

# Waste Statistics 2004



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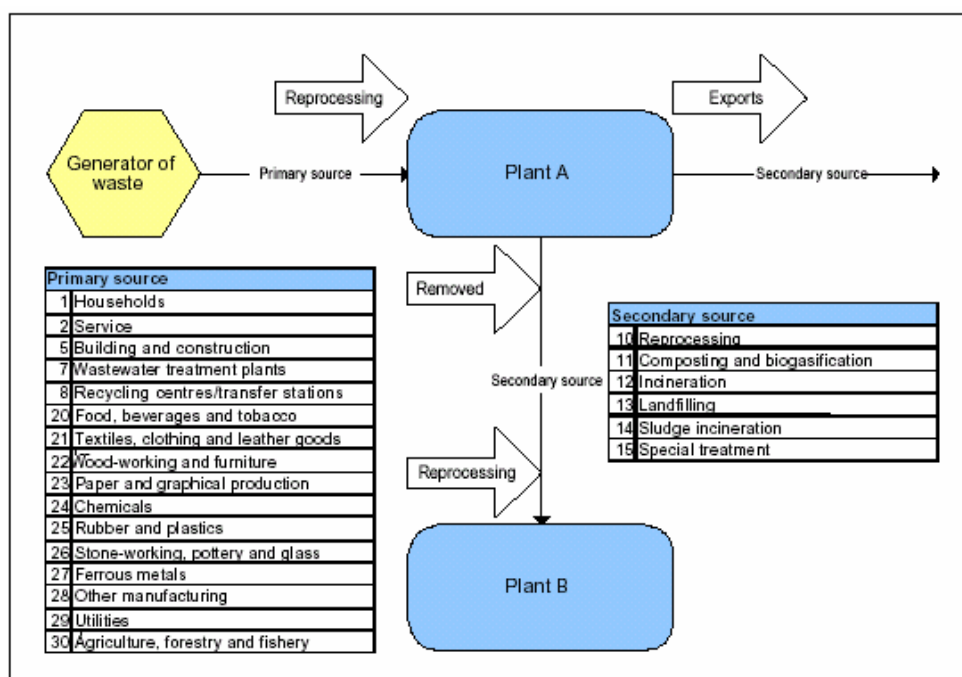
# Preface

## The ISAG Waste Information System

The ISAG (Information System for Affald og Genanvendelse - information system for waste and recycling) was used for the first time in 1993. The 2004 report is the twelfth consecutive report.

The ISAG is based on statutory registration and reporting from Danish waste-treatment plants for all waste entering or leaving the plants. Information concerning waste in the previous year must be reported to the Danish Environmental Protection Agency each year, no later than 31 January.

In order to avoid double reporting, it is important to distinguish between waste from direct (primary) sources and waste from plant (secondary) sources. The principle behind registration in the ISAG is shown below.



The Danish EPA carries out quality assurance of the information it receives and collects additional information from sector organisations and other sources. Each year the Danish EPA prepares a publication called "Waste Statistics", which gives an overview of waste composition and waste arisings in Denmark.

The publication also calculates the quantities of waste recycled, incinerated, and landfilled relative to the total waste amounts. Information is analysed between commercial sources and waste types.

## New methods

Since 2001 data have been reported according to new rules set out in Statutory Order No. 619 of 27 June 2000 on waste (Statutory Order on Waste). These new

rules have entailed a number of changes to the ISAG. For example, the source "manufacturing etc." was discontinued, so that since 2001 breakdown of industrial waste has been divided between 11 sectors.

Since 2001 there has been a shift between sectors in that waste volumes from industry have been falling, while waste volumes from the service sector have been rising. Waste volumes from industry thus fell by 37 per cent in the period 2000 to 2004, whereas in the service sector volumes increased by 64 per cent. In the period 2003 to 2004 waste volumes from industry went up by 1 per cent, whereas in the service sector volumes went up by 11 per cent. The shift between the two sectors may be due to faulty reporting as the source "manufacturing etc." was discontinued from 2001 following the amendment of the Statutory Order on Waste<sup>1</sup>. This means that waste from industry must be reported as originating from one of the following 11 subgroups: food, beverages and tobacco; textiles, clothing and leather goods; wood-working and furniture; paper and graphical production; chemicals etc.; rubber and plastic; stone-working, pottery and glass; ferrous metal; other manufacturing; utilities; agriculture, forestry, fishery etc. It is likely that some carriers find it easier to report industrial waste as service-sector waste. This should be remembered when reading the statistics. Moreover, parties reporting to the ISAG are encouraged to be very attentive to this risk of incorrect reporting.

Structural changes, i.e. the fact that society is changing from an industrial to a knowledge society, may be another reason for the shift between the two sectors. The shift could be supported e.g. by the fact that from the early 1990s to early 2001, the number of new enterprises in traditional industry has gone down, while the number of new enterprises in the knowledge services industry has increased dramatically<sup>2</sup>.

Packaging waste is a fairly new waste type in the ISAG and it does not yet reflect the total amount of cardboard and plastic packaging waste collected for recycling in Denmark. Parties reporting to the ISAG are therefore encouraged to be especially aware of this reporting possibility.

The principles for categorising waste from recycling centres/transfer stations with regard to the fractions glass and paper and cardboard have likewise been changed compared to the years 1994 to 2000. See Annex 2 for a more detailed explanation of the principles for this re-categorisation.

From 2001, sludge for mineralisation has been stated with a dry matter content of 20 per cent. This means that sludge which is mineralised is included in the statistics with the same dry matter content as other sludge. In previous years dry matter content for sludge for mineralisation was 1.5 per cent.

Please note that the changes to the way data is reported to the ISAG mentioned above, mean that care should be taken when comparing waste arisings at sector level from 2001 and later with waste arisings from previous years.

The government's Waste Strategy 2005-2008 presents a shift in focus from use of waste arisings as the only indicator for target fulfilment, to the supplementary use of new waste indicators for resource loss and environmental impacts.

### Reading guide

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<sup>1</sup> Statutory Order no. 619 of 27 June 2000 on waste.

<sup>2</sup> Statistical Ten-Year Review 2003 and 2004. Statistics Denmark.

Waste Statistics 2004 follows the same structure as previous reports: Chapter 1 describes general trends in waste generation, while Chapter 2 deals with waste recycling.

Chapter 3 deals with generation and treatment of hazardous waste, and Chapter 4 describes developments in imports and exports, both for ordinary waste and waste subject to mandatory notification.

Chapter 5 describes developments in waste arisings and treatment of waste from individual sources. Furthermore, this Chapter assesses the level of achievement of targets for treatment in the Danish government's Waste Strategy 2005-2008.

Chapter 6 presents the latest figures for the number of Danish incineration plants and landfills.

For the first years, tables and figures will show figures for every second year; whereas for the most recent years, there will be figures for each year. This is due to visual scope and to make it possible to present the tables in a format big enough to read.

Regrettably, an error was made in Waste Statistics 2003, where about 222,000 tonnes of sludge was counted twice. This means that overall waste arisings in 2003 totalled 12,614,000 tonnes and not, as stated previously, 12,835,000 tonnes. The tables and figures in Chapters 1 and 5.6 have therefore been corrected and Annex 1 has been changed to accommodate the correct 2003 figure.

# Summary and conclusions

The 2004 reporting to the ISAG comprises 394 plants owned by 256 enterprises. In 2003, reports covered 403 plants owned by 273 enterprises.<sup>3</sup>

Waste generation in 2004 is compared to targets for 2008 in the government's Waste Strategy 2005-2008.

The following summarises waste generation in 2004:

- In 2004, total reported waste arisings amounted to 13,359,000 tonnes, which is 745,000 tonnes, or 6 per cent, more than in 2003.
- If amounts of residues from coal-fired power plants are excluded from statistics, waste arisings in 2004 were 12,179,000 tonnes, which is a 9 per cent increase from 2003.
- If amounts of residues from coal-fired power plants and waste from the building and construction sector are excluded from statistics, total waste generation in 2004 amounted to 7,684,000 tonnes, which is 328,000 tonnes, or 4 per cent, more than in 2002. In other words, there has been an increase in total waste arisings, if residues and waste from building and construction are excluded. Waste from the building and construction sector is more sensitive to economic change than most other waste.
- The total rate of recycling was 65 per cent. The 2008 target for recycling is 65 per cent. The rate of recycling in 2003 was also 65 per cent.
- The total amount of waste led to incineration amounted to 26 per cent, plus an additional 1 per cent left in temporary storage to be incinerated at a later time. The 2008 target for incineration is 26 per cent. These are the same percentage figures as applied to incineration and storage in 2003.
- The total amount of waste led to landfills amounted to 8 per cent, which is one percentage point better than the overall landfill target of a maximum of 9 per cent landfilling in 2008. Also in 2003, 8 per cent of the waste was landfilled.
- The targets for treatment of waste from individual sectors are still not being met: too little waste from households and the service sector is being recycled, and too much waste from industry is being led to landfills.

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<sup>3</sup> Primarily, the fall in the number of plants/enterprises is due either to discontinuation or consolidation with other ISAG-reporting plants.



# 1 Waste generation and management

## 1.1 Waste generation 2004 and developments 2003-2004

Waste generation in 2004 and developments in waste arisings from 2003 to 2004 are presented in Table 1<sup>4</sup>.

Table 1. Total waste generation in Denmark	'000 tonnes							Change in % 2003-2004
	1994	1996	1998	2000	2002	2003	2004	
Households	2,575	2,767	2,796	3,084	3,121	3,009	3,164	5
<i>Domestic waste</i>	1,662	1,655	1,702	1,676	1,700	1,677	1,692	1
<i>Bulky waste</i>	606	639	572	730	655	634	687	8
<i>Garden waste</i>	286	401	438	519	517	500	500	0
<i>Other waste</i>	21	72	83	158	246	198	284	43
Service*	656	851	955	1,119	1,357	1,655	1,833	11
Industry*	2,309	2,632	2,783	2,948	2,311	1,841	1,855	1
Building and construction	2,433	3,088	2,962	3,223	4,044	3,785	4,496	19
Wastewater treatment plants	1,156	1,212	1,251	1,476	1,011	836	819	-2
Slag, fly ash etc. (coal)	1,962	2,332	1,469	1,176	1,228	1,473	1,180	-20
Other	14	30	18	5	34	15	14	-6
<b>Total</b>	<b>11,105</b>	<b>12,912</b>	<b>12,233</b>	<b>13,031</b>	<b>13,105</b>	<b>12,614</b>	<b>13,359</b>	<b>6</b>

\*From 2001 and onwards, the figures pertaining to service and industry should be interpreted with some reservation since there are fluctuations in the figures from the two sources which cannot be readily explained.

Source: ISAG; Danisco; the Association of Danish Recycling Industries and large scrap dealers; Elsam; Energi E2; and Reports to the Danish EPA on sludge from municipal wastewater treatment plants applied to farmland etc., and incineration of sludge at sludge incineration plants. (For sludge for recycling and incineration, figures from 2002 have been applied to 2004 – see footnote 26). From 2001, sludge is stated in wet weight, excluding however sludge for mineralisation which has been adjusted to 20 per cent dry matter. Sludge for long-term storage has been included in sludge amounts applied to farmland etc. Sludge for recovery has been included in sludge amounts for incineration.

The figures do not include imports of waste. Waste generation is stated as amounts of waste delivered to treatment plants from all primary sources. Primary sources include waste generators other than waste treatment plants (reprocessing plants, incineration plants, composting/biogas plants and landfills). Slag, fly ash and flue-gas cleaning products from waste incineration plants are therefore not included in the statement, as this would result in the waste being counted twice. Moreover, waste from the primary source recycling centres/transfer stations has been allocated among the other primary sources. The principles behind this allocation are explained in Annex 2. Other waste includes the fractions packaging waste, plastic, sludge, and electric and electronic equipment.

In 2004, Danish waste generation amounted to 13,359,000 tonnes. This corresponds to an increase of 6 per cent from the 2003 figure. Most of this increase stems from a 19 per cent increase in construction and demolition waste compared to 2003. Furthermore, there is an upward trend in amounts of waste from the service sector, where amounts have gone up by 11 per cent. As mentioned in the preface, the development in waste arisings from the service sector is, however, linked to great uncertainty. Waste amounts of slag, fly ash, etc. have gone down 20 per cent.

<sup>4</sup> Regrettably, an error was made in Waste Statistics 2003, where about 222,000 tonnes of sludge was counted twice. This means that overall waste arisings in 2003 totalled 12,614,000 tonnes and not, as stated previously, 12,835,000 tonnes.

Waste from households amounted to 3,164,000 tonnes in 2004. This is a 5 per cent increase in waste generation compared to 2003. The four types of waste from households either show no changes or have increased.

Domestic waste arisings remain almost unchanged from previous years. As Table 1 shows, domestic waste arisings have increased by a total of 2 per cent during the period 1994 – 2000, showing only very slight changes from year to year<sup>5</sup>. Domestic waste includes separately collected paper, glass, organic waste, and other waste.

The amount of bulky waste increased by 8 per cent, or 53,000 tonnes, compared to 2003.

The amount of waste reported as other waste grew by 43 per cent, which corresponds to a total amount of waste of 86,000 tonnes. Packaging waste is included under other waste. Separated packaging waste became subject to reporting to the ISAG for the first time in 2001. However, this waste type is still not being reported to a sufficient extent. Therefore, packaging waste reported to the ISAG does not give a real picture of the total amount of collected packaging waste.

Waste from the service sector amounted to 1,833,000 tonnes in 2004, which is 11 per cent more than in 2003. In absolute figures this is an increase of 178,000 tonnes. Waste from the service sector includes waste from institutions, trade and offices. This increase is apparent in the following fractions: various combustible; various non-combustible; paper and cardboard; healthcare risk waste; hazardous waste; and other waste. These fractions have increased by 13 per cent, 4 per cent, 1 per cent, 1 per cent, 7 per cent, and 23 per cent respectively relative to 2003. The fractions glass and food waste/other organic waste have gone down by 12 per cent and 46 per cent respectively (see Table 26).

Waste from industry rose by 1 per cent<sup>6</sup>. This means an increase of 14,000 tonnes; from 1,841,000 tonnes in 2003 to 1,855,000 tonnes in 2004.

This increase is primarily evident in the fractions: various non-combustible, plastic, food waste/other organic waste, beet soil, sludge, hazardous waste, and other waste. Relative to 2003, these fractions increased by 17 per cent, 1 per cent, 6 per cent, 42 per cent, 12 per cent, 6 per cent, and 6 per cent respectively. On the other hand, the following fractions have gone down: various combustible, paper and cardboard, and ferrous metal. These fractions fell by 10 per cent, 11 per cent, and 12 per cent respectively. (See Table 27).

Since 2001 there has been a shift in waste arisings between service and industry, so that amounts of waste from the service sector have increased significantly while amounts of waste from industry have decreased by about the same extent. Amounts of waste from industry thus fell by 20 per cent in the period 2002 to 2004, whereas amounts increased by 35 per cent in the service sector. In the period 2003 to 2004 waste volumes from industry increased by 1 per cent, whereas in the service sector volumes increased by 11 per cent. The shift between the two sectors may be due to faulty reporting as the source "manufacturing etc." was discontinued from 2001 following the amendment of the Statutory Order on

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<sup>5</sup> Developments from 1994 to 2004 are described in more detail in section 1.5.

<sup>6</sup> In Waste Statistics 2002, the sources with codes 20-30 (previously called manufacturing etc.) are called industry.

Waste<sup>7</sup>. This means that waste from industry must be reported as originating from one of the following 11 subgroups: food, beverages and tobacco; textiles, clothing and leather goods; wood-working and furniture; paper and graphical production; chemicals etc.; rubber and plastic; stone-working, pottery and glass; ferrous metal; other manufacturing; utilities; agriculture, forestry, fishery etc. It is likely that some carriers find it easier to report industrial waste as service-sector waste. Parties reporting to the ISAG are therefore encouraged to be aware of this possible source of incorrect reporting.

Changes in the industrial structure, the fact that society is changing from an industrial to a knowledge society, may be another reason for the shift between the two sectors. The shift is further underpinned by the fact that from the early 1990s until the beginning of 2001, the number of industrial enterprises went down significantly while there was a substantial increase in the number of new enterprises within the knowledge services industry<sup>8</sup>.

The generation of waste in the building and construction sector increased from 2003 to 2004. Volumes of construction and demolition waste amounted to 4,496,000 tonnes in 2004, which is 711,000 tonnes, or 19 per cent, more than in 2003. This increase is present in the following fractions: various non-combustible, concrete, tiles, other construction/demolition waste, and soil and stone. These fraction rose by 5 per cent, 9 per cent, 18 per cent, 33 per cent, and 63 per cent respectively. On the other hand, the fractions asphalt, other recyclable waste, and other waste fell by 0.2 per cent, 37 per cent, and 0.3 per cent respectively. (See Table 30).

A total of 528,377 more tonnes of soil and stone were reported in 2004. This is due e.g. to increased activity in the building and construction sector. By far the major part, or 94 per cent, of waste from the building and construction sector is recycled<sup>9</sup>.

There has been a 2 per cent drop in the amount of sludge from municipal wastewater treatment plants: in 2004 the amount was 819 tonnes, stated with a dry matter content of 20 per cent<sup>10</sup>. This is 17,000 tonnes less than in 2003. From 2001, sludge for mineralisation has been included with a dry matter content of 20 per cent, so that this sludge is incorporated into the statistics with the same dry matter content as other sludge. In previous years dry matter content for sludge for mineralisation was 1.5 per cent.

Waste generation at coal-fired power plants fell by 20 per cent, from 1,473,000 tonnes in 2003 to 1,180,000 tonnes in 2004. This is primarily due to the fact that Denmark's actual consumption of coal for energy generation fell significantly from 2003 to 2004.

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<sup>7</sup> Statutory Order no. 619 of 27 June 2000 on waste.

<sup>8</sup> Statistical Ten-Year Review 2003 and 2004, Statistics Denmark.

<sup>9</sup> Note however that a large part of the soil delivered is led to soil remediation. Presumably, some of the treated soil cannot be recycled but must be landfilled, which means the overall recycling rate may go down. The Danish EPA will look into this in Waste Statistics 2005.

<sup>10</sup> As of yet, there is no statement from the municipal wastewater treatment plants of the amounts of sludge applied to farmland or incinerated at sludge incineration plants in 2004. For recycling and incineration, the 2002 figures from the Danish EPA's sludge statistics have therefore been used, while for landfilling the 2004 figures from the ISAG have been used. See "Sewage sludge from municipal and private wastewater treatment plants in 2002". Environmental Review No. 5, 2004, Danish EPA.

In the period 1996 to 2000, there was a fall in waste arisings from coal-fired power plants. This can be attributed e.g. to the fact that there has been a conversion of energy generation from coal to renewable energy resources. Denmark had net imports of electricity for the first time in this period in 2000<sup>11</sup>.

## 1.2 Waste management in 2004

In the following, developments in Danish management of total waste arisings are described. Waste management is compared to treatment targets in the Danish government's Waste Strategy 2005-2008.

Table 2 shows that 8,746,000 tonnes, corresponding to 65 per cent of total waste arisings, were recycled in 2004. In absolute figures, this is an increase of 528,000 tonnes in recycled waste relative to 2003.

Table 2. Waste treatment and targets for 2008	1994		1996		1998		2000		2002		2003		2004		2008	
	'000 tonnes	%	'000 tonnes	%	'000 tonnes	%	'000 tonnes	%	'000 tonnes	%	'000 tonnes	%	'000 tonnes	%	'000 tonnes	%
Recycling	6,174	56	7,787	60	7,542	62	8,461	65	8,382	64	8,218	65	8,746	65	65	65
Incineration	2,216	20	2,507	19	2,740	22	3,064	24	3,344	26	3,287	26	3,437	26	26	26
Landfilling	2,613	24	2,524	20	1,868	15	1,489	11	1,194	9	981	8	1,024	8	8	9
Special treatment	102	1	95	1	84	1	17	0	22	0	20	0	16	0	0	0
Storage									163	1	108	1	136	1	0	0
Total	11,105	100	12,912	100	12,233	100	13,031	100	13,105	100	12,614	100	13,359	100	100	100

Source: same as Table 1, and the Danish government's Waste Strategy 2005-2008.

The total sum of the percentage distribution between the different treatment options for 2001, 2003 and 2004 does not add up to 100 per cent due to rounding.

Special treatment includes treatment of hazardous waste, including healthcare risk waste.

The amount of waste incinerated in 2004 came to 3,437,000 tonnes. This is inclusive of 332,000 tonnes of sludge from municipal wastewater treatment plants. This is actually an increase of 150,000 tonnes in waste amounts compared to the previous year, and it corresponds to 26 per cent of total waste arisings. Waste led to landfills in 2004 amounted to 1,024,000 tonnes, which constitutes an increase of 43,000 tonnes from 2003. The rate of waste landfilled amounts to 8 per cent of total waste arisings. The percentage share of waste led to landfills has fallen by 61 per cent in the period 1994 to 2004, corresponding to a fall in landfilled waste amounting to 1,589,000 tonnes.

As the table shows, the relative distribution in recent years among treatment options has varied only little. Variations are often explained by developments in waste arisings in individual fractions. For example, variations in amounts of residues from coal-fired power plants and construction and demolition waste have large implications on the total rate of recycling, as these two waste types account for a large percentage of total waste arisings and typically have a rate of recycling of 90 per cent or more.

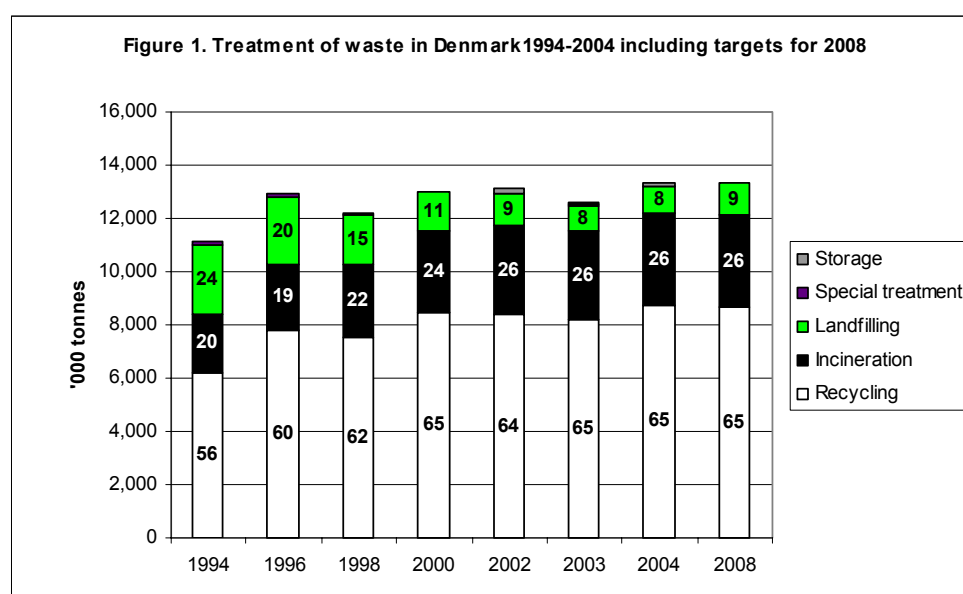
In the Danish government's Waste Strategy 2005-2008 the target of stabilising Danish waste generation is supplemented by a number of qualitative elements such as better exploitation of resources in waste, better quality in treatment of waste, and limitation of problems caused by environmental contaminants in waste.

<sup>11</sup> Preliminary figures from the Danish Energy Authority on energy generation and consumption, and CO<sub>2</sub> emissions in 2004. Denmark's actual energy consumption from coal was 238 PJ in 2003; in 2004 this figure fell to 186 PJ.

In general, targets for different sectors and individual fractions will mean an increased rate of recycling and incineration. Overall waste treatment targets for 2008 in the government's Waste Strategy 2005-2008 are 65 per cent recycling, 26 per cent incineration, and a maximum of 9 per cent landfilling.

As can be seen from Figure 1, the overall targets for treatment of waste in 2008 were met in 2004 and were already met for the first time in 2003. In 2004, one per cent of total waste arisings was reported under the treatment option storage. Storage means temporary landfilling of waste suitable for incineration until incineration capacity is available. This means that the waste is stored until it can be incinerated for the purpose of energy/heat generation.

The general fall in the rate of waste led to landfills can be attributed to the ban on landfilling of waste suitable for incineration that came into effect on 1 January 1997. However, there are other important factors as well.



Source: same as Table 1. Note that total waste arisings in 2008 have been set to correspond to waste arisings in 2004. This should not be seen as a projection of developments in total waste arisings.

The amount of residues from coal-fired power plants was reduced significantly and recycled to a greater extent. Thus as opposed to previously, a larger proportion was recycled rather than landfilled.

### 1.3 Treatment of waste without residues and construction and demolition waste

Amounts of residues from coal-fired power plants not only depend on energy consumption in Denmark, but also on exports of electricity to Sweden and Norway. In addition, due to the strategy of the past 10 years to phase out coal, a still larger shift is taking place from use of coal and coke to use of natural gas and renewable energy.

Since 1996, when Denmark's electricity exports to Sweden and Norway were particularly large, amounts of residues decreased steadily up until and including 2000. In fact, this is a 786,000-tonne decrease (see Table 32), corresponding to a 40 per cent reduction. In the period 2003 to 2004, there has been a fall of 293,000 tonnes, which is primarily attributable to falling exports of electricity to

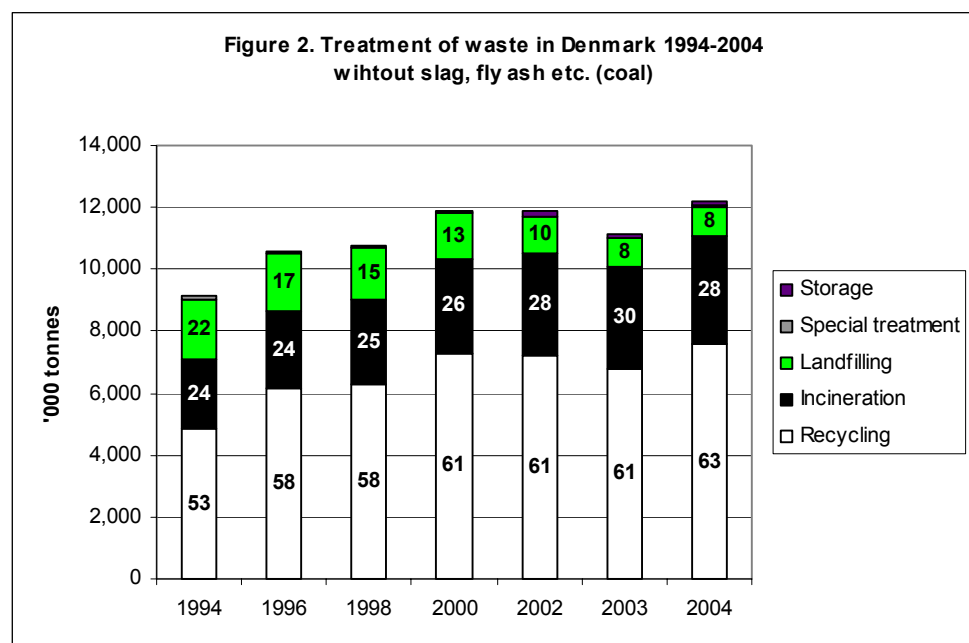
e.g. Sweden, Norway, and Germany. This means that net exports of electricity decreased by 66 per cent from 2003 to 2004<sup>12</sup>.

Naturally, this has an impact on developments of total waste arisings, but as residues have a very high rate of recycling, it also has an impact on the ability to meet overall treatment targets.

A similar picture is seen for construction and demolition waste. As discussed in section 5.4, the rate of recycling of construction and demolition waste typically reaches around 90 per cent.

It is therefore interesting to look at the distribution of waste between the different treatment options, if residues and construction and demolition waste are excluded from the statistics.

Figure 2 shows the distribution between the different treatment options when residues from coal-fired power plants are excluded from the statistics.



Source: same as Table 1.

When residues are excluded it is seen that 63 per cent of remaining waste was recycled in 2004, which is an increase of 807,000 tonnes compared to total amounts in 2003. This more or less means that a substantial part of the increase in overall waste arisings is to be found in construction and demolition waste volumes, of which, as mentioned, a large part is being recycled.

The rate of remaining waste in 2004 which was incinerated is 28 per cent, which is to say that 150,000 tonnes more waste were incinerated in 2004 than in the year before. The fact that in 2003 this figure was 2 per cent greater should be linked to the fact that the total waste generation was greater in 2004 than in 2003. The proportion of waste led to landfills was 8 per cent. In absolute figures this means that 57,000 tonnes more waste was landfilled in 2004 than in 2003.

In absolute figures this means that in 2004, apart from residues, 12,179,000 tonnes of waste were generated, corresponding to an increase of 9 per cent from

<sup>12</sup> The Danish Energy Authority's monthly electricity statistics.

2003. Of this, 7,612,000 tonnes were recycled, whereas 3,437,000 tonnes were incinerated, and 978,000 tonnes were landfilled. Moreover, 16,000 tonnes were treated separately and 136,000 tonnes have been temporarily landfilled until incineration capacity becomes available<sup>13</sup>.

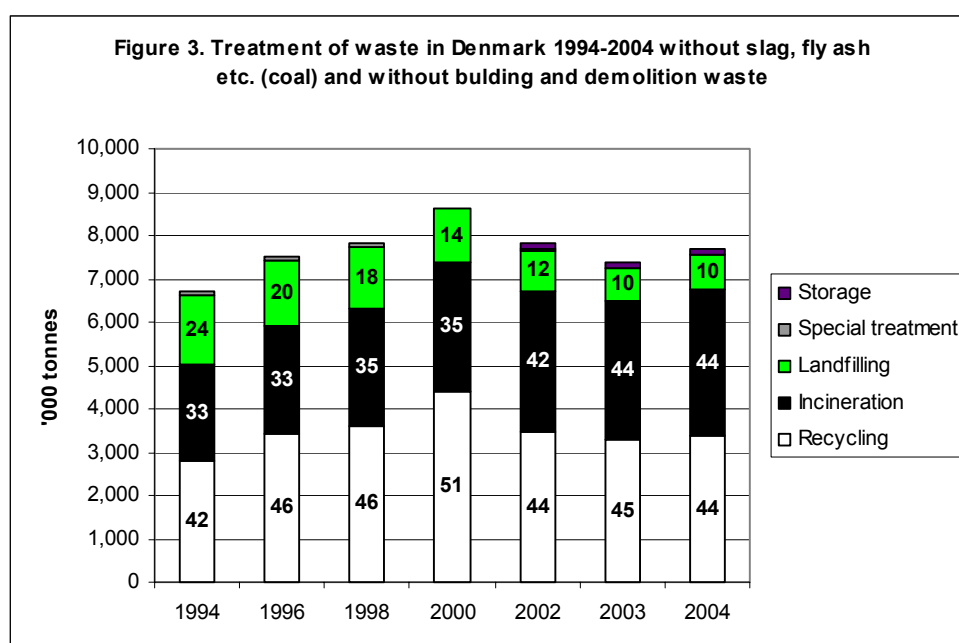
Total waste amounts without waste from coal-fired power plants increased by 33 per cent from 1994 to 2004.

Waste from the building and construction sector has also been excluded from statistics in Figure 3. As is evident, this will make the recycling rate fall and the rate of waste which is incinerated or landfilled grow.

In absolute figures, waste generation without residues and without waste from building and construction amounted to 7,684,000 tonnes in 2004, which is 328,000 tonnes, or about 4 per cent, more than in 2003. In other words, there has been an increase in total waste arisings, if residues and waste from building and construction are excluded. This increase is explained by an overall increase of waste from households and the service sector of 330,000 tonnes from 2003 to 2004. (See Table 1).

Residues from coal-fired power plants and construction and demolition waste are recycled to a very large extent: in 2004, 96 per cent and 94 per cent respectively, cf. Chapter 5. As can be seen from Figure 3, the high recycling rates for these two sources contribute significantly to the overall recycling rate for the remaining waste. Since, proportionally, construction and demolition waste constitutes a large part of overall waste arisings, it means that the recycling rate falls when this waste type is excluded from the statement.

The recycling of residues from coal-fired power plants and construction and demolition waste will therefore also have a great influence on fulfilling the treatment targets set out in the government's Waste Strategy 2005-2008.



Source: same as Table 1.

<sup>13</sup> Exemption clause in Section 37(3), Danish Statutory Order on Waste (Statutory Order No. 619 of 27 June 2000).

#### 1.4 Treatment by source and waste type

Figure 4 shows total waste generation in 2004 analysed by source and treatment option. Figure 5 shows waste generation analysed by waste type and treatment option. Tables with detailed figures are given in Annex 1.

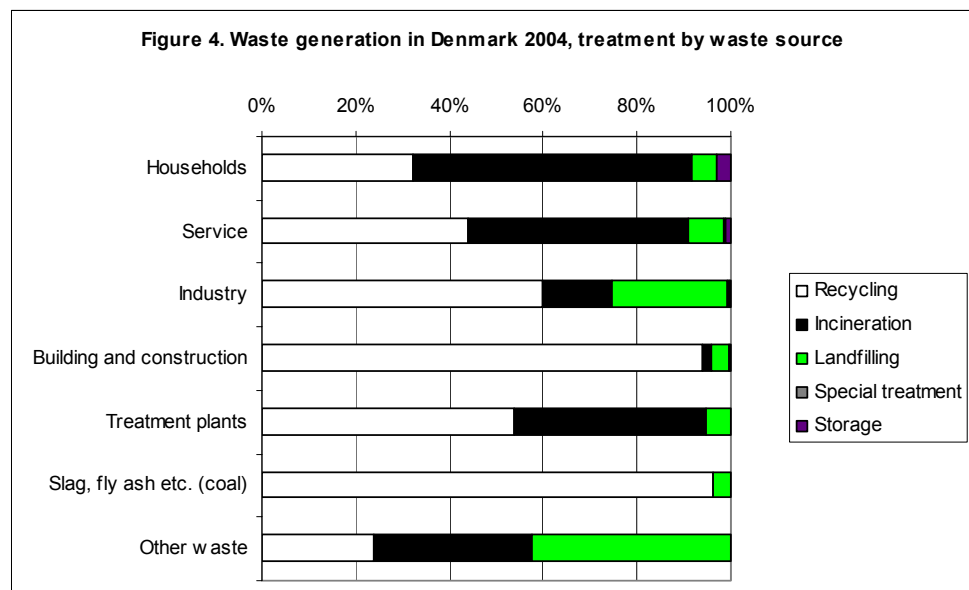
Figure 4 shows that especially waste from the building and construction sector, power plants and wastewater treatment plants is characterised by very high recycling rates. Consequently, the targets for recycling set out in Waste Strategy 2005-2008 have been met for waste generated by these three sectors (see Annex 1).

The rate of recycling of waste from industry is also fairly high: 60 per cent compared to a target of 65 per cent recycling. The high rate of recycling, however, is especially attributable to recycling of ferrous metal. Too much waste from this sector is still being led to landfills, namely 24 per cent against the target of only 15 per cent, and a challenge lies ahead to divert larger amounts of the other fractions from landfilling to incineration or recycling.

The rate of recycling of waste from the service sector is likewise too low compared to the 2008 target of 50 per cent recycling. In 2004, 44 per cent of the waste was recycled. This, however, constitutes a significant rise from 2002, when only 36 per cent was recycled.

Too much waste is being incinerated, namely 47 per cent against a target of 45 per cent. Too much waste is being landfilled: 8 per cent against the target of 5 per cent. The challenge for the service sector is to divert more waste from incineration and landfilling to recycling.

Treatment of the waste type domestic waste also does not comply with the targets set out in Waste Strategy 2005-2008, cf. Figure 5. In 2004, only 17 per cent of this waste type was recycled. In the period 1994 to 2002 the recycling rate fluctuated between 14 per cent and 17 per cent (see also Figure 7).

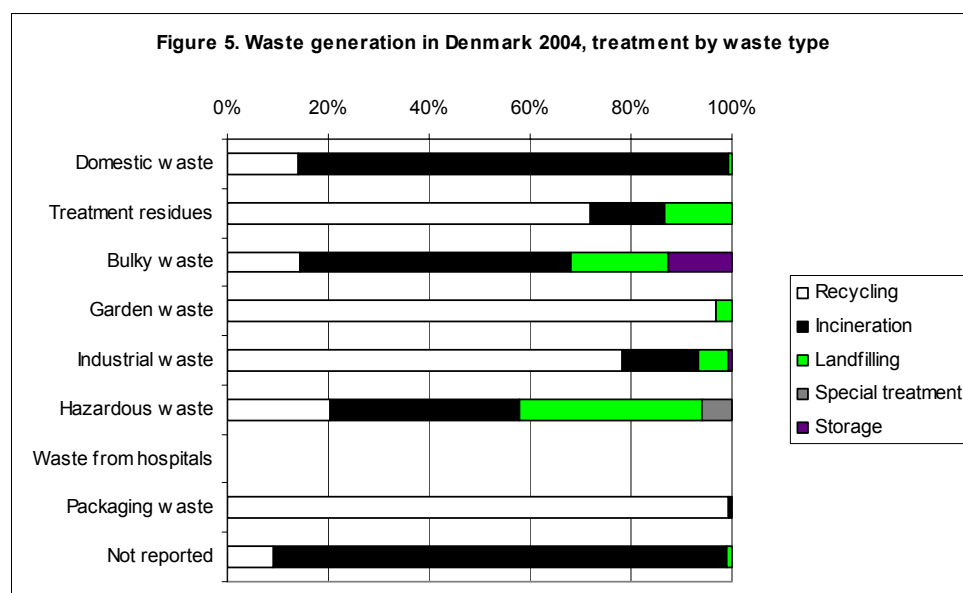


Source: same as Table 1.

The target is to reach a recycling rate for domestic waste of 20 per cent in 2008, whereas the targets for incineration and landfilling are 80 per cent and 0 per cent



respectively. The rate of domestic waste incinerated in 2004 reached 83 per cent, whereas about 1 per cent was led to landfills<sup>14</sup>.



Source: same as Table 1.

### 1.5 Developments in waste generation 1994-2004.

Table 3 shows total waste arisings in Denmark for the years 1994 to 2004. Breakdown of the information is by source.

There was a 20 per cent increase in total waste arisings in the period 1994 to 2004.

Waste generation was largest in 2004. Due to the changes in statement methods for 2001, waste arisings for this year should be taken with some reservation.

In the period 1994 to 2004, waste arisings have fluctuated, but at have stayed at around 13 million tonnes in recent years, however with a more substantial increase in 2004.

The increase in the first half of the 1990s may be due partly to the fact that coverage of the ISAG system increased and partly due to real increases in waste arisings.

The large amounts of waste in 1996 were primarily due to particularly high amounts of residues from coal-fired power plants in 1996, which in turn were due to large exports of electricity to Sweden and Norway. However, increasing waste arisings in 2000 must be attributed to an increase in waste from households and waste from building and construction. The same applies for 2002. For 2004, the increase in waste arisings must be ascribed to more waste from the service sector and the building and construction sector.

<sup>14</sup> Note that organic domestic waste suitable for incineration must be assigned to incineration. However, for islands that are not connected by land to an incineration plant there is an exemption from this duty of assignment. Here, landfilling is allowed.

Table 3. Total waste generation in Denmark	'000 tonnes							Change in % 1994-2004
	1994	1996	1998	2000	2002	2003	2004	
Households	2,575	2,767	2,796	3,084	3,121	3,009	3,164	23
<i>Domestic waste</i>	1,662	1,655	1,702	1,676	1,700	1,677	1,692	2
<i>Bulky waste</i>	606	639	572	730	655	634	687	13
<i>Garden waste</i>	286	401	438	519	517	500	500	75
<i>Other waste</i>	21	72	83	158	246	198	284	1,258
Service*	656	851	955	1,119	1,357	1,655	1,833	179
Industry*	2,309	2,632	2,783	2,948	2,311	1,841	1,855	-20
Building and construction	2,433	3,088	2,962	3,223	4,044	3,785	4,496	85
Wastewater treatment plants	1,156	1,212	1,251	1,476	1,011	836	819	-29
Slag, fly ash etc. (coal)	1,962	2,332	1,469	1,176	1,228	1,473	1,180	-40
Other waste	14	30	18	5	34	15	14	3
<b>Total</b>	<b>11,105</b>	<b>12,912</b>	<b>12,233</b>	<b>13,031</b>	<b>13,105</b>	<b>12,614</b>	<b>13,359</b>	<b>20</b>

Source: same as Table 1.

Other waste includes the fractions packaging waste, plastic, sludge, and electrical and electronic equipment.

\*The figures pertaining to service and industry from 2001 and onwards should be interpreted with some reservation since there are fluctuations in the figures for the two sources which cannot be readily explained.

## 2 Recycling

### 2.1 Recycling by fraction

Table 4 shows the amounts separated from the different waste fractions for the purpose of recycling in the form of either reprocessing, composting or biogasification. The Table does not show the total amount of waste generated by the individual fraction.

Fraction	1995	1996	1998	2000	2001	2002	2003	2004
Hazardous waste	28	53	56	51	71	46	85	89
Paper and cardboard	557	548	623	702	709	688	691	677
Bottles and glass	92	99	104	108	152	135	118	140
Plastic	26	29	33	40	43	51	50	54
Food waste/other organic waste	198	193	194	252	212	151	160	165
Waste electrical and electronic equipment						15	17	26
CFC-containing refigderators and freezers						6	5	8
Branches, leaves, grass etc.	376	452	551	632	576	652	675	663
Ferrous metal (1) and (4)	983	899	968	1.192	952	788	670	606
Automobile rubber	9	8	31	34	42	45	47	76
Concrete	485	942	780	1.054	1.004	980	1.016	1.119
Tiles	75	93	123	227	266	250	228	280
Other construction/demolition waste	526	532	507	311	527	331	453	632
Asphalt	694	737	654	551	378	563	723	731
Waste wood	10	15	24	81	64	55	74	58
Soil and stone	344	391	388	460	588	1.291	834	1.360
Other recyclable waste	108	166	228	373	408	362	360	306
Fly ash and slag from coal-fired power plants, including bio fly ash and bio slag (2)	1.276	1.213	859	770	794	802	1.090	851
Fly ash and slag from other sources, excluding from waste incineration plants	3	2	2	1	52	60	54	60
Flue-gas cleaning products (plaster, TASP, sulphuric acid) (2)	288	416	400	406	408	388	323	329
Sludge from municipal wastewater treatment plants applied to farmland, composted, or biogasified (3)	918	918	875	1.132	752	568	354	354
Sludge from other sources	50	81	141	83	103	129	117	153
<b>Total</b>	<b>7.046</b>	<b>7.787</b>	<b>7.541</b>	<b>8.460</b>	<b>8.101</b>	<b>8.357</b>	<b>8.144</b>	<b>8.738</b>

Source: the ISAG and (1) Recycling industries and other large scrap dealers. (2) Elsam and Energi E2. (3) Reports to the Danish EPA on sludge from municipal wastewater treatment plants applied to farmland etc. Data has been delayed a year so that 2002 figures are used for 2003 and 2004, and 2001 figures are used for 2002 (see also 5.6. Sludge for long-term storage has been included in the amount for recycling. (4) To avoid double reporting, figures have been corrected for ferrous metal removed from waste incineration plants.

The Table shows that in 2004 8,738,000 tonnes of waste were recycled. This is 7 per cent, or 594,000 tonnes, more than in 2003. The increase is primarily due to more recycling of soil and stone and other construction/demolition waste. Fly ash

and slag from coal-fired power plants fell by 239,000 tonnes. Otherwise, there are no large fluctuations evident for the individual fractions.

## 2.2 Paper and cardboard

Consumption of virgin paper and the rate of collection of waste paper in the period from 1994 to 2004 are shown in Table 5.

The total amount of waste paper collected in 2004 amounted to 677,000 tonnes. This constitutes a reduction of 14,000 tonnes or 2 per cent relative to the amounts collected in 2003.

	1994	1996	1998	2000	2002	2003	2004
Consumption of virgin paper (1)		1,181	1,304	1,332	1,373	1,345	
Waste paper collected in Denmark (2, 4)	352	548	623	702	688	691	677
Collected waste paper as a percentage of the amount of virgin paper consumed		46	48	53	50	51	
Danish waste paper led to Danish paper mills (2)		318	334	424	396	406	410
Net exports of waste paper (3)		220	242	287	327	346	

Source: (1) Statistics on collected waste paper and cardboard 2003. Danish EPA, Environmental Project No. 1017, 2005 (not available in English). (2) ISAG reports. (3) Statistics Denmark. In Waste Statistics 2001, net exports of collected waste paper were stated as 258,000 tonnes. The final figure from Statistics Denmark was 316,000 tonnes. (4) Some of the increase from 1998 to 2000 is explained by corrections to ISAG reports. Thus, about 100,000 tonnes were diverted from secondary sources to primary sources in connection with quality control of reporting in 2000. The relevant waste treatment plants (probably) also reported incorrectly in previous years, which may account in part for previous differences in amounts of collected waste paper in statements based respectively on ISAG and material flow monitoring of collected waste paper (Danish waste paper delivered to Danish paper mills and net exports of waste paper). **This rise in the amount of waste paper from trade/offices, along with the drop in the amount of paper from households, is probably due to the reporting plants having difficulties determining whether the waste should be reported as coming from primary or from secondary sources. In connection with the quality control, Smørum Papir, for example, stated that they no longer receive waste paper from households. This alone accounts for a fall of 45,000 tonnes compared to 2000. Apparently, no other plant has reported a compensating increase.**

Table 6 shows collected paper by source and by packaging waste and remaining waste types. Not surprisingly, the largest amounts of waste paper are collected from households, the service sector and industry. The largest amounts of packaging waste are collected from industry.

Type	Source	1994	1996	1998	2000	2002	2003	2004
Packaging waste	Households	-	-	-	-	11,784	10,071	6,933
	Service	-	-	-	-	28,567	32,777	31,616
	Industry	-	-	-	-	33,881	41,879	47,268
	Building and construction	-	-	-	-	1,257	1,552	1,401
	Wastewater treatment plants	-	-	-	-	2	101	187
	Other sources	-	-	-	-	0	0	0
<i>Subtotal</i>		-	-	-	-	75,492	86,380	87,404
Other waste types	Households	142,668	160,469	208,486	181,315	192,275	210,893	213,806
	Service	102,889	173,289	203,537	227,790	221,747	272,316	277,463
	Industry	106,463	214,015	210,278	292,069	197,002	119,693	97,157
	Building and construction	5	163	255	401	1,921	1,278	803
	Wastewater treatment plants	0	2	1	3	1	8	7
	Other sources	1	213	0	0	0	0	0
<i>Subtotal</i>		352,027	548,150	622,557	701,579	612,947	604,189	589,236
<b>Total</b>		<b>352,027</b>	<b>548,150</b>	<b>622,557</b>	<b>701,579</b>	<b>688,438</b>	<b>690,570</b>	<b>676,641</b>

Source: ISAG reports 1994-2004. Note that double reporting in 1998 apparently explains why the total amount is about 20,000 tonnes too high. The total amounts of waste paper and cardboard for 2000 and 2001 were reported incorrectly in Waste Statistics 2001. The corrected figures have been included in Table 6.

Packaging waste is a new waste type in the ISAG and it does not yet reflect the total amount of cardboard packaging waste collected for recycling in Denmark. In 2003, 298,000 tonnes of paper and cardboard packaging waste were collected for recycling<sup>15</sup>.

There is almost no change in the amount of waste paper collected from households in the period 2003 to 2004. As can be seen, historically the amount of waste collected from households has been subject to some fluctuations throughout the period, increasing to around 221,000 tonnes in 2004.

The amount of paper collected from the service sector has gone up by around 3,986 tonnes, or 1 per cent, amounting to 309,079 tonnes in 2004. The amount of paper collected from industry has fallen by around 17,148 tonnes corresponding to 11 per cent compared to 2003.

In the ISAG, waste delivered to a recycling centre/transfer station is reported with the commercial source "recycling centre/transfer station". This means that it is not stated whether the waste originated from households or from other primary commercial sources. From 2001, recycling centres/transfer stations must indicate a split between waste types and primary source. Since this is not yet routine, the ISAG Secretariat has divided the waste as shown in Annex 2.

### 2.3 Plastic

Table 7 shows the amount of plastic collected for recycling, reported to the ISAG. In 2004 this amount was 53,997 tonnes, which is an increase of around 4,056 tonnes from 2003. However, it is assumed that some plastic has been collected and exported directly for recycling abroad without having been registered at a Danish treatment plant. It is therefore probable that the amount of waste plastic collected in Denmark is higher than 53,997 tonnes.

<sup>15</sup> Reporting of packaging waste to the EU.

Type	Source	1994	1996	1998	2000	2002	2003	2004
Packaging waste	Households	-	-	-	-	1,682	1,130	692
	Service	-	-	-	-	2,764	2,413	2,808
	Industry	-	-	-	-	1,342	3,197	1,602
	Building and construction	-	-	-	-	26	30	93
	Other sources	-	-	-	-	0	0	0
<i>Subtotal</i>		-	-	-	-	5,814	6,771	5,195
Other waste types	Households	1,372	1,206	1,233	1,585	3,165	1,737	3,146
	Service	2,546	2,928	4,021	7,411	10,126	10,124	12,807
	Industry	24,678	24,551	27,517	31,150	30,713	29,287	31,234
	Building and construction	1	29	67	117	719	1,896	1,420
	Wastewater treatment plants	0	0	0	0	6	8	8
	Other sources	0	0	129	0	81	116	189
<i>Subtotal</i>		28,597	28,714	32,966	40,263	44,809	43,170	48,802
<b>Total</b>		<b>28,597</b>	<b>28,714</b>	<b>32,966</b>	<b>40,263</b>	<b>50,623</b>	<b>49,941</b>	<b>53,997</b>

Source: ISAG reports 1994-2004.

The fraction plastic covers both production waste, plastic packaging waste, and other plastic waste, with individual figures shown in Table 7.

Packaging waste is a new waste type in the ISAG and it does not yet reflect the total amount of waste plastic packaging collected for recycling and reprocessing in Denmark. Therefore, in the following description of plastic recycling, ISAG figures have been supplemented with information from more detailed statistics on waste plastic packaging.

Statistics for waste plastic packaging in 2003 show that 20,018 tonnes of waste plastic packaging were reprocessed in Denmark in 2003<sup>16</sup>. About half of this amount was imported.

In 2003, 26,998 tonnes of waste plastic packaging were collected and recycled in Denmark. Of this amount, 16,259 tonnes were exported for recycling abroad.

The total amount collected corresponds to 17.4 per cent of the total Danish consumption of plastic packaging. This constitutes an increase from 2002, when 15.5 per cent of waste plastic packaging was collected for recycling. Waste plastic of the type polyethylene (PE) accounted for 83 per cent of collected amounts.

## 2.4 Bottles and glass

According to the ISAG reports, 140,472 tonnes of bottles and glass were collected for recycling in Denmark in 2004. This is 22,646 tonnes more than in 2003.

As seen in Table 8, the amount of glass collected for recycling went up by 30,944 tonnes, or 28 per cent, during the period 1994 to 2004. However, the figures fluctuate somewhat throughout the period. At the same time it is seen that the amount of glass packaging collected from households has dropped in the period 2002 to 2004.

<sup>16</sup> Statistics on waste plastic packaging 2003. Environmental Project No. 1035, 2005.

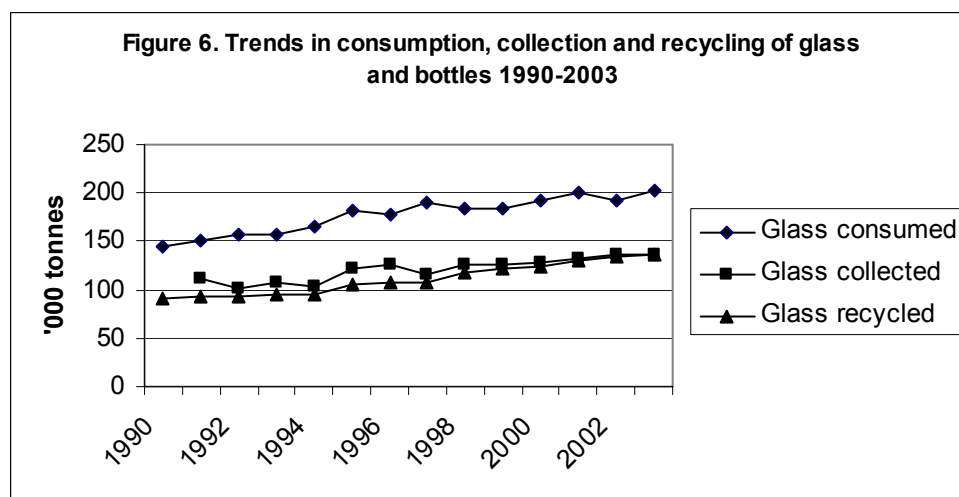
Type	Source	1994	1996	1998	2000	2002	2003	2004
Packaging waste	Households	-	-	-	-	103,895	74,128	75,947
	Service	-	-	-	-	6,824	14,052	9,455
	Industry	-	-	-	-	6,667	12,800	11,984
	Building and construction	-	-	-	-	0	0	6
	Other sources	-	-	-	-	0	0	0
<i>Subtotal</i>		-	-	-	-	117,385	100,979	97,393
Other waste types	Households	69,064	64,903	83,033	82,351	6,863	2,833	11,652
	Service	25,507	34,282	20,076	18,262	4,859	2,529	5,132
	Industry	14,778	53	27	7,453	473	6,435	12,722
	Building and construction	0	199	455	234	5,420	5,050	13,573
	Other sources	178	0	0	0	0	0	0
<i>Subtotal</i>		109,528	99,438	103,590	108,300	17,616	16,847	43,079
<b>Total</b>		<b>109,528</b>	<b>99,438</b>	<b>103,590</b>	<b>108,300</b>	<b>135,001</b>	<b>117,826</b>	<b>140,472</b>

Source: ISAG reports 1994-2004.

It is evident from Table 8 that by far the major part of the glass collected is packaging waste: thus, packaging waste accounted for 69 per cent of the total amount of glass in 2004.

However, the ISAG does not provide a complete picture of the overall material flow. This is especially significant with regard to recycling of bottles and glass, which is a process comprising several collection, reuse and treatment steps before glass becomes waste.

Therefore, in the following description of overall glass recycling, ISAG information is supplemented with information from Statistics on glass packaging 2003, cf. Figure 6<sup>17</sup>.



Source: Statistics on glass packaging 2003. Environmental Project No. 1012, 2005. Note that total consumption for 1999 has been adjusted to reflect Statistics on glass packaging 1999. The adjustment is due to a write up of amounts of glass packaging for food preservation.

Apart from minor fluctuations, consumption of glass packaging increased throughout the 1990s.

Correspondingly, the amount of glass packaging collected and recycled has increased.

<sup>17</sup> Statistics on glass packaging 2003. Danish EPA. Environmental Project No. 1012, 2005.

The amount of glass collected was 137,000 tonnes in 2002. The same amount was collected in 2003. The amount of recycled glass increased; from 135,000 tonnes in 2002 to 137,000 tonnes in 2003.

This means that in 2003 the collection rate as a percentage of total consumption reached 68 per cent, which means a 3 per cent drop from 2002. In 2002, the recycling rate as a percentage of total consumption reached 68 per cent.

Bottles for beer and soft drinks manufactured for reuse are not included in this statement. Refillable glass bottles, on average, make 30 trips. If these bottles were manufactured as single-use bottles, it would give an increase in waste glass of around 310,000 tonnes.

## 2.5 Ferrous metal

Table 9 shows the overall amount of ferrous scrap collected, analysed between consignees. It is seen that 634,000 tonnes of ferrous metal were recycled in 2004, which is a decrease of 223,000 tonnes, or 26 per cent, from 2003.

	1995	1996	1998	2000	2002	2003	2004
I. Ferrous scrap from Denmark led to foundries and the Danish Steel Works (2)	471	356	462	416	183	261	137
II. Ferrous scrap exported by scrap dealers (2)	567	612	535	689	611	738	571
III. Ferrous scrap imported by scrap dealers (2)	32	35	26	16	76	142	74
Total amount of Danish ferrous scrap for recycling I+II-III	<b>1006</b>	<b>933</b>	<b>971</b>	<b>1089</b>	<b>718</b>	<b>857</b>	<b>634</b>
Ferrous scrap imported by foundries and the Danish Steel Works (1)	-	263	216	220	116	10	8

Source: (1) ISAG reports, (2) information from the Association of Danish Recycling Industries and other large scrap dealers. Note that calculations in Table 9 differ from those in Table 4. Amongst other things, the figures have not been corrected for amounts of ferrous metal removed from waste incineration plants. 2003 as well as 2004 saw a substantial drop in imports of ferrous scrap by foundries and the Danish Steel Works. This is because the Danish Steel Works was closed down and therefore no longer contributes to the ISAG.

Table 9 shows a drop from 2002 to 2004 of 108,000 tonnes, or 93 per cent, in the amount of ferrous scrap imported by foundries and the former Danish Steel Works. The Association of Danish Recycling Industries has reported that ferrous scrap not sent to the Danish Steel Works has been exported.

However, the Association of Danish Recycling Industries normally estimates a recycling rate for ferrous scrap in excess of 90 per cent.

According to reports to the Danish EPA, the Danish Steel Works and other Danish foundries imported 8,000 tonnes of ferrous scrap in 2004, whereas scrap dealers imported around 74,000 tonnes. In other words, total imports in 2004 amounted to 82,000 tonnes, which is 70,000 tonnes, or 46 per cent, less than in 2003.

Scrap dealers exported 571,000 tonnes of ferrous scrap in 2004, which means that net exports in 2004 were 497,000 tonnes. This is a fall of 17 per cent from 2003.



## 2.6 Organic waste for composting, wood chipping and biogasification

The amount of organic waste led to reprocessing in the form of composting, wood chipping, biogasification, or fodder is shown in Table 10.

Organic waste led to reprocessing in 2004 amounted to 1,229,000 tonnes. This is 77,000 tonnes less than in 2003. This fall stems for a great part from added branches, leaves, etc. and added sludge for composting, which, together, have fallen by 317,000 tonnes. At the same time, the amount of sludge for Carbogrit has gone up by 172,000 tonnes.

Materials and treatment	1995	1996	1998	2000	2002	2003	2004
Branches, leaves etc. led to plants for composting/wood chipping	376	452	551	677	685	716	682
Organic domestic waste led to plants for composting	34	36	42	38	18	18	47
Organic domestic waste led to plants for biogasification	5	10	9	7	19	20	1
Other organic waste led to plants for composting	6	2	1	9	45	48	6
Other organic waste led to plants for biogasification	120	111	96	165	65	74	114
Other organicwaste led to plants for animal fodder	32	34	44	48	18	17	4
Sludge led to plants for composting	7	6	57	218	348	336	53
Sludge led to plants for biogasification	59	92	91	35	86	77	91
Sludge led to plants for use on farmland	0	0	0	0	0	0	6
Sludge led to plants for incineration	0	0	0	0	0	0	54
Sludge led to plants for the production of Carbogrit	0	0	0	0	0	0	172
Led to plants in total	639	743	891	1,197	1,284	1,306	1,229
Bark/wood chips removed from plants	49	34	15	13	15	27	14
Compost removed from plants	102	162	197	293	323	312	311
Screenings removed from plants	5	19	16	21	12	18	22
Removed from plants in total	156	215	228	328	350	356	346

Source: the ISAG does not contain information on whether organic materials are reprocessed via composting, wood chipping or biogasification. Figures are based on assessments and calculations of data from the ISAG reports. According to calculations in Statistics on treatment of organic waste from households 2001, Environmental Project No. 856, 2003, organic domestic waste led to composting and biogasification amounts to 37,000 tonnes.

The amount of bark/wood chips and compost removed from treatment plants does not reflect the total amount generated at the plants. Rather, this amount indicates the quantity sold or delivered free from the plants.

As is seen from the table, the amount of sold/removed bark/wood chips came to around 13,000 tonnes less than in 2003, whereas the amount of sold/removed compost was 1,000 tonnes less than in 2003.

## 2.7 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 recycling of used tyres in Denmark. In this way, landfilling is avoided and appropriate resource recovery ensured which prioritises recycling over energy recovery.

The scheme commenced on 1 April 1995 and is financed by a fee on all tyres covered by the agreement and marketed in Denmark.

According to the agreement, the target is a take-back rate of at least 80 per cent.

From 1 April 2000 the scheme was extended to cover tyres from all types of motor vehicles. This accounts for the leap in data between 1998 and 2000 in Table 11.

The table shows that in 2002 as well as in 2004 the collection rate for waste tyres surpassed 100 per cent. According to reports from the Danish Tyre Trade Environmental Foundation, this is presumably due to the fact that waste tyres have been imported from Germany, as well as to the fact that some waste tyres have been collected and stored for several years.

	1996	1998	2000	2002	2003	2004
Waste tyres covered by the scheme	16,705	19,378	34,776	41,126	40,886	40,257
Tyres collected	12,670	19,926	34,418	43,452	40,867	42,607
Of which for:						
<i>Retreading and continued use</i>	5,477	5,472	6,690	4,085	3,660	3,121
<i>Temporary storage</i>	1,133	0	0	0	0	0
<i>Rubber powder or incineration</i>	6,060	11,454	27,728	39,367	37,252	37,488
Collection in per cent of tyres covered by the scheme	75.8	87.3	98.9	105.7	99.9	105.8

Source: reports from the Danish Tyre Trade Environmental Foundation in 1996, 1998, 2000, 2002, 2003 and 2004.

### 3 Hazardous waste

Table 12 shows treatment of hazardous waste in 2003 and 2004 by main group. The statement covers waste from both primary and secondary sources. A more detailed statement of hazardous waste, analysed by ISAG fractions is available in Annex 4. Table 12 has been changed somewhat from previous years to make it more comprehensible. This means that certain fractions are now only found in Annex 4.

Waste from secondary sources, such as waste from incineration plants, is not included in total waste generation, cf. Table 1. This is because the waste would otherwise be counted twice in the statistics: the first time upon receipt at the primary treatment plant and the second time as a residue. However, it may be reasonable to include waste from both primary and secondary sources when estimating capacity needs for hazardous waste management.

Waste fraction	Reprocessing		Incineration		Landfilling		Special treatment		In total	
	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004
<b>Primary sources</b>									0	0
Animal and vegetable fats	1	1	2,524	2,641	0	1	17	45	2,542	2,688
Halogen-containing organic compounds	4	3	1,037	958	0	0	4	22	1,045	982
Halogen-free organic compounds	443	569	33,887	29,633	439	282	3,159	2,468	37,929	32,952
Inorganic compounds	3,662	4,166	5,136	7,924	1,839	1,803	6,631	6,380	17,267	20,273
Other hazardous waste	2,508	2,569	17,967	27,179	105,883	2,105	1,449	1,800	127,807	33,653
Waste oil	43,631	47,802	19,093	20,745	13	1	2,558	1,532	65,294	70,079
Health-care risk waste	0	0	1,479	1,520	0	0	2,822	2,745	4,301	4,265
Fly ash	0	0	0	0	2,811	1,994	0	0	2,811	1,994
Other flue-gas waste	31,091	33,403	0	0	0	0	0	0	31,091	33,403
Asbestos	0	0	0	0	17,029	16,666	0	0	17,029	16,666
Batteries	3,582	209	0	0	0	0	0	0	3,582	209
Lead batteries (1)	17,549	17,118							17,549	17,118
Hermetic Ni-Cd batteries (2)	62	100							62	100
CFC cooling agents	2	1	0	0	0	0	37	16	39	18
Shredder waste	0	0	0	0	0	107,626	0	0	0	107,626
<b>Primary sources in total</b>	<b>102,536</b>	<b>105,941</b>	<b>81,123</b>	<b>90,599</b>	<b>128,015</b>	<b>130,477</b>	<b>16,676</b>	<b>15,009</b>	<b>328,349</b>	<b>342,025</b>
<b>Secondary sources</b>									0	0
Flue-gas waste (1)	0	0							0	0
Fly ash and flue-gas cleaning products from waste incineration (4)					88136	86834			88,136	86,834
<b>Secondary sources in total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>88136</b>	<b>86834</b>	<b>0</b>	<b>0</b>	<b>88136</b>	<b>86834</b>
<b>Total</b>	<b>102,536</b>	<b>105,941</b>	<b>81,123</b>	<b>90,599</b>	<b>216,151</b>	<b>217,311</b>	<b>16,676</b>	<b>15,009</b>	<b>416,485</b>	<b>428,859</b>

Source: ISAG reports 2003 and 2004, and (1) Registrations under the EU regulation on shipments of waste. (2) Danish EPA calculations. Double reporting may have occurred, because some of the hermetically sealed Ni-Cd batteries may have been included in the amount of batteries reported to the ISAG. (3) Elsam and Energi E2. (4) Based on the ISAG. It is expected that waste from secondary sources will be exported and landfilled abroad.

The table shows that hazardous waste from primary sources amounted to 342,025 tonnes in 2004. This is an increase of 13,676 tonnes from 2003. The three fractions which have gone up the most are: waste oil, inorganic compounds, and other flue-gas waste.

The Figure also shows that the amount of shredder waste has gone from 0 to 107,626 tonnes in 2004. This is because in 2003, we chose to register shredder waste under the category "other hazardous waste". Since shredder waste is reported as landfilled waste exempted from tax, the ISAG leaves no other option than including it under "other hazardous waste". This waste fraction, however, is so large that this year we chose to include shredder waste in the statistics separately. This, then, results in a fall in the amount of "other hazardous waste", which went from 127,807 tonnes in 2003 to 33,653 tonnes in 2004.

The amount of shredder waste was around 100,000 tonnes in 2003.

Hazardous waste from secondary sources amounted to 86,834 tonnes in 2004, which is 1,302 tonnes less than in 2003.

Tables 13 to 16 show the amounts of waste generated by the four sectors: households, service, industry, and building and construction.

**Table 13. Treatment of hazardous waste from households 2003 and 2004. Stated in tonnes.**

Waste fraction	Reprocessing		Incineration		Landfilling		Special treatment	
	2003	2004	2003	2004	2003	2004	2003	2004
Animal and vegetable fats	0	0	54	52	0	0	0	1
Halogen-containing organic compounds	0	0	60	61	0	0	0	1
Halogen-free organic compounds	0	0	7072	4878	2	0	2612	2165
Inorganic compounds	18	7	292	490	11	19	56	85
Other hazardous waste	202	138	1888	2092	319	292	772	1177
Waste oil	365	213	7751	12593	0	0	1767	1464
Health-care risk waste	0	0	0	0	0	0	18	19
Fly ash	0	0	0	0	4	1	0	0
Asbestos	0	0	0	0	1700	2334	0	0
Batteries	507	43	0	0	0	0	0	0
CFC cooling agents	1	0	0	0	0	0	4	4
<b>Total</b>	<b>1,093</b>	<b>402</b>	<b>17,118</b>	<b>20,166</b>	<b>2,037</b>	<b>2,646</b>	<b>5,231</b>	<b>4,916</b>

Source: ISAG 2002 and 2003.

**Table 14. Treatment of hazardous waste from the service sector 2003 and 2004. Stated in tonnes.**

Waste fraction	Reprocessing		Incineration		Landfilling		Special treatment	
	2003	2004	2003	2004	2003	2004	2003	2004
Animal and vegetable fats	0	1	587	647	0	0	2	7
Halogen-containing organic compounds	0	1	178	269	0	0	1	20
Halogen-free organic compounds	90	205	3,665	3,009	6	1	36	13
Inorganic compounds	267	285	1,272	2,788	17	125	361	305
Other hazardous waste	127	117	3,669	2,281	306	209	129	127
Waste oil	17,591	21,931	2,420	3,843	5	0	790	49
Health-care risk waste	0	0	1,479	1,495	0	0	2,664	2,668
Fly ash	0	0	0	0	90	11	0	0
Asbestos	0	0	0	0	210	195	0	0
Batteries	2,469	142	0	0	0	0	0	0
CFC cooling agents	1	1	0	0	0	0	21	10
<b>Total</b>	<b>20,546</b>	<b>22,682</b>	<b>13,269</b>	<b>14,333</b>	<b>633</b>	<b>541</b>	<b>4,004</b>	<b>3,198</b>

Source: ISAG 2002 and 2003.

**Table 15. Treatment of hazardous waste from industry 2003 and 2004. Stated in tonnes.**

Waste fraction	Reprocessing		Incineration		Landfilling		Special treatment	
	2003	2004	2003	2004	2003	2004	2003	2004
Animal and vegetable fats	0	0	1,875	1,940	0	1	15	37
Halogen-containing organic compounds	4	2	794	623	0	0	2	2
Halogen-free organic compounds	348	362	22,761	21,419	391	262	511	290
Inorganic compounds	3,375	3,870	3,482	4,632	1,750	1,632	6,158	5,979
Other hazardous waste	1,531	1,502	10,133	21,040	105,231	221	538	484
Waste oil	25,665	25,651	4,387	3,022	8	1	0	19
Health-care risk waste	0	0	1	25	0	0	140	59
Fly ash	0	0	0	0	2,549	1,758	0	0
Other flue-gas cleaning waste	31,091	33,403	0	0	0	0	0	0
Asbestos	0	0	0	0	297	216	0	0
Batteries	553	23	0	0	0	0	0	0
CFC cooling agents	0	0	0	0	0	0	11	2
Shredder waste	0	0	0	0	0	107,626	0	0
<b>Total</b>	<b>62,566</b>	<b>64,814</b>	<b>43,432</b>	<b>52,701</b>	<b>110,226</b>	<b>111,718</b>	<b>7,376</b>	<b>6,872</b>

Source: ISAG 2002 and 2003.

Table 16. Treatment of hazardous waste from the building and construction sector 2003 and 2004. Stated in tonnes.								
Waste fraction	Reprocessing		Incineration		Landfilling		Special treatment	
	2003	2004	2003	2004	2003	2004	2003	2004
Animal and vegetable fats	0	0	5	2	0	0	0	0
Halogen-containing organic compounds	0	0	6	4	0	0	0	0
Halogen-free organic compounds	4	2	272	257	41	18	0	0
Inorganic compounds	2	4	46	7	46	14	53	8
Other hazardous waste	616	804	2,212	1,735	26	1,382	9	11
Waste oil	9	5	291	695	0	0	0	0
Fly ash	0	0	0	0	7	7	0	0
Asbestos	0	0	0	0	13,941	13,027	0	0
Batteries	52	0	0	0	0	0	0	0
<b>Total</b>	<b>685</b>	<b>814</b>	<b>2,831</b>	<b>2,699</b>	<b>14,061</b>	<b>14,448</b>	<b>62</b>	<b>19</b>

Source: ISAG 2002 and 2003.

The total amount of hazardous waste from industry is 236,105 tonnes, whereas the total amount from the service sector is 40,754 tonnes, the total amount from households is 28,130 tonnes, and the total amount from building and construction is 17,980 tonnes. A comparison of the total amounts of hazardous waste from the four sectors shows that industry generated almost three times as much hazardous waste as the three remaining sectors put together.

The building and construction sector, which generates least hazardous waste, has one primary source of hazardous waste, namely asbestos. Asbestos is also present in other sectors, however in significantly smaller quantities.

Healthcare risk waste from the service sector, or more precisely from hospitals, is another hazardous waste fraction primarily originating from one sector.

The three fractions waste oil, halogen-free organic compounds, and other hazardous waste occur in the largest amounts in industry, the service sector, and households. Organic compounds without halogens include e.g. solvents, dye/varnish/paint and tar, and rust-preventing oils.

Inorganic compounds are found in significant amounts in both industry and the service sector. This fraction is found only in small amounts in both households and the building and construction sector.

## 4 Imports and exports of waste

### 4.1 Imports

Table 17 shows the amount of waste imported to Denmark in 2003 and 2004 by waste fraction and treatment option. In 2004, 513,137 tonnes of waste were imported, which is 9,701 tonnes more than in 2003.

The amount of waste imported in 2004 corresponds to around 4 per cent of total waste generated in Denmark. This is about the same as in 2003.

Fraction	Recycling		Incineration		Landfilling		Special treatment		In total	
	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004
Glass (2)	60,000	125,300							60,000	125,300
Paper and cardboard (2)	92,400	88,300							92,400	88,300
Plastic (2)	43,800	59,500							43,800	59,500
Ferrous metal (3)	142,000	74,000							142,000	74,000
Other combustible waste (4)			70,800	74,700					70,800	74,700
Special hospital waste (1)							0	0	0	0
Food waste/other organic waste (1)	17,100	10,900							17,100	10,900
Other recyclable waste (1)	22,500	28,600							22,500	28,600
Sludge (4)	2,600	33							2,600	33
Other waste reported (4)	52,200	49,600			0	0	36	200	52,236	49,800
<b>Total</b>	<b>432,600</b>	<b>438,237</b>	<b>70,800</b>	<b>74,700</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>200</b>	<b>503,436</b>	<b>513,137</b>

Source: (1) ISAG reports; (2) Statistics Denmark; (3) Association of Danish Recycling Industries and other large scrap dealers; (4) registrations under the EU regulation on shipments of waste: Council Regulation No. 259/93 on the supervision and control of shipments of waste within, into and out of the European Community.

Around 70 per cent of imported waste is categorised pursuant to the EU regulation on shipments of waste (18) as so-called green waste for recovery<sup>18</sup>. Green waste covers primarily glass, paper and cardboard, plastic, ferrous metal, and organic waste. Green waste is not subject to mandatory notification under the EU regulation on shipments of waste.

Waste imported belonging to the category "other combustible waste" is destined for incineration with energy recovery, and comprises different types of waste oil. This is waste subject to mandatory notification and it is therefore also included in Table 19.

### 4.2 Exports

Table 18 shows the amount of waste exported from Denmark in 2003 and 2004. The amount of waste exported from Denmark in 2004 corresponded to around 12 per cent of the total waste generated in Denmark.

In 2004, waste exports amounted to 1,621,674 tonnes, or 217,514 tonnes less than in 2003. The fall can be attributed to a smaller amount of ferrous metal, namely 167,000 tonnes, and residues from waste incineration plants, namely

<sup>18</sup> Council Regulation No. 259/93 on the supervision and control of shipments of waste within, into and out of the European Community

70,500 tonnes. A detailed statement of the amount of exported waste subject to mandatory notification is found in Table 19.

Around 62 per cent of waste exported from Denmark in 2003 belongs to the category "green waste for recovery". This category includes the fractions glass, paper and cardboard, plastic, and ferrous metal.

<b>Table 18. Export of waste in 2003 and 2004 stated by fraction and in tonnes.</b>		
	<b>2003</b>	<b>2004</b>
Glass (2)	10,536	18,964
Paper and cardboard (2)	434,723	493,200
Plastic (2)	29,543	36,700
Ferrous metal (3)	738,000	571,000
Other combustible waste (4)	139,200	114,200
Fly ash and slag from coal-fired power plants (5)	88,000	70,700
Sulphuric acid from coal-fired power plants (5)	0	0
Slag and flue-gas cleaning products from iron production (4)	0	0
Lead batteries (4)	17,500	16,000
Ni-Cd batteries and other batteries (4) and (6)	186	106
Residues from waste incineration plants (4)	229,000	158,500
Iron residues from waste incineration plants (4)	12,500	4,900
Other waste subject to mandatory notification (4)	140,000	135,400
<b>In total</b>	<b>1,839,188</b>	<b>1,621,674</b>

Source: (1) ISAG reports; (2) Statistics Denmark; (3) Association of Danish Recycling Industries and other large scrap dealers; (4) registrations under the EU regulation on shipments of waste: Council Regulation No. 259/93 on the supervision and control of shipments of waste within, into and out of the European Community; (5) Elsam and Energi E2; (6) the Danish EPA registered 110 tonnes of Ni-Cd batteries collected in 2002 and 62 tonnes in 2003.

### 4.3 Imports and exports of waste subject to mandatory notification

Table 19 shows the countries to and from which Denmark has exports and imports of waste subject to mandatory notification. Waste subject to mandatory notification means waste that must be notified to the competent authorities of dispatch and the competent authorities of destination according to Council Regulation No. 259/93 on the supervision and control of shipments of waste within, into and out of the European Community.

As can be seen from the table, in 2004 Denmark imported 235 tonnes of waste for disposal, which is about 200 tonnes more than in 2003. This waste came from Germany and Latvia and mainly consisted of waste from metal coating and chemical waste from wood preserving.

In 2004, Denmark imported around 124,400 tonnes of waste for recovery. Most of this waste originated from Norway and Sweden and primarily consisted of waste oil and alkaline solutions etc.

The amount of imported waste destined for recovery fell by 1,228 tonnes compared to 2003, when around 125,615 tonnes of waste were imported.

Waste subject to mandatory notification exported for disposal amounted to 222,682 tonnes in 2004, which is 86,137 tonnes less than in 2003. This waste was exported to Norway and Germany and primarily consisted of residues from waste incineration plants.

In addition, Denmark exported 206,317 tonnes of waste subject to mandatory notification destined for recovery. This is 5,536 tonnes less than in 2003. Countries of destination were primarily Sweden and Germany. The waste types concerned were primarily waste from processed cork and wood, lead batteries, and other waste.

**Table 19: Imports and exports of waste subject to mandatory notification in 2004. Stated in tonnes.**

Country (X)	OECD code	Disposal		Recovery	
		Exports from Denmark to X:	Imports from X to Denmark	Exports from Denmark to X:	Imports from X to Denmark:
Belgium					
	AB080	0.00	0.00	37.73	0.00
	AC030	0.00	0.00	0.00	684.99
	AC070	0.00	0.00	123.85	0.00
	AA040	0.00	0.00	190.07	0.00
	AA100	0.00	0.00	88.34	0.00
	AA130	0.00	0.00	1,419.68	0.00
<b>Total:</b>		<b>0.00</b>	<b>0.00</b>	<b>1,859.66</b>	<b>684.99</b>
England					
	AC030	0.00	0.00	0.00	24.84
	AA060	0.00	0.00	1,121.93	0.00
	AA120	0.00	0.00	22.00	0.00
	AA160	0.00	0.00	58.72	0.00
<b>Total:</b>		<b>0.00</b>	<b>0.00</b>	<b>1,202.65</b>	<b>24.84</b>
Finland					
	RX100	0.00	0.00	351.52	0.00
<b>Total:</b>		<b>0.00</b>	<b>0.00</b>	<b>351.52</b>	<b>0.00</b>
France					
	AA180	0.00	0.00	50.55	0.00
<b>Total:</b>		<b>0.00</b>	<b>0.00</b>	<b>50.55</b>	<b>0.00</b>
The Netherlands					
	AB010	0.00	0.00	0.00	568.90
	AB040	0.00	0.00	1,410.57	0.00
	AB080	0.00	0.00	46.38	0.00
	AD070	0.00	0.00	281.28	0.00
	AD110	0.00	0.00	0.00	2,069.36
	RX100	0.00	0.00	135.37	0.00
	AA040	0.00	0.00	149.19	0.00
<b>Total:</b>		<b>0.00</b>	<b>0.00</b>	<b>2,022.78</b>	<b>2,638.26</b>
India					
	AA100	0.00	0.11	0.00	0.00
<b>Total:</b>		<b>0.00</b>	<b>0.11</b>	<b>0.00</b>	<b>0.00</b>
Ireland					
	AC030	0.00	0.00	0.00	10.47
	AC090	0.00	0.00	0.00	519.04
	AC210	0.00	0.00	0.00	12,075.56
	AC220	0.00	0.00	0.00	94.38
	AC230	0.00	0.00	0.00	152.92
	AD010	0.00	0.00	0.00	1,061.19
	AD020	0.00	0.00	0.00	2.63
	AD070	0.00	0.00	0.00	30.60
	RX100	0.00	15.06	0.00	288.27
<b>Total:</b>		<b>0.00</b>	<b>15.06</b>	<b>0.00</b>	<b>14,235.07</b>

Cont.



Country (X)	OECD code	Disposal		Recovery	
		Exports from Denmark to X:	Imports from X to Denmark	Exports from Denmark to X:	Imports from X to Denmark:
Iceland					
	AB110	0.00	0.00	0.00	0.35
	AC220	0.00	0.00	0.00	15.04
	AD010	0.00	0.00	0.00	1.79
	AD020	0.00	0.00	0.00	1.48
	AD060	0.00	0.00	0.00	2.91
	AD070	0.00	0.00	0.00	104.47
	AD110	0.00	1.72	0.00	0.00
	RA010	0.00	2.41	0.00	0.00
	RX100	0.00	0.00	0.00	247.74
	AA180	0.00	0.00	0.00	1.21
<b>Total:</b>		<b>0.00</b>	<b>4.14</b>	<b>0.00</b>	<b>374.98</b>
Israel					
	RX100	0.00	0.00	0.00	129.62
<b>Total:</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>129.62</b>
Latvia					
	AB030	0.00	153.36	0.00	0.00
<b>Total:</b>		<b>0.00</b>	<b>153.36</b>	<b>0.00</b>	<b>0.00</b>
Norway					
	AB010	622.84	0.00	0.00	0.00
	AB020	154,420.94	0.00	0.00	0.00
	AB070	0.00	0.00	0.00	2,458.37
	AB110	0.00	0.00	0.00	12,299.88
	AC010	0.00	0.00	0.00	163.13
	AC030	0.00	0.00	6,317.46	6,668.34
	AC250	0.00	0.00	0.00	350.74
	AC270	0.00	0.00	0.00	2.12
	AD010	0.00	0.00	0.00	1.12
	AD020	40,879.47	0.00	0.00	0.00
	AD030	0.00	0.00	0.00	1.57
	AD060	0.00	0.00	0.00	20,501.87
	AD070	0.00	0.00	0.00	602.71
	AD090	0.00	0.00	0.00	1,379.54
	AD140	60.30	0.00	0.00	0.00
	AD160	0.00	0.00	0.00	2,804.78
	RX100	0.00	0.00	0.00	27,447.54
	AA020	0.00	0.00	346.28	0.00
	AA050	161.06	0.00	0.00	0.00
	AA100	0.00	0.00	0.00	3.23
<b>Total:</b>		<b>196,144.61</b>	<b>0.00</b>	<b>6,663.74</b>	<b>74,684.94</b>
Poland					
	RX100	0.00	0.00	34.31	0.00
<b>Total:</b>		<b>0.00</b>	<b>0.00</b>	<b>34.31</b>	<b>0.00</b>
Scotland					
	RX100	0.00	0.00	0.00	142.00
<b>Total:</b>		<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>142.00</b>

Cont.

Country (X)	OECD code	Disposal		Recovery	
		Exports from Denmark to X:	Imports from X to Denmark	Exports from Denmark to X:	Imports from X to Denmark:
Sweden					
	AB070	0.00	0.00	1,436.37	0.00
	AB080	0.00	0.00	490.92	0.00
	AB100	0.00	0.00	0.00	113.30
	AC030	0.00	0.00	0.00	10,545.67
	AC090	0.00	0.00	0.00	192.49
	AC150	0.00	0.00	0.00	19.27
	AC170	0.00	0.00	9,768.50	0.00
	AC220	0.00	0.00	0.00	205.35
	AD020	0.00	0.00	0.00	53.36
	AD040	0.00	0.00	0.00	48.83
	AD060	0.00	0.00	0.00	5,672.17
	AD070	0.00	0.00	0.00	6,513.16
	AD090	0.00	0.00	0.00	581.70
	AD160	0.00	0.00	0.00	111.84
	RA010	0.00	3.41	0.00	0.00
	RA020	0.00	0.00	0.00	29.04
	RX100	0.00	0.00	21,734.65	1,855.13
	AA030	0.00	0.00	53.36	0.00
	AA100	0.00	0.00	2.01	27.76
	AA170	0.00	0.00	15,952.75	0.00
	AA180	0.00	0.00	67.39	0.00
<b>Total:</b>		<b>0.00</b>	<b>3.41</b>	<b>49,505.95</b>	<b>25,969.08</b>
Germany					
	AB020	26,516.41	0.00	12,661.98	0.00
	AB040	0.00	0.00	2,210.43	0.00
	AB070	0.00	0.00	3,394.14	0.00
	AB080	0.00	0.00	530.62	0.00
	AB090	0.00	0.00	0.00	537.41
	AC030	0.00	0.00	3,047.25	0.00
	AC170	0.00	0.00	2,574.23	0.00
	AC270	0.00	0.00	2,548.92	0.00
	AD020	0.00	0.00	0.00	205.96
	AD030	0.00	59.22	0.00	0.00
	AD060	0.00	0.00	0.00	1,223.41
	AD070	0.00	0.00	5,437.61	0.00
	AD110	0.00	0.00	43.46	0.00
	AD160	0.00	0.00	87.32	0.00
	RX100	0.00	0.00	99,949.23	3,536.89
	AA010	0.00	0.00	959.48	0.00
	AA020	0.00	0.00	494.55	0.00
	AA040	0.00	0.00	16.04	0.00
	AA050	0.00	0.00	4,598.34	0.00
	AA070	0.00	0.00	4,394.75	0.00
	AA100	21.24	0.00	268.61	0.00
	AA120	0.00	0.00	1,056.32	0.00
	AA130	0.00	0.00	222.90	0.00
<b>Total:</b>		<b>26,537.65</b>	<b>59.22</b>	<b>144,496.17</b>	<b>5,503.67</b>
Austria					
	AB080	0.00	0.00	90.15	0.00
	AA060	0.00	0.00	39.63	0.00
<b>Total:</b>		<b>0.00</b>	<b>0.00</b>	<b>129.78</b>	<b>0.00</b>
<b>Total, all countries</b>		<b>222,682.26</b>	<b>235.29</b>	<b>206,317.11</b>	<b>124,387.44</b>

Source: Danish EPA Transport Database. The reporting is based on reporting of shipments completed under the EU regulation on shipments of waste (Council Regulation No 259/93). The competent authorities of destination must submit copies of the completed consignment note to the competent authorities involved no later than 3 days from receipt of the waste. No later than 180 days after receipt of the waste, the consignee must send proof that the waste has been recovered. OECD waste codes are described in detail in Commission Decision of 21 October 1994 (OJ 1994 L288/36).

## 4.4 OECD- codes

### OECD waste 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.
AA080	Thallium waste and residues.
AA090	Arsenic waste and residues.
AA100	Mercury waste and residues.
AA110	Residues from alumina production not elsewhere specified or included.
AA120	Galvanic sludge.
AA130	Liquors from the pickling of metals.
AA140	Leaching residues from zinc processing, dusts and sludge such as jarosite, hematite, goethite, etc.
AA150	Precious metal bearing residues in solid form which contain traces of inorganic cyanides
AA160	Leaching residues from zinc processing, dusts and sludge such as jarosite, hematite, goethite, etc:
AA161	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.
AA190	Magnesium waste and scrap that is flammable, pyrophoric or emits, upon contact with water, flammable gases in dangerous quantities.
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.
AB040	Glass waste from cathode-ray tubes and other activated glasses.
AB050	Calcium fluoride sludge.
AB060	Other inorganic fluorine compounds in the form of liquids or sludge.
AB070	Sands used in foundry operations.
AB080	Waste catalysts not on the green list.
AB090	Waste hydrates of aluminium.
AB100	Waste alumina.
AB110	Basic solutions.
AB120	Inorganic halide compounds, not elsewhere specified or included.
AB130	Used blasting grit.
AB140	Gypsum arising from chemical industry processes.
AB150	Unrefined calcium sulphite and calcium sulphate from flue gas desulphurization (FGD).
AC010	Waste from the production/processing of petroleum coke and bitumen, excluding anode butts.
AC020	Asphalt cement wastes.
AC030	Waste oils unfit for their originally intended use.
AC040	Leaded petrol (gasoline) sludge.
AC050	Thermal (heat transfer) fluids.
AC060	Hydraulic fluids.
AC070	Brake fluids.
AC080	Antifreeze fluids.
AC090	Waste from production, formulation and use of resins, latex, plasticisers, glues and adhesives.
AC100	Nitrocellulose.
AC110	Phenols, phenol compounds including chlorophenol in the form of liquids or sludge.
AC120	Polychlorinated naphthalenes.
AC130	Ethers.
AC140	Triethylamine catalyst for setting foundry sands.
AC150	Chlorofluorocarbons.
AC160	Halons.
AC170	Treated cork and wood wastes.
AC180	Leather dust, ash, sludge and flours.
AC190	Fluff light fraction from automobile shredding.
AC200	Organic phosphorous compounds.
AC210	Non-halogenated solvents.
AC220	Halogenated solvents.
AC230	Halogenated or unhalogenated non-aqueous distillation residues arising from organic solvent recovery operations
AC240	Wastes arising from the production of aliphatic halogenated hydrocarbons.
AC250	Surface active agents (surfactants).
AC260	Liquid pig manure; faeces.

AC270	Sewage sludge.
AD010	Wastes from the production and preparation of pharmaceutical products.
AD020	Wastes from the production, formulation and use of biocides and phytopharmaceuticals.
AD030	Wastes 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.
AD050	Organic cyanides.
AD060	Waste oils/water, hydrocarbons/water mixtures, emulsions.
AD070	Wastes 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	Wastes from production, formulation and use of reprographic and photographic chemicals and materials not elsewhere specified or included.
AD100	Wastes from non-cyanide based systems which arise from surface treatment of plastics.
AD110	Acidic solutions.
AD120	Ion exchange resins.
AD130	Single-use cameras with batteries.
AD140	Wastes from industrial pollution control devices for cleaning of industrial off-gases, not elsewhere specified or included.
AD150	Naturally occurring organic material used as a filter medium (such as bio-filters).
AD160	Municipal/household wastes.
AD170	Spent activated carbon having hazardous characteristics and resulting from its use in the inorganic chemical, organic chemical and pharmaceutical industries, waste water treatment, gas/air cleaning processes and similar applications.
RA010	Wastes, 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.
RA020	Waste tarry residues (excluding asphalt cements) arising from refining, distillation and any pyrolytic treatment.
RB010	Asbestos (dusts and fibres).
RB020	Ceramic-based fibres of physico-chemical characteristics similar to those of asbestos.
RC010	Wastes that contain, consist of or are contaminated with any congener of polychlorinated dibenzofuran
RC020	Wastes that contain, consist of or are contaminated with any congener of polychlorinated dibenzodioxin
RC030	Leaded anti-knock compounds sludge.
RC040	Peroxides other than hydrogen peroxide.
RX100	Other wastes not specified with an OECD code.

# 5 Individual waste sources and status in relation to targets for 2008

## 5.1 Waste from households

Waste from households covers the waste types domestic waste, bulky waste, and garden waste, which in turn are divided into individual fractions, e.g. paper and cardboard, bottles and glass, and food waste/other organic waste. Table 20 shows waste arisings by mixed and separately collected fractions to the extent it has been possible to register these individually.

This means, for example, that the amount of paper and cardboard stated does not show the complete potential in household waste arisings but only the amount which has been separated and collected for recycling. The rest of the paper is part of the fraction various combustible.

Waste arisings in households in 2004 amounted to around 3,164,000 tonnes, which constitutes a 5 per cent increase from 2003. The increase in the total amount of household waste can be tracked for the major part to food waste/other organic waste separated for recycling and other waste. These two fractions went up by 39 per cent and 69 per cent.

The fraction various combustible, however, still makes up the largest part of total household waste arisings, namely around 62 per cent.

Table 20. Waste from households, stated by fraction and in tonnes	1994	1996	1998	2000	2002	2003	2004	Change in % 2003-2004
Various combustible	1,797,717	1,800,752	1,775,930	1,985,975	1,956,486	1,888,700	1,959,363	4%
Various non-combustible	203,430	164,356	146,707	154,482	162,562	151,457	150,696	-1%
Paper and cardboard separated for recycling	142,668	160,469	208,486	181,315	204,059	220,964	220,739	0%
Bottles and glass separated for recycling	69,064	64,903	83,033	82,351	110,758	76,961	87,599	14%
Food waste/other organic waste separated for recycling	32,907	45,905	51,926	44,672	37,072	37,922	52,805	39%
Branches, leaves, grass etc. separated for recycling	258,574	386,874	408,877	505,113	512,199	493,072	495,129	0%
Hazardous waste (1)	-	16,214	14,395	27,548	19,840	29,370	28,130	-4%
Ferrous metal (2) separated for recycling	-	-	11,926	16,768	24,596	25,479	25,028	-2%
Other waste	83,456	129,479	94,569	85,362	92,992	85,285	144,038	69%
<b>In total</b>	<b>2,574,817</b>	<b>2,766,952</b>	<b>2,795,848</b>	<b>3,083,586</b>	<b>3,120,564</b>	<b>3,009,209</b>	<b>3,163,526</b>	<b>5%</b>

Source: ISAG reports. (2) For the year 1996, ferrous metal are included under "Other waste".

Table 20 shows several shifts between the different household waste fractions, so that various combustible, glass, food waste/other organic waste, hazardous waste, and other waste have increased by 4 per cent, 14 per cent, 39 per cent, 10 per cent, and 69 per cent respectively, compared to 2003. Various non-combustible, paper and cardboard, hazardous waste and ferrous metal, on the other hand, have dropped by 1 per cent, 0.1 per cent, 4 per cent, and 2 per cent respectively, compared to 2003.

### 5.1.1 Household waste per capita and per household

In Table 21, household waste arisings are stated per capita and per household. Furthermore, the Table shows total arisings analysed between selected waste types and separately collected waste fractions.

Total household waste generation per capita amounted to 586 kg in 2004, which is 27 kg more than in 2003. Household waste per household was 1,275 kg in 2004.

Of these, domestic waste per capita and per household was 313 kg and 682 kg respectively in 2004. Compared to 2003, this means a slight increase of 1 kg per capita, while the amount per household grew by 2 kg.

**Table 21. Household waste generation 2001-2004 per capita and per household. Stated in kg. Including both waste types and waste fractions**

	2001		2002		2003		2004	
	Per capita	Per household	Per capita	Per household	Per capita	Per household	Per capita	Per household
Household waste in total	567	1261	581	1271	559	1220	586	1275
Domestic waste in total	318	696	317	692	312	680	313	682
<i>Of these, separately collected:</i>								
<i>Domestic waste/paper</i>	28	62	31	69	35	75	36	78
<i>Domestic waste/glass</i>	23	51	21	45	14	31	16	35
<i>Domestic waste/food waste</i>	8	18	7	15	7	15	10	21
Hazardous waste from households	4	10	5	10	5	10	5	11
Garden waste from households	86	187	96	210	93	203	93	202
Bulky waste from households	128	280	122	267	118	257	126	275
<i>Of these:</i>								
<i>Paper separated for recycling</i>	8	16	7	15	7	14	5	11
<i>Glass separated for recycling</i>	0	0	0	0	0	0	0	0

Source: ISAG reports. Statistics Denmark's statement of population growth and number of households has been used. Note that Tables 20 and 21 are not readily comparable, as Table 20 concerns waste generation stated by fraction while Table 21 also includes waste types.

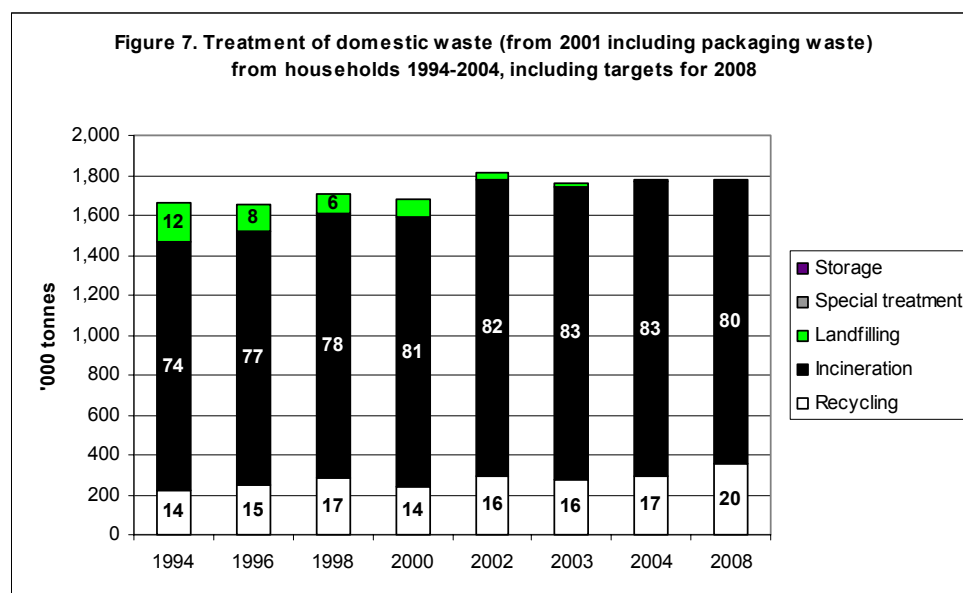
### 5.1.2 Domestic waste

Domestic waste from households covers ordinary waste from private household consumption. This includes paper, bottles, glass, organic food waste and other waste. Usually, domestic waste is collected from households at regular intervals, once a week or once every other week.

As mentioned in Chapter 1, domestic waste amounted to 1,692,000 tonnes in 2004, which is 15,000 tonnes more than in 2003. Since 1994, the amount of domestic waste has varied slightly from year to year, however, without showing any clear trend. The amount has increased by 2 per cent over the entire period, cf. Table 3.

In 2004, 17 per cent of domestic waste was recycled, whereas 83 per cent was incinerated and about 1 per cent landfilled. The breakdown by treatment option therefore shows slight changes from 2003 when 16 per cent was recycled and 1 per cent landfilled. The same percentage share was incinerated in 2003.

For the early years, packaging waste is included as part of the waste type domestic waste. To make comparison with these early years possible, packaging waste from households in 2001, 2002, 2003 and 2004 of 107,000, 117,000, 85,000 tonnes, and 84,000 tonnes respectively has been included in Figure 7.



Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

Figure 7 shows that the relative distribution in the period 1994 to 2004 among treatment options has varied only little. Seen over the whole period, the trend since 1994 is that around 80 per cent of domestic waste is incinerated, but this figure is increasing. The general trends for recycling and landfilling are around 16 per cent and 5 per cent, respectively. The landfilling rate, however, is falling.

This means that we are still incinerating and landfilling too much domestic waste in relation to the targets in Waste Strategy 2005-2008; conversely, the amount of waste which is recycled is too small.

It should be noted that domestic waste is considered suitable for incineration and it is therefore not to be landfilled. If not recycled, domestic waste is to be incinerated. However, islands that are not connected by land to an incineration plant are exempt from this obligation.

Table 22. Treatment of domestic waste 1994-2004 stated in '000 tonnes. Illustrated in Figure 7.

Domestic waste	1994	1996	1998	2000	2002	2003	2004	2008
Recycling	226	249	281	240	290	275	295	355
Incineration	1,237	1,274	1,324	1,352	1,491	1,463	1,470	1421
Landfilling	198	132	98	85	37	24	11	0
Special treatment	0	0	0	0	0	0	0	0
Storage					0	0	0	0

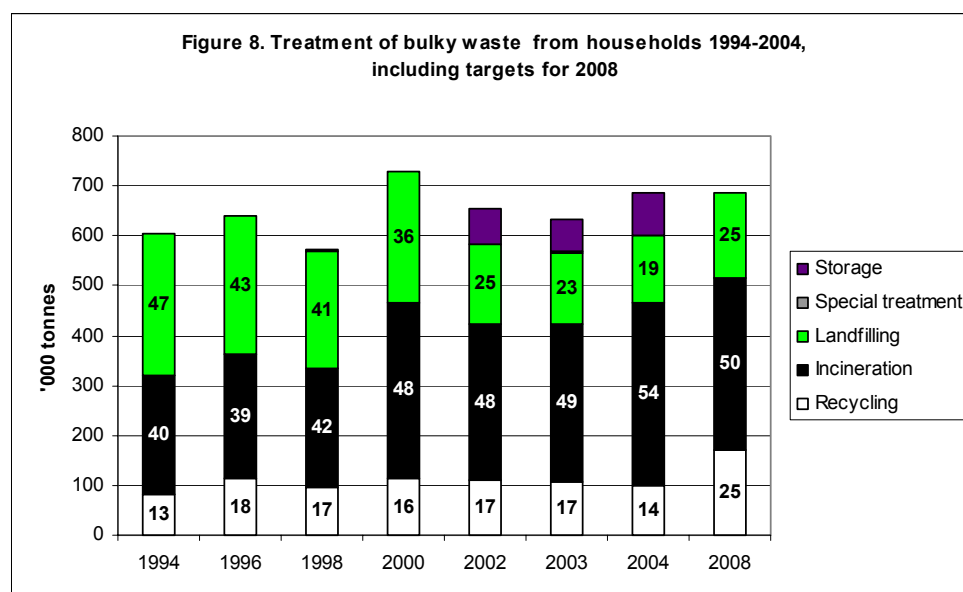
Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

### 5.1.3 Bulky waste

Bulky waste generated by Danish households amounted to 687,000 tonnes in 2004. This is 53,000 tonnes more than in 2003. In other words, there has been an increase of 8 per cent.

During the period from 1994 to 2004 bulky waste increased by 13 per cent. The increase in bulky waste amounts is due to a real increase but also very much to the implementation of pick-up and bring schemes for this waste type.

Figure 8 shows bulky waste analysed between three treatment options: landfilling, incineration, and recycling for the period 1994 to 2004. The general trend for the period is that a larger proportion of bulky waste is being incinerated, whereas decreasing amounts are being landfilled. For recycling the percentage rate is stable but showing a slight downward trend in 2004.



Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

In 2004, 54 per cent of bulky waste was incinerated, the rate for landfilling fell to 19 per cent, and the rate for recycling fell to 14 per cent. The remaining 13 per cent, however, was led to temporary storage; i.e. temporary landfilling of waste suitable for incineration. This means that the waste will be stored until it may be incinerated in order to sell the energy/heat generated<sup>19</sup>. This means that the real incineration rate for bulky waste is higher than 54 per cent. At the same time, the figures show that the amount of waste led to landfills has gone down considerably since 1994.

The target of a maximum landfilling rate of 25 per cent has thus been met. However, too much bulky waste is still being incinerated and not enough is being recycled.

If targets for treatment in 2008 are to be met, considerable efforts are required to separate and collect more of the different waste fractions in bulky waste. A number of initiatives covering e.g. cardboard, waste electrical and electronic equipment, impregnated wood and PVC-containing waste have been, or are in the process of being, implemented.

<sup>19</sup> Exemption clause in Section 37(3), Danish Statutory Order on Waste (Statutory Order No. 619 of 27 June 2000).



Bulky waste	1994	1996	1998	2000	2002	2003	2004	2008
Recycling	80	114	96	113	111	108	98	172
Incineration	241	250	239	351	311	314	369	344
Landfilling	284	275	234	264	161	143	132	172
Special treatment	0	1	4	2	1	3	1	0
Storage					71	66	86	0

Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

Storage means that the waste in question has been assigned to temporary storage by local authorities (the local council), cf. section 37(3) of the Statutory Order on Waste. Denmark has excess incineration capacity, but storage can be due to e.g. repairs or shut down of operations at plants.

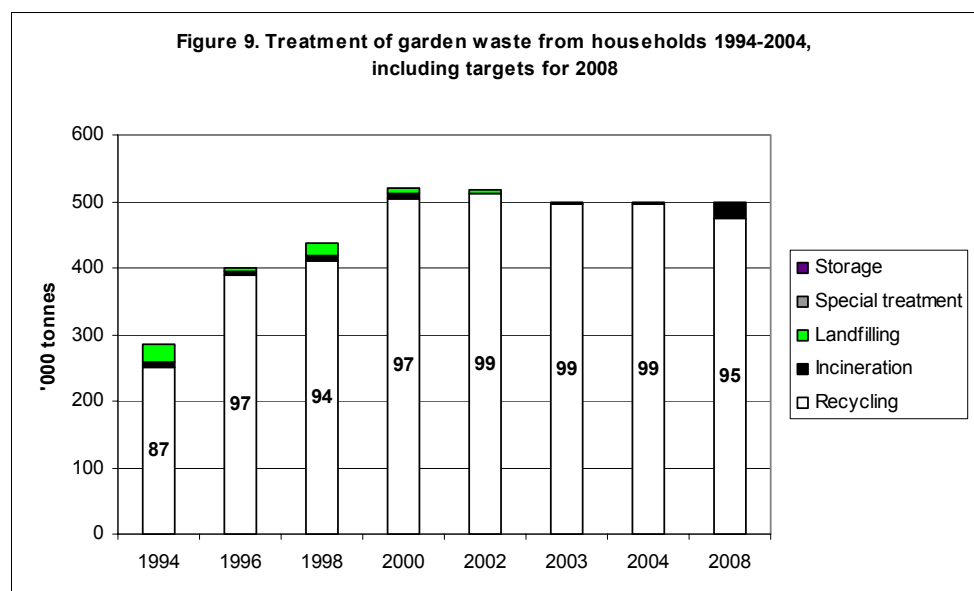
#### 5.1.4 Garden waste

The amount of garden waste collected from households in 2004 came to 500,000 tonnes. This is the same amount as in 2003.

Throughout the 1990s the amount of garden waste increased steadily. From 1994 to 2004 there has thus been a 75 per cent increase

This increase does not reflect a real increase in garden waste. It is rather the result of increasing opportunities for householders to dispose of garden waste at municipal waste treatment plants at the expense of home-composting. This means larger waste volumes to be treated in the municipal waste treatment system.

Treatment of garden waste is presented in Figure 9. In 2004, 99 per cent of garden waste was recycled, and 1 per cent was landfilled.



Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

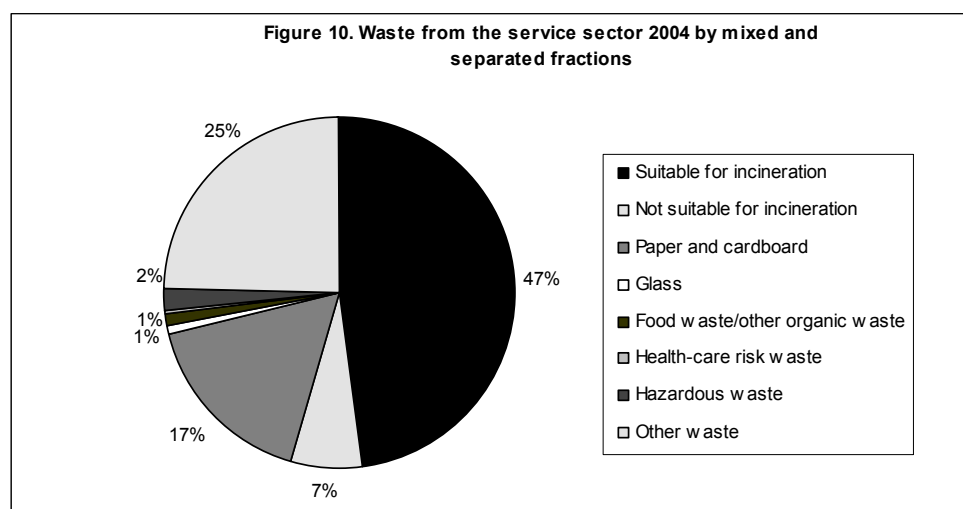
Garden waste	1994	1996	1998	2000	2002	2003	2004	2008
Recycling	250	388	411	505	513	496	495	475
Incineration	9	6	8	7	0	0	0	25
Landfilling	27	6	20	7	4	4	5	0
Special treatment	0	0	0	0	0	0	0	0
Storage					0	0	0	0

Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

So, the targets for recycling and incineration of garden waste from households have been met by a good margin. Estimates indicate that it is impossible to increase the recycling rate any further. Future efforts with respect to garden waste will therefore concentrate on retaining the present high recycling rate and reducing the volumes treated in the municipal waste treatment system. Garden waste may be home-composted without permission from the local council, providing the regulation is complied with. Waste incineration is only allowed in plants that have been approved for the purpose.

## 5.2 Waste from the service sector

Waste from the service sector amounted to 1,833,000 tonnes in 2004, which is 178,000 tonnes, or 11 per cent, more than in 2003<sup>20</sup>. As mentioned in Chapter 1, there is however uncertainty as to the increase and it should therefore be regarded with some caution.



Source: ISAG reports 2004. The key is listed clockwise beginning at "12 o'clock".

Waste from the service sector is analysed by mixed and separated fractions in Figure 10. There is no great change in the percentage distribution of fractions from 2003 to 2004. Changes are between 0 and 3 per cent where "other waste" has gone up 3 per cent. Waste suitable for incineration, paper and cardboard, and other waste are the three largest waste fractions from the service sector with 47 per cent, 17 per cent, and 25 per cent respectively.

<sup>20</sup> The service sector covers the source: institutions, trade and offices.

Service, trade and offices	1994	1996	1998	2000	2002	2003	2004	2008
Recycling	203	317	338	449	485	736	807	916
Incineration	280	380	438	515	669	760	859	825
Landfilling	152	135	161	152	137	131	140	92
Special treatment	21	19	18	4	4	4	3	0
Storage					62	24	23	0

Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

Storage means that the waste in question has been assigned to temporary storage by local authorities (the local council), cf. section 37(3) of the Statutory Order on Waste. Denmark has excess incineration capacity, but storage can be due to e.g. repairs or shut down of operations at installations.

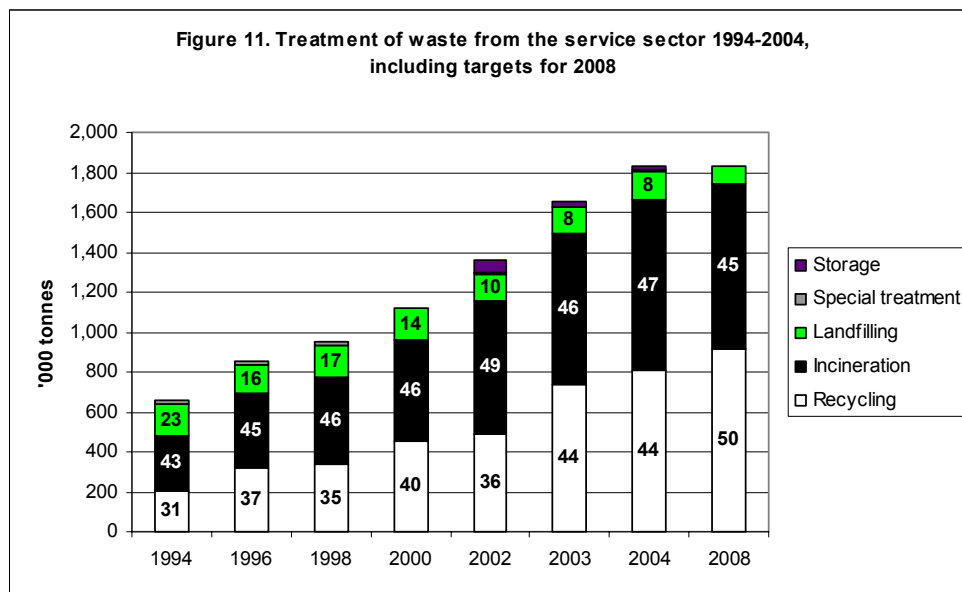
Table 26 shows the development in waste generation from the service sector in the period 2003 to 2004, analysed by fractions. It can be seen, that the overall amount of waste has gone up by 11 per cent. This increase primarily stems from the fractions "various combustible" and "other waste". On the other hand, the fraction "food waste/other organic waste" has gone down by 46 per cent.

	2003	2004	Change in %
Various combustible	777,654	875,944	13
Various non-combustible	115,465	120,241	4
Paper and cardboard separated for recycling	305,093	309,079	1
Bottles and glass separated for recycling	16,581	14,587	-12
Food waste/other organic waste separated for recycling	33,542	18,013	-46
Health-care risk waste	4,142	4,163	1
Hazardous waste	34,310	36,592	7
Other waste	367,857	454,298	23
<b>In total</b>	<b>1,654,644</b>	<b>1,832,917</b>	<b>11</b>

Source: ISAG reports 1994-2004.

Of the 1,833,000 tonnes of waste the service sector generated in 2004, 44 per cent was recycled, 47 per cent was incinerated, while 8 per cent was landfilled and 1 per cent put in temporary storage, cf. Figure 11. Thus, in 2004 the same percentage proportions were recycled and landfilled as in 2003, whereas the percentage led to incineration was greater than in 2003. The waste put in temporary storage will be incinerated when incineration capacity becomes available<sup>21</sup>. In other words, the incineration rate is actually higher than the 47 per cent. Figure 11 shows that a still greater proportion of waste from the service sector is being recycled. This means there has been a diversion of waste volumes from landfilling to recycling.

<sup>21</sup> Exemption clause in Section 37(3), Danish Statutory Order on Waste (Statutory Order No. 619 of 27 June 2000).

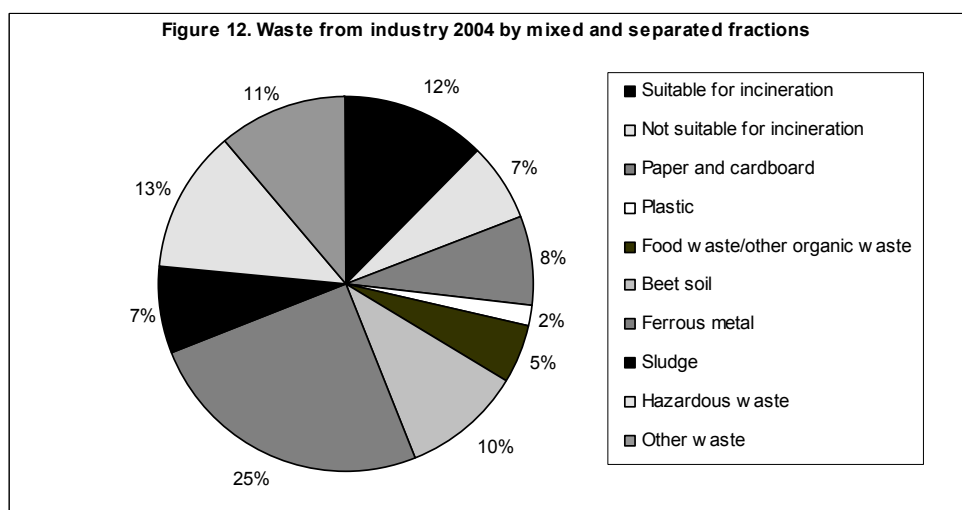


Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings. As stressed in Chapter 1, the increase in waste arisings from the service sector from 2001 should be regarded with some caution.

In relation to the targets for treatment in 2008 set out in Waste Strategy 2005-2008, still too little waste from the service sector was recycled and too much incinerated and landfilled in 2004. If the 2008 targets are to be met, separation and collection of waste must be improved so that a larger proportion of recyclable materials can be recycled, and so that environmentally harmful waste types can be separated and treated separately.

### 5.3 Waste from industry

Waste generation from industry amounted to 1,855,000 tonnes in 2004, which is 14,000 tonnes or 1 per cent more than in 2003. As mentioned in Chapter 1, there is however uncertainty as to this figure and it should therefore be regarded with some caution.



Source: ISAG reports 2004. The key is listed clockwise beginning at "12 o'clock".

Figure 12 shows a breakdown of waste from industry by mixed and separated fractions. As can be seen, ferrous metal is by far the largest single fraction,

followed by hazardous waste, the mixed fraction waste suitable for incineration, and other waste.

The individual fractions' percentage shares of total industrial waste are more or less unchanged from 2003. The greatest change is in ferrous metal which dropped from 28 per cent in 2003 to 25 per cent in 2004, whereas the amount of beet soil went up by 3 per cent. The remaining fractions show changes within 0-1 percentage points.

Table 27 shows the development in waste generation by industry in the period 2003 to 2004, analysed by fractions. It can be seen that the amount of beet soil has increased by 42 per cent, and that the fraction "various non-combustible" has gone up by 17 per cent. However, another large fraction has gone down, namely ferrous metal, which has fallen by 12 per cent.

<b>Table 27. Waste generation by industry. By fractions, stated in tonnes.</b>	<b>2003</b>	<b>2004</b>	<b>Change in %</b>
Various combustible	255,767	230,314	-10
Various non-combustible	105,557	123,092	17
Paper and cardboard separated for recycling	161,573	144,425	-11
Plastic separated for recycling	32,484	32,835	1
Food waste/other organic waste separated for recycling	85,671	90,798	6
Beet soil	137,195	194,666	42
Ferrous metal separated for recycling	524,720	461,652	-12
Sludge	122,490	137,410	12
Hazardous waste	223,600	236,104	6
Other waste	191,772	203,559	6
<b>In total</b>	<b>1,840,829</b>	<b>1,854,855</b>	<b>1</b>

Source: ISAG reports 2003 and 2004.

From 2002 to 2003, industry experienced a fall in waste arisings of 20 per cent; while the service sector saw a rise in waste generation of 22 per cent. This shift between the two sectors may be due to faulty reporting as the source "manufacturing etc." was discontinued from 2001 following the amendment of the Statutory Order on Waste<sup>22</sup>. This means that waste from industry must be reported as originating from one of the following 11 subgroups: food, beverages and tobacco; textiles, clothing and leather goods; wood-working and furniture; paper and graphical production; chemicals etc.; rubber and plastic; stone-working, pottery and glass; ferrous metal; other manufacturing; utilities; agriculture, forestry, fishery etc. It is likely that some carriers find it easier to report industrial waste as service-sector waste. Parties reporting to the ISAG are therefore encouraged to be aware of this possible source of incorrect reporting.

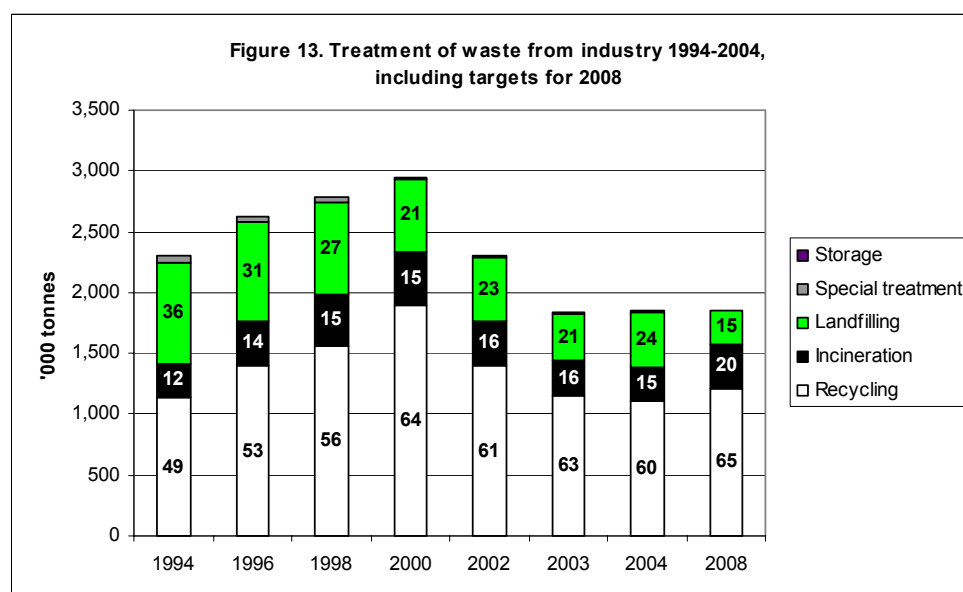
Structural changes, i.e. the fact that society is changing from an industrial to a knowledge society, may be another reason for this shift between the two sectors. The shift could be supported e.g. by the fact that from the early 1990s to early 2001, the number of new enterprises in traditional industry went down, while the number of new enterprises in the knowledge services industry increased considerably<sup>23</sup>.

However, it is interesting how the shift between the two sectors seems to be evening out. This could be interpreted as reflective of a better registration practice, bearing in mind the structural changes mentioned above, and the fact that waste arisings might be settling at a natural level. Future statistics will tell if this is the case.

<sup>22</sup> Statutory Order no. 619 of 27 June 2000 on waste

<sup>23</sup> Statistical Ten-Year Review 2003 and 2004, Statistics Denmark.

Treatment of waste from industry is shown in Figure 13. In 2003, 60 per cent of the waste from this sector was recycled. This corresponds to 1,111,000 tonnes in absolute figures. In recent years, the recycling rate has been around 62 per cent.



Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings. As stressed in Chapter 1, the fall in waste arisings from industry from 2001 should be regarded with some caution.

Table 26. Treatment of waste from industry 1994-2004 stated in '000 tonnes. Illustrated in Figure 13.

Manufacturing	1994	1996	1998	2000	2002	2003	2004	2008
Recycling	1,140	1,397	1,564	1,896	1,403	1,157	1,111	1206
Incineration	271	361	425	431	363	290	276	371
Landfilling	830	822	746	611	520	379	452	278
Special treatment	69	52	47	9	10	7	7	0
Storage					15	8	9	0

Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings. Storage means that the waste in question has been assigned to temporary storage by local authorities (the local council), cf. section 37(3) of the Statutory Order on Waste. Denmark has excess incineration capacity, but storage can be due to e.g. repairs or shut down of operations at installations.

The proportion of industrial waste led to incineration in 2004 was 15 per cent. The landfilling rate has gone up by 3 per cent ending at 24 per cent.

This means that the 2008 target of landfilling a maximum of 15 per cent of industrial waste has not been met. Denmark still landfills far too much industrial waste. Even if the rates of recycling and landfilling have taken a positive direction since 1994, there is still some way to go before the 2008 targets for these two treatment options have been met, cf. Figure 13.

The volumes and composition of waste from industry depend on the sector generating the waste, as well as size and number of enterprises. Possibilities of waste prevention or recycling will therefore differ from one waste fraction and sector to another.

In order to meet the targets in the Waste Strategy 2005-2008, the Danish EPA has selected a number of waste types from industry to come into focus. These

waste types include waste from foundries and shredder waste, which are to be diverted from landfilling to recycling whenever environmentally and economically efficient.

With the latest amendment to the Statutory Order on Waste the Danish EPA has implemented a number of changes to the ISAG system, so that since 2001 it has been possible to analyse waste from industry between eleven different sectors. In future a number of enterprises must in addition keep a register in a specific format with various information on their waste generation<sup>24</sup>. This will enhance the possibility of conducting sector-specific analyses and initiatives in industry.

**Table 29. Waste from industry 2004, stated by sector and treatment option and in tonnes.**

Sector	Reprocessing	Incineration	Landfilling	Temporary storage	Special treatment	Total
Manufacturing etc. (discontinued fraction)	26,944	1	0	0	0	26,945
Food, beverages, and tobacco	194,045	27,151	10,260	1,195	13	232,664
Textiles, clothing, and leather goods	8,806	3,193	482	362	0	12,843
Wood-working and furniture	10,284	7,573	2,266	1,158	6	21,286
Paper and graphical production	173,517	12,147	3,301	2,321	76	191,362
Chemicals etc.	5,758	40,365	6,673	72	288	53,157
Rubber and plastic	38,000	13,564	3,206	560	69	55,399
Stone-working, pottery, and glass	19,817	4,879	45,317	319	2	70,334
Ferrous metal	123,195	10,872	111,051	1,293	5,447	251,858
Other manufacturing	65,991	139,262	24,622	1,130	901	231,906
Utilities	101,763	12,034	45,649	158	40	159,643
Agriculture, forestry, fishery etc.	15,158	5,134	4,507	213	31	25,042
<b>Total</b>	<b>783,278</b>	<b>276,175</b>	<b>257,333</b>	<b>8,781</b>	<b>6,872</b>	<b>1,332,439</b>

Source: ISAG reports 2004. The Table does not cover beet soil and ferrous metal reported by large scrap dealers.

Waste generation in industry stated by sector and treatment option can be seen in Table 29.

As apparent from the table, food, beverages, and tobacco; the ferrous metal industry; other manufacturing; the paper and graphical production industry; and utilities contributed 80 per cent of waste from industry in 2004. The amount of waste from manufacturing etc. was 26,945 tonnes. In 2002, waste generation from this source amounted to 238,815 tonnes, which means that reporting enterprises have improved their reporting on the new commercial sources (cf. as the commercial source manufacturing industries etc. was discontinued in 2001).

#### 5.4 Waste from building and construction activities

Generation of waste in the building and construction sector was significantly greater in 2004 than in 2003. Thus, construction and demolition waste reached 4,496,000 tonnes, which is 711,000 tonnes, or 19 per cent, more than in 2003.

As is apparent from Table 30, which shows the development in waste arisings in the building and construction sector, the greatest increase in total arisings stems from the fraction soil and stone, which increased by 528,000 tonnes or 63 per cent. Also in the fraction other construction/demolition waste, the increase is substantial, at 33 per cent. A drop in arisings is evident only in the fraction other recyclable, as this fraction fell by 37 per cent. The explanation for the general

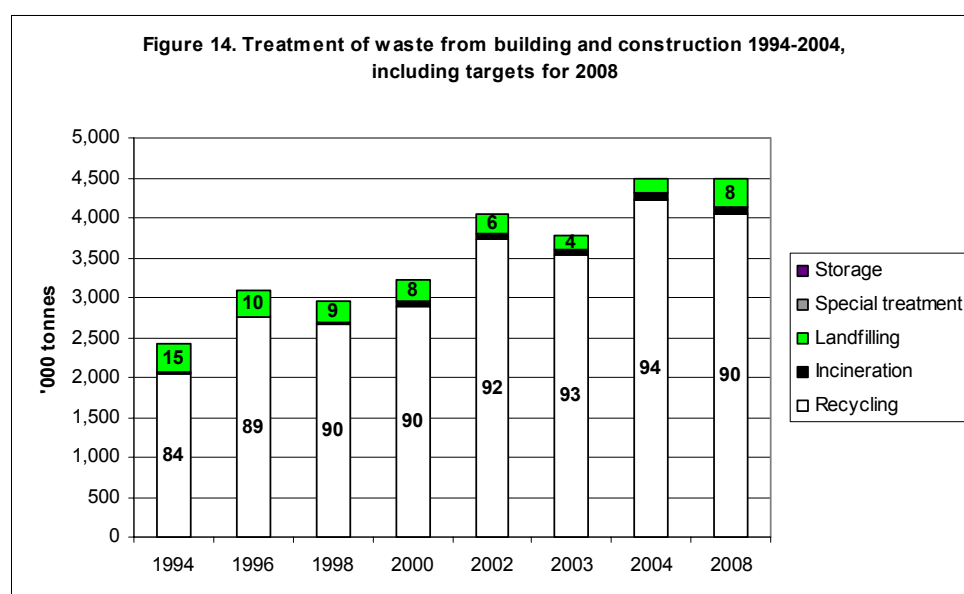
<sup>24</sup> Enterprises subject to approval according to the Statutory Order on approval of listed activities and other enterprises covered by the Statutory Order on user payment for approval and supervision under the Danish Nature Protection Act (bekendtgørelse om brugerbetaling for godkendelse og tilsyn efter miljøbeskyttelsesloven, only available in Danish).

increase is increased activity in the building and construction sector. By far the major part, or 94 per cent, of waste generated by the building and construction sector is recycled.

	2003	2004	Change in %
Various non-combustible	119,000	124,476	5
Concrete	957,162	1,046,921	9
Tiles	210,002	247,210	18
Other construction/demolition waste	401,949	536,456	33
Asphalt	717,719	716,481	0
Soil and stone	838,817	1,367,194	63
Other recyclable	223,398	140,760	-37
Other waste	317,127	316,072	0
<b>In total</b>	<b>3,785,174</b>	<b>4,495,570</b>	<b>19</b>

Source: ISAG reports 2003 and 2004.

Figure 14 shows that the rate of waste which is recycled has gone up by 1 per cent, while the rate for landfilling and incineration remained the same as in 2003, namely 2 per cent and 4 per cent respectively.



Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

As the figure also shows the recycling rate for construction and demolition waste increased by 10 per cent in the period 1994 to 2004. At the same time the landfilling rate went down by 11 per cent. The figure also shows that the distribution of waste between the different treatment options has been in line with targets for 2008 since 2000.

Building and construction	1994	1996	1998	2000	2002	2003	2004	2008
Recycling	2,052	2,748	2,664	2,889	3,735	3,531	4,231	4,046
Incineration	16	17	32	65	72	77	81	90
Landfilling	363	317	266	269	229	170	172	360
Special treatment	2	6	1	0	0	0	0	0
Storage					8	8	11	0

Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

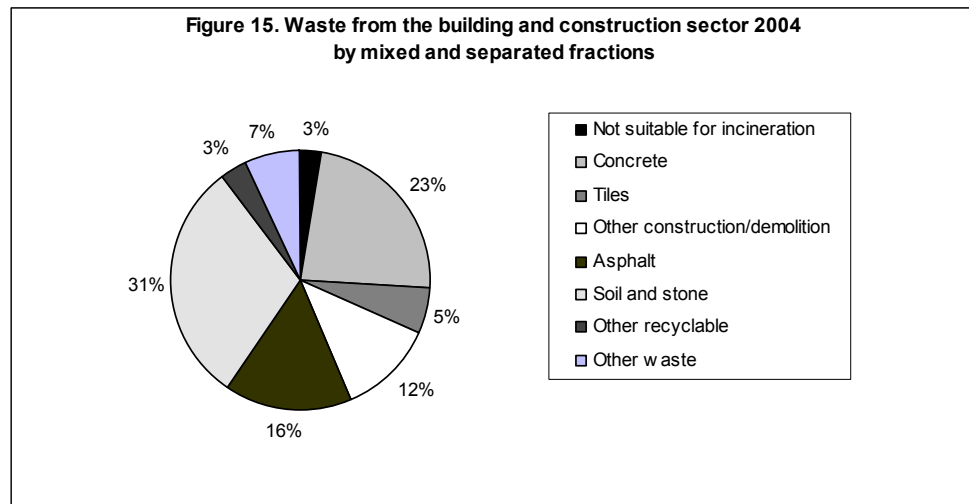
Storage means that the waste in question has been assigned to temporary storage by local authorities (the local council), cf. section 37(3) of the Statutory Order on Waste.



The high recycling rate for construction and demolition waste is due partly to the fact that recycled waste, unlike landfilled or incinerated waste, is exempt from taxation, and partly due to the departmental circular on municipal regulation issued in 1995 concerning the separation of construction and demolition waste intended for recycling<sup>25</sup>. In addition, the Danish Ministry of Environment and Energy (now Ministry of the Environment) and the Danish Contractors' Association entered an agreement on selective demolition of buildings so that waste is sorted at an early stage.

Figure 15 shows construction and demolition waste analysed by mixed and separated fractions for 2004. It can be seen that the bulk of building waste consists of concrete, asphalt, and soil and stone.

Relative to 2003, the share of soil and stone has gone up, from 22 per cent in 2003 to 31 per cent in 2004. This is due to greater activity in the building and construction sector, resulting in more soil being sent to some of the treatment plants. Otherwise, there have not been great changes in the spread between fractions from 2003 to 2004. Changes are between 0 and 3 per cent.



Source: ISAG reports 2004. The key is listed clockwise beginning at "12 o'clock".

A large part of the waste from the building and construction sector is reprocessed at mobile crushing plants which are used for different assignments at different locations throughout Denmark.

The owner of the mobile crushing plant is responsible for the ISAG reports to the Danish EPA, but sometimes the entrepreneur also reports the waste. The Danish EPA is very much aware of this possible source of double reporting, and great efforts are being made, in co-operation with the providers of the reports, to ensure quality control and avoid double reporting.

## 5.5 Residues from coal-fired power plants

The generation of residues at coal-fired power plants varies from one year to the next due to variations in Danish imports/exports of electricity to and from

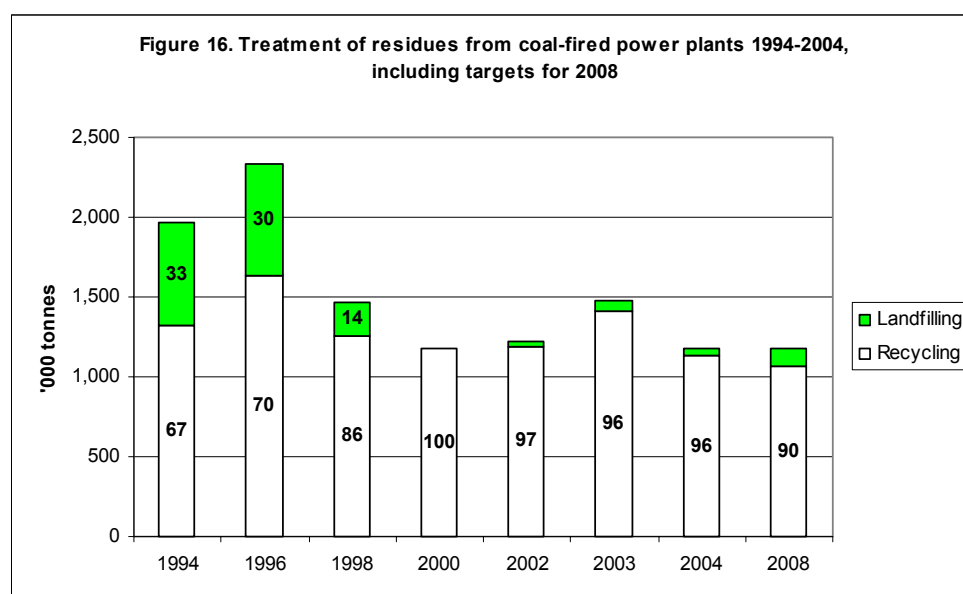
<sup>25</sup> Circular No. 94 of 21 June 1995.

Sweden and Norway. Imports/exports of electricity to and from Sweden and Norway depend largely on precipitation in these countries - if there is much precipitation, much electricity is generated from hydropower in Sweden and Norway, and Danish exports will be correspondingly lower.

For example, in 1996 exports of power were particularly high, which is reflected in amounts of residues in this year, cf. Figure 16. In 2000, there was high precipitation in Sweden, which resulted in so much cheap hydroelectricity on the market that power stations in both Denmark and Norway had to cease operation temporarily.

Amounts of residues have decreased steadily since 1996, but show an increase from 2002 to 2003. The decrease is mainly explained by the last 10 years' strategy to phase out coal, so that in the long term coal will be replaced by natural gas and renewable energy sources, including bio-fuels. Energy statistics reflect that an increasingly smaller share of electricity generation is based on coal<sup>26</sup>. Also in future, the strategy to phase out coal 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.

Residues from coal-fired power plants amounted to around 1,180,000 tonnes in 2004, which is a fall of 20 per cent from 2003. As Figure 16 shows, 96 per cent of residues was recycled and 4 per cent was landfilled. This fall is due to falling exports to for example Sweden, Norway, and Germany. Thus, net exports fell by 66 per cent during 2004<sup>27</sup>.



Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

Power plants	1994	1996	1998	2000	2002	2003	2004	2008
Recycling	1,319	1,629	1,259	1,176	1,190	1,413	1,134	1,062
Landfilling	643	703	210	0	38	60	46	118

<sup>26</sup> The latest Energy Statistics are found on [www.ens.dk](http://www.ens.dk), the Danish Energy Authority's website.

<sup>27</sup> Danish Energy Authority Monthly Electricity Statistics. Available at [www.ens.dk](http://www.ens.dk).

Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

The recovery of residues in 2004 is stated in more detail in Table 33. More than 90 per cent of residues is used as raw materials in industrial manufacture of, for example, cement, concrete and plasterboard, whereas the remaining part is primarily used as backfilling, either in accordance with the provisions of Statutory Order no. 655 of 27 June 2001 from the Ministry of the Environment, or as backfilling with special approval under the Danish Environmental Protection Act.

<b>Table 33. Use of residues from coal-fired power plants, in Denmark and abroad, 2004. Stated in tonnes.</b>	Fly ash (1)	Slag/bottom ash (2)	Plaster	TASP	Sulphuric acid	In total
Cement	164,413		29,620			194,033
Concrete	165,997					165,997
Light concrete						0
Asphalt	24,426					24,426
Roofing felt/concrete block		24,101				24,101
Backfilling in accordance with Statutory Order no. 568						0
Backfilling in accordance with Chapter-5 approvals	37,478	8,409				45,887
Granulate				0		0
Fertiliser		6,076		9,900	477	16,453
Backfilling						0
Plasterboard			80,009			80,009
Miscellaneous	254,516	14,226	140,693			409,435
Exported for recovery	70,700					70,700
Desulphurisation				34,271		34,271
Refining						0
Landfilled	8,890	1,107	20,329	14,180		44,506
For storage						0
<b>Total</b>	<b>726,420</b>	<b>53,919</b>	<b>270,651</b>	<b>58,351</b>	<b>477</b>	<b>1,109,818</b>

Source: Reports from Elsam and Energi E2.

## 5.6 Sludge from municipal wastewater treatment plants

The statement for 2004 from municipal wastewater treatment plants of amounts of sludge applied to farmland and incineration of sludge at sludge incineration plants is not yet available due to a reorganisation of the electronic reporting system. 2002 figures from the Danish EPA's sludge statistics have therefore been used for recycling and incineration<sup>28</sup>.

As mentioned in Chapter 1, it was decided to state amounts of sludge for mineralisation with a dry matter content of 20 per cent, so that sludge for mineralisation would be stated with the same dry matter content as other sludge. In the treatment in sludge mineralisation plants (long-term storage) sludge is reported with around 0.5 - 1 per cent dry matter content, whereas alternatives typically contain 20 per cent.

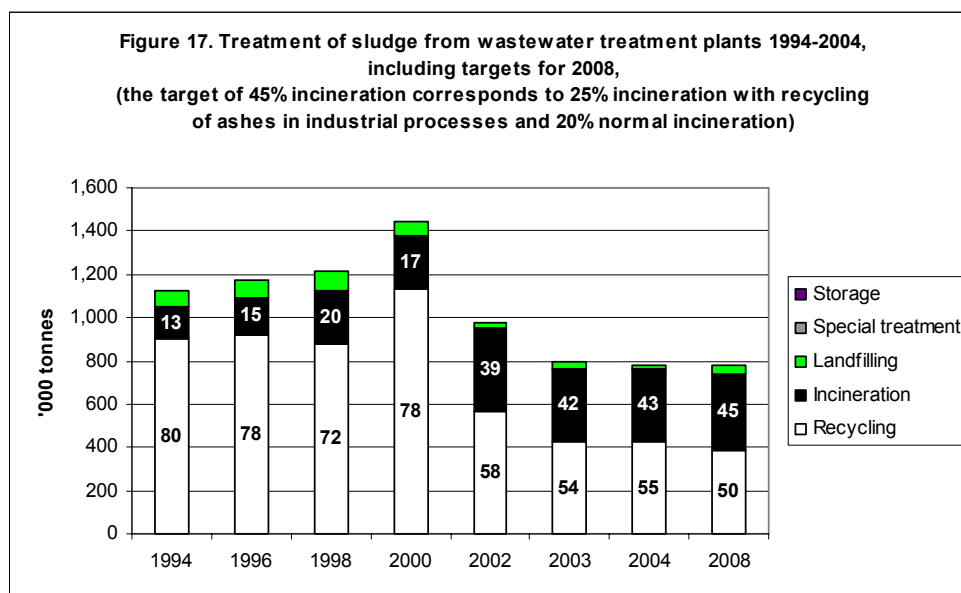
If stated in wet weight, sludge from municipal wastewater treatment plants would have amounted to about 1,370,000 tonnes in 2004, which is about 672,000 tonnes less than in 2001, corresponding to a fall of 33 per cent.

Treatment of sludge from municipal wastewater treatment plants is shown in Figure 17. According to the Figure, 55 per cent of sludge is recycled, 43 per cent is incinerated, and 2 per cent is landfilled.

The figures for recycling include 45,600 tonnes of sludge with a dry matter content of 20 per cent, corresponding to 607,922 tonnes sludge in wet weight, which are being treated in long-term storage with the objective of further

<sup>28</sup> See Annex 4.4 of "Sewage sludge from municipal and private wastewater treatment plants in 2002". Environmental Review No. 5, 2004, Danish EPA. Landfilling figures are from ISAG, figures for 2004.

mineralisation. This amount has been included in the amounts for recycling because the sludge will be recycled after a number of years in storage.



Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings. The figure shown for 2003 is based on 2002 figures. The method of calculation of sludge for mineralisation has been changed with effect from 2001. The figures for recycling include 45,600 tonnes of sludge with a dry matter content of 20 per cent, corresponding to 607,922 tonnes when stated in wet weight. Long-term storage and incineration amounts include 221,730 tonnes for other uses (Carbogrit and production of concrete).

**Table 34. Treatment of sludge from municipal wastewater treatment plants 1994-2004 stated in '000 tonnes**

Sludge	1994	1996	1998	2000	2002	2003	2004	2008
Recycling	902	918	875	1,132	568	429	429	389
Incineration	144	174	248	244	382	332	332	350
Landfilling	81	83	90	71	27	31	16	39
Special treatment	0	0	0	0	0	0	0	0
Storage					0	1	0	0

Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings. The figures for 2003 and 2004 are based on 2002 figures.

Sewage sludge is mainly recovered as fertiliser on farmland. In recent years, the requirements regarding contents of certain organic and chemical substances in sludge applied to farmland have been made stricter. In the short term, the rate of recycling is therefore expected to decrease. In the long term, it is expected the general phase-out policy for xenobiotic substances will improve the quality of sludge further.

Finally, it appears that alternative methods of sludge recovery are being discovered to an ever greater extent. After sludge incineration, the inorganic residue is recovered in the production of e.g. sand blasting agents, or cement. Sludge recovered by such alternative methods in 2002 amounted to about 220,000 tonnes<sup>29</sup>. In Figure 17, this amount has been included under incineration as the methods applied are recovery, not recycling.

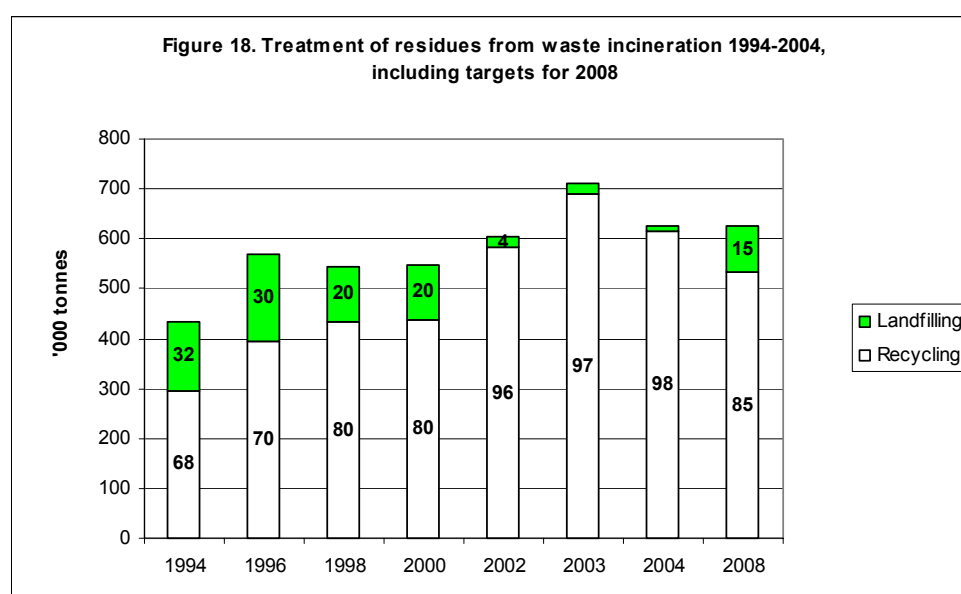
<sup>29</sup> The statement for 2004 is not yet available. The figure is from "other, etc." from Annex 4.4 of the "Sewage sludge from municipal and private wastewater treatment plants in 2002". Environmental Review No. 5, 2004, Danish EPA.

## 5.7 Residues from waste incineration plants

Figure 18 shows amounts of residues (slag, fly ash, and flue-gas cleaning products) from waste incineration plants 1994 to 2004 in tonnes, including treatment option.

Residues from waste incineration plants have not been included in calculations of total waste generation, since the waste would then be counted twice in the statistics. However, residues are a large waste fraction and to secure adequate capacity for their treatment, a calculation of amounts is required.

By far the major part of residues is recycled. The recycling rate was 98 per cent in 2004 which is 1 percentage point more than in 2003. Residues, however, are not recyclable when containing large quantities of heavy metals, which may leach into the environment and the groundwater. In such cases landfilling is required.



Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings. Note that Figure 18 is not comparable with Table 33 and Figure 19, because Figure 18 is exclusive of exported residues.

Residues	1994	1996	1998	2000	2002	2003	2004	2008
Recycling	295	396	435	436	581	691	615	532
Landfilling	140	171.6	110	110	23	19	11	94

Source: same as Tables 1 and 2. Note that arisings in 2008 have been set to correspond to arisings in 2004. The figures are not projections of developments in waste arisings.

Contaminated fractions such as PVC, impregnated wood, and electric and electronic products, are not to be incinerated. This means that contents of heavy metals in slag will be reduced significantly. However, requirements for recycling of slag were tightened in 2000 to take account of the groundwater. The 2008 target of 85 per cent recycling has already been met.

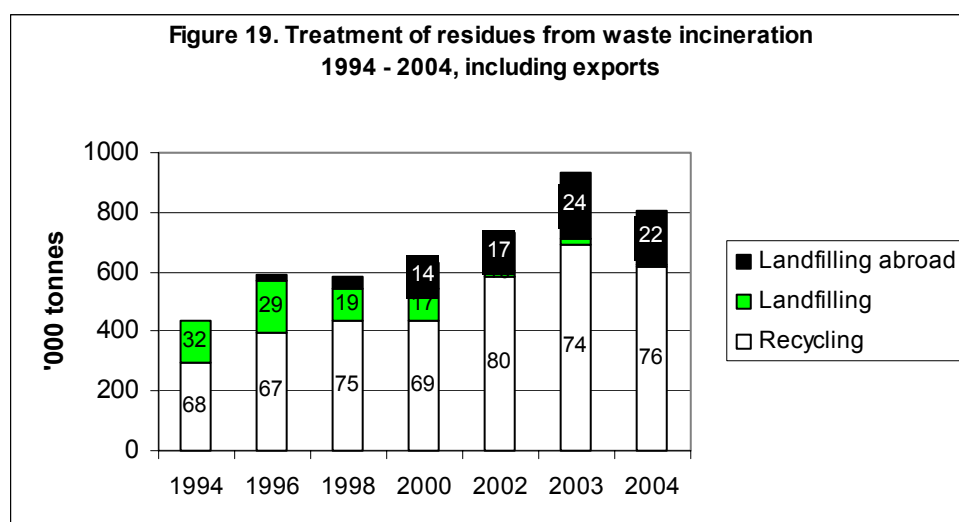
Table 36 shows the uses of residues from waste incineration. Naturally, amounts of residues depend on the amount of waste incinerated. Slag and flue-gas cleaning products typically comprise around 20 per cent and 5 per cent, respectively, of

the waste amount led to incineration. Due to temporary storage at incineration plants amounts can, however, shift from one year to the next.

Table 36. Slag, fly ash and flue-gas cleaning products removed from waste incineration plants. 1996-2004. Stated in tonnes.						
	1996	1998	2000	2002	2003	2004
Removed slag	509,200	468,500	494,055	543,254	644,626	564,313
Removed/exported fly ash and flue-gas cleaning products	71,900	82,500	68,018	84,531	88,136	86,834
<i>Removed in total from waste incineration plants</i>	<i>581,100</i>	<i>551,000</i>	<i>562,073</i>	<i>627,785</i>	<i>732,762</i>	<i>653,147</i>
Landfilled slag	126,300	76,400	106,265	19,365	15,348	10,644
Landfilled fly ash and flue-gas cleaning products	45,300	33,300	3,478	3,623	3,316	446
Fly ash and flue-gas cleaning products landfilled abroad	21,103	37,900	85,700	124,820	226,013	180,937
<i>Landfilled in total from waste incineration plants</i>	<i>192,703</i>	<i>147,600</i>	<i>195,443</i>	<i>147,808</i>	<i>244,677</i>	<i>192,027</i>
Slag reported as sent to reprocessing plants	101,800	115,200	131,201	88,351	100,756	96,818
Removed slag deemed recycled directly	281,100	276,900	256,589	435,538	528,522	456,851
<i>Recycled in total from waste incineration plants</i>	<i>382,900</i>	<i>392,100</i>	<i>387,790</i>	<i>523,889</i>	<i>629,278</i>	<i>553,669</i>
Fly ash and flue-gas cleaning products removed and deemed stored	5,497	11,300	-21,160	-43,912	-141,193	-92,549

Source: Calculations are based on ISAG reports and registrations under the EU regulation on shipments of waste. Note that Table 36 and Figure 18 are not comparable. This is because Figure 18 does not include exports.

Table 33 shows that residues from waste incineration amounted to around 653,000 tonnes in 2004. This is 86,000 tonnes less than in 2003. Out of the 653,000 tonnes of residues removed from waste incineration plants, around 192,000 tonnes were landfilled, while around 554,000 tonnes were recycled. This means that, in reality, the stored amounts of fly ash and flue-gas cleaning products have been reduced by about 93,000 tonnes.



Source. ISAG reports and registrations under the EU regulation on shipments of waste.

As is evident in Figure 19, the amount of residues exported for landfilling abroad has been increasing since 1996. The amount of residues exported for landfilling went up from 21,000 tonnes in 1996 to 181,000 tonnes in 2004. Relative to 2003, there has been a drop in the amount that was landfilled of 45,000 tonnes. The main part of this amount was excavated from landfills in Denmark. This can be seen in Table 36.

From 1996 to 2004, amounts of landfilled residues have fallen by about 1 per cent and recycling has increased by 46 per cent

# 6 Incineration plants and landfills

## 6.1 Incineration plants

In 2003, total waste incineration capacity was around 3,389,000 tonnes, distributed between 32 plants, cf. Table 37. This is an increase in capacity of 691,000 tonnes compared to the 1999 capacity.

In the early 1990s, an extensive conversion of waste incineration plants from heating generation to combined heat and power took place. In this connection, capacity adjustments were effected in relation to expected waste volumes for incineration in the future.

As a result of the ban on landfilling of combustible waste that took effect on 1 January 1997, there is now increasing pressure on incineration capacity. Volumes of non-recyclable waste suitable for incineration will be surveyed regularly in order to ensure the necessary incineration capacity.

In 2003, there were 32 waste incineration plants in Denmark. It is expected that 2 of the small plants will close down in 2005.

<b>Table 37. Number of incineration plants and available incineration capacity in 1989, 1993, 1994/95, 1996, 1999, and 2003</b>	<b>1989</b>	<b>1993</b>	<b>1994/95</b>	<b>1996</b>	<b>1999</b>	<b>2003</b>
Number of incineration plants	38	31	31	31	31	32
Theoretic capacity, '000 tonnes	2164	2329	DH: 1217 CHP: 1315	DH: 1060 CHP: 1413	DH: 915 CHP: 1783	3389
Nominal capacity, tonnes/hour	313	335	DH: 174 CHP: 188	DH: 171 CHP: 194	DH: 166 CHP: 271	

Source: Rambøll & Hannemann 1990: Analysis of data for energy plants based on waste, for the Danish EPA and the Danish Energy Authority. The Danish EPA and the Danish Energy Authority 1994: Waste resources for waste incineration 1993 and 2000. The Danish EPA and the Danish Energy Authority 1997: Waste for incineration year 2000. The Danish EPA and the Danish Energy Authority 2001: Waste incineration in 2004 and 2008. Volumes and capacities. Environmental Review No. 11, 2001.

Figures for 1989 and 1995 are calculated on the basis of nominal capacity at 7,000 hours/year. In figures for 1999 the nominal capacity includes plants erected in 1999. District heating capacity (DH) may be subject to restrictions under the Danish Act on Heating Supply. CPH = combined power and heating. In figures for 1999 the nominal capacity includes plants erected in 1999. This gives a larger nominal capacity as furnaces were not in full operation in 1999. The figure for 2003 was calculated by the Danish EPA.

## 6.2 Landfills

In the Statutory Order on landfills, a landfill is defined as waste disposal facilities on land for the landfill of waste covered by K 1b, K 3a, K 3b or K 3c in Annex 1 of

the Statutory Order on Approval of Listed Activities<sup>30</sup>. This definition includes landfills (including controlled landfills), inert waste landfills and mono-landfills<sup>31</sup>.

Today, there are 134 landfill facilities in Denmark with an environmental approval, according to a questionnaire study conducted by the Danish EPA in February/March 2001, cf. Table 38.

Of these, 100 facilities are owned by public authorities, whereas 34 are under private ownership. The 100 public facilities cover 51 landfills, 25 inert waste landfills, and 24 mono-landfills.

The privately owned facilities cover 3 landfills, 10 inert waste landfills and 21 mono-landfills.

	Landfills			Inert waste landfills			Mono-landfills	
	1992	1994	2001	1992	1994	2001	1994	2001
Number of sites	60	64	54	70	49	35	63	45

Source: Danish EPA: Working Report No. 54, Landfill Capacity 1992. Danish EPA 1997: Working Report no. 33, Landfills in Denmark, plus own calculations. Questionnaire study carried out by the Danish EPA in February/March 2001.

<sup>30</sup> Statutory Order no. 650 of 29 June 2001 on landfills.

<sup>31</sup> Statutory Order no. 943 of 16 September 2004 on approval of listed activities.





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

Reported as				Changed to		
Source	Waste type	First year	Fraction	Per cent	Source	Waste type
Households	All	2001	Glass	100	Unchanged	Packaging waste
Institutions Manufacturing Building	Bulky waste	All *)	All	100	Unchanged	Industrial waste
Container centres	Domestic waste	All	All	100	Households	Unchanged
	Bulky waste	All	Concrete, Tiles, Other building waste, Asphalt, Wood, Soil and stone, Asbestos	100	Building	Industrial waste
			Paper and cardboard, Glass	100	Households	Domestic waste
			Remaining	100	Households	Unchanged
	Garden waste	All	All	100	Households	Unchanged
	Industrial waste	2001	Paper and cardboard	25	Institutions	Unchanged
				75	Households	Domestic waste
			Glass	100	Households	Packaging waste
		All	Concrete, Tiles, Other building waste, Asphalt, Wood, Soil and stone, Asbestos	100	Building	Unchanged
	Remaining		100	Institutions	Unchanged	
	Packaging waste	2001	All	100	Other	Unchanged
		2002	Paper and cardboard	25	Institutions	Unchanged
				75	Households	Unchanged
			Plastic	50	Institutions	Unchanged
				50	Households	Unchanged
			Remaining	100	Households	Unchanged
	Hazardous waste	All	All	100	Households	Unchanged
	Other	All	All	100	Other	Unchanged

\*) Not applied to the new sources codes 20-30 in 2001

### Appendix 3. Statement of organic waste for composting, wood chipping and biogasification

Waste from the following plants have been included under the various categories:

Reprocessing of organic waste (53.00) from all sources into animal foodstuff.  
PNA 83 ApS. DAKA

Reprocessing of organic domestic waste (53.00) from households (source 1) for composting.  
Østdeponi Amba. I/S Amagerforbrænding. Fredericia Municipality. Fangel Miljø & Energiselskab  
amba. Klintholm I/S. Marius Pedersen Kolding. Solum. Køstrup Komposteringsanlæg.

Reprocessing of organic domestic waste (53.00) from households (source 1) for biogasification.  
Hashøj Biogas. Grindsted Municipality. AFAV I/S. Solum.

Reprocessing of organic waste (53.00) from remaining sources for composting.  
Østdeponi Amba. Renoflex. Klintholm I/S. Fredericia Municipality. Komtek Miljø A/S.  
Grindsted Municipality.

Reprocessing of organic waste (53.00) from remaining sources for biogasification.  
Fangel Miljø og Energiselskab. Thorsø Miljø og Biogas. AFAV I/S. Hashøj Biogas.

Reprocessing of sludge (83.00) for composting.  
RGS 90. Odense Magistrat. Affaldsselskab Vest. I/S Fællesforbrænding. BN Industrirenovation.  
Affaldsselskabet Vendsyssel Vest I/S. I/S Reno Syd. Komtek Miljø A/S. H.J. Hansen Genvinding  
A/S.

Reprocessing of sludge (83.00) for biogasification.  
Linkogas. Lemvig Biogasanlæg. Hashøj Biogas. Aarhus Kommunale Værker.

Branches, leaves, grass (54.00) for composting/wood chipping.  
All plants which have received fraction 54.00 for reprocessing.

## Annex 4. Hazardous waste generation

Treatment of hazardous waste in 2003 and 2004. Stated in tonnes.	Reprocessing		Incineration		Landfilling		Special treat.		In total	
	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004
Washing and cleaning agents	1	1	2,524	2,641	0	1	17	45	2,542	2,688
Organic solvents with organically bound compounds	4	2	452	317	0	0	0	19	456	338
Inflammable organic solvents with organically bound compounds	0	0	314	311	0	0	0	0	315	311
Organic solvents with halogens/sulphur compounds	0	0	9	76	0	0	0	0	9	77
PCB and PCT waste	0	0	4	4	0	0	1	3	6	7
Liquid residues from organic synthesis containing toxic substances and halogens/sulphur	0	0	12	11	0	0	0	0	12	11
Liquid residues from organic synthesis with halogens/sulphur	0	0	115	103	0	0	0	0	115	103
PVC sludge from plastic coating with organic solvents	0	0	64	19	0	0	0	0	64	19
Solid residues from recovery of halogen-containing solvents	0	0	5	1	0	0	0	0	5	1
Solid residues from organic synthesis containing toxic substances and halogens/sulphur	0	0	3	2	0	0	0	0	3	2
Solid residues from organic synthesis with halogens/sulphur	0	0	59	113	0	0	2	0	61	113
Aromatic organic solvents without halogens/sulphur	17	16	8,345	8,387	0	0	2	7	8,364	8,409
Organic solvents without aromatic solvents or halogens/sulphur	12	6	5,826	6,466	0	0	1	0	5,838	6,472
Printing ink/varnish/paint with organic solvents	26	25	8,808	5,978	0	0	2,391	1,846	11,225	7,848
Printing ink/varnish/paint without organic solvents	18	4	7,658	6,187	430	279	0	0	8,106	6,471
Tar and rust-protecting oils	51	161	241	164	0	0	0	0	292	324
Alcohol/water mixtures from nylon plates	0	31	39	31	0	0	0	0	39	62
Residues from distillation of mixtures with acetone/styrene/unhardened polyester	0	1	177	85	0	0	0	0	177	86
Metal organic compounds without mercury	3	0	47	50	0	0	0	0	50	50
Liquid organic residues from distillation without halogens/sulphur	1	0	852	719	0	0	0	0	853	719
Formaldehyde solvents < 30 %	1	0	63	52	0	0	0	0	63	52
Phenol and formaldehyde emulsions	0	0	22	19	0	0	0	0	22	19
Di-isocyanates	1	0	111	74	0	0	0	1	112	76
Anti-freeze liquids	282	306	711	567	0	0	765	611	1,758	1,483
Latex/rubber sludge with organic solvents	0	0	55	19	0	0	0	3	55	22
Acidic sludge from re-refining used lubricant oils	0	0	13	18	0	0	0	0	13	18
Waste glue with organic solvents/2-component glues	31	19	493	456	0	0	0	0	524	474
Solid residues from organic synthesis without halogens/sulphur	1	1	413	354	0	0	0	0	414	355
Swarf with asbestos/metals	0	0	14	6	9	2	0	0	22	8
Beat pulp with lead compounds	0	0	1	0	0	0	0	0	1	0
Acidic aqueous solutions with chromium compounds	1	1	55	36	0	4	402	241	458	281
Acidic aqueous solutions with nitric acid but without hydrofluoric acid	0	0	40	13	2	1	164	326	206	341
Acidic aqueous solutions with hydrofluoric acid/fluorides	1	1	39	72	4	2	411	359	455	434
Acidic aqueous solutions with nitric/sulphuric/phosphoric acid	4	18	581	551	7	6	4,726	4,804	5,318	5,378
Photographic developing baths	1,592	2,026	1,414	4,216	0	0	1	0	3,007	6,243
Chromium-containing photograph processing baths	0	0	2	8	0	0	1	0	2	8
Fixing baths	1,407	1,232	8	16	0	0	107	85	1,522	1,333
Basic, aqueous solutions without cyanide	73	63	1,464	1,459	7	11	237	184	1,781	1,717
Basic, aqueous solutions with cyanide	0	0	57	32	0	0	49	46	106	78
Metal hydroxide and oxide sludge	333	489	1,432	1,368	1,476	1,509	329	52	3,570	3,418
Flue-gas sludge and flue-gas dust from iron and metal foundries	0	0	13	51	342	269	161	259	515	579
Dyeing wastes	0	0	5	3	0	0	0	0	5	3
Aqueous sludge from wood impregnating	0	0	3	17	0	0	0	0	3	17
Hardening salts	0	0	18	10	0	0	15	1	33	12
Mercury waste	250	336	6	70	2	0	28	24	285	430
Other hazardous wastes	0	1	0	0	0	0	0	0	0	1
Cloths containing organic solvents	40	64	113	106	0	0	0	0	153	169
Waste from production and distribution of chemical pesticides	123	261	2,778	3,260	6	5	43	112	2,949	3,636
Waste from medicinal products	0	0	825	917	0	0	471	626	1,296	1,544
Chemicals from laboratories etc.	8	17	647	597	7	3	19	15	681	632
Glass/mineral wool waste with phenols	610	0	14	8	2,607	53	0	0	3,231	61
Other hazardous wastes	1,727	2,227	13,589	22,292	103,264	2,044	916	1,047	119,497	27,610
Waste oil	24,641	25,156	0	0	0	0	0	0	24,641	25,156
Motor oil	5,648	5,864	11,240	8,272	0	0	20	22	16,908	14,158
Gear or hydraulic oil	54	48	140	144	0	0	0	0	194	192
Heat transfer oils	0	0	88	58	0	0	0	0	88	58
Other lubricant oils	80	54	2,069	1,301	0	0	3	4	2,152	1,359
Oil and petrol separators	402	374	1,132	1,437	0	0	0	0	1,534	1,811
Drilling/cutting oils, unthinned	110	69	13	2	0	0	0	0	123	71
Oil emulsions	0	0	216	503	0	0	0	0	216	503
Lubricant greases	0	1	29	14	0	0	0	0	29	15
Motor petrol	4	5	18	15	0	0	0	0	22	20
Motorbenzin	0	0	46	76	0	0	0	0	46	76
Diesel oil	2	0	27	46	0	0	35	43	64	89
Gas oil	0	0	8	14	0	0	0	0	8	14
Fuel oil	1	0	241	133	0	0	1,612	0	1,854	133
Other oil-containing products	12,689	16,231	3,634	8,530	13	1	888	1,463	17,223	26,224
Cutting oils	0	0	83	55	0	0	0	0	83	55
Cutting liquids	0	0	8	2	0	0	0	0	8	2
Mineral drilling/cutting oils in water	0	0	39	107	0	0	0	0	39	107
Synthetic drilling/cutting oils in water	0	0	62	37	0	0	0	0	62	37
Health-care risk waste	0	0	1,479	1,520	0	0	2,822	2,745	4,301	4,265
Fly ash	0	0	0	0	2,811	1,994	0	0	2,811	1,994
Other flue-gas cleaning waste	31,091	33,403	0	0	0	0	0	0	31,091	33,403
Asbestos	0	0	0	0	17,029	16,666	0	0	17,029	16,666
Batteries	3,582	209	0	0	0	0	0	0	3,582	209
CFC cooling agents	2	1	0	0	0	0	37	16	39	18
Shredder waste	0	0	0	0	0	26,019	0	0	0	26,019
Other hazardous wastes	0	0	0	0	0	81,607	0	0	0	81,607
<b>ISAG total, primary sources</b>	<b>84,925</b>	<b>88,723</b>	<b>81,123</b>	<b>90,599</b>	<b>128,015</b>	<b>130,477</b>	<b>16,676</b>	<b>15,009</b>	<b>310,738</b>	<b>324,807</b>

Cont.

Cont.

Treatment of hazardous waste in 2003 and 2004. Stated in tonnes.	Reprocessing		Incineration		Landfilling		Special treat.		In total	
	2003	2004	2003	2004	2003	2004	2003	2004	2003	2004
Lead batteries (1)									0	0
Hermetically-sealed Ni-Cd batteries (2)									0	0
<b>Primary sources, total</b>	<b>86,928</b>	<b>90,727</b>	<b>83,126</b>	<b>92,603</b>	<b>130,018</b>	<b>132,481</b>	<b>18,679</b>	<b>17,013</b>	<b>312,741</b>	<b>326,811</b>
Flue gas waste (1)									0	0
Fly ash and flue-gas cleaning products from waste incineration (4)					88,136	86,834			88,136	86,834
<b>From waste incineration plants in total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>88,136</b>	<b>86,834</b>	<b>0</b>	<b>0</b>	<b>88,136</b>	<b>86,834</b>
<b>Hazardous waste, primary and secondary sources in total</b>	<b>86,928</b>	<b>90,727</b>	<b>83,126</b>	<b>92,603</b>	<b>218,154</b>	<b>219,315</b>	<b>18,679</b>	<b>17,013</b>	<b>400,877</b>	<b>413,645</b>

The table has been changed relative to the first version of the statistics