 and 9.3). In the longer-term, there were often social benefits resulting from subsidy reform, such as increased equity, infrastructure modernisation, reduced dependency and more balanced community growth. Damania (2005) therefore argues that the 'political economy of reform' must focus on all the information needed for effective decision-making, including what is needed to overcome the barriers, which are often social.

For example, at the workshop it was recognised that often the most difficult aspect of the reform is dealing with the short-term social impacts and understanding the social costs of the existence of the subsidies. As discussed in Box 7, in many countries the rationale behind the subsidies to national coal industries is often social. At the OECD's workshop, it was considered that such an understanding was necessary in order to be able to overcome the obstacles that often underlie arguments for the retention of subsidies, to understand the social benefits of the reform and to handle better any short-term transitions that are necessary. It was also suggested that there might be a rationale to extending the checklist approach (see Chapter 7) to cover the three pillars of sustainable development.

Box 7: Understanding the social aspects of subsidies

German, Spanish and UK coal industries. The political imperative to protect jobs has been a major factor in the aid provided to the German and Spanish coal industries (EEA, 2004). In spite of its relative success with reforming its coal industry and reducing the subsidy that the industry receives, the UK has chosen to reinstate a subsidy to its coal industry. The aim of this aid is to create or safeguard jobs in the UK coal industry within socially and economically disadvantaged areas by encouraging coal producers to enter into commercially realistic investment projects that maintain access to coal reserves; that would not otherwise go ahead; and that will ensure the medium-term economic viability of the relevant mines. The rationale for this State aid is that the closure of most of the mines would have considerable adverse consequences for the local communities, as has been seen in many traditional mining areas in the UK. Many of these communities already perform below the national average across a broad range of social and economic indicators.

As it will be discussed in Chapter 9, Damania (OECD, 2005) argues that one of the obstacles to the reform of subsidies is that the benefits of subsidies are significant

financially to the relatively few recipients who receive them, whereas the costs are not well understood and the economic impact on those who pay the subsidy, i.e. the tax payer, is relatively small. Consequently, he argues that the provision of *more information on subsidies to voters* might stimulate more opposition to subsidies from the electorate. However, this might happen only if there is a distinct difference between the positions of the key parties, which may not be the case if the benefits received by the opponents of reform remain significant and the lobbyists have influenced the positions of all main parties. The transparency or otherwise of the extent of subsidies can impact on the extent of pressure for reform (see Box 8).

Box 8: The impact of transparency

German coal subsidies. In the case of German coal subsidies, a 1994 decision of the German Constitutional Court ruled that the previous way of subsidising the coal industry – a surcharge on the price of electricity – was unconstitutional. This led to the subsidy coming directly from the state budget, which meant that its cost to the economy became clearer, thus contributing to the pressure for reform (see Box 6).

Lack of transparency in the nuclear debate. It is argued that one of the main obstacles to change in the nuclear sector is the substantial lack of information concerning the amounts of money employed to support nuclear technologies and the damages associated to the use of such a kind of energy source.

8.2 Subsidy reform does not happen in isolation

As discussed elsewhere in this report, there will be winners and losers from the reform of subsidies. Often the losses are felt in the short-term, while the benefits develop over longer time periods (see Chapter 9 for examples). Hence, it is important that the reform of subsidies is complemented by other policy measures, which can either be put in place to address any short-term adverse impacts resulting from the reform, or as part of a broader package of reform measures, such as environmental (or ecological) fiscal reform. In other words, subsidy reform should be part of a broader ‘reform’ package of measures.

The type and detail of the other policy measures that should make up this reform package will clearly depend on the original objectives of the subsidy, the detail of the reform itself and they will also need to mitigate any adverse impacts, particularly social ones, that might result from the reform. If a clear understanding of the subsidy, its rationale and potential impacts of its reform have been well understood, as set out in the previous section, then this information can be used to target and design any policies that might be needed to mitigate the adverse impacts of reform. Such policies to assist those in most need could, for example, consist of transitional income assistance and debt forgiveness (OECD, 2005; see also Box 9).

Box 9: Accompanying measures that ease agreement on reform

Compensatory measures in Polish VAT and coal subsidy reform. In Poland, in order to compensate the poorest households for the increase in VAT on energy, compensatory measures were introduced. These included direct allowances, as well as cheap credit to finance the modernisation of local heating sources. As noted in Section 4.2.2, in recognition that reform to Polish coal subsidies would result in job losses, the government

provided generous severance packages for miners to ease the adverse economic impact of the job losses.

Damania (OECD, 2005) argues that *enhancing competition* has potentially a key role to play in enabling subsidy reform. He argues that there is evidence that economies that are more open adopt more stringent environmental policy and that sectors that are exposed to greater competition pollute less. Hence policies to increase competition might reduce the benefits that can be accrued from the receipt of subsidies, and thus reduce the resistance to subsidy reform. However, he notes that the same arguments that block subsidy reform can also be used to resist changes to competition policy.

The reform of environmentally harmful subsidies can also be taken forward as part of a broader environmental (or ecological) fiscal reform (EFR). As it includes subsidy reform, EFR is a step beyond environmental tax reform, which focuses on shifting taxes and tax burdens from ‘goods’, e.g. income, to ‘bads’, e.g. environmental damage. Such reform has been considered in a number of countries, but the most ambitious plans were put forward in Germany in 2002, although they were never implemented in full. The proposal was to extend the environmental tax reform that had already been implemented by reducing environmentally harmful subsidies, such as the VAT exemption for international flights, reducing the distance-based commuters allowance and reducing subsidies for the German hard-coal mining industry. The full proposals were, however, rejected by the German upper house (BMU, 2004; EEA, 2006).

8.3 The need for strong leadership and a broad coalition

The need for subsidy reform to be part of a reform package underlines that there needs to be political support for this package and, in particular, a champion of reform. Indeed, in several of the case studies looked at for this report, there was evidence of a strong champion of reform (see Box 10). A strong political advocate of reform will help both in communicating a clear message and in developing the necessary package of measures needed to mitigate any adverse effects (see the previous section). At the OECD workshop, it was suggested that high-level political support was important in taking reform forward. Given the broad impacts – social, economic and environmental – of reform, the support of different government departments can also be instrumental. In cases where there is a lack of a strong department to take the lead in taking forward reform, it was suggested that strong bureaucratic leadership might be important, particularly where the interests of different government departments had to be brought together.

Box 10: Examples of leadership in subsidy reform

Reform of German eco-tax exemptions. One of the principal drivers of the reform to remove exemptions to German eco-taxes was the Green Party, when it was part of the ruling coalition. After the red-green coalition had been voted in for a second time in 2002, the reform of these exemptions was taken forward, in all likelihood, on the basis of plans that already existed, but which gained new momentum from the re-election. However, after the formation of the ‘grand coalition’, which did not include the Green Party in 2005, exemptions to the eco-taxes were increased.

Polish VAT reform. In Poland, the reform of VAT on energy was actively taken forward by the national Finance Ministry. Original proposals were abandoned in 1994, only for the Ministry to reintroduce its proposals in mid-1995. There was a fair amount of opposition against higher consumer prices in general, not just energy prices, during the 1990s, but the Ministry saw through the reform, eventually implementing a phased increase (from 7% in 1995 to 12% in 1996, 17% in 1997 to the standard rate of 22% in 1998).

Reform of the UK coal industry. In the UK, the election of the Thatcher government in 1979 marked a major change in British politics and economic policy, with the privatisation of (inefficient) state owned companies being pushed through by the new government. This included the coal industry and over the subsequent years, the coal subsidy in the UK was eliminated, although it has recently been reinstated, even when significant losses accompanied the reform. However, it should be noted that concern for the environment did not play a role in the reform of the UK coal sector; rather the rationale for reform was linked to a broader political agenda.

However, strong leadership on its own will not necessarily be sufficient (as can be seen in Box 11). In cases where reform has happened, governments have generally been supported by a wide coalition of diverse stakeholders and other decision makers. At the OECD workshop, it was underlined that it was important to use partnerships to engage vested interests in the decision making process, as well as mobilising other interest groups. A better understanding of the current situation and potential impacts of reform, as discussed in Chapter 7, should assist with the construction of a coalition to support the reform.

Box 11: Engaging the opposition

Reforming the Polish coal industry. In Poland, the coal mining industry is characterised by relatively strong unions. The lobbying power of the unions is also enhanced by their connections with political groups, which is a result of Poland's political history. The authors of all restructuring programmes have had no choice but take into account the opinions of the mining unions. In Poland, there is also a strong tie between workers and employees in the industry: when faced with imminent restructuring programmes, they have put up a united front against the government. Mining remains the most important source of income in regions like Silesia, and the social costs of restructuring the sector have been considerable – and remain high.

8.4 The need for a well-managed process

The recipients of subsidies can become dependent on the existence of the support, thus creating a barrier to reform (see also Chapter 9.2). Such 'entitlement mentalities can quickly develop, and in subsidies that were originally intended to be in place for the short-term can soon become embedded in the sector and its expectations (OECD, 2006). This underlines the importance of an open debate on how to handle the transition and the associated structural reform (see Chapter 7). The result of such a debate needs to be a well managed process for reform, which could, for example, include a gradual approach in which reforms and any mitigation measures are implemented in a clear sequence to enable easier transitions. Also, if possible, it is beneficial to take advantage of an economically advantageous stage in the business or sectoral cycle (see Box 12). In other

cases, a response to a crisis can be taken as an opportunity to engage a consensus for, and push forward, reform (OECD, 2006).

Box 12: Managing reform

German coal subsidy reform. The gradual reform of subsidy has been a feature of several recent energy subsidy reforms. For example, in Germany, a 1997 ‘compromise’ led to the reduction of coal subsidies from €4.7 billion in 1998 to €2.7 billion in 2005 and then down to €2.38 billion in 2008. The current coalition intends to further reduce subsidies after 2008. In Poland, reform of the VAT treatment of energy also took a staged approach. A similar approach was previously taken in the UK in relation to its successful removal of coal subsidies.

VAT reform in Poland. Part of the reason why the VAT reform in Poland was successful was that it occurred at a time of falling inflation and rising real disposable household income, hence the impact of the VAT increase was significantly reduced. Having said that the reform of the VAT rate applied to energy in the Czech Republic – it rose from 5 to 22% in 1998, occurred at a time of recession.

8.5 Summary

In summary, a number of practical lessons for taking forward the reform of subsidies can be identified, i.e.:

- **The need for good quality information and transparency.** This is important so that all those involved in the decision-making process and all those potentially affected by the policy reform are clear as to the rationale behind the proposed reform and its expected effect.
- **Subsidy reform does not happen in isolation.** Subsidy reform should be part of a broader reform package to include, for example, policies to mitigate any potential adverse impacts from the removal of the subsidies.
- **The need for strong leadership and a broad coalition.** There needs to be a champion for the reform, either political or bureaucratic, to galvanise support for the reform and to communicate well with those stakeholders involved or potentially affected.
- **The need for a well-managed process.** It is important to set out clear stages for the reform and to make use of any economically advantageous situations.

Regarding the first point (i.e. the need for good quality information and transparency), a conclusion from case study analysis is that the absence of a clear and well-understood justification for reform was sometimes an impediment to reform. In the past, the advocates of reform have been focusing their efforts on the environmental, economic or trade impacts of subsidies, in order to increase the understanding of these impacts. However, a broader understanding of the impacts and benefits of subsidies and their reform, particularly in relation to the social aspects (e.g. short-term job losses), is needed to enable reform to be taken forward. There is a rationale to extending the checklist approach to cover the three pillars of sustainable development. This issue will be explored further in Chapter 9.3.

Regarding the second point, reforms are generally accepted where there are compensatory measures or where these are part of a broader fiscal reform. Of course, the detail of the

reform itself is crucial and the measures agreed also need to mitigate any adverse impacts, particularly social ones, which might result from the reform.

Thirdly, the need of engaging a broad coalition is deemed necessary, for example, not to incur into the risk that a change of government might nullify a painful reform processes (e.g. see case study on ecotax exemptions in Germany – Chapter 4.2.). But, as well as engaging in bipartisan support, there is a need for interdepartmental support within the public administration, as well as using partnerships to engage vested interests in the decision making process. A better understanding of the current situation and potential impacts of reform, as discussed in Chapter 9, should assist with the construction of a coalition to support the reform.

Also, an open debate on how to handle the transition and the associated structural reform is important. The results of such a debate should lead to proposals for which reforms and mitigation measures are implemented in a clear sequence in order to enable easier transitions. It should, ideally, take advantage of an economically advantageous stage in the business or sectoral cycle. In other cases, a response to a crisis can be taken as an opportunity to engage a consensus for, and push forward, reform (OECD, 2006).

9 EXAMINING THE ARGUMENTS AGAINST REFORM

Ideally linked to the previous Chapter on lessons learned for EHS reform, this Chapter analyses in depth the arguments raised *against* subsidy reform. In fact, there are a number of arguments that opponents of reform put forward as obstacles to the reform of environmentally harmful subsidies, in the energy sector in particular. These arguments survive due to a significant lack of information and understanding of subsidies, their scale and their harmful effects. This section examines some of these arguments and concludes that the reality is more complex than opponents of reform often recognise.

In particular we will consider the following arguments:

- Removing subsidies will harm competitiveness
- Removing subsidies will result in job losses
- Reforming subsidies will have implications for social equity
- Reforming subsidies will adversely impact on energy security
- Removing subsidies will increase imports of similar fuels or other products

9.1 Removing subsidies will harm competitiveness

Concerns about competitiveness are often raised by industries to object to the removal of subsidies. However, the examples of coal subsidy reform in Poland, the UK and Germany demonstrate that keeping subsidies in place for too long can create a vicious circle where the government has to keep providing increasing support to the industry to enable it to protect itself from external competition. Subsidies keep industry artificially protected from having to respond to improving standards in the international market. After forty years in which the British government sustained its national coal industry, the industry, by the time of the subsidy removal in the early 1990s, had grown vastly inefficient by world standards.

Moreover, as the reform of coal subsidies in Poland shows, subsidies that have been in place for decades require increasing amounts of money to remove. In the 1990s, the Polish coal industry faced serious problems: high costs, scarcity of funds, over-staffing, over-supply, deteriorating geological conditions and significant environmental consequences. In July 1998, the Government agreed to a five-year programme to restructure the industry, at an estimated cost of US\$2 billion (about €1.5 billion³⁵). This included closing 24 mines, reducing employment from 240,000 to 105,000, reducing output, and writing off more than half of the sector's US\$4 billion in debt (€3 billion³⁵). In Germany, the reason for the introduction of coal subsidies has been the same as the reason for their reduction: the steady deterioration of German coal's competitive situation indicating that subsidies do nothing to aid an industry's *long-term* competitiveness.

Another argument used to stimulate debate on the undesirability of maintaining the current system of State aid to coal production is budgetary. The efficiency of subsidising coal mining is questionable in the face of financial constraints faced by public authorities: it is vital to prioritise the allocation of resources in such a way as to get the most benefit from the best options. In the energy sector, these options include the effective management of energy demand and the further expansion of renewable energy sources.

Also, the impact on the energy market of preserving subsidies is dubious and perverse when we consider the contradiction of perpetuating support to coal production through State aid while simultaneously calling for greenhouse gas emissions reductions through, for instance, the EU Emission Trading Scheme.

9.2 Removing subsidies will result in job losses

Opponents of removing subsidies to the coal industry also cite the employment and social benefits that arise from retaining subsidies: coal subsidies – and energy subsidies in general – are often used to maintain local employment, especially in periods of economic transition. The political imperative to protect jobs has been a major factor in the aid provided to the German and Spanish coal industries (EEA, 2004). In some cases, reform of subsidies will result in job losses, but alternative investment can be put in place to minimise the adverse impacts. For example, in Poland and in the UK, generous severance packages for miners were provided.

Even though previously subsidised industry may lose jobs, there is of course the potential for job gains in other, more competitive industries. For instance, a strategy to ensure buy-in for the reform could be the diversion of funds previously used to subsidise the coal industry to social and economic programmes, or business tax incentives to attract investment, in the areas such as coal mining regions, that may suffer from subsidy removal. In some cases, the companies involved can be helped to diversify, for example, in the Netherlands the former state-owned coal mining company has been transformed into a successful multinational chemicals company (DSM). Funds can also be used to enable a restructuring of the energy market (e.g. shift to cleaner fuels, renewable energies, etc.) that will decrease dependency on carbon intensive fuels, reduce pollution, and counteract the argument of the supporters of subsidy that the removal of subsidies will not impact on pollution. More or less all countries offer a compensatory measure in such circumstances, some more successfully than others. More research is needed in order to identify successful and well designed support measures that address hardships in vulnerable groups.

9.3 Reforming subsidies will have implications for social equity

Often subsidies are motivated and defended on the grounds of social considerations. For example, several EU Member States apply reduced VAT rates to energy products such as coal, heating oil, natural gas and electricity. Low VAT on the final users of energy has generally been motivated by social considerations, just like the usual low VAT on other 'basic needs' such as food. However, it is not necessarily those on the lowest incomes that benefit the most from these reduced rates. An interesting finding by Freund and Wallich (1997) was that poor households in Poland benefited much less from energy subsidies than the richer ones. Not only did the richer ones use more energy in absolute terms, but also in relative terms (in other words, the demand for energy has an income elasticity of more than one). The poorest 20% of the population spent 7.4% of their total expenditures on energy, and the richest 40% more than 10%. During the reform between 1996 and 1998, Poland demonstrated that support from public funds could be redirected in a more efficient way to relief poor families and pensioners that were hit hardest by VAT increase and the contextual inflation. Compensation measures were taken, which

included direct allowances, as well as cheap credit for the modernisation of local heating sources.

9.4 Reforming subsidies will adversely impact on energy security

The fact that much of the fossil fuel resources available are found in politically insecure parts of the world – especially the ‘strategic ellipse’ that encompasses the Middle East and Russia – is often used to claim that future energy supply can no longer be taken for granted, with the consequent need to maintain a healthy indigenous coal, and nuclear, industry to reduce dependency on imported gas and oil.

Indeed, often the need to ensure that countries have some degree of independence with respect to energy production has been an argument for continued support to the energy industry. It is however widely recognised (e.g. CAN/EEB, 2006) that, with respect to coal, market conditions are unlikely to change in the decades ahead, and there is no ‘insecurity of supply’ regarding coal in the EU, nor are there likely to be any future interruptions of supply. Thus, granting financial support to domestic coal production on the basis of maintaining security of supply, or hedging against future insecurity, is not warranted, and is arguably a form of hidden protectionism.

9.5 Removing subsidies will increase imports of similar fuels

It is often argued that it is the substitution of the more polluting fuels, such as coal, by less polluting fuels that would lead to the most benefit in terms of reduced emissions. However, as opponents of reform argue, in many countries where, for example, reform of coal subsidies has taken place, domestically-produced coal has been replaced with imported coal – providing little environmental benefit. This was the case in the UK, where removing subsidies that support the domestic production of coal has led to a shift from the use of indigenous coal to the use of imported, cheaper (and sometimes cleaner in terms of sulphur content) coal. Thus, the expected environmental benefits have not always materialised to the desired degree, and the reform has come at substantial social costs in terms of job losses and negative impacts on the local economy.

However it has been argued that reform would probably lead consumers to switch to imported coal, rather than another fuel, only in the *short term* (IEA, 2000, Mountford, 2000). In the medium- and longer-term, as the markets react to the ensuing higher coal prices, there would probably be increased use of gas and renewable energies (OECD, 2004). In estimating the environmental benefits of the removal of coal subsidies, one should therefore take into account the effect on the redistribution of production, the effect on world prices and the long-term effects of fuel substitution. However, generally, it is too early in the reform process to assess the structural impact of reforms of the coal mining sector, and the interlinkages among technologies and sectors, energy demands and prices are difficult to model. Furthermore, the rising price of coal in the world market has improved the economic situation of several coal mines, raising questions about the rationale for maintenance of state support for profitable companies.

9.6 Summary

As it was underlined in Chapters 2.3 and Chapter 7.1, the impact of subsidies is complex. The extent of any adverse economic and environmental impacts depends on numerous

factors, including the details of the subsidy itself, broader socio-economic characteristics and other policies that are in place. However, subsidies have potentially adverse economic and environmental impacts, as they impact directly on levels of production, usually by keeping these higher than would be the case if the market was left to operate without such interventions. This, in turn, can impact on economic activity both upstream (e.g. more inputs are needed), and downstream (e.g. on trade by reducing the need for cheaper imported products). Any adverse environmental impacts flow from the fact that the support maintains production at levels that are higher than would otherwise be economically efficient and therefore 'inefficient' levels of resource use and pollution result.

There are, however, other obstacles that inhibit, in general, many policy reform processes, and, in particular, subsidy reform. These have been labelled as the 'key obstacles' for subsidy reform by the OECD (2005):

- Strength of special interests and rent-seeking behaviour;
- mythologies and fear of change;
- policy convergence stifling debate between political parties;
- competitiveness and distributional concerns, particularly with respect to regional interests;
- lack of transparency;
- legal, administrative and technological constraints; and
- growth of a culture of "entitlement" to subsidies.

Counter arguments might be proved to be built on 'mythologies and fear of change', which often turn into genuine fears that the removal of subsidies can have adverse impacts. For example, in this Chapter we briefly discuss the argument that subsidy removal would harm competitiveness, a powerful argument against reform: however, in reality, competitiveness is proved to be hindered by long term subsidies, which lock-in inefficient technologies and push the sector to overcapacity. This often leads to a vicious circle, for which more and more support is needed to keep an industry or a sector alive, making subsidy reform even more drastic and difficult to reach. At the same time, advantageous new technologies may be locked out by the subsidy.

One way of getting out of the muddle, not least in electoral terms, would be to consider subsidy reform within an overall fiscal reform context. It has been argued that subsidies are maintained more for social reasons, as Unions are concerned that prices should reflect true prices, intended as social and environmental. However, often, social benefits kept alive through subsidies are not very satisfactory and might be better substituted by other development and regeneration measures and initiatives. Indeed, job losses could in these circumstances be addressed by shifting funds to alternative development programmes.

Further research on distributional issues highlights that often we do not know enough of who the real beneficiaries of subsidies are, and that where data is gathered the result is that, controversially, it is businesses not households that get the most exemptions, or high income classes who benefit more than poor communities. We believe there is a strong argument that this one of the key points to investigate further in future research. Last but not least, in this Chapter, we tried to tackle the arguments that favour subsidies in the name of security of supply issues and the fears that fuels subsidies removal will just lead

markets to substitute domestically produced fuel with imported fuel, with no benefit for the environment whatsoever.

We have tried to analyse and show the inconsistencies of the main arguments against reform basing these on the evidence arising from case studies included in this report.

10 VISIONS AS TO WHAT THE EU COULD DO

Within this Chapter we aim at identifying those principles recognised within the EU Treaty and EU sectoral policy making that support an EU move towards a strong policy on environmentally harmful subsidy reform. Also we try to identify where the EU can find space for action on EHS reform and where the obstacles lay in the EU decision making system. On taxation and budgetary issues, in fact, the EU has to find ways around the well entrenched subsidiarity principle for legislation implementation and to bypass traditional Member States resistance of EU interference on taxation and budgetary policies. In this Chapter we analyse in particular the following issues which might support an EU EHS reform action:

- The ‘polluter pays’ principle (PPP) in EU policies
- Economic and financial measures: space for action on EHS
- ‘Better Regulation’ and the Lisbon agenda
- Potential Links between EHS and EU State aid policy
- Practical recommendations for EU policies

The EU has already laid the grounds for more action in this field through the widespread acceptance and integration of the polluter pays principle (PPP) in EU Policies, lately, by including the removal of environmentally harmful subsidies within the Integrated Guidelines for Member States’ implementation of the Lisbon Strategy. The European Commission itself, through the Impact Assessment (IA guidelines) of different policy options, has to consider when proposing legislation the environmental consequences of firms activities (e.g. if the policy option considered makes environmentally unfriendly goods and services cheaper or more expensive through changes in taxation, certification, product, design rules, procurement rules etc). The IA guidelines will be reviewed by April 2007, hopefully not to downplay this issue. Moreover, there is a potential space for action in ensuring that State aid policy fully contributes to sustainable development and environmental protection. In this Chapter we engage in discussing how this could be done. Finally we list out practical recommendations for EU internal and international policies.

10.1 The ‘polluter pays’ principle in EU policies

Arguably, the acceptance of the need for reform or removal of environmentally harmful subsidies relies firstly on the widespread recognition of the following related principles within policy making and public opinion alike:

- the polluter pays principle (PPP); and
- the full internalization of external costs as a precondition for undistorted competition within the EU (Thöne, 2006)⁹⁰

⁹⁰ The list is not exhaustive of the principles that guide the internalisation of environmental and social costs within the economy. Broader concepts are the full cost recovery principle (i.e. the costs of environmental services should be fully recovered from the entity benefiting from the service; this includes the user pays principle); the beneficiary pays principle (i.e. where an action provides a benefit, those who receive the

Indeed, in many case studies analysed by this report, we have seen that the starting point for reform has been on the basis of the ‘polluter pays principle’. It has been demonstrated by various cases, that this argument is likely to receive positive responses from the public opinion, in that it includes some elements of equity and distributes social costs on fair grounds.

The ‘polluter pays principle’ has been recognised by the EU within the Environment Title introduced by the Single European Act (now in Articles 174-176), which, among other things, sets out the principles on which Community environmental policy has to be based, which are:

- the attainment of a high level of protection, taking account of regional variations across the Community;
- the precautionary principle;
- the polluter pays principle;
- prevention rather than remediation;
- environmental damage to be rectified at source.

Although the broad objectives of EU environmental policy as set out in Articles 174-176 provide the Community with legal competence to act in all areas of environmental policy, it is clear from the Treaty that this competence is not exclusive and that it is shared with the Member States. In practice, the scope of the Community’s intervention in environmental policy is limited by two major factor:

1. The first is the principle of ‘subsidiarity’, which restricts action at EU level to those areas where it can be more effective than national or regional interventions. Partly as a result, some environmental Directives have taken the form of ‘framework’ legislation, leaving Member States with considerable discretion in their implementation.
2. The second factor limiting the scope of the Community’s environmental policy has been the continuing requirement in the Treaty for the unanimous – rather than majority – support of Member States in the Council of Ministers for Community action in areas which most of them regard as particularly sensitive. Examples include, among others, taxation, including *‘green’ taxation*.

In general taxation issues remain underdeveloped by the EU because Member States continue to resist the Commission’s attempts to develop competences over matters of tax (the most obviously useful market instrument) mainly for domestic political reasons. This has been facilitated by the continued requirement for unanimous voting in the Council for taxes, including ‘green’ taxes.

However, use of economic instruments for the internalisation of externalities has been made at the Member State level especially within Scandinavian countries and the Netherlands

benefit should pay for the cost of providing that benefit); and social pricing (i.e. prices reflects scarcity of the resource). For a detailed discussion see Ten Brink P. (2006).

, who were early runners on environmental tax reform (ETR), but the UK and Germany have also made progress in the late 1990s. At the EU level one notable exception to the sparse use of market based instruments for the environment is the start in 2005 of the EU's Emissions Trading System (ETS), the largest in the world, for carbon dioxide emissions.

10.2 Economic and fiscal policy: space for action on EHS

Subsidies are included in the Member States' realm of economic and fiscal policy for the environment. The European Union here has only indirect or supplemental powers – for example in relation to State aids policy. The main tasks of the Community in this area are based on Title VII of the EC Treaty 'Economic and Monetary Policy'. Article 98 states that 'Member States shall conduct their economic policies with a view to contributing to the Community's objectives, including sustainable development', set out in Article 2. This is to be achieved in the context of the annual 'Broad Economic Policy Guidelines' (BEPGs) which are agreed by the ECOFIN Council.

Within the recommendations in the BEPGs for the 2005-2008, there are guidelines to Member States referring on *how* to enhance environmental sustainability. Accordingly they call in some detail *to promote the development of means of internalisation of external environmental costs and decoupling of economic growth from environmental degradations*, including the use of market-based instruments and *the reform of subsidies that have considerable negative effects on the environment and are incompatible with sustainable development, with a view to eliminating them gradually*.

A number of other pieces of legislation have been adopted that relate to the harmonisation of taxation frameworks in Member States. For example, the so-called Mineral Oils Directives (92/81/EEC and 92/82/EEC) provided a harmonised framework, and set minimum rates of excise duty, for a range of mineral oils from 1992. These were subsequently superseded by the Energy Tax framework (2003/96/EC). This sets minimum duty rates for most fossil fuels, but includes a wide range of derogations, for example long transition periods for Member States with low duty rates and for energy intensive industries within Member States. See case study on tax exemptions for energy intensive industries in Chapter 4.

The 'Eurovignette' Directive addressed other taxes on HGVs, such as vehicle taxes, tolls and road user charges (1999/62/EC). Subsequently it has been modified to update it, for example to reflect increased interest in heavy goods vehicle charging schemes, and a revised proposal was presented in 2003. This proved very controversial, however, in part as to the possibilities for Member States to reflect externality costs in their charges, as the peripheral States were generally strongly opposed to this. The approved revision of the Directive (2006/38/EC) sets new framework conditions for the implementation of HGV charges, and may pave the way for including externalities. For a more detailed discussion see case study on road infrastructure cost recovery in Chapter 5.

A Communication on a package to tackle harmful tax competition in the European Union (COM(97)564) was finally adopted in 2003. A separate measure proposing the harmonization of diesel duty for road haulage was proposed in 2002 in the wake of the fuel protests of autumn 2000, but it has not been adopted as the Member States have not

taken the measure forward in the Council. This proposal suggested that duties should eventually be harmonised at a specified rate. At the time of writing it is reported that there are plans to launch a revised proposal that will simply raise the minimum rates of diesel duty; but this too is likely to prove controversial and derogations would likely be needed for the measure to be adopted.

Also in 2002, a Communication on vehicle taxes and duties (COM(2002)431) proposed moves towards a harmonized tax structure, but did not directly propose new legislation on the issue. Subsequently, in July 2005, the Commission published a proposal for a Directive on passenger car taxes (COM(2005)261)). The Impact Assessment accompanying this proposal noted that relatively few Member States explicitly linked their vehicle taxation with environmental objectives and only two (the UK and Cyprus) either based or adjusted taxation according to CO₂ emissions. The proposal sought therefore to increase the harmonization of circulation tax (CT) and registration tax (RT) across Member States by using three measures:

1. A phase out of RT over a five to ten year time frame.
2. A refund of RT and CT for consumers penalised by the movement of vehicles between Member States.
3. Restructuring the tax base of RT and CT to be totally or partially CO₂ based.

As with other tax-based measures, however, this proposal has not found favour with all Member States, and has not made progress.

Due to the requirement for fiscal environmental measures to be agreed by unanimity in the Council (Article 175 EC Treaty), most EU activity has been limited to general policy statements. For example, the Commission issued in 1997 guidelines on the use of green taxes (COM(97)9), intended to support the use of such instruments. In 2001, the Commission published its White Paper on the Common Transport Policy – COM(2001)370. A central recommendation of this and its subsequent Mid-Term Review in 2006 was that the price faced by transport users should cover the marginal social costs of constructing and maintaining the infrastructure, plus the ‘external costs’ caused by its use. This was intended to reduce pollution, congestion and accidents by including the cost of these in the price which the driver pays for use of road transport infrastructure. The White Paper also explicitly acknowledged the global dimensions of air pollution and emphasised the need to incorporate the costs of climate change into the marginal cost element.

But the Commission’s own proposal for a revision to the Eurovignette (discussed above) violated them by not allowing charges to reflect the cost of environmental externalities.

10.3 ‘Better Regulation’ and the Lisbon agenda

Launched in March 2000 at the European Council in Lisbon, the Lisbon Strategy aims to make the EU the most competitive, knowledge-based economy in the world by 2010, and introduced a number of new mechanisms for policy development aimed at achieving this. There are two main instruments which have been developed within the EU policy making aimed at taking forward the better regulation and the Lisbon agenda. These are:

- Integrated guidelines for growth and Jobs 2005-2008;

- Impact assessment guidelines (which every Desk officer within the European Commission should follow when drafting a Communication or a legislative proposal).

The new meaning of better regulation was re-emphasised in both the ‘Integrated Guidelines on Growth and Jobs’ (12 April 2005), which guided the development of National Reform Programmes in the Member States, and in the Community level counterpart - the Community Lisbon Programme⁵. The macroeconomic guidelines for growth and jobs state that an efficient allocation of resources *are a necessity* for the public sector to make a full contribution towards growth and employment, without jeopardising the goals of economic stability and sustainability’. Member States should therefore:

‘direct the composition of public expenditure towards growth-enhancing categories, adapt tax structures to strengthen growth potential and ensure that mechanisms are in place to assess the relationship between public spending and the achievement of policy objectives and ensure the overall coherence of reform packages’ (Integrated guideline No3)

In order to achieve well-designed tax and expenditure systems, Member States can:

‘control other expenditure categories through the use of expenditure rules and performance budgeting and by putting mechanisms in place to ensure that individual reform measures and overall reform packages are well-designed.’ (Guideline 3)

The microeconomic recommendations are based on the acknowledgement that the dynamism of the European economy is crucially dependent on its innovative capacity. This implies well functioning financial and product markets’, and a sustainable use of resources. Guideline 14 states that Member States should:

‘give priority to the internalisation of external environmental costs; to increasing energy efficiency and to the development and application of environment-friendly technologies. The implementation of these priorities should be in line with existing European commitments and with the actions and instruments proposed in the Environmental Technologies Action Plan (ETAP), through the use of market-based instruments, risk funds and R&D funding, greening of public procurement and the removal of environmentally harmful subsidies alongside other policy instruments (Integrated guideline No 14).

In order to improve national regulation, when preparing or revising legislation, Member States should systematically assess the costs and benefits of their legislative initiatives. Also they should:

‘should improve the quality of their regulations through a systematic and rigorous assessment of their economic, social and environmental impacts, while taking into consideration the

administrative costs associated with regulation. Moreover, Member States should consult widely on the costs and benefits of their regulatory initiatives, in particular where these imply trade-offs between different policy objectives' (Integrated guideline No 9).

The Impact Assessment guidelines (update March 2006)⁹¹ are instead aimed at European policy making, looking at economic, environmental and social impacts of different policy options. Among the environmental impacts, the Commission should consider the environmental consequences of firms activities, and in particular:

1. Does the option lead to changes in natural resource inputs required per output (e.g. will it lead to more energy intensive production)?
2. Does the option make environmentally unfriendly goods and services cheaper or more expensive through changes in taxation, certification, product, design rules, procurement rules etc?
3. Does the option promote or restrict environmentally un/friendly goods and services through changes in the rules on capital investments, loans, insurance service etc?
4. Will it lead to businesses becoming more or less polluting through changes in the way in which they operate?

These are guidelines for policy making impact assessment at the EU level. There is no enforcement mechanism within the Commission, however, to ensure that these guidelines are effectively integrated in policy making. New guidance will come following an independent evaluation of the IA system, which is expected in April 2007. The hope is that this reform will not downplay the above guidelines.

10.4 Potential Links between EHS and EU State aid policy

So far, the discussion on the relationship between EU State aid policy and environmental policy has traditionally focused on the conditions under which certain forms of State aid granted for environmental protection purposes may be declared compatible with the common market by the Commission. This matter is the subject of the Community guidelines on State aid for environmental protection⁹² which define the current policy of the Commission in scrutinizing Member States' plans for environmental aid and are due to be reviewed in the course of 2007. However, these guidelines are not the relevant framework to address the issue of EHSs, since they concern subsidies whose purpose is to advance environmental protection objectives (i.e. subsidies which are presumed to be environmentally beneficial, rather than environmentally harmful). Although this is not always the case (see case study on biofuels in Chapter 5.5.), and, as it is argued below, for environmental subsidies as well as for others, the Commission should expand the relevant criteria for evaluating the negative effects of the aid measure beyond strictly economic criteria to include its environmental impacts.

⁹¹ EC, Impact Assessment guidelines, March 2006 update, SEC(2005)791.

⁹² OJ C 37, 3.2.2001, p. 3-15,
http://europa.eu.int/eur-lex/pri/en/oj/dat/2001/c_037/c_03720010203en00030015.pdf

The issue of EHS needs to be addressed into the context of other forms of State aid as well as in those covered by the above-mentioned guidelines. Indeed, many, though not all EHSs as defined in this study, when granted by EU Member States, would be considered as State aid within the meaning of the EC Treaty and be subject to the relevant Treaty rules. *A priori*, the objectives of EHS reform and EU State aid policy should be compatible, since both are aimed at a reduction or phasing out of subsidies. Indeed, the basic legal position under Art. 87(1) EC is that State aid which distorts or threatens to distort competition within the internal market is incompatible with the Treaty, unless it falls within a limited range of exemptions listed in Art. 87(2) or is specifically judged to be compatible with the common market by a Commission decision based on one of the grounds listed in Art. 87(3). In applying the criteria mentioned in Art. 87(3), which include no reference to environmental aspects, the Commission enjoys a wide measure of discretion. However, it has sought to exercise this discretion consistently by applying general guidelines which it has laid down for different types of aid and which are periodically reviewed. These guidelines include both horizontal guidelines, such as the environmental guidelines, and guidelines concerning aid to specific sectors. Some of the horizontal guidelines may apply to aid which could be of an environmentally sensitive nature, such as, for example, the guidelines for national regional aid⁹³, the Multisectoral framework on regional aid for large investment projects⁹⁴, and the guidelines on aid to promote risk capital investment in SMEs⁹⁵.

However, none of these guidelines explicitly provides that the environmentally harmful impact of proposed State aid may be a relevant criterion for judging the Member States' aid proposals. The only reference to environmental impact is to be found in the regional aid guidelines where they provide that aid to offset additional transport costs in remote and low population density regions may be authorised, but that "external costs to the environment should also be taken into account",⁹⁶ together with a range of other economic criteria, in evaluating such aid.

In response to a call from the March 2005 European Council for a reduction in the general level of State aid, and the 'redeployment' of any remaining aid consistent with the objectives of the Lisbon strategy, the Commission issued a consultation document entitled 'State aid Action Plan Less and better targeted State aid: a roadmap for State aid reform 2005-2009'⁹⁷ in which it stated that it would seek to ensure that 'State aid rules better contribute to sustainable growth, competitiveness, social and regional cohesion and environmental protection'.⁹⁸ The document also states that 'appreciating the compatibility of State aid is fundamentally about balancing the negative effects of aid on competition with its positive effects in terms of common interest'.⁹⁹ This implies that while the positive effects may include non-economic objectives of common interest, its

⁹³ Adopted in 2006 for the period 2007-2013; [http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006XC0304\(02\):EN:NOT](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006XC0304(02):EN:NOT)

⁹⁴ http://eur-lex.europa.eu/LexUriServ/site/en/oj/2002/c_070/c_07020020319en00080020.pdf

⁹⁵ [http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006XC0818\(01\):EN:NOT](http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52006XC0818(01):EN:NOT)

⁹⁶ Para. 80.

⁹⁷ COM(2005) 107final,

http://europa.eu.int/comm/competition/state_aid/others/action_plan/saap_en.pdf

⁹⁸ *ibid.*, p. 3

⁹⁹ *ibid.*, p. 4

negative effects are to be appreciated solely in terms of its impact on competition. This appears also from the general “balancing test” for State aid which the Commission applies, for instance, in the recently adopted guidelines on aid to promote risk capital investment in SMEs:

1. A well-defined objective of common interest has to be identified (example: cohesion, growth, employment, environment).
2. Aid instruments have to well target the identified objective of common interest:
 - State aid is the appropriate policy instrument;
 - The aid measure has an incentive effect;
 - The aid measure is proportional to the problem tackled.
3. Distortions of competition and effect on trade should be limited so that the aid measure is not on balance contrary to the common interest.

Ensuring that State aid policy fully contributes to sustainable development and environmental protection would imply expanding the relevant criteria for evaluating the negative effects of the aid measure beyond strictly economic criteria to include its environmental impacts. By doing so, the reform of State aid policy could further contribute to the objective of phasing out EHSs.

10.5 Practical recommendations for EU policies

In general, EHS are governed within the realm of Member States taxation, fiscal and budgetary policies, however as we noted in the above paragraphs, the EU has space for action, often supplemental or indirect, however increasingly important.

For example, we have highlighted the potential greening of EU State aid guidelines, within the review processes of State aid Regulations for example through a stronger reliance on competition and its allocation effects.

It has been noted in many circumstances that the Energy Tax Directive allows for too many exceptions. It has been suggested (Thöne, 2006; Markandya, 2006; Soares, 2006; Meyer, 2006) that an Energy tax Directive revision should take to further harmonisation of energy taxes in the EU. Also, this harmonisation should be sought earlier than 2014.

Another action that the EU should take forward for some internalisation of externalities is the inclusion of the transport sector within the EU Emission Trading Scheme (ETS).

The European Commission could also set a good example within its funding policies, ensuring that these are consistent with the environmental protection and the ‘polluter pays’ principles. This is particularly sensitive in the area of R&D subsidies and within infrastructure investments under the EU structural funding schemes, in areas, such as new Member States or other economically disadvantaged regions in the EU, where the choice of development options could still influence greatly the environment.

The EU could take action in the area of support and through other instruments, such as Communications (Green Papers), or proposing a Framework Directive which addresses specifically the issue of EHS. Moreover, it could support new research, in order for instance to (based on Markandya, 2006):

- Assist in the analysis of the implications of the removal of subsidies and in the design of support measures.
- Prepare indicators of level of EHS by sector and Member State available on an annual basis. Use both a fiscal and social cost definition.
- Work with Member States to agree on ‘reduction rounds’ by target dates, much like the reductions of trade tariffs.

The EU could also push for reform acceleration on the international level:

- Work with international bodies (e.g. WTO) on time bound programs to reduce EHS world-wide.

10.6 Summary

Arguably, the acceptance of the need for reform or removal of environmentally harmful subsidies relies firstly on the widespread recognition of the following related principles within policy making and public opinion alike:

- the polluter pays principle (PPP); and
- the full internalization of external costs as a precondition for undistorted competition within the EU (Thöne, 2006)

Indeed, in many case studies analysed by this report, we have seen that the starting point for reform has been based on the wide acceptance of the ‘polluter pays principle’. It has been demonstrated by various cases, that this argument is likely to receive positive responses from the public opinion, in that it includes some elements of equity and distributes social costs on fair grounds.

The ‘polluter pays principle’ has been recognised by the EU within the Environment Title introduced by the Single European Act (now in Articles 174-176). However, in practice, the scope of the Community’s intervention in environmental policy and taxation issues has so far been limited by two major factors, entrenched in the nature of EU policy making:

1. The first is the principle of ‘subsidiarity’, which as a result, has determined some environmental or ‘difficult’ Directives to take the form of ‘framework’ legislation, leaving Member States with considerable discretion in their implementation.
2. The second factor limiting the scope of the Community’s environmental policy has been the continuing requirement in the Treaty for the unanimous – rather than majority – support of Member States in the Council of Ministers for Community action in areas which most of them regard as particularly sensitive. These include, among others, *energy supply, taxation and budget* issues (where this does not infringe on State aid legislation requirements and the Euro structural related measures).

Moreover, as far as subsidies are concerned, these are included in the Member States realm of economic and fiscal policy for the environment. The European Union here has only indirect or supplemental powers. In this area, ECOFIN Ministers have called on Member States to intensify the use of market-based mechanisms to integrate environment into economic policy, *including the application of the polluter pays principle, reducing energy subsidies, adjusting transport taxes and renewing efforts to meet the Kyoto commitments* (in their annual 'Broad Economic Policy Guidelines' (BEPGs)).

The Integrated Guidelines for Growth and Jobs in the context of the Lisbon Strategy call on Member States to internalise *external environmental costs, which should be achieved alongside other policy instruments through the use of market-based instruments, risk funds and R&D funding, greening of public procurement and the removal of environmentally harmful subsidies alongside other policy instruments* (Guideline 14). This microeconomic recommendation is based, among others, on the acknowledgement that the dynamism of the European economy is crucially dependent on its innovative capacity. This implies well functioning financial and product markets', and a sustainable use of resources.

At the EU policy level, the Commission's Impact Assessment Guidelines also require the EC to pay attention at the environmental impact of firms when assessing the policy options to achieve a policy objective, in particular it should assess whether the option:

- a) leads to changes in natural resource inputs required per output (e.g. will it lead to more energy intensive production)
- b) makes environmentally unfriendly goods and services cheaper or more expensive through changes in taxation, certification, product, design rules, procurement rules etc
- c) promotes or restricts environmentally un/friendly goods and services through changes in the rules on capital investments, loans, insurance service etc
- d) leads to businesses becoming more or less polluting through changes in the way in which they operate

New guidance will come following an independent evaluation of the IA system, which is expected in April 2007. From the perspective of EHS, it is strongly desirable that this review should not downplay the above assessment requirements.

Last but not least, the Commission should make sure that EU State aid policy is compatible with a reduction or phasing out of subsidies. So far, none of the guidelines on State aid explicitly provide that the environmentally harmful impact of proposed State aid may be a relevant criterion for judging the Member States' aid proposals. The only reference to environmental impacts is to be found in the regional aid guidelines, where they provide that aid to offset additional transport costs in remote and low population density regions may be authorised, but that 'external costs to the environment should also be taken into account',¹⁰⁰ together with a range of other economic criteria in evaluating such aid. In this respect the Commissions should strengthen its stance towards the EHS issue and use the general guidelines which it lays down for different types of aid, and which it periodically reviews, to include reference to environmental issues (i.e. expanding

¹⁰⁰ Para. 80.

the relevant criteria for evaluating the negative effects of the aid measure beyond strictly economic criteria to include its environmental impacts). By doing so, the reform of State aid policy could further contribute to the objective of phasing out EHSs.

Moreover, the EU could support new research in order to (Markandya, 2006):

- Assist in the analysis of the implications of the removal of subsidies and in the design of support measures.
- Prepare indicators of level of EHS available by sector and Member States on an annual basis, including both a fiscal and social cost definition.
- Work with Member States to agree on ‘reduction rounds’ by target dates, much like the reductions of trade tariffs.

The EU could also push for acceleration of reform at the international level, for example working with the OECD for the development of the common framework for subsidy reporting (see Chapter 3.1) and with international bodies (e.g. WTO) on time-bound programs to reduce EHS worldwide.

11 SUMMARY AND CONCLUSIONS

The importance of processes to review and potentially reform environmentally harmful subsidies is now well recognised. Increasing policy support has been given to underline that progress is needed, and this has been underlined in numerous policy documents and other statements from all the EU institutions.

- The 6th Environmental Action Programme recognised that *‘the identification and, where possible, removal of environmentally harmful subsidies is a first step towards correcting prices and reducing subsidies’ potential negative effects on the environment’*.
- The 2006 Spring European Council *‘endorsed (...) further exploration of appropriate incentives and disincentives, and the reform of subsidies that have considerable negative effects on the environment and are incompatible with sustainable development, with a view of gradually eliminating them.’*
- In 2004, the Environmental Technologies Action Plan¹⁰¹ (ETAP) adopted by the Commission also included a review of environmentally harmful subsidies as one of its priority actions, as it was argued that the removal of these should support the competitiveness of the EU.
- The revised EU’s Sustainable Development Strategy (2006) calls on the European Commission to produce a road map by 2008, for each of the relevant sectors, on the removal of environmentally harmful subsidies (EHS).

Furthermore, some countries have begun discussing the reform of environmentally harmful subsidies in the broader context of a general ecological fiscal reform (EFR). Under EFR, the tax burden is shifted from ‘good’ things such as income and employment and on to ‘bad’ things such as pollution and resource use, while other environmentally adverse incentives, such as subsidies, are removed.

The increased support reflects a number of issues:

- Concern that some subsidies are an **inefficient use of government resources** – notably where the subsidies’ **original rationale is no longer applicable**.
- Concern that some subsidies create **environmental burdens** –e.g. pollution and climate effect; excessive resource use; or other impacts such as on fisheries stock viability, biodiversity, etc.
- Concern that these lead to **inefficient working of the internal market**, and overall impacts on **competitiveness**. It is important to create a **level playing field**.
- Concerns that subsidies can **hinder innovation by locking in old technologies and locking out new ones** and hence undermining the needed innovation developments for a competitive and environmentally-sustainable economy.
- Concerns that **important targets will not be met or be difficult to meet without reforming subsidies** – notably meeting CO₂ reduction targets.

¹⁰¹ Communication from the Commission to the Council and the European Parliament *Stimulating Technologies for Sustainable Development: An Environmental Technologies Action Plan for the European Union* - COM(2004)38, 20.01.2004

11.1 The range of subsidies and definitions of subsidies

There are many types of subsidies, ranging from the most obvious and well-known ones such as

- direct grants, transfers of funds that are clearly visible in some countries' budgets (i.e. on-budget subsidies);
- tax exemptions (which are generally less visible on government accounts, but can be calculated);
- others that are less evident as subsidies (e.g. accelerated depreciation).

Beyond this there are other subsidies that are not always recognised as such: for instance, where prices for goods and services, such as water supply, do not reflect the full costs of provision (i.e. not full cost recovery pricing), or do not reflect the resource costs. A further important category is where there is no internalisation of externalities such as environmental damage (i.e. not following the polluter pays principle).

Many definitions for subsidies exist which are often linked to a specific purpose. Definitions of 'subsidy' exist for the purposes of accounting, trade and policy analysis. A summary of types of subsidies and their coverage, divided between *on-budget* (i.e. visible in budget accounts or estimated from budget accounts) and *off-budget* (i.e. not accounted for in budgets), is given in the Table below. The types of subsidy listed in the Table can be found in the energy and transport sectors, as well as in other sectors of the economy.

Table 1: Mapping types of subsidy to definitions

Type of Subsidy	Definitions of a subsidy			
	ESA	WTO	OECD	Pieters
On-budget subsidies				
Direct transfer of funds, e.g. grants	X	X	X	X
Potential direct transfers of funds, e.g. covering liabilities		X	X	X
Government provides goods or services other than general infrastructure		X	X	X
Government directs other bodies to do any of the above		X	X	X
Off-budget subsidies				
Income or price support		X	X	X
Government revenues due are foregone or not collected, e.g. tax credits*		X	X	X
Tax exemptions and rebates*		X	X	X
Preferential market access		X	X	X
Accelerated depreciation allowances*			X	X
Regulatory support mechanisms, e.g. feed-in tariffs, demand quotas			X	X
Selective exemptions from government standards			X	X

Resource rent for foregone natural resources			X	X
Implicit subsidies, e.g. resulting from the provision of infrastructure				X
Implicit income transfers resulting from a lack of full cost pricing				X
Implicit income transfers resulting from non-internalisation of externalities				X

*The OECD (1998), lists as ‘on-budget’: accelerated depreciation allowances (if selective), preferential sales tax and VAST rates, income tax concessions (if selective), concessional credit and debt write off.

The definition of an environmentally harmful subsidy provided by the OECD (1998 and 2005) is potentially ambiguous, so an alternative definition, which draws on the OECD’s definition, might define an environmentally harmful subsidy as:

a result of a government action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs, but in doing so, discriminates against sound environmental practices.

Adapted from OECD (1998 and 2005)

This definition has the advantage that it could encompass a potentially broad range of subsidies, including implicit ones, such as the absence of full cost pricing. The above definition has, however, the further limitation that it only refers to ‘action’, and not to ‘non-action’. In some cases non-action, for instance not applying road pricing to cover costs of roads, or not applying VAT or excise taxes on certain fuels, or not internalising externalities, lead to prices which do not reflect environmental and social costs, thus creating implicit subsidies.

Recommendation: It is proposed that the EU adopt the following rather broad definition of EHS:

a result of a government action or non-action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs, but in doing so, discriminates against sound environmental practices.

Recommendation: While it is of course possible to continue looking at definitions of subsidies, this should not be an argument for delaying efforts to reform those that offer already suitable benefits from reform.

Recommendation: It is important to look at all subsidies not only on-budget subsidies, which would lead to an incomplete picture of subsidisation.

11.2 Quantifying subsidies

There have been numerous efforts at quantifying subsidies, though in this field there are often divergences of estimates, as different approaches look at different definitions and apply a different coverage of types of subsidies. For example:

- For OECD countries, the most recent data on support for energy production estimated by the IEA suggested that this amounted to US\$20-30 billion (about €15-22.7 billion) a year in 2001 (OECD, 2005).
- Other researchers' estimates that suggest support to energy producers may be closer to US\$80 billion (about €60.6 billion) a year (see van Beers and de Moor, 2001).

These data are both reported by the OECD (2005) to give an idea of the inconsistent and incomplete estimates available on energy subsidies.

Furthermore, the EEA (2004) estimates that the total on- and off-budget energy subsidies (excluding external costs) in the EU-15 were in the order of €29 billion in 2001. The EEA report also underlines that these figures should be regarded as indicative due to the lack of consistent data throughout EU countries and the assumptions that had to be made.

Other examples of quantification of subsidies include:

- *Subsidies for road transport*: data suggest that transport subsidies amount to roughly 225 to 300 billion USD (about €170-230 billion¹⁰²) worldwide. Of these, about 110 to 150 billion USD per year (€130-275 billion^{Error! Bookmark not defined.}) are considered to be 'perverse subsidies' - i.e. subsidies that are harmful to the environment and to the economy (EEA 2005b and Kjellingbro and Skotte (2005)¹⁰³). An updated calculation of level of annual transport subsidisation in Europe (EEA, 2007) identified about € 240 billion spent in transport subsidies in the EU 15. This estimation, based however on incomplete data, covers on-budget, infrastructure (here infrastructure costs minus infrastructure charges), VAT exemptions and fuel tax exemptions.
- *Household fuels*: the authors estimated the subsidies due to VAT reduced rates for EU households to be amounting to €7,3 billion, with €5008.7 million for electricity, €2130.7 million for natural gas, 114.1€ million for fuel oil and €65.6 million for solid fuels (based on Eurostat, 2004 and OECD, 2004).
- *Coal subsidies*: to put some of the numbers into context: in 2005, €2.7 billion (equivalent to €75,000 per mining job) of coal subsidies were spent in Germany. Furthermore, hard coal is the source of primary energy that gets more per unit support in Germany: approximately €11/GJ and 4 cents/kWh (Meyer, 2004), which is more than the costs of generating electricity from wind turbines.

In addition, the **level of estimates depends on what is being measured and/or what definition is used**. For example:

- *Subsidies to coal in Germany*: in 2003, State aid for coal accounted for €3.3 billion as measured by DG Competition, State aid Scoreboard. However, if we take into consideration external costs, subsidies by regulation, as well as tax exemptions and financial transfers, hard coal in Germany was subsidized by €22.2 billion, rather than the €3.3 billion in 2003 (Meyer B., 2004).
- *Transport subsidies accounting*: if comparing road investments to receipts from fuel taxes then there appears little subsidy in many countries; if including

¹⁰² Exchange rate 3 March 2007: 1 USD = 0.758585 EUR

¹⁰³ The authors recognise that this is a very rough estimate ('guesstimate').

externalities (environmental and social, including congestion), then there is a clear under-pricing.

The quantification of off-budget subsidies is complex and, in some cases, impossible, as it often requires that the benefit be calculated on the basis of differential treatment against a norm or baseline, which is a subjective decision. Whether off-budget subsidies should be considered as a subsidy remains an area of contention, hence the distinction that the EEA makes between on- and off-budget subsidies.

Recommendation: There is need for more research in order to collect information on off-budget subsidies, especially on implicit and cross subsidies in the EU, for which reporting is incomplete and non harmonised.

There are systematic efforts at subsidy quantification in the State Aid Scoreboards, which focused on a those subsidies that link to concerns of State aids. There are, however, fewer cases of systematic national efforts to document subsidies and transparency and completeness are not always evident. A good attempt has been made by the German National Subsidy Report (Meyer, 2004), though even here the authors themselves note that more could be done.

A further point is that some analysis presents snap shot figures for subsidies. However, the historical profiles of subsidies are also relevant; ultimately the cumulative subsidies are the major indicator at hand for the level of support for the activity. This point was made very clearly in the German analysis, where a quick look at current level of subsidies suggests that renewables are obtaining a similar level of subsidy as some fossil fuels; but when comparing cumulative subsidies it is clear that renewables have received only a fraction of the total support granted to coal over the decades, for instance.

Recommendation: If there is to be real progress with the reform of EHS, more countries need to commit to a systematic and comprehensive tracking of subsidies, and report transparently as to the result of the analysis. However, efforts at further quantification should not be used as an excuse for non-action.

11.3 Insights from case studies and literature

Development of subsidies / subsidy reform

Reform of subsidies has received a lot of rhetorical support, but progress has been less than the support, though there are examples of positive successes. Some examples of reforms include:

- **Decreasing State aid to hard coal.** Since 2001 State aid for coal has decreased in every country, although it remains high for Germany, Spain, France and Poland. Belgium, Ireland, the Netherlands, and Portugal have more or less ceased their state support to the industry.
- Systematic and gradual moves towards **full cost recovery for the provision of basic utilities – energy, water, waste water and waste.** This has been faster for energy than for others, but nevertheless is generally progressing in the other areas, with a speed of reform limited by concerns of affordability and different

conceptions of public service responsibilities and obligations. For example water pricing has gone from being virtually free in the Czech Republic in the 1980s as pre-market economy, to being close to recovering full costs now. Water consumption has fallen by half over the period.

- **EU-wide reform of the tax exemption of aviation fuel.** Unilateral attempts at removing this implicit subsidy have encountered several difficulties, and have not usually been successful. Only the Netherlands have successfully introduced (January 2005) a kerosene tax on its limited internal flights, where other countries have attempted its introduction, but backed away and abolished it.
- **Transport infrastructure charging.** Austria, Germany and Switzerland have implemented distance-based HGV charges to recover infrastructure costs, thereby reducing implicit subsidies to shipping by road. With the exception of toll roads, this was first put in place in Switzerland (1 January 2001), and subsequently Austria (1 January 2004) and Germany (1 January 2005; Act: 2002). In addition, a new EU Eurovignette Directive was launched in 9 June 2006 that is a step forward from the earlier version.
- **Commuter subsidies reform** in Germany and the Netherlands. In these countries, as in a number of others, commuter subsidies have been in place including support for car travel. In 2001, in the Netherlands, the travel cost deduction has been restricted to commuters travelling by public transport (and, until 2003, for those travelling by bicycle). In Germany, opposition to efforts for change only allowed for a reduction but not full abolition of support for private transport use for commuting.

The Harmfulness of EHS

Not all subsidies are as environmentally harmful as they would appear at first sight, as in some cases there are ‘policy filters’ in place to reduce impacts. The latter can take the form, for instance, of emissions limits, quality standards, conditionalities, requirements for maintenance. However, in many cases the subsidies are indeed harmful. Examples and insights include:

- **Subsidies to coal extraction or production** have several impacts and distortions. First of all, they lead to **overproduction** of coal, and, in so far as energy is produced through fossil fuel burning, energy consumption. As such, **GHGs emissions are increased**. Secondly, subsidies play a role in **inhibiting changes in the industry**. In the case of the UK, for instance, subsidies to the coal industry are thought to have slowed down the transition to renewable and low pollution energy sources.
- **High costs of environmental damages from mining activities.** A regional institute for economic research (Frondel, Kambeck and Schmidt, 2006) estimated that damages caused by mining activities amounted to several billion Euros.¹⁰⁴
- **Harm can occur many years after the end of a subsidy.** The UK has some 900 abandoned coal mines, around 400 of which are leaking methane into the atmosphere. Just a part of emissions is capable of being controlled. It is estimated that 52ktonnes of methane are emitted from abandoned mine sites. This is

¹⁰⁴ Frondel, Kambeck and Schmidt (2006).

equivalent to about 1MtCO₂; and these emissions represent 1.7% of total GHG produced by the UK. Some is captured (at a cost). Similarly waste intrusion has to be addressed even after closure to avoid groundwater pollution, again at a cost.

- **Harm will increase if nothing is done soon for some subsidies (i.e. cost of inaction).** For instance, the costs of UK aviation industry contribution to climate change have been estimated at over GBP 2 billion in 2001. Unless action is taken now, CO₂ emissions are expected to increase by 588% between 1992 and 2050. The overall hidden economic costs of the EU aviation sector are now estimated at GBP 14.3 billion a year (3.7 from the UK). These estimates exclude the costs of aviation accidents and accidents services.
- **Costs of lost revenues.** Recent estimates (EEA 2007) note that €4,865 billion in annual commuter-tax deductions were made in Germany, Austria, and Sweden (EEA, 2007). In Germany, initially, the *Entfernungspauschale* caused foregone revenues of around €5.8 billion (Innovations Report, 2005).

Benefits of subsidy reform

The removal of subsidies can have potentially beneficial effects on the economy and the environment. The reason for this is that their existence can adversely affect both the economy and the environment, by making the former inefficient and thus leading to the utilisation of inefficient levels of resources (e.g. fuels) and causing inefficient levels of pollution (e.g. greenhouse gases). The extent of any adverse impact, and therefore the potential benefit of removing the subsidies, depends on numerous factors, such as the details of the subsidy itself, other policy measures in place and the social-economic characteristics of the context in which the subsidised activity takes place. However, subsidy reform is often opposed as a result of real concerns about the, usually short-term, adverse impacts that might result, even though there are often longer-term benefits from removing subsidies. Types of positive benefits expected are:

- Subsidy reform liberates money for environmentally-beneficial investments and may generate more jobs.
- Subsidy reform liberates industry from lock-in to certain technologies, reduced lock-out and reduced brake on innovation.
- Subsidy reform improves resource efficiency of production and consumption and hence reduces environmental footprints and facilitates moves towards living within the constraints of the planet's resources and eco-systems.

It is important to underline that the benefits of reform require some analysis and depend on the existence of policy filters (i.e. environmental policy), and on the availability (or not) of environmentally friendly technologies / better substitute inputs. It should also be clear that in some cases the benefits will be more evident in the long term rather than in the short term. Furthermore, how the subsidy removal is done can affect the costs and benefits. In many cases a forewarned move and gradual introduction is preferable as it allows the development of substitutes, or accessing available substitutes as well as the social response (e.g. retraining) to address potential social concerns. Note that coal's abrupt subsidy removal in the UK led to significant social hardships. Examples of benefits or estimates of benefits include:

- **CO₂ savings:** the removal of subsidies to the coal industry in Europe and Japan was estimated (Michaelis (1996)) to lead to a reduction of 10 to 50 million tonnes of CO₂. The OECD estimates that removing coal producers' grants and price supports could save 100 million tonnes of CO₂ per year by 2010 in OECD countries, and also **reduce acid gas emissions**. Also, the German environment ministry (UBA (2003)) analysed the effects of subsidy reallocation from coal subsidies to two other options: shifting subsidies to heat production from renewable energies would reduce CO₂ emissions by nearly 50 million tons, (5.6% of CO₂ emissions); subsidising energy retrofits of buildings would save 6 million tons (0.7% of CO₂ emissions); CO₂ savings for a no-subsidies scenario have not been identified.
- **Revenues:** following the reform of the tax exemption for kerosene in aviation, the Netherlands' revenues from kerosene tax were approximately €14 Million
- **Reduced draw on government budget:** in Germany, the 2004 reform of commuter subsidies reduced the subsidy by 30%, to €4 billion. The 2006 reform achieved further reductions.
- **Decrease in traffic:** the abolition of excise duty exemption, and the introduction of a kerosene tax of €0.2 per litre, have been estimated as likely to decrease the emissions from air traffic by 25-30 per cent by 2025 in comparison with a business as-usual scenario (German Advisory Council on Global Change (WBGU), 2002).
- **Decrease in car mileage and CO₂:** after the company car tax reform in the UK, it has been estimated that the reduction in business mileage, following the tax reform, was between 300 and 400 million miles or 25,000 to 35,000 tonnes of carbon every year (IR, 2004).
- **Revenues and improved transport efficiency:** the main benefits of introducing road infrastructure cost recovery in Switzerland, Germany, Austria have been economic, shifting infrastructure funding to more of a "user pays" model based on distance travelled and type of vehicle:
 - In Germany, the system collects net charges of €2.5 billion. In addition, the haulage load per vehicle has increased, the number of empty trips has decreased (by 6%) and 6% of road freight has shifted to rail. These changes have decreased associated emissions of carbon dioxide and other pollutants in Germany (CIT, 2006).
 - In Switzerland, the policy has noticeably slowed growth in road freight, but has caused little modal shift. However, because the Swiss policy is based on vehicle weight and emissions, there has been a shift to lower-emission vehicles (CIT, 2006).

Further insights from case studies

In the field of subsidies and subsidy reform there is a lot of speculation on theoretical grounds as to what works and does not work and what the implications of reform could be. In the following paragraphs we include some insights deriving from case studies to complement the theoretical expectations.

Subsidies do not always fulfil their objectives or no longer fulfil their objectives

- *Reform of Reduced VAT rates for energy products in households in Poland:* the original rationale for the coal subsidies was determined by social considerations. Freund and Wallich (1997), however, demonstrated that poor households in

Poland benefited much less from energy subsidies than the richer ones. The richer ones use more energy in absolute terms, but also in relative terms. The poorest 20% of the population spent 7.4% of their total expenditures on energy, and the richest 40% more than 10%.

- *Coal subsidies were set up after the war to ensure energy security*: however, with the range of options available and the international markets this is no longer arguably necessary (though the energy security argument is now back on the agenda).
- *Agricultural and fisheries subsidies*: set up to ensure that Europe could feed itself, they are clearly no longer the most efficient means to fulfilling that function.

Subsidies can be a ‘waste of money’

- *Subsidies to hard coal mining industry reform in Germany*: a citizens’ initiative calculated that the necessity of pumping groundwater over a period of many years would use up more energy than the associated coal production could deliver
- *Polish coal subsidies reform*: thanks to export subsidies, Polish mines were able to sell coal on foreign markets for less than the cost of extraction. The annual value of export subsidies for hard coal was 350-450 million USD at the end of the nineties (about €267-343 million³⁹) (B.Fiedor and A.Graczyk, 2000). One rationale for this was to obtain foreign currency.

Design insights for subsidies

More attention is needed on the development of guidelines for the design of new subsidies, in order, for instance, to prevent long term subsidisation, lock-in effects and unintended consequences deriving from the ill targeting of subsidies. Either for new subsidies or for the reform of existing subsidies, it is important to bear in mind a number of design insights. The subsidy should:

- Be justified by effective and relevant public interests, be necessary, adequate and proportional to those interests;
- Be selective, transitory, applied within clearly defined periods and conditional to the adoption of some kind of effort by the beneficiaries to comply with the principles (efficient mitigation measures);
- Only partially cover the costs caused by the polluter (i.e. tax reductions rather than tax exemptions); and
- Not be unnecessarily prolonged (e.g. some have been kept for quite a long time, beyond their natural lives).

Below we offer some preliminary points which should be addressed when designing a subsidy (mostly built on Steenblich, 2006):

- Designers need to put themselves in the role of the recipient and think through how they would respond to incentives;
- Designers need to be clear about the goals of the policy, particularly public goals, and build in criteria that reduce the chance of diversion to non-target beneficiaries;
- Designers need to think in terms of specific environmental and social outcomes, not nebulous (and usually incomplete) objectives, such as ‘renewability’ (biofuels – only the crop is renewable, but a lot of other aspects

- are not);
- Designers need to ensure that subsidies when launched also include an assessment on how they are going to be used and not just on what they are put on;
 - Designers need to think through the demand and supply changes;
 - Check that the subsidy is well targeted (this issue is particularly pertinent to biofuels);
 - The subsidy should have regular review clauses and potential for revision;
 - The subsidy should have a finite lifetime;
 - Criteria for qualifying for the subsidy should be clear and transparent;
 - Care must be taken as regards subsidies with multiple objectives – ideally focused subsidies will be designed for a specific objective, however, in practice multi objectives tend to play a role (necessary to get agreement for the subsidy);
 - Is subsidisation a cost-effective choice of allocation of public funds? ¹⁰⁵
 - Is there sufficient and appropriate data available to design the subsidy?

11.4 Rationales for Reform

There are many different rationales for reform and often there is a combination of rationales behind any reform. Examples include:

- **Economic and budgetary concerns**
 - *Reform of Reduced VAT rates for energy products in households in Poland*: the main drivers of Poland's decision to move energy from the reduced to the standard VAT rate category and to relax energy price controls were economic and budgetary concerns.
 - The introduction of the fuel tax in the Netherlands for the aviation sector allowed the reduction of the *budget deficit*, generating an estimated €14 million additional revenue.
 - *Road infrastructure cost recovery*: in Germany it allowed to cover the costs of damage from transit traffic.
 - *Water supply cost recovery*: in the Czech Republic it allowed to cover costs of water provision.
- **Environmental concerns, physical damage, over resource use and other losses**
 - High public disturbance: the level of transit of heavy goods vehicles in Switzerland raised concerns re damage to roads, congestion and pollution.
 - Price signalling to reduce excessive resource use: water pricing, virgin materials (rock, sand, gravel).
 - Environmental damage avoidance: historically this has not been a significant driver for subsidy reform, though with increasing concerns as to climate change, water scarcity etc, this may become more important in the future.

¹⁰⁵ Cost effectiveness criteria can be difficult to apply globally as there are different motivations and in many cases multiple motivations for subsidies.

- **Competitiveness, level playing field and internal market**
 - The EU State aid regime has been set up to ensure that MS governments do not unfairly support the competitiveness of their domestic industry through subsidies / State aids and hence encourage the development of level playing fields and appropriate functioning of the internal market.
- **International demands and conditions**
 - *Reform of reduced VAT rates for energy products in households in Poland:* here the reform was brought by the need to comply with conditions imposed by external financial institutions such as the IMF and the World Bank (the latter having invested in Poland's natural gas industry on the condition that gas prices would reach Western European levels by 1996).
- **Political / ideological aims**
 - The reform to coal subsidies in the UK was not only economically driven but part of a broader power/ideological battle, with Conservative government intentions to reduce union power.

Making reform happen: drivers and conditions for reform

Reforming harmful subsidies is a notoriously difficult process and requires a number of drivers and conditions. Generally what works is specific for the case at hand and transferability should not be assumed across countries. However, it is possible to identify key lessons that can help to bring about a successful reform, such as:

- **The need for good quality information and transparency.** This is important so that all those involved in the decision-making process and all those potentially affected by the policy reform are clear as to the rationale behind the proposed reform and its expected effect.
- **Subsidy reform does not happen in isolation.** Subsidy reform should be part of a broader reform package to include, for example, policies to mitigate any potential adverse impacts from the removal of the subsidies.
- **The need for strong leadership and a broad coalition.** There needs to be a champion for the reform, either political or bureaucratic, to galvanise support for the reform and to communicate well with those stakeholders involved or potentially affected.
- **The need for a well-managed process.** It is important to set out clear stages for the reform and to make use of any economically advantageous situations.

Additional, case study supported insights as to drivers and conditions for a reform to be possible and potentially successful include:

- **Recognising that there is a problem**
 - In some cases this is clear, but needs careful and transparent documentation and sometimes rigorous new analysis so as to get the political attention and public support. This is easier in some cases than in others, and sometimes differences of view can be accounted for by different perspectives or different definitions of what constitutes a subsidy.

- Growth of road traffic and increased transit of heavy goods vehicles across countries (Switzerland, Austria, Germany) and associated costs (repairs, congestions, noise, pollution) to transit countries (often with very little benefit of the transit), creates clear recognition of the problem in these countries and need for (a) recovery of costs; and (b) encouraging a shift from road to rail.
- **Political commitment and appropriate context and signal**
 - *Clear signal through commitment to environmental fiscal reform (EFR):* the Netherlands has been the first EU country to introduce a kerosene tax on domestic flights. It is the government policy to green the tax system (Ministerie van Financiën, 2005): the *political commitment* of the government bodies can be considered as a key driver of reform in the Dutch aviation sector.
 - Broad political commitments to the polluter pays principle (PPP) and the principle of full cost recovery also help (e.g. in the Constitution, in national strategies etc.).
 - The existence of political commitments to environmental targets can help to push EHS reform, where this would facilitate reaching the target (e.g. CO₂ emissions reduction targets).
 - *Getting the context/conditions right:* the revised EU Eurovignette Directive on the charging of heavy goods vehicles for the use of certain infrastructures (2006/38/EC) sets new framework conditions for the implementation of heavy good vehicles (HGV) charges. This improved conditions for road charging and hence full cost recovery and internalisation of externalities over its predecessor, Directive (99/62). Now, differentiation on environmental criteria will be mandatory from 2010 onwards and external costs may in the future be included in the calculation basis for infrastructure costs; however this is not yet assured.
 - *Requirements:* in the case of Austria, another driving behind HGV charging force was the obligation to reduce State debt in order to meet the stability criteria of the European monetary union. This led to debts from infrastructure construction being assigned to a private company with the right to recover costs via road tolling.
- **Constitutional / legal action – changing the context and conditions**
 - *Subsidies to coal:* one turning point in coal subsidisation was the decision of the German Constitutional Court in 1994 which declared the “coal penny”—a surcharge on the electricity price introduced in 1974 to support domestic coal— as unconstitutional. This decision required the shift of the subsidy to the Budget.
 - *Subsidies to aviation:* at the EU level, the reform of the sector has been made easier by the introduction of Single European Aviation Market, which supersedes individual ASAs between Member States. Those that remain with third party countries are likely to be substituted with agreements negotiated at EU level. Furthermore, the Energy Products Directive (2003/96/EC) changed the legal environment, allowing Members States to enter into bilateral fuel tax agreements.
- **Positive conditions and seizing the opportunity**
 - *Reform of Reduced VAT rates for energy products in households in Poland:* a favourable circumstance for the VAT and energy price reform was the fact that inflation in Poland was falling continuously. During the

1990s, every single year showed a lower increase of the consumer price index than the previous one (from 586% in 1990 to 7% in 1999). Moreover, real disposable household income showed a remarkable growth. As a result, the share of expenditure on energy in household consumption did not increase over the 1990s despite the real energy price increases

- *Polish coal*: the recent favourable situation in the world coal market has improved the economic situation of some coal mines, raising questions about the rationale for maintenance of state support for profitable companies. The Ministry of Economy and Labour is considering the withdrawal of financial support for selected mines but faces strong resistance.
- *Beneficial circumstances and road charging*: Switzerland made use of a “window of opportunity” related to the negotiations with the EU (Balmer 2005).
- **Change of government and opportunities (and risks)**
 - *German coal subsidy reform*: a new government in the federal State of North-Rhine Westphalia helped drive reform.
- **Pressure from other sectors / other providers in the sector**
 - *Aviation tax reform*: there is also increasing pressure from other transport sector for the removal of what they perceive as an unfair advantage to the aviation industry.
- **Change of level of opposition provides an opportunity**
 - *German coal subsidy reform*: public support for the sector has decreased over time, driven by: tight budgets, the decreasing reliance on coal, the decreasing number of jobs involved and a growing public concern about the environment and climate change
 - *Polish coal*: for the first time in years, there has been positive feedback from the general public to the idea of questioning the rationality behind earmarking considerable public funds for the mining sector. This has been facilitated by the intensity of current discussions on the efficiency of the sector.
- **Champions need to drive the reform**
 - *Reform of Ecotax exemptions for businesses in Germany*: the Green Party appears to have been a major driving force for reform, together with environmental NGOs. Environmental NGOs have long been advocating a reform of ecotax exemptions and presented elaborated concepts on this matter. Ongoing pressure from the European Commission on competition grounds is also important. That being said, strong leadership on its own it is not a sufficient condition for the reform to happen or to endure. A broad coalition supporting the reform is preferable to avoid setbacks.
- **Transparency**
 - *Transport taxes in Germany*: a major factor in the push for reform of environmentally harmful subsidies is increased transparency. Transparency can stimulate voter opposition to subsidies and make subsidy reform less politically damaging for governments (OECD, 2005).
- **Earmarking of revenues / savings to ‘acceptable’ ends and communication**
 - Opposition to reform may be reduced if the funds generated by the imposition of a kerosene tax are *earmarked for climate policies*.
 - Transparency of external costs generally promotes public acceptance, but it is also an important factor for public acceptance that if charges are

raised, other fiscal burdens (vehicle taxes or excise duties) are lowered. The internalisation of external costs requires a thoroughly developed and implemented communication concept.

- **Substitutes or suitable responses are available**
 - *UK Coal*: the existence of natural gas and increasing opportunities for imported coal (and investment in import infrastructures) facilitated the move away from domestic coal.
 - *Heavy goods vehicles and pricing*: rail alternatives are helpful, as there is a danger that the problem simply goes elsewhere.
 - The ability to purchase low energy products (refrigerators, freezers, light bulbs) or access to insulation, important for subsidy reductions to household fuel bills.
 - Alternative means of support should be available where there it is needed (e.g. for very low income households): here other support tools can work.
- **The technology is available**
 - Distance-based road pricing is an area where new technological developments have made possible policy solutions.
- **Understanding and addressing social impacts and concerns**
 - *Reform of reduced VAT rates for energy products in households in Poland*: compensatory measures were taken for those poor families and pensioners that were hit hardest by the higher energy prices. These measures included direct allowances as well as cheap credit from the National Housing Fund to finance the modernisation of local heating sources.
- **Compensation can be vital for a successful reform**
 - *Polish coal subsidies reform*: the 1998-2002 restructuring programme provided a generous 'social package' for miners leaving work in the industry.
- **Compromises can be necessary along the long road of reform**
 - *Polish coal subsidies reform*: one element of the detail was to guarantee to the employees of the liquidated mines indefinite employment in other mining operations.
 - More generally there are numerous examples where a less-than-optimal compromise had to be accepted, at least as a first step towards wider reform.
- **Assessing and understanding the implications**
 - *Polish coal*: reforms need to be focused, and analyse the potential cascade impacts on the whole economy. And finally, reforms are not environmental-neutral, and environmental impact assessments need to be carried out.
 - *Swiss HVF fees*: solid scientific work was done to define the level of the fee. Without this approach, it is believed that full cost recovery including external costs, leading to high charging levels, would not have been politically accepted.
- **Underlining and publicising the benefits**
 - *Polish coal subsidies reform*: environmental considerations can play a major role in determining the success of reform. In particular, any efforts directed towards the reduction of GHGs emissions is now likely to be met

with more tolerance by the public, given the high political priority that climate change is receiving

- **Reform can cost a lot in the short and medium term, but be worth it in the long term**
 - *Polish coal subsidies reform*: reforming heavily subsidised sectors weighs heavily on State budgets, as generous severance packages are needed for buying support to the reform; such costs are however experienced in the short to medium term, until completion of the reform; otherwise subsidies would remain as high or higher in the long term.

11.5 Barriers to reform

There are a wide range of barriers to reform of existing EHS. The relative lack of progress with EHS reform and the pervasiveness of subsidies attest to the difficulties of tackling these barriers. Examples include:

- **Vested interests, rent seeking behaviour, and links between particular interests and political parties**
 - *Coal subsidies in Germany*: strong links between particular interests and political parties makes it difficult to introduce reform.
- **Development of a culture of “entitlement” to subsidies**
 - A mentality of entitlement is almost universal amongst those who receive subsidies.
 - The coal mining sector represents a case where this problem has now been substantially tackled; but it has yet to be overcome in agriculture or fisheries, for example.
 - Establishing an expectation from the outset that subsidies will be time-limited and degressive may help to limit expectations, but is unlikely to eliminate them.
- **Social concerns**
 - *Coal subsidies in Germany, Spain and Poland*: strong support to avoid job losses from restructuring. This is clearly a *bone-fide* concern in the short term, but less convincing for the long term.
- **‘Bad’ examples from elsewhere**
 - *Coal subsidies in Germany*: the case of Germany is often used by other countries as an argument to maintain subsidies to domestic coal industry.
- **Complexity**
 - *Removal of tax exemptions for fuel in the aviation sector*: both the European Commission and several individual countries (e.g. the UK, Germany) have been considering the removal of tax exemptions on aviation fuel, but they have backed off, as this would entail the renegotiation of hundreds of bilateral aviation service agreement treaties (ASAs) implementing Article 24 of the Chicago Convention. Reforming the sector is thus legally difficult, in addition to being opposed by the strong lobbying industry.
- **Danger of loss of activity / competitive loss through unilateral action**
 - *Removal of tax exemptions for fuel in the aviation sector*: in Germany, a study commissioned by the Federal Environmental Agency in 2005 (Pearce E., 2005) reached the conclusion that unilaterally removing the tax

break on aviation fuel would not have any benefits for the environment, nor reduce the kerosene used by the industry, unless a way could be devised to tax the kerosene used in Germany, regardless of where the planes refuelled. Otherwise, airlines would re-fuel in tax free countries.

- **National interests**
 - *Removal of tax exemptions for fuel in the aviation sector:* while there is strong support for ending fiscal incentives to the aviation sector in policy circles, there is also strong opposition from countries who wish to support their aviation sector. At the EU level noted opponents are Ireland and Spain. Therefore it seems unlikely that the necessary unanimity at EU level will be forthcoming.
- **Policy convergence stifling debate between political parties**
 - It has been suggested that a lack of diversity of political opinion can block open discussion of reform – for example, there is little discussion of serious agricultural reform in some countries, or of reducing fuel tax exemptions
- **Legal, administrative and technological constraints**
 - Legal barriers have been cited as obstacles to full cost internalisation for both aviation and road haulage.
 - Technological barriers have for a long time impeded the implementation of effective road pricing schemes, and even now, incompatibility issues remain between the schemes that have been put in place.
- **Lack of transparency**
 - It is argued that one of the main obstacles to change in the nuclear sector is the substantial lack of information concerning the amounts of public money employed to support nuclear technologies
- **The absence of a clear and well-understood justification for reform**
 - It is important that the case be made clearly, transparently and in a manner accessible to the public. There is often a lack of trust for government action and this can undermine support if communication possibilities are not taken into account.
- **Fear of change and mythologies**
 - See below on *Examining the arguments against reform - debunking the myths*.

Examining the arguments against reform: debunking the myths

There are a number of arguments that opponents of reform put forward as obstacles to the reform of environmentally harmful subsidies, in the energy sector in particular. These arguments survive due to a significant lack of information and understanding of subsidies, their scale and their harmful effects. The reality is more complex than opponents of reform often recognise. These ‘myths’ are:

- **Removing subsidies will harm competitiveness:** however, keeping subsidies is bad for long-term competitiveness of the sector; the sector becomes dependent on subsidy and puts strains on public finances and can reduce national competitiveness
- **Removing subsidies will result in job losses:** in the short-term, this can be the case for the specific sector, but compensatory measures can address some adverse

short-term impacts and incentives can be put in place to attract investment; also there are possible employment gains from use of monies elsewhere – the net effect depends on relative labour intensities

- **Reforming subsidies will have implications for social equity:** but poorer households are often not the main beneficiaries (e.g. they spend less on energy than middle income households in both relative and absolute terms), so there are better ways of helping the former than broad subsidies
- **Reforming subsidies will adversely impact on energy security;** there is unlikely to be any ‘insecurity of supply’ for coal – one of the most subsidised energy sources – in the EU for the foreseeable future. Also if funds are used for renewables instead it actually can increase security.
- **Removing subsidies will increase imports of similar products:** this may be true in the short term, but not necessarily in the long term as it depends on the effect of the subsidy removal on world prices, and on the long term alternatives (eg other fuels for electricity generation).

11.6 Priorities for reform

From the literature, expert opinion and from the contributions given by experts and stakeholders who attended the HGL on energy, competitiveness and the environmental, ad hoc group on EHS, on 7 December 2006, it was clear that there should be immediate action to reform environmental harmful subsidies. It is not a matter of doing more research but more a matter of engaging the political commitment and practical commitment to action. In particular, there are certain subsidies for which attention is needed, these are (though non inclusion here does not suggest that an item is not important):

- Subsidies for fossil fuel-based electricity production and use in some countries;
- subsidies to aviation and road transport in most countries;
- subsidies to inputs and outputs in intensive agricultural practices – further CAP reform is required;
- subsidies to fishing - further CFP reform is required;
- subsidies to nuclear energy – liabilities and waste – with the current climate change concerns it is important that any progress on nuclear is done with full understanding and full account of its true costs over the whole life cycle;
- subsidies to energy intensive industries – in selective countries;
- subsidies to company cars – in selective countries;
- subsidies for natural resources through non full cost recovery and where resource costs are not taken into account properly (notably water);
- ensuring that, in conformity with the polluter pays principle, future changes to the Eurovignette system maximise the possibilities to charge for external costs.

Regarding future subsidies which would have to be properly designed, the working group highlighted the following: They also noted growing concerns regarding:

- Biofuels – inter alia, to avoid making the mistake of choosing the wrong fuels and source of fuels ;
- Grandfathering (free allocation) of emissions credits, as opposed to auctioning, within the EU Emissions trading scheme (ETS);
- Carbon capture and storage (ensure that risks and liabilities are fully factored in).

This is not an exhaustive list. As regards what to do, this will have to be assessed case by case, but one immediate potential action is for Member States to develop full subsidy assessments and develop and present regular transparent reports about EHS in their countries – covering the full range of subsidies as set out above.

For the case by case assessment the OECD checklist is a valuable tool to explore whether reforming the subsidy can lead to benefits. Clearly it is important to identify whether subsidies exist, whether there are environmental concerns associated with the economic activity, and whether there are policies (i.e. a ‘policy filter’) in place to mitigate any environmental impacts. Then:

1. **Identifying the impact of the policy filter.** If the policy filter adequately addresses the adverse environmental impact resulting from the existence of the subsidy, the removal of the latter might not have any beneficial environmental impact – unless the filter is amended, accordingly. Hence, the restrictions that the policy filter places on the environmental impacts need to be understood, as does the potential impact on the filter of the subsidy removal.

A subsidy should always be analysed within the circumstances in which the subsidy is set. In fact, in some cases subsidies (especially market price support ones) are accompanied by various production limitations such as: exploitation or production quotas (e.g. in agriculture, fisheries, forestry); limitations of the available infrastructure (e.g. in energy and transport); planning and zoning requirements (e.g. in industry, agriculture, energy, transport); pollution limits (all sectors). If those limitations are maintained, it may be these that determine the overall effect of subsidy removal (Pieters, 2003).

2. **Identifying the existence and relative environmental impacts of alternatives.** As noted above, the existence of subsidies can lead to technology lock-in, whereby more environmentally beneficial alternative technologies are unable to compete as a result of the subsidy in place. Hence, in order to determine whether the environmental impact of the subsidy removal would be beneficial, it is important to identify what the alternatives are and their potential impacts.
3. **Understanding the conditionality of the subsidy.** The existence of a subsidy is usually linked to a point of impact, (e.g. output, input, profits and income), which impact to a higher or lesser extent on the levels of production. Such characterisation, however, is quite theoretical, as real cases are not easily captured in such broad categories. Hence, it is important to understand what these conditions are and assess the impact of removing the subsidy on production levels, including upstream and downstream effects, which, as noted above, is the first linkage between the existence of the subsidy and its environmental impact. The conditionality of a subsidy is particularly important, therefore we analyse below its main elements.

The issue of conditionality is very important. It is in fact very important to determine first whether the subsidy to-be-removed is conditional on input or output levels, if not its removal would affect relative incomes, but not have significant environmental impacts (only those that are affected by changes in relative incomes). In the report we discuss in particular the environmental effects of the removal of subsidies to inputs (variable costs) and output (market price support measures and deficiency payments and sales premiums).

Whilst the OECD criteria are invaluable, it is helpful to add some further simple rules of thumb to help identifying problem areas and whether there is any scope for action in the policy time period available. We have produced a first set of simple questions that a policy maker wants to approach the removal, reform or design of a subsidy should bear in mind.

First, there should be a preliminary assessment: **is there a problem?** This question can be answered by a superficial skimming of the available evidence.

- *Does the subsidy no longer fulfill its original objectives and rationale?*
- Is there a clear and significant environmental impact (i.e. not just appearance of a problem but an actual one)?
- Are the negative impacts (externalities) greater than the benefits (positive externalities)¹⁰⁶ expected from reform?
- Is there a clear ‘waste of money’ or an inappropriate allocation of government resources?
- Is there an inefficient allocation of resources or does the market not function properly (e.g. were prices to be right)?
- Is the subsidy illegal and/or does it run counter to the letter/spirit of State aid policy?
- Does the subsidy run counter to objectives and principles committed to (e.g. polluter pays principle)?

If the answer to any one of the above questions is in the affirmative, then there is a problem that needs addressing. Evidence gathered from the case studies in this report has highlighted that public opinion is more likely to support subsidy reform if the impacts of the subsidy on the environment or the economy is sufficiently clear. This requires good information provision and transparency.

Of the above, one key element to assess if a subsidy should be removed is to assess if it still fulfils its original objectives and rationale. If not, then this is an important sign that the subsidy is misplaced.

Secondly, given the evidence gathered through the preventive analysis, another question should be addressed: **would subsidies reform address the problem?** Here, the OECD checklist (illustrated in Chapter 7 of the report) provides the appropriate analysis tool to assess whether removing the subsidy would deliver an environmental benefit.

¹⁰⁶ This is a non-trivial question as the expectations of benefits are related to an expectation of development – e.g. baseline scenario. In some cases incentives avoid a deterioration of issues. It is also important to look at whether the scenarios used (explicitly or implicitly) are still valid.

Importantly, there is a third question to ask: **is there the potential means to address the problem?** For instance:

- Is there sufficient information to allow action?
- Is there a political willingness to act?
- Is there a legal basis upon which to act (EU, national)?
- Is there a champion to make it happen?
- Is there bipartisan support (i.e. removing EHS is a process and ideally requires support from both the government and the opposition as the reform can cover several periods of office)?
- Is the timing right (i.e. is there a potential window for action)?
- Is it understood who the potential opponents to the reform are and can their potential opposition be addressed?
- Is there an international dimension to the subsidy in question, and if so, are there opportunities for bilateral or multilateral cooperation in progressive reform?
- Are there potential (set of) compensatory measures that could be taken?¹⁰⁷
- Would the potential *measures* offer benefits (i.e. environmental improvement)?

This again is not a complete list, which would need to be developed specifically for the specific case. However, it arguably offers a useful checklist of questions that builds on the lessons from the EHS reform processes carried out to date.

What can the EU do?

In general EHS are governed within the realm of Member States taxation, fiscal and budgetary policies, however as we noted in the above paragraphs, the EU has space for action, often supplemental or indirect, however increasingly important.

For example, in the report we have highlighted the potential greening of EU State aid guidelines, within the review processes of State aid Regulations for example through a stronger reliance on competition and its allocation effects.

It has been noted in many circumstances that the Energy Tax Directive allows for too many exceptions. It has been suggested (Thöne, 2006; Markandya, 2006; Soares, 2006; Meyer, 2006) that an Energy Tax Directive revision should move towards further harmonisation of energy taxes in the EU. Also, this harmonisation should be sought earlier than 2014.

Another action that the EU should take forwards for some internalisation of externalities is the inclusion of the aviation sector within the EU Emission Trading Scheme (ETS). Further consideration might be given to inclusion of other transport subsectors into the ETS, and/or consideration of separate solutions e.g. to allow trading of new car specific CO₂ emissions between carmakers. However it is emphasised that suitable solutions are needed here, as it cannot be assumed that inclusion of a new subsector into the ETS guarantees full internalisation of external costs.

¹⁰⁷ Note that subsidies do not act in isolation and hence to reform the subsidy may often require a series of issues to be changed.

The European Commission could also set a good example within its funding policies, ensuring that these are consistent with the environmental protection and the ‘polluter pays’ principles. This is particularly sensitive in the area of R&D subsidies and within infrastructure investments under the EU structural funding schemes, in areas, such as new Member States or other economically disadvantaged regions in the EU, where the choice of development options could still influence greatly the environment. Moreover, it could support new research in order to (Markandya, 2006):

- Assist in the analysis of the implications of the removal of subsidies and in the design of support measures;
- prepare indicators of level of EHS by sector and MS available on an annual basis. Use both a fiscal and social cost definition;
- work with Member States to agree on ‘reduction rounds’ by target dates, much like the reductions of trade tariffs.

The EU could take action in the area of support and through other instruments, such as Communications (Green Papers), or proposing a Framework Directive which addresses specifically the issue of EHS. For example, Impact Assessment Guidelines for EU policy making (update March 2006)¹⁰⁸ state that among the environmental impacts, the Commission should consider the environmental consequences of firms activities deriving from different policy options, and in particular:

1. Does the option lead to changes in natural resource inputs required per output (e.g. will it lead to more energy intensive production)?
2. does the option make environmentally unfriendly goods and services cheaper or more expensive through changes in taxation, certification, product, design rules, procurement rules etc?
3. does the option promote or restrict environmentally un/friendly goods and services through changes in the rules on capital investments, loans, insurance service etc?
4. will it lead to businesses becoming more or less polluting through changes in the way in which they operate?

There is no enforcement mechanism within the Commission, however, to ensure that these guidelines are effectively integrated in policy making. New guidance will come following an independent evaluation of the IA system, which is expected in April 2007. The hope is that this reform will not downplay the above guidelines.

The EU could also push for reform acceleration on the international level:

- Work with international bodies (e.g. WTO) on time bound programs to reduce EHS worldwide.

The EU is of course not the only actor or indeed even the key actor as regards EHS, this is rather the Member States themselves given their responsibilities for fiscal issues. As regards what to do about this, it will have to be assessed case by case, but one immediate potential action is for Member States to develop full subsidy assessments and develop and

¹⁰⁸ EC, Impact Assessment guidelines, march 2006 update, SEC(2005)791.

present regular transparent reports about EHS in their countries – covering the full range of subsidies.

In addition, it is clear that broad commitments help and countries would benefit from:

- Having statements committing to reform EHS
- Developing specific working groups on EHS to support the priority action in ETAP.
- Commit to environmental tax and fiscal reform (ETR/EFR) with the objective of moving towards getting prices right / social pricing and appropriate fiscal burden allocation.
- Coordinate and communicate with other countries to allow a step wise progress – own initiative open method of coordination.

The process to reforming EHS is expected to be a slow and demanding one, one of small steps but one where the direction is clear. There is a need to make the market work and for this to happen prices need to reflect costs to society; hence there is a need to reform the fiscal systems such that explicit and implicit subsidies are reformed where there is no (longer) any reason for them to be in place. The challenges of climate change, sustainable development and international competitiveness can coincide with the issue of EHS reform, so it is in the interests of governments to tackle the barriers and challenges.

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