

TRENDS IN ENVIRONMENTAL TAX REFORMS IN EUROPEAN UNION

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Abstract: This paper analyzes the evolution of ecological tax reform in European Union (EU). Ecological tax reform has become a topic discussed on a broad scale, both in economic policy and theory. Of course, the environment and taxation, taken individually, are complex issues and articulate, but it is clear that, when put together, "environmental taxes" influence each other. EU member states have adopted these fiscal instruments in order to solve the problem of environmental pollution. They believe in this type of instrument, because it was shown that taxpayers, when they see their production increase in the benefit of the Treasury, tend to adapt to environmental policies

Keywords: environmental taxes, energy taxes, transport taxes, pollution taxes, resource taxes

1. Introduction

The introduction of environmental tax reforms gained increasing support during the 1990s. The basic idea was to shift the tax burden from labour towards environmentally harmful goods and activities. With the publication of Jacques Delors' White Paper on *Growth, Competitiveness and Employment* in 1993 the idea of such a fiscal reform became politically attractive, as it offered a means to promote simultaneously growth, jobs and environmental protection, i.e. to achieve a "double dividend". At the same time, measures had to be taken to protect producers from any negative effect on competitiveness arising from increases in the cost of inputs, most particularly energy.

An environmental tax is defined as 'a tax whose base is a physical unit such as a litre of petrol, or a proxy for it, for instance a passenger flight, that has a proven specific negative impact on the environment' (Eurostat, A statistical guide, 2001, p 9). This definition has been agreed by international experts and adopted by the Statistical Office of the European Communities (Eurostat) and the Organisation for Economic Co-operation and Development (OECD). It enables analysis on the effects of taxes rather than the aims behind their introduction, that is, the aim of a tax for raising government revenue rather than reducing environmental degradation does not preclude it from being defined as an environmental tax. Nevertheless, the interpretation and use of measures of environmental taxes need care. In particular, the levels of revenues from environmental taxes do not necessarily indicate the relative importance or the success of environmental policy. High environmental tax revenues can result from high rates of taxes or high levels of environmental problems leading to a large tax base. The broad measure of revenues can also fail to capture the effect of the differential rates that encourage a shift away from higher impact behaviour. Offsetting these cost increases through various tax

reduction and refund schemes has indeed been one of the key features of the 'green' tax reforms that many Member States have introduced over the last decade. Green tax reforms, generally can consist of three types of approaches: (Barde, 1999):

- reduction or elimination of environmentally harmful subsidies, exemptions in environmentally related taxes potentially harmful for the environment;
- restructuring of existing taxes according to environment criteria;
- introduction of new environmentally related taxes.

2. Environmental taxes in European Union by tax type

The environmental taxes and fees were adopted in the EU member states as a way to promote the use of the fiscal instruments for the purpose of increasing the environment policy efficiency. The environment taxes and fees are not imposed at the level of the Community, but in and by the Member States, and the European Commission permanently encouraged this strategy.

Environmental taxes are an instrument to adjust revenues in national budgets and to some extent serve as an incentive to change the behaviour of citizens by increasing the costs of certain products which have a negative impact on the environment (Steinbach, 2007).

Energy taxes are by far the most significant, representing around three quarters of environmental tax receipts and around one twentieth of total taxes and social contributions. Energy taxes comprise taxes on energy products used for both transport and stationary purposes. The most significant energy products for transport purposes are petrol and diesel; energy products for stationary use include fuel oils, natural gas, coal and electricity. The CO₂ taxes are included under energy taxes rather than under pollution taxes because they are partly introduced as a substitute for other energy

taxes (Schlegelmilch, 1998). In October 2003, the European Union introduced a Directive restructuring the Community framework for the taxation of energy products and electricity (2003/96/EC). It widens the scope of the EU's previous minimum tax rate system from mineral oils to all energy products (including coal, natural gas and electricity) and increases the rates of previously existing minimum tax taxes. It thus aims at reducing distortions that currently exist between Member States and between mineral oils and the other energy products which up to now have not been subject to EU tax legislation. The Directive is considered an essential requirement for both the proper functioning of the internal market and the coherence of energy, transport and environment policies in Europe (Kohlhaas et al., 2004).

Table 1. Environmental energy taxes in the European Union (2000-2008) in % of GDP

Country / Years	2002	2003	2004	2005	2006	2007	2008
Belgium							
Bulgaria	1.4	1.4	1.5	1.5	1.4	1.3	1.2
Czech Republic	2	2.6	3	2.7	2.7	3	3.1
Denmark	2.2	2.3	2.4	2.5	2.4	2.3	2.3
Germany	2.6	2.6	2.5	2.3	2.2	2.1	2.1
Estonia	2.2	2.3	2.2	2.1	2	1.9	1.8
Ireland	1.5	1.5	1.8	1.9	1.8	1.9	2
Greece	1.3	1.3	1.4	1.3	1.3	1.2	1.3
Spain	1.4	1.3	1.3	1.2	1.2	1.2	1.2
France	1.7	1.6	1.6	1.5	1.4	1.4	1.3
Italy	1.8	1.7	1.7	1.6	1.6	1.5	1.4
Cyprus	2.3	2.4	2.2	2.2	2.2	2.1	1.9
Latvia	1	1.9	2.1	1.9	1.8	1.8	1.6
Lithuania	1.8	2	2.1	2.2	2	1.7	1.7
Luxembo	2	2	1.8	1.7	1.6	1.6	1.5
Hungary	2.6	2.7	2.9	2.8	2.5	2.4	2.3
Malta	2.2	2.3	2	2.1	2.1	2	2
Netherlan	1.4	1.3	1.3	1.3	1.3	1.8	1.5
Austria	1.8	1.8	1.9	2	2	1.8	1.9
Poland	1.7	1.8	1.9	1.8	1.6	1.6	1.6
Portugal	2	2.1	2.1	2.3	2.3	2.4	2.3
Romania	2.1	2.2	2.2	2.1	2	2	1.9
Slovenia	1.7	2	2.1	1.8	1.7	1.7	1.4
Slovakia	2.7	2.6	2.6	2.5	2.3	2.3	2.4
Finland	1.9	2.2	2.2	2.1	2	1.8	1.8
Sweden	2	2	1.9	1.9	1.8	1.6	1.8
nited Kingdom	2.5	2.5	2.4	2.4	2.3	2.2	2.2

Source of data: Eurostat Statistical books, 2010

Transport taxes. In the EU-27, transport taxes correspond to, on average, slightly less than one quarter of total environmental tax revenues and 1.4 % of total taxes and social contributions. Transport taxes are related to the ownership and use of motor vehicles.

Taxes on other transport equipment and related transport services are also included here, when they conform to the general definition of environmental taxes. The transport taxes may be related to imports or sales of the equipment or they may be recurrent taxes such as an annual road tax. Taxes on petrol, diesel and other transport fuels are included under energy taxes (Streinbach et al., 2009).

Table 2. Environmental transport taxes revenues in the European Union (2000-2008) in % of GDP

Country /Years	2002	2003	2004	2005	2006	2007	2008
Belgium	0.7	0.7	0.7	0.7	0.6	0.6	0.6
Bulgaria	0.2	0.2	0.2	0.2	0.3	0.3	0.3
Czech Republic	0.3	0.3	0.2	0.2	0.2	0.2	0.2
Denmark	1.9	1.8	2	2.2	2.3	2.2	1.9
Germany	0.4	0.3	0.4	0.4	0.4	0.4	0.4
Estonia	0.2	0	0.1	0.1	0.1	0.1	0
Ireland	1	1	1	1.2	1.2	1.2	1.1
Greece	0.9	0.8	0.9	0.9	0.8	0.8	0.8
Spain	0.4	0.4	0.4	0.4	0.4	0.4	0.3
France	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Italy	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Cyprus	1.9	1.8	1.9	1.6	1.5	1.6	1.6
Latvia	0.3	0.4	0.4	0.3	0.3	0.3	0.2
Lithuania	0.7	0.7	0.8	0.5	0.1	0.1	0
Luxembourg	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Hungary	0.4	0.2	0.5	0.5	0.6	0.6	0.6
Malta	2	2.1	1.8	1.8	1.8	1.7	1.7
Netherlands	1.2	1.2	1.3	1.3	1.4	1.4	1.3
Austria	0.9	0.9	0.8	0.8	0.8	0.8	0.8
Poland	0.2	0.2	0.3	0.3	0.2	0.2	0.3
Portugal	1	0.9	0.9	1	0.9	0.9	0.7
Romania	0.1	0.1	0.1	0.1	0.1	0.3	0.4
Slovenia	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Slovakia	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Finland	1	1.2	1.2	1.2	1.1	1	0.9
Sweden	0.3	0.3	0.3	0.4	0.4	0.4	0.5
United Kingdom	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Source of data: Eurostat Statistical books, 2010

Pollution taxes and resource taxes. The remaining two categories, pollution taxes and resource taxes, raise only a marginal amount of revenue: together they make up just 5 % of total environmental taxes. **Pollution taxes** include taxes on measured or estimated emission to air or water, management of solid waste and noise. An exception is the CO₂ taxes, which are included under energy taxes (Streinbach et al., 2009).

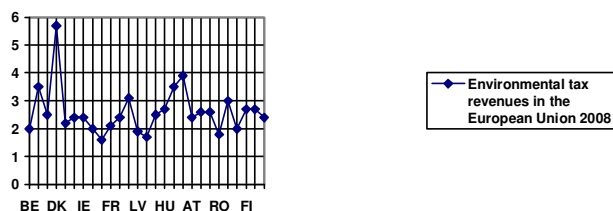
Resource taxes are related to water consumption, forestry and mining. Taxes on oil and gas extraction are excluded from the definition of environmental taxes, as these are often designed to capture the

resource rent and do not influence prices in the way that other environmental taxes do (Streinbach et al., 2009).

Table 3. Environmental pollution taxes and resource taxes revenues in the European Union (2000-2008) in % of GDP

Country /Years	2002	2003	2004	2005	2006	2007	2008
Belgium	0.2	0.2	0.2	0.2	0.2	0.1	0.1
Bulgaria	0.1	0.2	0.2	0.1	0.1	0.1	0.1
Czech Republic	0	0	0	0	0	0	0
Denmark	0.9	0.9	1.1	1.4	1.7	1.5	1.8
Germany	0	0	0	0	0	0	0
Estonia	0.3	0.3	0.2	0.3	0.3	0.3	0.3
Ireland	0	0	0	0	0	0	0
Greece	0	0	0	0	0	0	0
Spain	0	0	0	0	0	0	0
France	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Italy	0	0	0	0	0	0	0
Cyprus	0	0	0	0	0	0	0
Latvia	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Lithuania	0	0	0.1	0.1	0.1	0.1	0.1
Luxembourg	0	0	0	0	0	0	0
Hungary	0.2	0.2	0.2	0.1	0.1	0.1	0.2
Malta	0.1	0	0	0.2	0.2	0.3	0.3
Netherlands	0.6	0.6	0.6	0.6	0.7	0.6	0.6
Austria	0	0	0	0	0	0	0
Poland	0.2	0.1	0.1	0.1	0.3	0.1	0.1
Portugal	0	0	0	0	0	0	0
Romania	0.3	0.3	0.2	0.1	0.1	0	0
Slovenia	0.2	0.3	0.2	0.2	0.2	0.2	0.2
Slovakia	0.1	0.1	0.1	0.1	0.1	0.1	0
Finland	0	0.1	0	0.1	0.1	0.1	0.1
Sweden	0.1	0.1	0.1	0.1	0	0	0
United Kingdom	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Source of data: Eurostat Statistical books, 2010



In general, most Member States tend to fall in a band ranging from 2% to 3% of GDP, or slightly higher. Only four Member States show levels below 2 % of GDP (Latvia, Lithuania, Romania and Spain, at around 2 % in 2006), while in four other countries environmental tax revenues exceed or are equal to 3.5 % of GDP (Denmark has by far the highest level of "green" taxes 6.0% in 2006, followed by the Netherlands 4.1 %).

3 Conclusion

Due to the increase in the people's exigencies related to the quality of the environment, many countries have shifted their focus on environmental taxes. Despite the contradictory signals related to the efficiency of environmental taxes as well as to the downtrend in the revenues from such taxes at the level of the European Union, the situation of the resources available to the state for the achievement of the economic and social policy objectives, also influenced by the current global context suggests that, in the future, the importance environmental taxes might grow. The increase in environmental tax revenues, especially in the new member states, may generate an increase in the capacity to attract European funds, by providing for appropriate co-financing.

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Country	<i>Treend in environmental taxes in European Union by tax type</i>
Belgium	Revenues from environmental taxation have declined in percentage of GDP since 2004. In 2008 environmental tax revenue amounted to 2.0 % of GDP, below the EU-27 average (2.6 %). The low revenues from energy taxation explain this difference (1.2 % compared to EU-27 1.8 %).
Bulgaria	At 3.5 % of GDP, revenues from environmental taxes are the third highest in the EU (2.6 %). This is due to high revenue from energy taxation, which — at 3.1 % of GDP — is the highest in the EU (1.8 %). This again reflects the strong reliance of the country on revenues from indirect taxes and the high share of excise duties in total taxation, 50% of which comes only from excise duties on fuel. Consequently, the country ranks first in revenues from energy taxes levied on transport fuel – 3 % of GDP in 2008, while transport taxes excluding fuel are of somewhat lesser importance amounting to only 0.3 % of GDP.
Czech Republic	Environmental taxes represent 2.5 % of GDP. This value is slightly below the EU average (2.6 %) and has remained roughly constant during the past seven years. As in the majority of Member States, most of this revenue is realised on energy (2.3 % of GDP).
Denmark	The reform is partly financed by higher energy, transport and environmental taxes to support the energy and climate policy objectives of the government, and also by increases of excise rates on health-related goods (fat, candy, sugary drinks, tobacco). These increases are partly compensated to the households by giving a 'green check' of DKK 1 300 (€ 175) to everybody above 18 years and DKK 300 per child for up to two children. The 'green check' is nominally fixed and is rapidly phased out for income above DKK 360 000 (€ 48 300). These measures will increase government tax revenues by about DKK 8.7 billion (€ 1.2 billion) in 2011 before the green check (DKK 4.4 billion in 2011). Broadening of the tax base is another main source financing the reform. The measures include a gradual reduction from 2012 to 2019 of the tax value from 33.5 % to 25.5 % of assessment oriented deductions and limitations of the tax deductibility of net interest payments over a nominal threshold of DKK 50 000 (DKK 100 000 for married couples). Also the deductibility of payments above DKK 100 000 a year to individual pension insurance schemes with less than life-long coverage is limited, as well as tightening of the tax treatment of company cars and other fringe benefits. Also certain other measures, which will increase the tax burden on enterprises by around DKK 5 billion, are introduced.
Germany	Environmental taxes were strongly increased in the 1999–2003 period as a consequence of the ecological tax reform (from a pre-reform level of 2.1 % of GDP to 2.7 % in 2003). In the following years, however, they declined again to 2.2 % of GDP (in 2008) and now again lie clearly below the EU-27 average (2.6 %).
Estonia	Revenue from environmental taxes forms now 7.3 % of total taxation, exceeding the EU average by 0.2 percentage points. The proportion of environmental tax revenues displays a rather steadily rising trend from 1995 onwards, reflecting partly the need to adjust the excise duties up to the EU minimum rates, but also a deliberate policy of the government to finance the cuts of personal income taxes by increases in consumption and environmental taxation.
Ireland	As for environmental taxation, it has almost continuously declined over the period, moving from an above average level 2000 (2.9 % against 2.8 % for the EU-27) to a below average level of 2.4 % (compared to 2.6 % for the EU-27). Transport taxation is relatively high compared to the EU-27 average (0.5 % points above the EU-27 average) while taxation on energy (1.3 %) was the third lowest in the Union in 2008.
Greece	The role of environmental taxation has been decreasing over recent years in Greece: their share in terms of GDP has declined steadily by a cumulative 0.5 percentage points since 2001. This decline was driven by shrinking revenues from energy taxation. In 2008 the ratio of environmental taxation stood at 2.0 % of GDP, a value among the lowest in the Union (the EU-27 average is 2.6 %).
Spain	Environmental taxation decreased again and remains the lowest in the EU-27 (1.6 % of GDP). As in the majority of Member States, it is mostly concentrated on energy (1.3 % of GDP).
France	As concerns environmental taxation, the Finance Amendment Law 2008 introduces a penalty of € 160, which applies to vehicles emitting more than 250 g CO ₂ per kilometre as of 1 January 2009. In addition, the Finance Law 2009 provides the extension of the general tax on polluting activities (TGAP) to the installations for incineration of household waste. Other measures in the area of green taxes introduce tax credits for owners of residential properties built according to given environmental standards.
Italy	In the late 1990s, Italy displayed one of the highest levels of environmental taxation in the EU, mainly on account of elevated energy taxes. Environmental tax revenues have, however, declined considerably since then, as a percentage of GDP, and are now slightly below the EU average.
Cyprus	Albeit on a decreasing path, the share of environmental taxes in GDP in Cyprus (3.1 %) is still above EU-27 average. This is mainly due to the large share of transport taxes (1.6 % of GDP), one percentage point above the EU-27 average. Revenue from energy taxes has more than doubled since 2000 as a proportion of GDP, but has been trending downwards in the past few years, just like the deflated ITR on energy.
Latvia	Revenue from environmental taxes has tended to decrease from 2005 and remains one of the lowest in the EU with 1.9 % of GDP after Lithuania and Romania.

Lithuania	At 1.7 % of GDP, revenue from environmental taxation is the second lowest in the EU, due in particular to the very low revenue from transport taxes. Since 2003, environmental tax revenue, as a share of GDP, has fallen by almost 40 %.
Luxembourg	Environmental taxation accounted for 2.5 % of GDP in 2008, down from 3.1 % in 2004. This drop, driven by lower energy tax revenues, caused Luxembourg's environmental tax revenues to fall marginally below the EU-27 average (2.6 %).
Hungary	Environmental taxes represented 2.7 % of GDP. This share is slightly above the EU average (2.6 %) and has remained roughly stable between 2000 and 2008. As in most countries, taxes on energy account for the largest part of environmental tax revenues.
Malta	Environmental taxes are relatively high (Malta 3.5 % of GDP, EU-27 2.6 % of GDP). The high level of environmental tax revenue is attributable to taxation on transport, which is the second highest in the Union (1.7 % of GDP, EU-27 0.6 %), while revenue from taxation on energy is somewhat below the EU average (1.5 %, EU-27 1.8 %).
Netherlands	At 3.9 % of GDP, the Netherlands has the second highest level of environmental taxes as a percentage of GDP in the EU after Denmark. The Netherlands raises significant revenue from transport taxes and is one of the few countries in the Union with a non-negligible contribution of pollution taxes, originating from a tax on pollution of surface waters and sewerage charges (0.6 % of GDP, EU-27 0.2 %).
Austria	Environmental taxes gradually increased until 2003 but have fallen back to their 2000 ratio since. Their revenues are below the EU-27 average (2.4 % of GDP, EU-27 2.6 %). By contrast the implicit tax rate on energy increased considerably in 2007, most likely reflecting the increase in mineral oil taxes on gasoline and diesel in July 2007 (Abgabenänderungsgesetz 2007). Transport taxes are relatively important in Austria, contributing nearly one third to the overall revenue from environmental taxes, compared to an EU-27 average share of only one quarter.
Poland	The ratio of environmental taxation to GDP has increased by half percentage point since 2000, to reach 2.6 % of GDP in 2008, which equals the average value in the European Union. With a value of 1.9 percentage points, revenues from transport fuel taxation over GDP are among the largest in the EU.
Portugal	At 2.6 % of GDP, Portugal's level of environmental taxes is equal to the EU average (EU-27 2.6 %), notably with respect to energy taxes (around 66 % of total environmental taxes). The 2008 level is, however, well below the 2002 peak (3.2 % of GDP).
Romania	Based on available data, environmental tax revenue, at 1.8 % of GDP in 2008, lies well below the EU-27 average (2.6 %); in fact, this value is the third lowest in the EU. Most of this revenue is realised on energy: the other two categories of environmental taxes, transport and pollution/resources, each raise less than half the EU average. Revenues from environmental taxes have overall decreased in recent years.
Slovenia	In 2008, environmental taxes represented 3.0 % of GDP. This share dropped by 0.3 percentage points from a 3.3 % value in 2001–2004, but remains well above the EU average (2.6 %). As in most countries, taxes on energy account for the lion's share of environmental tax revenues; their revenue is high also in the international comparison (Slovenia ranks second in the Union in this respect). Despite their lower absolute revenue, pollution/resource taxes, too, are well developed in Slovenia, taking the fifth highest level in the EU.
Slovakia	As of 2008, the ratio of environmental taxation stood at 2.0 % of GDP, a value slightly below the EU-27 average (2.6 %). Revenues from environmental taxation have been declining from 2004 mainly due to shrinking receipts from energy taxation.
Finland	Environmental tax revenues represent 2.7 % of GDP in 2008, close to the EU-27 average level (2.6 %) and the seventh highest in EU-27. The tax revenues have declined steadily since 2004 reflecting the fact that nominal tax rates have been kept constant and were raised only in 2008. The level of energy taxation in relation to GDP (1.8 %) is at the same level as the EU average in 2008, while that of transport taxes (0.9 %) is somewhat higher due to relatively heavy vehicle taxation in the Finland.
Sweden	Environmental taxes as a proportion of GDP (2.7 %) are in line with the EU-27 average (2.6 % in 2008). Their level has been rather constant over the period from 2000–2008. Revenue from environmental taxes consists, to a relatively large extent, of energy taxes.
United Kingdom	Revenues from environmental taxes (in % of GDP) have fallen. This is mainly due to the evolution of the collection of customs duty on mineral oils in recent years as its level has risen slower than GDP since 2001.