



PBL Note Environmentally harmful subsidies

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Summary

This publication aims to provide a general overview of environmentally harmful subsidies in the Netherlands. Abolition of such subsidies would mean a significant first step towards 'getting the prices right' for the environment. As a result, citizens, businesses and governments would take more account of the effect of the (over)exploitation of natural resources caused by decisions that they make. Large environmentally harmful subsidies are specifically found in the energy, transport and agricultural sectors. In the Netherlands, in 2010, this amounted to a total of between 5 and 10 billion euros. A more precise number is difficult to derive, as this strongly depends on varying criteria and methods of calculation. The same applies to determining the harmful effects on the environment. Although abolition of environmentally harmful subsidies would reduce environmental pressures, it may also create negative effects that may be felt elsewhere in society. Subsidies, after all, serve a different purpose and abolition means financial loss for the recipients. To facilitate this consideration an overview of all the consequences of abolition would be needed. This requires further elaboration of the information that is provided in this paper.

Abolition of certain environmentally harmful subsidies could be arranged on a national level; for example, those related to delivery vans and taxation advantages for company vehicles and private use of such vehicles. However, for most of these harmful subsidies related to energy and fuels it would seem most logical that abolition takes place within European context, not in the last place to avoid border issues because of differences between national regimes. Furthermore, if these subsidies relate to companies that fall under the European Emissions Trading System (EU ETS), abolishing these subsidies would lead to a lowering of the CO₂ price, giving foreign companies the opportunity to purchase additional emission credits. Under the EU ETS regime, abolition of subsidies only will lead to a reduction in CO₂ emissions if combined with a proportional and simultaneous adjustment of the emissions ceiling.

Environmentally harmful subsidies under discussion

Subsidies or tax exemptions are considered harmful to the environment if they have an unintended negative effect on nature and/or the environment. Although their abolition would in fact reduce environmental pressures, this has to be weighted against any negative effects felt elsewhere in society.

From different sides, calls have been heard to abolish subsidies that have the unintended side effect of stimulating a type of behaviour that negatively affects nature

and/or the environment. Abolition of these subsidies would remove the imbalance in pricing; certain uses of the environment will become more expensive – thus less attractive – with the effect of reducing the pressures these uses put on the environment, although this would not prevent some other environmental uses that cannot be incorporated in pricing (external effects, collective goods). Getting the prices right would require a number of additional corrections. However, these types of corrections are not within the scope of this paper and therefore are not discussed here.

From the notion that environmentally harmful subsidies send out a distorted price signal, the OECD has been calling for their abolition for a while now, and recently in its strategy for green growth (OECD, 2011). Research by Van Beers and Van den Bergh (Van Beers et al., 2002; 2007; Van Beers and Van den Bergh, 2009) is often used to illustrate environmentally harmful subsidies in the Netherlands. Recently, Ecofys and CE presented an overview of these types of subsidies in the energy sector (De Visser et al., 2011). Based on these publications, environmental and nature organisations, such as Greenpeace, have been arguing the abolition of environmentally harmful subsidies. In addition, abolition of such subsidies would save billions of euros – benefiting not only the environment but also government finances and perhaps even the business community.

This paper intends to provide an overview of the nature and magnitude of environmentally harmful subsidies in the Netherlands. The scope is not limited to the energy sector market; an indication is given of the current magnitude of the most relevant and environmentally harmful subsidies. Their actual abolition would be a political choice, weighing all the pros and cons.

First, this paper presents the basis for the environmentally harmful subsidies. Subsequently, the various subsidies are identified, followed by a discussion of a number of studies that indicate the magnitude of the most important of these subsidies in the Netherlands. This paper only briefly discusses the actual effects of abolishing these subsidies on nature and the environment, as the current information is rather limited and would require further research. In addition, it comments on the results from those studies and the manner in which the term 'environmentally harmful subsidies' has been applied. The paper closes with an overview of the possibilities to abolish a number of these subsidies, and makes a distinction between those that can be abolished within the Netherlands and those for which European agreement and decision-making would be needed or desirable.

What is the purpose of environmentally harmful subsidies?

According to the OECD, subsidies refer to all government regulations that, directly or indirectly, keep consumer prices below or producer prices above market level or to those that reduce costs for consumers and producers (OECD, 1997). An important general objective of subsidies or tax exemptions is the adjustment of relative prices. Subsidies may restore certain market failures; for example, the subsidy on fuel-efficient passenger vehicles. This subsidy stimulates consumers to include the importance of cleaner air and fewer greenhouse gas emissions when purchasing a new vehicle. Subsidies may also be related to distributional motives, for example, rent subsidies, boosting national or international competitiveness in certain sectors, or stimulating employment opportunities in certain regions or for certain professions. Subsidies often benefit a combination of objectives. Price guarantees related to EU agricultural products, for example, were established to provide direct or indirect income support to farmers, while maintaining food production levels to ensure a basic level of self-sufficiency for the EU.

A number of subsidies and tax exemptions have unintended effects on nature and the environment. This can be the result of international agreements. For example, agreements in international aviation have exempted this sector from paying duty. Although this particular agreement is meant for the advancement of international trade, it also provides aviation with an unfair advantage over other modes of transport. This creates an additional consumer stimulus and in turn increases the environmental burden. If this burden caused by air transport exceeds that by other modes of transportation that do pay duties and VAT, then the tax advantage for aviation in fact acts as a perverse stimulus. In cases where subsidies or tax exemptions lead to unintended negative effects on nature and/or the environment, the information that is available on these effects should be studied to determine whether the motivation for introducing the financial advantage still applies to the current situation and continues to be acceptable, both politically and within society.

Various types of environmentally harmful subsidies

As already mentioned, subsidies refer to all government regulations that, directly or indirectly, keep consumer prices below or producer prices above market level or to those that reduce costs for consumers and producers. The term 'subsidy' can be misunderstood, within this context, as, in actual practice, this may refer to fiscal facilities, price agreements or guarantees. This is one of the reasons why Van Beers et al. (2002) elaborate on the definition of environmentally harmful subsidies. They distinguish between seven types of such subsidies:

1. *Direct subsidies*, involving a direct transfer of public funds to private parties. Examples of such subsidies are those awarded to fisheries and coal mining in many countries.
2. *Tax subsidies*, involving an indirect transfer in which the government generates income through taxation and duties, such as exemptions, deductions and special tariffs. Examples in the Netherlands are the lower duties on red diesel, lower tariffs in duty on energy for large-scale users and tax exemptions on kerosene.
3. *Public provision of goods and services below cost price*, such as connection charges for new electric facilities and only partly charging the costs of infrastructure in public transport and energy.
4. *Capital subsidies*, including loans that are granted at below-market interest rates or in combination with government guarantees. An example of this is the agreed lower returns on the government share in Amsterdam Airport Schiphol. In the past, a number of provinces also accepted lower returns on their shares in power plants. Another example of exploitation subsidies is the allocation of free emission credits.
5. *Price regulations* by setting minimum and maximum prices. EU price guarantees for agricultural products are a well-known example of this practice. These types of subsidies have partly been reduced and further reductions are to be expected.
6. *Restrictions on volume*, such as production quotas and other size-related schemes that guarantee certain large-scale purchases. For example, the obligation of German power plants to purchase a certain share of their coal from German coal mines, even though this coal is more expensive than at the world market price.
7. *The creation of trade barriers*, such as product requirements imposed on imports, import and/or export quotas and export tariffs. A European example here is the export credit insurances.

A recent study by Ecofys and CE has also applied this categorisation of harmful subsidies to the different government interventions of the energy market (De Visser et al., 2011). Other categorisations could also be applied; for example, see the study by the OECD (2010) for a more detailed grouping.

Subsidies may be considered to be environmentally harmful when government regulations have a negative impact on nature and/or the environment. This refers only to active government regulation, not to government inertia that also causes such impacts. Therefore, external effects such as stress on the environment which are not being factored into prices through policy measures are not seen as environmentally harmful subsidies (compare Van Beers et al., 2002). Also outside the scope of this paper is thus the question of whether prices adequately reflect the scarcity balance, or how this could be improved in case they would be found to be inadequate.

Studies on environmentally harmful subsidies in the Netherlands

Overview of results from Van Beers and Van den Bergh for 2001

The research by Van Beers and others was taken as a starting point, because these results have often been used to provide insight into the nature and magnitude of environmentally harmful subsidies in the Netherlands. Since Van Beers et al. have studied these regulations, many of them have been abolished (e.g. on nutrients) or drastically altered, such as the use of various production rights in agriculture (replaced by reimbursements per hectare and minimum prices for agricultural products). A systematic update of the total overview of environmentally harmful subsidies in the Netherlands has not yet been made. What has been made, however, is an update for the energy market. For our paper, we used several studies on environmentally harmful subsidies to provide an indication of the magnitude of the most relevant environmental subsidies in the Netherlands.

According to Van Beers et al. (2002), there are 47 environmentally harmful subsidies: 20 in the agricultural sector, 7 on energy, 15 related to traffic and 5 on tourism. The authors estimated that these subsidies represented a total value of 22 billion euros in 2002. Around half of this amount concerned agricultural subsidies, in the form of lower VAT tariffs for food, minimum prices for agricultural products, use of land for agricultural purposes, and some regulations that have since been amended or abolished (e.g. the above named tax exemption for nutrient loads and freely distributed emission rights). The other half of the 22 billion euros is related to the energy and transport sectors, in the form of lower energy tax tariffs, duty free kerosene, VAT exemptions on airline tickets, fiscal advantages for delivery vans, and to costs of rail and water infrastructure that are only partly included in the prices for the use of this infrastructure.

Van Beers et al. (2002) analysed for eight of these environmentally harmful subsidies the environmental benefits of subsidy abolition. This showed that the size of the subsidies not always related to the amount of damage to the environment (or to the benefit to the environment in case of abolition).

In 2009, Van Beers et al. published a paper focussing on the environmental effects, using data from 2001. They concluded that abolition of eight environmentally harmful subsidies – together amounting to 7.5 billion euros – would lead to emission reductions totalling 6.1 Mt CO₂ and 63 kt SO₂ equivalents. Although this last study is referred to more often as it is the more recent of the two, it has to be noted that both studies used the same data for assessing the size of the subsidies. Further research would be needed to update these subsidy amounts as well as the claimed benefits to the environment.

Energy market overview by Ecofys and CE for 2010

The nature of government intervention in the energy market was recently researched by De Visser et al. (2011). They made an inventory of the various interventions in both the production and end-use phases, for renewable energy as well as for fossil fuel and nuclear energy. This inventory included measures to stimulate the use of renewable energy sources. We make no further mention of these measures, as they are not harmful to the environment. The long list of 53 measures has been subdivided into those that relate to production (this only applies to electricity) and end use. End use, in turn, has been subdivided into electricity, heat and engine fuels.

This study showed that the end use of fossil energy is being supported by government to the tune of 4.4 billion euros. This support consists mainly of duty reductions and tax exemptions. Exemptions for kerosene and marine fuels relate to 2.1 billion euros and energy tax reductions for large-scale users in 2010 amounted to 1.8 billion euros (Table 1).

To determine the size of environmentally harmful subsidies for large-scale users, Ecofys and CE use their own system. First they determine what the tariff would be if all environmental costs would be included in the energy price. The difference between this tariff and the one that is paid by large-scale users is seen as the environmentally harmful subsidy. Users that are in a bracket that contains a higher tariff (the first bracket for gas and the first three brackets for electricity) pay even more than the tariff that would include all environmental costs, but nevertheless receive no rebates.

In the study by Ecofys and CE the lowered tariffs for red diesel, with 235 million euros, represent around 5% of the environmental subsidies on end use. This share is nearly double that for red diesel used in agricultural machinery and other mobile sources, according to the Dutch Budget Memorandum (*Miljoenennota*) (*Tweede Kamer* (Dutch Lower House), 2009). The amount of 235 million euros was based on a study by Ecofys (2010) and also used in the Dutch Government's Broad Reconsiderations (Rijksoverheid, 2010a).

The revenues generated by abolition of fuel tax exemptions in shipping would equal 440 million euros, according to Ecofys and CE. Of this amount, 60 million is related to exemptions for red diesel used in coastal and inland shipping (Ecofys, 2010).

In addition to subsidies on end use, Ecofys and CE found that subsidies were also awarded to the production of fossil fuels and nuclear energy. This involves a total amount of 1.4 billion euros, of which 1.3 could be regarded as environmentally harmful. The largest share of this total consists of freely distributed emission credits to companies that fall under the greenhouse gas Emissions Trading System (EU ETS). Currently, this represents a total value of 1.5 billion euros – this amount was also used in calculations in the study by Ecofys and CE.

Table 1 Environmentally harmful subsidies related to energy end use in 2010, according to De Visser et al. (2011)

Energy tax exemptions and lower tariffs	million euros (in round figures)
1. Reduced gas tariff for large-scale users	1,500
2. Reduced gas tariff in greenhouse horticulture	90
3. Reduced electricity tariff for large-scale users	250
4. Exemptions for energy-intensive industries	10
5. Energy tax rebates for churches and non-profit organisations	35
Energy tax in total	1,880
Fuel tax exemptions and lower tariffs	
	million euros (in round figures)
1. Exemptions for kerosene use	1,700
2. Exemptions for shipping	440
3. Reduced tariffs for red diesel	235
4. Reduced tariffs for LPG	225
Fuel tax in total	2,600

Broad Reconsideration

The Dutch Broad Reconsideration's reports also include proposed efficiency measures that could be considered as abolition of environmentally harmful subsidies (Rijksoverheid 2010a; 2010b). For example, the report by the Working Group on Energy and Climate proposes to abolish the lower tariffs for red diesel and energy in the greenhouse horticultural sector. The list also includes energy tax rebates received by churches and non-profit institutes (Rijksoverheid, 2010a). The report by the Working Group on Local Environment and Nature suggests to abolish the tax advantages for delivery vans, and to bring LPG duties to the same level as that of diesel. Furthermore, the report mentions the abolition of fiscal favouring of classic cars (oldtimers) and the use of red diesel (Rijksoverheid, 2010b).

Some Comments

The importance of substitution effects

According to Van Beers et al., as well as Ecofys and CE, the revenues from abolishing harmful subsidies only relate to net income for the government and do not reflect effects on economic growth, employment, or available income, which could all be considered socially more relevant. Although Van Beers et al. (2002), in their calculations of the effects on environmental pressure, took into account that abolition of these subsidies causes less production or consumption, they did not look at the effects of such lower levels of production or consumption on economic growth, employment and available income.

However, such an analysis would be needed in order to accurately weigh the pros and cons of abolition of environmentally harmful subsidies. In addition, in previous determinations of environmental effects, possible substitution effects were not taken into account. For example, if tax rebates related to commuter use of public transport were to be abolished, a certain number of people are likely to turn their backs on public transport and take their cars to work, instead. This would reduce the positive effect on the environment related to abolition of such subsidies and may even have an overall negative effect.

Determining subsidies and environmental damage

It can be debated whether certain measures listed in Van Beers et al. (2002) are indeed subsidies and if some are environmentally harmful at all. An example would be the tax free threshold for the already abolished nutrients taxation. This threshold was set because nitrogen loss up to a certain level per hectare has no detrimental effects on the environment. Conversely, it could be said that environmental space is limited and, therefore, has a value of more than zero. Allocation and distribution of this limited space would require explicit regulation - something which currently is either non-existent or incomplete.

Furthermore, the approach in Van Beers et al. (2002) can be questioned with respect to the free distribution of emission rights for agricultural products under quota, which they consider an environmentally harmful subsidy. As certain agricultural products carry production quota, farmers have to pay to produce, while companies in other sectors with a production that has equally harmful effects on the environment that are not affected by quota, do not have to pay to produce. In principle, there is something to be said for taxing the use of the environment. However, in order to be fair, all these production sectors should fall under such a taxation regime, and for certain cases, the fact that harmful effects only occur if a certain threshold is exceeded should also be taken into account (duty-free tax bracket). Distribution of the use of the environmental space over the various sectors is a matter of political choice. It should, however, be noted that determination of the boundaries of this space is surrounded by uncertainty and also requires political choice (Dietz, 2000).

For a number of the subsidies identified by Van Beers et al. (2002) it is uncertain to which extent they harm the environment if substitution effects are also taken into account. This applies, for example, to tax rebates on the use of public transportation for commuter trips, and for student travel cards. Abolition, on balance, may even increase the environmental burden. Furthermore, designating land for agricultural use may not necessarily be harmful to the environment, as this would mean that the land cannot be used for urban development, something that can be more harmful to nature and the environment compared to agricultural activities.

In addition, there are a number of subsidies that would have a larger positive environmental effect if a part of the subsidy is maintained. Van Beers et al. (2002) regard the lower VAT tariff on all foodstuffs as an environmentally harmful subsidy. If this tariff would be changed to the higher one, it is likely that total expenditure on food will drop slightly, which would result in a modest reduction in environmental burden. Even if incomes were to be compensated for this higher tariff, for example, by a lower income tax, the positive effect on the environment would remain – as a euro spent on food on average is more polluting than one spent elsewhere. However, the environmental effect could be increased, substantially, if the higher VAT would be applied to only the most polluting food products, as this would result in the substitution effect of people choosing the cheaper, relatively clean products. This effect of substitution between food products would be many times greater than from any substitution between food products and other goods, and therefore be more effective.

Delimiting environmentally harmful subsidies also requires political choices

Van Beers et al. (2002) provide a theoretical framework to identify environmentally harmful subsidies. The authors use a broad definition, which means also subsidies are included that, although they do stimulate polluting behaviour, may lead to even more pollution when abolished (e.g. the abolition of tax rebates on public commuter transport). For some other subsidies identified as harmful in the publication by Van Beers et al., only partial abolition would be more effective to stimulate their substitution with less polluting products (e.g. low VAT tariffs on food could be increased only for meat, fish and dairy products, rather than for all foodstuffs). In actual practice, it is sometimes difficult to determine the size of the subsidy. This also applies to tax exemptions and lower tax rates. For example, Van Beers et al. (2002) and De Visser et al. (2011) use different tariffs for environmentally harmful subsidies related to lower energy tax for large-scale users. Another point of discussion relates to whether duty-free brackets should be applied in cases where environmental use up to a certain level causes no damage. However, this requires determination of the environmental space, which is quite difficult to determine scientifically, and also calls for political choices because of uncertainties with respect to environmental effects and the costs and benefits of measures.

The government revenue generated by the abolition of environmentally harmful subsidies strongly depends on the assumptions made about these subsidies. These assumptions cannot always be scientifically underpinned and are political by nature. In order to support political considerations of the scope of environmentally harmful subsidies, several factors need to be taken into account. Not only the environmental benefits related to abolition, but also the consequences for economic development should be considered, which can be assessed using indicators, such as economic growth, employment, disposable income and international competitiveness.

Overview of relevant environmentally harmful subsidies

An overview of the most relevant current environmentally harmful subsidies is provided below. This includes only those subsidies that represent a substantial monetary value (in excess of 100 million euros). This overview, therefore, is not exhaustive but presents an order of magnitude for the most important environmentally harmful subsidies. As the included amounts relate to different years, or vary according to the literature, we chose not to present them in the form of a table. This also implies that this paper only provides a general insight into the magnitude of environmentally harmful subsidies in the Netherlands.

As far as the consequences of abolition are concerned, Van Beers et al. (2002) and De Visser et al. (2011) only indicate the expected financial yields for the government. Therefore, in order to obtain a quantitative view of all the consequences of abolition of environmentally harmful subsidies, a calculation needs to be made containing all the effects of this abolition, including the consequences for the original target of the individual subsidies. Especially the abolition of large subsidies is expected to cause substantial effects for the receiving parties. Adverse effects of abolition could be partly avoided by agreements on European level.

Environmentally harmful subsidies that could be abolished in the Netherlands

1. Agriculture

a. Raising the VAT tariff from low to high for meat and possibly also dairy products.

A low VAT tariff of 6% applies to all food products, instead of the general 19% tariff. Raising the tariff for meat alone would yield 0.6 billion euros (CPB and PBL, 2010). This measure would cause greenhouse gas emissions to decrease by 0.2 Mt, although this reduction would largely take place abroad. As the environmental burden caused by dairy and fish is also substantial, a similar change in VAT could be applied to these products (Westhoek et al., 2010). Expenditures on dairy products (including eggs) are about three quarters of those on meat (CBS, Statline), which means that the financial yield for dairy products would be around 0.45 billion euros. Expenditure on fish is about 15% of that on meat, therefore, raising the VAT tariff here would yield less than 0.1 billion euros. Raising the VAT tariff for meat, dairy and fish would provide the government with an additional 1.1 billion euros.

b. VAT tariffs on ornamental plant cultivation from low to high

Raising the VAT on ornamental plant cultivation would yield 0.39 billion euros (Ter Haar, 2009). Strictly speaking, there is no valid reason for the low VAT tariff for ornamental plants. The low tariff is meant for primary goods and thus does not apply to ornamental plants. The low VAT on these plants results from their categorisation as agricultural products. If some of these agricultural products are shifted to the higher VAT tariff (meat and perhaps also fish and dairy) it seems logical that this would also apply to ornamental plants.

c. Lower tariffs for energy used in greenhouse horticulture

At the introduction of energy taxation, greenhouse horticulture was awarded a lower tariff in order to equalise the burden of taxation for all energy-intensive industry (Dutch Government (*Rijksoverheid*), 2010a). Raising the tariff on energy taxation for greenhouse horticulture would yield between 0.10 and 0.17 billion euros (respective amounts taken from Dutch Government (*Rijksoverheid*), 2010a; and Studiecommissie Belastingstelsel, 2010). An additional complication here is that gas used for cogeneration (combined heat and power (CHP)) is exempted from energy taxation. Higher tariffs for energy used in greenhouse horticulture in combination with tax exemptions on the use of gas in CHP installations would lead to an increase in the application of CHP. This, in turn, would lead to more local power generation outside the ETS system and to fewer power plants that fall under the ETS. On balance, this would lead to an increase in CO₂ emissions (Van der Werf et al., 2010). Without further calculations, the consequences for the sector cannot be indicated.

2. Transport

a. Lower tax rate on red diesel

Red diesel is used in machinery, especially in construction and agriculture, and in coastal and inland shipping and diesel locomotives (De Visser et al., 2011). Coastal and inland shipping have been exempted from paying tax, while for other applications a lowered tariff applies. Abolition of the lower tariff on red diesel would yield the government 0.235 billion euros (Ecorys, 2010; Dutch Government (*Rijksoverheid*), 2010a; De Visser et al., 2011). The PBL provides the same amount (CPB and PBL, 2010), whereas the Dutch Budget Memorandum for 2010 speaks of 0.131 billion (Dutch Lower House (*Tweede Kamer*), 2009); this amount is also used in Studiecommissie Belastingstelsel, 2010). However, as no elaboration of the

calculations is provided, it cannot be determined which elements are included in this amount. CE calculated a yield of 0.125 billion euros, but also does not elaborate on their calculations (Blom et al., 2010). Red diesel was first introduced in 1962, for domestic uses. From 1972 onwards, tax exemptions were awarded to diesel used in vehicles that would not drive on public roads. Apparently, tax revenues were mostly used towards road construction. However, through the years, other forms of taxation were added, such as those related to environmental pollution by the use of engine fuels. This type of pollution also occurs from off-road vehicle uses, which renders the argument for a lower tariff less valid. Exemptions for coastal and inland shipping are based on international agreements and could only be abolished in an international context. This abolition would yield around 0.06 billion euros.

b. Subsidies for delivery vans

The study Optiedocument Verkeersemissies estimated that the abolition of these subsidies would yield 1.6 billion euros (Van den Brink et al., 2004), but today this yield would be substantially lower as certain adjustments have since been made to the fiscal situation for delivery vans. CE calculated a yield of 2 billion euros if delivery vans were to be taxed in the same way as passenger vehicles (Kampman et al., 2003). Additional research is needed to obtain more clarity on the current yields of this measure.

c. Fiscal benefits commuter transportation by car, use of company vehicles

Abolition of tax rebates on commuter transportation by private and company vehicles would yield 1.1 billion euros (CPB and PBL, 2010).

d. Abolition exemption of road tax for oldtimers

The road tax exemption for oldtimers was first introduced to relieve the tax burden for oldtimer enthusiasts who would only drive these vehicles very rarely. However, the use of these old vehicles for everyday transportation has increased. This tax measure, therefore, was recently adjusted; from 2012 onwards, the age criterion of 25 years has been abolished. Now, only vehicles that were registered before 31 December 1986 will be exempt from road tax. Currently, the oldtimer regulation applies to around 300,000 vehicles. If this road tax exemption would be abolished, this would yield 0.15 to 0.30 billion euros. The exemption for oldtimers is not the only vehicle tax regulation that could be regarded as environmentally harmful. In the government report *Autobrief*, an overview is presented of all special regulations related to vehicle taxation (Dutch Ministry of Finance, 2011). In addition to the tax regulations that apply to oldtimers and delivery vans, this especially applies to regulations that would yield only a limited financial benefit if abolished.

Environmentally harmful subsidies for which abolition in European context would be more effective

1. Energy

a. Lower tariffs for energy taxation on large-scale use.

Ecofys and CE calculated that for gas, the yield would be 1.6 billion euros, and for electricity this would be 0.25 billion (De Visser et al., 2011). They determined the tax tariff in such a way that negative external effects resulting from the use of gas and electricity could be counteracted, adequately. Other systems would also be possible, generating other yields. Because the EU Emissions Trading System (ETS) applies to large-scale users, any measures taken by the Netherlands only would have no effect on total CO₂ emissions. Although in such a situation Dutch companies would emit less

CO₂, this would also reduce the demand for emission credits, thus decreasing the price of these credits. This, in turn, would make it more attractive for foreign companies to buy emission credits instead of taking measures to lower their own CO₂ emissions. Any benefit to emission levels from a situation where Dutch companies reduce their emissions due to higher taxations, would then be countered by foreign companies emitting more. Moreover, even when this taxation of large-scale users of energy would be applied Europe-wide, this would not have any effect on total CO₂ emissions if the emission ceiling would not be adjusted, as well. Energy taxation would make emission reduction measures cost effective and, thus, cause emissions to be reduced. However, the resulting lower demand for emission credits would also lower their price, making their purchase more attractive, compared to investments in emission reduction measures. As long as the emission ceiling is not lowered, energy taxation ultimately would lead to a reduction in the price of emission credits instead of a reduction in emission level. Thus, a lower emission level could only be achieved if energy taxation for large-scale users is combined with a lower emission ceiling. In this situation, the CHP leakage would also play a role, as would be the case in horticulture as described above.

b. Freely distributed emission credits under the ETS

Under the 'polluter pays' principle, a free distribution of emission credits to companies under the ETS could be regarded an environmentally harmful subsidy. After all, these companies would not have to pay for the pollution they cause to the environment. In the third phase of the emissions trading system (2012–2020), the free distribution of emission credits already will be limited to the amount of one billion euros. Europe may also choose for an EU-wide abolition.

2. Transport

a. Exemptions on excise duty and VAT on kerosene

If taxation on kerosene would be set to equal that on diesel, and if this also would apply to all air traffic, the yield would be 1.7 billion euros (De Visser et al., 2011). This is in line with the results by Van Beers et al. (2002) who arrive at a lower amount (1.2 billion euros) but that is because the authors assumed a lower tariff (33 cents per litre, against 42 cents assumed by De Visser et al.) and because they used data from an earlier year with less flights. CE studied a European taxation on intra-European flights (Rensma et al., 2007). Costs for end users were estimated at 0.23 billion euros for 2010 and at 0.35 billion by 2020, under a tariff of 33 cents per litre. The additional tax revenues would be difficult to estimate, according to CE.

b. VAT exemption on air tickets

The study 'Optiedocument Verkeersemissies' presents a calculation of the revenues that result from a VAT tariff of 6% in European context for all intra-European flights (Van den Brink et al., 2004). For Europe, this would yield 2 billion euros, and for a VAT of 19% (also accounting for reduced demand) this would be 5.5 billion. It is difficult to determine the yield for the Netherlands separately.

If only flights within Europe would be taxed, through taxation of kerosene or VAT on tickets, it would become more attractive for people to travel to destinations outside Europe, which may lead to a reduced number of flights (due to higher prices) but this environmental benefit may be partly counteracted by the fact that the remaining number of flights would be longer (substitution). Therefore, taxation of all flights would be more logical, from an environmental point of view. A tax only on European flights would exempt the most polluting intercontinental flights. However, an argument

for imposing such a European tax could be that within Europe there are alternative modes of transportation (trains, coaches, cars) that hardly exist for intercontinental flights (boats not being a realistic alternative). Furthermore, the aviation sector will fall under the ETS from 2012 onwards. Abolition of VAT exemptions on air tickets and the introduction of taxation and VAT on kerosene will have to be regarded within that context.

c. Exemptions on excise duty and VAT on shipping

If exemptions on excise duty and VAT would be abolished in aviation, it seems logical that this also applies to shipping. Agreements of tax exemptions for fuels used in both sea shipping and coastal and inland shipping have been made on an international level. Abolition would require international deliberation. The yields are around 0.44 billion euros (De Visser et al., 2011), 0.06 billion of which relates to coastal and inland shipping.

Total benefits of abolishing environmentally harmful subsidies

The above overview shows that it is difficult to estimate expected yields for a number of environmentally harmful subsidies. This applies especially to those subsidies for which European-wide abolition would be most effective. For subsidies that could be abolished by the Netherlands alone, it is easier to calculate possible yields, with the exception of those related to the use of private and company vehicles. The yields from regulations that could be abolished by the Netherlands add up to around 4.5 to 5.5 billion euros. If we include the yields from abolition in European context, this would total between 5 and 10 billion euros. This amount is substantially lower than that calculated by Van Beers and Van den Bergh. Especially in the agricultural sector, we consider the number of environmentally harmful subsidies to be much lower than indicated for 2001 by Van Beers and Van den Bergh. This explains most of the differences in yields following abolition.

There is not much information available on environmental benefits of the abolition of these environmentally harmful subsidies, and the small amount of information available is mostly not very recent. Benefits are largely related to reduction in greenhouse gas emissions and polluting substances. Abolition of environmental subsidies in agriculture may lead to less or less intensive use of agricultural lands and pesticides and herbicides.

Conclusions

Environmentally harmful subsidies are found in particular in the energy, transport and agricultural sectors. The precise magnitude of them is difficult to determine, however, and this strongly depends on calculation methods and applied definition. This is also the case for the effects on the environment. Nevertheless, it can be stated that for the Netherlands substantial amounts of money are involved in environmentally harmful subsidies. For the subsidies discussed in this paper, this is between 5 and 10 billion euros. Abolition of environmentally harmful subsidies would be an important first step towards a more realistic pricing of the environment, and to a more explicit valuation of natural resources in the decision-making process by citizens, companies and governments. Abolition would reduce the environmental burden, but would also raise the question of whether this advantage would not be outweighed by the disadvantages that could occur elsewhere within society. In order to facilitate this political process by providing an overview of the consequences that is as complete as possible, a further study would be required.

Large-scale users of energy pay considerably less than smaller scale consumers, because of exemptions and lower tariffs. The 'polluter pays' principle thus has been reversed, as this energy taxation is degressive: the more energy is used, the lower the tariff. To counter this situation, a more uniform system of taxation would be the obvious solution. Much can be gained, also in the area of taxes and duties related to energy and fuels, by harmonisation on European level. In addition, the transport sector has subsidies for delivery vans and fiscal advantages related to the use of company vehicles. The latter could be addressed by the Netherlands on a national level.

In agriculture, environmentally harmful subsidies have been greatly reduced over the past years, as the system of direct production support has shifted to support per hectare, and is coupled to the supply of green services. This has caused the subsidies in this sector to be less or no longer environmentally harmful. For food products, it seems logical to tax the items that are more environmentally harmful than average, such as meat, fish and dairy. Ornamental plant cultivation could also be moved from a low VAT to the higher tariff. It should be noted that earlier studies have shown that a shift from low to high VAT for meat only has a limited effect on the environment, as the costs of meat are only a small part of total consumptive household expenditures. In order to have a noticeable effect on the environment, much larger price changes would be needed (MNP, 2007).

The number of environmentally harmful subsidies related to energy that would have an effect when abolished only in the Netherlands, is limited and applies particularly to red diesel and the lower gas tariff in horticulture. Abolition of most of the environmentally harmful subsidies for energy and fuels could be more effective if applied on European level, especially because of transboundary effects. In cases where abolition of subsidies also reaches sectors under the ETS, a CO₂ effect could only be achieved if the ETS emission ceiling would be reduced, proportionately. The reason for this is that without such a combination abolition would only affect the price of emission credits and not the level of emissions. This currently already applies to the tax advantage for large-scale users over small-scale consumers, and in the future this will also apply to aviation when this sector will fall under the ETS, as well.

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