

Orientering fra Miljøstyrelsen Nr. 2 2001

Waste Statistics 1998

Contents

1. INTRODUCTION	7
2. WASTE GENERATION	8
2.1 GENERATION	8
2.2 TREATMENT OF WASTE IN 1998	9
2.2.1 <i>Without slag, fly ash and construction/demolition waste</i>	11
2.3 TREATMENT BY SOURCES AND WASTE TYPES	12
3 RECYCLING	14
3.1 RECYCLING DISTRIBUTED ON FRACTIONS	14
3.2 PAPER AND CARDBOARD	15
3.3 GLASS	16
3.4 FERROUS METALS	17
3.5 ORGANIC WASTE FOR COMPOSTING, WOOD CHIPPING AND BIOGASIFICATION	18
3.6 TYRES	18
4 HAZARDOUS WASTE	20
5 IMPORTS AND EXPORTS OF WASTE	22
5.1 IMPORTS	22
5.2 EXPORTS	22
5.3 IMPORTS AND EXPORTS OF WASTE SUBJECT TO MANDATORY NOTIFICATION	23
5.4 OECD- CODES	26
6 WASTE FRACTIONS AND STATUS RELATED TO TARGETS FOR YEAR 2004	27
6.1 RESIDUES FROM WASTE INCINERATION PLANTS	27
6.2 WASTE FROM BUILDING AND CONSTRUCTION ACTIVITIES	29
6.3 WASTE FROM HOUSEHOLDS	30
6.3.1 <i>Domestic waste</i>	31
6.3.2 <i>Bulky waste</i>	32
6.3.3 <i>Garden waste</i>	33
6.3.4 <i>Household waste per capita</i>	34
6.4 WASTE FROM MANUFACTURING INDUSTRIES	35
6.5 WASTE FROM INSTITUTIONS, TRADE AND OFFICES	36
6.6 RESIDUES FROM COAL-FIRED POWER PLANTS	38
6.7 SLUDGE FROM MUNICIPAL WASTEWATER TREATMENT PLANTS	40
7 INCINERATION PLANTS AND LANDFILLS	41
7.1 INCINERATION PLANTS	41
7.2 LANDFILLS	41
Annex 1. Tables outlining waste generation	
Annex 2. Principles for distribution of waste received at recycling centres and transfer stations	

1 Introduction

In 1993, the ISAG (Information System for Waste and Recycling) was used for the first time. The 1998 reports are the sixth consecutive reports.

Reports to the ISAG for 1998 cover 420 plants distributed on 313 enterprises. In 1997, reports covered 424 plants distributed on 307 enterprises.

The results of the 1998 reports are presented in this publication, which is laid out as in previous years.

Chapter 2 describes general developments in generation and treatment of waste. In Chapter 3, recycling of waste is presented. Chapter 4 deals with generation and treatment of hazardous waste, and in Chapter 5 developments in imports and exports are described, both for ordinary waste and for waste subject to mandatory notification. In Chapter 6, a detailed description of developments in waste amounts and treatment of waste from different sources is given. Furthermore, figures are compared to targets for treatment in year 2004 in the Danish Government's Waste Management Plan 1998 - 2004, Waste 21. Finally, Chapter 7 gives an outline of Danish incineration plants and landfills.

The general picture for 1998 shows that:

- Total waste generation in 1998 amounted to 12,233,000 tonnes, which is 624,000 tonnes or 5 per cent less than in 1997. This decrease is mainly due to relatively large decreases in waste amounts from the very sensitive building and construction sector and from coal-fired power plants.
- If residues from coal-fired power plants are not included in statistics, waste generation decreased by 3 per cent.
- If also construction and demolition waste is kept apart, there has been an increase in waste amounts of 2 per cent.
- Recycling has been almost stable, accounting for 62 per cent in 1998 against 63 per cent in 1997. Landfilling is also relatively stable. A minor decrease of 1 percentage point to 15 per cent has taken place, whereas incineration increased by 2 percentage points to 22 per cent.
- Generation of domestic waste in households increased by 5 per cent, whereas generation of bulky waste decreased by 3 per cent.
- Garden waste amounts are almost similar to 1997.
- Waste generation in manufacturing industries and institutions/trade and offices increased by 2 per cent and 11 per cent respectively.
- Landfilling of waste from industry is still too high.

2 Waste Generation

2.1 Generation

Total Danish waste generation in 1995, 1996, 1997 and 1998 distributed on sources is shown in Table 1 and Figure 1.

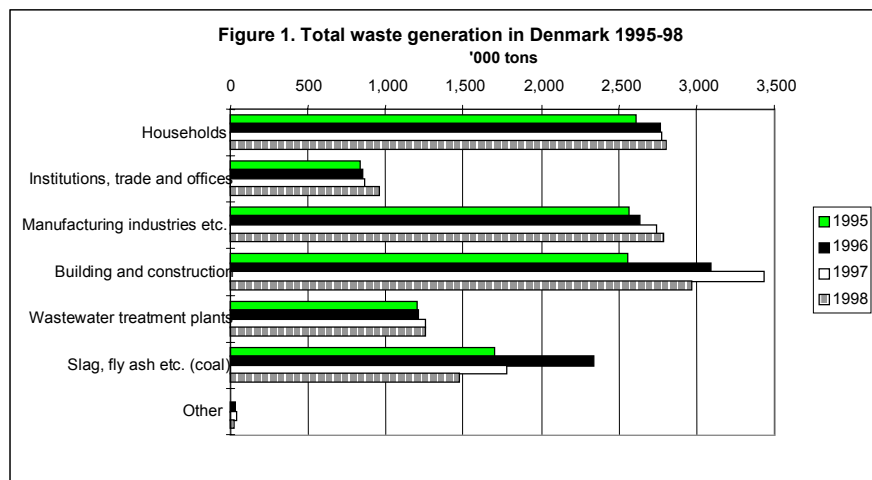
Source	*000 tonnes				Change in %
	1995	1996	1997	1998	1997-98
Households	2,610	2,767	2,776	2,796	1
<i>Domestic waste</i>	1628.1	1654.5	1620.8	1702.4	5
<i>Bulky waste</i>	617.9	639.1	587.7	572.4	-3
<i>Garden waste</i>	326.0	401.1	442.7	438.3	-1
<i>Other</i>	37.8	72.2	124.8	82.7	-34
Institutions/Trade and offices	834	851	861	955	11
Manufacturing industries etc.	2,563	2,632	2,736	2,783	2
Building and construction	2,559	3,088	3,427	2,962	-14
Wastewater treatment plants	1,195	1,212	1,248	1,251	0
Slag, fly ash etc. (coal)	1,699	2,332	1,775	1,469	-17
Other	6	30	34	18	-47
Total	11,466	12,912	12,857	12,233	-5

Sources: ISAG-reports for 1995, 1996, 1997 and 1998, Danisco, Association of Danish Recycling Industries and other large scrap dealers, Elsam, Elkraft, and reports to the Danish Environmental Protection Agency on sludge from municipal wastewater treatment plants applied to farmland etc. (for 1998, figures from 1997 have been used. Sludge in long-term storage has been included in amounts of sludge applied to farmland etc.), and incineration in sludge incineration plants (for 1998, figures from 1997 have been used). Figures for sludge are stated in wet weight. Figures have been adjusted for imports of waste. The generation of waste in relation to the ISAG reports has been found by stating the quantity of waste delivered to waste treatment plants from primary sources. For this purpose, "primary sources" means waste generators that are not waste treatment plants (reprocessing facilities, incineration plants, composting and biogas plants, and landfills). Waste such as slag, fly ash, and flue gas cleaning products from waste incineration plants is therefore not included in the statement as it would otherwise be counted twice. Furthermore, waste from the source "recycling centres/transfer stations" is distributed on other primary sources. The principles for distribution are given in Annex 2.

The following changes in waste generation from 1997 to 1998 may be pointed out:

- Total waste generation in 1998 amounted to 12,233,000 tonnes, which is 624,000 tonnes less than in 1997, corresponding to a decrease in waste amounts of 5 per cent.
- Overall, waste generation in households increased slightly in 1998 compared to 1997: 2,796,000 tonnes in 1998 against 2,776,000 tonnes in 1997. This increase covers an increase in domestic waste amounts of 5 per cent, from 1,620,800 tonnes in 1997 to 1,702,400 tonnes in 1998. Furthermore, bulky waste amounts decreased by 3 per cent from 587,700 tonnes to 572,400 tonnes, and garden waste amounts decreased from 442,700 tonnes in 1997 to 438,300 tonnes in 1998.
- Waste from institutions, trade and offices increased by 94,000 tonnes, corresponding to 11 per cent.
- Waste generation in manufacturing industries etc. has been relatively stable. There has been a minor increase of 2 per cent or 47,000 tonnes.
- Waste generation from building and construction activities decreased by 14 per cent or 465,000 tonnes.

- Waste generation at wastewater treatment plants has been relatively stable from 1997 to 1998.
- Waste generation at coal-fired power plants decreased by 17 per cent, from 1,775,000 tonnes in 1997 to 1,469,000 tonnes in 1998.



Source: See table 1 above.

The decrease in total waste generation is mainly due to a relatively large decrease in waste amounts from building and construction activities and coal-fired power plants. The decrease in construction and demolition waste amounts may be attributed to the recession in the building and construction sector in 1998. The decrease in waste amounts from coal-fired power plants is due to modest power exports to Norway and Sweden and to increasing use of natural gas and sustainable energy sources instead of coal in energy generation.

Waste generation at coal-fired power plants not only depends on Danish consumption, but also on weather conditions in Sweden and Norway. It is therefore reasonable to keep amounts of slag and fly ash apart from overall statistics. In that case, total waste amounts decreased by 3 per cent. If also construction and demolition waste is kept apart, waste amounts increased by 2 per cent.

2.2 Treatment of waste in 1998

Developments in treatment of total waste amounts are shown below. Treatment is furthermore related to targets for treatment in the Danish Government's Waste Management Plan 1998 - 2004, Waste 21.

'000 tonnes	1995		1996		1997		1998		2004	
	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes	%
Recycling	7046	62	7787	60	8046	63	7829	62	64	64
Incineration, of which	2306	20	2507	19	2622	20	2740	22	24	24
<i>Sludge incineration plants</i>	170		170		177		161			
<i>Incineration plants with energy recovery</i>	2136		2337		2445		2579			
Landfilling	1969	17	2524	20	2103	16	1868	15	12	12
Special treatment (1)	145	1	95	1	86	1	84	1	0	0

Sources: ISAG-reports for 1995, 1996, 1997 and 1998, Danish Government's Waste Management Plan 1998-2004, Waste 21, Danisco, Association of Danish Recycling Industries and other large scrap dealers, Elsam, Elkraft, and reports to the Danish Environmental Protection Agency on sludge from municipal wastewater treatment plants applied to farmland etc. (for 1998, figures from 1997 have been used. Sludge

in long-term storage has been included in amounts of sludge applied to farmland etc.), and incineration in sludge incineration plants (for 1998, figures from 1997 have been used).

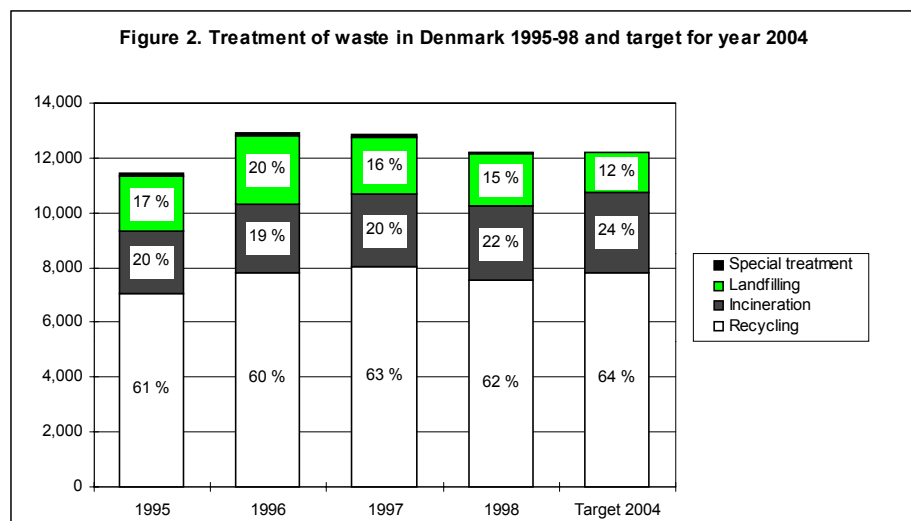
(1) States that waste is assumed to be treated separately by special treatment. Comprises treatment of hazardous waste, including special health-care waste.

Table 2 shows that 7,542,000 tonnes or 62 per cent of total waste amounts were recycled in 1998, corresponding to a decrease of 1 percentage point compared to 1997. Waste incinerated in 1998 amounted to 2,740,000 tonnes or 22 per cent, corresponding to an increase of 2 percentage points compared to 1997. In 1998, waste amounts going to landfill decreased compared to 1997: 1,868,000 tonnes corresponding to 15 per cent.

According to Waste 21, targets for stabilising developments in waste amounts shall be supplemented by a number of qualitative elements, such as better utilisation of resources in waste, quality in treatment and mitigation of problems relating to environmental contaminants in waste.

In general, the new targets for sectors and fractions mean that recycling will increase, more waste will be incinerated, and landfill capacity needs will decrease. Therefore, Waste 21 draws up a number of general targets for waste treatment that are different from targets in the previous waste management plan, The Government's Plan of Action for Waste and Recycling 1993-97.

Waste 21 targets for waste management in year 2004 are: 64 per cent recycling, 24 per cent incineration and a maximum of 12 per cent landfilling.



Sources: As table 2 above. Remark that the figure has been designed in a way that total waste amounts year 2004 are similar to waste amounts in 1998. This should not be taken as an expression of projections of total waste amounts.

Figure 2 shows that amounts of waste for landfilling decreased in 1998, but there is still some way to go before the targets of Waste 21 have been met.

It is assessed that the decrease in amounts of waste going to landfill is mainly due to the ban on landfilling of waste suitable for incineration.

Furthermore, amounts of residues from coal-fired power plants have decreased, and they are furthermore recycled to a higher extent than in previous years where they were mainly landfilled.

2.2.1 Without slag, fly ash and construction/demolition waste

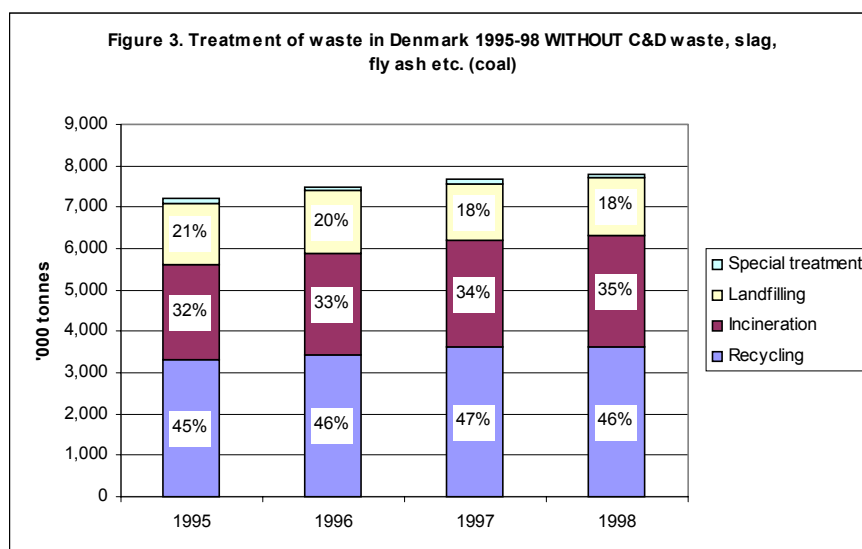
As mentioned above, the decrease in total waste amounts is mainly due to the decrease in waste amounts from coal-fired power plants and the building and construction sector. Therefore, it is interesting to keep waste from building and construction activities and residues from power plants apart from statistics and take a closer look at treatment of remaining waste fractions.

If residues from coal-fired power plants are kept apart, 58 per cent of remaining waste was recycled in 1998. This is a decrease of 3 percentage points compared to 1997. The proportion of remaining waste incinerated increased slightly from 24 per cent in 1997 to 26 per cent in 1998, whereas the proportion landfilled in 1998 remained unchanged from 1997.

In absolute figures this means that without slag and fly ash, 10,764,000 tonnes of waste were generated in 1998. Of this, 6,283,000 tonnes were recycled, 2,740,000 tonnes were incinerated, 1,658,000 tonnes were landfilled, and 84,000 tonnes were subjected to special treatment.

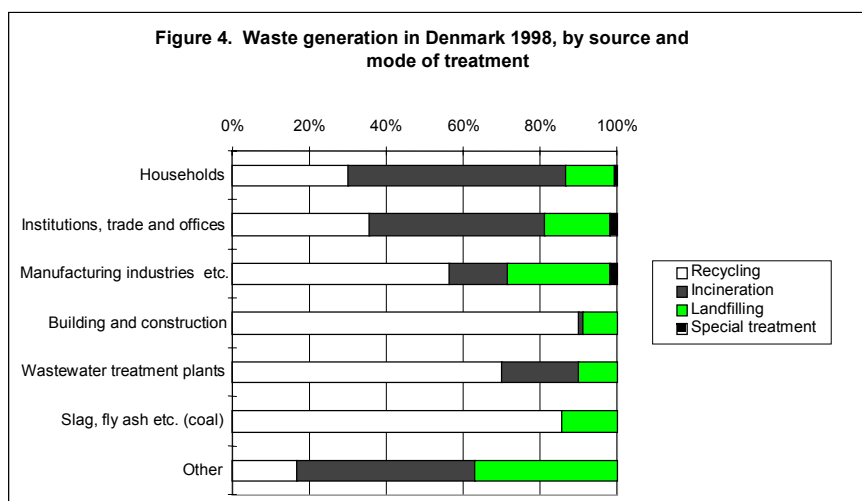
If also construction and demolition waste is kept apart from statistics, it is seen that no significant changes have taken place in the distribution among treatment options compared to 1997: 46 per cent of waste was recycled, whereas 35 per cent was incinerated and 18 per cent landfilled, cf. figure 3.

Residues from coal-fired power plants and construction and demolition waste are thereby seen to have a large impact on fulfilment of targets for treatment of waste.



2.3 Treatment by sources and waste types

Figure 4 shows total waste generation in Denmark in 1998, distributed on sources and mode of treatment. Figure 5 shows waste generation distributed on waste type and mode of treatment. Tables with detailed figures are given in Annex 1.



Source: as table 2.

It is seen from Figure 4 that the rate of recycling is particularly high when it comes to waste from building and construction activities, wastewater treatment plants and coal-fired power plants.

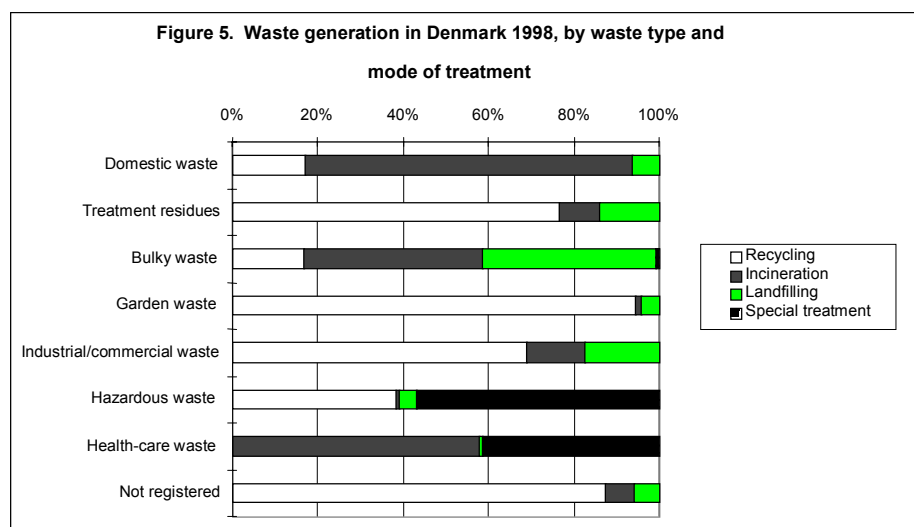
Targets for recycling in Waste 21 are met regarding waste from building and construction activities and sewage sludge, whereas there is still a little way to go before targets are met for residues from coal-fired power plants.

Waste from manufacturing industries also has a relatively high rate of recycling: 56 per cent. But still there is some way to go before the Waste 21 target of 65 per cent is met. The reason is that too much

industrial waste is landfilled: 27 per cent. The target for year 2004 is 15 per cent.

Similarly, the rate of recycling of waste from institutions, trade and offices is not high enough in relation to the targets in Waste 21. In 1998, only 35 per cent of this waste was recycled, and the target for year 2004 is 50 per cent. While the target for incineration of waste from this source has almost been met, there is still a long way to the target of a maximum of 5 per cent landfilling.

Figure 5 also shows that treatment of household waste does not meet the targets of Waste 21. With a rate of recycling of, for example, domestic waste of 17 per cent in 1998 there is still a long way to the target of 30 per cent recycling in year 2004.



Source: as table 2.

3 Recycling

3.1 Recycling distributed on fractions

Table 3 shows waste fractions that are recycled, either by reprocessing, composting or biogasification. The table is not an outline of output from these fractions.

	1995	1996	1997	1998
Oil and chemical waste	28	53	72	56
Paper and cardboard	557	548	583	623
Bottles and glass	92	99	89	104
Plastic	26	29	28	33
Food waste / other organic waste	198	193	230	194
Branches, leaves, grass etc.	376	452	528	551
Ferrous metals ^{1 and 4}	983	899	1,004	968
Automobile tyres	9	8	20	31
Concrete	485	942	1,167	780
Tiles	75	93	125	123
Other construction/demolition waste	526	532	520	507
Asphalt	694	737	853	654
Wood	10	15	21	24
Soil and stone	344	391	353	388
Other recyclables	108	166	240	228
Fly ash and slag from coal-fired power plants ²	1276	1213	911	859
Fly ash and slag from other sources except waste incineration plants	3	2	2	2
Flue gas cleaning products (gypsum, dry desulph. product, sulphuric acid) from coal-fired power plants ²	288	416	394	400
Sludge from municipal wastewater treatment plants for recovery on farmland, composting and biogasification ³	918	918	870	875
Sludge from other sources	50	81	40	141
Total	7,046	7,787	8,050	7,541

Sources: ISAG-reports for 1995, 1996, 1997 and 1998, (1) Association of Danish Recycling Industries and other large scrap dealers, (2) Elsam and Elkraft, (3) Reports to the Danish Environmental Protection Agency on sludge from municipal wastewater treatment plants applied to farmland etc. (for 1998, figures from 1997 have been used. Sludge in long-term storage has been included in amounts of sludge applied to farmland etc.), (4) Correction for ferrous metals removed from waste incineration plants has been made to avoid double counting. Some of the collective terms such as "Other recyclables", "Other construction and demolition waste" and "Soil and stone" may contribute – after separation has been completed – to additional quantities of items such as tiles, wood etc.

The most significant amounts are found for waste fractions relating to industry (ferrous metals), building and construction activities (for example concrete and asphalt), coal-fired power plants (fly ash, gypsum and slag) and wastewater treatment plants (sludge).

Waste fractions such as paper and cardboard, branches, leaves, grass etc. and glass also account for large amounts. A large proportion of this waste is generated in households.

In absolute figures, recycling of paper and cardboard, bottles and glass as well as plastic increased from 1997 to 1998, whereas recycling of, for example, ferrous metals and waste from the building and construction sector decreased.

Also recycling of fly ash and slag from coal-fired power plants decreased in absolute figures from 1997 to 1998. This is due to lower generation of such residues, as the rate of recycling actually increased by 14 percentage points.

3.2 Paper and cardboard

Consumption of virgin paper, paper collected for recycling, and exports of waste paper are shown in Table 4.

	1995	1996	1997	1998
Consumption of virgin paper ¹	1208	1181	1347	1304
Waste paper collected ²	557	548	583	623
Waste paper collected as a percentage of virgin paper	46	46	43	48
Danish waste paper sent to Danish paper mills ²	332	318	335	334
Net exports of waste paper ³	150	220	204	242

Sources: (1) Material stream analysis of waste paper from the Danish Waste Management Information Centre and Statistics Denmark. (2) ISAG reports for 1995, 1996, 1997 and 1998. (3) Statistics Denmark. The discrepancy between waste paper collected, and Danish waste paper sent to Danish paper mills + net exports, may be due to stock enlargement, and it may be a consequence of applying different statistical sources and statement methods.

From 1997 to 1998, a decrease in the consumption of virgin paper took place. At the same time, there has been an increase in waste paper collected, which means that the collection rate for waste paper reached 48 per cent in 1998.

Consumption of virgin paper per capita decreased slightly in 1998 compared to 1997: 250 kg in 1998 against 259 kg in 1997. Furthermore, 120 kg/capita paper and cardboard were collected in 1998 against 112 kg in 1997.

In 1998, net exports of waste paper amounted to 242,000 tonnes, which covers imports of waste paper of some 98,000 tonnes and exports of just above 339,000 tonnes.

Sources of waste paper collected are stated in Table 5. Collection of waste paper increased from 583,000 tonnes in 1997 to 623,000 tonnes in 1998, corresponding to an increase of just above 7 per cent.

This increase may be attributed to an increase in amounts collected from households and institutions, trade and offices, whereas amounts collected from manufacturing industries decreased.

Amounts collected from households and institutions, trade and offices increased by 14 per cent for both sources, whereas amounts collected from manufacturing industries decreased by 5 per cent.

	1995	1996	1997	1998
Households	173,333	160,469	183,116	208,486
Institutions, trade and offices	180,647	173,289	178,158	203,537
Manufacturing industries	203,054	214,015	220,935	210,278
Building and construction	172	163	234	255
Wastewater treatment plants		2	1	1
Not reported		213	731	0
Total	557,205	548,151	583,174	622,557

Source: ISAG reports for 1995, 1996, 1997 and 1998.

3.3 Glass

According to ISAG reports, recycling of bottles and glass from primary sources amounted to 104,000 tonnes in 1998. This is an increase of 15,000 tonnes compared to 1997. By only including waste from primary sources, however, a complete picture of total material streams is not obtained. Of special importance is recycling of glass during which several collection and treatment steps have been passed.

As a consequence, the following description of total recycling of glass is based on the material stream analysis for glass in 1997 made by the Danish Waste Management Information Centre.

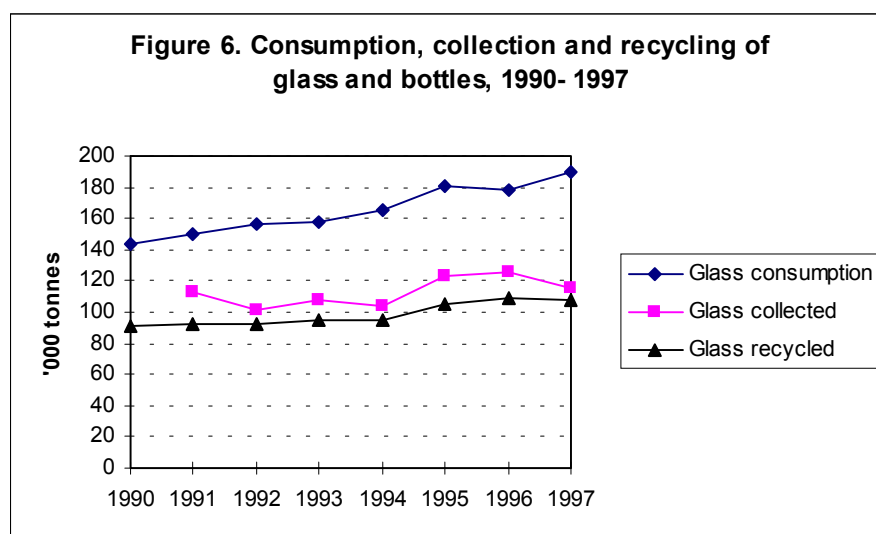
Apart from a minor decrease in 1996, consumption of glass packaging has been increasing throughout the 1990s. In 1997, 190,000 tonnes of glass packaging were used, which is 6.5 per cent more than in 1996. Also collection and recycling of glass packaging have been increasing throughout the 1990s.

However, amounts of collected glass decreased from 126,100 tonnes in 1996 to 115,200 tonnes in 1997. This means that the rate of collection in relation to total consumption decreased from 71 per cent in 1996 to 61 per cent in 1997. The reason for this decrease is not evident.

Correspondingly, there has been a minor decrease in amounts of recycled glass packaging. The rate of recycling in relation to total consumption reached 57 per cent in 1997 against 61 per cent in 1996.

Bottles for beer and soft drinks manufactured for reuse are not included in this statement. Refillable glass bottles, on average, make

35 trips. If these bottles were manufactured as single-use bottles, it would give an increase in waste glass of around 350,000 tonnes.



Source: Glass, bottles and cullets 1997. Danish Waste Management Information Centre

3.4 Ferrous metals

Table 6 shows amounts of collected ferrous scrap, distributed on consignees. It is seen that in 1998, 971,000 tonnes of ferrous scrap were recycled, and this is 41,000 tonnes less than in 1997. Total potential of ferrous scrap is not known precisely. Recycling industries normally estimate a recycling rate in excess of 90 per cent for ferrous scrap.

According to ISAG reports, the Danish Steel Works and other Danish foundries imported 216,000 tonnes of ferrous scrap in 1998, whereas scrap dealers imported 26,000 tonnes. Total imports in 1998 thereby amounted to 242,000 tonnes of ferrous scrap, which is 46,000 tonnes less than in 1997.

	1996	1997	1998
Danish ferrous scrap sent to foundries	356	406	462
Ferrous scrap exported by scrap dealers	612	684	535
Ferrous scrap imported by scrap dealers	35	78	26
Total recycling of Danish ferrous scrap	933	1012	971
Ferrous scrap imported by foundries	263	210	216

Sources: (1) ISAG reports 1996, 1997 and 1998, (2) information from the Association of Danish Recycling industries and other large scrap dealers. The statement used in table 6 is slightly different from the statement in table 3. For example, the correction for ferrous scrap removed from waste incineration plants (1996: 15,100, 1997: 19,774 and 1998: 12,226) has not been made, as this table shows the total balance for ferrous metals.

3.5 Organic waste for composting, wood chipping and biogasification

Organic waste amounts delivered to composting, wood chipping and biogasification are shown in Table 7.

There has been an increase of almost 10 per cent in amounts of organic waste for composting, wood chipping or biogasification from 1997 to 1998. This increase is mainly due to an increase in amounts of garden waste (branches, leaves, grass etc.) for composting, and sewage sludge for composting or biogasification.

Likewise, organic domestic waste for biogasification increased in 1998, and amounts are now at the 1996-level. By contrast, amounts of organic domestic waste for composting decreased slightly. This may be due to the fact that more and more local councils launch home composting schemes, and thereby amounts are not registered in the ISAG.

Amounts of other organic waste for biogasification were around 30 per cent lower in 1998 than in 1997, whereas amounts of other organic waste for composting remained stable.

Quantities of bark/wood chips and compost removed from the plants do not reflect the quantities generated. This quantity should be considered as reflecting the quantity sold or delivered free. The table shows that quantities of both compost and bark/wood chips removed from the plants were considerably smaller in 1998 than in 1997.

Table 7. Amounts of organic waste 1995-98 delivered to composting, wood chipping, and biogasification, and removal from the plants of compost, wood chips and screenings. Stated in '000 tonnes				
Material	1995	1996	1997	1998
Branches, leaves etc. for composting/wood chipping	376	452	528	551
Organic domestic waste for composting	34	36	46	42
Organic domestic waste for biogasification	5	10	1	9
Other organic waste for composting	6	2	1	1
Other organic waste for biogasification	120	111	139	96
Other organic waste for fodder production	32	34	42	44
Sludge for composting	7	6	7	57
Sludge for biogasification	59	92	52	91
Total	639	743	816	891
Removal from plants of bark/wood chips	49	34	44	15
Removal from plants of compost	102	162	214	197

Source: ISAG reports do not include information on the quantity of biogas generated. The table is designed on the basis of calculations and estimates based on ISAG reports for 1995, 1996, 1997 and 1998.

3.6 Tyres

In 1995, the Minister for Environment and Energy entered an agreement with a number of organisations, on a take-back scheme for used tyres from cars, vans, and motorcycles.

The purpose of the agreement is to ensure collection and recovery of used tyres in Denmark. Landfilling is avoided and resource recovery ensured, whereby material recovery is prioritised to energy recovery.

The scheme started 1st April 1995 and is financed by a fee on tyres comprised by the agreement and marketed in Denmark. The fee amounts to DKK 8 per new or old tyre, and DKK 4 per retreaded tyre.

According to the agreement, the target was a take-back rate of 60 per cent in 1995, whereas the target for 1996 onwards is 80 per cent.

The table shows that the rate of collection amounted to 87.3 per cent in 1998, which is 6.5 percentage points less than in 1997. However, also in 1998 the target for collection has been met by a good margin.

Table 8. Take-back of car, van and motorcycle tyres. Tonnes.				
	2nd half 1995	1996	1997	1998
Used tyres covered by the take-back scheme	8725	16705	18405	19378
Collected tyres	7600	12670	17229	16926
Of which for				
<i>Retreading or continued use</i>	3300	5477	4581	5472
<i>Temporary storage</i>	955	1133	0	0
<i>Rubber powder production</i>	3345	6060	12648	11454
Collection, % tyres covered by the scheme	87.1	75.8	93.8	87.3

Source: Statement from Danish Environmental Protection Agency for the period 1.7.95 - 31.12.95 and reports from the Danish Tyre Trade Environmental Foundation for 1996, 1997 and 1998. 2nd half 1995 includes 1,000 tonnes collected in the first half of 1995, thereby increasing the collection rate.

4 Hazardous waste

Table 9 on hazardous waste amounts includes waste from primary and secondary sources distributed on treatment options. Waste from secondary sources, such as waste from incineration plants, is not included in total waste generation, cf. Table 1. However, it is reasonable when assessing the total generation of hazardous waste to include waste from both primary and secondary sources.

Table 9 shows that total generation of hazardous waste in 1998 amounted to some 280,000 tonnes, which means that from 1997 to 1998 there was an increase of just above 30,000 tonnes in the generation of hazardous waste. This increase is mainly due to an increase in amounts of hazardous waste from secondary sources.

In 1998, Kommunekemi received around 73,000 tonnes of hazardous waste for special treatment. This is almost similar to the amounts received in 1997.

Fraction	Recycling		Incineration		Landfilling		Special treatment		Total	
	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
Primary sources										
Lead batteries (1)	14895	14644							14895	14644
Hermetically closed nickel-cadmium batteries (2)	95	85							120	120
Waste oil delivered to district heating plants (3)			22576	19797					22576	19797
Washing and cleaning agent waste							1457	1837	1457	1837
Organic solvents w.org. halogen without inflam. solvents							540	438	540	438
Organic solvents w.org. halogen mixed with inflam. solvents							940	174	940	174
Organic solvents with org. halogen and/or sulphur	-	1					56	38	56	39
PCB and PCT waste							34	437	34	437
Liquid residues from org. synthesis w. toxic subs., hal./sulph.							113	16	113	16
Liquid residues from org. synthesis w. halogen/sulphur							472	362	472	362
Sludge from plastic coatings containing PVC							126	74	126	74
Solid residues from recovering solvents cont. halogen							306	22	306	22
Solid residues from recov. solvents w. toxic subs., hal./sulph.							21	80	21	80
Solid residues from organic synthesis w. org. halogen/sulphur							32	26	32	26
Organic aromatic solvents without org. halogen/sulphur							6879	6525	6879	6525
Org. solvents without aromatic solvents or halogen/sulphur	-	7					2267	1667	2267	1674
Printing inks, paint, varnish with organic solvents	-	10					8793	11269	8793	11279
Printing inks, paint, varnish without organic solvents	-	19					6082	7656	6082	7675
Tar and rust-protection oils	-	0					686	381	686	381
Alcohol/water mixtures from nylon plates	-	1					115	97	115	98
Residues from distillation of mixtures with acetone, styrene and unhardened polyester							394	261	394	261
Organic metal compounds, except mercury compounds							131	70	131	70
Liquid organic residues from distillation without halogen/sulphur							1184	1051	1184	1051
Formaldehyde solvents < 30%							58	58	58	58
Aqueous phenol and formaldehyde emulsions							32	62	32	62
DI-isocyanides							218	197	218	197
Anti-freeze liquids	-	1838					828	748	828	2586
Latex and rubber sludge containing organic solvents							68	83	68	63
Acidic sludge from used oil refining							30	21	30	21
Waste glue with organic solvents/two-component glue	-	3					515	653	515	656
Solid residues from organic synthesis without org. halogen/sulphur	-	1246					427	563	427	1809
Slip from production of brake linings etc.							110	84	110	84
Beet pulp containing lead compounds							4	5	4	5
Acidic, aqueous solutions with chromium compounds	-	994					607	652	607	1646
Acidic, aqueous solutions with nitric acid, without hydrofluoric acid	-	4					227	169	227	173
Acidic, aqueous solutions with hydrofluoric acid and/or nitric acid salts	-	4					514	497	514	501
Acidic, aqueous solutions with hydrochloric/ sulphuric/ phosphoric acid	-	9					3520	3679	3520	3688
Photograph developing baths	-	1929					2509	2915	2509	4844
Photograph processing baths containing chromium							4	4	4	4
Fixing baths	-	1401					31	1035	31	2436
Base aqueous solutions without cyanide	-	8					2514	2215	2514	2223
Base aqueous solutions with cyanide							140	254	140	254
Metal hydroxide and metal oxide sludge	-	776					4816	5491	4816	6267
Smoke rinsing sludge and smoke filter dust							2803	2686	2803	2686
Dye-works waste							11	15	11	15
Aqueous sludge from pressurised impregnation of wood							55	75	55	75
Hardening salts							64	83	64	83
Mercury waste	-	62				0	185	188	185	250
Cloths and rags polluted with organic solvents	-	2					200	213	200	215
Waste from production and distribution of chemical neutralising agents							700	1206	700	1206
Waste from medicines							780	1098	780	1098
Chemical waste from laboratories etc.	-	1					2049	1277	2049	1278
Glass and mineral waste containing phenols							104	43	104	43

Other hazardous waste		4534					65	7238	65	11772
Motor oil		4776					11576	7254	11576	12030
Gear and hydraulic oil		3					37	163	37	166
Hot transmission oil							0.3	36	0.3	36
Other lubricating oil							80	900	80	900
Oil and petrol separators		335					505	826	505	1161
Drilling/cutting oil, unthinned		119					2	27	2	146
Oil emulsion		3200					12	73	12	3273
Lubricating grease							2	45	2	45
Motor petrol							3	25	3	25
Petroleum							0.5	0.3	0.5	0.3
Diesel oil							2	32	2	32
Gas oil							2	19	2	19
Fuel oil							5	143	5	143
Other products containing oil		4192					288	2680	288	6872
Cutting oil							2	36	2	36
Cutting fluids							2	8	2	8
Mineral drilling/cutting oil in water							8	26	8	26
Synthetic drilling/cutting fluids in water							4	26	4	26
Oil and chemical waste	28600	10300	9500		3000	16400	8100	1300	49200	28000
Health-care waste			5920	4130			2941	2963	8861	7093
Dust-emitting asbestos					7036	7635			7036	7635
Sulphuric acid from coal-fired power plants (4)	8000	6000							8000	6000
Total primary sources	51590	56503	37996	23927	10036	24035	78387.8	82570.3	178035	187050
Secondary sources										
Filter dust from flue gas cleaning (1)	10137	11046							10137	11046
Fly ash (5)					8579	5229	11742	17671	20321	22900
Flue gas cleaning products (5)					28617	28085	12383	31515	41000	59600
Total secondary sources	10137	11046	0	0	37196	33314	24125	49186	71458	93546
Total	61727	67549	37996	23927	47232	57349	102512.8	131756.3	249493	280596

Sources: (1) Registrations according to EU Regulation 259/93 on shipments of waste, (2) Calculations by the Danish Environmental Protection Agency. The difference between total quantity of waste hermetically closed nickel-cadmium batteries (120 tonnes) and the amount collected for recycling (85 tonnes) is due to the fact that the batteries are not collected separately, but comprised by the general collection of waste, (3) Payment of subsidies for recovery of waste oil, (4) Elsam, (5) The figure for special treatment covers that the quantity is in storage. Remaining items: ISAG reports 1997 and 1998 and Kommunekemi. Under the terms of Statutory Order no. 660 of 24th September 1986 on asbestos from the Ministry of Labour, asbestos is divided into three categories: I) dust emitting asbestos, II) asbestos that may emit dust, and III) non-dust emitting asbestos. Only asbestos of the first category is hazardous waste, but reports to the ISAG comprise asbestos of both categories I and II.

Remark that figures for 1997 and 1998 cannot be compared directly, as the basis for the statement of hazardous waste was changed in connection with the 1998 reports. This means that for 1997 only waste treated at Kommunekemi was stated at the detailed fraction level. Waste treated at other treatment plants was registered under the collective term “oil and chemical waste”.

5 Imports and exports of waste

5.1 Imports

Table 10 shows imported amounts of waste for 1997 and 1998 distributed on waste fractions and treatment options. Amounts of imported waste decreased by 6 per cent from 1997 to 1998 and account for just above 4 per cent of waste generated in Denmark.

Fraction	Recycling		Incineration		Landfilling		Special treatment		Total	
	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
Glass ¹	1500	1700							1500	1700
Paper and cardboard ²	105857	96857							105857	96857
Plastic ¹	18500	19000							18500	19000
Ferrous metals ^{1 and 3}	299312	262260							299312	262260
Other burnable ⁴			23693	17965					23693	17965
Special health-care waste ¹							29	0	29	0
Food waste/other organic ¹	8900	4700							8900	4700
Other recyclables ¹	2600	39200							2600	39200
Sludge ¹	12013	9652							12013	9652
Other notified waste ⁴	21164	8104			-	934	6837	7782	28001	16820
Total	469846	441473	23693	17965	0	934	6866	7782	500405	468154

Source: (1) ISAG reports 1997 and 1998, (2) Statistics Denmark, (3) Association of Danish Recycling Industries and other large scrap dealers (4) Registrations according to EU Regulation on shipments of waste.

91 per cent of imported waste is categorised as green waste for recovery according to the EU Regulation on shipments of waste, and it covers glass, paper and cardboard, plastic, ferrous metals, as well as organic waste. Waste imported is destined for recycling or incineration with energy recovery.

The remaining 9 per cent of waste imported is listed on the OECD amber and red lists and is subject to mandatory notification under the EU Regulation on shipments of waste, cf. Table 12. Waste of this type is destined for disposal (landfilling and incineration without energy recovery) or recovery (recycling and incineration with energy recovery).

5.2 Exports

Table 11 shows amounts of waste exported in 1997 and 1998. It is seen that amounts exported account for some 10 per cent of total waste generation in Denmark. In 1998, exports of waste were some 60,000 tonnes below the 1997 level. This decrease is mainly due to a decrease in exports of ferrous metals, whereas there was an increase in exports of, for example, fly ash and slag from coal-fired power plants and flue gas cleaning products from waste incineration plants.

Just above 93 per cent of amounts exported is classified as green waste destined for recovery, and it covers primarily the fractions paper and cardboard and ferrous metals, which alone account for 73 per cent of exports.

Table 11. Exports of waste in 1997 and 1998 stated by fraction. In tonnes		
	1997	1998
Glass ¹	1168	233
Paper and cardboard ¹	309658	338519
Plastic ¹	12718	11406
Ferrous metals ^{2 and 6}	699473	535500
Other burnable ⁶	9100	34500
Fly ash and slag from coal-fired power plants ³	113000	146000
Sulphuric acid from coal-fired power plants ³	0	0
Slag/flue gas cleaning prod. from iron/steel manufacture ^{4, 6}	25900	11000
Lead batteries ^{4 and 5}	14895	14644
Hermetically closed nickel-cadmium batteries ^{4 and 5}	95	85
Flue gas cleaning products from waste incineration plants ⁴	26510	37904
Ferrous metals from waste incineration plants ⁴	26692	8310
Other notified waste ⁴	22145	64695
Total	1,261,354	1,202,796

Sources: (1) Statistics Denmark, (2) Association of Danish Recycling Industries and other large scrap dealers, (3) Elsam and Elkraft (4) Registrations according to EU regulation on shipments of waste (5) Collection of nickel-cadmium batteries registered by the Danish Environmental Protection Agency (6) ISAG 1997 and ISAG 1998.

Exports of waste destined for disposal and waste destined for recovery, which are listed on the OECD red and amber waste lists, are subject to mandatory notification in accordance with the EU Regulation of shipments of waste. These exports amounted to some 137,000 tonnes in 1998, cf. table 12, which is 23,000 tonnes more than in 1997.

5.3 Imports and exports of waste subject to mandatory notification

Table 12 shows countries of export and import of waste subject to mandatory notification.

It is seen that Denmark did not import much waste for disposal in 1998: only just above 9,000 tonnes. Most waste was imported from Norway.

By contrast, some 36,000 tonnes of waste were imported with a view to recovery in 1998, which is 12,000 tonnes less than in 1997. Of these amounts, the large majority of waste came from Germany, consisting of fractions such as waste oil and sewage sludge.

Countries receiving most waste for recovery from Denmark in 1998 were Spain, Sweden and Germany, whereas waste for disposal was exported to Norway and Germany. Waste exported from Denmark for recovery or disposal abroad is typically household hazardous waste, lead batteries and residues from incineration of household waste.

In 1998, 38,000 tonnes of waste were exported for disposal, which is 10,000 tonnes more than in 1997. Just above 99,000 tonnes were exported for recovery. This is 13,500 tonnes more than in 1997.

Table 12. Imports and exports in 1998 of waste subject to mandatory notification. Stated in tonnes.				
Country	Disposal:		Recovery:	
	Exports from DK to:	Imports to DK from:	Exports from DK to:	Imports to DK from:
Belgium				
AC220	0	0	228.02	0
AA040	0	0	19.41	0
AA130	0	0	731.25	0
Total:	0	0	978.67	0
Great Britain				
AC220	0	54.88	0	35.03
AD010	0	0	0	145.69
AD110	0	0	67.54	0
RX100	0	0	1281.09	0
AA060	0	0	3068.41	0
AA100	0	0	4.25	0
AA120	0	0	300.58	0
AA180	0	0	2.55	0
Total:	0	54.88	4724.42	180.72
Finland				
AA050	0	0	106.58	0
AA070	0	0	1762.59	0
Total:	0	0	1869.17	0
France				
AA180	0	0	82.50	0
Total:	0	0	82.50	0
The Netherlands				
AB010	0	0	0	1860.59
AA030	0	0	340.10	0
AA070	0	0	17.14	0
Total:	0	0	357.24	1860.59
Ireland				
AC210	0	1666.12	0	3012.42
AC220	0	0	0	1561.71
AD010	0	354.99	0	2558.64
AA060	0	0	936.13	0
Total:	0	2021.11	936.13	7132.77
Iceland				
AC220	0	328.12	0	0
Total:	0	328.12	0	0
Norway				
AB020	25163.60	0	0	0
AC030	0	11.30	0	150.92
AC090	0	894.10	0	0
AC210	0	113.70	0	0
AD070	0	0	0	43.95
AD090	0	0	0	57.94
AD150	0	0	0	67.88
RA010	0	10.82	0	0
RA020	0	1668.12	0	0
RX100	0	3341.95	0	25.4
AA020	0	0	1705.17	0
AA110	0	25.46	0	0
Total:	25163.60	6065.45	1705.17	346.09

Poland				
AA070	0	0	0	2.82
Total:	0	0	0	2.82
Spain				
AA010	0	0	11045.67	0
Total:	0	0	11045.67	0
Sweden				
AB070	0	0	729.89	0
AC030	0	0	0	1630.64
AC150	0	11.43	0	0
AC170	0	0	3408.96	0
AC210	0	238.02	0	0
AD060	0	0	1959.85	0
AD070	0	0	0	486.57
AD160	0	0	14143.19	0
RX100	0	0	23420.18	851.58
AA030	0	0	110.82	0
AA100	1.46	0	0.30	0
AA130	0	0	0	20.35
AA170	0	0	14599.26	0
AA180	0	0	55.50	0
Total:	1.46	249.45	58427.95	2989.14
Germany				
AB010	0	0	0	48.68
AB020	12740.22	0	8309.93	0
AB040	0	0	161.77	0
AC030	0	0	2877.14	4866.86
AC090	0	0	14.50	0
AC170	0	0	0	2733.62
AC210	0	0	0	843.18
AC220	0	0	41.26	0
AC270	0	0	0	9651.79
AD040	26.68	0	0	0
AD060	0	0	0	3419.44
AD070	0	0	76.36	1.23
AD090	0	0	98.83	0
AD160	0	0	3002.99	0
RA010	0	0	0	25.54
RX100	0	0	2.93	1247.92
AA010	0	0	0	368.42
AA040	0	0	98.20	0
AA050	0	0	1364.78	0
AA060	0	0	3.99	0
AA070	0	0	113.81	0
AA100	115.04	0	168.89	0
AA130	0	0	2438.39	0
AA160	0	0	4.955	0
Total	12881.94	0	18778.71	23206.68
Total all countries:	38047.00	8719.01	98905.62	35718.80

Sources: Danish Environmental Protection Agency, database of shipments. The registration is made on the background of completed consignment notes under EU Regulation 259/93 on shipments of waste. The consignee must send a copy of the filled-in consignment note to the competent authorities within three working days after receipt of the waste. OECD-codes are defined in Commission Decision of 21st October 1994 (no. L 288/36, Official Journal of the European Communities of 9th November 1994).

5.4 OECD codes

AA010 Dross, scalings and other wastes from the manufacture of iron and steel.

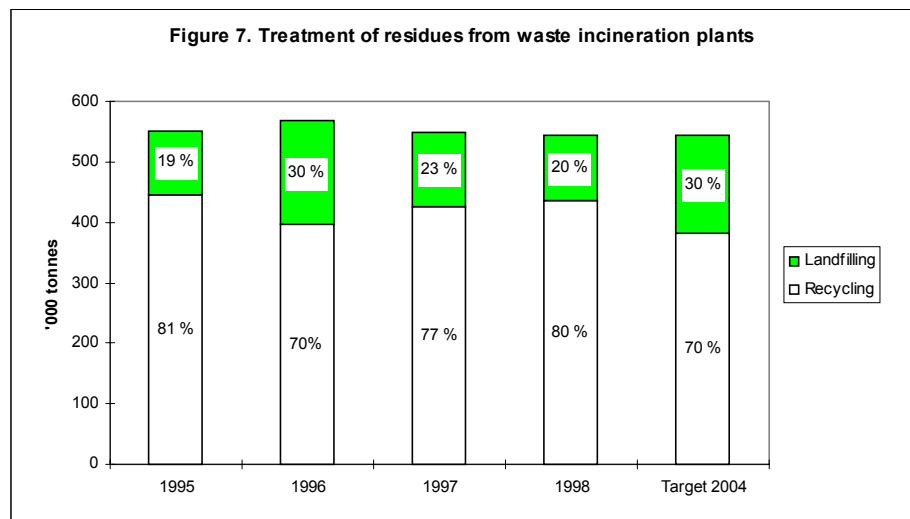
AA020	Zinc ashes and residues.
AA030	Lead ashes and residues.
AA040	Copper ashes and residues.
AA050	Aluminium ashes and residues.
AA060	Vanadium ashes and residues
AA070	Ashes and residues containing metals or metal compounds not elsewhere specified or included.
AA130	Liquors from the pickling of metals.
AA100	Mercury waste and residues.
AA120	Galvanic sludges.
AA160	Ash from incineration of printed circuit boards
AA162	Photographic film ash.
AA170	Lead-acid batteries, whole or crushed.
AA180	Used batteries or accumulators, whole or crushed, other than lead-acid batteries and waste and scrap arising from the production of batteries and accumulators, not otherwise specified or included.
AB010	Slag, ash and residues, not elsewhere specified or included.
AB020	Residues arising from the combustion of municipal/household wastes.
AB030	Waste from non-cyanide based systems which arise from surface treatment of metals.
AB070	Sands used in foundry operations.
AB080	Waste catalysts not on the green list.
AB100	Waste alumina.
AB110	Basic solutions.
AC030	Waste oils unfit for their originally intended use.
AC040	Leaded petrol (gasoline) sludges
AC070	Brake fluids.
AC090	Waste from production, formulation and use of resins, latex, plasticisers, glues and adhesives.
AC170	Treated cork and wood wastes.
AC210	Non-halogenated solvents.
AC220	Halogenated solvents.
AC260	Liquid pig manure; faeces.
AC270	Sewage sludge.
AD010	Waste from the production and preparation of pharmaceutical products.
AD030	Waste from the manufacture, formulation and use of wood preserving chemicals.
AD040	Inorganic cyanides, excepting precious metal-bearing residues in solid form containing traces of inorganic cyanides.
AD060	Waste oils/water, hydrocarbons/water mixtures, emulsions.
AD070	Waste from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish.
AD080	Wastes of an explosive nature, when not subject to specific other legislation
AD090	Waste from production, formulation and use of reprographic and photographic chemicals and materials, not elsewhere specified or included.
AD140	Wastes from industrial pollution control devices for cleaning of industrial offgases, not elsewhere specified or included.
RA010	Waste, substances and articles containing consisting of or contaminated with polychlorinated biphenyl (PCB) and/or polychlorinated terphenyl (PCT) and/or polybrominated biphenyl (PBB), including any other polybrominated analogues of these compounds at a concentration level of 50 mg/kg or more.
RC030	Leaded anti-knock compounds sludges
RX100	Other wastes not specified with an OECD-code

6 Waste fractions and status compared to targets for year 2004

6.1 Residues from waste incineration plants

Residues from waste incineration plants have not been included in statements of total waste generation presented so far, as waste would otherwise be counted twice.

Figure 7 shows amounts of residues (slag, fly ash, and flue gas cleaning products) from waste incineration in 1998, stated in tonnes, as well as treatment option.



Source: BIRG reports for 1995, 1996, 1997 and 1998, as well as Waste 21. The figure has been designed in a way that total waste amounts year 2004 are similar to waste amounts in 1998. This should not be taken as an expression of projections of total waste amounts.

As Figure 7 shows, by far the largest proportion of residues is recycled. However, residues cannot be recycled if heavy metal contents are too high – in that case they will be led to landfill.

According to Waste 21, environmental contaminants such as PVC, impregnated wood and waste electrical and electronic equipment may no longer be assigned to incineration.

This means that heavy metal contents in slag will drop significantly. However, at the same time requirements for recycling will become more stringent in consideration of groundwater, and therefore targets from the previous plan of action are maintained in Waste 21, which means a target recycling rate of 70 per cent.

Table 13. Slag, fly ash and flue gas cleaning products removed from

waste incineration plants in 1995, 1996, 1997 and 1998 related to treatment option. Tonnes				
	1995	1996	1997	1998
Slag removed from waste incineration plants	491,300	509,200	493,800	468,500
Fly ash and flue gas cleaning products removed/exported from waste incineration plants	63,300	71,900	61,300	82,500
Total removed from waste incineration plants	554,600	581,100	555,100	551,000
Landfilled slag from waste incineration plants	64,500	126,300	87,100	76,400
Landfilled fly ash and flue gas cleaning products from waste incineration plants	44,400	45,300	36,600	33,300
Fly ash and flue gas cleaning products exported for landfilling	2,564	21,103	26,510	37,900
Total landfilled from waste incineration plants	111,464	192,703	150,210	147,600
Slag from waste incineration plants registered as delivered to reprocessing plants	121,900	101,800	106,100	115,200
Slag from waste incineration plants estimated as delivered directly to recycling	304,900	281,100	300,600	276,900
Total recycling from waste incineration plants	426,800	382,900	406,700	392,100
Fly ash and flue gas cleaning products removed from waste incineration plants and estimated as in storage	16,336	5,497	-1,810	11,300

Source: Calculations based on ISAG reports for 1995, 1996, 1997 and 1998, and registrations according to the EU regulation on shipments of waste. Remark that Table 13 and Figure 7 cannot be compared directly, as exports are not included in Figure 7.

In Table 13, amounts of residues removed from waste incineration plants are detailed further.

Amounts of residues from waste incineration naturally depend on amounts of waste incinerated. Slag and flue gas cleaning products account for 20 per cent and 3 per cent respectively of waste feed.

The table shows that amounts removed from waste incineration plants in 1998 are almost similar to amounts in 1997 – there has only been a minor decrease of 4,000 tonnes.

Of amounts removed - 551,000 tonnes - 147,600 tonnes were landfilled, which is 2,600 tonnes less than in 1997.

Recycling of residues from waste incineration accounted in 1998 for 392,000 tonnes, which is some 15,000 tonnes less than in 1997. By contrast, it is estimated that just above 11,000 tonnes were sent to storage in 1998 with a view to future recycling.

6.2 Waste from building and construction activities

In 1998, waste from the building and construction sector amounted to 2,962,000 tonnes, which is 14 per cent or 465,000 tonnes less than in 1997. The reason for this decrease is believed to be the recession in the sector in 1998.

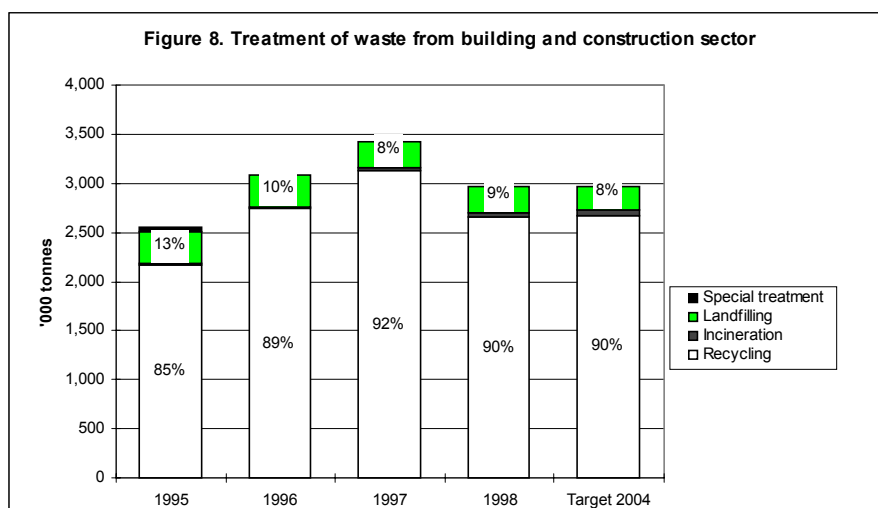
As it can be seen from Figure 8, by far the largest proportion of waste from the building and construction sector was recycled – only 1 per cent of waste was incinerated in 1998, whereas 9 per cent was landfilled. The recycling rate reached 90 per cent in 1998, which is 2 percentage points less than the previous year, but still sufficient for meeting the targets for year 2004.

However, there is still scope for improving waste treatment within the building and construction sector, and future efforts will focus on separating and treating the types of construction waste that are most harmful to the environment, such as PVC and impregnated wood.

Furthermore, we must become better at making “cradle-to-grave” assessments and applying environmentally correct design in new building projects.

There are several reasons for the high recycling rate for construction and demolition waste. Firstly, recycled waste is exempt from the waste tax, contrary to waste landfilled or incinerated. Secondly, a circular¹ on municipal regulations regarding separation of construction and demolition waste with a view to recycling came into effect in 1995.

And finally, the Ministry of Environment and Energy has entered an agreement with the Danish Demolition Association on selective demolition of building materials.



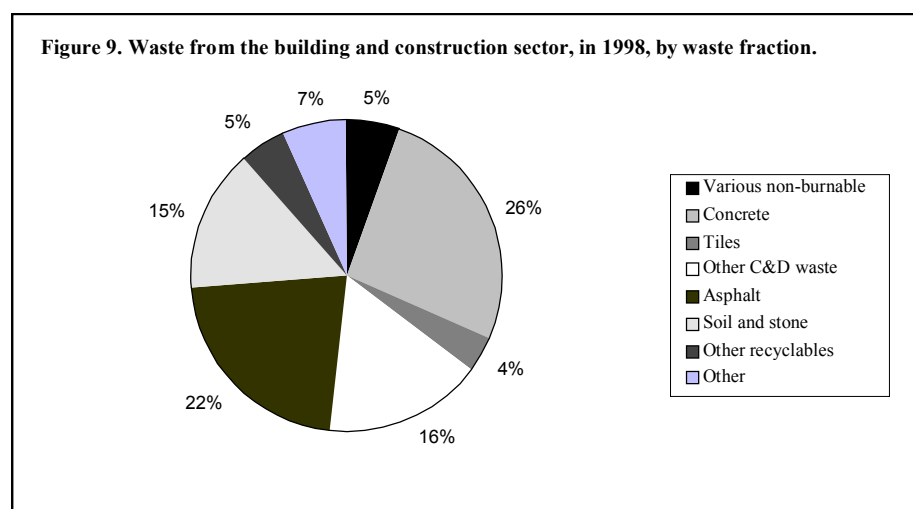
Source: ISAG reports for 1995, 1996, 1997 and 1998, as well as Waste 21. The figure has been designed in a way that total waste amounts year 2004 are similar to waste amounts in 1998. This should not be taken as an expression of projections of total waste amounts.

¹ Circular No. 94 of June 21, 1995

Figure 9 shows construction and demolition waste distributed on fractions. The most important fractions are concrete, asphalt, soil and stone.

A large proportion of construction and demolition waste is reprocessed in mobile crushing plants moved around the country for various assignments.

In some cases, both the owner of the crushing plant and his client report to the ISAG. The Danish Environmental Protection Agency is aware of this possible source of double counting, and great efforts are made in co-operation with enterprises reporting to subject data to quality assurance in order to avoid double counting.



Source: ISAG reports 1998. Legend: clock-wise from top.

6.3 Waste from households

Waste from households covers primarily the waste types domestic waste, bulky waste, and garden waste, which again can be divided into waste fractions such as paper and cardboard, bottles and glass, and food waste/other organic waste. See also Table 14 where fractions are stated, in so far as it has been possible to register them separately.

Table 14 shows that total waste generation in households in 1998 amounted to around 2,796,000 tonnes, which is a minor increase of some 20,000 tonnes compared to 1997. This increase is exclusively due to an increase in domestic waste amounts. Actually, bulky waste and garden waste amounts show a decrease.

Amounts of the fractions “various burnable” and “various non-burnable” from households decreased for the fourth consecutive year. At the same time, amounts of separately collected fractions like “paper and cardboard”, “bottles and glass”, “food waste/other organic”, “oil and chemical waste” and “ferrous metals” have increased.

This may indicate that waste from households is separated to a still higher extent, ensuring that a larger proportion of household waste may be recycled instead of going to incineration or landfill.

Table 14. Waste generation in households by fraction. Stated in tonnes	1996	1997	1998	Change in per cent 1997-1998
Various burnable	1,800,752	1,784,342	1,775,930	-0.5
Various non-burnable	164,356	155,590	146,707	-6
Paper and cardboard	160,469	183,116	208,486	14
Bottles and glass	64,903	67,771	83,033	23
Food waste/other organic	45,905	47,085	51,926	10
Branches, leaves, grass cuttings etc.	386,874	426,309	408,877	-4
Oil and chemical waste	16,214	12,668	14,395	14
Ferrous metals (1)	-	12,610	11,926	5
Other	127,479	86,571	94,569	9
Total	2,766,952	2,776,061	2,795,848	0.7

Source: ISAG reports 1996, 1997 and 1998. (1) Ferrous metals were included in the figure "Other" in 1996.

The decrease in burnable and non-burnable household waste amounts cannot outweigh the increase that has taken place in amounts of separately collected fractions – there has been an actual increase in the generation of these fractions.

Amounts of branches, leaves, grass etc. from households decreased for the first time in the years when Danish waste statistics have been based on the ISAG.

This may be attributed to the increasing number of home composting schemes launched in municipalities. Under these schemes, waste is no longer treated at a waste treatment facility and thereby not registered in the ISAG.

Developments and treatment of different waste types are detailed below.

6.3.1 Domestic waste

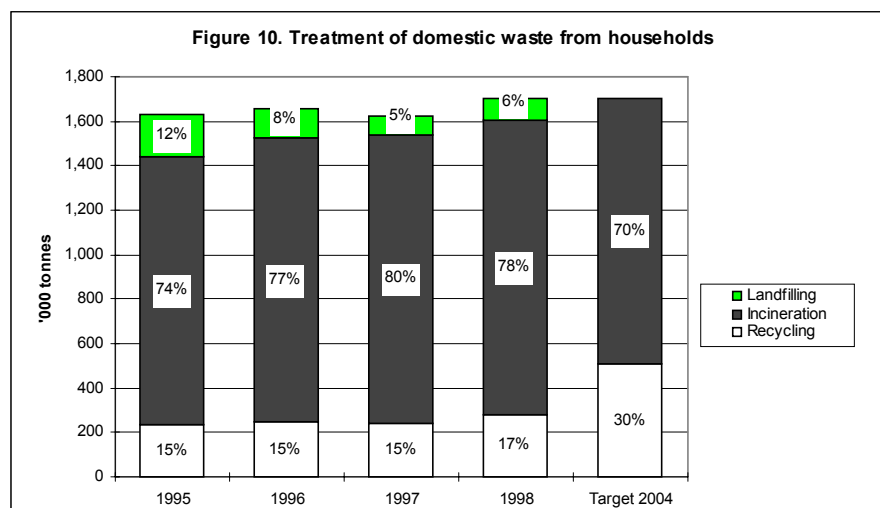
Domestic waste from households covers waste that results from normal consumption in private households, i.e. paper, bottles and glass, organic food waste, and residual waste, collected at the household at regular intervals, normally weekly or every second week.

As Table 1 shows, domestic waste amounts from households increased from 1,620,800 tonnes in 1997 to 1,702,400 tonnes in 1998, corresponding to an increase of 5 per cent.

Also recycling of domestic waste increased in 1998: 17 per cent was recycled against 15 per cent in 1997. Domestic waste led to incineration decreased from 1997 to 1998: 78 per cent against 80 per

cent, cf. Figure 10. By contrast, amounts of landfilled domestic waste increased slightly and accounted for 6 per cent in 1998 against 5 per cent in 1997.

This trend is in conflict with the general ban on landfilling of waste suitable for incineration, including domestic waste. It seems that temporary storage of a small amount of domestic waste takes place, which is in contradiction to current regulation.



Source: ISAG reports for 1995, 1996, 1997 and 1998, as well as Waste 21. The figure has been designed in a way that total waste amounts year 2004 are similar to waste amounts in 1998. This should not be taken as an expression of projections of total waste amounts.

The proportion of domestic waste led to incineration decreased in 1998, but still too large amounts of domestic waste are incinerated or landfilled. And as it is seen in Figure 10, there is still some way to go before the target for year 2004 of a rate of recycling of 30 per cent has been met.

To meet the target for recycling in year 2004 a number of initiatives will be launched in the coming years. For example, separate collection for recycling of glass, paper, and cardboard and plastic packaging will be extended.

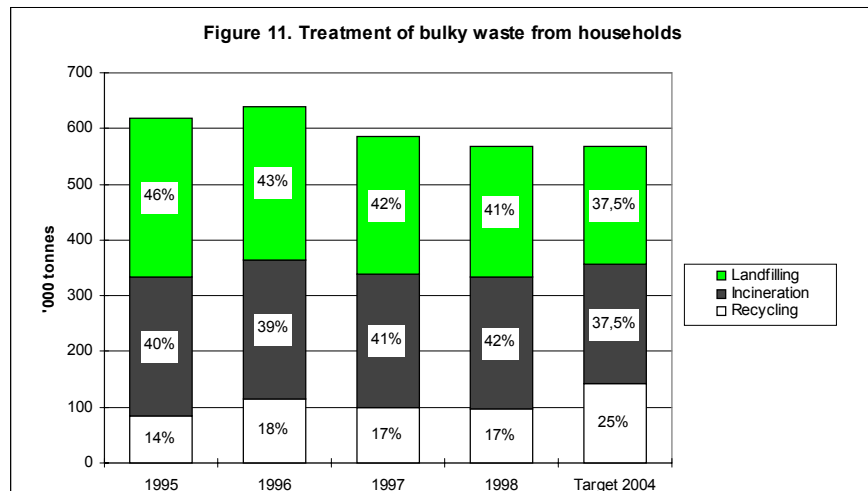
Furthermore, initiatives will be launched with a view to recycling of a larger proportion of organic domestic waste. Today, only around 4 per cent is recovered in biogas plants. The target is a recycling rate of 7 per cent of organic domestic waste in year 2004.

6.3.2 Bulky waste

In 1998, 572,400 tonnes of bulky waste were generated in Danish households, which is 3 per cent less than in 1997, cf. Table 1.

Amounts of bulky waste doubled from 1985 to 1996. This is due to a real increase in bulky waste amounts, but for a major part also to the introduction of collection schemes and bring schemes at recycling centres. However, bulky waste amounts decreased both in 1997 and 1998. From 1996 to 1998 there has been a decrease of 10 per cent.

It can be seen from Figure 11 that the distribution of bulky waste among the three treatment options of recycling, incineration and landfilling has been relatively stable since 1995.



Source: ISAG reports for 1995, 1996, 1997 and 1998, as well as waste 21. The figure has been designed in a way that total waste amounts year 2004 are similar to waste amounts in 1998. This should not be taken as an expression of projections of total waste amounts.

Therefore, efforts are called for in the coming years if the target for year 2004 of at least 25 per cent recycling and a maximum of 37.5 per cent incineration and landfilling shall be met.

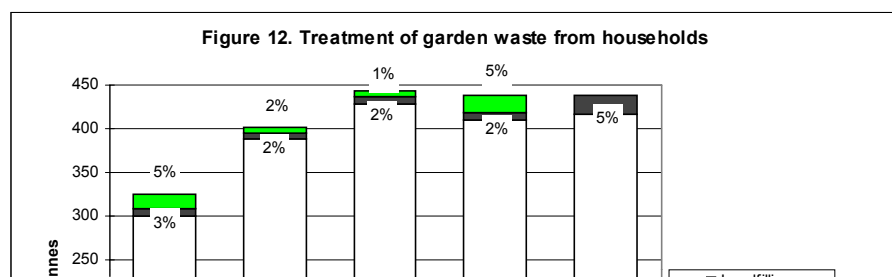
This may be achieved, for example, by separate collection of more bulky waste fractions such as cardboard, waste electric and electronic equipment, impregnated wood and PVC-containing waste.

6.3.3 Garden waste

Garden waste collected from Danish households in 1998 amounted to 438,300 tonnes, which is slightly less than in 1997, cf. Table 1.

Treatment of garden waste is shown in Figure 12. It is seen that 94 per cent of garden waste was recycled in 1998, which is 3 percentage points less than in 1997 and also less than the target for year 2004. The proportion of garden waste incinerated is unchanged compared to previous years and also below the target for year 2004. Incineration of garden waste is only allowed at approved plants. 5 per cent of garden waste was landfilled in 1998, which is 4 percentage points more than in 1997 and also more than the target for year 2004.

As Figure 12 shows, it is planned that all garden waste shall be either recycled or incinerated in year 2004. It is estimated to be impossible to increase recycling of garden waste further. Therefore, future efforts with respect to garden waste will concentrate on maintaining the present situation.



Source: ISAG reports for 1995, 1996, 1997 and 1998, as well as Waste 21. The figure has been designed in a way that total waste amounts year 2004 are similar to waste amounts in 1998. This should not be taken as an expression of projections of total waste amounts. The remarkable increase from 1995 to 1996 of 75,000 tonnes is not only attributable to actual increases. Around 20,000 tonnes derive from plants that should have reported in 1994 and 1995, but only did so from 1996.

6.3.4 Household waste per capita

Table 15 states the generation of household waste per capita and per household in 1997 and 1998. The table covers both waste type and waste fraction.

As the table shows, total waste generation in households stated per capita and per household has shown a modest increase: 2 kg and 1 kg respectively. Of this, amounts of domestic waste per capita and per household increased by 6 kg and 9 kg respectively, whereas bulky waste and garden waste amounts decreased.

The table also shows that a good half of total waste amounts from households is collected in separate collection schemes for paper/cardboard, bottles/glass, food waste/other organic, hazardous waste, bulky waste and garden waste. Of this, however, only just above one fifth of domestic waste is collected in separate collection schemes.

Table 15. Waste generation in households in 1997 and 1998 per capita and per household. Stated in kg.				
	1997		1998	
	Per capita	Per household	Per capita	Per household
Households total	526	1,161	528	1162
Domestic waste total	316	698	322	707
<i>Of which separately collected</i>				
<i>Domestic waste/paper</i>	31	68	35	77
<i>Domestic waste/glass</i>	12	27	15	33
<i>Domestic waste/food waste</i>	9	20	10	22
Household hazardous waste	2	6	3	6
Garden waste from households	84	185	83	182
Bulky waste from households	111	246	108	238
<i>Of which</i>				
<i>Paper</i>	4	9	5	10
<i>Glass</i>	1	2	1	2

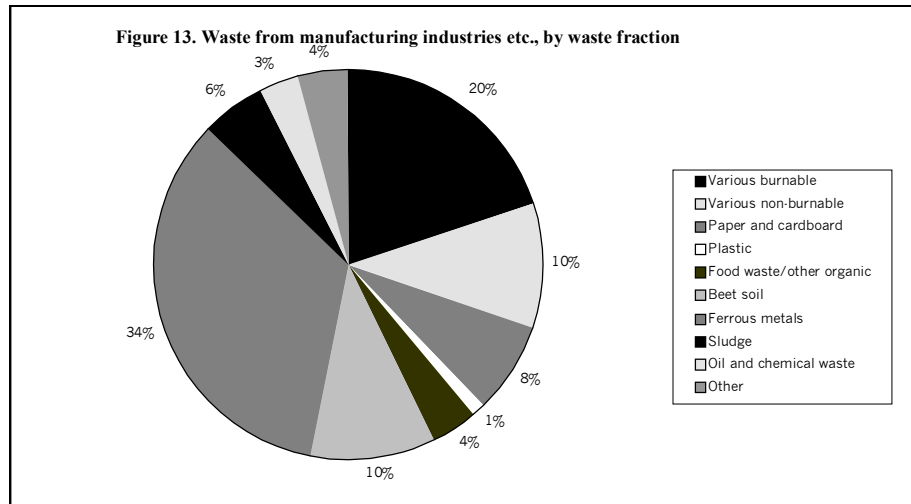
Source: ISAG reports 1997 and 1998. Population figures and number of households per 1st January 1997 and 1st January 1998 have been used.

6.4 Waste from manufacturing industries

Waste from manufacturing industries, distributed on waste fractions, is presented in Figure 13. It can be seen that ferrous metals, various burnable, various non-burnable and beet soil account for the largest waste fractions from industry.

In 1998, waste generation from manufacturing industries amounted to 2,783,000 tonnes, which is 50,000 tonnes more than in 1997.

In 1998, beet soil amounted to 288,000 tonnes, which is 75,000 tonnes more than in 1997, but 25,000 tonnes less than in 1996. Beet soil generation depends on weather conditions during harvesting of sugar beets. The sector continues to seek solutions to reduce amounts of soil sticking to beets during harvesting, but weather conditions were not as good in 1998 as in 1997.

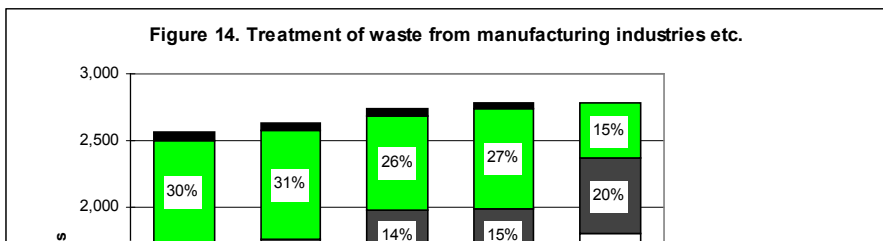


Source: ISAG reports 1998. Legend: clock-wise from top.

Figure 14 shows treatment of industrial waste. It is seen that 56 per cent of waste was recycled in 1998, which is 2 percentage points or 26,000 tonnes less than in 1997.

Amounts for incineration and landfilling also increased in 1998: by 36,000 tonnes and 39,000 tonnes respectively.

This means that 15 per cent of waste was incinerated and 27 per cent was landfilled in 1998. There is still some way to go before the target for treatment in year 2004 has been met.



Source: ISAG reports for 1995, 1996, 1997 and 1998, as well as Waste 21. The figure has been designed in a way that total waste amounts year 2004 are similar to waste amounts in 1998. This should not be taken as an expression of projections of total waste amounts.

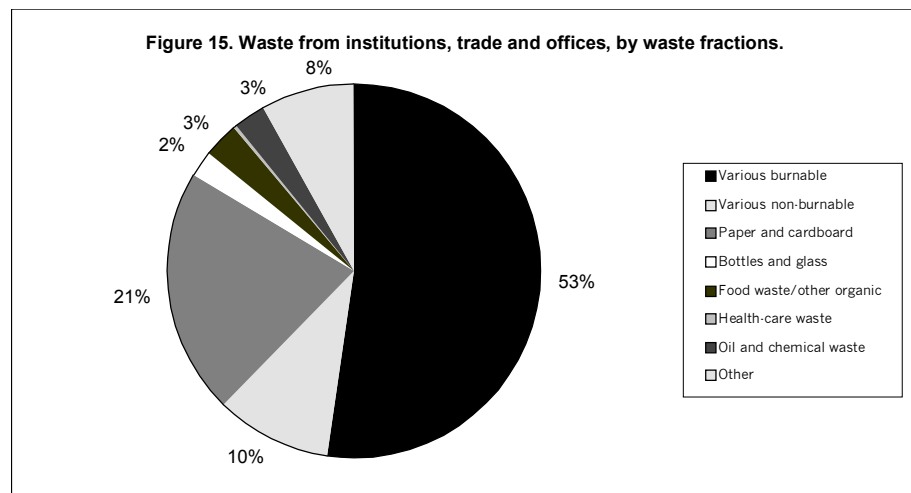
Amounts and composition of waste from manufacturing industries depend on the sector generating the waste, as well as size and number of enterprises. Possibilities of preventing or recycling waste will therefore differ from one waste fraction and sector to another.

In order to meet targets in Waste 21, the Danish Environmental Protection Agency has selected a number of waste types from industry to come into focus.

One such waste type is shredder waste. New treatment technologies shall contribute to diverting shredder waste from landfilling to recycling. Another waste type in focus is hazardous waste, for which collection schemes shall be established with a view to separation and recycling.

6.5 Waste from institutions, trade and offices

Waste from institutions, trade and offices, distributed on waste fractions, is shown in Figure 15. It is seen that the major proportion of waste – 73 per cent – falls within the fractions various burnable and paper and cardboard.



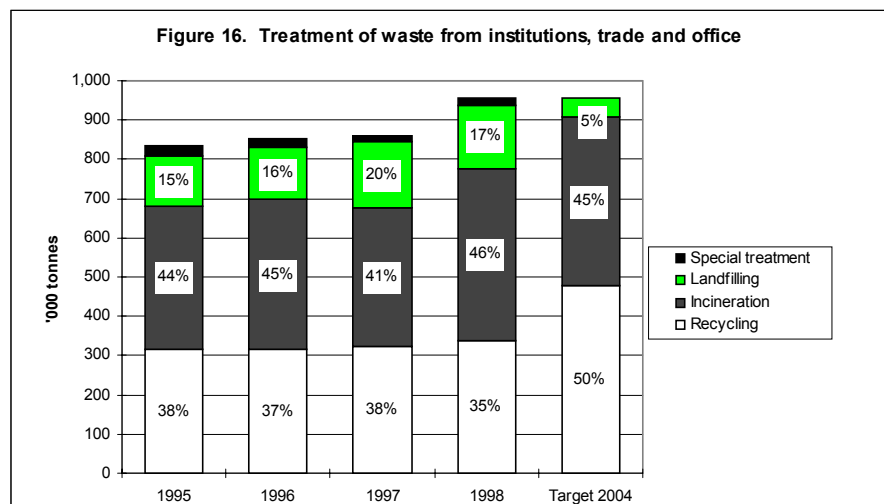
Source: ISAG reports 1998. Legend: clock-wise from top.

Waste from institutions, trade and offices amounted in 1998 to 955,000 tonnes, which is 94,000 tonnes or 11 per cent more than in 1997. Almost exclusively, this increase is attributable to the two fractions that make up the major proportion of waste from this sector: various burnable and paper and cardboard. These fractions increased by 110,000 tonnes and 25,000 tonnes respectively. By contrast, the fraction various non-burnable, which is mainly landfilled, decreased by 25,000 tonnes.

These changes in the composition of waste from institutions, trade and offices are also reflected in the distribution on treatment options, cf. Figure 16. Landfilling decreased in 1998 by 3 percentage points compared to 1997, which means that 17 per cent of waste from institutions, trade and offices was landfilled in 1998, whereas 46 per cent was incinerated against 41 per cent in 1997. The rate of recycling was lower in 1998 than in 1997, whereas absolute figures show a slight increase of 14,000 tonnes.

Figure 16 also shows that recycling in this sector is too modest and landfilling too high compared to the targets of Waste 21 of at least 50 per cent recycling and a maximum of 5 per cent landfilling in year 2004.

If targets are to be met, separation and collection of waste must be improved so that a larger proportion of recyclable material can be recycled and environmental contaminants separated and treated separately.



Source: ISAG reports for 1995, 1996, 1997 and 1998, as well as Waste 21. The figure has been designed in a way that total waste amounts year 2004 are similar to waste amounts in 1998. This should not be taken as an expression of projections of total waste amounts.

6.6 Residues from coal-fired power plants

Amounts of residues from coal-fired power plants vary over the years due to variations in Danish power exports to Sweden and Norway. For example, generation of residues was especially high in 1996 due to large exports of power. Since then, power exports have decreased.

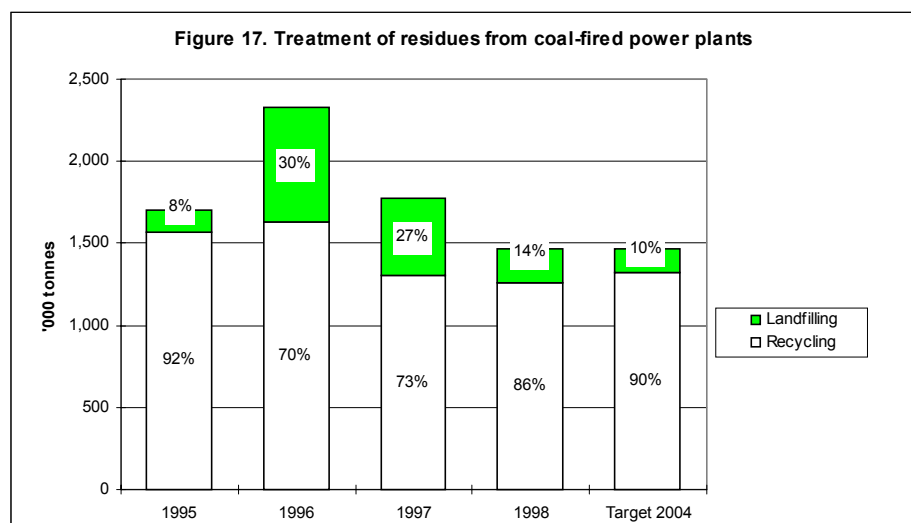
Under the terms of the Government's Energy Action Plan 1996, "Energy 21", natural gas and renewable energy sources, including bio-fuel, shall substitute coal in the long-term perspective. It is reflected in energy statistics² that an increasing part of electricity generation is based on natural gas and renewable energy sources.

Also in future, Energy 21 will result in a decrease in residues from coal-based energy generation, whereas there will be an increase in fly ash and bottom ash from bio-fuels. Recycling of bioashes will be given top priority in future.

Generation of residues from power plants amounted in 1998 to 1,469,000 tonnes, which is 17 per cent less than in 1997.

As it is seen in Figure 17, by far the major proportion of residues is recycled. In 1998, 86 per cent was recycled, which is an increase of 9 percentage points compared to 1997. In absolute figures, however, recycled amounts are similar to 1997.

The decrease in total amounts of residues is reflected in less landfilling of residues, as only 14 per cent was landfilled in 1998, against 27 per cent in 1997.



² Energy Statistics 1998, is found on the homepage of the Danish Energy Agency www.ens.dk

Source: ISAG reports for 1995, 1996, 1997 and 1998, as well as Waste 21. The figure has been designed in a way that total waste amounts year 2004 are similar to waste amounts in 1998. This should not be taken as an expression of projections of total waste amounts.

Table 16 states recycling options for residues from coal-fired power plants.

Table 16. Recovery in 1998 of residues from coal-fired power plants. In '000 tonnes.						
	Fly ash	Slag/ bottom ash	Gyp- sum	Dry desulph. prod.	Sulph. acid	Total
Cement	332		41			373
Concrete	246					246
Porous concrete	2					2
Asphalt	42			1		43
Roofing felt	3					3
Backfilling cf. Statutory Order 568	10	81				91
Backfilling cf. Part 5 approvals (Env. Protection Act)	106	15				121
Granulates				5		5
Fertiliser				3	6	9
Backfilling				26		26
Plaster board			319			319
Various		5				5
Storage		17				17
Total	741	118	360	35	6	1260

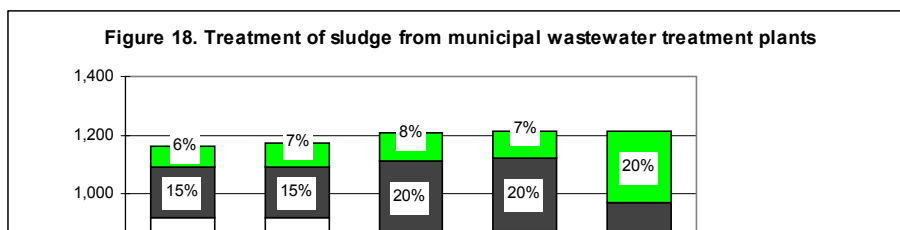
Source: Reports from Elsam and Elkraft.

Just above 82 per cent of recycled residues in 1998 was used as secondary raw materials in industrial manufacture of, for example, cement, concrete and plaster board. Just above 17 per cent was recycled either under the terms of Statutory Order no. 586 of December 6 1983 from the Ministry of Environment and Energy, or as backfilling with special approval under the Danish Environmental Protection Act.

In other words, these residues are either used in building and construction works as backfilling below buildings, roads and squares, backfilling in cable conduits and trenches, for noise barriers, or as backfilling in land reclamation works or harbour fillings.

6.7 Sludge from municipal wastewater treatment plants

Figure 18 shows treatment of sludge from municipal wastewater treatment plants. The statement only includes sludge, excluding sand and screenings. Sludge amounts are stated in wet weight, and amounted in 1998 to 1,213,000 tonnes, which is almost similar to 1997.



Source: ISAG reports for 1995, 1996, 1997 and 1998, as well as Waste 21. The figure has been designed in a way that total waste amounts year 2004 are similar to waste amounts in 1998. This should not be taken as an expression of projections of total waste amounts. For 1998, 1997 figures have been used. Sludge in long-term storage is calculated as recycling.

Treatment of sludge in 1998 is distributed on 72 per cent recycling, 20 per cent incineration and 7 per cent landfilling, which is similar to 1997.

Sewage sludge is recovered as fertiliser on farmland. In future, more stringent requirements for the contents of certain organic and chemical substances will be made in relation to application to farmland.

In the short-term perspective, the rate of recycling is therefore expected to decrease. However, in future, the quality of sludge is expected to improve due to the general policy of phasing-out of xenobiotic substances.

7 Incineration plants and landfills

7.1 Incineration plants

In 1996, total waste incineration capacity was 2,474,000 tonnes, distributed on 31 plants, cf. Table 17. In the beginning of the nineties, an extensive conversion of waste incineration plants from heating generation to combined power and heating generation took place. In this connection, capacity adjustments were effected in relation to expected waste amounts for incineration in future.

As a result of the ban on landfilling of waste suitable for incineration that took effect on 1st January 1997, increased pressure on incineration capacity is expected. Amounts of non-recyclable waste suitable for incineration will be surveyed regularly in order to ensure necessary incineration capacity.

Table 17. Number of incineration plants and available incineration capacity in 1989, 1993, 1994/95 and 1996	1989	1993	1994/95	1996
Number of incineration plants	38	31	31	31
Theoretic capacity, '000 tonnes	2164	2329	DH: 1217 CPH: 1315	DH: 1060 CPH: 1413
Nominal capacity, tonnes/hour	313	335	DH: 174 CPH: 188	DH: 171 CPH: 194

Sources: Rambøll & Hannemann 1990: Analysis of data for energy plants based on waste, for the Danish Environmental Protection Agency and the Danish Energy Agency. The Danish Environmental Protection Agency and the Danish Energy Agency 1994: Waste resources for waste incineration 1993 and year 2000. The Danish Environmental Protection Agency and the Danish Energy Agency 1997: Waste amounts for incineration year 2000. Figures for 1989 and 1995 are calculated on the basis of nominal capacity at 7,000 hours/year. Figures for 1996 are based on actual hours of operation of plants. District heating capacity (DH) may be subject to restrictions under the Act on heating supply. CPH = combined power and heating.

7.2 Landfills

Total remaining capacity at landfills in 1994 amounted to 24.7 million tonnes distributed on 64 sites. Remaining capacity at landfills for inert waste in 1994 was 6.4 million tonnes distributed on 49 sites. Remaining capacity at separately located mono-landfills amounted to 6.2 million tonnes in 1994, distributed on 63 sites.

A landfill is defined as a site receiving waste that, immediately or over time, presents a risk of pollution of groundwater, surface water and/or air. A landfill for inert waste is a site receiving waste that does not, or only to a very limited extent presents a risk of pollution of groundwater, surface water and/or air. A mono-landfill is a site

receiving only one or a limited range of waste types with known composition.

As a consequence of the above-mentioned ban on landfilling of waste suitable for incineration, in combination with an increased and further differentiated waste tax, a drop in landfill capacity needs is expected. Thus, at the national level, it is not expected that there will be a need for large extensions of landfill capacity in future.

Table 18. Number of landfills, inert waste landfills, and separately located mono-landfills, and available landfill capacity in 1992 and 1994					
	Landfills		Inert waste landfills		Separately located mono-landfills
	1992	1994	1992	1994	1994
Number of sites	60	64	70	49	63
Remaining capacity, million tonnes	30.9	24.7	14.3	6.7	6.2
Annual filling rate, million tonnes	2.1	1.7	0.9	0.12	0.8

Sources: Danish Environmental Protection Agency. Working report no. 54, Landfill capacity 1992, Danish Environmental Protection Agency 1997: Working report no. 33, Landfill sites in Denmark, and internal calculations.

Annex 1. Tables outlining waste generation

Table 1. Waste generation in Denmark in 1996, 1997, 1998, and target for year 2004. Stated by source and treatment option. Stated in '000 tonnes and in per cent.

ENTIRE COUNTRY	Recycling								Incineration								Landfilling								Special Treatment								Total					
	1996		1997		1998		Target		1996		1997		1998		Target		1996		1997		1998		Target		1996		1997		1998		Target		1996		1997		1998	
Source	'000 t	%	'000 t	%	'000 t	%	%	'000 t	%	'000 t	%	'000 t	%	%	'000 t	%	'000 t	%	'000 t	%	'000 t	%	%	'000 t	%	'000 t	%	'000 t	%	'000 t	%	'000 t	%	'000 t	%			
Households	777	28	818	29	839	30		1.545	56	1.602	58	1.585	57		428	15	343	12	355	13				16	1	14	0	17	1			2.767	21	2.776	22	2.796	23	
Domestic waste	249	15	239	15	281	17	30	1.274	77	1.298	80	1.324	78	70	132	8	83	5	98	6	0	0	0	0	0	0	0	0	0	0	0	0	1.655	13	1.621	13	1.702	14
Bulky waste	114	18	98	17	96	17	25	250	39	241	41	239	42	38	275	43	248	42	234	41	38			1	0	1	0	4	1	0	0	639	5	588	5	572	5	
Garden waste	388	97	428	97	411	94	95	6	2	8	2	8	2	5	6	2	6	1	20	5	0	0	0	0	0	0	0	0	0	0	0	0	401	3	443	3	438	4
Other	26	36	52	42	51	62	0	15	21	55	44	14	17	0	16	22	5	4	3	4	0	0	16	22	12	10	14	16	0	0	72	1	125	1	83	1		
Institutions/trade and offices	317	37	324	38	338	35	50	380	45	352	41	438	46	45	135	16	170	20	161	17	5	19	2	16	2	18	2	0	0	851	7	861	7	955	8			
Manufacturing industries etc.	1.397	53	1.590	58	1.564	56	65	361	14	389	14	425	15	20	822	31	707	26	746	27	15	52	2	51	2	47	2	0	0	2.632	20	2.736	21	2.783	23			
Building and construction	2.748	89	3.136	92	2.664	90	90	17	1	21	1	32	1	2	317	10	264	8	266	9	8	6	0	5	0	1	0	0	0	3.088	24	3.427	27	2.962	24			
Wastewater treatment plants	918	76	872	70	875	70	50	176	15	245	20	252	20	30	117	10	130	10	124	10	20	1	0	0	0	0	0	0	0	0	1.212	9	1.248	10	1.251	10		
Slag, fly ash etc. (coal)	1.629	70	1.300	73	1.259	86	90	0	0	0	0	0	0	0	703	30	475	27	210	14	10	0	0	0	0	0	0	0	0	2.332	18	1.775	14	1.469	12			
Other	1	3	6	17	3	17	0	27	91	13	39	8	46	0	2	6	15	44	7	37	0	0	0	0	0	0	0	0	0	30	0	34	0	18	0			
Total	7.787	60	8.046	63	7.542	62	64	2.507	19	2.622	20	2.740	22	24	2.524	20	2.103	16	1.868	15	12	95	1	86	1	84	1	0	12.912	100	12.857	100	12.233	100				

Source: ISAG reports 1996, 1997 and 1998, Waste 21 – The Danish Government's Waste Management Plan 1998 - 2004, Danisco, Association of Danish Recycling Industries and other large scrap dealers, reports to the Danish Environmental Protection Agency on sludge applied to farmland etc. (for 1998, figures from 1997 have been used) and incineration of sludge at waste incineration plants (for 1998, figures from 1997 have been used). Waste amounts from wastewater treatment plants include sand and screenings.

Table 2. Waste generation in Denmark in 1996, 1997 and 1998 stated by waste type and treatment option. Stated in tonnes and in per cent.

Waste type	Recycling						Incineration						Landfilling						Special Treatment						Total		
	1996		1997		1998		1996		1997		1998		1996		1997		1998		1996		1997		1998		1996	1997	1998
	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes	tonnes	tonnes
Domestic waste	284.940	16	263.907	16	301.280	17	1.311.750	76	1.331.666	79	1.366.690	77	140.307	8	89.031	5	109.128	6	0	0	0	0	0	0	1.736.997	1.684.604	1.777.098
Bulky waste	114.973	18	98.253	17	95.512	17	249.806	39	240.511	41	238.929	42	281.704	44	247.778	42	234.128	41	637	0	1.243	0	3.545	1	647.120	587.784	572.114
Garden waste	453.539	95	530.159	96	552.546	94	8.216	2	9.654	2	9.120	2	18.152	4	14.126	3	23.869	4	0	0	0	0	0	0	479.908	553.940	585.535
Industrial/commercial waste	4.334.406	70	4.909.762	73	4.380.896	69	710.881	11	766.597	11	858.403	14	1.146.153	18	1.061.182	16	1.104.627	17	5.485	0	2.968	0	987	0	6.196.925	6.740.509	6.344.913
Hazardous waste	45.308	31	50.679	35	51.472	38	6.364	4	9.387	7	768	1	10.252	7	4.359	3	5.414	4	85.490	58	78.731	55	76.062	57	147.413	143.156	133.716
Health-care waste	0	0	0	0	0	0	5.780	66	5.345	63	4.130	58	0	0	173	2	44	1	2.996	34	2.923	35	2.962	42	8.776	8.441	7.136
Treatment residues	2.551.344	69	2.177.586	70	2.149.540	77	213.595	6	258.746	8	260.952	9	919.417	25	669.305	22	389.854	14	0	0	0	0	0	0	3.684.357	3.105.637	2.800.346
Not registered	2.726	26	15.903	48	10.367	87	227	2	444	1	797	7	7.645	72	16.805	51	690	6	0	0	0	0	0	0	10.598	33.152	11.854
Total	7.787.236	60	8.046.249	63	7.541.613	62	2.506.618	19	2.622.351	20	2.739.789	22	2.523.632	20	2.102.758	16	1.867.754	15	94.607	1	85.865	1	83556	1	12.912.093	12.857.223	12.232.712

Source: ISAG reports 1996, 1997 and 1998, Waste 21 – The Danish Government's Waste Management Plan 1998 - 2004, Danisco, Association of Danish Recycling Industries and other large scrap dealers, reports to the Danish Environmental Protection Agency on sludge applied to farmland etc. (for 1998, figures from 1997 have been used) and incineration of sludge at waste incineration plants (for 1998, figures from 1997 have been used).

Annex 2. Principles for distribution of waste received at recycling centres and transfer stations.

Recycling centres/transfer stations

The ISAG covers a commercial source "recycling centres/transfer stations". This means that waste, for example from households, delivered via transfer stations is not recorded as waste from "households".

The source "recycling centres/transfer stations" is therefore distributed on the original sources. This distribution is obviously based on estimates.

- All domestic waste from "recycling centres/transfer stations" is converted into domestic waste from the source "households".
- All bulky waste, apart from the fractions "paper and cardboard" and "bottles and glass", from "recycling centres/transfer stations" is converted into bulky waste from the source "households".
- All bulky waste covering the fractions "paper and cardboard" and "bottles and glass" is converted into "domestic waste" and transferred from the source "recycling centres/transfer stations" to the source "households".
- All garden waste from "recycling centres/transfer stations" is converted into garden waste from the source "households".
- All industrial and commercial waste from "recycling centres/transfer stations", apart from the fractions "concrete", "tiles", "other construction and demolition waste", "asphalt", "wood", and "asbestos", is converted into industrial and commercial waste from the source "institutions, trade and offices".
- All industrial and commercial waste from "recycling centres/transfer stations", covering the fractions "concrete", "tiles", "other construction and demolition waste", "asphalt", "wood", and "asbestos", is converted into industrial and commercial waste from the source "building and construction sector".
- All hazardous waste from "recycling centres/transfer stations" is converted into hazardous waste from the source "households".
- All waste of the type "treatment residues" and "not registered" from "recycling centres/transfer stations" is converted into a new source: "other".

Bulky waste

- All waste of the type "bulky waste" from the sources "institutions, trade and offices", "manufacturing industries", and "building and construction sector" is converted into "industrial and commercial waste", although deriving from the same sources.

Ferrous metals

- Reports to the ISAG on ferrous metals are made according to the Statutory Order on waste by enterprises, including smelting works, that reprocess collected and separated ferrous metals by remelting. Scrap dealers that collect ferrous metals are not subject to mandatory reporting to the ISAG, but are requested to uphold a register in accordance with ISAG regulations.

- The Danish Environmental Protection Agency receives information from scrap dealers directly from the Association of Danish Recycling Industries and other large scrap dealers. In waste statistics, such ferrous scrap has been attributed to the source "manufacturing industry".