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Overview of the use of landfill taxes in Europe

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Context
The Topic Centre has prepared this working paper for the European Environment Agency (EEA) under its 2011 work programme as a contribution to the EEA's work on green economy and green recycling

Disclaimer

Contents

Introduction and objective of the report

Towards the end of October 2010, the European Environment Agency (EEA) in co-operation with the Irish Comhar Sustainable Development Council arranged a workshop discussing environmental tax reform and its potential contribution in dealing with the Irish Budgetary Crisis. The Irish ministries of finance and the environment participated in the workshop, where the EU Commissioner Connie Hedegaard was also amongst the speakers.

The EEA asked its Topic Centr on Sustainable Consumption and Production (ETC/SCP) to make a presentation at the workshop about the use in Europe of landfill taxes, aggregate taxes and packaging taxes. In order to carry out the task, the ETC/SCP collected information regarding the use of landfill taxes from multiple sources, including through the internet, accessing relevant available publications and via direct contact with the responsible authorities in the respective countries.

The information collected was related to the following questions/knowledge areas and eventually included information on 18 European countries:

1. Who pays and how much
2. Who monitors and collects
3. Leakage issues
4. Revenues generated, and what happens to them
5. Environmental impacts
6. Economic impacts
7. Social impacts
8. Main opponents
9. Lessons learned

Following on from the workshop, the ETC/SCP systematically collated the information for each country, although not all questions have been fully answered for every country. From this information, a draft report was produced and sent to review in Eionet from September to November 2011. This process provided a considerable amount of additional and updated information.

The sources of the information contained within each country chapter are indicated by numbered square brackets (e.g. [1]) and the full reference for that number can be found at the end of each country's chapter. Information directly reported in the country profile sections containing the assessments and opinions of the particular noted national source are highlighted accordingly. Wherever relevant, the text and opinions expressed in the country profile chapters of the report have been kept as close to the original source as much as possible, although we have conducted a light edit for the sake of consistency and clarity.

The SCP/ETC hopes the information will prove useful in furthering the discussion about the use of landfill taxes and its costs and benefits. This report does not include any general assessments of the landfill tax as such but does include some general conclusions.

Acknowledgements

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Summary

Twenty European countries have introduced a tax on waste sent to landfills. Table 1 shows to which waste types the taxes are applicable in the different countries.

Table 1 Types of waste included in landfill tax regulation in different European countries

	Soil, sand	Construc-tion/ inert	Residues from pre-treatment and recycling	Residues from incine-ration	Hazar-dous waste	Combu-stible/ biode-gradable	Main Exceptions
Austria							Mining waste
Flanders (Belgium)							Residues from recycled glass production, asbestos
Wallonia (Belgium)							Dredging waste, water-treatment waste and waste from soil rmediation operations
Bulgaria							Hazardous waste
Czech Republic							Asbestos is charged only as municipal waste and do not pay the special risk charge
Denmark							
Estonia							Oil-shale ash/semicoke/ enrichment residues
Finland							Contaminated soil, sludge from de-inking of wate paper, flyash from power plants,
France							
Ireland							Stabilised waste from composting, waste from street cleaning, dredging, non-metal residues from shredding of ELV, WEEE
Italy							
Latvia							
Netherlands							Disposal of dredgings
Norway							Inorganic waste with less the 5 % TOC
Poland							
Portugal							Wastes from forestry
Slovenia							
Spain (Andalusia)							Covers only industrial hazardous waste not municipal waste
Spain (Catalonia)							Includes only municipal waste
Spain (Madrid)							Municipal waste is excepted
Spain (Murcia)							Municipal waste is excepted
Sweden							Waste from mining industry,,waste water sludge, contaminated soil
Switzerland							
United Kingdom							Dredging from inland waters and harbours, mining and quarrying

Taxed | **Not taxed** | **Banned to landfill** | **Partly banned to landfill**

Source: See the information given under each country report

Although there is some variation regarding the waste types covered by the landfill tax, overall this variation is not very large between countries. Tax is charged on construction and inert waste; residues, hazardous waste and biodegradable waste. As well as a landfill tax on biodegradable waste, some countries also have a ban or restriction on how much

you may landfill of this type of waste. In some countries the tax only covers non-hazardous waste. Most countries have some exceptions for certain specific waste types. These exceptions are indicated in the country fact sheets.

Who collects the landfill tax?

The authority that actually collects the tax differs between tax & custom authorities, environmental agencies and municipalities. In most cases tax collection is undertaken by the relevant tax authorities. In only two countries is the tax collected by municipalities.

Table 2 Authorities who collect the landfill tax

	Federal Institution	Regional Institution	Municipality	Name of Institution
Austria	■			Regional customs offices (belong to federal authorities)
Flanders (Belgium)		■		OVAM (public Flamish Waste Agency)
Wallonia (Belgium)		■		Office wallon des déchets, Direction des Instruments Economique
Bulgaria		■		Regional Environmental Inspectorates (RIOSV)
Czech Republic	■		■	State Environmental Fund, Municipalities
Denmark	■			Danish tax office
Estonia	■			Until 2011: Environmental Board; then: customs office (via e-platform)
Finland	■			Customs office
France	■			Customs and Indirect Rights Office (DGDD)
Ireland			■	Local authorities on behalf of Depart. of the Env.,Heritage and Local Government
Italy		■		The regional authorities
Latvia	■			The State Revenue Service
Netherlands	■			The Tax administration
Norway	■			The Norwegian customs offices
Poland				
Portugal	■			The federal environmental agency
Slovenia	■			Custom office of Republic of Slovenia
Spain (Andalusia)		■		
Spain (Catalonia)		■		The Catalan environmental agency
Spain (Madrid)		■		
Spain (Murcia)		■		
Sweden	■			Swedish tax office
Switzerland	■			Federal Office for the Environment
United Kingdom	■			HM Revenue and Customs

Source: See the information given under each country report

Level of the landfill tax

The landfill tax level varies greatly between countries and also depending on the waste type concerned. In some areas, the lowest level is only a few Euros per ton of waste while in others the largest is more than EUR 200 per ton.

Most countries operate with only a limited numbers of tax levels (1-3), although a few countries and regions operate a more differentiated tax system. Poland has the most differentiated landfill tax system with more than 20 different rates. Figure 1 shows some but not all of the different taxes used in each country on different waste types or different landfill types. The different bars for the countries represent the different applied taxes. Inert waste types, e.g. residues from incineration of waste or construction waste often have a lower tax level than mixed municipal waste.

The majority of countries have a tax level for the most common waste types of EUR 30 per ton or higher, however many countries are already increasing their tax level so that it is already or will soon be between EUR 50 and EUR 70 per ton of waste. Increased taxation levels have already created a considerable economic incentive for diverting waste away from landfills to other treatment forms.

Revenues from the landfill tax

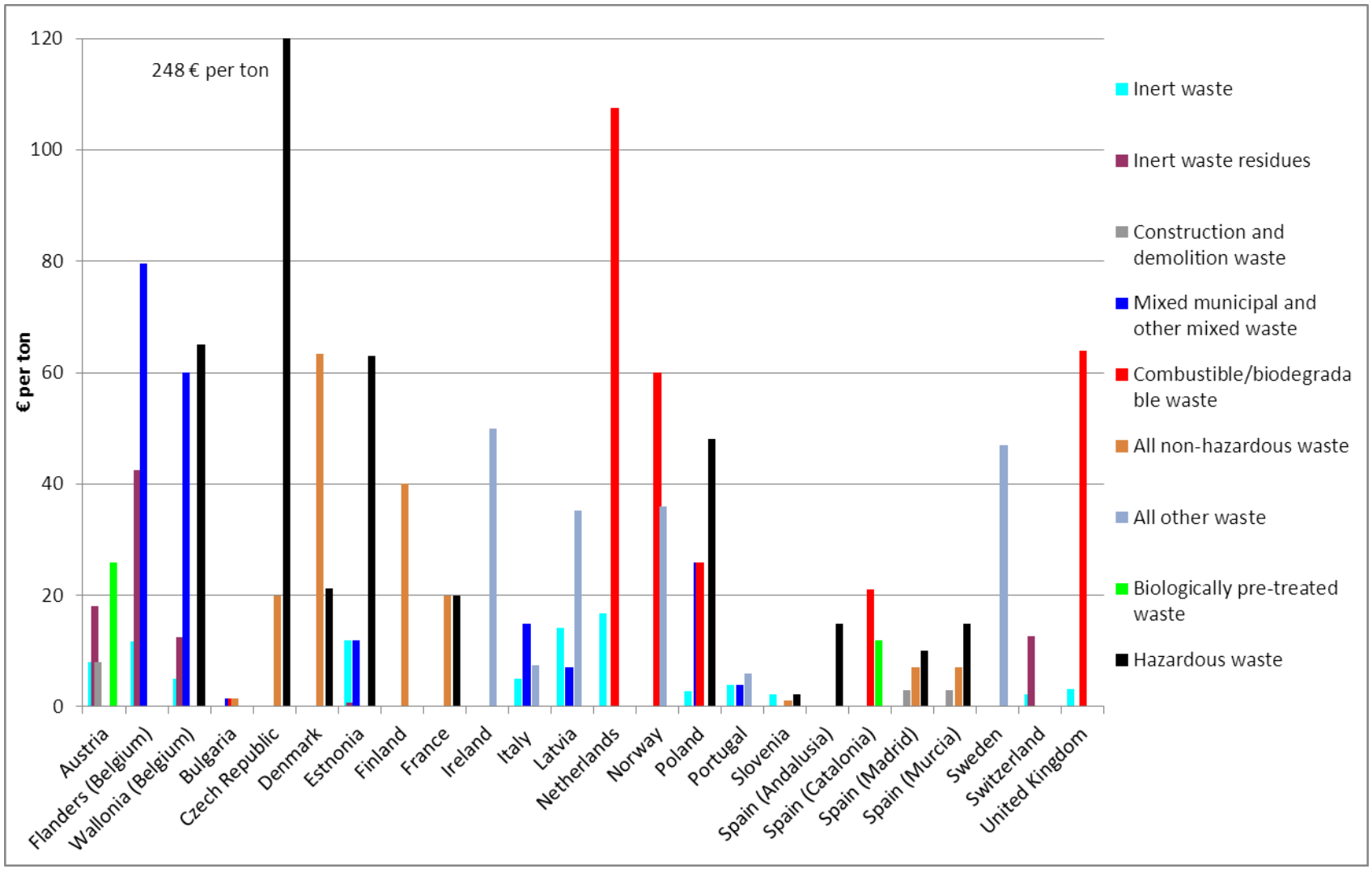
Table 3 shows how large revenues received from landfill tax in each country are and also

Table 3 Total revenues from landfill tax by country

Austria	Appro. € mill. 50 (2009)	Decrease from € 100 mill. a few years ago
Flanders (Belgium)	€ 14 mill. (2009)	
Wallonia (Belgium)	€ 23.8 mill. (2009)	
Bulgaria	The tax was introduced in 2011	
Czech Republic	€ 74.8 milll (2010)	Increase from € 18.4 mill. in 1999
Denmark	€ 11.9 mill. (2010),	Decrease from € 41 mill. in 2000 and € 69 mill. in 1993
Estonia	€ 14.2 mill. (2010)	Decrease from € 27 mill. in 2008
Finland	€ 45 mill. (2009)	Decrease from € 33.3 mill. in 2000
France	€ 259 mill. (2010)	Decrease from € 297 mill. in 2002
Ireland	€ 48 mill.(2010)	Increase from € 17.8 mill. in 2002
Italy	€ 186 mill.(2010)	Decrease from € 322 mill. in 2000
Latvia	€ 4 mill. (2009)	
Netherlands	Appro. € 42 mill. (2010)	Decrease from € 177 mill. in 2006
Norway	Appro. € mill. 35 (2009)	
Poland	Appro. € mill 30 (2010)	Increase from € 22 mill. In 2008
Portgugal	€ 15.7 mill (2010)	Increase from € 10 mill. in 2007
Slovenia	€ 7.8 mill. (2010)	Decrease from € 13.6 mill. in 2004
Spain (Andalusia)	€ 0.4 mill. (2009)	Decrease from € 0.6 mill. in 2005
Spain (Catalonia)	Appro. € 30 mill (2008)	Increase from € mill. 13.5 in 2004
Spain (Madrid)	€ 2.5 mill. (2009)	Decrease from € 10.2 mill. in 2003
Spain (Murcia)	€ 2.2 mill. (2010)	Decrease from € 3.0 mill. in 2007
Sweden	€ 15.5 mill. (2009)	Decrease from € 76 mill. in 2003
Switzerland	Appro. € 20.5 mill. (2009)	Almost unchanged since 2002
United Kingdom	Appro. € 1200 mill. (2010)	Increase from € mill. 520 in 1998

Source: See the information given under each country report

Figure 1 Comparison of landfill tax levels in European countries EUR per tonne in 2011 (excluding VAT)



Source: See the information given under each country in the report

whether the development has been increasing or decreasing over recent years.

Table 3 shows that landfill tax revenues in all of the countries are significant. The table also shows that for the fifteen countries where there is information provided about the development of landfill tax revenues, eight of these have seen a decrease in revenue. This can be interpreted as meaning that the landfill tax has had the desired effect in driving waste away from landfills towards other and environmentally better waste management forms, where the resources existing in the waste can be better exploited. This revenue decrease has occurred even in areas where the landfill tax per ton of waste has been increased.

In recent years the revenues from the tax on landfill have been dramatically reduced in the Netherlands together with the reduction of waste landfilled. Due to the decreasing revenue of the landfill tax the Ministry of Finance in the Netherlands has decided to eliminate the tax from January 2012 as part of a simplification of the tax system, principally to ease the administrative burden the tax creates.

In three countries – the Czech Republic, Ireland and the United Kingdom – revenues have continued to increase during recent years, which can be explained by the consistent steeply increasing rates of the landfill tax.

Landfill taxes generated a total revenue of around EUR 2.1 billion in 2009/2010 for the countries and regions which applied them. By comparison, the total tax revenue for the same countries was about €3220 billion (Source: Eurostat, Economy and finance Statistics in focus 26/2011). Therefore, the landfill tax provided an average of 0.07 % of the total tax revenue.

The use of the landfill revenues

The use of the revenues from landfill tax differs greatly among the countries, as shown in Table 4. In Denmark, the Netherlands, Norway and Sweden, 100 % of the revenue goes directly to the general state budget.

In other countries the revenue is used both as a contribution to the state budget as well as for the cleaning up of contaminated sites, waste management initiatives and environmental initiatives (Bulgaria, Finland, Wallonia part of Belgium, France, Poland, Portugal, different regions in Spain and United Kingdom). In some countries the revenue is partly used in the regional budget (Flanders in Belgium, Czech Republic, Estonia, Italy, Latvia and Spain). In Austria and Switzerland the revenue is used for the clean-up of contaminated sites.

Table 4 Use of landfill tax revenues in different European countries

	State Budget	Regional Budget	Waste Management	Clean up of contaminated sites	Environmental measures
Austria	■			■	
Belgium (Flanders)		■			
Belgium (Wallonia)			■	■	
Bulgaria			■		
Czech Republic		■	■		■
Denmark	■				
Estonia	■	■			■
Finland	■			■	
France	■		■		■
Ireland			■		■
Italy		■			■
Latvia	■	■	■		■
Netherlands	■				
Norway	■				
Poland	■	■	■		■
Portugal	■	■	■		
Slovenia					■
Spain (Andalusia)					■
Spain (Catalonia)			■		
Spain (Madrid		■			
Spain (Murcia)		■	■		
Sweden	■				
Switzerland				■	
United Kingdom	■		■		

Source: See the information given under each country report

General conclusions regarding the landfill tax

- The tax is used by the majority of the EU Member States and by Norway and Switzerland;
- The administration of the tax does not seem complicated;
- The tax appears to be a strong driver in diverting waste away from landfills;
- Denmark and the Netherlands were the first to implement the landfill tax and subsequently have some very low rates of landfilling for all waste types;
- The tax seems especially useful for homogenous waste types, e.g. construction and demolition waste;
- The majority of countries have a tax level for the most common waste types of €30 per ton or higher,
- Many countries are already increasing their tax level so that it is already or will soon be between €50 and €70 per ton of waste.
- The landfill tax provides a reasonable source of revenue, particularly during its early implementation;
- The twenty countries in Europe that apply a landfill tax generated total revenue of around €2.1 billion in 2009/2010 from the landfill tax.
- The revenue contributes both to the general state budgets or regional budgets as well as to environmental initiatives including the clean up of contaminated sites and waste management initiatives
- The revenue appears to decrease over time because the tax has created incentives to divert waste to better waste management types than landfilling.

Austria

The Austrian landfill tax ('Altlastenbeitrag') was introduced in 1989 with the aim of raising revenues for the clean up of contaminated sites.

1. Who pays and how much?

Since 1996, rates have been differentiated according to the technical quality of the landfill site and to the type of waste itself. Landfills with state-of-the-art technology pay a much lower rate than sites without any anti-pollution provisions, e.g. against the leakage of landfill gas. The 'Altlastenbeitrag' was extended in 2006 to cover incineration. Current landfill taxes are:

Landfill tax in Austria in EUR per ton waste

	From 01.01.08 to 31.12.11	From 01.01.12
Landfills for construction material and soil only	8 EUR/t*	9.20 EUR/t*
Landfills for inorganic residuals	18 EUR/t *	20.60 EUR/t*
Landfills for mechanically-biologically pre-treated waste	26 EUR/t *	29,80 EUR/t*
Landfills for hazardous waste	26 EUR/t *	29,80 EUR/t*
Landfills with a high level of organic waste **	87 EUR/t *	
Tax for incineration	7 EUR/t *	8 EUR/t *

* All values per tonne or part thereof as raw weight including packaging

** Since 2009 waste containing more than 5 mass-% TOC is banned from landfilling; exception for mechanically-biologically pre-treated waste
[3] [7]

For mass waste landfills the total allowed organic content (TOC) is limited to (5 %). However wastes from Mechanical Biological Treatment (MBT) are except from this TOC-limit. For landfilling of MSW pretreated in a MBT the calorific value has to be below 6.6 MJ/kg dry matter. Further the respirometric index and the "Gasspendensumme" have to be below a certain level [1] [7].

Exceptions

There is a general exception for mining waste, radioactive waste and waste explosives and – under specific circumstances – for a few more types of waste [7]. Waste landfilled in connection to a disaster (floods, landslides, mudflow, and avalanches) are also exempt. Proof has to be stated by the municipality in whose territory the disaster happened [4].

Residues from incineration and co-incineration plants are also exempt from the landfill tax. As noted above, the incineration of waste also falls under the landfill tax, so further taxation of the landfilling of residues would constitute double taxation on a treatment option according to the Austrian authorities [7].

2. Who monitors and collects?

Regional customs offices are in charge of collection. There are nine customs offices in Austria; one for every 'Bundesland' [5].

3. Leakage issues

The taxes must also be paid if the wastes are exported; the specific activities are defined in §3 (1) 1, 2, 3 and 3a in law [3].

4. Revenues generated, and what happens to them?

Total revenues have declined in recent years from a peak of around EUR 100 million to today's level of around EUR 50 million [6].

Until 2011, the revenues from the 'Altlastensanierungsabgabe' were earmarked for the remediation of contaminated land. 85 % of the money is used for safety measures and restoration, and research on restoration-technology, and 15 % is used for the identification, study and clean up of contaminated sites. In accordance with § 11 in the amended landfill tax law from 2011, a part of the revenue is to be used for the general state budget [3]. For 2011-2014 increasing amounts are to be used for the general state budget [7].

2011 ..... 3,391,000 EUR

2012 ..... 10,000,000 EUR

2013 ..... 16,191,000 EUR

2014 ..... 18,443,000 EUR

5. Environmental impacts

According to the Austrian Federal Environment Agency, differentiation of the landfill tax has caused a clear incentive to modernise the Austrian landfills. In 1996/97, 21 sites did not meet the latest technological standards, by 1999 this had decreased to only 4 sites [2].

The landfill tax, together with the landfill ordinance, has encouraged recycling and recovery of waste. Both measures led to reduced quantities of waste going to landfilled [7]. This effect is demonstrated by the following figures [7]:

- The amount of landfilled waste from households and similar establishments was reduced by about 34 % from 2004 to 2009;
- the total amount of landfilled waste dropped by 28 % from 2003 to 2010;
- last but not least, the revenues declined by about 50 % in recent years (despite higher rates of contribution).

6. Economic impacts

ETC/SCP has found no information on this topic

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

ETC/SCP has found no information on this topic.

9. Lessons learned

Due to declining incomes from the tax on landfilling and incineration, but the continuous high needs for financial means for the remediation of contaminated sites, the Austrian government is now considering the introduction of a tax on waste-trade [6].

Sources

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[7] Information received during the Eionet consultation. E-mails of 4 October 2011 from Gernot Döberl and of 3 November 2011 from Christoph Lampert on the behalf of the Austrian Federal Ministry of Agriculture and Forestry, Environment and Water Management and the Environment Agency Austria.

Belgium (Flanders region)

Flanders has a complicated system of landfill and incineration taxes, dependent on the type of waste and landfill [1]. Tax is also payable for waste which is shipped to be landfilled, incinerated or co-incinerated out of Flanders [2]. The landfill tax was introduced in 1990 at almost EUR10/t. Between 1993 and 1997 the tax rose from EUR 15/t to EUR 54/t. Over the next nine years, the tax increased only moderately until it was raised from EUR 64/t to EUR 75/t in 2007 and almost EUR 80/t in 2010 [3]. Since 1998, the Flemish government has prohibited the incineration and landfilling of separately collected municipal waste and since 2000 the landfilling of untreated municipal waste is also banned.

1. Who pays and how much?

There were 16 different tax rates in 2011:
3 tax rates for the landfill of combustible and non combustible waste;
5 tax rates for the landfill of the residues of the sorting or recycling of waste:
- 2 general for combustible and non combustible residues;
- 3 specific for residues of the cleaning of soil, sludge from drainholes and sand residues of demolition waste;

1 tax rate for the landfill of immobilized non combustible waste
4 tax rates for the landfill of 'mono-waste streams' (e.g. gypsum)
1 tax rate for the landfill of inert waste;
1 tax rate for the incineration and co-incineration of waste;
1 tax rate for illegal landfilling, incineration and co-incineration of waste (without the necessary permit). This applies in addition to the legal enforcement undertaken by the authorities; the offender must also pay a special tax rate [4].

Landfilling of flammable waste	79.56 EUR/t
Landfiling of non-flammable waste	42.44 EUR/t
Incineration without permit	159.12 EUR/t
Landfilling of household waste that cannot be incinerated in an incinerator	21.22 EUR/t
Landfilling of flammable recycling residues (some categories have a lower tax rate = compensation factor)	79.56 EUR/t
Landfilling of non-combustible recycling residues (some categories have a lower tax rate = compensation factor)	42.44 EUR/t
Landfilling of dredging sludge on a specific site therefore permitted	0.11 EUR/t
Landfilling of residues from permitted treatment facilities of sewage sludge	3.19 EUR/t
Landfilling of residues from soil sanitation	3.19 EUR/t
Landfilling of sludge residues from the cleaning of sieving sand	3.19 EUR/t
Landfilling of inert waste	11.67 EUR/t
Landfilling of ore residues	5.31 EUR/t
Landfilling of iron oxide of waste from zinc production	5.31 EUR/t
Landfilling of gypsum or calcium chloride waste	1.07 EUR/t
Landfilling of immobilised non-flammable waste	24.40 EUR/t

Source: [2]

Exceptions

No charge is due for landfilling of residues of recycling enterprises that use glass waste originating from selective collections for the production of new glass.

No charge is due for the landfilling of ground waste that fulfils the conditions to be used as soil. These conditions are mentioned in the Flemish Waste Legislation (VLAREA) and the Flemish Legislation on Soil Remediation (VLAREBO).

No charge is due for the landfilling of sludge used as the sealing layer of a licensed construction.

No charge is due for the landfilling of waste containing asbestos in a licensed landfill [2].

2. Who monitors and collects?

In Flanders the OVAM (the public Flemish waste agency) is in charge [2].

3. Leakage issues

There is an export tax to equalise treatment in- or outside the Flemish region: All waste products landfilled or incinerated in the Flemish Region are subjected to the Flemish charges. Flemish waste products that are exported outside of the Flemish region to be landfilled or incinerated are subjected to the charge that is due in the Flemish Region, less the charge already paid outside the Flemish Region.

No charge is due for the export of waste outside the Flemish Region, if it is treated outside the Flemish Region in a way that no charge is due within the Flemish Region. [2]

4. Revenues generated, and what happens to them?

Amount of waste landfilled and the revenue of the landfill tax in Flemish Region in EUR per ton waste in 2009

	Tonne	EUR
Landfilling on a permitted landfill of flammable waste	395,810	7,925,049
Landfilling on a permitted landfill of non-flammable waste	981,611	5,702,204
Incineration	1,844,868	11,881,527
Co-incineration	303,593	887,134
Export	643,296	2,204,568

Source: [2]

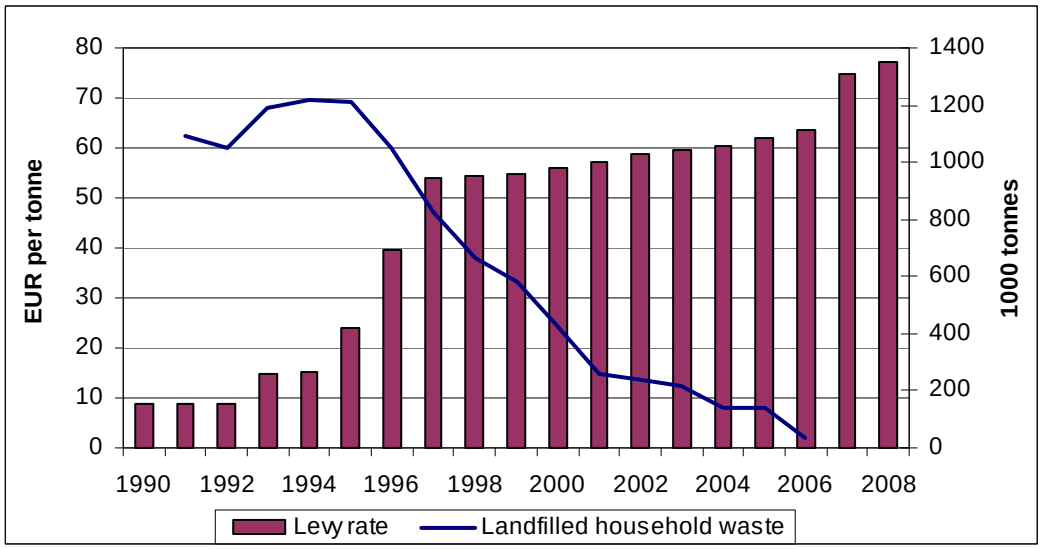
The OVAM collect funds to be included in the budget of the Flemish government. The money then goes to MINA (Prevention and Remediation Fund for Nature and Environment) [2].

5. Environmental impacts

The environmental aim of the tax is to support Flanders waste policy in reducing the amount of waste that is landfilled, and to make the environmentally friendly handling of waste more attractive. Several tax rates are charged to create a regulating effect [2].

The figure below shows the development in the landfill tax and the amount of landfilled household waste. From the graph it seems that the diversion of waste from landfill started when the tax reached EUR 40/t. [3].

Landfill tax rates (levy rate) and landfilled quantities of household waste, 1990-2008



Source: [3]

6. Economic impacts

The landfill tax is formed according to the polluter pays principle. Companies experienced the economic effects after the introduction of the tax, but this was equal for all, as every waste producer is treated equally.

The tax rates are set to have a regulating effect. It is the only way to discourage, for example, the disposal of flammable waste. The tax rates do not reflect the costs of processing [2].

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

There has been opposition. Before a change of tax rate takes place, a consultation of various business sectors takes place in order to find a compromise [2].

9. Lessons learned

- The introduction of environmental taxes has a direct and significant effect on the industry.
- It is necessary to have good contacts with the business sectors to create a platform.
- The knowledge and interest of the involved industry is very important.
- The total cost for the landfill must be higher than the total cost for the incineration of waste. Since the processing cost for incinerating is a lot higher than for the landfill of waste, the landfill taxes must be noticeably higher.
- The charging system must remain easily understandable. The introduction of a limited number of rates is recommended.
- By making the landfill of waste more expensive, there is a reduction of the amount of waste that is landfilled. The recycling sector is still expanding. In future the amount of waste that can be treated or pre-treated will expand and the amount of waste to landfill will decrease.
- Landfilling stays the only solution for some specific waste/residues that cannot be treated by incineration or recycling.

- There are lower tax rates for the residues of the sorted or recycled waste and several specific residues to make recycling more cost-efficient compared to landfill or incineration.

It is more cost-efficient to recycle specific waste first and remove only the residues for landfill or incineration. The prices for waste disposal (processing price + tax) are so high that a run through recycling cycle is more cost-efficient. A large amount of the waste can be reused after recycling as secondary raw material. This system of tax rates has proven its efficiency in support of the waste policy [2].

Sources

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[2] E-mail Linda Peetermans, Dienst Heffingen en subsidies, OVAM by 6 October 2010 and by 19 October 2010.

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[4] Telephone information given by Linda Peetermans on 2 September 2011.

Belgium (Wallonia)

Wallonia introduced taxes both on landfilling and incineration in 1991 [2].

1. Who pays and how much?

The landfill tax in Wallonia in EUR per ton waste from 2007 to 2010

	2007	2008	2009	2010	Following years
Non-Hazardous Household Waste	0	25	25	65	65 indexed
Hazardous Household Waste	0	25	25	65	65 indexed
Non-Hazardous Waste Industrial Waste	35	35	35	60	65 indexed
Hazardous Industrial Waste	35	40	40	65	65 indexed

Source: [2]

The landfill tax is reduced to lower rates in the following cases:

Incineration residues, waste after inert stabilization, 'foundry'-sands, steel-fabrication waste ..... 12.5 EUR/t

Waste from the destruction of car wrecks and scrap ..... 10.0 EUR/t

Non-inert waste from recycling units of the glass collected selectively for the production of new glass ..... 8.0 EUR/t

Inert waste ..... 5.00 EUR/t

Asbestos fibres, glass fibres, waste from the treatment of potable water, iron oxides, manganese oxides ..... 2.5 EUR/t

Phosphogypsum, soda ash plant sludge, sludge from brines of minerals and mining waste ..... 1.5 EUR/t

Wood, recycled pulp ..... 1.25 EUR/t

Soil ..... 0.25 EUR/t

If waste conforms to several levels of tax, the highest tax is applicable [1].

Exceptions

Dredging waste, water-treatment waste and waste from soil remediation operations coming from public institutions or with approval from the government is exempt from the landfill tax [1].

Ban and restrictions to landfilling (introduced in 2004 and continuously expanded):
In addition to the landfill tax the Walloon Region has introduced a time schedule for waste types which may not be landfilled any more or which have to be pre-treated before landfilling [4].

The following waste types are included: Domestic waste/bulky household waste, waste sorted for recycling, biodegradable organic waste, inert waste, various packaging materials/plastics, various metals/shredded residues of metal, various hazardous or wastes with unknown effects on human or environmental health (e.g. from research facilities, hospitals), batteries and accumulators, liquid wastes (sludge, slag), tyres/shredded tyres, electric waste, fly ash and bottom ash from coal fired power plants, dust from blast furnaces and steel mines, waste containing free asbestos [1] [4].

Before being placed in landfill sites, waste is subject to processing operations to remove and isolate recoverable fractions and to prevent and minimise risks to human health or the environment, including the pollution of surface water, groundwater, soil, air and environment of the planet, including the greenhouse effect.

For all of the categories of waste mentioned above, only the final waste from the sorting and processing of such waste may be accepted at landfill sites.

2. Who monitors and collects?

The environmental ministry (DGARNE) is in charge of controls of the landfill sites. Within the ministry, it is the Dept. for Economic Instruments that is in charge of collection of the landfill tax [2].

3. Leakage issues

ETC/SCP has found no information on this topic.

4. Revenues generated, and what happens to them?

Tax revenues are channelled into a fund (the Fund for Waste Management) dedicated to the prevention and clean up of contaminated sites. This fund is invested in waste management facilities that conform with the legislation; education and advocacy for the waste management strategy; financial aid for laboratories for work related to waste handling; promotion of research on the development and use of ecologically sound waste treatment techniques; the clean up of contaminated sites; security measures; and IT management (authorisation procedures) [1].

5. Environmental impacts

From 2004 (coinciding with the introduction of landfill bans for numerous waste-categories) the amount of waste going to landfills has decreased sharply [2].

6. Economic impacts

Landfills are being closed because managers have adopted and developed other means of waste handling (incineration, co-incineration, production of biogas) [2].

7. Social impacts

There have not been any social problems related to the introduction of landfill taxes, the ban for landfilling of numerous waste categories and the closing of landfills [2].

8. Main opponents

While the level of resistance to the introduction of the landfill tax in 1991 was not known, no direct resistance to the renewed law from 2007 was reported. It furthermore resulted in a movement to introduce taxes on incineration.

Even the doubling of tax-levels in 2010 has not triggered any major reaction. This is due to the fact that, because of the great number of waste categories now banned from landfills, landfill operators had anticipated the move and taken adaptation measures [2].

9. Lessons learned

One problem with the subsequent closing down of many landfills is to conserve sufficient landfill capacity in case major problems are to occur with an incineration plant. Despite being unprofitable now, consideration has to be given to the preservation of publicly run landfills [2].

The following line of action is planned for the future:
1. The doubling of the 11 reduced tax-levels
2. The doubling of incineration tax
3. The introduction of tax on co-incineration for non-hazardous wastes [2]

Sources

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http://environnement.wallonie.be/legis/dechets/detax001.htm

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[5] BIPRO, 2009. Workshop arranged for the European Commission, Brussels: Minutes Belgium – landfill of waste and waste prevention, 28 July 2009.
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Bulgaria

Bulgaria is the most recent European country to introduce a landfill tax. The law came into force on 1 January 2011 [1]. The goal of the tax is to reduce the amount of waste going to landfill, increase the amount of recycled waste and increase reuse. Furthermore, the tax shall speed up the development of the recycling infrastructure by generating of funds in the municipalities, which can be used for construction of recycling infrastructure [2].

1. Who pays and how much?

The tax is paid for waste sent to:

- Non-hazardous waste landfills
- Municipal waste landfills
- Landfills for construction and demolition waste [1]

There are two tax levels:

1. Waste to municipal waste landfills and for non-hazardous waste landfills.

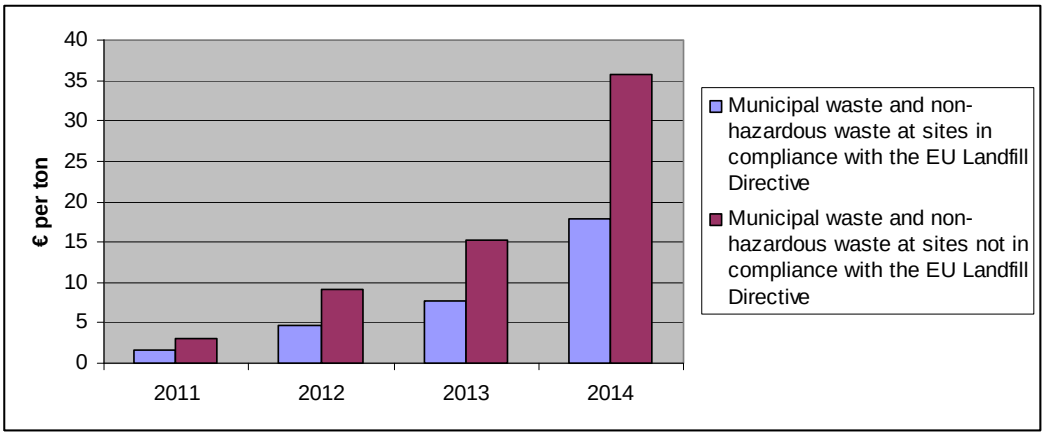
   The 2011 rate for landfills in compliance with the EU Landfill Directive is 3 Bulgarian lev (BGN) per ton of waste, equivalent to 1.53 EUR/t. For landfills not in compliance with the EU Landfill Directive, the rate is twice as much - 3.06 EUR/t.

2. Inert waste to landfills for construction and demolition waste

   The tax level for inert waste to landfills for construction and demolition waste is 6 times lower than the tax for non-hazardous waste and municipal waste, i.e. 0.5 BGN per ton of waste, equivalent to 0.26 EUR/t [1].

The Bulgarian tax rate for 2011 was very low but it will increase significantly in coming years. By 2014 the tax level for municipal waste and non-hazardous waste will be about 18 EUR/t for landfills in compliance with the EU Landfill Directive.

Development of the landfill tax rate in Bulgaria in EUR per ton from 2011 to 2014



Exemptions:
No tax is paid for hazardous waste [1].

2. Who monitors and collects
The tax is paid by the landfill operators to the Regional Environment Inspectorates, which also monitor the payment [1].

3. Leakage issues
ETC/SCP has found no information on this topic.

4. Revenues generated, and what happens to them?
The tax was introduced on 1 January 2011 and no information has therefore been available on this question. According to the regulation, the revenue is to be spent for the construction of waste infrastructure, of waste treatment infrastructure, and measures included in the Waste Management Programmes. Regional Environment Inspectorates are responsible for the allocation of funds to waste projects [1].

5. Environmental impacts
ETC/SCP has found no information on this topic, but most of the waste is currently landfilled. The tax can therefore provide an incentive to divert waste away from landfills and it will also contribute to finance investments in recycling of waste. This incentive will be strengthened in coming years by the increase in the tax rates.

6. Economic impacts
ETC/SCP has found no information on this topic.

7. Social impacts
ETC/SCP has found no information on this topic.

8. Main opponents
ETC/SCP has found no information on this topic.

9. Lessons learned
It is too early to conclude on lessons learned in the implementation of the Bulgarian landfill tax.

[1] E-mails from Ruslan Zhechkov on 13 February 2012, 27 February 2012 and 2 March 2012, Regional Environmental Center for Central and Eastern Europe (REC) based on information from Svetla Bojkova, the Bulgarian Ministry of Environment.

[2] The tax is introduced according to Article 71 of the Waste Management Act and is regulated with Decree 207/2010.

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Czech Republic

A landfill tax was established in 1992. The initial base tax rate was very low but significantly higher, however, for landfilling waste in "insecure" landfills (1992-1997). In 1997, the operation of these "insecure" landfills (not fulfilling new legislative requirements) was banned. Since 1998 (based in Act No. 125/1997 Col., later transposed to Act No.185/2001 Col.), the charge for all landfills consists of two components: 1) the basic charge (paid for municipal, other and hazardous waste) and 2) the risk charge (paid only for hazardous waste). Both components (rates) of the charge grow progressively, in particular for hazardous waste, so that generators are stimulated to limit the generation of waste and introduce different technologies, and use inputs of raw materials that do not generate hazardous wastes [2] [3] [4] [6].

1. Who pays and how much?

In 2011 the landfill taxes were:

Basic charge (revenues go to the municipality):

Municipal and other waste ..... 500 CZK (~EUR 20)/t

Hazardous waste ..... 1,700 CZK (~EUR 68)/t

Risk charge (revenues go to the State Environmental Fund):

Hazardous waste ..... 4,500 CZK (EUR 180)/t

To the average net fee for landfilling of EUR 20/t an additional 20 % in VAT or a reduced rate of 10 % has to be paid. The reduced VAT rate is applied to services related to the waste from households [1] [4] [6].

As shown in the table below the tax has increased during the last ten years.

Developing of the Czech landfill tax from 1998 to 2009 in CZK per ton waste

		1998	1999	2001	2002	2005	2007	2009
The basic charge	***Hazardous waste***	200	250	350	1100	1200	1400	1700
	Municipal and other waste	20	30	50	200	300	400	500
The risk charge	***hazardous waste***	300	500	750	2000	2500	3300	4500

Note: 24.5 CZK ~ EUR 1
Source: [4]

Exemptions:

Material and waste which is used as technological material (for fulfilling the security and technical conditions of landfill operating) is not subject to landfill tax [4].

When the municipality (in whose area the landfill is located) is the producer of waste, it is exempt from paying the basic charge (as this would be revenue from the same municipality) [4].

Waste which includes asbestos although having the character of hazardous waste is charged only as municipal or other waste - that means it is not subject to the "risk" charge, it is only subject to the basic charge [4].

2. Who monitors and collects

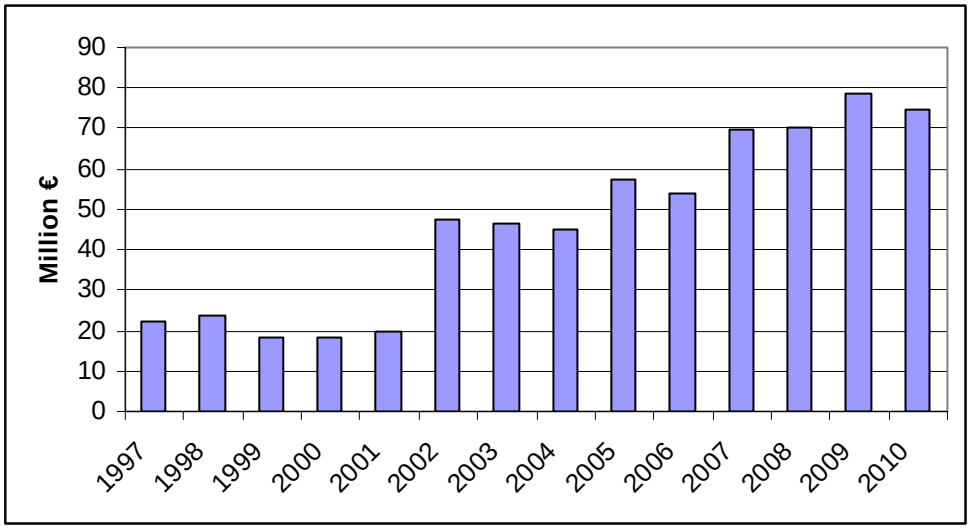
The charge is paid by waste producers as an addition to the price for waste deposition to the landfill. The landfill operator sends the collected money each month to the recipients (the municipality in whose area the landfill is located and the State Environmental Fund). The role of state institutions then consists of control activities - municipal and regional authorities identify cases where the charge was not paid, these cases are then solved by financial authorities.

3. Leakage issues

The Ministry of the Environment of the Czech Republic is not aware of any substantial effects on transboundary waste shipments [4].

4. Revenues generated, and what happens to them?

Development in the total landfill tax revenue from 1997 to 2009, the Czech Republic



Note: The stated revenue includes both the basic charge and the risk charge
Source: [6] [7]

In 2007 the part of the revenue coming from the risk charge was CZK 114 million (~EUR 4.7 million) and CZK 300 million (~EUR 12.2 million) [4]. The revenue of the basic charge goes to the municipalities. This constitutes the main part of the revenue.

The revenue from the risk charge goes to the State Environmental Fund, which is used for subsidising environmental projects in all environmental areas (the money received from waste charges does not need to be necessarily used for waste management projects) [4] [6].

5. Environmental impacts

According to the Czech Ministry of Environment and the Czech Environmental Information Agency the development of the landfilling of municipal waste has been:

Development in MSW management in the Czech Republic from 1997 to 2010

	1997	1999	2000	2005	2010
Recycled	12 %	15 %	15 %	21%	32 %
Incinerated	3 %	8 %	8 %	10 %	9 %
Landfilled	85 %	65 %	60 %	64 %	60 %

Source: [3] [6]

The objective for 2005 was 30 % recycled, 10 % incinerated and 60 % landfilled [3].

According to Eurostat the development of the landfilling of municipal waste has been [5]:

1997 ..... 100 % landfilled

2000 ..... 84 % landfilled

2009 ..... 75 % landfilled

6. Economic impacts

The rates of the charge were increased gradually. Landfilling was, for large parts of waste, almost the only possibility in Czech Republic as it is, still, the cheapest form of waste management in the majority of cases (recycling or incineration / use for energy purposes are usually costly processes). During recent years, capacities for other forms of waste management have gradually been built-up, sometimes with the help of EU subsidies. This means that there are more waste processing facilities able to compete with landfilling (as the technological and economical conditions are changing).

The difference between landfilling and more preferable waste management (e.g. recycling) in average costs is, however, estimated to be still at the level of thousands of CZK per tonne. The main goal of charges in a new Waste Management Act currently under preparation should be to balance these costs. This would require the charges for landfilling to again be increased (gradually) - to cover the difference in average costs in comparison to other waste management options [4].

7. Social impacts

For households, costs could be increased by the charges for landfilling, but the behaviour of households was influenced rather by the changes in the fee paid by households to their municipality for waste collection.

The design of the fee has historically influenced the behaviour of households in this way: as the amount of the annual fee per household was dependent on the amount of waste (or rather the number of collections of a household's garbage container per year and the volume of the container), the amount of illegal littering was rather high, with the competent authorities not always able to find the originator to penalise them. Since 2002, the Act on municipal fees (No. 565/1990 Col.) enables the municipality to use a different design of the fee. The fee is paid by every citizen of the village / city and the amount of the fee is the same for everyone in the municipality - maximum 500 CZK per person per year. The municipalities using this method have eliminated significant problems with illegal municipal waste because it is quite impossible to avoid paying the fee, so there is no motivation to get rid of the waste in an illegal way.

The current maximum fee (CZK 500) does not, in recent years, enable all municipalities to cover the costs of municipal waste management, so the municipality has to cover the remaining costs from its own budget (the households are then not burdened with full costs). There has been a discussion for the last 2 years about the necessity to increase the maximum limit of the fee.

8. Main opponents

From the business side, there is always opposition if an increase of any environment related charges is proposed. However for many businesses, of greater importance are the costs related to various obligations stated in environmental law than costs caused by these charges.

For households, the situation is dependant on specific conditions in their municipality - the design of the fee (as mentioned above) can be different and also the costs per inhabitant varies among cities/villages [4].

9. Lessons learned

A problem is that the fiscal effect (the revenue) from the charges for hazardous waste does not correspond to the amounts of hazardous waste deposited into landfills in the Czech Republic. This is because of the use of hazardous waste as technological material for construction elements of the landfill, and these wastes are exempt from the charge. It is expected that the new Act on waste will either modify this exemption (to place a strict limit on the quantity of exempt waste) or cancel it (however there is strong opposition from landfill operators) [6].

The Ministry of Environment's goal for the new Act is therefore not necessarily to increase the rate of the charges for hazardous waste (this will depend on further analysis of the costs in hazardous waste management) but to make this issue more transparent [4].

Sources

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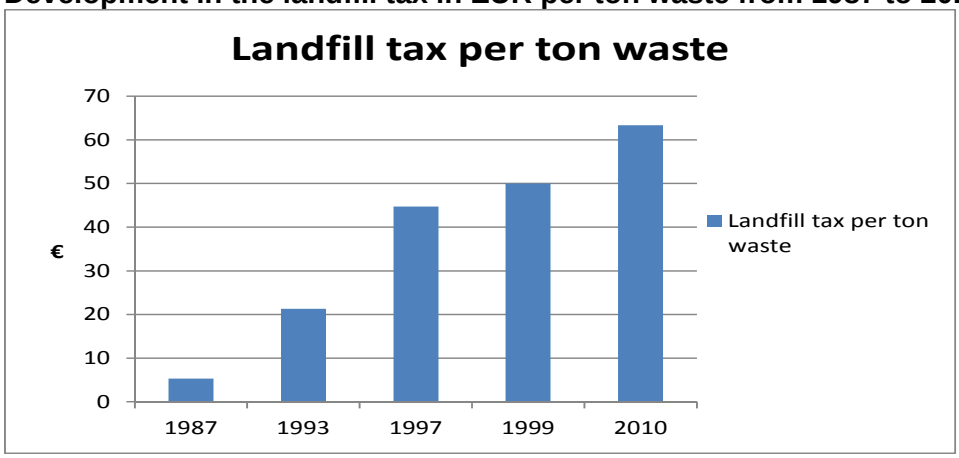
Denmark

The Danish Landfill tax was introduced on the 1st January 1987 along with the introduction of a tax on incineration. The aim was to create an incentive to help reduce the amount of waste going to landfills and incineration plants and so promote recycling [1].

1. Who pays and how much

Originally the landfill tax only included landfills receiving waste from municipal collection schemes, but already in 1989 coverage was extended to all landfills with the exception of landfills for hazardous waste. In 1987 the tax was DKK 40 per ton of waste (~EUR 5.3). The tax was increased several times during the 1990s; to DKK 160 in 1993 (~EUR 21.3), DKK 335 in 1997 (~EUR 44.7), DKK 375 (~EUR 50) in 1999 and DKK 475 (~EUR 63.3) in 2010. The tax is levied on waste delivered to registered plants and a refund is granted for waste that is subsequently removed, e.g. for recycling. In that way the tax is only paid for the net amount received [1].

Development in the landfill tax in EUR per ton waste from 1987 to 2010



Note: The tax rates for 2010 are also valid in 2011
Source: [2] [3]

Exceptions

Until 2010, landfills for hazardous waste were exempt from the tax; however from 2012 those landfills will be required to pay DKK 160 per ton (~EUR 21.3), and the full tax (DKK 475) by 2015.

The following waste types are exempt from paying the tax: [1]

1) Clean soil which is used for the daily and final covering of a landfill site;
2) Compost used for the final covering of a landfill site;
3) Ashes or slag stemming from the separate incineration of meat and bone meal:

2. Who monitors and collects

The landfill owner or operator has to pay the landfill tax of every ton of waste delivered to the landfill and the tax will therefore be charged on the waste producers or waste collectors, who deliver waste to the landfill. The tax is paid as an addition to the price for waste deposition to the landfill. Every quarter of the year the landfill owner pays the tax to the regional customs and tax offices in Denmark. There are 6 regional offices in Denmark [5].

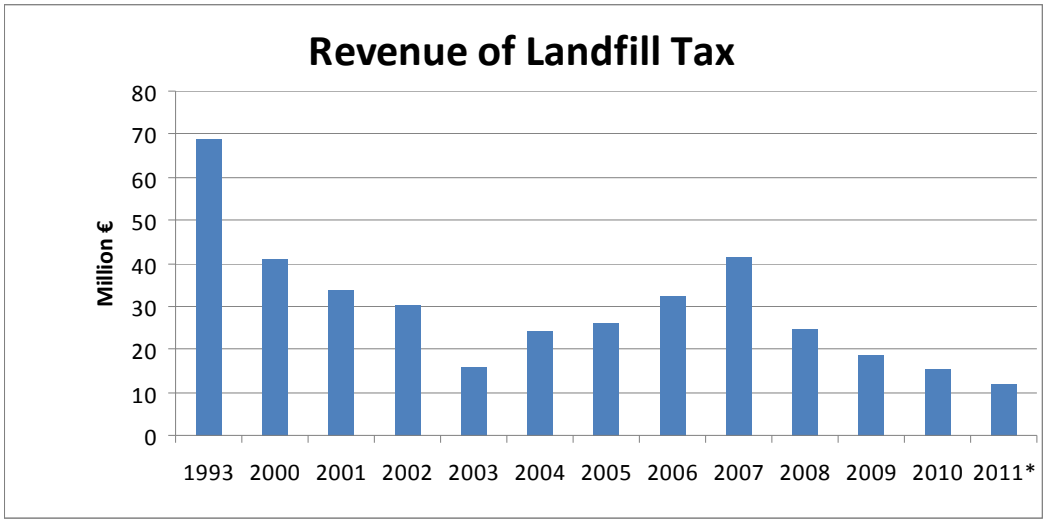
3. Leakage issues

Export of waste for landfilling requires, according to the EU Waste Shipment Regulation, an approval from the authorities. This implies that the authorities can say no to any transboundary shipment for landfilling. It seems that the landfill tax does not have any substantial effects on transboundary waste shipments, whereas the incineration tax has had some influence, because transboundary shipments for recovery cannot be rejected as easily as shipments for landfilling [5].

4. Revenues generated, and what happens to them?

The revenue was EUR 69 million in 1993, EUR 41 million in 2000, EUR 18 million in 2009 and EUR 12 million in 2010 [2]. The revenue has firstly seen a decrease because less and less waste is landfilled.

Development in the landfill tax revenue in million EUR 1993-2011



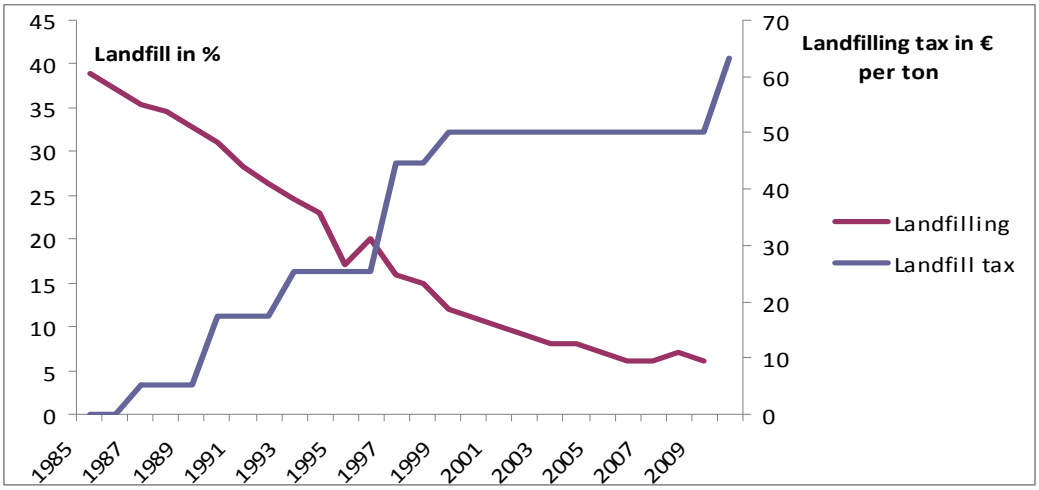
Note: * Estimate made by the Danish Ministry of Tax in August 2011
Source: [2] [6]

The revenue of the tax is included in the ordinary state budget. The revenue is in that way spent on public expenses such as health, education, police etc. Originally when the tax was introduced, a larger part of the revenue was spent on supporting recycling and cleaner technology projects.

5. Environmental impacts

Total waste going to landfill has been reduced from 3.5 million tonnes in 1985 to 0.8 million tonnes in 2009. In the same period there has been an increase in the waste generation from to 9 million to 15.6 million tonnes. In percentage landfilling declined in the period 1985 to 2009 from 39 % to 6 %.

Development of landfilling of total waste and landfill tax in Denmark



Note: The figures for landfill in % for 1988 to 1992 are calculated [5]

Looking at sectors and waste types where the tax has had a significant impact on the reductions in waste sent to landfills, there has been a significant reduction in the types of wastes that have a large weight and are reasonably homogenous, e.g. construction and demolition waste and garden waste [3] [5].

The development for waste from construction and demolition activities and households [3]

	Treatment of construction and demoliton waste (in%)			
	1985	**1995**	**2001**	**2008**
Recycling	12	85	90	95
Landfilling	82	14	8	3
Incineration	6	1	2	1
Generated waste in million tonnes	1.7	2.6	3.4	6.0

	Treatment of household waste (in %)			
	1985	**1995**	**2001**	**2008**
Recycling	16	24	29	41
Landfilling	33	19	8	4
Incineration	51	56	61	51
Generated waste in million tonnes	1.9	2.6	3.1	3.7

In the period from 1985 to 2008 the absolute amount of waste to landfill from construction and demolition activities has declined by 1.2 million tonnes or equivalent to a reduction of 88 %. In the same period the absolute reduction in waste for landfilling from households has been 0.5 million tonnes, equivalent to an absolute reduction of 77 %. The landfill tax has played a part in this reduction, together with other measures, i.e. a ban on the landfilling of combustible waste [4] [5].

The amount of waste from manufacturing activities to landfill has not decreased so greatly. In 1985, the rate was 35 % and in 2008 it was 23 %.

There are no indications of increased fly-tipping but down-cycling or "shame" recycling is a risk especially for construction and demolition waste. Furthermore, it seems that certain types of waste have increased extraordinarily. For example, the hazardous part of shredder waste from end of life vehicles has increased considerably, which can be explained by the fact that hazardous waste is exempt from the tax. In that way there might be an incentive to classify waste as hazardous even if it is non-hazardous.

The landfill tax provides important incentives for separate collection and separation schemes. The tax is a catalyst for recycling and the sorting of waste at landfill sites has improved.

6. Economic impacts

Since Denmark introduced both a tax on waste sent to landfill and incineration there has been a larger economic incentive for recycling. A private market for recycled construction and demolition waste has been developed. Similarly, there has been a development to a certain extent of a private market for compost products.

Even if the landfill tax is quite high compared with other European countries, the extra costs for the generators of the waste are still quite low. It implies that the tax as such has not created an incentive to generate less waste, but firstly an incentive to divert waste away from landfills [5].

7. Social impacts

ETC/SCP has found no information that social impacts have been registered.

8. Main opponents

Most landfills in Denmark are owned by the municipalities. This provides one explanation of why there has not been very strong opposition against the tax. Another explanation can be that in the beginning much of the tax revenue was used for supporting recycling activities, returning the revenue to the waste management sector itself. However, in the last 10 to 15 years only a small amount of the revenue has been returned to support the development of better waste management activities [5].

There has been some opposition against the tax from producers of large amounts of the same waste type. However, some of these producers have been given very strong incentives to develop recycling methods for their waste. For example, paper sludge from the production of paper was earlier landfilled but it is now recycled. The extension of the landfill tax in 2010 to also include hazardous waste has been received with opposition from the concerned plants [5].

9. Lessons learned

The Danish landfill tax has been introduced with few exemptions, which has made it easier to administrate for the tax authorities. The constant increase of the tax in the 1990s created continuous pressure for waste to be diverted away from landfills. Combined with economic support to develop recycling technologies and related schemes, a positive interpretation of the tax was given. Both the carrot and the whip have been used. However, it can be seen that presently the tax solely provides an economic incentive for recycling and revenues are now almost exclusively used for other purposes than the development of better waste management [5].

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Estonia

Landfill tax in Estonia was established in the first half of 1990 [5]. The charges differ by type of waste, location of the sites and the sites adherence to environmental regulations [3][4]. In Estonia all industrial waste disposal falls under the landfill tax - this is not a widely used concept [5].

1. Who pays and how much?

The Estonia tax rates for the main waste types in EUR per ton waste by 2010

Pollutant charge rates for waste disposal	EUR per 1 ton of waste
1. Non-hazardous and hazardous waste deposits which are permitted in a landfill for non-hazardous waste based on the waste permit or integrated environmental permit for the operation of landfills held by the possessor of the landfill, except for the waste specified in points 5-9 hereinafter	12
2. Municipal waste	12
3. Waste deposited in landfills for inert waste	12
4. Waste from building materials and construction demolition waste containing asbestos	0.64
5. Mine waste from oil shale, including waste from mineral dressing, discharged into open landfills	0.7
6. Waste which contains wood preservatives, inorganic pesticides, asbestos, arsenic or lead, except for the waste specified in point 4 above, coal and oil shale tar and products thereof, as well as bituminous compounds containing such materials and waste pitch from the processing of oil shale	63
7. Waste which contains mercury, cadmium, cyanides, polychlorinated biphenyls or polychlorinated terphenyls (PCBs, PCTs) or organic pesticides	625
8. Oil shale fly ash and oil shale bottom ash and cement clinker dust	1.2
9. Oil shale semi-coke	1.2

Sources: Point 1-3 and 5-9 are from [6]. Point 4 from [5]

- The tax on non-hazardous waste, incl. inert waste and municipal waste (point 1-3) will rise by 20 % per year to EUR 30/t until 2015. The landfills amount is about 400,000 t/y.
- The low tax on asbestos containing waste is due to the particular situation for asbestos – there is no alternative to landfilling it, and it was regarded as better to collect and landfill it on proper sites than to encourage illegal landfilling.)
- The tax on oil-shale ash and oil-shale semicoke (points 8 and 9) will rise by 20 % p.a. to EUR 3 per ton until 2015. The landfilled amount is about 6-7 million tonnes per year
- Oil-shale enrichment residues (point 5) have an amount of about 6 million tonnes landfilled per year. There is no increase planned for this tax

Source: [5]

The charge is paid by landfill operators [1].

Exceptions

No exceptions, any waste disposed to the landfills (D1, D5) should pay the relevant tax [5].

2. Who monitors and collects?

So far, the Environmental Board (Agency) under the Ministry of the Environment controls the calculation document prior to payment and collects the tax. The landfill owners or operators have to submit quarterly reports on landfilling and pay the tax.

A new e-platform is in development at the moment. This will be a dedicated web page of the Tax and Customs Board which the landfill operators shall themselves declare the tax and provide all relevant additional information [5].

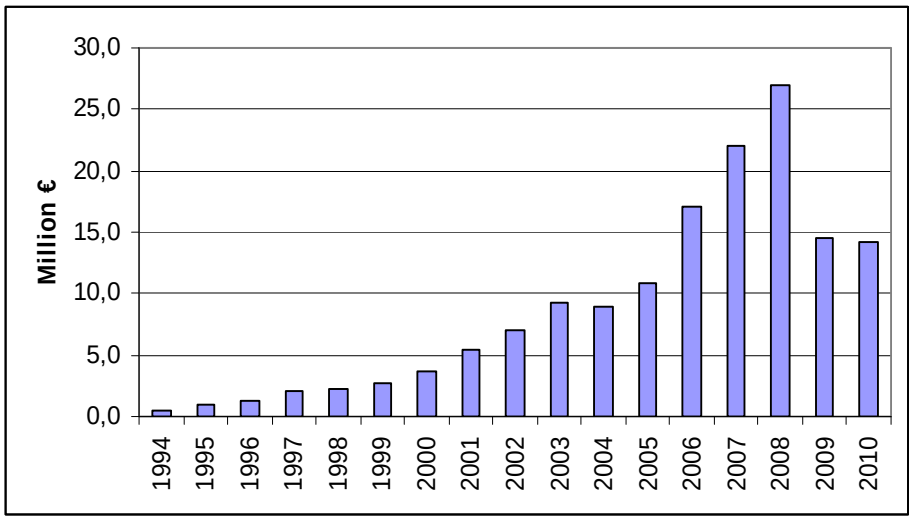
3. Leakage issues

As landfill tax has generally and very clearly motivated all kinds of recovery operations, several materials are also sorted out at a higher rate and as a majority of recyclables are exported, there could be seen to be a connection. There is still no evidence of mixed municipal waste or industrial waste shipments due to the landfill tax. This is perhaps partly because of geographic location; a difficult border situation to the east with Russia, Finland being accessible by ferry only, while Latvia's border area has a low density population. The risk from illegal shipments is also considered. The problem might partly be, especially in the case of mineral construction and demolition waste, wastes recovered in rather big quantities as backfilling material. Also material which should not be there, and the mixing of some treated wood to clean wood streams as the mixture goes for incineration, etc. There might be attempts 'to hide something' away, as landfilling is considered expensive, but the real recovery favouring approach clearly overweight this [5].

4. Revenues generated, and what happens to them?

Total revenues from landfill tax in Estonia were EUR 14 million in 2010. This is down from EUR 27 million only a few years ago [5].

Development in the landfill tax revenue in million Euros from 1994 to 2010 [7]



75 % of the revenues collected by the Environmental Board are returned to the waste generating municipalities. This 75 % is calculated from the basic 2009-tariff level; thus 'extras' and the 20 % rise in tariffs until 2015 are not part of the municipal share. The municipalities' share of the revenue should by law be used for the development of waste management, but no control mechanisms are in place and revenues often simply feed into the general budget. From 2011, the Tax and Customs Board will take over the role of the Environmental Board (collect and distribute revenues from landfill tax) [5].

The remaining part of the tax-revenue is transferred to the Environment Investment Centre/Fund (EIC). This will not change after 2011. The EIC is considered part of the state budget, but its funds are earmarked for environmental projects (not only for the waste sector). Yearly, around EUR 7 million in landfill tax revenues are returned to waste sector projects via the Environmental Investment Fund (the main national supporter for waste management projects). This fund builds new landfills and closes old ones (from 200 landfills to 5 non-hazardous landfills in 2009) [3].

5. Environmental impacts

Due to separate collection, the amount of landfilled municipal waste decreased by 20 % in 2008 compared with 2007. For the 1st quarter of 2009 another 20 % decrease is reported [3]. Today, 80 % of construction and demolition waste is recovered, clearly an effect of the tax (making it cheaper to recover than to landfill) [5].

Before July 2009, new and old landfills were in operation in parallel. The old landfills had a higher tax charge, so that the preference by waste-collectors for an old landfill being geographically closer would be equalled out. The phasing out of old landfills was one clear environmental effect of the tax.

The trend towards increasing overall gate fees (2001 ca EUR 10/t incl. tax; today ca. EUR 55/t) has redirected several waste streams predominantly landfilled 10 years ago into recovery (sewage sludge, construction and demolition waste, garden and parks green waste, wood and timber waste as sawdust, etc.).

There was a large project to build a cement factory, using as input material oil-shale semi coke. This project is frozen due the economic downturn, but one of the arguments behind it was the landfill tax for this waste [5].

The effect on municipal waste has been perhaps less visible so far - as during previous years, municipalities were obliged to organise municipal waste collectors' tenders, which have brought household costs down, despite the growing landfill costs themselves. In many areas there is still a so called 'free market' i.e. collection prices are not regulated and are thus higher. An average household pays directly for municipal waste collection EUR 1-7 per month and often those lower rates are considered too cheap to motivate sorting purely on the basis of costs [5].

6. Economic impacts

Current landfill gate-fees do not cover all landfilling related to direct costs (the closing up of old landfills will be subsidized during the coming years with around EUR 38 million). Landfill gate-fees have been subsidised so far (via investment support). Even though the landfill tax is still low compared to other countries, the increase of the charge has been considerable. Moreover, the rate is twice as high (and will be three times as high from 2009) for landfills that do not comply with the Landfill Directive [1].

As 75 % of all revenue from landfill tax comes from waste generated by oil-shale incineration, and this is where 90 % of domestic electricity-production comes from, the landfill tax also has an effect on electricity prices, ultimately making the consumer pay through higher electricity prices [5].

7. Social impacts

Subsidies for landfilling have been implemented to soften the transition from around 250 to 5 landfills and avoid negative social-economic impacts [3].

8. Main opponents

There was no opposition when the landfill tax was initially introduced. As the major part of the landfill tax revenues (beside the share going back to municipalities) is going to the Environmental Investment Centre (i.e. redirected back to all kinds of environmental projects), there is some understanding that lower taxes also mean less support. However, certain municipalities and political actors say that higher taxes will increase littering and wild landfilling, and for special industrial waste-streams an argument often brought forward is that these industries should be closed anyway (even though none are actually closed) [5].

9. Lessons learned

The initial low landfill tax didn't create the expected motivation to find alternatives to landfilling. However, the situation is changing as from 2006 the landfill tax rose considerably.

Due to the fact that much of the tax revenue has been applied for the construction of new landfills, there has not been enough money remaining for recovery operations [3].

The landfill tax is perhaps even too differentiated- fewer tax levels would make the system more understandable [5].

Environmental charges should be introduced, so that sanctions for those not applying the law are available [5].

For the municipalities – which get 75 % of the collected tax as a refund to the municipal budget – it is a problem that mechanical biological treatment (MBT) prior to landfilling and incineration are becoming more common. There will be 3-4 times less waste, and the part that is landfilled is not municipal waste according to the EU Waste List anymore. This will financially hurt small municipalities. Therefore municipalities might turn out to be working against the implementation of the waste hierarchy, and instead try to motivate landfilling. This is a political "hot potato" at the moment [5].

Public waste stations/public amenity sites would be much needed to support proper sorting and collection. The costs for such sites (EUR 20 000 – 40 000/y) is a major burden for small municipalities though [5].

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Finland

The Finnish tax on waste landfilling was introduced in 1996 [1]. The first waste tax Act was in force 1997-2010. The second one has been in force from the start of 2011 [11].

1. Who pays and how much?

The landfill tax per tonne of waste has increased from EUR 15.15/t in 1996 to EUR 23/t in 2003, EUR 30/t in 2005 and EUR 40/t in 2011 [7] [11]. The tax is planned to be EUR 50/t in 2013 [6]. There is a ban on landfilling of biodegradable municipal waste.

In the scope of the first waste tax act was municipal landfills and also private landfill service sites, which were not disposing own waste. Private industrial sites were out of the scope in that time.

According to the new waste act, in force from the start of 2011, the tax is paid for landfilling of all wastes that have an alternative possibility for recovery (instead of landfill) from an environmental and technical point of view. In the Act's annex is a tax list over waste types, which follows the EU-list of wastes. All waste types that have no other ways toward recovery or disposal than landfill are excluded from tax list. The industrial landfills are under taxation as well [11].

Exceptions

Waste taxes are paid by the owner of the landfill, who passes on the cost to the original producer of the waste through fees charged for the reception of waste [2].

Exempted from the tax are contaminated soil, waste (sludge) from the de-inking of waste paper, fly ash and desulphurisation waste from power plants, waste utilised in the construction of the landfill site not including glass waste and some concrete waste.

Municipal sites where only soil and stone are deposited are not in the scope of the tax. Sorted waste intended for recycling or disposition can be stored in a separate area tax-free for three years [6].

According to the new waste tax act hazardous waste is exempted from tax.

2. Who monitors and collects?

The tax is accounted for quarterly and is collected by the regional customs offices [6].

3. Leakage issues

No legal transboundary shipments of waste for landfilling are observed. The fact that it was only common landfills or municipal owned landfills that paid the tax created incentives to use private owned landfills. In 2007 the Government started to investigate whether the landfill tax was to be extended to other types of landfills or waste types [7] and a new law including the extension came into force in 2011 [8].

4. Revenues generated, and what happens to them?

The fiscal income from waste taxation was EUR 52 million in 2008 and EUR 45 million in 2009 [6]. It has increased since 2000 from EUR 33.3 million.

Revenue of landfill taxes in Finland 2000-2009

Year	Revenue in million EUR
2000	33.3
2001	31.3
2002	31.8
2003	41.0
2004	42.0
2005	53.0
2006	55.0
2007	56.0
2008	52.0
2009	45.0

Source: [6]

The waste tax revenue is passed to the general budget. The money is made available to fund contaminated land remediation [7].

5. Environmental impacts

Kautto and Melanen (2004) state that the landfill tax has encouraged companies to increase the recovery of waste, although the costs associated with waste management are relatively low. Charges increased over the late 1990s and these increases may have signalled to firms that the government was serious about minimising waste levels and therefore acted as an encouragement to firms to search for new ways to minimise wastes [1].

The Ministry of the Environment assessed the effectiveness of waste tax in Finland in a report published in 2005, which indicates that waste taxation has helped to reduce the amounts of waste ending up in public landfills in spite of increasing consumption. Reductions were particularly significant for construction, commercial and industrial waste. Taxation controls have been less effective in terms of limiting household waste [2].

The number of landfills in Finland has decreased considerably in recent years, with such activities becoming increasingly concentrated in fewer but larger sites. Many of the landfill sites were closed down by the end of 2007, when they no longer met toughened requirements concerning the sealing of the bases of landfills.

At the beginning of 2008 a total of 165 landfill sites were functioning in Finland, of which 21 were for hazardous waste, 137 for non-hazardous waste and 7 for inert waste [9].

Furthermore, the landfill tax has prompted the development of special landfills, e.g. for the energy sector, for clean soils, and for rejects from recycling since these waste types are not subject to the waste tax [7].

The number of facilities recovering and otherwise treating municipal waste has correspondingly risen - to a total of 180 by the beginning of 2005 [3].

6. Economic impacts

It is evaluated that the taxation has particularly reduced landfilling of construction wastes as well as industrial wastes and wastes from the commercial sector by improving the competitiveness of the recovery operations [7].

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

There was strong opposition in the private sector but slowly attitudes have changed [5]. According to interviews done by Kautto and Melanen's (2004), many people feel that taxation and other economic instruments are appropriate tools for enhancing eco-efficiency and sound waste management [1].

The industry has been against the extension of the landfill tax also to cover private industrial landfills [7].

9. Lessons learned

In general, the waste taxation is considered not to have contributed so much to waste prevention, but rather to have developed and increased recovery. The tax level is not high enough to change waste generators' behaviour, and the tax would have to be unrealistically high to have an effect on waste generators behaviour [7].

The tax on waste to municipal landfills was introduced in 1996. Between 1995 and 1997 the amount of landfilled municipal waste declined by about 15 %. Since then the amount of municipal waste landfilled has not decreased very much. From 2008 to 2009 the amount decreased by 16 %. Thus, it seems that the landfill tax seems to have supported the policy to divert waste away from landfills to a limited degree only. The largest change has occurred in the amount of construction and demolition waste landfilled. Even the increases of the tax in 2003 and 2005 have not resulted in a major reduction of municipal waste landfilled [7] and [10].

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France

The first attempts to implement a landfill tax were made in 1992. [3] The first French landfill tax was introduced in 1993 [2]. In 1999, the TGAP (Taxe Générale sur les Activités Polluantes) was implemented, which introduced the polluter pays principle into legislation. The landfill tax has since then become a part of the TGAP.

The French landfill tax is made up of two elements:

- A tax on the operation of the landfill site. This tax is all inclusive and does depend on the environmental impacts of the facility but not on the quantity of waste received. It has to be paid each year by the landfill site operator and is calculated by multiplicating a basic rate by a coefficient depending on the problems that may be caused by the facility.
- A tax depending on the quantity of waste received and the environmental impacts of the site. The rate of this tax is different for hazardous and non-hazardous waste. The tax on non-hazardous waste was created on 1 January 1999 [9].

In France, all landfill sites are ICPE (« installations classées pour la protection de l'environnement », i.e. classified installations for the protection of the environment). Indeed, any industrial or agricultural operation likely to create risks or cause pollution or environmental problems is a classified installation. Under the authority of the Prefect, these operations are entrusted to the Inspectorate of classified installations, made up of sworn State officials. All landfill sites have to have a permit according to the landfill directive (1999/31/CE) [9].

1. Who pays and how much?

The site operator is liable to pay the tax. The landfill tax is also applied to waste received in an internal landfill site used by a company to manage its own waste [9].

When it was introduced, the landfill tax for non-hazardous waste was 20 FRF/t (EUR 3.05/t). The rate increased to 60 FRF/t (EUR 9.15/t) in 1995. In 2000, a reduced rate was introduced for EMAS or ISO 14000 certified sites (EUR 7.50/t). [2] [9]

The table below gives the evolution of the level of landfill tax between 2000 and 2008.

The landfill tax in EUR per ton for non-hazardous waste from 2000 to 2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
General landfill tax	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.9	10.03
Unauthorized sites	13.72	13.72	13.72	18.29	18.29	18.29	36	38.9	39.41
EMAS/ISO 14001 certified sites	-	-	7.5	7.5	7.5	7.5	7.5	8.1	8.21

[9] An unauthorized landfill site is a facility where regular inputs of waste take place and usually managed by a local authority. Since 2007, all unauthorized landfill sites in Metropolitan France have been either closed or authorized after upgrading works. In 2011, there are 258 non hazardous waste landfills sites and 16 hazardous waste landfill sites, all authorized. Only 4 unauthorized landfill sites remain open. All located in French Guyana, They will be closed in the near future and, in the meantime, are closely monitored by the French authorities.

The current landfill tax builds on a law from 27 December 2008. Apart from raising the landfill tax, this law also established a tax on incineration. This law foresees a stepwise increase in the landfill tax; from EUR 10.03/t in 2008, it will increase to EUR 40/t in 2015 [1].

The table below indicates the level of landfill tax from 2009 to 2015, and the level of incineration tax for comparison purposes.

The Landfill tax for non hazardous waste in France in EUR per ton waste from 2009-2015

Year	General landfill tax	Good energetic performance	EMAS/ISO 14001 certified sites	Unauthorized sites	General incineration tax
2009	15	10	13	50	7
2010	20	11	17	60	7
2011	20	11	17	70	11.2
2012	30	15	20	100	11.2
2013	30	15	22	100	14
2014	30	20	24	100	14
2015	40	20	32	150	14

[6] [7] [9]

The table shows that the landfill tax rate depends on the characteristics of the sites and not on the nature of waste flows. A landfill site operator cannot claim more than one reduced TGAP rate, and thus has an incentive to improve the facility in order to pay less TGAP [9].

There is another landfill tax for hazardous waste. In 2010, the rate of this tax was around EUR 20/t. [9].

The different types of waste falling under the tax is as follows: Municipal waste from households including bulky waste, waste from municipal parks, wastewater sewage sludge/residuals, mixed industrial waste collected by municipalities, inert and harmless industrial waste e.g. paper, board, metals, wood and plastics from industry, administrations, retail, services which do not require any special treatment. Other types of waste paying the tax are mixed industrial waste collected separately from household waste and disposed of in private or public landfill sites, inert and harmless construction waste, inert extraction waste and other aggregates (débais et gravats) [8].

The total amount of waste paying the landfill tax was approximately 20.5 million tonnes in 2009. In 2008, this amount was 22 million tonnes [9].

Exceptions

There is no landfill tax on sorting centres and transfer sites (both public and private) [9].

2. Who monitors and collects?

The tax is payable quarterly by all non hazardous waste landfill sites. The minimum level of landfill tax per year is EUR 450 per landfill site, otherwise the tax has to be paid for every ton of waste entering the site. The facility liable to pay the tax has to send a declaration of tonnage to the Customs and Indirect Rights Office (DGDDI in French). Fur-

thermore, all operators of non-hazardous waste landfill sites are required to keep a register in which various data are recorded for each waste consignment received, tonnage and type of waste, place of origin and identity of producer, date and time of delivery, name of transporter, etc. [5] [9].

3. Leakage issues

ETC/SCP has found no information on this topic.

4. Revenues generated, and what happens to them?

The table below gives the revenues of landfill tax. After a decrease until 2008, revenues derived from landfill tax increased by EUR 95 million from EUR 185 million in 2008 to EUR 280 million in 2009. In 2010, they were a little lower than in 2009 because the aggregate environmental and energetic performance of facilities improved [9].

Revenue of landfill taxes on non-hazardous waste landfill sites in France 2000-2011 in million EUR

Year	Landfill tax on non-hazardous waste landfill sites (million EUR)
2000	114
2001	227
2002	297
2003	232
2004	213
2005	191
2006	197
2007	196
2008	185
2009	280
2010	259
2011 (estimate)	279

[9]

The landfill tax payments are received by the Customs and Indirect Rights Office. One part of this landfill tax (and one part of other green taxes) is then allocated to ADEME for the financial support of local prevention programs and recycling facilities. Between 2009 and 2011, EUR 520 million were allocated to waste management policies, more than EUR 170 million per year (in average). In 2008, the total amount of public financial support was about EUR 60 million [9].

5. Environmental impacts

One indication of the effect of the landfill tax is the development in municipal waste. From 1995 to 2009, the per capita amount of municipal waste in France has increased by 13 %, from 475 kg to 535 kg. Even though the share of recycled waste has increased from 18 % to 34 % and the share of landfilled waste has declined from 45 % to 32 %, i.e. from 213 kg per capita to 173 kg.[4]

6. Economic impacts

When the tax was introduced at 20 FF/t (EUR 3.05/t) it was decided that a minimum charge should be 5,000 FF per year (EUR 760). In 2010 the minimum charge was EUR 450. [3] [9]

The effect of the landfill tax in France has and will change relative prices for recycling, incineration and landfilling. In 2008, landfilling including taxes cost EUR 65/t, incineration EUR 80/t, and recycling EUR 70/t. In 2015, landfilling including tax will cost EUR 95/t, incineration including tax EUR 92/t, and recycling will remain at EUR 70/t [1].

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

ETC/SCP has found no information on this topic.

9. Lessons learned

The rate of the French landfill tax is currently increasing. To be effective and divert waste from landfill, landfilling waste (net cost plus taxes) has to cost more than recycling or recovery of it. So, the rate of the French landfill tax will be of EUR 40/tonne from 2015 that will represent approximately 80% of the cost of landfilling waste [9].

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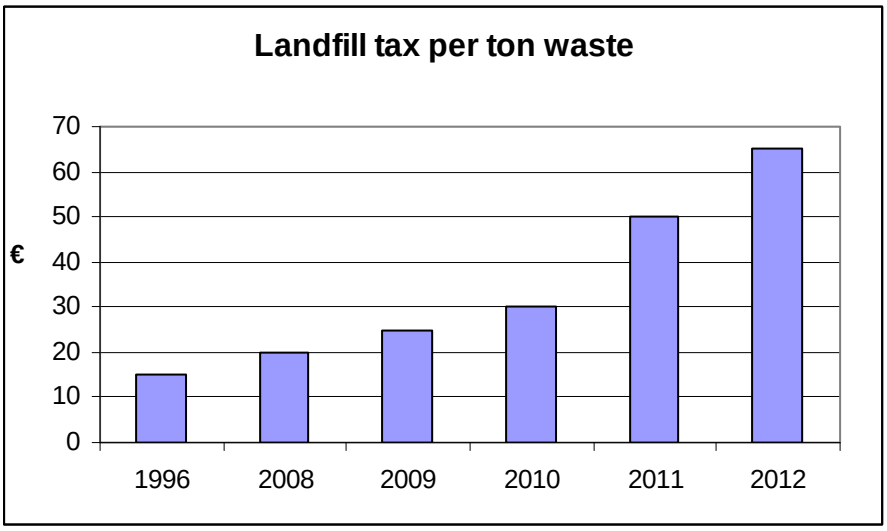
Ireland

A landfill tax was introduced in 1996 and is paid on top of the normal landfill fees by businesses and local authorities that want to dispose of waste using a landfill site. VAT is charged on the full waste disposal fee, inclusive of the landfill tax. The aim of the tax is to encourage the disposal of less waste, to recover increased value from waste through recycling and composting, and to stimulate moves to more environmentally friendly waste management methods [2] [4].

1. Who pays and how much?

The tax is paid by the holder of a waste licence in relation to the disposal of waste at an authorised landfill facility [6]. The initial rate was EUR 15 per ton. It was increased to EUR 20/t in 2008, to EUR25/t in 2009 and EUR 30/t in 2010 [4]. By 1 September 2011 the landfill tax was increased to EUR 50/t by September 2011 [9] and it will increase to EUR 65/t by July 2012 and EUR 75/t by July 2012 [5].

The Irish landfill tax in EUR per ton waste from 1996 to 2012



[4] [5] [9]

Exceptions

In respect of the disposal (i.e. tax not paid on waste recovery to landfill) to an authorised landfill facility of the following wastes:

(a) Non-hazardous waste from construction and demolition activities, comprising concrete, bricks, tiles or other such similar materials, with a particle size of 150 mm or less, which is used for landfill site engineering, restoration or remediation purposes;
(b) Excavation spoil comprising clay, sand, gravel or stone, which is used for landfill site engineering, restoration or remediation purposes;
(c) Stabilised waste arising from the composting of the biodegradable fraction of municipal waste, to which a fraction of sewage sludge may have been added; In recent years the landfill regulators in Ireland have banned the placement of un-stabilised sewage sludge to landfill.
(d) Waste arising from street cleaning activities carried on by or on behalf of a local authority;

(e) Waste which has been deposited elsewhere without appropriate authorisation and is subsequently removed by or on behalf of a local authority for disposal, for the purpose of preventing environmental pollution (but not including waste which has been deposited elsewhere without appropriate authorisation and is subsequently required to be removed for disposal by a person at the direction of a local authority or the Agency. In case the illegal landfill operation is detected the illegal holder is pursued and has also to a pay the landfill tax);
(f) Waste arising from local clean-up activities carried on by community or environmental groups, where such activity is approved of in advance by the relevant local authority for the purposes of exemption of such waste arising from the levy;
(g) Residues from filtration during the extrusion of recycled polymeric material;
(h) Non-metallic residues arising from the shredding of end-of-life vehicles, white goods and other metal waste; and
(i) Dredge spoil from inland waterways and harbours.
(j) The disposal of waste in a landfill facility, where such a facility is connected or associated with an activity specified in the First Schedule of the Environmental Protection Agency Acts 1992 and 2003 and is subject to a licence or revised licence granted by the Agency under section 83 of the Environmental Protection Agency Acts 1992 and 2003. These are non-merchant (i.e. own use only) mono-landfills attached to IPPC and mining activities, and
(k) The deposition in a quarry of natural material arising from the excavation of that quarry, where such material is in a chemically unaltered state [6] [14].

2. Who monitors and collects

On behalf of the Department of the Environment, Heritage and Local Government, the local authority in whose functional area the waste disposal activity which is subject to the levy is carried out in, collects the tax [6] [8].

3. Leakage issues

Increases in the cost of waste management, combined with landfill scarcity and a lack of organised services for rental properties, have led to ad-hoc fly-tipping, backyard incinerating and more organised larger-scale illegal landfilling as well as a significant illegal waste movement to Northern Ireland, especially in 2002-2004 [8]. Though these illegal activities have subsequently been terminated due to enforcement actions [14].

4. Revenues generated, and what happens to them?

Fiscal income from waste taxation was EUR 17.8 million in 2002 [6] and EUR 42.7 million in 2010. The revenue goes to the Environment Fund, which supports a range of activities in waste management, including prevention and reduction programmes, reco-very activities, research and development, enforcement of laws relating to waste management and both regional and national environmental awareness-raising campaigns [8].

Revenue of landfill taxes in Ireland [6] [10]

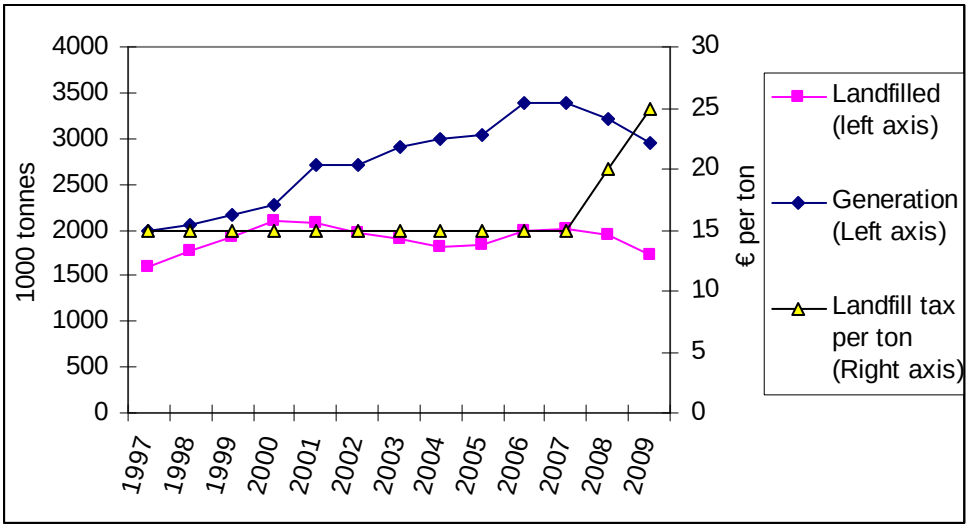
Year	Revenue in million EUR
2002	17.8
2003	29.4
2004	26.8
2005	27.8
2006	30.8
2007	32.4
2008	33.5
2009	32.0
2010	42.7

5. Environmental impacts

The total amount of waste landfilled has decreased from 8.3 million tonnes in 2001 to 5.7 million tonnes in 2008 [8] [12]. As the figure below shows municipal waste generation increased from 1.6 million tonnes in 1997 to 3.4 million tonnes in 2007 and it has then decreased to 3.0 million in 2009 [13] due to the crisis. Although municipal waste for recycling has increased, the amount of municipal waste landfilled per year still averages 1.9 million tonnes but it decreased to 1.7 million tonnes in 2009 [13]. The increase of the landfill tax rate in 2010 and 2011 has given an extra incentive to reduce the amount of municipal waste landfilled.

Furthermore, even if more waste is collected separately for recycling, recycling capacity has not increased in Ireland. Ireland exports 75 % of its recyclable municipal waste for recovery and treatment and it has no facilities to recycle ferrous metal, glass, or paper and cardboard material [8].

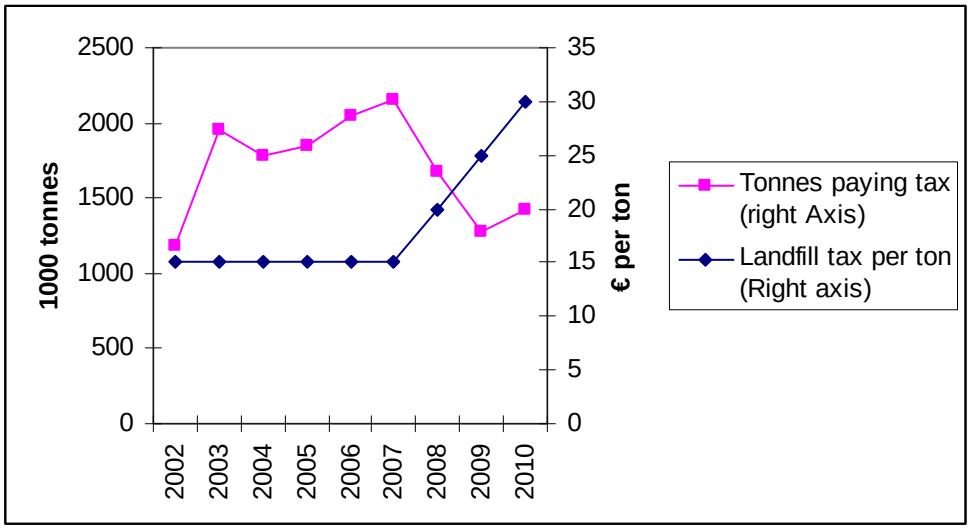
Development of landfill tax per ton from 1997 to 2009 related to generation and landfilling of municipal waste



[4] [5] [9] [13]

The figure below shows the development of tonnes of waste liable to pay the landfill tax from 2002 to 2010. It should be remembered that waste generation in Ireland increased significantly until 2008. That said, the figure indicates that the tax before 2008 has had a stabilising effect on the amount waste landfilled. The ETC/SCP finds the development from 2007 to 2010 indicates that the increased waste tax per ton has given an extra incentive to divert waste away from landfill, although the decreases from 2007 to 2008 and from 2008 to 2009 also have to be seen as a consequence of the crisis. This assessment is also supported by the fact that the decrease of waste paying the landfill tax was 0.9 million tonnes from 2007 to 2009, whereas the decrease of landfilled municipal waste was only 0.3 million tonnes.

Development of the landfill tax per ton from 2002 to 2010 related to the amount of tonnes paying the tax



[4] [5] 6] [9] [10]

6. Economic impacts

In terms of waste treatment costs, while landfill gate fees are levelling off, Ireland is one of the most expensive countries for landfilling compared with, for example, Belgium, Denmark, the Netherlands and Sweden. Furthermore, Ireland is also expensive regarding biological waste treatment gate fees [1]. The increased levies of recent years has also incentivised the coming on stream of new materials recovery activities that are enhancing the extraction of recoverable material from residual household and commercial waste streams (e.g. RDF). The coming into force of the Landfill Directive pre-treatment and biodegradable waste diversion obligations (in 2010) (c.f. Articles 5 and 6 of the EU Landfill Directive) are also yielding further reductions of waste tonnage to landfill (e.g. stabilised biowaste now classed as recovered when used in landfill engineering – is tax exempt) [14].

The increasing tax in recent years allied to the falling demand for landfill has also forced a number to companies to abandon their landfill construction projects due to unfavourable economic return-on-investment modelling [14].

In relation to the discharge of the funds from the Environment Fund there have been significant economic benefits for industry and others through, for example, the Levy funded National Waste Prevention Programme (NWPP). The attached draft report to the Minister of the Environment on the NWPP provides more detail (EPA 2012, in press – Draft attached) [14] [15].

7. Social impacts

ETC/SCP has found no information on this topic. Domestic bin charges in Ireland are high, varying from €250 to €350 per annum for each household [14]. The Environment fund has been promoting activities in Green Communities and Green Home [14].

8. Main opponents

In the found literature there is no specific description of main opponents mentioned regarding the landfill tax. The main opponents seem first of all to be related to the establishing and the location of waste treatment plants as such, especially landfills and incineration plants.

9. Lessons learned

Although Ireland has quite a high landfill fee, until 2011 it had one of the lowest tax surcharge rates for landfilling. The high fees have created an incentive to divert waste away from landfill. Landfilling of municipal was at its lowest in 2003 and 2004, when the total landfill fees were the highest [8]. High landfill gate fees incentivised illegal landfill activities which required a comprehensive and expensive enforcement response [14].

The suggested increases of the landfill tax in the years to come will provide further incentives to diverting waste away from landfills. Recovery of waste instead of landfilling therefore at the moment depends a great deal on the exporting of the waste. [8] Ireland is a very small economy and population and does not have the scale to feed and efficiently run many of the high quality recycling activities such as paper & card pulping, plastics, metals and glass recycling [14]. Facilities in other EU countries have this economy of scale allowing them to create a price structure that incentivises export – from Ireland - over indigenous recycling [14]. This market pressure has led to local recycling initiatives closing. Ireland cannot ban the export of recyclable materials as this is illegal under EU trade laws. Therefore according to the Irish EPA with small economies such as Ireland, export of recyclables will likely remain a significant element of its waste management practice. This is entirely legitimate under EU waste legislation [14].

Sources

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Italy

In Italy, landfill taxes are applied on a regional level, and all regions have to implement them. The tax was introduced in 1996[3]], based on Law 549/1995 (art. 3 par. 24-40) and following amendments, in order to reduce waste production and foster material and energy recovery. The national regulation defines the upper and the lower level of the tax [5].

1. Who pays and how much?

Often there are lower taxes for municipalities with source separation in place.

According to Law 549/1995, the tax base is the amount of solid waste which is landfilled. The tax level shall be established by the regions (regional laws shall be approved by 31 July of a certain year in order to be applied the following year). Law 549/1995 defines the upper and lower level of the tax as follows [3] [9]:

- Inert waste (Waste from the mining, extractive, building and metalworking sector): EUR 1.03-10.33/t
- Hazardous and non hazardous waste including municipal waste: EUR 5.16-25.82/t

The heterogeneity in the tax levels is quite high. The average tax over the period 1998-2008 was 14.9€ per tonne of MSW landfilled, with a peak of 25.8€ in Piedmonte, a (rare) case where taxes have increased over time, and a lowest value in Campania (5.2€) [11].

The table below shows how the landfill tax has developed in the different Italian regions from 2008 to 2012. In almost all regions the tax has been unchanged in that period.

Landfill tax in the Italian regions in EUR per ton from 2008 to 2012 [12]

Region	2008	2009	2010	2011	2012
Molise	21,0	21,0	21,0	21,0	21,0
Piemonte	25,0	25,0	25,0	25,0	25,0
Puglia	15,5	15,5	15,5	15,5	15,5
Sardegna	25,8	25,8	25,8	25,8	25,8
Sicilia	12,4	12,4	12,4	12,4	12,4
Toscana	17,0	17,0	17,0	17,0	17,0
Trentino alto Adige	11,4	11,4	11,4	11,4	12,5
Umbria	25,8	25,8	25,8	25,8	25,8
Valle d'Aosta	51,7	10,3	10,3	10,3	10,3
Veneto	25,8	25,8	25,8	25,8	25,8
Abruzzo	25,0	25,0	25,0	25,0	25,0
Basilicata	25,0	25,0	25,0	25,0	25,0
Calabria	10,3	10,3	10,3	10,3	10,3
Campania	5,2	5,2	5,2	5,2	25,0
Emilia-Romagna	18,1	18,1	18,1	18,1	18,1
Friuli	25,8	25,8	25,8	25,8	25,8
Lazio	15,5	15,5	15,5	15,5	15,5
Liguria	10,3	10,3	10,3	10,3	10,3
Lombardia	10,5	10,5	10,5	10,5	10,5
Marche	15,5	20,0	20,0	20,0	20,0

A respirometric test threshold is adopted for classifying whether waste is biodegradable (or not) for the purposes of calculated diversion pursuant to the Landfill Directive, although waste is not excluded from landfill on this basis. Meeting the respirometric test thresholds in Italy is not linked to any lower level of landfill tax. Wastes which have been 'pre-treated' (either by incineration or mechanical biological treatment), however, are eligible for a lower rate of tax. In this context, for districts which also reach recycling targets, rebates may be as high as 80 % [1].

The charge is paid by landfill operators [4].

2. Who monitors and collects

Landfill operators pay the tax directly to the Regions [4].

In charge of collection are the 'regional competent authorities'. Law 549/95 establishes that a detailed definition of the taxation is delegated to the competent regional administrations, which have the possibility to deliberate on three important elements:

- tax level,
- waste typologies on which to apply the tax,
- destination of use of the tax revenue [3].

3. Leakage issues

The ETC/SCP has not found precise information on whether the landfill tax and the different tax levels between the regions are a driver for leakage. However, it is estimated that 35 % of the overall production of 108 million tons of waste per year in Italy are treated incorrectly or illegally [7].

4. Revenues generated, and what happens to them?

Revenue of landfill taxes [10]

Year	Revenue in million EUR
2000	322
2001	289
2002	251
2003	231
2004	235
2005	234
2006	233
2007	228
2008	192
2009	186
2010	186

The regions decide the use of the revenues. 90 % of the revenue goes to the regions and 10 % to the provinces of Italy [6]. The tax has an environmental dimension as regions shall spend 20 % of the revenue on improving the waste management system, financing regional environmental protection agencies or protecting natural areas [5].

The tax revenue can be used by the local administration in order to finance environmental projects, such as:

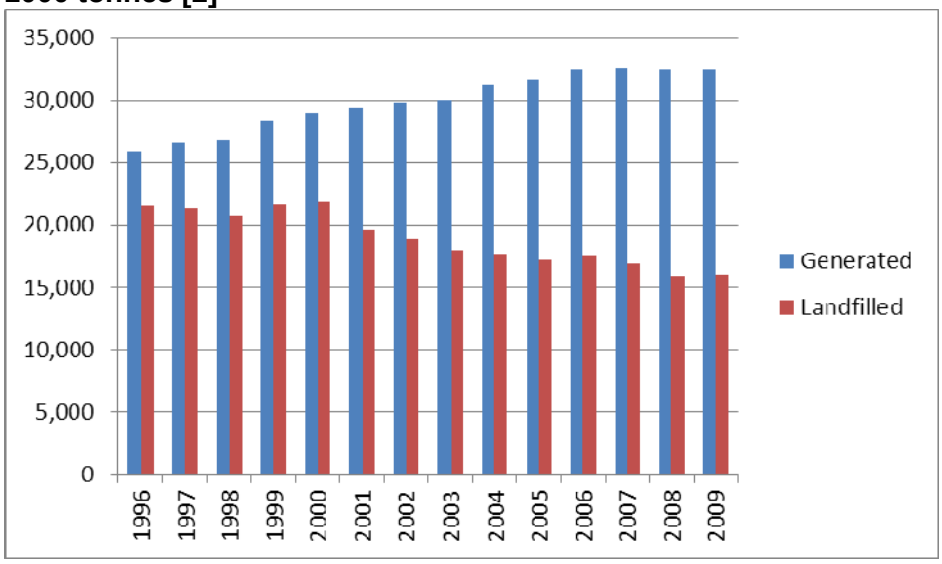
- waste prevention;
- projects on recycling and recovery of materials and energy from waste;
- reclamation of contaminated sites and abandoned industrial sites;
- recovery of degraded sites;
- financing of the regional environmental protection agencies;

- introduction and maintenance of protected natural areas [5].

5. Environmental impacts

A strong stabilisation of the generation of municipal waste, coupled with the increase of separate collection, produced a strong reduction of the waste do be disposed, as can be seen in the following table.

Generation and landfilling of municipal waste in Italy from 1996 to 2009, in 1000 tonnes [2]



6. Economic impacts

Although the tax has created incentives to divert waste away from landfills, the effect may have been less than hoped for because the tax is too low to provide a sufficient incentive to choose an alternative to landfilling [5] and [8].

7. Social impacts

The public is in general very sceptical and critical of the waste sector. However, in some regions planning and investments in incineration plants as an alternative to landfills have been undertaken with little opposition from local people, whereas there is also a strong opposition to new plants (both incineration plants and landfills) as illustrated by the case of Naples [5].

8. Main opponents

ETC/SCP has found no main opponents mentioned in the literature.

9. Lessons learned

The tax level might be too low to be a strong driver for diverting waste away from landfills. Furthermore, there may also be a need to monitor how the revenue from the tax is used to ensure that the revenues are really used to improve better waste management [5].

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Latvia

The landfill tax is a part of the law on Natural Resources Tax [1]. The landfill tax was introduced in Latvia in 1991 and amended in 1996 and 2006 [2].

The aim of the specialised Natural Resource Tax (NRT) is to protect the environment from the abuse of its natural resources and reduce pollution, through restricting the manufacture and sale of products which are deemed to pollute the environment. It also promotes the implementation of new and improved technology that can reduce pollution in the environment and supports the strategy of sustainable development in the economy, as well as generating the funding necessary for environment protection measures. The system entails a permit/charge/non-compliance fee system in air, water, waste and natural resource extraction sectors [4].

1. Who pays and how much?

The taxpayer is the person who has received a landfill permit. A taxpayer shall calculate tax and pay it into a budget account for the preceding quarter by the 20th date of the following month [5].

Landfill tax in Latvia in EUR per ton waste

Category of waste	1996	2002	2007	2009	2010	2011	2012
Municipal waste, non-hazardous (having weight bridges)		1.07	1.07	1.78	4.27	7.11	9.96
Municipal waste, non-hazardous (without weight bridges)	0.36	0.34	0.36	1.78	4.27	7.11	9.96
Hazardous waste	2.14	14.29	14.29	1.78	7.11	14.23	21.34
Construction and demolition waste				14.23	35.57	35.57	35.57
Asbestos fibre waste			35.75	35.57	35.57	35.57	35.57
Production waste				1.78	4.27	14.23	21.34

Source: [1] [5] [6] [8]

2. Who monitors and collects?

The state revenue service collects the tax.

3. Leakage issues

ETC/SCP has found no information on this topic.

4. Revenues generated, and what happens to them?

No information has been found about the total revenue from the landfill tax.

40% of the revenue goes into the State's basic budget and 60 % goes into the special environmental protection budget, which can support municipalities where the landfills are located [1].

In 1999 total revenue from the Natural Resource Tax (including the landfill tax) was about EUR 17.3 million. Since then the revenue has been quite stable when measured in

Latvian lat and reached a high point in 2006 equivalent to only EUR 15.7 million due to a lower exchange rate. After 2006 it has decreased in Latvian lat and was EUR 13.3 million in 2008 [1].

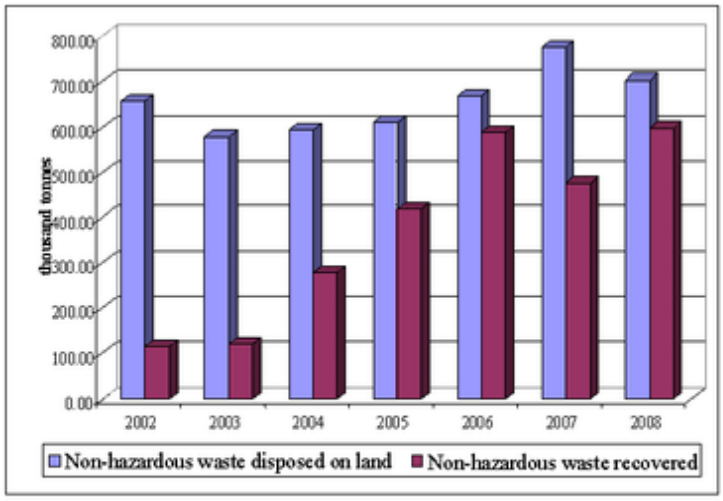
If it is assumed that all waste landfilled (approximately 700,000 tonnes) pays an average rate of EUR 10/t it is estimated by the authors that the landfill tax provided revenue of around 4 million tonnes in 2009 and will give EUR 7 million in 2011.

5. Environmental impacts

Until 2006, the total waste quantity in Latvia grew significantly because the economy also grew very quickly. In 2006, 2007, and 2008, quantities were more or less stable [7].

The amount of non-hazardous waste for recovery increased sixfold from 2002 to 2008, whereas there was only a minor increase in waste for landfill [7]. In that way it seems the landfill tax has given some economic incentive for increasing the recovery of waste.

Disposed on land and recovered wastes in Latvia (1,000 tonnes)



Source: [7]

Ten new non-hazardous waste disposal sites have been opened in recent years. This means that risks for the environment and human health have been reduced very significantly [7].

6. Economic impacts

The Latvian landfill tax is still low per ton of waste compared to other countries and it is therefore difficult to argue it has a large economic impact. However, since 60% of the tax is allocated to environmental projects in the municipalities in which the landfills are located, the tax can be seen as providing a support to better waste management.

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

ETC/SCP has found no information on this topic.

9. Lessons learned

The landfill tax in Latvia is still quite low although it has been increased considerably since 2007. It has provided some incentives for diverting waste away from landfills and in 2011 and 2012 these incentives will have even stronger for municipal waste, as well as for production waste, construction and demolition wastes. The tax also provides an income to the state budget. The largest part of the revenue is used for environmental projects.

Sources

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The Netherlands

The Netherlands introduced a landfill tax in 1995. Landfill of municipal waste and recyclable waste is banned, as well as separated construction and demolition waste, if there is a possibility for reuse, recycling or incineration [1].

However, the Ministry of Finance has decided to eliminate the tax on landfill as part of a simplification of the taxes. In recent years revenues from the tax on landfill have dramatically reduced in line with the reduction of waste landfilled. However the tax creates much administrative burden. It is for these reasons that the tax has been eliminated on 1 January 2012 [5].

1. Who pays and how much?

When the landfill tax was introduced in 1995 it was set at EUR 13/t.

In 2000, two different levels of taxes were introduced. The starting point was that landfilling is always charged with a high tax, because it is assumed that incineration is an alternative to landilling for all waste except for waste with a density greater than 1,100 kg/m^3. Waste with a density over 1,100 kg/m^3 is assumed to be non-combustible, and may therefore be landfilled at a lower tax. In 2005, a considerable increase to EUR 85/t (high tax) came into effect, while the low tax only increased by EUR 1 - 14/t. A tax on incineration also exists, but is currently set at EUR 0 [1] [2] [3].

Today, the landfill tax is structured as follows:
Low tax: Inert waste (not banned) EUR 16.79 /t
High tax: Banned waste landfilled with a permit: EUR 107.49/t [1]

2. Who monitors and collects?

Landfill tax is collected by landfill operators, along with payment of the gate fee. The tax is passed on to the Dutch finance ministry. The simplicity of this system means compliance is close to 100 per cent [1].

3. Leakage issues

Due to insufficient incineration capacities, until 2005 waste-producers had to choose between export to neighbouring countries or the acceptance of increasingly high landfill costs in the Netherlands [2][3]. To avoid the landfill tax, in the period 2002 - 2005, a lot of combustible waste was shipped to Germany. This ended suddenly with the implementation of a landfill ban in June 2005 in Germany. In January 2007 the Netherlands opened their borders for the incineration of waste (both household and commercial/industrial) and kept closed the borders for the landfilling of combustible waste. This action was taken to stimulate the construction of further incineration capacity in the Netherlands but so far there have been few significant quantities of cross border trade in combustible waste [1].

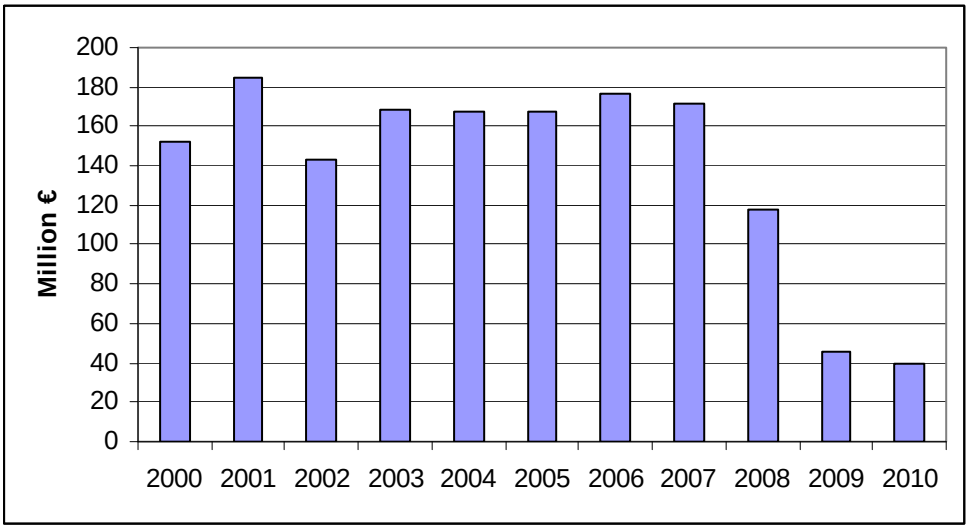
4. Revenues generated, and what happens to them?

The revenues from the Dutch landfill tax are not earmarked and therefore part of the overall budget [2].

The revenues from the landfill tax are received by the Treasury department. The taxes are part of a scheme of greening the tax system, which means the undesirable activities are taxed to generate income for the Treasury (use of groundwater, pesticides, energy, packaging, etc.) [1].

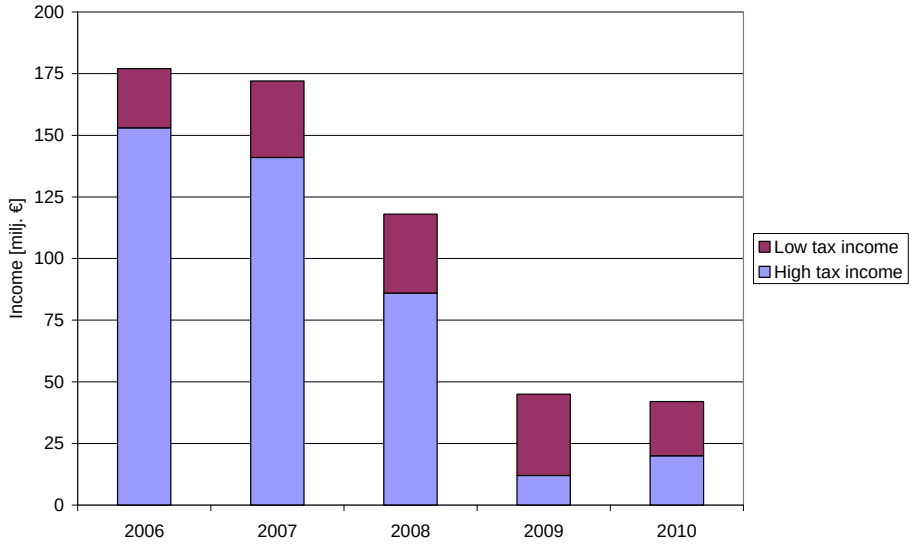
The revenue was at its maximum in 2001 and has been reasonable stable until 2008, where the revenue began to decrease and further decreased in 2009 and 2010.

Revenue of the landfill tax in the Netherlands from 2000 to 2010 [4] [5]



In the figure below the development in the revenue from 2006 to 2010 is shown related to the type of tax rate (the high and low tax). The development shows very clearly that the reduced amount of waste sent to landfill is mainly linked to not-inert waste types paying the high tax rate.

Revenue of the landfill tax in the Netherlands 2006-2010 related to type of tax rate



Source: [5]

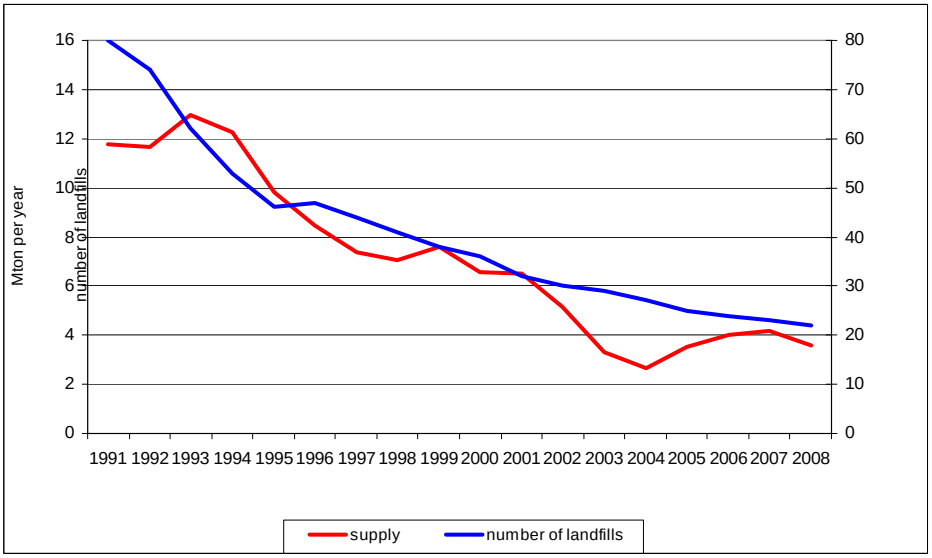
5. Environmental impacts

In 1996 42 % (3.2 million tonnes) of the total household waste production were recycled, 35 % (2.6 million tonnes) incinerated, and 23 % (1.7 million tonnes) were landfilled. In 2005 these rates were 52 % (4.8 million tonnes) for recycling, 43 % (3.9 million tonnes) for were incinerated and 4 % (0.4 million tonnes) for were landfilled [5].

The figure below shows the amount of waste going to landfills and the number of landfills between 1991 and 2008. In 1991 about 12 million tonnes of waste was landfilled and in 2008 this was somewhat over 2 million tonnes [5]. In the same period there has also been a large reduction in the number of landfills.

There is a moratorium on landfill expansion and new landfills since 1995 [1].

Development in waste landfilled in million tonnes and number of landfills in the Netherlands



Source: [1]

6. Economic impacts

It was the *combination* of the landfill ban with an increasing landfill tax which was significant in bringing treatment capacity on-stream over the last few years. This has particularly been the case since 2002, when an increase in landfill tax to approximately EUR 80/t made landfill more expensive than alternatives. Currently the combination of tax and gate fees mean that it costs approximately EUR 127/t to landfill a tonne of waste, compared to around EUR 90/t for incineration [1].

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

ETC/SCP has found no information on this topic.

9. Lessons learned

Both the landfill ban and fiscal and legislative measures to steer waste away from landfill, have been important. It is 'almost impossible' to determine what impact the ban has had in isolation from other measures [1].

Sources

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Norway

The landfill waste tax in Norway was introduced in 1999 in order to help reduce the amounts of waste produced. Since July 2003, landfill tax rates have been differentiated according to the environmental standard of the landfill site to which the waste is delivered. The higher rate has been applied to sites which do not fulfil requirements with regard to site linings [1]. Landfills that did not meet the new requirements had to be closed down July 16th 2009. Since then all the landfills are classified as high standard sites. However a few landfills have received short-term exemptions to the new requirements [9].

An incineration tax was also introduced in 1999 but it was removed by 1 October 2010 [1] [7].

Since 2001 Norway has banned the landfilling of easily biodegradable waste. As of July 2009, a second and more comprehensive landfill ban was introduced, prohibiting the landfilling of degradable waste with (total organic carbon) TOC > 10 % or organic matter > 20 % [2] [5].

The number of landfills in Norway has been reduced from about 330 in 1992, to about 60 today. Landfill of biodegradable waste was prohibited by 1 July 2009 [9].

1. Who pays and how much?

Before 2009 the landfill tax was related to the standard of the landfill [1] [5].

The Norwegian landfill tax in EUR per ton waste from 2000 to 2007

	2000	2002	2003	2004	2005	2007
Landfill – all qualities	37	43	41			
Landfill – high site standard			53	48	50	53
Landfill – low site standard				62	65	69

Landfill taxes in Norway by 2011 per ton are as follow:

- EUR 60 for biodegradable waste going to landfill by an exemption granted by the pollution control authorities
- EUR 36 for other waste [9]

This landfill tax is paid by the landfill operator [6].

The average net fee for landfilling is approximately EUR 100 /t [4].

Exceptions

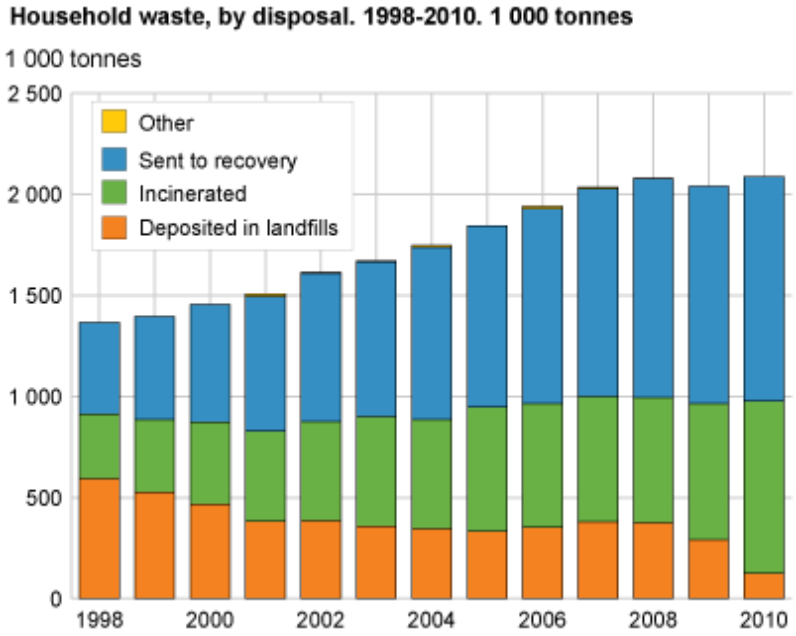
Inorganic waste with less the 5 % TOC is exempted from the landfill tax [6]. Exemptions from the landfill tax are also granted for hazardous waste [9].

2. Who monitors and collects?
The landfill tax is collected by the Norwegian customs offices, with offices in each region [6].

3. Leakage issues
No increase in waste shipment to other countries has been witnessed [6].

4. Revenues generated, and what happens to them?
Total annual revenue for 2009 is approximately EUR 35 million. The revenue is not earmarked and feeds into the national budget [6].

5. Environmental impacts
The introduction of the landfill tax has had a stimulating effect on the recycling industry [6]. The total amount of waste landfilled decreased in Norway only slightly from 2,040,000 tonnes in 2000 to 1,900,000 tonnes in 2009 [8]. The figure below shows however that the amount of landfilled household waste declined from about 600,000 tonnes in 1998 to 125,000 tonnes in 2010 [8].



6. Economic impacts
Statistics from industry and business show a decreasing trend of waste being landfilled. This is due to industry and business having more to gain by material recycling of their waste. If we look at household waste it shows that this waste source is increasing more than GDP and also waste being landfilled from this source is increasing. However, of the waste being generated in Norway, 70 % is recycled [5].

7. Social impacts
ETC/SCP has found no information on this topic.

8. Main opponents
No major opposition from stakeholders was witnessed [6].

9. Lessons learned

Less waste is being landfilled, but not only due to the landfill tax. This reduction is the result of several measures which were introduced in the waste sector particularly in the 1990s. With a few exceptions, it is prohibited to dispose of easily degradable organic waste, sewage sludge included, at landfills in Norway [5].

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Poland

The main method of financing environmental protection in Poland is by way of funds for environmental protection and water management. There are four types of funds: One national fund, 16 regional funds as well as county and communal funds for each of these entities in Poland [6]. Direct organizational dependencies among the four types of funds do not exist, but the national and the regional funds possess legal identity [6].

The basic sources for income of these funds are different types of ecological fees for use of the natural environment. One of these fees or taxes is for placing wastes at landfills [6].

The fees from landfills cover [13]:

- emitting gases and dusts into the atmosphere
- discharging wastewater into the water system or the ground
- water uptaking
- waste landfilling

The practice of applying a fee to the use of landfill is quite old in Poland. The first act is from 1980. It divided industrial waste into four groups (from most hazardous to least hazardous) and for each group a fee (tax) was to be paid. The rates were relatively low. This system was used until 1997 [1].

The first Polish Act setting a landfilling tax was prepared in 1997 based on Act on Waste of 1997. The tax came into force on 1 January 1998 [1]. The tax used four different rate-levels and each of the approximately 850 different waste types in the European List of Waste was allocated a rate [3].

The first tax included three unusual elements [1]:

- The tax was to be paid by the entity which delivered waste to the landfill, i.e the tax was not paid by the landfillowner. The idea was to make waste producers more conscious about their waste generation.
- On top of the initial taxpayment, the waste producer should pay 3 % of the tax for each year the waste is in the landfill, i.e. until the landfill was closed.
- Municipal waste was not included.

In 2001 all environmental taxes (i.e. for the emissions into the air, into water, for landfilling etc.) have been integrated into Environmental Protection Act and each year the Minister issues an act informing about levels for the given year.

By 2001 the act was also changed so municipal waste also has to pay the tax. Furthermore, in order to simplify the money flow system it was also decided that the landfills themselves are responsible for the collection of the tax and transferring it to the environmental fund. Finally, the above mentioned 3 % of the tax for each year the waste is in the landfill was abandoned due to its complexity [1].

1. Who pays and how much?

The landfill tax is paid by the landfill operator [6]. Over 20 different types of rates exist [6]. The tax rates increase annually at a similar rate to inflation [6].

The different rates can be related to three main groups [7]:

Landfilling of waste of high risk category:..... 29.3 - 52.6€ per tonne

Landfilling of waste of medium risk category:..... 12 - 27€ per tonne

Landfilling of waste of low risk category: ..... 2.6 - 7.3€ per tonne

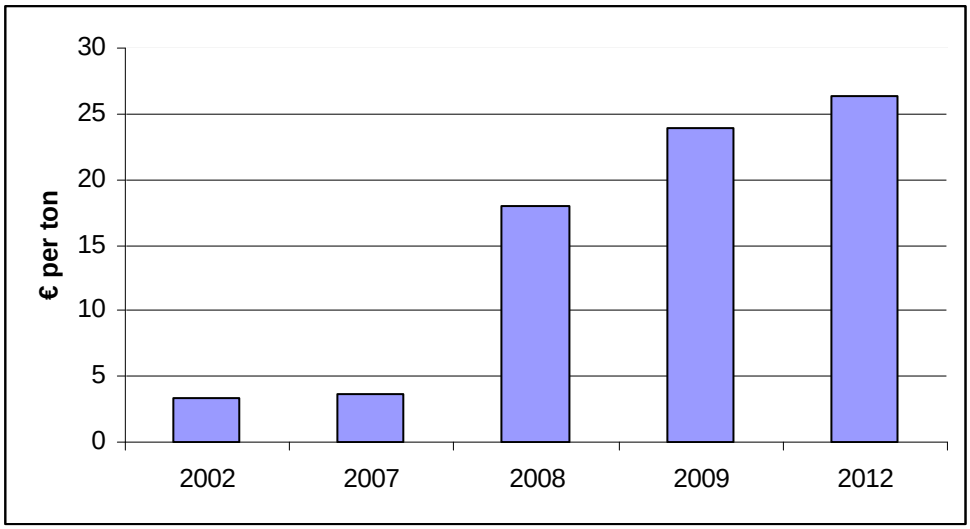
Examples of the landfill tax in Poland per ton waste in Zloty and EUR by 1997, 2004 and 2012

Category of waste	1997 in Zloty	2004 in Zloty	2012 in Zloty	2012 in EUR
Wastes from mineral metalliferous excavation	10	14.87	18.00	4.32
Wastes from mineral non-metalliferous excavation	6	9.59	11.61	2.79
De-inking sludges from paper recycling	32	47.73	57.76	13.86
Acid tars from the pyrolytic treatment of coal	84	125.32	151.69	36.4
Batteries	84	170.26	206.09	49.5
All types of packaging waste	6-10	14.87-24.57	110.65	26.6
Concrete and bricks	6	9.59	11.61	2.79
Biodegradable Municipal waste		24.57	110.65	26.6
Mixed municipal waste		14.87	110.65	26.6
Bulky waste – MSW		14.87	110.65	26.6

Note: 100 Zloty = 23.96 Euro by 2012
[3] [4] [5]

The tax on mixed municipal waste has seen a strong increase in the last few years to discourage landfilling of this waste type. The tax was PLN 13.80 in 2002; PLN 15.71 in 2007; but PLN 75 in 2008; PLN 100 in 2009 and now PLN 110 for 2012.

Development in the landfill tax of municipal waste in EUR per ton waste from 2002 to 2012



Note: 100 Zloty = 23.96 Euro by 2012
Source: [1]

Exceptions

There is no environmental tax for residues from composting [2].

2. Who monitors and collects?

Poland is divided into 16 administrative regions called voivodship. Voivodship has two administrations: one is Voivod, who is sent from the central government, and the other is Local Parliament a self-government selected locally via election. Council members from the Local Parliament select from themselves a Marshall [2].

The landfills are obliged to keep a register containing information and data about the amounts of landfilled waste. The landfills pay the different environmental fees including the landfill tax to the Marshall's offices twice a year [13].

Marshals' offices are also responsible for monitoring the way in which the fees are set for the use of the environment [13].

3. Leakage issues

ETC/SCP has found no information on this topic.

4. Revenues generated, and what happens to them?

The main goal of the four types of ecological funds is to support various types of ecological initiatives [6]. These resources are earmarked solely for financing of environmental protection and water management as defined by law [13].

The revenue from the fees for the use of the environment and the administrative financial fines constitute the income of:

- National Fund for Environmental Protection and Water Management;
- 16 voivodship funds for environmental protection and water management;
- budgets of the individual poviats and municipalities [13].

50 % of the revenues go municipal government funds, 10 % to county government, 26 % to provincial ecological fund and 14 % to National Ecological Fund. Local governments should use revenues only for environmental objectives [7].

Marshals' offices income obtained from fees for the use of the environment in general in 2008, 2009 and 2010 in Zloty and EUR

	2008	2008	2009	2009	2010	2010
Currency in million	PLN	EUR	PLN	EUR	PLN	EUR
The total revenues of the environmental fees in general	1,788.5	74.6	1,810.6	75.6	1,892.6	79.0
The % the total revenues coming from the landfill tax	29.2	29.2	39	39	37.8	37.8
The revenues of the landfill tax	522.2	21.8	706.1	29.5	715.4	29.9

Source: [13] [14]

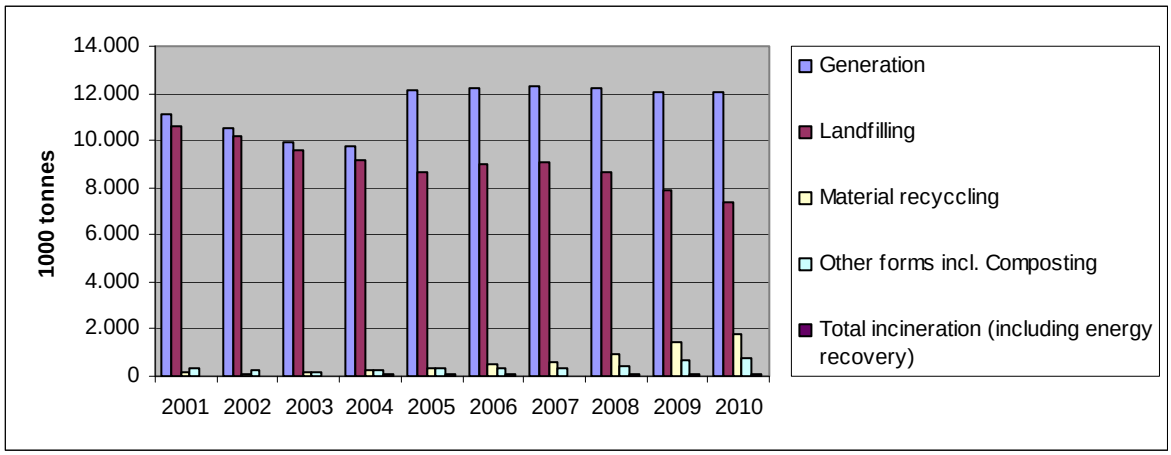
As mentioned above, in 2008 the tax on landfilling was increased significantly. The tax is payable in the following year, so in 2009 there was a huge growth in percentage of the total revenue coming from the landfilling tax (fee). In 2009 and in 2010 the income from tax (fees) on contributed more than any other environmental fee.

5. Environmental impacts

No written information has been found claiming that the landfill tax has given incentive diverting waste away from landfills. However, the ETC/SCP has found that the development of treatment of municipal waste, as shown in the figure below, indicates that since 2008 there has been a trend of diverting waste away from landfills. Recycling and incin-

eration have increased from 8 % in 2007 to 11 % in 2008, 18 % in 2009 and 22 % in 2010. As shown above, the landfill tax increased significantly between 2007 and 2008; this increase has continued.

Development of municipal waste management in Poland from 2001 to 2010



Source: [10]

Another reason for what was, until recently, a relatively low rate of diverting waste away from landfills, can be linked to the organisation of the municipal waste management in Poland.

When the Polish society moved from communism to a market-based economy municipal waste management was much affected by a rather radical shift towards privatisation [2].

The collection and management of municipal waste was no longer the responsibility of the municipalities as such. It was the owner of properties - individual houses as well as apartments - that selected a collection company. Waste collectors received money from their customers (i.e. citizens) for their service directly, and no money went to the municipality. This created situations where different collection companies could collect waste from households on the same street, making the collection system inefficient [2]. The companies have not had an incentive to invest in infrastructure, as the cheapest way of managing the waste is to send it to landfill. Many households also reportedly dump their waste illegally to avoid the costs of waste disposal altogether [9].

The system also implied that, apart from where a municipality received part of the national landfill tax, they have had no, or very limited, resources for waste management [2].

The above description of the municipalities' role of waste management was changed 1st of January 2012 where the responsibility to manage municipal waste was given to the local authorities (gmina) [9]. With the new law, the responsibility to improve infrastructure, particularly waste collection and recovery, will also lie with municipal authorities. This is expected to help Poland meet goals set out in the waste framework directive [9].

6. Economic impacts

The increase of the tax in 2008 has given a reasonably strong incentive to divert waste away from landfills.

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

ETC/SCP has found no information on this topic.

9. Lessons learned

ETC/SCP assesses that as long the landfill tax has been low it has not given sufficient incentive to divert waste away from landfills, because landfilling has still been cheaper than other treatment options. It seems that the increase of the tax by 2008 has provided a reasonably strong incentive to divert waste away from landfills. For municipal waste this incentive can be even stronger when the changed responsibility of organising municipal waste management introduced on 1 January 2012 starts to function in practice.

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Portugal

The landfill tax in Portugal is a part of the Portuguese waste management tax (TGR), which was introduced in 2007 as an instrument to make producers and consumers aware of the associated environmental costs and to stimulate waste reduction to meet domestic objectives with regard to waste management. The waste management tax is applied annually and differentiated depending on the type of treatment (waste deposited in landfills, managed by specific waste flow systems or the integrated centers for the recovery and disposal of hazardous waste (CIRVER), and incinerated or co-incinerated) [1].

1. Who pays and how much?

The landfill tax is paid by the landfill operator. The tax rate is 50% higher for waste fractions classified as recyclable [1].

The development of waste management tax rates in Portugal in EUR per ton from 2007 to 2011 [3]

	2007	2008	2009	2010	2011
Landfilling of inert waste and industrial non-hazardous waste	5	5.5			
Landfilling of municipal waste and similar wastes	2	2.5	3	3.5	4
Landfilling of inert waste from constructions and demolition activities		2.5	3	3.5	4
Landfilling of wastes in CIRVER landfills			5	5.5	6
Landfilling of other types of waste			5	5.5	6
Waste incineration or co-incineration	1	1.03	1.06	1.05	1.07
Waste managed by specific waste flow systems that do not comply with the targets established in their licenses	2	2.05	2.1	2.08	2.11

CIRVER are centres for integrated recovery and disposal of hazardous waste [2]

The minimum amount due is EUR 5,000 per entity [1].

Exceptions

The following waste types are excepted for the landfill tax:

- Landfill building materials or used for landfill coverage,
- Ashes and slags recovered from the incineration of municipal waste landfilled,
- Waste classified with the 020107 according to the European List of Waste codes (Wastes from forestry),
- Refuses and rejected materials from municipal waste recovery facilities incinerated or landfilled,
- Inert waste managed under the environmental remediation and landscaping of stone quarries [4].

2. Who monitors and collects?

The tax is collected by the Portuguese Environment Agency (APA) [1].

3. Leakage issues

ETC/SCP has found no information on this topic.

4. Revenues generated, and what happens to them?

The landfill tax revenue increased from EUR 10 million in 2007 to EUR 12 million in 2008 and EUR 14 million in 2009 [1]. In 2010 the revenue was EUR 15.7 million [6].

The revenue is earmarked for financing the involved authorities' activities, but also supporting the activities of waste management operators. The involved authorities are the Portuguese Environment Agency and the entity responsible for licensing (the Regional Co-ordination and Development Committees) [1].

5. Environmental impacts

Due to its limited time of application, it is not yet possible to evaluate the impact of the tax on final disposal. Even though the waste management tax has helped to increase the costs of landfilling and redirect some waste streams from final disposal their role was limited to revenue raising for waste management activities as in many cases it has not been passed over to households through the waste collection charges [1] [2].

The impact of the landfill tax is to a certain extent reflected in the management of municipal waste. The amount of municipal waste generated per capita increased from 299 kg in 2007 to 314 kg in 2009, whereas there has been a decrease in the percentage of waste landfilled from 64 % to 61 % [5].

6. Economic impacts

The landfill tax revenue shows an upward trend, mainly due to;

- The annual increase of the values charged per ton of managed waste,
- The progressive growth of the number of operators and economic activities.

The use of the revenues for financing of activities of waste management operators follows a certain procedure. Projects are submitted at national or regional level and evaluated in terms of their contribution to the achievement of national targets for waste management. In 2010 the first national procedure for the financing of activities was opened [3].

In all, 42 applications were received at national level and 16 were supported. The projects financed were mainly in the areas of:

- Collection of small quantities of hazardous waste contained in municipal waste.
- Recycling and recovery of specific waste streams, such as waste packaging, waste edible oil, construction and demolition waste, biodegradable waste,
- Specific communication, particularly in the context of eco-consumption and reduced consumption of plastic bags [3].

The selection of the projects at regional level is currently underway [3].

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

ETC/SCP has found no information on this topic.

9. Lessons learned

It is noteworthy to underline that the level of behavioural response to the landfill tax is not yet perceptible as only three years have elapsed since the tax was introduced [3].

A situation that may deserve special mention is the shift of landfill waste derived from construction and demolition and other inert waste, which might be influenced by the landfill tax, but also of specific legislation that has lead to its reuse and recycling in construction and other similar activities [3].

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Slovenia

The Slovenian landfill tax was introduced in 2001, when the Decree on environmental tax for environmental pollution caused by waste disposal was adopted. All landfill operators of hazardous, non-hazardous and inert landfill are obliged to pay tax for the disposal of waste. Until 2010, landfill operators were obliged to transfer the collected tax to the state budged unless they had a valid investment requirement (to the sanitation, technical adjustment of the landfill, construction or purchasing of equipment), which was confirmed by the Ministry for the Environment and Spatial Planning – Slovenian Environment Agency. After October 2010, the collected tax is the revenue of the municipalities or state. In general, landfill tax revenue from municipal landfills goes to municipalities and revenue from industrial landfills to the state budget [4] [7].

1. Who pays and how much?

Landfill tax in Slovenia in EUR per ton waste

	Tax rate EUR/t		
Category of waste	2007 - 2009		2010
Inert waste	2.2		2.2
Nonhazardous waste	Proportion of biodegradable = 0	4.4	11
	proportion of biodegradable = 0.47	19.1	
Hazardous waste	Proportion of biodegradable = 0	22	22
	Proportion of biodegradable = 0.47	36.7	

[7]

The landfill tax is paid by the landfill operator. [4][7]

Exceptions

There is no obligation to pay the tax on waste used for covering the landfill in accordance with the regulations governing the disposal of waste in landfills [7].

2. Who monitors and collects?

The landfill tax is collected monthly, by Customs Office of Republic of Slovenia. Landfill tax for industrial waste is paid to state budget. Landfill tax for municipal waste is paid to municipalities where wastes were generated. Ministry of the Environment and Spatial Planning calculate the proportion of environmental taxes that belongs to the individual municipality [7].

3. Leakage issues

ETC/SCP has found no information on this topic.

4. Revenues generated, and what happens to them?

Since the landfill tax was introduced the revenues have developed as follows: [7]

Year	Revenue in million EUR
2002	13.2
2003	13.5
2004	13.57
2005	12.88
2006	13.02
2007	13.29
2008	12.1
2009	3.54
2010	7.84

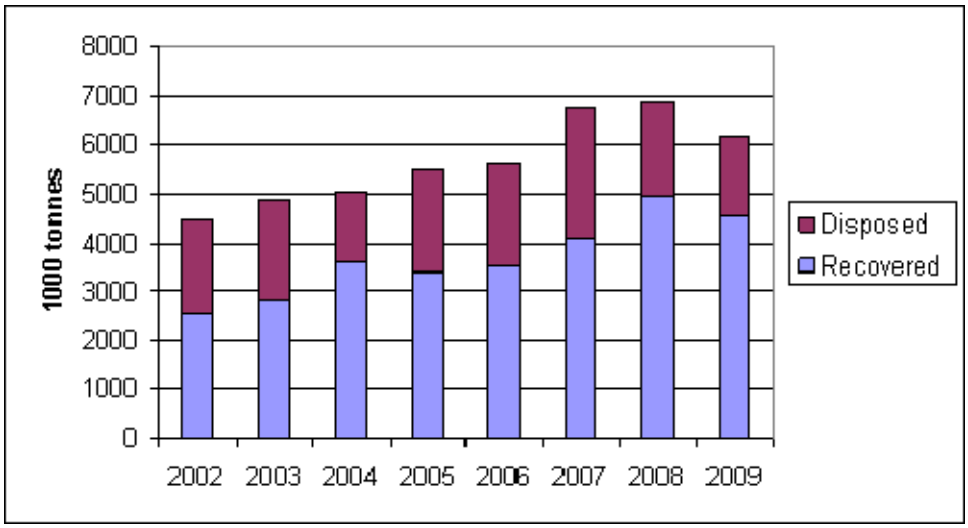
Financial sources collected through the landfill tax are mainly earmarked for investments in waste management centres [3]. Since 2001 the investments in public infrastructure have increased. The revenue was around EUR 13 million from 2002 until 2008 [4]. From 2001 to 2004 the largest share was spent on landfills of municipal and hazardous waste to bring them into compliance with the requirements in the EU Landfill Directive, but significant investments were also made into collection and recycling schemes [4].

5. Environmental impacts

Quantities of waste are growing in Slovenia, and on average slightly more than 6 million tonnes of waste are generated each year, of which more than 900,000 tonnes are municipal waste, which is about 450 kg per inhabitant.

Schemes for the collection and treatment of individual types of waste streams, along with financing of activities that ensure proper management of such waste, have been established [6]. The figure below shows that recovery has increased during recent years. The recovery of waste from manufacturing and services has reached around 70 % in recent years, while the figure for municipal waste is only around 30 % [6]. Until 2006 the total amount of waste disposed of was reasonably stable, then rose between 2006-2008, and slightly decreased in 2009.

Total quantities of recovered and disposed of waste in Slovenia from 2002 to 2009 in 1000 tonnes



Source: [6] [7]

6. Economic impacts

The importance of using economic instruments, such as a landfill tax, has been significant because the majority of the revenues collected have been earmarked for environmental protection measures. This has been even more important for Slovenia as a country in transition and a full member of the EU since 2004 [3].

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

ETC/SCP has found no information on this topic.

9. Lessons learned

The ETC/SCP assesses that, as seen in other countries, the landfill tax in Slovenia has not been able to give sufficient incentives to decrease or stabilise the waste generated. However, because the revenue from the tax has been used to finance a better waste infrastructure, the waste facilities now have a higher environmental standard. Furthermore, there has been an increase in the percentage of waste going to recovery.

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Spain

Spain has no national landfill tax but Article 16 in the Spanish Waste Act gives the possibility for the waste authorities to introduce economic and fiscal measures in order to promote waste prevention and separate collection including landfill and incineration taxes on municipal waste [8]. Furthermore according to the legislation on taxation, the Autonomous Communities (the regions) can, under certain circumstances, create their own taxes [8].

Several regions in Spain have introduced taxes on landfilling and incineration but only the region of Catalonia has introduced a tax on municipal waste.

- Landfill and incineration taxes on municipal waste: Catalonia,
- Landfilll taxes on industrial waste: Andalusia, Cantabria, Madrid and Murcia,
- Landfill taxes on construction waste: Catalonia, Madrid and Murcia [8].

Landfill tax on municipal waste in Catalonia

The region of Catalonia introduced a landfill tax in 2004 [1] [4].

1. Who pays and how much?

The rate of the tax was EUR 10 /t of municipal waste. (Incineration was taxed at EUR 5 /t.) However, for municipal waste coming from municipalities, which have not initiated separate collection schemes of organic waste, the tax rate was set at EUR 20/t (EUR 15 for incineration) [5].

In 2011 the landfill tax rates were increased to EUR 12/t and EUR 21/t for municipal waste coming from municipalities not having introduced separate collection of municipal waste. For incineration the increase was EUR 5.5/t and EUR 16/t respectively [8].

Municipalities and any other users pay this amount to landfill managers who are responsible for passing the money on to a special fund (Fons de Gestió de Residus) created by the regional government [3] [5].

2. Who monitors and collects?

Owners of public and private landfills are obliged to arrange for automated payment to the 'Agència de Residus de Catalunya' on a quarterly basis (within 20 calendar days after every quarter) [5].

3. Leakage issues

No effects on waste shipments to the rest of Spain and other countries have been observed [5].

4. Revenues generated, and what happens to them?

The tax raised EUR 32.2 million in its first year (2004) [8] and it has since 2006 declined to EUR 25.1 million in 2009.

Revenue of municipal waste tax in Catalonia in million EUR

	2004	2005	2006	2007	2008	2009
Landfilling	32,159	31,874	32,954	31,531	29,413	25,147
Incineration						3,484

Source: [8]

The landfill tax is earmarked for the Waste Management Fund (Fons de Gestió de Residus) [5]. This fund redistributes the collected money back to the local municipalities (based on a per tonne basis, varying with the level of contamination of the waste) to improve the efficiency of their activities, in particular in terms of the collection and treatment of organic waste [1]. Door-to-door schemes are likely to receive greater support than schemes based on road containers [2].

50 % of the funds generated must be used to reduce the cost of managing biowaste coming from household source separation; the remaining revenue is used for funding the cost of collecting biowaste and recyclables; reducing the quantity and toxicity of landfill refuse; and developing public information campaigns. In order to describe specific aspects of the functioning of the tax, the Municipal Waste Governing Board annually approves guides containing the criteria for the application of the tax [5].

Refunding to municipalities is based on the following rates indicated for the years 2004 and 2011

Type of activity	Amount 2004	Amount 2011
1. Biowaste treatment	32.5 EUR/t	33.5 EUR/t
2. Biowaste source separation and collection	11.2 EUR/t	8.6 EUR/t
3. Treatments to reduce the quantity or improve the quality of landfill refuse	1.6 EUR/t	2.5 EUR/t
4. Treatments to reduce the quantity or improve the quality of incineration of refuse		1.25 EUR/t
5. Paper / cardboard source separation and collection	27.0 EUR/t	0 EUR/t
6. Active recycling centre in the municipality	0.5 EUR/ inhabitant	
7. Special waste in small quantities in recycling centres		500 EUR/t
8.1. Home composting		20 EUR/unit
8.2. Community composting		60 EUR/unit

Source: [5] [8]

The refund system shows that the support has been used in a dynamic way over time. For example, home and community composting are now supported, whereas there is no longer support for separate collection of paper and cardboard [8].

Rates for activity 1 and 2 are multiplied by a coefficient dependent on the level of impurities in the collected biowaste:

Biowaste quality	Maximum level of impurities	Coefficient
Optimal	10 %	1.2
Intermediate	20 %	1.0
Low	30 %	0.7

In 2011 the way to calculate the rates for activity 1 and 2 was changed so the equation is Y=-o.1X +2.5, where X is the level of impurities [8].

In addition, the rate for activity 2 is adjusted using the following coefficients based on the size of the municipality:

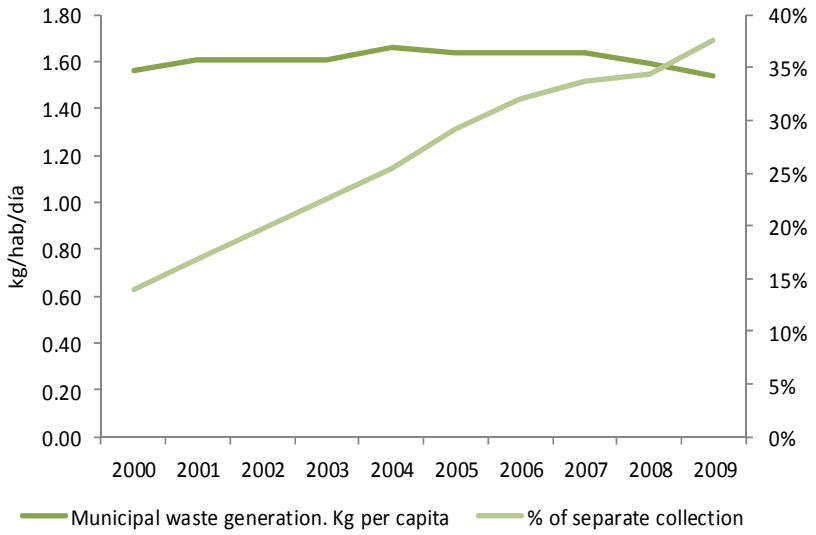
Type of municipality	Population	Coefficient
Rural	< 5,000	1.5
Semi-rural	5,000 – 49,999	1.28
Urban	> 50,000	1.00

Source: [3]

5. *Environmental impacts*

Since the first application of the landfill tax in 2004 the rate of selective collection rose from 22.6 % in 2003 to 37.5 % in 2009, regarding the total amount of municipal waste subject to separate recollection [8]. The percentage of separately collected municipal waste increased further to 40.6 % in 2010 [9].

Development in the Catalan municipal waste generation and the percentage which is separately collected

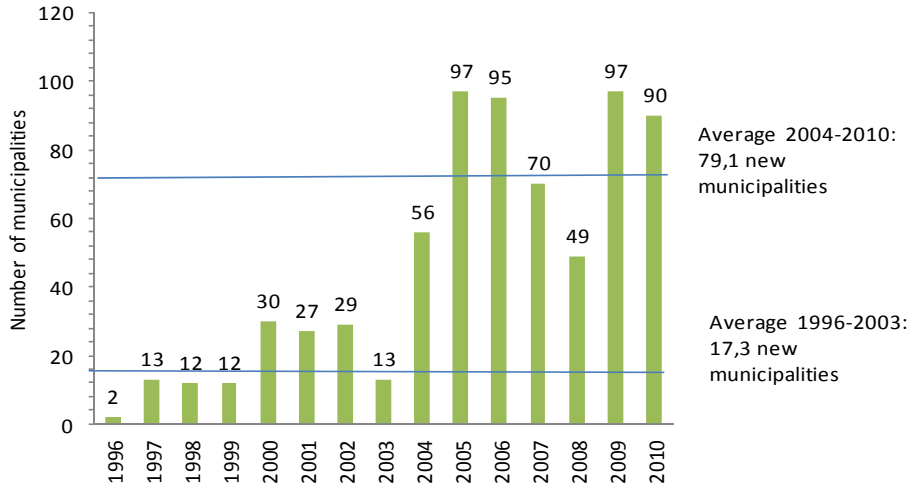


Source: [8]

Regarding the organic fraction of municipal waste, the percentage separate collection of the organic fraction of municipal waste rose from 3.8 percent of the total MSW to 8.1 % of the total MSW.

Another indicator for the environmental impact of the landfill tax is the number of municipalities in Catalonia implementing separate collection of bio-waste. Catalonia has 946 municipalities [4]. In the period from 1996 to 2003, i.e. before the landfill tax was introduced, as a yearly average only 17 municipalities started separate collection of bio-waste. After the landfill tax was introduced this yearly average number covering the period from 2004 to 2010 has increased to new 79 municipalities. This development indicates that the tax has given an incentive for 4 to 5 times more municipalities to handle the bio-waste in an environmentally better way [8]. 698 municipalities out of 946 had introduced separate collection of bio-waste in December 2010 [4].

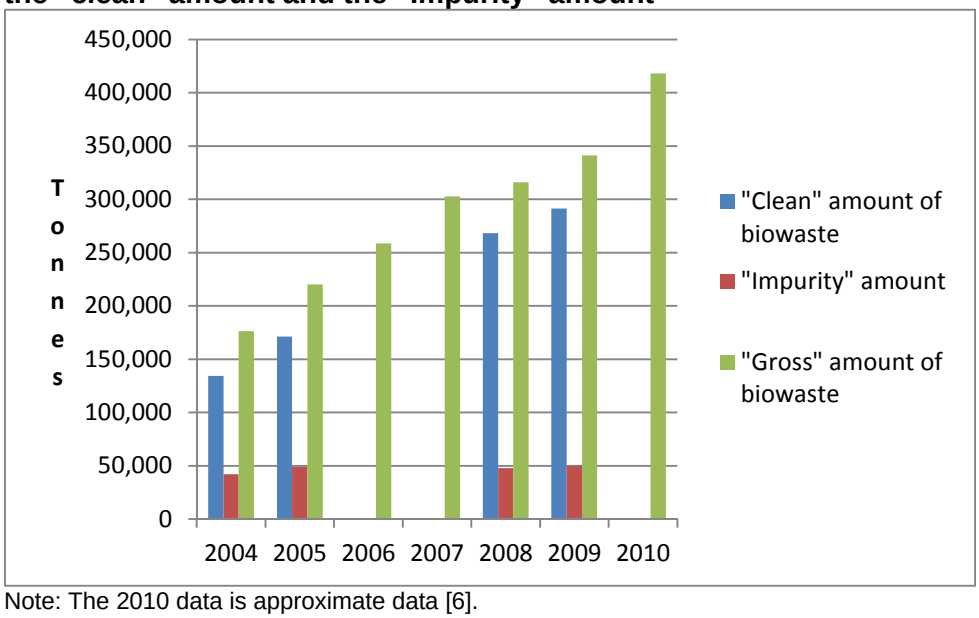
Yearly number of municipalities in Catalonia implementing separate collection of bio waste before and after the introduction of the landfill tax



Source: [8]

The figure below shows the development in the amount of separately collected bio-waste and its quality. Based on a number of characterisation test increasing from 428 in 2004 to 1198 in 2010 the amount of "clean" biowaste is defined [6]. The amount of "clean" bio-waste has more than doubled from 2004 to 2009 and must be assumed to have further increased in 2010.

Development in amount of collected biowaste from 2004 to 2009 related to the "clean" amount and the "Impurity" amount



Note: The 2010 data is approximate data [6].
Source: [6]

6. Economic impacts
From 2004 to 2010 EUR 45 million have been given as subsidies to local authorities for promoting separate collection of bio-waste [6]. In addition subsidies have been given to the managing of other recyclables. As mentioned above the annual landfill tax revenue has been about EUR 30 million until 2008, but it declined to EUR 25 million in 2009.

7. Social impacts
ETC/SCP has found no information on this topic.

8. Main opponents
ETC/SCP has found no information on this topic.

9. Lessons learned in Catalonia
As a result of the tax incentives and use of the revenues to support better waste management, many new municipalities have implemented source separation. It is therefore projected that the fee per tonne paid by the fund to the municipalities will decrease in the future. To prevent negative consequences of this and to enhance the positive effects of this taxation scheme, the tax was increased in 2011 [3] [6].

The adoption of specific legislation and planning on separate collection of biowaste (combining mandate & targets) and of the introduction of a landfill tax have been essential for the developing of bio-waste recycling in Catalonia [6].

Landfilll taxes on industrial and construction waste in Andalusia, Madrid and Murcia

1. Who pays and how much?
In Andalusia the users of public and private landfills for hazardous waste from industrial, construction and demolition activities pay a landfill tax. The rate is depending on whether the hazardous waste is recoverable or not. The tax came into force in 2004 [8].

In Madrid, the users of public and private landfills for industrial and construction waste pay the tax. The tax came into force in 2003 [8].

In Murcia the users of public and private landfill pay the tax for landfilling of industrial waste and for inert waste. The rate for industrial wastes is dependent on whether the waste is hazardous or not. The tax came into force in 2006 [8].

Tax rates for landfilling in EUR per ton for industrial and construction waste in Andalusia, Madrid and Murcia

Tax in € per ton	Industrial hazardous waste	Industrial hazardous waste - Non-recoverable	Industrial hazardous waste – Recoverable	Industrial non-hazardous waste	Construction and demolition waste
Andalusia		15	35		
Madrid	10			7	3 per m^3
Murcia	15			7	3

Source: [8]

In all three regions pay the landfill operators pay the tax to the authorities [8].

Exceptions

In Madrid municipal waste as well as ashes and slags from waste incineration do not pay the tax. In Murcia municipal waste and the use of construction and demolition waste for restoration or conditioning authorised activities are exempted for paying the tax [8].

4. Revenues generated, and what happens to them?

In Andalusia the revenues have increased from EUR 0.6 million in 2005 to EUR 0.9 million in 2008, when the crisis started. The revenue dropped to EUR 0.4 million in 2009. The revenue is earmarked to environmental policies in the region [8].

In Madrid the total revenues have decreased from EUR 10.2 million in 2003 to EUR 2.5 million in 2009 mainly due to a decrease in landfilling of construction and demolition waste. The revenues are not earmarked to specific activities [8].

The revenues in Murcia increased from EUR 3.0 million in 2007 to EUR3.9 million in 2008 and have then decreased to EUR 2.2 million in 2010. The revenues are earmarked but only very generically [8].

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Sweden

In 2000, a landfill tax was implemented [1]. Landfill of combustible waste was banned in 2002. Landfill of organic waste was banned in 2005 [9].

In 2009 there were 157 active landfill sites in Sweden, of which 28 were for hazardous waste, 96 for non-hazardous waste and 33 for inert waste [11].

1. Who pays and how much?

The landfilling tax was introduced at a rate of SEK 250 (about EUR 27) per tonne. In 2002, the rate was increased to SEK 288 and simultaneously requirements concerning the separation of combustible waste and a ban on landfilling separated combustible waste came into force. In 2003, the tax rate was further increased to SEK 370 (about EUR 40) per tonne [5]. In 2006 the landfill tax was increased to the current rate of SEK 435 (approximately EUR 47) [9].

Under the Landfill Tax Act, in force since January 2000, all material entering landfill facilities is taxed, while material removed from the facility qualifies for a deduction. The tax is paid by the owner of the landfill [3].

The tax is paid on the basis of weight (per tonne). If the amount of waste coming into a landfill is of a low quantity, it is possible to decide upon the tax based on other categories [3].

Exceptions

No tax has to be paid where less than 50 tonnes of waste/year is landfilled or stored for more than 3 years. No tax has to be paid for waste intended for the running of a landfill or which is brought to such a site without direct connection to the waste-handling.

There are 24 other exceptions such as, for example:

- rock from mining industry
- sand from mining industry and waste from waste water treatment including iron containing waste from the production of iron ore pellets
- radioactive waste
- waste water sludge
- contaminated soil from cleaning up ground sites
- sludges from different metallurgical processes
- liquid waste in reed bed

If waste is intended for composting or reactor-based digestion, incineration, the production of solid storable fuel, dewatering or cleaning (if fluid) no tax has to be paid. However tax has to be paid if residues from these activities are landfilled [9].

No tax has to be paid for fluid waste to be treated in a reed bed.

2. Who monitors and collects?

The Swedish Tax Agency (Skatteverket) administers the landfill tax [7].

3. Leakage issues

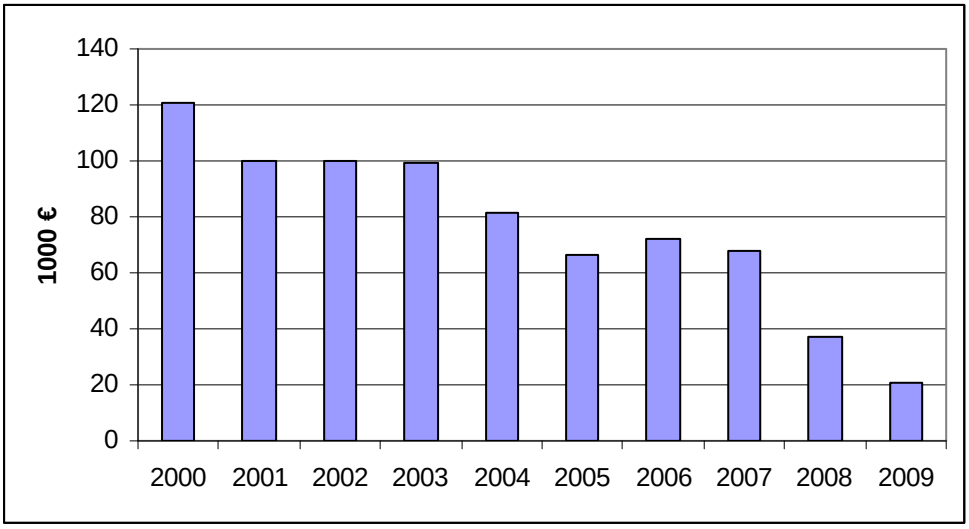
Too many aspects and policies have influence on the export of waste to ascertain the exact effect of landfill tax. The fact that acceptance criteria for waste to landfill are quite

stringent, for example, causes a number of incineration facilities to export fly ash and flue gas treatment residues to Norway [7].

4. Revenues generated, and what happens to them?

The revenue has decreased significantly since the tax was introduced in 2000; in 2009 only about 15% of the income in 2000 indicating that the tax has provided a good incentive to divert waste away from landfilling. [10]

Revenue of the landfill tax in the Sweden from 2000 to 2009



Source: [10]

5. Environmental impacts

The impact of the tax in terms of increased recycling and reduced landfilling has been considerable [1]. Landfilling has diminished by 13.6 % p.a. between 1999 and 2006, while recycling has increased by 4.6 % p.a. [2]. Before the introduction of the tax, landfill only decreased by 2 % p.a. (1996 – 1999).

The total production of waste per capita has increased by 2.3 % p.a. between 1996 and 2006 [6].

The amount of household waste sent to landfill each year decreased by more than 1.3 million tonnes between 1994 and 2008. A total of 63,000 tonnes of household waste was landfilled in 2009, which is equivalent to 1.4 % of all of Sweden's household waste during the same year.

The landfilling of industrial waste has been reduced to less than half that landfilled in 1994 and out of the household waste 1 % was landfilled in 2010 [9]. During 2008, a total of 419,000 tonnes of hazardous waste was landfilled [11].

A total of 62.5 million tonnes of non-hazardous waste was landfilled in 2008. The biggest contributor is mining, with approximately 58.7 million tonnes of waste [11].

However, it is not possible to say how much this is an effect from the landfill tax and how much this is an effect from other steering tools such as landfills bans for organic and combustible waste, introduction of producer responsibility and better regulations for landfilling as a result of the EU-regulations [9].

6. Economic impacts

The industry organisation 'Avfall Sverige' has undertaken a study examining the development of prices for waste going to municipal landfills (incl. VAT and landfill tax):

Development in prices for waste going to municipal landfills 2002-2009 in SEK

	2002	2003	2009
Price range (incl. landfill tax), SEK/ton	1,200 – 650	1,200 – 700	1,200 – 700
Price range (excl. landfill tax), SEK/ton	950 – 400	830 – 330	765 – 235
Tax, SEK/ton	250	370	435

Source: [12]

According to 'Avfall Sverige' the prices for landfilling have remained unchanged since 2002. This is because, while the landfill tax level has increased, the costs for landfilling have decreased.

Overall, the landfill tax did increase costs for the industry, but it also stimulated the industry into finding alternative treatments for waste. Incineration activity for example increased due to the landfill tax.

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

Even though there was opposition to the introduction of a landfill tax in the beginning, it is today accepted and regarded as having great value in relation to the aim of reducing landfilling [8].

9. Lessons learned

One problem witnessed in Sweden is that too much waste is used for the construction and covering of landfills as this type of waste handling is exempt from the tax [8].

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Switzerland

A landfill tax ('VASA tax') was introduced in 2001 [1].

1. Who pays and how much?

The following tariffs apply for landfilling in Switzerland:

Sanitary landfills: .....15 CHF/t (EUR 11.17)

Residue landfills: .....17 CHF/t (EUR 12.65)

Inert materials landfills: .....3 CHF/t (EUR 2.23)

Export for underground storage: .....22 CHF/t (EUR 16.38)

Source: [1]

2. Who monitors and collects?

The 'VASA-tax' is a federal tax; therefore the Federal Office for the Environment (Bundesamt für Umwelt) is in charge. It bills the landfills and conducts controls on the landfills [1].

3. Leakage issues

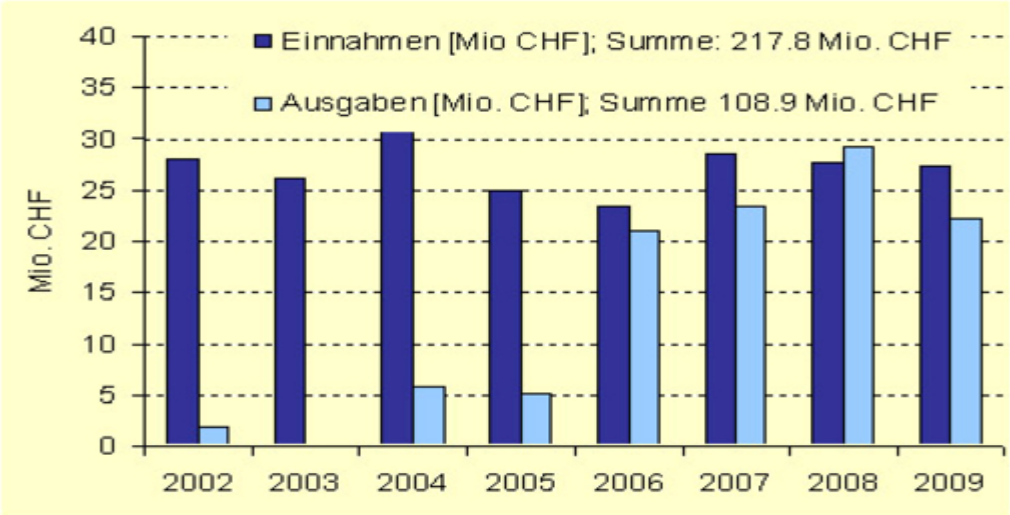
The 'VASA-tax' did not result in the increased export of waste. The export of waste to landfill in another country is prohibited by law (the only exception being underground storage).

Since 2010, even waste exported for recovery or treatment is subject to landfill tax if landfilled abroad after the treatment (unless the landfilled amount is less than 15 % of the exported waste in weight). This is to make sure the export of waste is not financially more attractive than landfilling in Switzerland [1].

4. Revenues generated, and what happens to them?

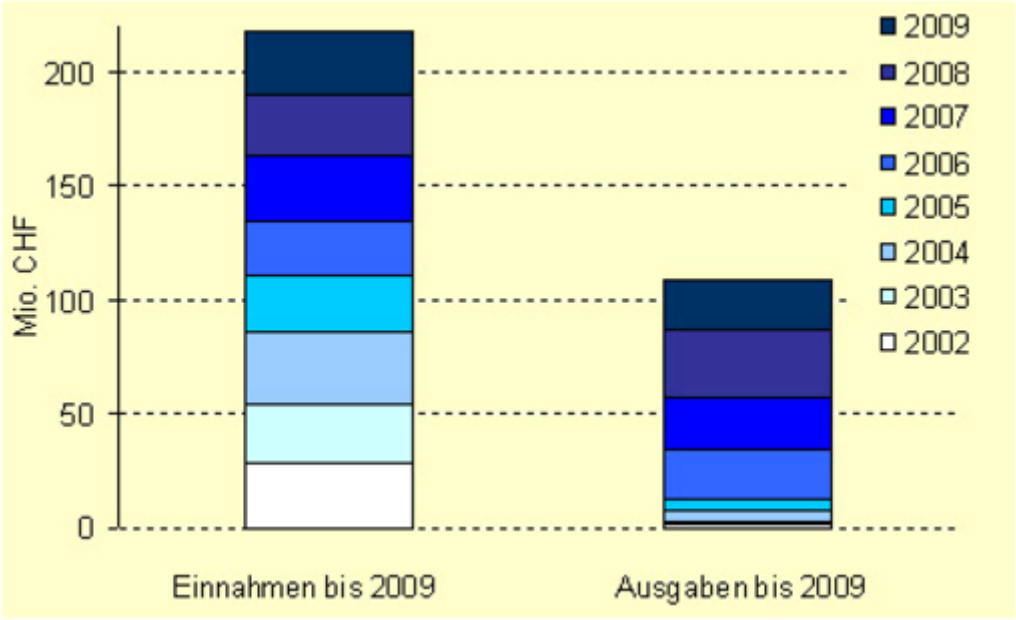
Revenues from the landfill tax go into an earmarked fund (Vasa-Fonds) dedicated to clean-up activity (for ex. contaminated soils) [1]. In 2009 the revenues were CHF 27.3 million (EUR 20.3 million). The following table presents revenues from the landfill tax 2002-2009:

Revenues from the Swiss landfill tax in million SFr from 2002-2009



"Einnahmen" means revenue and "Ausgaben" means expenses [2]

Total revenues 2002-2009 were CHF 217.8 million (EUR 162.3 million). CHF 108.9 million (EUR 81.2 million) was spent, while an equal amount remains in the 'Vasa Fonds'.



"Einnahmen" means revenue and "Ausgaben" means expenses [2]

5. Environmental impacts

There is no data available yet on the effects of the landfill tax on landfilling [1].
In a paper on waste handling in Switzerland from 2006, it is reported that the amount of waste going to sanitary landfills decreased by 12 % to 1.3 million tonnes between 2002 – 2004. [3]

6. Economic impacts

Financial support for the management of contaminated sites can be provided by the federal authorities. Around CHF 26 million per year is available for this purpose, thanks to charges levied on the landfilling of waste, which flow into the VASA fund [4]. Of a total of 3,000–4,000 contaminated sites, more than 250 have been remediated to date. Investigations of polluted sites are to be completed by 2015. Remediation efforts must be undertaken by 2017 in urgent cases and by 2025 at the remaining contaminated sites [4].

7. Social impacts

ETC/SCP has found no information on this topic.

8. Main opponents

ETC/SCP has found no information on this topic.

9. Lessons learned

The Swiss tax is special in the way that it is only spent on cleaning up contaminated sites. Before the introduction of the tax Switzerland already had quite a low percentage of landfilling of municipal waste.

In recent years, the Swiss Confederation's waste management policy has significantly reduced the level of environmental pressure caused by waste management despite continuous growth in the total volume of municipal waste arising. This trend can be attrib-

uted to the introduction of high waste management standards, to a highly effective infrastructure, and to a financing system that makes the waste producers responsible for the costs of disposal. Nonetheless, even a highly effective waste policy is by itself insufficient in reducing the country's overall consumption of resources [4].

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United Kingdom

The UK landfill tax was introduced in 1996 with the explicit intention of internalising externalities associated with landfill. Not until the introduction of accompanying policy instruments did the tax rise to a significant level though. A 2002 Strategy Unit review acknowledged that the 1996 level of tax had been set to reflect the externalities from landfill and that this was too low a rate to change behaviour. This link to externalities was replaced by a primary goal to change behaviour [3].

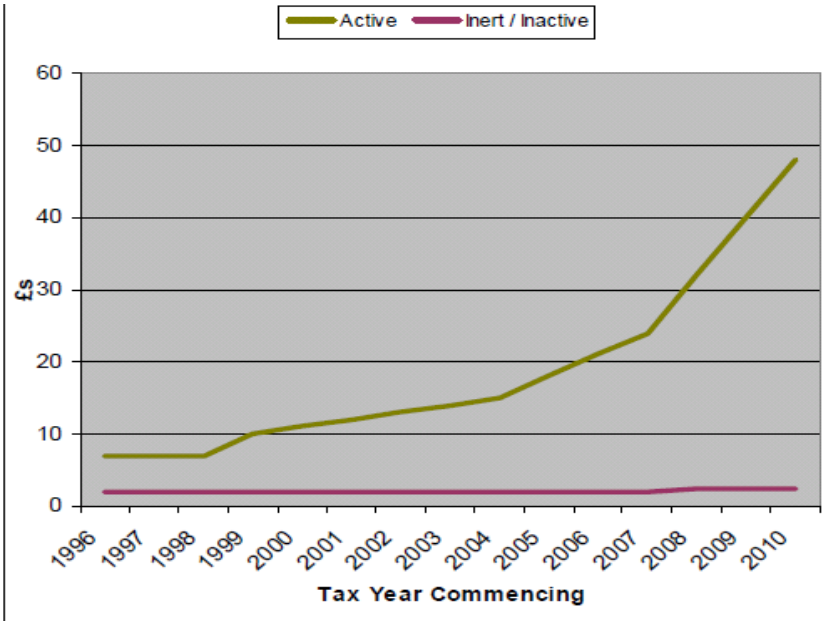
1. Who pays and how much?

When introduced (1996), the tax was set at EUR10/t for active waste, and EUR 2.9/t for inert waste. In 2005 it was then increased to EUR 26/t for active waste. Inert waste levels did not change. In 2008, the tax was increased to EUR 40.8/t, and in 2010 to EUR 54.1/t [1].

2010/11 rates are 48 GBP/t (about EUR 55) (+VAT) for active waste, and 2.5 GBP /t (about EUR 2.85) (+VAT) for inactive waste and 56 GBP/t (about EUR 64) from April 2011. In its latest budget, the UK has foreseen an increase of the landfill tax by 8 GBP/t (EUR 10) p.a. until at least 2014/15, when it will reach 80 GBP/t (about EUR 91), and there will be a floor under the standard rate at 80 GBP/t, so that the rate will not fall below this amount [1] [6].

New qualifying criteria for lower rated wastes was legislated in the Finance Bill introduced in the autumn (2010), to come into effect on 1 April 2011 [1].

The landfill tax in United Kingdom in GBP per ton waste from 1996 to 2010



Source: [3]

The amount of tax levied is calculated according to the weight of the material disposed of and whether it is active or inactive waste.

The landfill site operator is responsible for paying landfill tax [12]. However, operators will pass the cost on to businesses and local councils on top of normal landfill fees. VAT is charged on the landfill fees and the landfill tax.

Exceptions

There are exemptions from the tax for dredged waste from inland waterways and harbours; waste arising from mining and quarrying operations; the burial of pets; waste arising from clearance of contaminated land (for disposals made with a valid relief certificate made before 1 April 2012); waste used for the restoration of landfill sites; and waste from the filling of quarries [12].

2. Who monitors and collects?

The Landfill Tax is payable on waste that is disposed of at landfills. The Tax is regulated by HM Revenue and Customs.

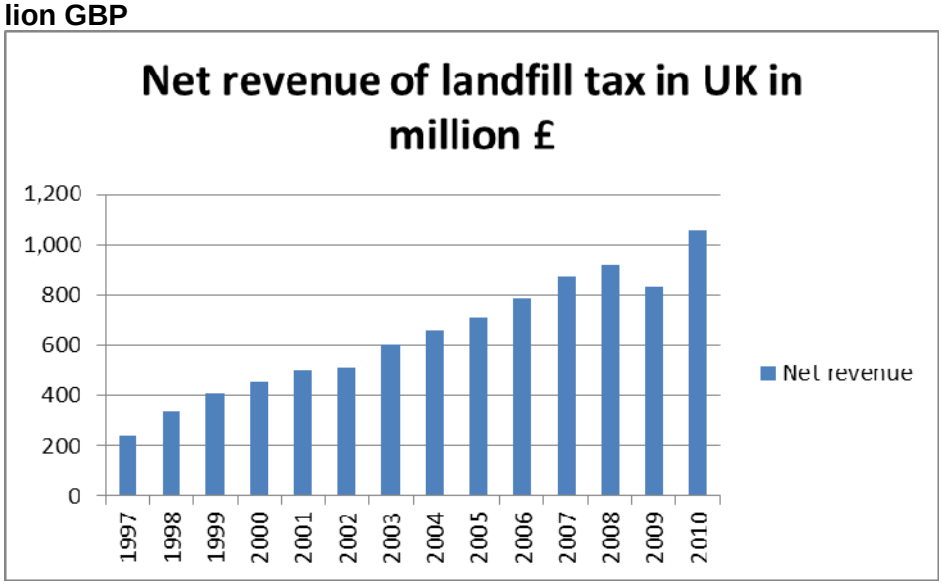
3. Leakage issues

ETC/SCP has found no information on this topic.

4. Revenues generated, and what happens to them?

In 2010 the revenues from the landfill tax were GBP 1.1 billion (EUR 1.2 billion) [9]. These revenues are not earmarked and added to the national budget. When introduced, the tax was in alignment with a reduction in employers' national insurance contributions. The UK landfill tax credit scheme was aimed at encouraging landfill operators to support projects with environmental objectives, such that tax credits can be claimed in respect of funds used (up to a maximum of 20 % of their tax liability).

The development of revenues from the landfill tax in UK 1997-2010 in million GBP



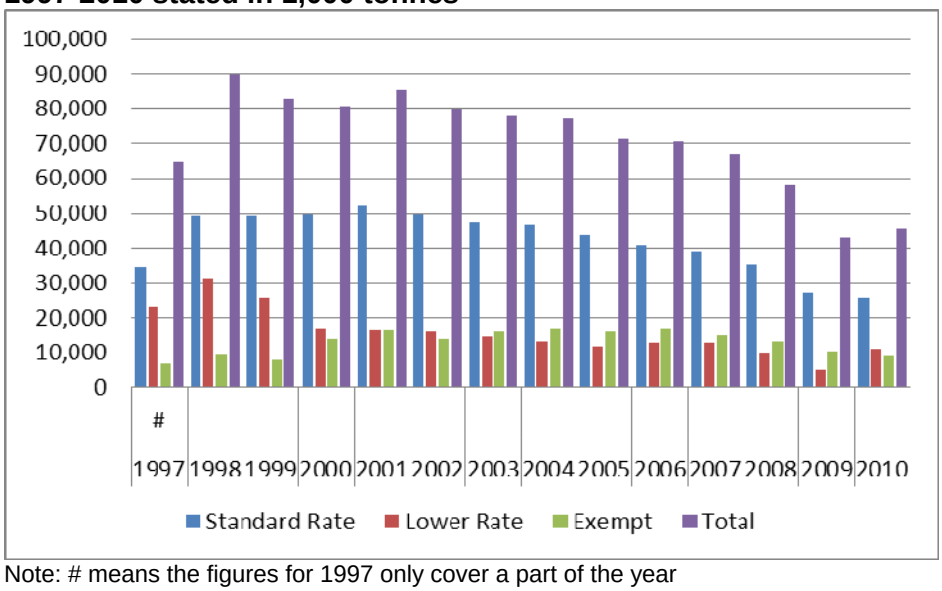
Note: The figure for 1997 only covers a part of the year
Source: [9]

From April 2005, two thirds of the revenue previously allocated to the Landfill Tax Credit Scheme (LTCS) was switched to a new Business Resource Efficiency and Waste (BREW) programme. BREW was developed in consultation with business representatives, the Treasury and the Department for Business, Enterprise and Regulatory Reform (DBERR) and allocates funds to specific programmes such as Envirowise, the Waste & Resources Action Programme (WRAP) and the National Industrial Symbiosis Programme (NISP) to promote more sustainable waste management on the part of commerce and industry [3].

5. Environmental impacts

The amount of waste landfilled has declined greatly in UK since the tax was introduced in 1996. From 1998 to 2010 the total amount landfilled has almost halved from 90 million tonnes to 46 million tonnes. The reduction covers both waste paying the standard rate and the lower rate.

The amount of waste received at landfills in UK related to type of landfill tax 1997-2010 stated in 1,000 tonnes



Note: # means the figures for 1997 only cover a part of the year
Source: [9]

In 1998 84 % (31.7 million tonnes) of the municipal waste were landfilled and 16 % (5.1 million tonnes) recovered. By 2009 49 % (16.0 million tonnes) were landfilled and 51 % 16.5 million tonnes recovered [11].

In combination with other policy measurements (the law on recycling in 2003, quotas and limits on landfilling of biodegradable waste in 2005 (Landfill Allowance Trading Scheme), investment subsidies and communication actions), the effect of the tax came into being from 2002. From 2001 – 2005 the amount of landfilled waste diminished by 5 million tonnes (- 6 % p.a.; almost – 25 % in 4 years). Total waste production per capita also slightly diminished (- 1 % p.a.) [2] [13].

The Landfill Allowance Trading Scheme (LATS) will be discontinued from 2013, as the landfill tax has risen so that LATS is no longer required to meet the Landfill Directive targets [13] [14].

Linked to the Landfill Directive targets, the UK changed its definition of 'municipal' waste in 2010. This widened the scope from waste collected by local authorities to wastes also similar in type to household waste (i.e. much more of commercial waste). The above mentioned figures for municipal waste relate to the old definition of municipal waste, which UK is now calling 'local authority collected waste' [13].

6. Economic impacts

The revenue from the landfill tax has increased considerably in UK from 1998 to 2010 [9]. The revenue has increased by a factor of four even if the amount of waste landfilled has decreased. The continuing increase of the land tax per ton explains this development. The tax has given an economic incentive for recycling the waste, especially after the tax was changed so it not only reflects the externalities, but also provides an incentive for changing behaviour.

7. Social impacts

The tax was designed to be revenue neutral. The cost to business was offset through a reduction in employers' higher rate national insurance contributions from 10.2 % to 10 %. In addition, the Landfill Tax Credit Scheme (LTCS) was established by HMRC to enable landfill operators to support a wide range of environmental projects by giving them a 90 % tax credit against their donations to environmental bodies [3]. The Landfill Tax Credit Scheme is now called the Landfill Communities Fund [13].

8. Main opponents

When the tax was introduced in 1996 the level of the tax was not very high and among the lowest in Europe. In that way it did not affect the industry very much, which could explain why it has not been possible to find information about the direct effects of the introduction of the landfill tax [10]. Another explanation could be that the landfill tax has a broad-based nature. It doesn't impact negatively on particular sectors, as an energy tax could do [13]. However, in the last couple of years the tax level has increased considerably and will continue to do so in the coming period. The landfill tax in the UK is now in the upper end of the European scale.

9. Lessons learned

Since the introduction of the tax, the proportion of waste sent to landfill has fallen by around a half. This change has been accompanied by firstly an increase in recycling, as well as also other forms of recovery.

Landfilling of construction and demolition waste has fallen since the introduction of the landfill tax [4]. A further decrease of construction, demolition and excavation waste from 23 million to 12.5 million tonnes is foreseen in the period from 2008 to 2012 [5].

The tax has therefore functioned as a policy tool and a driver to divert waste away from landfills to alternative forms of waste management.

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Annex II. The questions for which information has been collected

1. How high is the current landfill tax? Who pays it? Are there any exceptions to the landfill tax?
2. Who monitors and collects the tax? Does that happen on a regional/national level?
3. Leakage issues. Has the landfill tax resulted in increased waste shipment to other countries?
4. How high is the total revenue generated from the landfill tax, and what happens to them?
5. What are the environment impacts of the introduction of the landfill tax (less waste to landfill, more waste to incineration or recycling)?
6. What are the economic impacts? Higher costs for businesses and households, etc.)?
7. What are the social impacts of the landfill tax?
8. Who are the main opponents to the tax? Has there been any opposition to the introduction of the landfill tax from businesses, the public or other institutions, and has this changed over time?
9. Lessons learned? Are there any "lessons learnt" from the landfill tax so far (improvements, unexpected effects, etc.)?