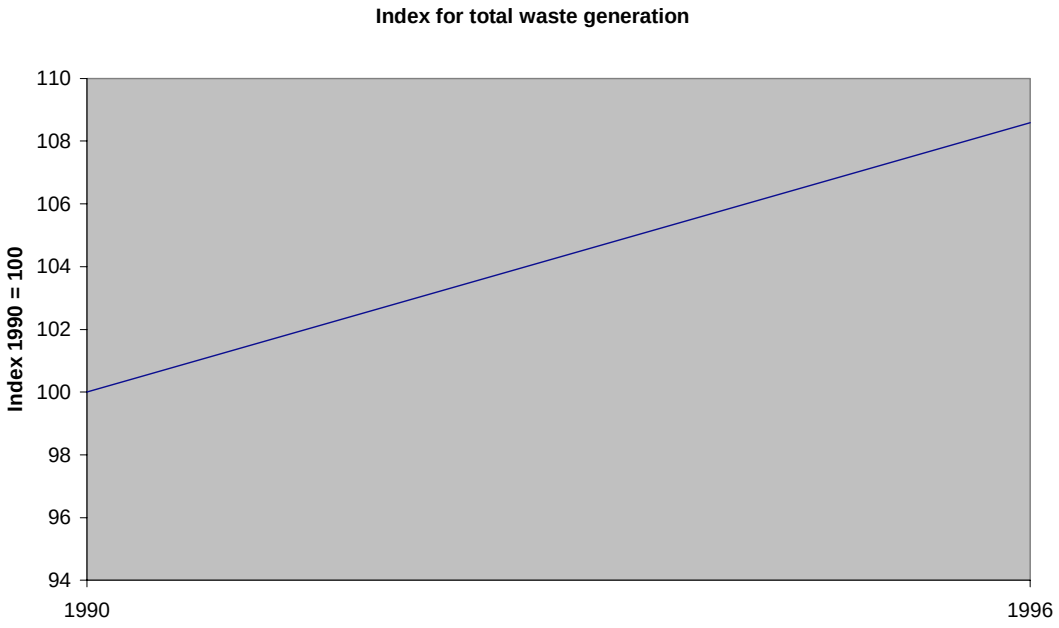
Indicator Fact Sheet Signals 2001– Chapter Waste

Total waste generation

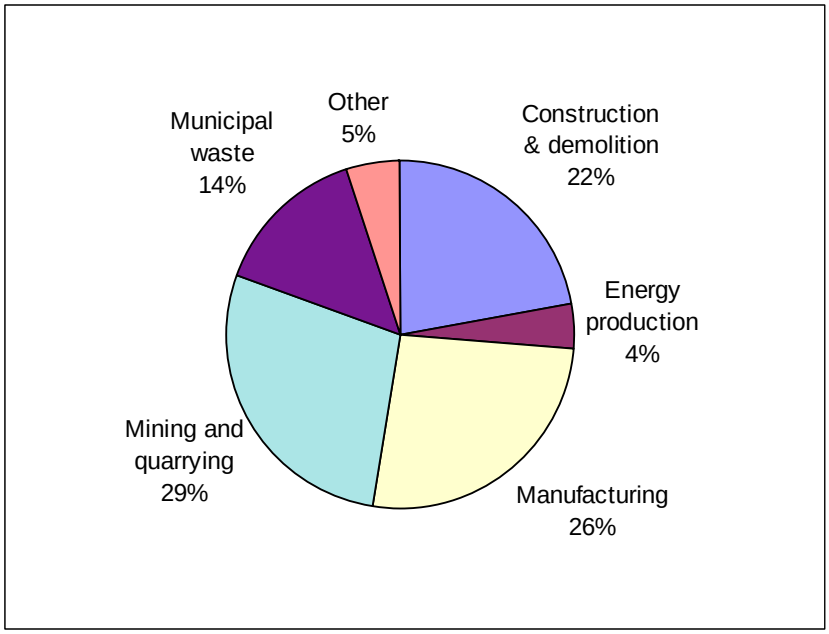
Figure W1a: Index for total Waste generation 1990 to 1996.



Note: Based on a selection of illustrative trends in Denmark, Ireland and Italy
Source: Eurostat: "Waste Generated in Europe". Luxembourg 2000 and ETCW enquiry on specific waste streams.

☹ Data from a limited number of countries suggests that total waste generation in EU is increasing. This goes against the general policy target of waste prevention.

Figure W1b: Total waste generation by sector EEA Countries 1992-1997.



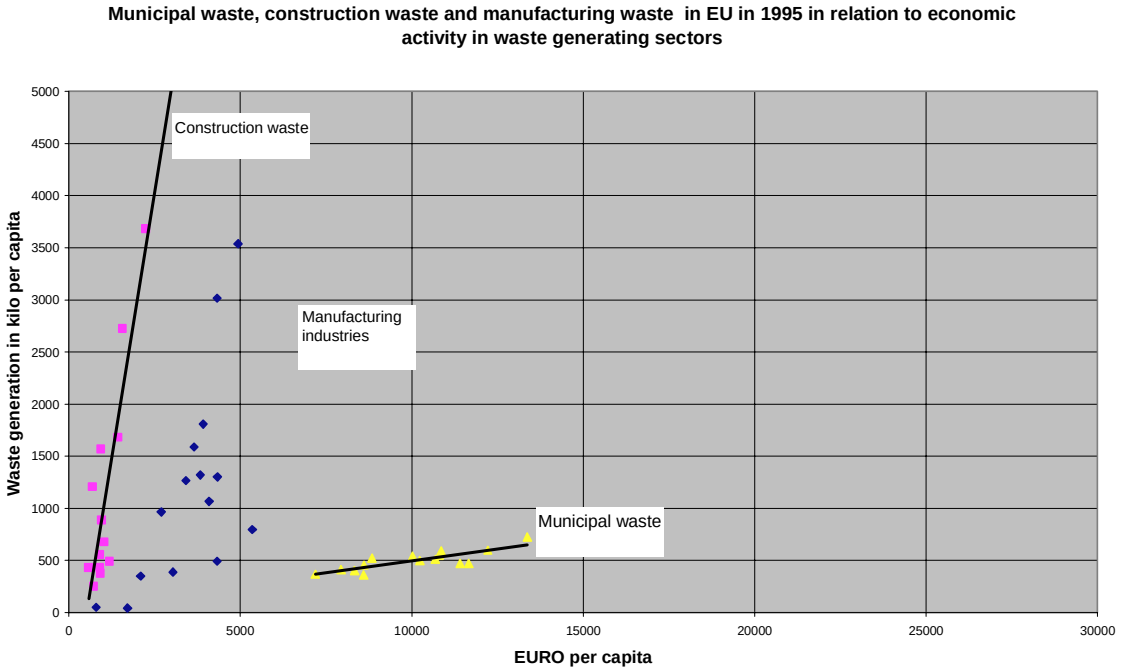
Source: Eurostat: “Waste Generated in Europe” Luxembourg 2000 and ETCW enquiry on specific waste streams.

Note: Sewage sludge is included under other waste (as dry weight).

☹ Total waste generation in EU is 1300 million tonnes per year. Construction & demolition and manufacturing industries generate half of total waste.

Figure W1C Correlation between economic growth and waste generation

Source: Eurostat: “Waste Generated in Europe” Luxembourg 2000 and ETC/W enquiry on specific waste streams.



Source for GDP: Eurostat (Cronos)
. Update from OECD/Eurostat questionnaire 2000 including data for 1998 and in some cases 1999.

Results and assessment

<u>Relevance of the indicator for describing developments in the environment:</u>

Quantity of waste is an indicator of the material efficiency of society, since excessive waste represents an enormous loss of resources in the form of materials and energy. Excessive quantities can result from:

- inefficient production processes;
- poor durability of goods;
- unsustainable consumption patterns.

Increasing quantities of solid waste are being produced from activities that aim to solve other environmental problems such as water and air pollution. Some of these wastes give rise to new problems – examples include sewage sludge and residues from cleaning of flue gases.

Managing waste causes a number of pressures on the environment:

- leaching of nutrients, heavy metals and other toxic compounds from landfills;
- land take for landfills;
- emission of greenhouse gases from landfills and treatment of organic waste;
- air pollution and toxic by-products from incinerators;
- air and water pollution and secondary waste streams from recycling plants;
- increased transport with heavy lorries.

While total waste quantities are a measure of resource loss, the environmental impact of waste can not be assessed by looking at quantities alone since the presence of even in small quantities of hazardous substances can have major impacts. However, the hazardous contents of waste are poorly described at the EU level.

Policy relevance

The overall aim of EU Waste Management Policy is ultimately to prevent the generation of waste. The data, however, show that waste quantities are increasing. This may be explained by a close link between economic growth and waste generation**,** but also by improved environmental performance in other fields such as waste-water purification and flue gas cleaning that involve the generation of additional solid wastes.

Assessment

On the basis of OECD/Eurostat figures, waste generation (excluding agricultural waste) in the EU is increasing, and in 1995 amounted to about 3.5 tonnes of solid waste per person, mainly from manufacturing, construction & demolition, and mining. There are major uncertainties in the figures, but the trend is confirmed by indicators on specific waste streams. Only for waste from manufacturing industries do quantities appear to be static and in some cases falling. The Council Regulation on Waste Management Statistics is expected provide the necessary statistical improvement to enable better assessment of overall waste generation (data referring to 2002 expected in 2004).

Waste quantities are influenced by how efficiently resources are used in production and by the quantities of goods produced and consumed. The importance of quantity means that in general there is a strong link between GDP and waste generation. Reported total waste generation in OECD Europe increased by nearly 10 % between 1990 and 1995 (EEA, 1998a) while GDP grew by about 6.5 %. The big challenge is to de-link waste generation from economic growth.

For each Member State, waste quantity/capita has been plotted against the economic activity related to the selected waste streams (fig w1c). Economic activity related to municipal waste is final consumption by households expressed in Purchasing Power Standard (PPS). Economic activity related to construction and manufacturing waste is the fraction of GDP originating in those sectors.

The generation of municipal and construction wastes seems well correlated with the economic activity that gives rise to the generation of the waste. For manufacturing waste there are significant variations between Member States and no general correlation with the level of economic activity. Some countries, like Germany and Denmark, generate relatively little waste per unit of activity, others relatively more. Some countries may, therefore, have reduced the amount of waste per unit of activity. This may indicate the use of the cleaner technology (including internal recycling) in production, but may also be a result of differences in industrial structure. For example much of heavy industry in Western Europe has closed down due to competition from Eastern Europe and Asia. Inadequacies in waste statistics make it impossible to draw more precise conclusions. Overall, the decline in waste from manufacturing in some countries, supposedly due to better use of cleaner technology, has not been sufficient to neutralise the increase in total waste quantities due to the growth in the amounts of goods produced and consumed.

There is no general correlation between quantities of waste from energy production and the related economic activity. This probably reflects differences in energy supply systems between countries. Coal-fired power plants generate large amounts of fly ash, nuclear power plants generate only small amounts of waste, and hardly any waste is produced from hydroelectric power stations.

For hazardous waste a correlation between GDP and waste quantities can be demonstrated for data for 1995 but not for 1990. There were large changes in awareness of hazardous waste and in definitions and classification procedures between these dates. The apparent correlation in 1995 may be coincidental and therefore no figure is included here.

DATA

W1a: Total waste generation by countries 1990 to 1998 in 1000 tonnes

	1990	1992	1993	1994	1995	1996	1997	1998
	1000 tonnes							
Austria					23800	26500		
Belgium				26580				
Denmark				11105	11466	12912		
Finland		45500						
France			235300					
Germany	376973		338602					
Greece		15612						
Iceland		178		180	183	186		
Ireland					10022			
Italy					106129			
Luxembourg					1987			
Netherlands	50135			50060	51284	51821		
Norway								
Portugal				6012				
Spain								
Sweden			70791					
UK					301000	292300		

W1b: Waste generation in 1000 tonnes by sector and country 1995

Country	Total[21]	Construction & demolition[22]	Energy & gas[23]	Manufac-turing[24]	Mining[25]	Other[26]	Municipal waste[27]
Austria[1]	25770	6400	775	14284	:	201	4110
Belgium[2]	28864	7718	1135	13359	389	1256	5007
Denmark[3]	11609	3427	1775	2736	-	845	2826
Finland[4]	43800	8000	3000	15400	15000	300	2100
France[5]	235600	24000	:	101000	75000	:	35600
Germany[6]	338602	131645	25310	65119	67813	:	48715
Greece[7]	20805	3400	7000	2905	3900	:	3600
Ireland[8]	10476	1520	353	3781	2200	774	1848
Italy[9]	106129	14311	1330	22208	:	42500	25780
Luxembourg[10]	1987	1499	:	:	:	189	299
Netherlands[11]	44072	13650	1410	19970	326	:	8716
Portugal[12]	8066	3200	392	418	472	84	3500
Spain[13]	99209	115	:	13800	70000	380	14914

Sweden[14]	66290	1500	600	13990	47000	:	3200
United Kingdom[15]	265000	70000	13000	56000	82000	15000	29000
EU 15[16]	1287922	290385	56080	344970	364100	61529	189215
Iceland[17]	189	:	:	9	:	30	150
Liechtenstein[18]	:	:	:	:	:	:	
Norway[19]	17188	3578	:	3288	7600	:	2722
EEA area[20]	**1323656**	293963	56080	348267	371700	61559	192087

Notes:
1) All figures refer to 1995 except "Mining" and "Energy" (1993) and "Municipal" (1996). OECD Environmental Data Compendium 1997, OECD/Eurostat (provisional 1998 questionnaire), Federal Waste Management Plan Austria, 1998 and Federal waste management Plan, 1995. Austria Federal Ministry of the Environment. The figure on municipal waste is household waste only.
2) All figures refer 1994 except for "Energy" (1995), regarding "Construction waste" data from Brussels are from 1992. Data for the other regions in Belgium are from 1994. OECD Environmental Data Compendium 1997, Waste generation in Europe 1985 - 1997, Eurostat Theme 8, Luxembourg 2000, OECD-questionnaire 1996 for municipal waste. For household waste OECD-questionnaire 1996 and Comments of 2. April 1997 from Belgium to draft OECD, Compendium 1997.
3) All figures refer to 1995 except for "Energy" 1997. OECD Environmental Data Compendium 1997, OECD/Eurostat (provisional 1998-questionnaire) and Waste statistics 1996 from Danish EPA, 1997.
4) All figures refer to 1992 except, 'Total', 'Other' and 'Municipal' from 1994. 70% eg waste from C&D is surplus soil. The Finish National Waste Plan, 1998, OECD-Compendium 1997 and letter of 070898 to the EEA from Juhani Puolanne, Finish Environment Institute
5) Figures are from : 1992 ("Mining" and "Construction"), 1993 ("Manufacturing" and "Total"), 1994 ("Municipal") and 1996 ("Energy"). OECD Environmental Data Compendium 1997, Letter from Jean Louis Bergey, ADEME. 14-07-2000, Ministry for Housing, Physical Planning and the Environment (VROM), Netherlands, 1996: Comparison of household waste figures for various countries in Europe and OECD, Environmental Compendium, 1997 and figures for mining (75 million tonnes) and construction waste (25 million tonnes) from Eurostat, Environment statistics 1996
6) All figures refer to 1993. The figures for "Energy" includes 'water purification and distribution' and rest of 'mining' but excluding residues from waste incineration with energy recovery.
7) All figures refer to 1992 except "Municipal" (1991) and "Mining" (1995). The figure for manufacturing is a partial total according to letter of 010998 from the Greece Ministry of Environment, Physical Planning and Public works to the EEA. The figure on "Mining" includes only asbestos quarrying. OECD Environmental Data Compendium 1997, OECD 1997: National Accounts 1983-1995, OECD/Eurostat (provisional 1998-questionnaire) and Letter from Greek NRC concerning Construction and Demolition waste in Greece.
8) National Waste Database Report 1995, Irish EPA 1996 and OECD Compendium 1997
9) All figures are from 1995 except 'Mining' (1997). OECD Compendium 1997, OECD/Eurostat joint questionnaire (February 2000)
10) Regarding Construction waste the amount represent construction waste disposed from regional centres for inert waste. Administration de l'Environnement, Luxembourg and Letter to the EEA from Julia Georgi, EPA Luxembourg (100898), OECD Environmental Data Compendium 1997 and Letter of 100898 from the EPA, Luxembourg to the EEA.
11) The figures refer to 1995 except for "construction", "mining" and "manufacturing" all from 1996. Manufacturing waste = industrial waste including about 4% process-independent waste. RIVM (Letter to the EEA from Huib Verhagen 100898) and OECD/Eurostat (provisional 1998-questionnaire).
12)All figures refer to 1994 except for "Municipal" (1995). Regarding "Manufacturing" the figures for Portugal are only related with the production of hazardous waste, which excludes the extracting industry. OECD Environmental Data Compendium 1997 and ETC/W
13) The figures refer to 1994 except for "Mining" (1993) and "Manufacturing" (1995). OECD, Environmental Compendium, 1997.
14) The figures refer to 1993 except for "Municipal" (1990), "Manufacturing" and "Mining" (1994). The figure on "Mining" only includes waste collected by municipalities. "Municipal" regards only Household waste.
15) The figures refer to 1990 except for "Energy" (1997) and "Municipal" (1995). The figure on "Mining" is the sum of furnace bottom ash and fuel ash OECD Environmental Data Compendium 1997, EPA UK: Waste strategy 2000 on waste oil and power station ash and Department of the Environment, Transport and the Regions, UK, 1997: Municipal Waste Management 1995/96. Scottish Office, 1996: Statistical Bulletin, Environment Series, Env/1996/5.
16) All figures refer to OECD Environmental Data Compendium.
17) All figures refer to 1995 except for "Municipal" (1994). OECD Environmental Data Compendium.
18) No figures available
19) All figures refer to 1993 except for "Mining" (1992) and "Municipal" (1995). OECD Environmental Data Compendium 1997 and Europe´s Environment, Statistical Compendium for the Second Assessment 1998.
20) The figures for EEA Area are the sum of the figures for EU, Liechtenstein, Norway and Iceland.
21) Source is OECD Environmental Data Compendium 1997 except for Austria (Federal waste management Plan, 1995. Austria Federal Ministry of the Environment), Belgium (Comments of 2. April 1997 from Belgium to draft OECD, Compendium 1997), Denmark (Waste statistics 1996, Danish EPA, 1997), Finland (The Finish National Waste Plan, 1998), Germany (Daten zur Umwelt, Ausgabe 1997), Ireland (National Waste Database Report 1995, Irish EPA 1996), Luxembourg (Letter of 100898 from the EPA, Luxembourg to the EEA) and the Netherlands (RIVM and letter to the EEA from Huib Verhagen (VRIM) 10-08-98)
22) Source is OECD Environmental Data Compendium 1997 except for Finland (Finish National Waste Plan, 1998 and letter of 070898 to the EEA from Juhani Puolanne, Finish Environment Institute), Germany (Estimations of Statischiches Bundesamt, Germany (Letter of 151098 from Federal Environment Agency, Germany to the EEA)), Greece (Letter from Greek NRC concerning Construction and Demolition waste in Greece.), Ireland (National Waste Database, 1995 (Irish, EPA)) and the Netherlands (RIVM (Letter to the EEA from Huib Verhagen 100898))
23) Most figures are excluding residues from waste incineration with energy recovery.
24) Source is "OECD Environmental Data Compendium 1997" except for Finland (Finish National Waste Plan, 1998 and letter of 070898 to the EEA from Juhani Puolanne, Finish Environment Institute), Germany (Estimations of Statischiches Bundesamt, Germany. Letter of 151098 from Federal Environment Agency, Germany to the EEA), The Netherlands (RIVM. Letter to the EEA from Huib Verhagen 100898)) and Portugal (ETC/W)
25)Source is OECD Compendium 1997 except for Austria, the Netherlands and Greece(OECD/Eurostat (provisional 1998 questionnaire))
26) In most cases the figure "other" is found by total waste amount subtracted waste from construction, energy, manufacturing, municipal and mining.
27)Source is OECD Compendium 1997 except for Austria (Federal Waste Management Plan Austria, 1998), Belgium (OECD-questionnaire 1996 for municipal waste. For household waste OECD-questionnaire 1996), France and Germany (Ministry for Housing, Physical Planning and

the Environment (VROM), Netherlands, 1996: Comparison of household waste figures for various countries in Europe), Ireland (National Waste Data Report, EPA, Ireland 1996), Luxembourg (Administration de l'Environnement, Luxembourg and Letter to the EEA from Julia Georgi, EPA Luxembourg (100898)), Netherlands (RIVM and CBS (Letter to EEA from Huib Verhagen (VRIM) 100898)), UK (Department of the Environment, Transport and the Regions, UK, 1997: Municipal Waste Management 1995/96. Scottish Office, 1996: Statistical Bulletin, Environment Series, Env/1996/5) and Norway (Europe´s Environment, Statistical Compendium for the Second Assessment 1998.)

Meta data

Technical information

1. *Data source:* Eurostat: "Waste Generated in Europe" Luxembourg 2000. ETCW enquiry on specific waste streams. Source for GDP: Eurostat (Cronos)
2. *Description of data*: Official reports from Member States.
3. *Geographical coverage*: EU plus Norway and Iceland.
4. *Temporal coverage*: The reference year for the OECD/Eurostat questionnaire 2000 is 1998, a few member countries will report for 1999 too and some member countries will not process any data from the recent years.
5. *Methodology and frequency*: Questionnaire with some limited guidelines and definitions send out every second year to OECD-members.
6. *Methodology of data manipulation*: Data taken direct from the source, estimate of simple index with base 1995 =100, for diagram W1a and estimate of simple percentage for diagram W1b

Quality information

7. *Strength and weakness*: Member countries are giving data to OECD/Eurostat on basis of a 'gentlemen's agreement' and only data which are available for other purpose. Some of the tables asked for can only be filled in for a few member countries.
8. *Reliability, accuracy, robustness, uncertainty*: Data is in some cases based on rough estimates, the necessary improvements in data collection will therefore lead to inevitable breaks in time series, already obvious in some cases.
9. *Further work required*: Statistical improvement needed in all Member States. The proposed Council Regulation on Waste Management Statistics will provide the necessary statistical improvement to give an assessment on overall waste generation.