

the EU, Norway and Switzerland and in 1994 the quantity peaked at 17.5 million tonnes (APME, 1995; APME, 1996).

Municipal Waste

Municipal waste is by far the largest 'source' of plastic waste with 61% of the total in 1996 (Figure 3.7.10).

Several problems are related to municipal waste, for example:

- it is difficult to handle as it consists typically of a number of fractions of waste and several plastic types; the bottleneck to more recycling is sorting the different plastics both in relation to available techniques and to health and safety problems related to sorting;
- it contains plastic types with a high degree of contamination from foodstuffs resulting in very labour- and energy-intensive recycling.

As shown in Figure 3.7.9 it is obvious that plastics waste has to be dealt with in a more innovative way in order to implement the Community Waste Management Strategy. Only 20% of plastic waste is subjected to material recovery or energy recovery while an average of 80% is disposed of. Disposal can be either incineration without energy recovery or landfilling. The figure also shows that despite increasing quantities of post-user plastic waste the fractions dealt with by material recovery and energy recovery are more or less constant at levels of about 7% and 15% respectively (APME, 1995; APME, 1996).

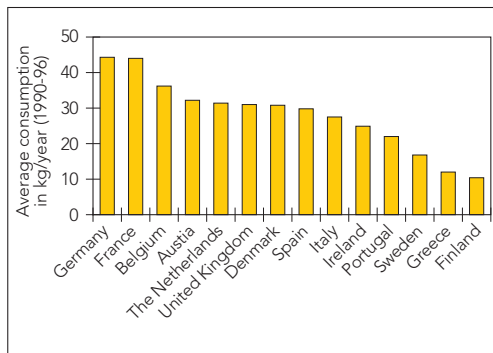
PVC waste

Polyvinylchloride waste (PVC waste) accounts for a total of 12% of all plastics waste in the EU, Norway and Switzerland, or 2.1 million tonnes PVC waste in 1994 (SOFRES, 1996). In comparison, PVC production in 1994 was 4.8 million tonnes (Allsopp, 1992) and is still increasing, confronting future generations with rising amounts of PVC waste. Recovery of PVC waste is lower than recovery of other kinds of plastic waste. A study in eight western European countries has shown recycling rates from 1% to 3% (DEPA, 1996). Material recovery of PVC requires sorting waste into generic materials; this is not done today.

PVC requires special attention due to its high content of dangerous substances which are used as plasticisers (phthalates), stabilisers (lead, cadmium and organotin com-

Average glass consumption in different countries, 1990-95 (in kilo per capita/year)

Figure 3.7.7

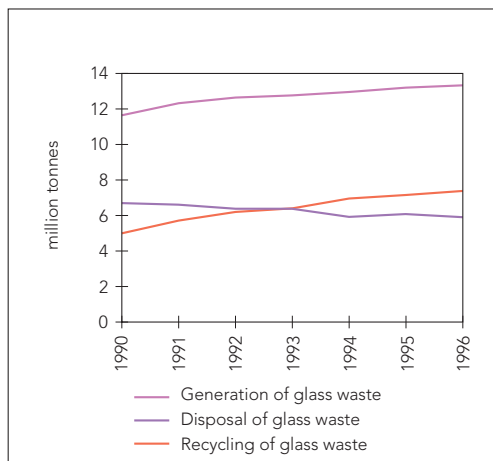


The yearly consumption of container glass per capita (and hereby the glass waste generation) is 4 times as high in countries with a high consumption compared to countries with a low consumption.

Source: FEVE, 1997 and NRCs, 1998a

Glass generation and management

Figure 3.7.8

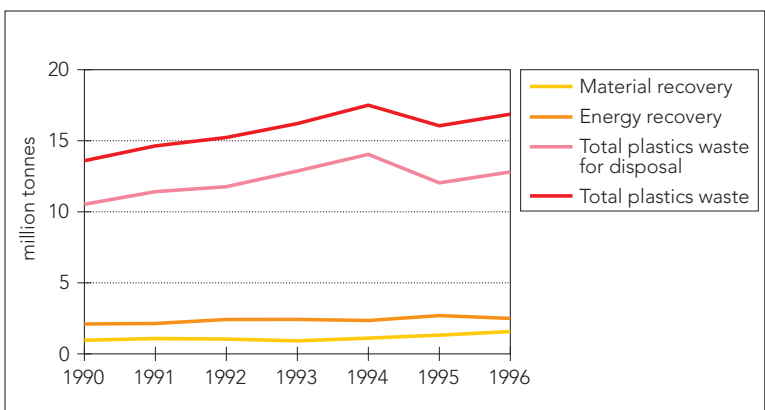


While recycling has increased by almost 50% from 5 million to 7.4 million tonnes per year, the amount of waste glass for disposal has decreased by only 12% (6.7 million to 5.9 million tonnes) due to the simultaneous increase in waste glass.

Source: FEVE, 1997; NRCs

Total plastic

Figure 3.7.9



The fraction of total plastic waste dealt with by disposal is more or less constant at about 75%.

Source: APME, 1995; APME, 1996.

better sorting of shredder waste can reduce the heavy-metal content considerably and make incineration with energy recovery less problematic (Miljøstyrelsen, 1997).

3. Waste amounts and treatment in the Accession Countries

The 10 central and eastern European Accession Countries applying for membership of the Union will need to harmonise legislation and practices in the area of waste management to ensure compliance with EU legislative requirements. Total reported quantities of waste reported are three times the EU average. Although there are differences of definition and data coverage, the main explanation seems to be higher reported amounts of mining waste and waste from agriculture. Where a breakdown is available by source the average figures for manufacturing waste and waste from energy are about 50% above the EU average (Figure 3.7.12 & 3.7.13).

The generation of industrial waste depends on both the type of industry and the extent to which production processes make use of cleaner technology and waste minimisation procedures.

4. Environmental impacts of landfilling and incineration of waste

4.1. Landfilling

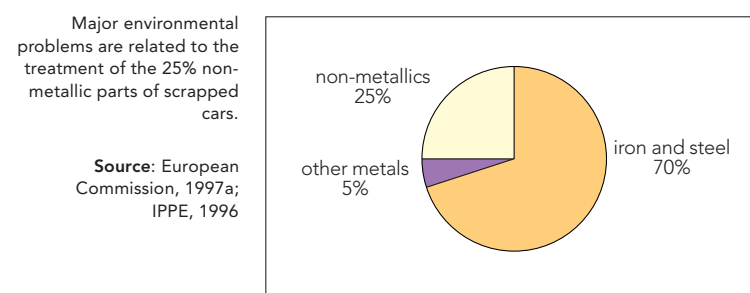
The main environmental pressures from landfilling of waste are:

- pollution of surface water and groundwater with toxic substances and nutrients leaching from the waste;
- contribution to the greenhouse effect by emission of methane;
- land use (including loss of natural areas).

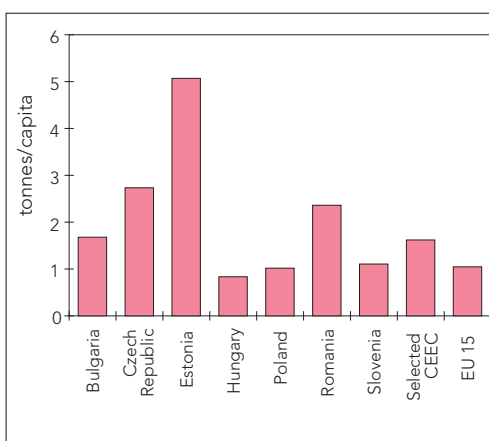
Furthermore the landfills represent a permanent loss of resources and the need for controlling the pollution leads to increasing public expenditure for monitoring and clean-up operations.

The extent of these problems varies according to the type of waste landfilled, the construction of the landfill and the hydrogeological conditions. In relation to the risk of groundwater pollution studies have shown that the leachate may be a risk even after several centuries. Pollution of

Car composition Figure 3.7.11



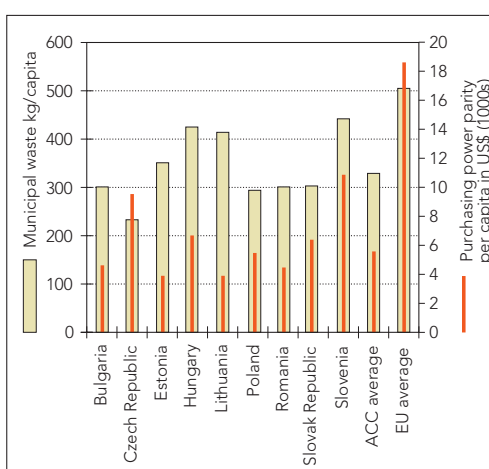
Manufacturing waste + Waste from energy/capita in selected Accession Countries Figure 3.7.12



The figure shows that the quantity of waste from manufacturing and energy production is in average about 50% higher in selected Accession Countries than in EU. The very high total for Estonia is mainly due to waste from oil-shale-based energy production.

Source: EEA, 1998b; OECD, 1997a

Manufacturing waste + Waste from energy/capita in selected Accession Countries Figure 3.7.13



The figure shows that the average generation of municipal waste is about 40% higher within EU (505 kilo/capita/year) than in the Accession Countries (AC) (311 kilo/capita/year). GDP expressed as average Purchasing Power Parity (PPP) in the AC is about 30% of the EU average. There is no trend in the connection between waste generation and PPP as there seems to be within the EU. Latvia is not included in the table because the data for Latvia is not clearly defined.

Source: EEA, 1998b; OECD, 1997a

Strategy	Legal action in force	Considered legal and political action
Shipment of waste: the principle of self-sufficiency aims at avoiding shipments for disposal between Member States, while shipments for recovery are mainly submitted to the principles of the internal market.	Requirements on notifications procedures (<i>Regulation 259/93</i>).	Increase approximations of standards in order to establish common environmental standards for recovery operations (<i>COM (96) 399</i>). Concern of large-scale movements within the Community of waste for incineration with or without energy recovery (<i>Council Resolution 97/C76/01</i>).

Table 3.7.8. Total waste generation by disposal and treatment method in selected EU countries and regions (%)

Country/region	Year	Land-filling	Incineration	Recycling	Other treatment
Denmark	1985	39	26	35	.
Denmark	1994	23	20	56	1
Denmark	1995	17	20	62	1
Denmark	1996	20	19	60	1
Germany	1990	68	3	21	8
Germany	1993	55	4	25	21
Ireland	1995	73	1	14	13
Netherlands	1985	42	7	51	.
Netherlands	1990	31	8	61	.
Netherlands	1994	21	9	70	.
Netherlands	1995	18	9	73	.
Netherlands	1996	16	11	74	.
Sweden	1990	75	13	10	.
Catalonia	1994	56	10	34	.
Catalonia	1995	56	10	34	.

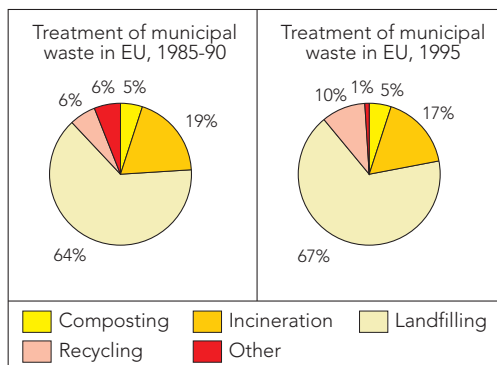
The table shows that progress has been made in some countries in increasing recycling and reducing landfilling

Source: NRCs , EEA 1998b; Junta de Residuos

Figure 3.7.19 Development in EU from 1985-90 to 1995 in treatment of municipal waste

The figure shows that despite increased recycling no progress has been made in reducing landfilling.

Source: EEA, 1998b; NRCs



ment route for waste and a major change is needed in order to implement the EU strategy on waste.

6.3. EU as a whole should treat its own hazardous waste

About 1.4 million of the 36 million tonnes of hazardous waste generated in EEA member countries (equivalent to 4%) is not treated in the country of origin but is exported, either to other EU countries, other OECD countries or to non-OECD countries.

According to the EU strategy, waste for disposal generated within the Community should be disposed in one of the nearest appropriate installations and should not be disposed outside the Community. For hazardous waste the EU has already banned export of all such waste for disposal to other countries except to EFTA countries. Export of hazardous waste for recovery to non-OECD countries is prohibited from 1998. This initiative follows a 1995 decision taken in the context of the Third Conference of the Parties of the Basel Convention on shipment of hazardous waste.

According to reports by the EU countries and Norway to the Basel Convention and the Commission very little hazardous waste was exported to non-OECD countries: 5802 tonnes out of a total of 1.47 million tonnes, corresponding to 0.4%, in particularly to India, New Caledonia and Kazakhstan. If the figures reflect the actual situation, the export ban of hazardous waste for recovery to non-OECD countries therefore should be relatively easy for EU Member States to comply with.

EU exports to other OECD countries corresponds to 8% of the total, the destination mainly being the US, Norway and Switzerland. The remaining (91%) is exported among EU countries. The Community is thus also fulfilling the aim of treatment of hazardous waste within its borders. This conclusion does not however mean that sufficient treatment capacity for hazardous waste exists within the EU.

Development of disposal and treatment of waste from construction/demolition and manufacturing activities (%)

Table 3.7.9.

Country/ Region	Year	Construction & demolition				Manufacturing			
		Land- filling	Incine- ration	Recycling	Other	Land- filling and other disposal	Incine- ration	Recycling	Other
Denmark	1985	82	6	12	0	35	26	39	0
Denmark	1996	10	1	89	0	31	14	53	2
Germany	1990	32		10	58	38	8	49	4
Germany	1993	32		12	57	28	9	60	3
Ireland	1995	57	0	35	8	73		27	0
Luxembourg	1994	93	0	7	0				
Luxembourg	1997	93	0	7	0				
Netherlands	1985	50	1	49	0	34	2	64	0
Netherlands	1996	8	1	91	0	14	5	81	0
Sweden	1996					17	32	41	9
Catalonia	1995					37	1	52	10
Catalonia	1996					33	1	53	13

Source: NRCs; Junta de Residus

About 1 665 500 tonnes of hazardous waste was imported to EU Member States and Norway in 1995. Of this, 85% arose in other EU Member States, 8% came from other OECD countries, in particular Switzerland, US, Norway, Hungary and the Czech Republic, and 6% has unknown sources.

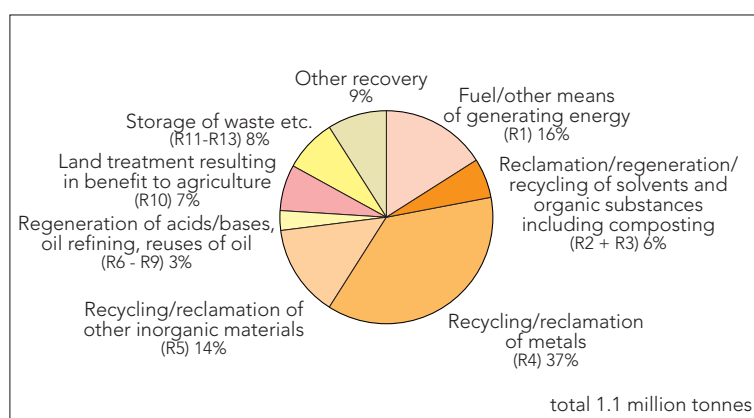
Many non-OECD countries do not have adequate facilities to treat their hazardous waste in a safe way. Until these countries are properly equipped, the EU could help by importing and treating this hazardous waste. However only 16 000 tonnes (1%) of imports to EU Member States and Norway was hazardous waste from non-OECD countries, in particular from South Africa, Brazil, Macedonia, and Slovenia.

Treatment of exported waste

About 75% of exported hazardous waste from the EU and Norway is exported for recovery and about 20% for disposal. Portugal, Spain, Luxembourg and the Netherlands export a large part for disposal. Figure 3.7.20 (according to the EU Framework Directive) shows which kind of treatment exported hazardous waste from the EU countries and Norway has received.

Treatment of exported hazardous waste according to the EU Framework Directive

Figure 3.7.20



The table does not include figures from Greece and Ireland. The figures for Sweden and France are 1994 figures.

Source: European Commission, 1998b; Norsas.