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Waste Statistics 2014

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Preface

With a few exceptions Waste Statistics 2014 are based on data reported to the Waste Data System (Affaldsdatasystemet - ADS) in the period 2012 to 2014.

The statistics give a detailed description of the quantity of waste generated in Denmark in the period 2012-2014 broken down on waste types and treatment options. This information is supplemented by detailed information about the sources generating the waste. In addition, information about quantities of waste imported and exported is presented. Finally, at the end of Waste Statistics 2014 a section provides the status for compliance at the national and regional levels with the 2022 targets in pursuance of "Denmark without waste - Resource plan for waste management 2013-2018" regarding recycling of waste from households (50% target).

Waste data from the period 2012-2014 as reported to ADS form the basis of Waste Statistics 2014. Waste data are in some cases adapted and supplemented with external waste data sources. For example, this has been the case in connection with the statement for sewage sludge and some residues from coal and biomass firing.

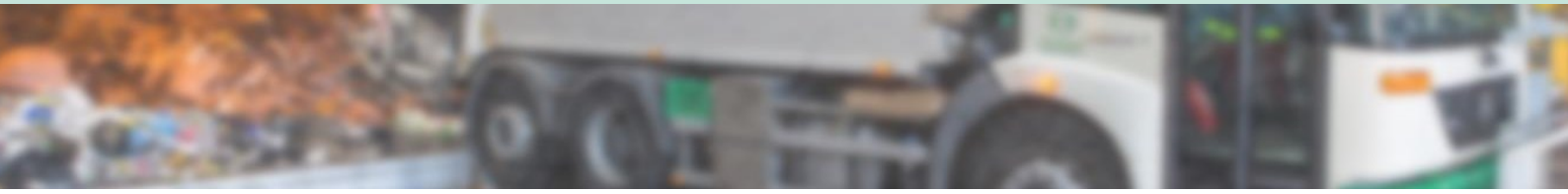
The Danish Environmental Protection Agency is the main responsible for quality assurance of waste data reported to ADS. Data quality has improved significantly since the system was introduced in 2010; improvements will continue in the coming years.

Significant main results in Waste Statistics 2014:

- The overall rate of recycling[1] has increased from 65% to 67%. (See section 2)
- The overall rate of recycling of waste from households has increased from 39% in 2012 to 43% in 2014. (See section 3)
- The rate of recycling in relation to the resource plan's 50% target in 2022 for selected waste fractions from households was 31% in 2014, which is a substantial increase from 26% in 2012 and 28% in 2013. (See section 5)
- Imports of waste for incineration increased significantly in the period from 2012 to 2014; they now make up 7.6% of total incineration at the Danish incineration plants. (See section 4)
- Quantities of construction and demolition waste have increased markedly from 2012 to 2014. (See section 3)
- 66% of sewage sludge from our wastewater treatment plants was recycled on agricultural land in 2014. (See section 3)
- Compared with Waste Statistics 2013 even more detailed data on waste from industry are presented. The overall rate of recycling in this sector attained 68% in 2014. (See section 3)

[1] Excluding soil

1. Introduction



Waste Statistics 2014 are based on data on primary waste generated in Denmark as reported to the Waste Data System (Affaldsdatasystemet - ADS) in the period 2012 to 2014, unless otherwise stated. Primary waste generated is waste not originating from waste actors[2].

The Danish Environmental Protection Agency is the main responsible for quality assurance of waste data reported to ADS. Quality assurance of 2014 waste data has also improved the quality of waste data reported to ADS before 2014; this means that Waste Statistics 2014 contain updated waste data for 2012 and 2013. Waste data are in some cases adapted and supplemented with external waste data sources. For example, this has been the case in connection with the statements for sewage sludge and residues from coal-fired power plants. Waste data for 2011 made up the first whole reporting year under ADS, and since then the quality and precision of reports have increased year by year. It should be noted in this context that when the composition of waste is presented at a more detailed level, the annual reports may show variations that would not appear if the waste composition was presented in more general categories. In these statistics a comment will be made when this type of variation is believed to be significant. More details on ADS, the difference between primary and secondary waste generated, collection, quality assurance and adaptation of waste data can be found in Appendix 1.

The statistics give a detailed description of the quantity of waste generated in Denmark in 2014 broken down on waste types and treatment options. The waste statistics contain detailed information about the sources generating the waste. Waste Statistics 2014 also present information about quantities of waste imported and exported.

Finally, in section 5 Waste Statistics 2014 provides the status for compliance at the national and regional levels with the 2022 targets in pursuance of “Denmark without waste - Resource plan for waste management 2013-2018” regarding recycling of waste from households (50% target).

In the appendices, the definition of primary waste sources forming the basis of these waste statistics is given.

Waste Statistics 2014 are different from the previous waste statistics in that they have a special section on batteries and a higher degree of detail in the industry-related section. The purpose of this is to increase the level of information among readers.

Raw data adapted from ADS and used in the preparation of these waste statistics can be found on the website of the Danish Environmental Protection Agency under Waste Statistics 2014 (in Danish)[3].

[2] Read more about primary and secondary waste in Appendix 1.
[3] Waste Statistics 2014 data: www2.mst.dk/download/jordogaffald/AS2014_data.xlsx

2. Waste generation in Denmark

Total Danish waste arisings (excl. soil) corresponding to primary waste generated in Denmark were in 2014 stated at approximately 11.74 million tonnes. It appears from Table 2.1 that total waste arisings have increased since 2012. The main reason is an increase in quantities of construction and demolition waste caused primarily by higher activity within demolition.

Table 2.1. Primary waste generated (excl. soil) in Denmark broken down on treatment form.

Total	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling[4]	7,127	64.8%	7,354	66.0%	7,877	67.1%
Incineration	3,118	28.4%	3,065	27.5%	3,138	26.7%
Landfilling	552	5.0%	487	4.4%	479	4.1%
Temporary storage[5]	62	0.6%	117	1.0%	100	0.9%
Special treatment[6]	139	1.3%	117	1.0%	147	1.3%
Total	10,999	100%	11,140	100%	11,740	100%

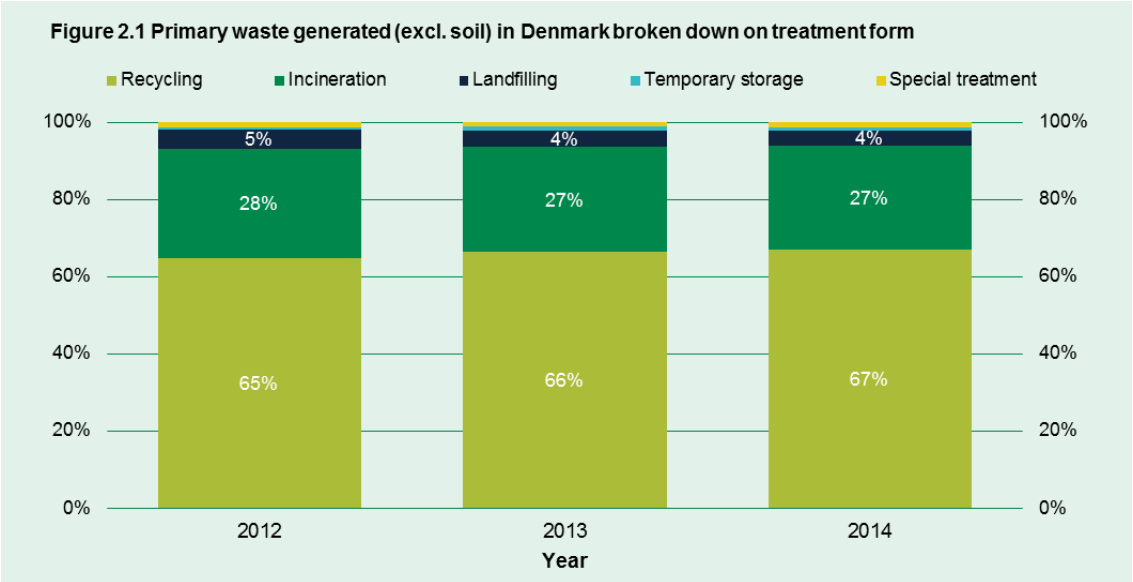


Figure 2.1. Primary waste generated (excl. soil) in Denmark broken down on treatment form.

[4] In the following, *recycling* means *quantities collected for recycling*. After sorting and reprocessing of this waste a minor part goes to incineration and/or landfilling in the form of so-called secondary waste. Read more about primary and secondary waste in Appendix 1.

[5] In Statutory Order on the Waste Data System (Order no. 1306 of 17 December 2012) temporary storage is defined as waste for incineration (including pretreatment), which is assigned for temporary storage. This treatment form exclusively covers waste that will go to incineration at a later stage.

[6] In Statutory Order on the Waste Data System (Order no. 1306 of 17 December 2012) special treatment is defined as waste treated separately in a special treatment form or as waste expected to be treated separately in a special treatment form. Special treatment exclusively covers hazardous waste, including health-care risk waste.

The share of total Danish waste arisings (excl. soil) going to recycling has increased since 2012 by 2 percentage points; among other things, this is due to an increase in quantities of household waste and construction waste going to recycling. Waste for other final material recovery, i.e. mainly crushed construction waste for recovery in construction projects, is included in quantities of recycled waste.

By contrast to the primary Danish waste generation (excl. soil) going to recycling the share of waste going to incineration has decreased since 2012; again, this is primarily explained by quantities of household waste diverted from incineration to recycling. It should be noted, however, that the relative waste quantity going to incineration has increased since 2013, which is primarily due to increased generation of construction and demolition waste and increased incineration of biomass.

The primary Danish waste generation (excl. soil) going to incineration is not equal to total waste quantities incinerated at Danish incineration plants. The difference is found, among others, in the fact that waste quantities for incineration received at Danish incineration plants comprise imports of waste from abroad, waste in temporary storage and waste that goes to incineration after various sorting processes[7]. In Table 2.2 the difference between primary waste generated in Denmark and total quantities of waste received for incineration at Danish incineration plants is shown. It should be noted that a number of the Danish incineration plants also receive biomass for incineration, but since this type of biomass, by contrast to biomass waste, is not regarded as waste, this quantity is not included in Table 2.2.

Table 2.2. Incineration of waste (excl. soil)

Incineration of waste	2012	2013	2014
	Tonnes (1,000)	Tonnes (1,000)	Tonnes (1,000)
Incineration - received[8]	3,568	3,645	3,839
Incineration - received without imports[9]	3,329	3,294	3,428
Incineration of waste (excl. special plants) Received[10]	3,306	3,347	3,535
Incineration of waste (excl. special plants) Received without imports[11]	3,203	3,188	3,280
Incineration - Primary waste generated[12]	3,213	3,206	3,272

The above Table 2.2 shows an almost constant quantity of waste received for incineration at the Danish incineration plants including special plants along with an increase in imports of waste for incineration from 239,000 tonnes in 2012 to 411,000 tonnes in 2014. In 2014, however, a minor increase is seen in waste amounts produced in Denmark (excl. soil) going to incineration; this is primarily due to higher quantities of construction and demolition waste and increased incineration of biomass waste.

As to primary Danish waste going to landfill (excl. soil) a decreasing trend in quantities is seen, as shown in Table 2.1. One of the main reasons for this decreasing trend is that since 2012 beet soil[13] has been increasingly recovered at the expense of landfilling.

[7] Waste originating from a waste pretreatment plant will be secondary waste, since a waste pretreatment plant is a waste actor receiving waste. A detailed description of primary and secondary waste generated is given in Appendix 1.
[8] Waste received for incineration/temporary storage at Danish incineration plants that cover dedicated plants (24 plants), multi-fuel firing units (3 plants) and special plants (4 plants), respectively. Source: ADS.
[9] Imports: Imports of waste received for incineration/temporary storage at Danish incineration plants that cover dedicated (24 plants), multi-fuel firing units (3 plants) and special plants (4 plants). Source: ADS.
[10] Waste received for incineration/temporary storage at Danish incineration plants that cover dedicated plants (24 plants) and multi-fuel firing units (3 plants), respectively. Source: ADS.
[11] Imports: Imports of waste received for incineration/temporary storage at Danish incineration plants that cover dedicated plants (24 plants) and multi-fuel firing units (3 plants), respectively. Source: ADS.
[12] This quantity covers primary waste in Denmark going to incineration, temporary storage and special treatment (if used in combination with the European treatment operations of R1, R13 or D10).

Just as for incineration, it should be mentioned that there may be differences between the primary Danish waste generation (excl. soil) going to landfill and the actual quantities of waste received for landfilling at the Danish landfills. The difference is primarily found in the fact that waste quantities received at Danish landfills comprise waste that goes to landfill after various sorting processes[14]. This difference is shown in Table 2.3.

Table 2.3. Landfilling of waste (excl. soil)[15]

Landfilling of waste	2012	2013	2014
	Tonnes (1,000)	Tonnes (1,000)	Tonnes (1,000)
Landfilling - Received[16]	565	504	533
Landfilling - Primary waste generated	552	487	479

By contrast to primary waste landfilled a minor increase is seen in the period 2013 to 2014 in total quantities of waste received for landfilling at Danish landfills. One of the main reasons for this increasing trend is the increase in those waste quantities that go to landfilling through various sorting processes. Again, this is to be seen in connection with the increase in quantities of construction and demolition waste.

Finally, Table 2.1 shows that the share of primary Danish waste generation (excl. soil) that goes to special treatment and temporary storage is at the same level in the years 2012-2014. As to the treatment option special treatment, which can only be used in connection with hazardous waste, it should be noted that primary hazardous waste generated can also be categorised under other treatment forms.

[13] Beet soil in Waste Statistics 2011 and 2012 was categorised under waste fraction E20 uncontaminated soil. In Waste Statistics 2013 this has been changed to E31 other wastes, as it cannot be considered as similar to soil from construction activities.
[14] Waste originating from a waste pretreatment plant will be secondary waste, since a waste pretreatment plant is a waste actor receiving waste. A detailed description of primary and secondary waste generated is given in Appendix 1.
[15] Compared with Waste Statistics 2013 quantities going to landfill have decreased for 2012 and 2013. This decrease is due to the fact that liquid waste in Waste Statistics 2014 is stated in dry weight instead of wet weight, where possible.
[16] Waste received for landfilling at the 41 Danish landfills that have an environmental approval for receiving waste for landfilling. Source: ADS.

2.1 Waste fractions

Table 2.4 shows total Danish waste arisings (excl. soil) corresponding to primary waste generated in Denmark and distributed on level of waste fraction[17].

Table 2.4. Primary waste generated (excl. soil) in Denmark distributed on level of waste fraction.

Fractions	Tonnes (1,000)		
	2012	2013	2014
Mixed residual waste	1,471	1,482	1,494
Waste suitable for incineration	1,490	1,448	1,470
Organic waste[18]	305	305	293
Paper incl. newsprint and packaging paper	383	330	351
Packaging cardboard and other cardboard	289	342	359
Packaging glass[19]	141	136	136
Flat glass	35	39	50
Packaging wood	1	17	15
Wood	241	276	393
Packaging plastics	28	33	35
Plastics	60	43	53
Packaging metal	7	8	8
Ferrous and non-ferrous metals	1,027	969	903
Electronics	60	73	67
Refrigerators containing freon	9	19	18
Batteries	19	19	23
Garden waste	751	810	831
Sludge from wastewater treatment plants	131	129	132
Sludge – other	197	123	150
Tyres	32	31	33
Mixed construction and demolition waste	2,707	2,744	3,117
Impregnated wood	34	37	39
PVC	11	5	6
Gypsum	159	234	211
Waste suitable for landfill	287	259	272
Residues from coal and biomass fired energy plants	563	716	692
Other wastes	562	512	589
Total	10,999	11,140	11,740

[17] Level of waste fraction in these waste statistics in some cases deviates from the waste fractions used in connection with ADS. This deviation is primarily caused by an aggregation of waste fractions for use in these statistics. For example, wood waste from households and industry, respectively, has been aggregated into one fraction *"wood"*.

[18] Compared with Waste Statistics 2013 organic waste quantities for 2012 and 2013 have decreased. This decrease is due to the fact that liquid waste in Waste Statistics 2014 is stated in dry weight instead of wet weight, where possible. The decrease in waste quantities from 2013 to 2014 is primarily due to a clarification of dry weight in 2014 and a decrease of organic waste quantities in industry.

[19] Quantities of glass packaging have been updated significantly since Waste Statistics 2013; this is due to reporting of outstanding quantities in 2014, both for 2014 and the preceding years.

Table 2.4 contains a number of broad waste fractions such as *waste suitable for incineration* and *mixed construction and demolition waste*, covering many different waste types. *Waste suitable for incineration*[20] and *mixed residual waste* are generally seen as waste going to incineration. In this connection, however, it should be mentioned that some waste quantities under the other waste fractions can also go to incineration; this is the case, e.g., for the waste fraction *sludge from wastewater treatment plants* that covers, among others, sewage sludge for incineration.

Compared with developments in quantities among the waste fractions the largest increase in 2014 is seen for construction and demolition waste; this is due to higher activity in the demolition sector[21].

The waste fraction *mixed construction and demolition waste* also covers concrete, bricks and tiles and accounts for the largest proportion of construction and demolition waste in Denmark. Construction and demolition waste, however, may also be categorised under other waste fractions such as *waste suitable for landfill, waste suitable for incineration, wood, flat glass* and *gypsum*. For example, the large increase in flat glass in 2014 is related to the substantial increase in construction and demolition waste. Other waste fractions containing construction waste are *mixed construction and demolition waste*, *impregnated wood* and *PVC*. A more detailed discussion of construction and demolition waste and developments in this fraction is found in section 3.4.

The large increase in wood waste may be explained by increased separation, primarily of household waste, by the generally higher quantities of construction and demolition waste and by different wastes of forest trees for incineration. The latter in particular is new in 2014 compared with previous years.

For domestic waste it should be noted that even if *mixed residual waste* is stated separately from *waste suitable for incineration* in Table 2.4, a minor share of that waste that is registered under *waste suitable for incineration* will consist of mixed residual waste. This type of incorrect registration is primarily seen in relation to waste from commercial and industrial activities from the service sector. This problem has been reduced over the years and is expected to continue decreasing in the future.

For packaging waste it is seen that quantities are at a relatively stable level for the fractions metal and glass, while plastic packaging has increased. Some of the packaging waste of metal and plastic, however, is found under the fractions *ferrous and non-ferrous metals* and *plastics*. Quantities of packaging waste of cardboard and wood show an increase. For packaging wood the increase is due to a clarification of reporting in 2013 and 2014.

Primary generated WEEE, which is primarily found under the waste fractions *electronics* and *refrigerators containing freon*, is discussed in more detail in section 2.3. More details on primary generation of waste batteries are given in section 2.4.

Residues from incineration in connection with primary waste generated should only be seen as residues such as bottom ash and fly ash from coal or biomass fired power plants. Residues from waste incineration are considered secondary waste, which is not shown in Table 2.4, as this table only covers quantities of primary waste generated. In addition to the fraction *residues from coal and biomass fired energy plants,* in particular the waste fractions *waste suitable for landfill* and *gypsum* will contain residues from coal, gas and biomass fired power plants. In section 3.5 developments for the most important waste arisings in the sector of power, gas and district heating supply are discussed.

The waste fraction *other wastes* generally covers waste types that cannot be categorised under other waste fractions. The largest share of *other wastes* consists of beet soil going to landfill and recycling, respectively. In addition to beet soil *other wastes* covers, among others, chemical waste and other hazardous wastes separated for *special treatment*.

[20] Small and large burnable items
[21] Statens nedrivningspulje (*national demolition fund*) is considered to be a significant reason for this higher demolition activity in 2014.

2.2 Hazardous waste

The treatment form for all primary generated hazardous waste in Denmark is shown in the below table.

Table 2.5. Primary hazardous waste generated (excl. soil) in Denmark distributed on treatment form.

Hazardous waste	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling	212	45%	180	39%	247	41%
Incineration	98	21%	99	21%	138	23%
Landfilling	83	18%	99	21%	110	18%
Temporary storage	1	0%	3	1%	2	0%
Special treatment	78	17%	84	18%	102	17%
Total	472	100%	466	100%	598	100%

The statement covers primary quantities generated and registered either under the waste fraction *hazardous waste*[22], or under others fractions with an LoW code[23] indicating that the waste is hazardous. This means that it is the combination of the two sets of codes that makes up total quantities of primary hazardous waste generated.

It should be noted that hazardous waste from secondary waste generation is not contained in the statement of primary hazardous waste generated. Examples of secondary waste generation are residues from the incineration of waste or imported hazardous waste.

It appears from Table 2.5 that the generation of hazardous waste has increased in 2014. This increase in the quantities, which is primarily seen in combination with the treatment form of recycling, is particularly due to an increase in hazardous oily waste and hazardous construction and demolition waste. For Table 2.5 it should also be mentioned that less than 20% of primarily hazardous waste generated is stated under the treatment form *special treatment*.

In Table 2.6 the primary generation of hazardous waste in Denmark is shown at a detailed waste type level. The clarification of the waste types may place high requirements for those who report to ADS, and small variations in the reports may lead to large variations in the quantities of the different waste types.

The table shows that *other construction and demolition waste* accounts for up to 20% of the primary generation of hazardous waste. Altogether, different forms of construction and demolition waste account for a large proportion of total quantities of hazardous waste. For example, *insulation materials and asbestos-containing construction materials* make up approximately 14%. Various forms of *oil wastes* make up approximately 15% of total quantities.

[22] Categorised under *other wastes*
[23] See description of waste codes in Appendix 1

Table 2.6. Primary hazardous waste generated (excl. soil) distributed on waste type.

Hazardous waste	2012	2013	2014
	Tonnes	Tonnes	Tonnes
Wastes from mineral excavation and processing	870	692	586
Drilling muds and other drilling wastes	8,414	4,744	4,574
Sawdust, shavings etc. containing dangerous substances from wood processing and the production of panels and furniture	1,915	303	114
Wastes from petroleum refining	5,117	763	4,239
Wastes from the manufacture, formulation, supply and use of acids and bases	2,270	2,988	3,007
Wastes from the manufacture, formulation, supply and use of salts and their solutions and metallic oxides containing cyanides and heavy metals	119	66	125
Metal-containing wastes containing mercury	8	6	18
Metal-containing wastes containing others heavy metals	1,645	2,701	2,092
Organic halogenated wastes and other wastes from the manufacture of organic chemicals	28,789	39,778	33,079
Wastes from the manufacture of paint and varnish	11,093	9,171	10,944
Wastes from the photographic industry	1,591	1,781	1,584
Acids and bases from chemical surface treatment	3,252	3,978	3,194
Phosphatising sludges from chemical surface treatment	259	375	408
Sludges and filter cakes from chemical surface treatment	1,126	1,421	1,609
Other hazardous wastes from chemical surface treatment	1,166	997	1,761
Wastes containing cyanide and other wastes from tempering processes	118	132	206
Machining oils, emulsions and solutions free of halogens	3,013	4,999	5,147
Wastes from hydraulic oils	1,132	756	633
Waste engine, gear and lubricating oils	20,338	23,201	23,043
Bilge oils	15,562	21,414	26,358
Oil, sludges and other wastes from oil/water separators	8,519	13,016	52,289
Other oil wastes	18,562	21,414	26,358
Waste organic solvents and refrigerants	6,819	5,148	2,710
Oil filters, brake fluids, antifreeze fluids and other hazardous waste from end-of-life vehicles	2,018	2,306	1,959
Waste electronics containing PCBs	533	110	113
Waste electronics containing CFC, HCFC or HFC	3,872	16,450	5,433
Other waste electronics	8,064	18,223	23,136
Fluorescent tubes and other mercury-containing waste	4,152	4,081	745
Discarded chemicals	3,259	5,022	7,366
Lead accumulators, Ni-Cd batteries and mercury-containing batteries	18,002	17,787	21,358
Concrete, bricks, tiles and ceramics containing dangerous substances	14,798	11,487	16,867
Glass, plastic and wood containing or contaminated with dangerous substances	18,790	14,254	18,712
Cables containing oil, coal tar and other dangerous substances	548	580	180
Insulation materials and asbestos-containing materials	63,959	68,902	81,482
Construction and demolition wastes containing PCB	3,066	3,791	11,149
Other hazardous construction and demolition wastes	99,984	34,906	96,988
Wastes from hospitals, medicare, dental care and research	7,276	7,057	6,346
Solvents, acids, alkalines and photochemicals from households and the service sector	1,422	1,504	1,447
Pesticides from households and the service sector	257	244	241
Paint, inks, adhesives and resins from households and the service sector	7,624	10,429	6,919
Medicines from households and the service sector	1,501	1,433	1,552
Wood containing dangerous substances from households and the service sector	18,899	17,164	20,140
Other	52,404	73,738	71,002
Total	472,386	466,086	597,892

2.3 Waste electronics (WEEE)

Waste electronics (WEEE[24]) covers waste from electrical and electronic equipment. The primary quantities of WEEE generated in Denmark can be related directly to the waste fractions *electronics* and *refrigerators with freon*. However, these waste fractions are not the only ones containing waste that can be categorised as WEEE. Waste fractions such as *ferrous and non-ferrous metals*, *other wastes* (e.g. waste containing dangerous substances) and *mixed construction and demolition waste* (e.g. cables) can be related to WEEE thanks to the combination with LoW codes[25]. Total primary quantities of WEEE generated are stated in Table 2.7 below.

Table 2.7. Primary WEEE generated (Source: ADS)

Waste electronics - waste fractions	2012	2013	2014
	Tonnes (1,000)	Tonnes (1,000)	Tonnes (1,000)
WEEE	83	96	91

As stated in the above table quantities of primary WEEE generated are decreasing slightly in 2014. In addition, it should be noted that quantities of WEEE are believed to be underestimated, especially in 2012; this is caused primarily by lack of reports and incorrect reports of waste categories that do not cover WEEE (e.g. ferrous and non-ferrous metals).

In Denmark we have different sources of data on WEEE. DPA-System (Danish Producer Responsibility System)[26], in addition to ADS is one of these sources. DPA-System registers quantities of electrical and electronic equipment placed on the market and collected. This information is used, among others, by the Danish Environmental Protection Agency in connection with the reporting to EUROSTAT, the statistical office of the European Union. Table 2.8 shows collected quantities of WEEE as stated by DPA-System.

Table 2.8. WEEE collected (Source: DPA-System)

Categories of electrical and electronic equipment.	Tonnes		
	2012	2013	2014
Large household appliances	32,052	32,145	31,692
Small household appliances	4,997	4,993	5,372
IT and telecommunications equipment	12,740	12,162	11,155
Consumer equipment and photovoltaic panels	22,841	19,143	17,132
Lighting equipment	702	693	1,639
Electrical and electronic tools[27]	959	979	2,007
Toys, leisure and sports equipment	340	214	532
Medical devices	47	48	24
Monitoring and control instruments[28]	450	466	21
Automatic dispensers	0	0	0
Total	75,128	70,843	69,574

There are two significant differences between the two sources of data on WEEE. DPA-System states WEEE at a more detailed level in a number of categories of waste in pursuance of EU rules, while ADS through its reporting of quantities from primary waste producers has a large quantity of

[24] *Waste from Electrical and Electronic Equipment, EU directive 2012/19/EU*
[25] European Waste Code, read more in Appendix 1. Selected LoW codes: 16 02 **; 17 04 11; 20 01 21; 20 01 23; 20 01 35; 20 01 36. LoW 17 04 11 covers cables.
[26] DPA-System is in charge of the national producer register and administrative tasks associated with the rules on producer responsibility under Danish environmental law regarding, among others, waste from electrical and electronic equipment
[27] With the exception of large-scale stationary industrial tools
[28] With the exception of all implanted and infected products

WEEE from businesses in comparison with the quantities of WEEE collected as stated by DPA-System.

2.4 Batteries

The primary quantities of batteries generated in Denmark can be related directly to the waste fractions *batteries*. Just as for WEEE this waste fraction is not the only one that can be related to batteries. Waste fractions such as *ferrous and non-ferrous metals* and *other wastes* (e.g. waste containing dangerous substances) can be related to waste batteries thanks to the combination with LoW codes[29]. Total primary quantities of batteries generated are stated in Table 2.9 below.

Table 2.9. Waste batteries generated (Source: ADS)

Batteries - Waste fractions	2012	2013	2014
	Tonnes (1,000)	Tonnes (1,000)	Tonnes (1,000)
Batteries	19	18	22

Just as for WEEE battery data are collected from various sources. DPA-System (Danish Producer Responsibility System)[30], in addition to ADS is one of these sources. DPA-System registers quantities of batteries placed on the market and collected. This information is used, among others, by the Danish Environmental Protection Agency in connection with the reporting to EUROSTAT, the statistical office of the European Union. Table 2.10 shows the quantities of waste batteries collected as stated by DPA-System.

Table 2.10. Waste batteries collected (Source: DPA-System)

Batteries collected	Tonnes		
	2012	2013	2014
Portable batteries	1,511	1,403	1,540
Automotive batteries	9,346	8,494	10,690
Industrial batteries	6,147	9,112	7,025
Total	17,004	19,009	19,255

DPA-System states waste batteries at a more detailed level in a number of categories of waste in pursuance of EU rules, while ADS states batteries at a more general level based on their constituents. It is presumed that ADS contains a larger quantity of lead accumulators than DPA-system, which is part of the explanation for the difference between the two systems in 2012 and 2014.

2.5 Soil

Just as in previous years' waste statistics it has been chosen to state quantities of soil waste separately from other primary waste generated. This is due to the fact that a few large construction works - such as the establishment of the Metro City Ring and the expansion of the Northern Harbour in Copenhagen - may lead to enormous variations in total waste arisings from one year to the next. Therefore, the variations in soil quantities risk overshadowing developments in quantities of other waste fractions, thus making it difficult to see trends and developments in quantities and treatment forms of this waste.

Table 2.11 shows the treatment of the uncontaminated[31] fraction of soil as well as that of contaminated soil.

[29] European Waste Code, read more in Appendix 1. Selected LoW codes: 16 06 **; 20 01 33; 20 01 34.
[30] DPA-System is in charge of the national producer register and administrative tasks associated with the rules on producer responsibility under Danish environmental law regarding, among others, waste from electrical and electronic equipment
[31] Slightly contaminated soil

Table 2.11. Primary soil waste generated distributed on treatment form and soil waste type (Source: ADS)

Contaminated soil	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recovery[32]	1,038	51%	1,438	61%	1,489	58 %
Disposal[33]	999	49%	936	39%	1,095	42 %
Total	2,038	100%	2,374	100%	2,584	100%

Uncontaminated soil	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recovery	1,111	59%	2,239	63%	2,222	57%
Disposal	771	41%	1,291	37%	1,643	43%
Total	1,882	100%	3,530	100%	3,864	100%

Soil, total	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recovery	2,149	55%	3,677	62%	3,711	58 %
Disposal	1,770	45%	2,227	38%	2,737	42 %
Total	3,919	100%	5,904	100%	6,448	100%

In a given year there may be large variations in quantity and type of contaminated soil and uncontaminated soil. This is not only due to changes in economic activity, but even more so due to the type of construction activities. Construction projects such as the metro typically generate more soil waste than the construction of a bridge or residential buildings. In addition, some construction projects will be on sites that are contaminated, so soil must be removed before the construction can start.

The quantity of primary generation of contaminated soil was largest in 2014, as approximately 2.5 million out of total soil quantities of approximately 6.5 million was contaminated. Even if soil is contaminated it may be recovered in construction projects depending on the contamination degree and based on a concrete assessment.

The quantity of contaminated soil for landfilling in the period 2012 to 2014 was on average approximately 1 million tonnes a year. This level is almost the same as the expected annual level of 1.2 million tonnes in the period 2013-2018 as seen in the Danish Environmental Protection Agency's projections of the need for landfilling of contaminated soil (Source: Guidelines from the Danish Environmental Protection Agency no. 4, 2014.

In 2013 and 2014 the quantity of uncontaminated soil was larger than the contaminated quantity, but still it was not possible to recover all this soil. Therefore, a relatively large proportion of the primary generation of soil was stated as landfilled/disposed.

It should be mentioned that there may be differences between the primary Danish soil waste generation going to landfill/disposal and the actual quantity of waste received for landfilling at the Danish landfills. The difference in 2012 and 2013 is primarily found in the fact that total waste quantities for landfilling received at Danish landfills comprise quantities that are first registered as recovery in

[32] Recovery covers all R codes in the R/D set of codes – see Appendix 1
[33] Disposal covers all D codes in the R/D set of codes – see Appendix 1

soil separation processes and then subsequently go to landfill[34]. In 2014 the difference is the opposite: a larger proportion of the primary generation of soil waste is registered as being subject to disposal, but has later been led to recovery. It is presumed that this challenge is primarily linked to the primary generation of uncontaminated soil that has first been stated as soil for disposal. These differences are shown in Table 2.12.

Table 2.12. Landfilling/disposal of soil waste

Soil – Landfilling/disposal of soil waste	2012	2013	2014
	Tonnes (1,000)	Tonnes (1,000)	Tonnes (1,000)
Landfilling - Received[35]	2,370	2,900	2,389
Disposal - Primary soil waste generated	1,770	2,227	2,737

[34] Waste originating from a waste pretreatment plant will be secondary waste, since a waste pretreatment plant is a waste actor receiving waste. A detailed description of primary and secondary waste generated is given in Appendix 1.

[35] Soil waste received for landfilling at the 41 Danish landfills that have an environmental approval for receiving waste for landfilling. Source: BEATE Landfill report 2011, 2012 and 2013

3. Sources of waste in Denmark

Waste sources in this section are the primary waste producers in Denmark[36]. Generally, these waste producers are divided into eight main sources as presented in Figure 3.1 and Table 3.1. In the following sections waste arisings are presented along with, where possible, subsectors of the different main sources. In addition to the main sources Figure 3.1 and Table 3.1 show a waste source *waste from commercial and industrial activities without sector*. This source is mainly waste from commercial and industrial activities that is not associated with a sector and therefore is a fraction of the seven main sources that are not *households*. The source *waste from commercial and industrial activities without sector* is discussed in section 3.9.

Just as for Waste Statistics 2013, Waste Statistics 2014 have been changed in relation to the waste contained in the different sources. The change is found in the statement of the main source *building and construction*; in addition to waste generated in this sector it also covers construction and demolition waste[37] generated by the other waste sources. This is a significant change from earlier practice and must be borne in mind when comparing these waste statistics with statistics from before Waste Statistics 2013.

Primary waste generated (excl. soil) distributed on main sources and treatment form is shown in Figure 3.1 and Table 3.1 below.

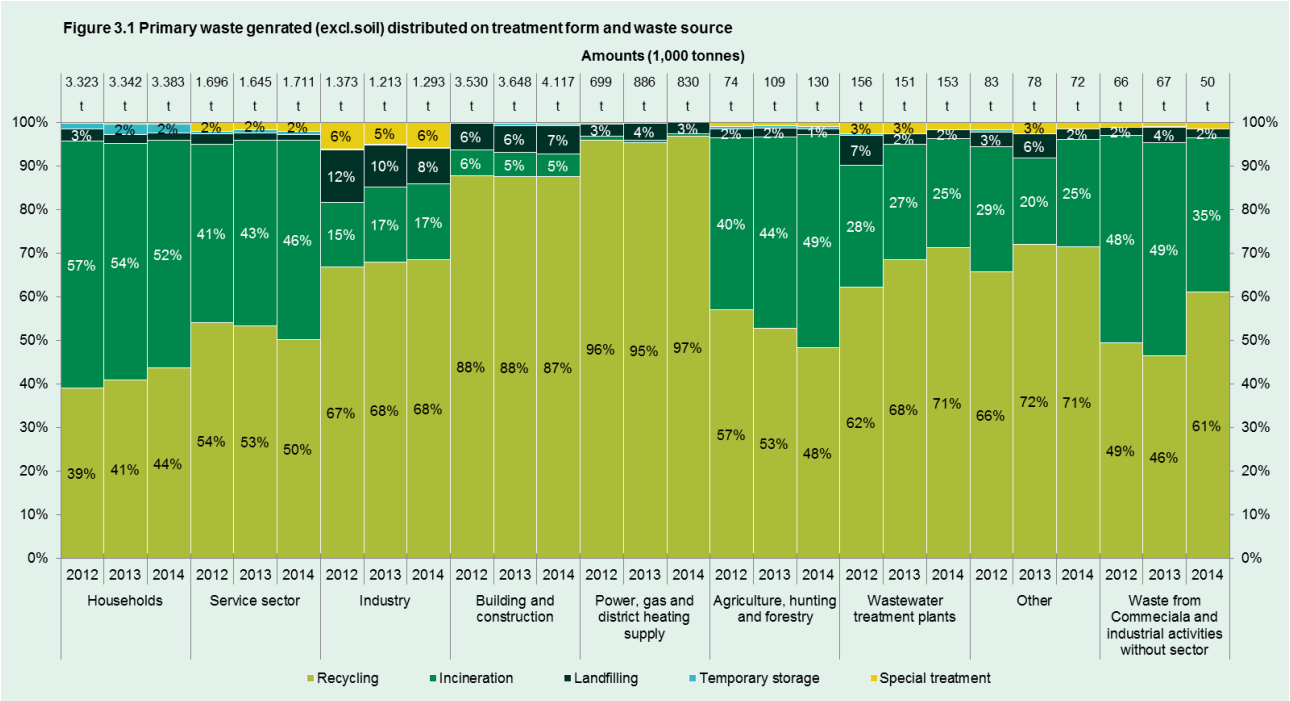


Figure 3.1. Primary waste generated (excl. soil) distributed on treatment form and waste source

[36] Read more about primary and secondary waste producers in Appendix 1.
[37] Construction and demolition waste in this context is waste registered in LoW group 17 and/or waste fractions *Construction and demolition waste, Stone* and *Asphalt*.

Table 3.1. Primary waste generated (excl. soil) distributed on treatment form and waste source

Waste sources	Total			Recycling			Incineration			Landfilling			Temporary storage			Special treatment		
	Tonnes (1,000)			Percent			Percent			Percent			Percent			Percent		
	2012	2013	2014	2012	2013	2014	2012	2013	2014	2012	2013	2014	2012	2013	2014	2012	2013	2014
Households	3,323	3,342	3,383	39%	41%	44%	57%	54%	52%	3%	2%	2%	1%	2%	2%	0%	0%	0%
Service sector	1,696	1,645	1,711	54%	53%	50%	41%	43%	46%	2%	2%	1%	1%	1%	1%	2%	2%	2%
Industry	1,373	1,213	1,293	67%	68%	68%	15%	17%	17%	12%	10%	8%	0%	0%	0%	6%	5%	6%
Building and construction	3,530	3,648	4,117	88%	88%	87%	6%	5%	5%	6%	6%	7%	0%	1%	0%	0%	0%	0%
Power, gas and district heating supply	699	886	830	96%	95%	97%	1%	1%	1%	3%	4%	3%	0%	0%	0%	0%	0%	0%
Agriculture, hunting and forestry	74	109	130	57%	53%	48%	40%	44%	49%	2%	2%	1%	1%	1%	1%	1%	1%	1%
Wastewater treatment plants	156	151	153	62%	68%	71%	28%	27%	25%	7%	2%	2%	0%	0%	0%	3%	3%	2%
Others source	83	78	72	66%	72%	71%	29%	20%	25%	3%	6%	2%	0%	0%	0%	2%	3%	2%
Waste from commercial and industrial activities without sector	66	67	50	49%	46%	61%	48%	49%	35%	2%	4%	2%	0%	0%	0%	1%	1%	1%
Total	10,999	11,138	11,740	65%	66%	67%	28%	28%	27%	5%	4%	4%	1%	1%	1%	1%	1%	1%

As it appears from Table 3.1 and Figure 3.1 the main source *power, gas and district heating supply* accounts for the largest proportion of waste for recycling in 2014 (97%). The second largest share for recycling is seen in the source *building and construction* (87%); this is mainly due to the large quantity of crushed building waste and asphalt for recovery in building and construction projects. At the other end of the scale the source *households* is seen to have the lowest proportion of waste for recycling (43%); this is primarily due to the fact that *households* also have the largest share of waste for incineration (52%). In this connection it should be mentioned that *households* are moving in a positive direction in terms of increasing the share of waste for recycling, which has also meant a decrease by five percentage points in the share going to incineration in the period 2012 to 2014.

The largest increase in waste for recycling is seen in the main source *wastewater treatment plants*; here, particularly sewage sludge going to recycling instead of landfilling is decisive. The largest decrease in the share of waste for recycling is seen in the main source *agriculture, hunting and forestry*, which happens in parallel to increasing waste amounts from this source for incineration. For the source *agriculture, hunting and forestry* it should also be noted that quantities of waste have increased significantly since 2012; this is in particular due to larger quantities of biomass for incineration primarily from forestry.

As to total waste arisings from all sources Figure 3.2 shows that the source *building and construction* generates most waste; it accounts for 35% of total waste generation without soil in 2014. Next are the sources *households, service sector, industry* and *power, gas and district heating supply*, accounting for 29%, 15%, 11%, and 7%, respectively, of total primary waste generated in Denmark. The waste source *waste from commercial and industrial activities without sector* accounts for less than 1% of total primary waste generated without soil.

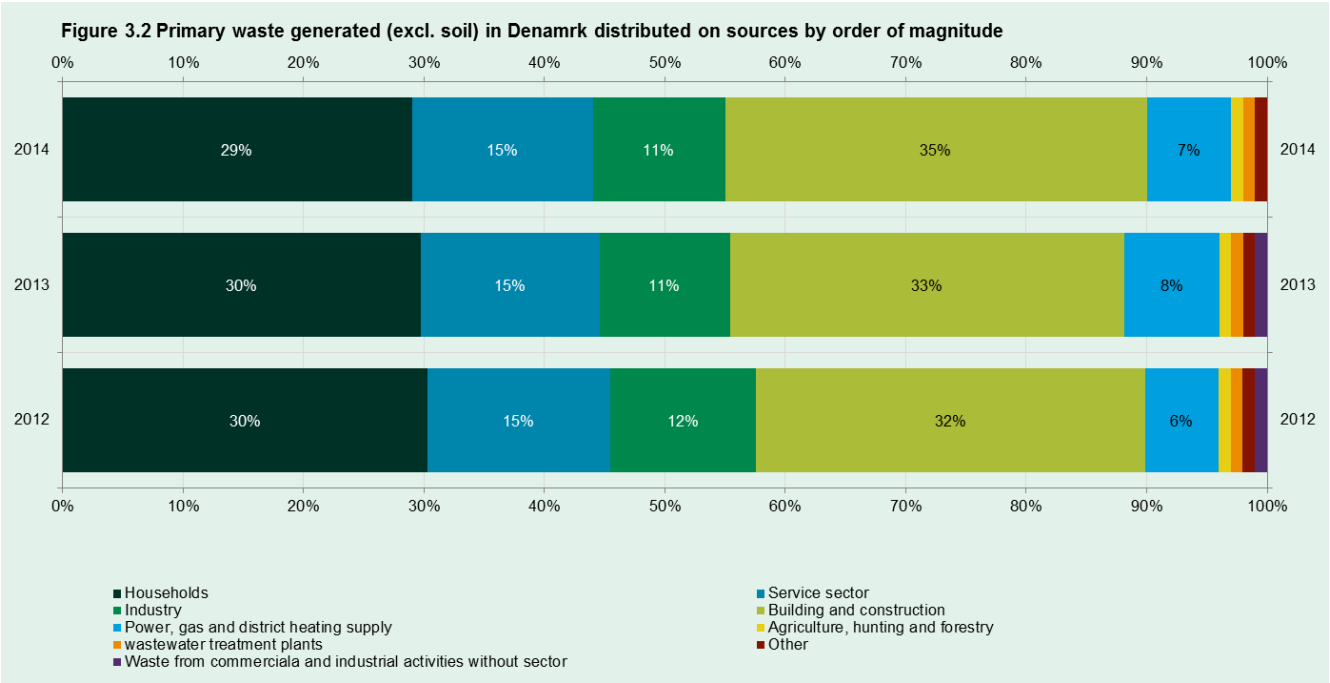


Figure 3.2. Primary waste generated (excl. soil) in Denmark in 2014 distributed on sources by order of magnitude.

3.1 Waste from households

Primary waste (excl. soil) from *households* is all waste generated in households, apart from construction and demolition waste. As described above, all construction and demolition waste is placed under the source *building and construction*.

Households are defined as primary and secondary residences as well as residential institutions (e.g. single-family homes, attached houses, flats, summer houses, student homes, nursing homes and other institutions where the residents have their official address). In addition, the source *households* covers all waste delivered at recycling centres[38]. The source households does not cover houses and residential rooms intended for limited stays as part of a commercial activity or a public service (e.g. hotels, schools and conference centres).

Table 3.2 shows that the quantity of primary waste generated from households is at a stable level over the years.

Households	2012	2013	2014
Total (1,000 tonnes)	3,323	3,342	3,383
Kg/cap.[39]	596	597	601
Kg/household[40]	1,281	1,282	1,291

Table 3.2. Annual primary waste quantity in households in kilograms per capita and kilograms per household (excl. soil).

As mentioned, the share of waste from *households* for recycling is increasing whereas waste for incineration is decreasing as shown in Table 3.3. The positive development for recycling in the period 2012 to 2014 is seen for all waste from households. Therefore, this level cannot be compared directly with the 50% target for certain waste fractions from households as stated in "Denmark without waste - Resource plan for waste management 2013-2018". Section 5 discusses the Resource Plan and its impact goals in more detail[41]. The distribution of primary waste generated in *households* between the different treatment options of landfilling, temporary storage and special treatment is relatively constant.

Households	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling	1,299	39%	1,364	41%	1,475	44%
Incineration	1,879	57%	1,813	54%	1,769	52%
Landfilling	93	3%	73	2%	54	2%
Temporary storage	45	1%	82	2%	68	2%
Special treatment	7	0%	11	0%	16	0%
Total	3,323	100%	3,342	100%	3,383	100%

Table 3.3. Primary waste generated (excl. soil) from households distributed on treatment form.

Developments in waste fractions from *households* are shown in Table 3.4. Noticeable facts are, among others, the decrease in the fraction *waste suitable for incineration* as well as the increase in *wood*. The increase in the fraction *garden waste* is believed to be primarily due to a clarification of the waste source *households* for reports in 2014.

[38] A minor share of waste delivered at recycling centres originates in commercial businesses. The share, which varies from one recycling centre to another, is assessed to be low; therefore, no adaptation has been made in Waste Statistics 2014.
[39] 2014: 5,627,235 inhabitants in Denmark (www.dst.dk)
[40] 2014: 2,621,249 households in Denmark (www.dst.dk)
[41] "Denmark without waste - Resource plan for waste management 2013-2018", Guidelines from the Danish Environmental Protection Agency no. 4, 2014

The primary reason for the decrease in *waste suitable for incineration* is the above-mentioned larger separation for recycling, which explains the increase in the waste fractions *wood*, *packaging cardboard and other cardboard* and *plastics*.

Some of the *Mixed residual waste* stated in Table 3.5 as coming from households actually derives from the service sector; this is explained in more detail in section 3.2.

Table 3.4. Primary waste generated (excl. soil) from households in Denmark broken down on waste fractions.

Households	Tonnes (1,000)		
	2012	2013	2014
Mixed residual waste	1,418	1,404	1,412
Waste suitable for incineration	485	476	415
Organic waste	26	38	38
Paper incl. newsprint and packaging paper	206	194	199
Packaging cardboard and other cardboard	38	44	53
Packaging glass	103	100	111
Flat glass	13	18	22
Packaging wood	0	5	4
Wood	89	107	154
Packaging plastics	16	17	16
Plastics	8	8	14
Packaging metal	6	7	8
Ferrous and non-ferrous metals	98	93	90
Electronics	43	55	53
Refrigerators containing freon	7	17	17
Batteries	3	3	5
Garden waste	606	613	655
Tyres	7	6	6
Impregnated wood	16	16	16
PVC	1	1	1
Gypsum	2	2	2
Waste suitable for landfill	72	53	49
Other wastes	59	65	44
Total	3,323	3,342	3,383

3.2 Waste from the service sector

Waste arisings in the service sector amounted to a total of approximately 1.7 million tonnes in 2014. The service sector covers both public and private service and it consists of different subgroups. ADS reporting makes it possible to break down the service sector sources on a very detailed level. In the past, it was not possible to have statistics at this detailed level. As a matter of clarity the subgroups are aggregated in some main groups as stated in Table 3.5.

It appears from the table that the sources of *retail trade, transporting and storage* and *communication, culture, financial services and private services* have by far the largest generation of waste. Each of these sources generated approximately 270,000 - 350,000 tonnes in 2014. Most of the subgroups have a relatively stable waste generation in the years 2012-2014; however, the two groups *retail trade* and, in particular, *transporting and storage* have a higher waste generation in 2014 compared with 2012-2013. This is first and foremost due to the fact that it was possible in the period 2012-2014 to reduce the quantities of *unspecified service sector waste* - waste from the service sector that has been reported in a way that makes it impossible to identify the subgroup source of this waste.

Table 3.5. Primary waste generated (excl. soil) in the service sector distributed on main subgroups.

Service sector	Tonnes (1,000)		
	2012	2013	2014
Retail trade	300	332	347
Wholesale and retail trade and repair of motor vehicles and motorcycles	107	91	94
Wholesale of waste and scrap	135	118	101
Wholesale trade	169	181	183
Transporting and storage	247	233	339
Hotels and restaurants	59	60	74
Communication, culture, financial services and private services	281	282	270
Public administration, education, human health and social work activities	170	169	178
Unspecified service sector waste	225	178	125
Total	1,696	1,645	1,711

With ADS the service sector waste generation can be divided into types of waste at a very detailed level. Table 3.6 shows some of the most significant waste types generated in the service sector. The most important waste type is *waste suitable for incineration*, which amounted to 656,000 tonnes in 2014, corresponding to approximately one third of total quantities. At a first glance, the reported quantity of *mixed residual waste* seems quite small; in 2014 it was at some 65,000 tonnes. This should be seen in conjunction with the fact that the quantity reported as *waste suitable for incineration* is large, but also that part of *mixed residual waste* from the service sector is collected together with domestic waste from households and is therefore registered as coming from this source. In total, it is estimated that some 15% of *mixed residual waste* from households actually derives from the *service sector*.

The quantity of *paper incl. newsprint* has decreased significantly in the period 2012 to 2014 from 90,000 tonnes to 61,000 tonnes. A significant reason for this development is that the consumption of newspapers, writing paper and similar is on a rapid decrease these days. Evidently, this decrease is reflected in waste arisings from the service sector. By contrast, the consumption of *packaging cardboard and other cardboard* is increasing although the consumption in 2012 is rather low compared with 2013-2014.

It is surprising that Table 3.6 does not show larger quantities of *packaging plastics* (10,000 tonnes) and *packaging metal* (around 150 tonnes). This may be due to imprecise reports from the waste collectors, but also to the fact that the service sector does not separate these packaging types for

recycling to a sufficient degree. Also, quantities of *waste electronics* reported from the service sector are low: approximately 10,000 tonnes in 2014.

Table 3.6. Primary waste generated (excl. soil) in the service sector distributed on waste fractions.

Service sector	Tonnes (1,000)		
	2012	2013	2014
Mixed residual waste	42	60	65
Waste suitable for incineration	620	600	656
Organic waste	45	59	63
Paper incl. newsprint and packaging paper	90	65	61
Packaging cardboard and other cardboard	197	240	240
Packaging glass	29	25	12
Flat glass	5	4	4
Packaging wood	0	4	4
Wood	36	25	38
Packaging plastics	5	8	10
Plastics	8	13	11
Packaging metal	0	0	0
Ferrous and non-ferrous metals	319	242	217
Electronics	9	9	10
Refrigerators containing freon	1	1	0
Batteries	15	14	16
Garden waste	107	125	113
Sludge - other	28	15	11
Tyres	16	17	18
Impregnated wood	1	1	2
PVC	1	0	0
Waste suitable for landfill	30	20	22
Other wastes	92	96	135
Total	1,696	1,645	1,711

3.2.1 Treatment of waste from the service sector

The rate of recycling of waste from the service sector shows a decrease from 54% to 50% in the period 2012 to 2014. This decrease is in particular due to a decrease in *ferrous and non-ferrous metals* for recycling and an increase in waste for incineration. The increase in the rate for incineration in 2014 is primarily due to a substantial increase in residual waste from pipeline cleaning for disposal[42], which is a waste that was not generated in 2012 and 2013. Landfilling has dropped from 2% to 1% in the period. Among the different main subgroups under the service sector relatively large variations in the treatment are observed.

Figure 3.3 shows how waste from the service sector is treated; it is shown for the main subgroups and the main treatment options. *Wholesale of waste and scrap* has the highest rate of recycling with more than 85%, while also *wholesale and retail trade and repair of motor vehicles and motorcycles* (also covering repair shops and tyre service) has a very high rate of recycling of approximately 80% of the generated waste. Evidently, the high rates of recycling reflect that ferrous and

[42] Disposal operation: D10 - Incineration without energy recovery

non-ferrous metals in general have a positive value that has even increased for many years; in recent years, however, metal prices have decreased. A substantial part of the recycling from sale and repair of motor vehicles and motorcycles consists of recycling of scrap tyres.

Retail trade; wholesale trade; transporting and storage; communication, culture, financial services and private services and *unspecified service sector waste* all have a lower rate of recycling between 39% and 54%. *Public administration, education, human health and social work activities* and *hotels and restaurants* have an even lower rate of recycling; it only attains between 34% and 41%. For all main subgroups it is noticeable that much of the waste goes to incineration: between 39% and 65%; there is evidently much scope for improvement of the rate of recycling.

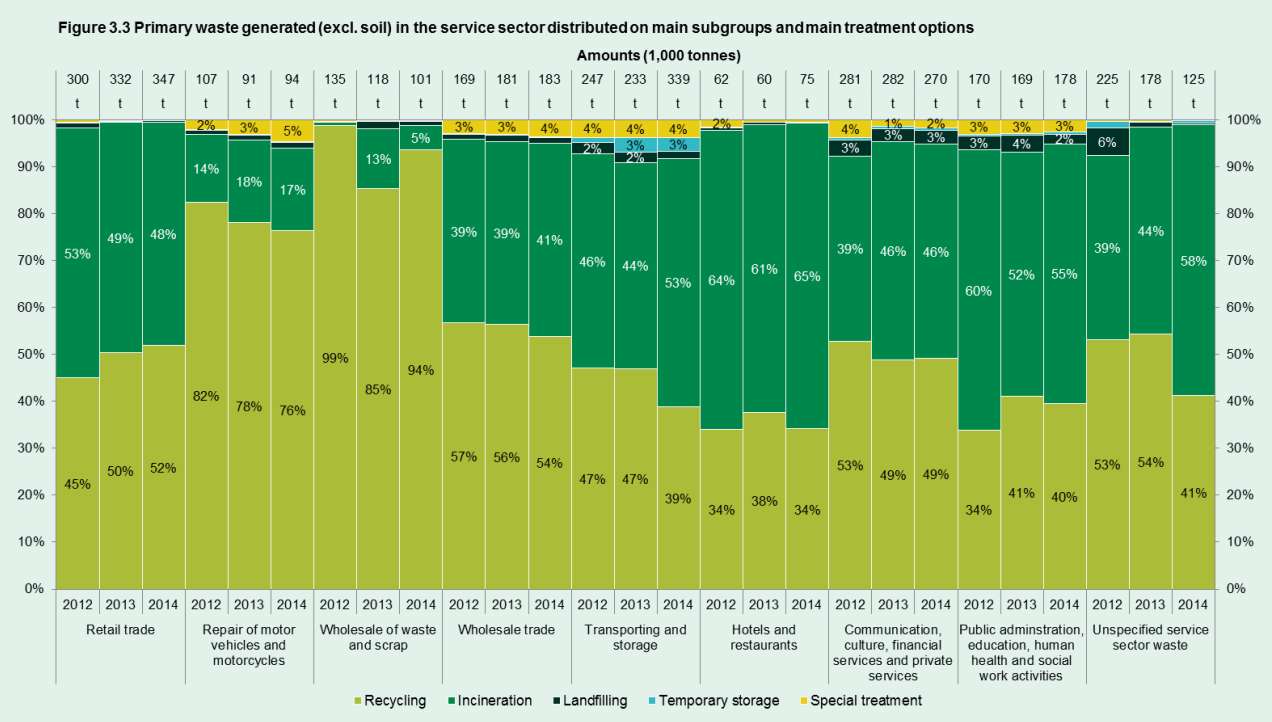


Figure 3.3. Primary waste generated (excl. soil) in the service sector distributed on main subgroups and main treatment options.

Table 3.7. Primary waste generated (excl. soil) from the service sector distributed on treatment form.

Service	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling	915	54%	878	53%	856	50%
Incineration	695	41%	701	43%	784	46%
Landfilling	40	2%	28	2%	23	1%
Temporary storage	9	1%	10	1%	13	1%
Special treatment	37	2%	29	2%	35	2%
Total	1,696	100%	1,645	100%	1,711	100%

3.3 Waste from industry

Generally, waste generation in industry has been on a decrease over the last 15 years. In 2000 waste generation attained approximately 3 million tonnes, in 2006 approximately 2 million tonnes, in 2008 approximately 1.7 million tonnes, in 2009 approximately 1.5 million tonnes and in 2014 it was at just below 1.3 million tonnes.

This general decrease in industry's waste generation since 2000 should be seen in connection with the development of industry's general importance for the Danish economy and the negative effect of the crisis from 2008. Thus, the number of full-time employed in industry, including raw material extraction, in the same period has decreased from 420,000 in 2000 to 332,000 in 2008 and 257,000 in 2014[43]. The waste generation trend should, however, also be seen in connection with developments in the type of industrial production in Denmark and a higher focus in industry on the highest possible resource utilisation and the lowest possible waste generation.

With ADS it is possible to state precisely the sources of waste in industry. Table 3.8 shows waste generation distributed on selected main sectors. It appears that *manufacture of food products, beverages and tobacco products* is the largest waste producer within the manufacturing industry with just below 40% of total quantities. In particular, the manufacture of food products generates much waste. Other major waste sources are *manufacture of chemicals and chemical products, manufacture of basic metals, fabricated metal products, except machinery and equipment* and *manufacture of machinery and equipment.* Within *manufacture of paper and paper products, printing and reproduction of recorded media* there has been a decrease in waste generation of almost 20% in the period 2012-2014. This reflects the fact that the consumption and thereby the manufacture of paper is on a continuous decrease in Denmark and that more and more printing assignments are carried out abroad.

Table 3.8. Primary waste generated (excl. soil) in industry distributed on main sectors.

Industry		Tonnes (1,000)		
		2012	2013	2014
I-1	Raw material extraction	13	12	12
I-2	Manufacture of food products	565	431	458
I-3	Manufacture of beverages and tobacco products	13	12	18
I-4	Manufacture of textiles, clothing and leather products	6	5	6
I-5	Manufacture of wood and of products of wood, cork and straw, except furniture	14	36	34
I-6	Manufacture of paper and paper products	73	29	35
I-7	Printing and reproduction of recorded media	71	64	82
I-8	Manufacture of coke and refined petroleum products	21	21	37
I-9	Manufacture of chemical products	79	56	79
I-10	Manufacture of basic pharmaceutical products and pharmaceutical preparations	32	62	40
I-11	Manufacture of rubber and plastic products	54	31	38
I-12	Manufacture of other non-metallic mineral products	76	81	87
I-13	Manufacture of metals	30	54	44
I-14	Fabricated metal products, except machinery and equipment	104	117	105
I-15	Manufacture of electrical and electronic equipment	18	18	20
I-16	Manufacture of machinery and equipment n.e.c.	113	98	109
I-17	Manufacture of motor vehicles, trailers and semi-trailers	16	20	13
I-18	Manufacture of furniture	52	44	54

[43] Source: Industry development 2000-2014, Statistics Denmark and StatBank Denmark (full-time employed), Statistics Denmark

I-19	Other manufacturing industry	7	6	5
I-20	Repair and installation of machinery and equipment	14	16	17
	Total	1,373	1,213	1,293

Table 3.9 shows which waste types are generated in industry; the table uses Danish waste fraction codes. An even more detailed statement of industry's waste generation has been produced using European waste codes. This detailed statement is found in the data appendix of these statistics.

Table 3.9 shows that the largest single fractions are *organic waste* and *ferrous and non-ferrous metals*, each amounting to almost 0.2 million tonnes. Other major waste fractions are *sludge* (stated in dry matter, where possible), *paper, packaging cardboard and other cardboard, gypsum* and *wood*. The fractions *waste suitable for incineration* and *waste suitable for landfill* are also large. The quantity of *other wastes* is also substantial, fluctuating between 254,000 and 315,000 tonnes in the period 2012-2014; more than half of this is soil from cleaning and washing of sugar beets.

Table 3.9. Primary waste generated (excl. soil) in industry distributed on waste fractions.

Industry	Tonnes (1,000)		
	2012	2013	2014
Mixed residual waste	6	7	7
Waste suitable for incineration	129	111	131
Organic waste	228	199	181
Paper incl. newsprint and packaging paper	79	65	81
Packaging cardboard and other cardboard	38	43	51
Packaging glass	8	7	12
Flat glass	9	9	8
Packaging wood	0	6	6
Wood	50	51	62
Packaging plastics	6	8	8
Plastics	33	16	19
Ferrous and non-ferrous metals	225	240	205
Electronics and refrigerators	1	4	2
Batteries	0	0	1
Garden waste	2	14	6
Sludge - other	152	84	116
Tyres	3	3	3
PVC	7	0	1
Gypsum	27	49	56
Waste suitable for landfill	49	38	26
Residues from incineration	5	5	3
Other wastes	315	254	308
Total	1,373	1,213	1,293

3.3.1 Treatment of waste from industry

Traditionally, industry has had a high rate of recycling of the waste generated. During the 1990s the rate of recycling attained between 50% and 60%. During the 2000s the rate of recycling attained between 60% and 65%. Table 3.10 shows the treatment of waste from industry in the period 2012 to 2014.

Table 3.10 shows that in the period 2012 to 2014 the rate of recycling of waste from industry increased from 67% to 69%. The total quantity of waste for incineration increased from 15% to 17%, while waste for landfilling decreased from 12% to 8% in the period 2012 to 2014.

Table 3.10. Primary waste generated (excl. soil) in industry distributed on treatment form.

Industry	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling	918	67%	823	68%	886	69%
Incineration	203	15%	210	17%	224	17%
Landfilling	166	12%	116	10 %	105	8 %
Temporary storage	2	0%	1	0%	3	0%
Special treatment	84	6%	62	5%	75	6%
Total	1,373	100%	1,223	100%	1,293	100%

As to the distribution of treatment options in the main sectors of industry it is seen in Figure 3.4 that in particular *manufacture of food products, beverages and tobacco products (I-3)*; *printing and reproduction of recorded media (I-7); manufacture of other non-metallic mineral products (I-12); manufacture of metals (I-13); manufacture of basic metals (I-14); manufacture of machinery and equipment (I-16)* and *manufacture of furniture (I-18)* have a high rate of recycling, attaining a level of more than 70%. *Other manufacturing industry (I-19)* also has a high recycling level while *manufacture of wood and of products of wood, cork and straw, except furniture (I-5); manufacture of coke and refined petroleum products (I-8);* and *manufacture of chemicals and chemical products (I-9)* and *basic pharmaceutical products and pharmaceutical preparations (I-10)* attain a relatively low rate of recycling. *Manufacture of textiles, clothing and leather products (I-4); manufacture of wood and of products of wood, cork and straw, except furniture (I-5); manufacture of paper and paper products (I-6); manufacture of coke and refined petroleum products (I-8)*; *the chemical (I-9); the pharmaceutical (I-10); manufacture of rubber and plastic products (I-11); manufacture of electrical and electronic equipment (I-15)* and *other manufacturing industry (I-19)* all have a high rate going to incineration (higher than 30%). *Raw material extraction* (I-1); *manufacture of coke and refined petroleum products (I-8)*, *the chemical industry (I-9)* and *repair and installation of machinery and equipment (I-20)* have a high rate of waste for special treatment (higher than 30%). It should be noted that the high increase and decrease, respectively, in the rate of recycling within *raw material extraction (I-1)* and *manufacture of textiles, clothing and leather products (I-4)* from 2012 to 2014 is primarily due to the fact that these sectors generate small quantities of waste so the changes only represent a quantity of 1,000 - 2,000 tonnes.

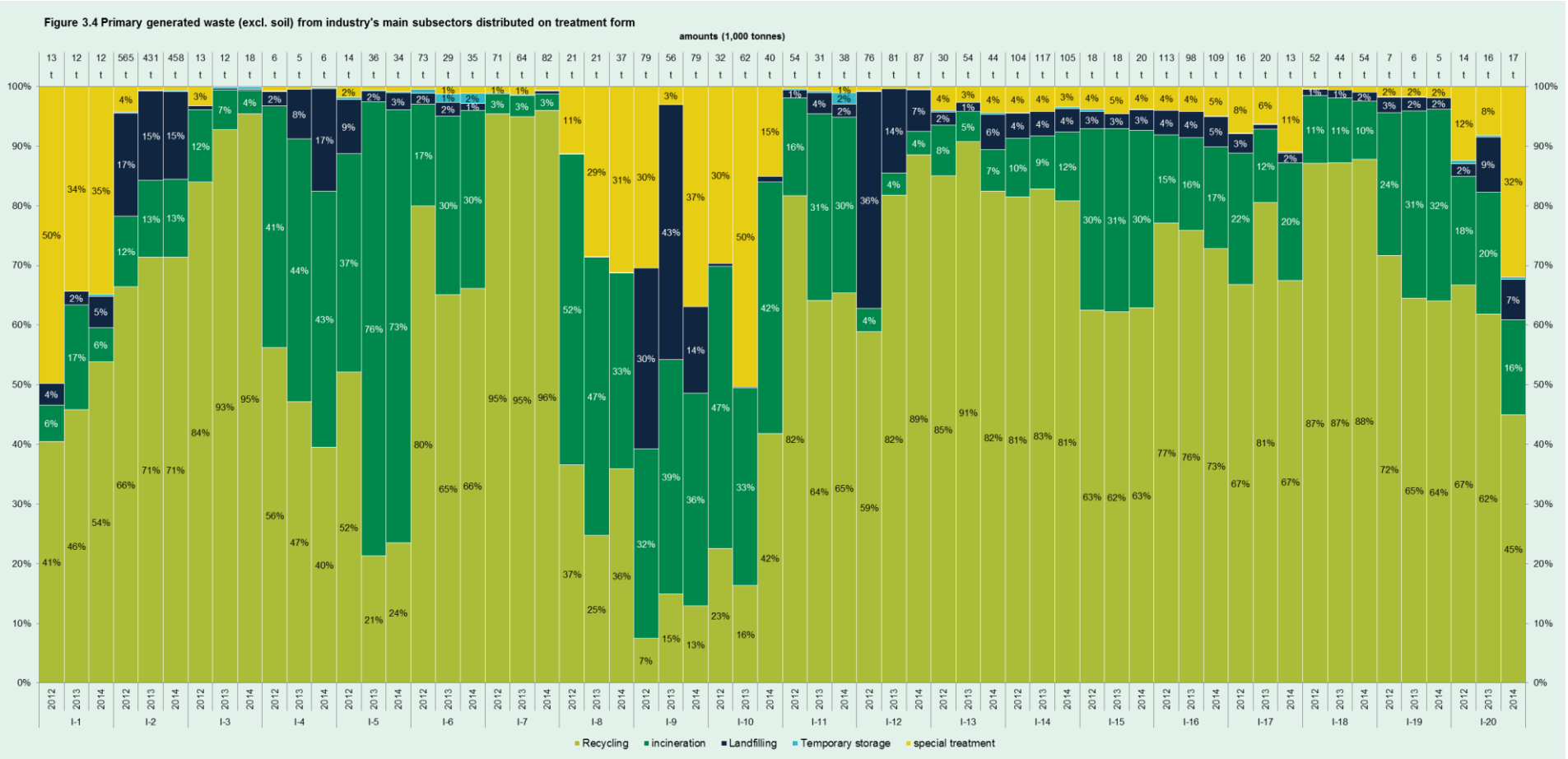


Figure 3.4. Primary waste generated (excl. soil) in industry's main subsectors distributed on treatment form.

3.4 Construction and demolition waste

The building and construction sector accounts for more than one third of waste generated in Denmark; this sector generated in 2014 approximately 4.1 million tonnes (excluding soil). If soil (see section 2.5) is included the quantity is even higher: approximately 10.6 million tonnes in 2014.

Waste generation from building and construction activities is traditionally very closely related to the economy. This is also seen in Figure 3.5, in which developments in construction and demolition waste arisings excluding soil are shown as an index in relation to the economic developments within the building and construction sector. There was a substantial decrease in waste amounts from 2008 to 2011 due to the financial crises that started in 2008. In the years 2011-2013 there was an increase in waste quantities, despite the fact that the economic activity remained relatively unchanged in the period 2010 to 2013. From 2013 to 2014 quantities increase by approximately 500,000 tonnes corresponding to 13 percentage points, compared with an increase in economic activity of only 2 percentage points. The increase is seen in particular in *concrete* and *bricks* as well as *mixtures of, or separate fractions of concrete, bricks, tiles and ceramics*. This increase can be explained in part by the fact that in each of the years 2014 and 2015 the Danish Parliament has earmarked a good DKK 200 million for the demolition and refurbishment of desolate buildings located in rural areas and in towns with a population of less than 3,000 inhabitants. It is assessed that in 2014 some 1,800 properties have been demolished with support from these funds[44].

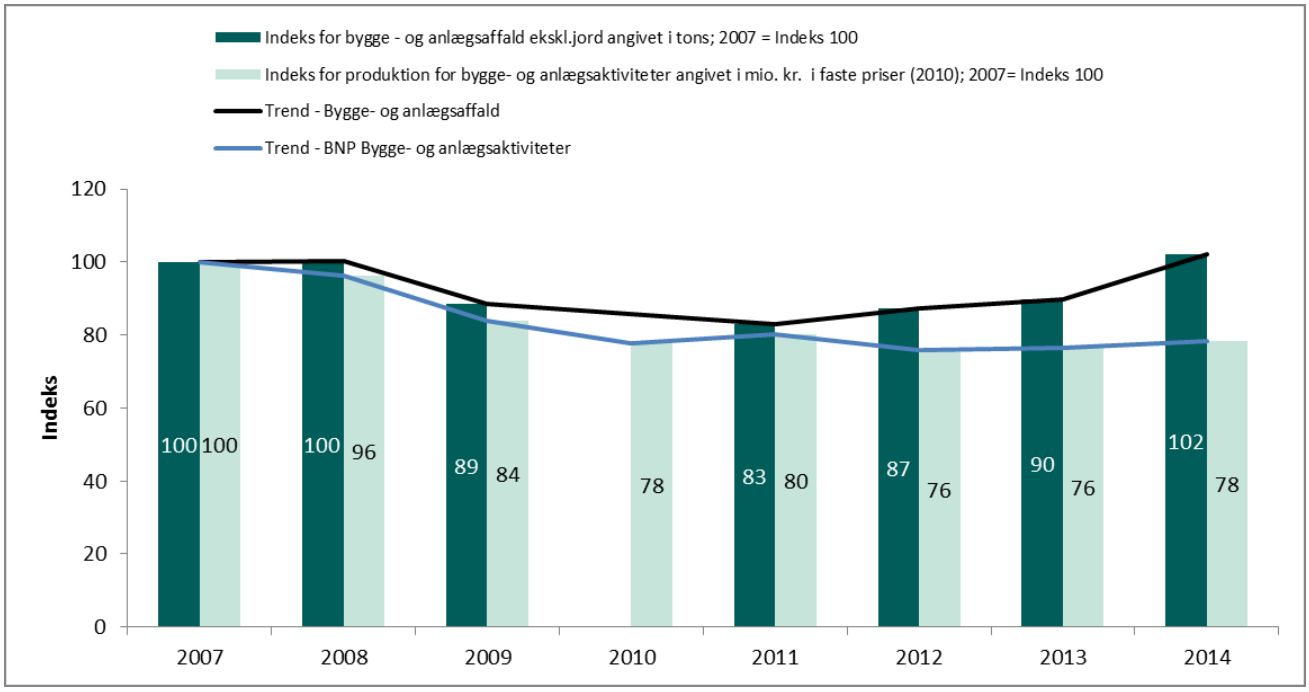


Figure 3.5. Generation of waste from building and construction activities (excl. soil) and economic activity (GDP) for the building and construction sector in the period 2007-2014. Stated as an index where 2007=100[45].

With ADS the generation of construction and demolition waste can be divided into types of waste at a very detailed level. All in all the reports are stated with 40 different European List of Waste codes (LoW codes) directly specifying construction and demolition waste. In addition the building and construction sector also generates other types of waste than construction and demolition waste, for instance waste similar to household waste such as domestic waste. Table 3.11 shows some of the most significant waste types generated in the building and construction sector.

[44] Source: Danish Building Research Institute "Midtvejsevaluering af pulje til landsbyfornyelse" *(Mid-term evaluation of funds for town and rural renewal)*, p. 6.

[45] Source: ADS; Guidelines from the Danish Environmental Protection Agency no. 4, 2011; StatBank Denmark.

It appears from Table 3.11 that waste in the form of *asphalt* and *concrete* by far makes up the largest quantities, each accounting for 20% of total quantities. But also *iron and steel waste*, *bricks*, *wood waste, construction materials containing asbestos* and *gypsum-based construction materials* carry weight in the statement. Finally large quantities of *mixed construction and demolition wastes* are generated in the form of approximately 300,000 tonnes of *mixtures of concrete, bricks, tiles and ceramics* and 350,000 to 450,000 tonnes of *mixed construction and demolition wastes* in the period 2012-2014.

Table 3.11. Primary waste generated (excl. soil) in the building and construction sector distributed on waste fractions[46].

Building and construction	Tonnes (1,000)		
	2012	2013	2014
Concrete	774	811	1,067
Bricks	101	107	176
Tiles and ceramics	43	51	55
Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics	332	325	399
Wood	54	83	122
Flat glass	7	6	14
Plastics	8	5	7
Bituminous mixtures, coal tar and tarred products	1,067	975	1,030
Copper, bronze, brass, aluminium	16	16	16
Iron and steel	263	272	274
Lead, zinc, tin, mixed metals and other metals	34	30	45
Cables	9	9	6
Track ballast	46	86	36
Insulation materials	4	12	13
Construction materials containing asbestos	64	69	81
Gypsum-based construction materials contaminated with dangerous substances	45	55	53
Construction and demolition wastes containing PCB	3	4	11
Mixed construction and demolition wastes	346	416	451
Domestic waste and waste similar to domestic waste	31	32	30
Other wastes from building and construction activities	284	287	232
Total	3,530	3,648	4,117

[46] With ADS it is possible to have more detailed information on the type of construction and demolition waste, including the sectors generating the waste. In other words, does the construction waste, for instance, originate from building activity in the food manufacturing industry or from the metal manufacturing industry. However, if these quantities of construction waste were attributed to the waste generation in the food manufacturing industry it would not give a true and fair picture of the quantities of manufacturing waste actually generated in this sector. It has therefore been decided to attribute all construction and demolition waste to the building and construction sector, regardless of the source. This also applies to construction and demolition waste from households and recycling centres.

3.4.1 Treatment of construction and demolition waste

Traditionally, Denmark has had a high rate of recycling of construction and demolition waste. In the 1990s this rate attained up to 90% and increased further after 2000 to more than 95%. However, construction and demolition waste often contains contaminants that must be removed from the waste stream before recycling. Therefore, during the last 15 years different governments have had more focus on removing such substances of concern from the construction waste; these substances are, for instance, PCB and other contaminants contained in concrete. One of the consequences of this higher focus on environmental contaminants in the construction and demolition waste is that a certain decrease of the rate of recycling is to be expected. In other words, the objective is first and foremost to increase the quality of recycling instead of having focus only on quantities. Therefore, the present objective is that the rate of recycling of construction and demolition waste excluding soil must only attain at least 70%.

Table 3.12 shows that the rate of recycling of construction and demolition waste excluding soil in the period 2012 to 2014 attained 87-88%, which is as expected somewhat lower than in the 2000s. Incineration and landfilling each account for approximately 5% to 7%.

Table 3.12. Primary waste generated (excl. soil) in building and construction activities distributed on treatment form.

Building and construction	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling	3,098	88%	3,195	87%	3,602	87%
Incineration	207	6%	201	5%	218	5%
Landfilling	218	6%	225	6%	269	7 %
Temporary storage	5	0%	23	1%	14	0%
Special treatment	2	0%	5	0%	14	0%
Total	3,530	100%	3,648	100%	4,117	100%

3.5 Power, gas and district heating supply

Energy plants generate waste in connection with the generation of heat and power. Waste comes in the form of slag and fly ash, but also waste - in particular gypsum waste - from the treatment of flue gas emitted from the energy plants. In addition, energy plants also generate other types of production waste such as oil waste and organic solvents. Furthermore, in the administrative part of the plants ordinary household waste is generated.

In the early 1990s the energy supply in Denmark was almost exclusively based on fossil fuels, in particular oil and coal. Fossil fuels accounted for 93% of the energy supply[47] while renewable energy (wind and biomass) and waste only accounted for 7%. Since the early 1990s a substantial change in the Danish energy supply has taken place. First of all, the share of fossil fuels has decreased to 73%, while renewable energy and waste have increased up to 27%. Also, the share made up by coal within the fossil fuels has decreased. In 1990 coal accounted for 40% of the energy supply, and this share was only 18% in 2014. The share of gas was 10% in 1990 and 17% in 2014.

Coal-based energy generation causes relatively large waste arisings; approximately 1/6 of the fuel consumption measured in tonnes ends up as waste. Therefore, waste generation from coal-fired power plants in the early 1990s was approximately 2 million tonnes a year. So in addition to reduced CO2 emissions a lower consumption of coal as a fuel also means lower waste generation.

[47] Main figures from the Danish Energy Agency's preliminary energy statistics for 2015
http://www.ens.dk/sites/ens.dk/files/energistyrelsen/Nyheder/2015/hovedtabel2015_foreloebig_stat.pdf

The use of natural gas as a fuel does not cause much waste, and even if biomass-based fuels also generate waste, this type of fuel is less waste intensive than coal.

The change in the fuel composition over the last 25 years has therefore meant that waste arisings from our energy plants have decreased to less than half of what it used to be. Total waste quantities from energy plants (excl. waste incineration plants) in 2014 amounted to a total of 830,000 tonnes. This quantity covers all waste from energy plants as reported to ADS, i.e. waste from power, gas and district heating supply.

Table 3.13 shows that the major part of waste from energy plants is fly ash from coal-fired plants[48] and gypsum waste from flue gas treatment at the energy plants[49]. The total reported quantity is assessed to be slightly below actual quantities, since there are outstanding reports on waste from some plants that exclusively use biomass fuels. The table shows a low level of waste arisings in 2012; this cannot, however, be explained with lower fuel consumption in 2012 compared with 2013 and 2014. The explanation to this decrease is assessed to lie in the fact that generated waste finds an outlet in larger batches and is therefore not reported to ADS until it is shipped off.

Table 3.13. Primary waste generated (excl. soil) at Danish energy plants distributed on waste type and based on the European List of Waste code (LoW)

Power, gas and district heating supply	Tonnes (1,000)		
	2012	2013	2014
Bottom ash, slag and boiler dust	75	103	132
Coal fly ash	460	548	461
Calcium-based reaction wastes from flue gas desulphurisation	111	156	155
Fly ash from co-incineration	2	2	2
Other wastes from gas cleaning	16	19	19
Other wastes	35	58	61
Total	699	886	830

The major part of waste generated at the energy plants is recycled. Table 3.14 shows that the rate of recycling attains 95% -97% in the years 2012-2014. Coal fly ash is recycled in connection with the production of concrete and cement as well as in asphalt. Gypsum waste is used for the production of new plasterboard and is thereby a fine example of industrial symbiosis. This means that waste generated in one company can be used by another company as a secondary raw material in products, thus substituting virgin materials.

Table 3.14. Primary waste generated (excl. soil) at Danish energy plants distributed on treatment form.

Power, gas and district heating supply	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling	670	96%	845	95%	804	97%
Incineration	6	1%	5	1%	4	1%
Landfilling	20	3%	34	4%	21	3%
Temporary storage	0	0%	0	0%	0	0%
Special treatment	2	0%	2	0%	1	0%
Total	699	100%	886	100%	830	100%

[48] European List of Waste code (LoW) 10 01 02
[49] European List of Waste codes (LoW) 10 01 05 and 10 01 07

3.6 Agriculture, hunting and forestry

Waste from agriculture, hunting and forestry activities amounts to just below 130,000 tonnes in total. It should be noted that this figure does not include slurry for centralised biogas plants which should actually be counted as waste according to the EU's waste definition.

In 2014, the major part of generated waste was: *waste suitable for incineration* with 52,000 tonnes, *wood* with 18,000 tonnes, *garden waste* with 17,000 tonnes, *sludge* with 11,000 tonnes and *ferrous and non-ferrous metals* with 8,000 tonnes. Table 3.15 shows that between 48% and 57% of waste from agriculture, hunting and forestry activities was recycled in the period 2012-2014.

Table 3.15. Primary waste generated (excl. soil) in agriculture, hunting and forestry distributed on treatment form.

Agriculture, hunting and forestry	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling	42	57%	57	53%	63	48%
Incineration	29	40%	48	44%	64	49%
Landfilling	2	2%	2	2%	2	1%
Temporary storage	0	1%	1	1%	1	1%
Special treatment	1	1%	1	1%	1	1%
Total	74	100%	109	100%	130	100%

Table 3.16. Primary waste generated (excl. soil) in agriculture, hunting and forestry distributed on waste fractions.

Agriculture, hunting and forestry	Tonnes (1,000)		
	2012	2013	2014
Mixed residual waste	2	1	2
Waste suitable for incineration	26	30	52
Organic waste	2	4	4
Packaging cardboard and other cardboard	1	1	1
Wood	8	9	18
Plastics	3	3	5
Ferrous and non-ferrous metals	11	18	8
Garden waste	6	19	17
Sludge - other	6	14	11
Tyres	4	4	6
Waste suitable for landfill	1	1	1
Other wastes	2	2	3
Total	74	109	130

3.7 Wastewater treatment plants

The wastewater treatment plants of Danish sewage companies generate sludge in connection with the treatment; in addition, sand and screenings are generated. Furthermore, the wastewater treatment plants also generate other types of production waste such as oil waste, and in the administrative part of the plants ordinary household waste is generated.

Total quantities of waste from wastewater treatment plants – not only sludge, but also screenings and other waste were seen in Table 3.1 to amount to 153,000 tonnes in 2014. Thereby, this quantity contains all waste generated at wastewater treatment plants; i.e. companies collecting and treating wastewater. The major part of this waste is sludge, and in the following discussion focus is only on this fraction.

Before sludge can be recovered or disposed it must normally be dewatered and pretreated; this is done in dewatering, biogasification, and sludge mineralisation processes. Depending on the concentration of heavy metals and organic xenobiotic substances in the sludge it can go to final treatment or disposal. This takes place either by spreading sludge on agricultural land as a fertiliser, it is composted, incinerated with energy recovery or, rarely, taken to a landfill facility.

Sludge will have different rates of dry matter depending on the pretreatment before final treatment. Therefore, to make figures for sludge comparable, quantities are stated in dry matter. In the reports to ADS it is only voluntary to state precisely the dry matter rate of the sludge. Therefore, for reporting of figures for 2014 the Danish Environmental Protection Agency has contacted specifically facilities incinerating or composting sludge in view of getting information on the dry matter rate. Furthermore, at the moment wastewater treatment plants do not report to ADS information about quantities of sludge spread on agricultural land. However, this information can be found in wet weight through reports to the supplier register of the Danish Agrifish Agency.

All sewage companies report every year to the Utility Secretariat of the Danish Competition and Consumer Authority on quantities of treated sludge stated in dry matter, but the treatment information does not follow the one used in ADS. Therefore, the figures are only used for the years 2012-2013.

The latest study conducted by the Danish Environmental Protection Agency about final treatment of sludge from wastewater treatment plants covers the years 2008 and 2009. Table 3.17 shows sludge treatment in the period 2008-2009 and 2012-2014.

Table 3.17 Treatment of sludge from wastewater treatment plants 2008-2009 and 2012-2014 stated in tonnes of dry matter.[50]

Sludge - wastewater treatment plants[51]	2008		2009		2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling on agricultural land	80	60%	75	58 %	80	61%	80	63%	87	66%
Composting and other recycling	22	17%	22	17%	12	9 %	12	10 %	11	8 %
Incineration	29	22%	31	24%	38	29%	35	27%	33	25%
Landfilling	1	1%	1	1%	1	1%	1	1%	1	1%
Total	133	100%	130	100%	131	100%	129	100%	132	100%

The total quantity of sludge varies slightly over the years. Quantities are somewhat lower in 2014 and furthermore quite much lower for incineration; this is due to the fact that one large Danish sludge incineration plant has incinerated around 4,500 tonnes less in 2014 than in 2013.

Table 3.16 shows that sludge is widely recycled on agricultural land as a fertiliser. The rate varies between 61 and 66%. The level is somewhat lower than in the 1990s when up to 80% was recycled on agricultural land. This decrease is due to the fact that in 1997 and 2000 more stringent requirements were introduced for the content in sludge of xenobiotic substances when used on agricultural land. The enhancement concerned a number of tar compounds called PAHs, the detergent LAS, nonylphenols NPE and the plasticiser DEHP. Incineration of sludge with energy recovery is the second most important treatment form and accounts for 22-29% in the period 2012-2014.

[50] 2008 and 2009 figures are calculated from Table 2.3 on page 12 and Table 4.1 on page 15 in ”Sewage sludge from municipal and private treatment plants 2008-2009”. 2008 and 2009 figures for composting and other recycling are calculated as the difference between dry matter and the other treatment options.

[51] Sources: Sewage sludge from municipal and private treatment plants 2008-2009 corrected for sludge for sludge mineralisation, Danish Environmental Protection Agency 2012; figures from the Utility Secretariat of the Danish Competition and Consumer Authority for the years 2012-2013 regarding landfilling, incineration, composting and spreading on agricultural land, however with some corrections based on contacts to the wastewater treatment plants; The supplier register of the Danish Agrofish Agency for 2014 for sludge from wastewater treatment plants spread on agricultural land and a dry matter rate of 25.4, as well as ADS for 2014 for incineration, composting and landfilling, where a dry matter rate has been used for landfilling of 5%, 15% and 100%, respectively, for waste fractions E26, E27 and E28.

3.8 Waste from others sources

The source *waste from others sources* consists of two subsectors: *water collection, treatment and supply* and *waste collection, treatment and disposal activities*.

Table 3.18. Primary waste generated (excl. soil) from the source "Others sources" distributed on treatment form.

Others sources	Waste collection, treatment and disposal activities					
	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling	49	65%	50	72%	45	70%
Incineration	23	30%	14	20%	17	27%
Landfilling	1	2%	3	5%	1	1%
Temporary storage	0	1%	0	0%	0	0%
Special treatment	1	2%	2	3%	1	2%
Total	76	100%	70	100%	64	100%

Others sources	Water collection, treatment and supply					
	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling	5	71%	5	70%	6	84%
Incineration	1	10 %	1	16%	0	5%
Landfilling	1	19%	1	13%	1	11%
Temporary storage	0	0%	0	0%	0	0%
Special treatment	0	0%	0	0%	0	0%
Total	7	100%	7	100%	8	100%

In addition to waste from ship dismantlers and scrap dealers, the subgroup of *waste collection, treatment and disposal activities* covers waste originating from primary waste sources such as *the service sector*, *households* or *industry*. The reason why *waste collection, treatment and disposal activities* is stated as the producer of primary waste generated is mainly lack of reporting from waste treatment companies regarding original waste producers. The level of detail in the reports has improved since Waste Statistics 2013, and it is expected in the future that this primary waste quantity will be registered under the correct sources to a higher extent.

The distribution of treatment options under the two subsectors shows a clear majority of primary waste generated going to recycling. This is particularly the case for *water collection, treatment and supply*.

As it appears from Table 3.18 *waste suitable for incineration*, *ferrous and non-ferrous metals* and *other wastes* are the largest waste fractions in quantitative terms under the source *other sources.* A significant share of quantities placed under *ferrous and non-ferrous metals* and *other wastes* originates from ship dismantlers and scrap dealers.

Table 3.19. Primary waste generated (excl. soil) by "Others sources" distributed on waste fractions.

Others sources	Tonnes (1,000)		
	2012	2013	2014
Mixed residual waste	1	4	3
Waste suitable for incineration	16	7	10
Organic waste	0	1	0
Paper incl. newsprint and packaging paper	2	2	3
Packaging cardboard and other cardboard	2	4	4
Packaging glass	1	2	0
Flat glass	0	0	1
Wood	9	10	14
Plastics	0	0	1
Ferrous and non-ferrous metals	33	32	22
Electronics	1	0	0
Garden waste	1	4	1
Sludge - other	6	4	7
Tyres	1	0	0
Waste suitable for landfill	1	1	1
Residues from incineration	0	1	0
Other wastes	9	7	5
Total	83	78	72

3.9 Waste from commercial and industrial activities without sector

The waste source *waste from commercial and industrial activities without sector* comprises those commercial and industrial wastes for which it has not been possible to identify the sector due to lack of P number of the producer[52] in the reports; this means that waste from this source should be attributed to the other main sectors. In cooperation with the reporting companies the Danish Environmental Protection Agency has had focus on minimising the quantities under *waste from commercial and industrial activities without sector* as far as possible by finding P numbers for companies having been stated without such a number. Since the publication of Waste Statistics 2013 this quantity has been reduced by approximately 66%. It is expected that the waste source *waste from commercial and industrial activities without sector*, which accounts for less than 1% of total primary waste generation in Denmark today (excl. soil), will be minimised in the future.

[52] A P number shows the geographical location of the commercial activity. A company with a CVR number may have more than one P unit if it carries out commercial activities at several locations. In addition to the address the P number indicates the commercial sector of the activity. More information can be found in Appendix 1.

The quantities of the different waste fractions under the source *waste from commercial and industrial activities without sector* can be seen in Table 3.20.

Table 3.20. Primary waste generated in commercial and industrial activities without sector (excl. soil) distributed on waste fractions.

Waste from commercial and industrial activities without sector	2012	2013	2014
	Tonnes (1,000)	Tonnes (1,000)	Tonnes (1,000)
Mixed residual waste	0	3	3
Waste suitable for incineration	30	29	15
Organic waste	1	1	0
Paper incl. newsprint and packaging paper	4	3	6
Packaging cardboard and other cardboard	11	7	7
Packaging glass	0	2	0
Wood	1	0	0
Ferrous and non-ferrous metals	8	11	10
Electronics	1	0	0
Garden waste	4	4	3
Sludge - other	1	0	0
Waste suitable for landfill	1	2	1
Other wastes	3	3	3
Total	66	67	50

It is assumed that much of the waste under the fraction *waste suitable for incineration* is attributable to the main sector *the service sector*. The same applies to the waste fraction *cardboard*.

As mentioned above, most of the waste under the source *waste from commercial and industrial activities without sector* goes to recycling; logically, this is due to the high proportion of separated waste in the waste fractions *ferrous and non-ferrous metals, cardboard*, *paper* and *garden waste.* In Table 3.21 the treatment options for primary waste generated in the source *waste from commercial and industrial activities without sector* are shown.

Table 3.21. Primary waste generated (excl. soil) in commercial and industrial activities without sector distributed on treatment form.

Waste from commercial and industrial activities without sector	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Recycling	32	49%	31	46%	31	61%
Incineration	31	48%	33	49%	18	35%
Landfilling	1	2%	2	4%	1	2%
Temporary storage	0	0%	0	0%	0	0%
Special treatment	1	1%	1	1%	1	1%
Total	66	100%	67	100%	50	100%

4. Imports and exports of waste

Figures for imports and exports of waste in this section are based exclusively on the Waste Data System (ADS)[53]. General developments in imports and exports of waste are presented in Figure 4.1 and Table 4.1. The trend of increasing imports has continued in 2014.

Figure 4.1. Imports and exports of waste

Table 4.1. Imports and exports of waste

Imports and exports	2012	2013	2014
	Tonnes (1,000)	Tonnes (1,000)	Tonnes (1,000)
Imports	813	1,015	1,380
Exports	2,398	2,252	2,365

The main reasons for the increase in imports are found in an increase in imports of waste suitable for incineration. In the following, the trends in this field are discussed in more detail regarding waste fractions, countries and treatment options. In addition, focus will be on imports of waste to the ordinary incineration plants.

[53] Data cover both notifiable waste (amber list wastes, unlisted and certain green list wastes) and non-notifiable waste (green list wastes). The Danish Environmental Protection Agency has made a random comparison of data from ADS and the waste shipment database on notifiable waste, cf. the EU waste shipment regulation. This comparison shows as expected that in total there are larger quantities in ADS than in the waste shipment database. Furthermore, for by far the most waste types quantities are larger in ADS than in the waste shipment database. In a few cases, however, it seems that reporters do not include all green list wastes that are exported; this is expected to improve in the future.

4.1 Imports of waste

Imports of waste are presented at the level of waste fractions in Table 4.2.

Table 4.2. Imports of waste by waste fraction

Imports - waste fractions	2012	2013	2014
	Tonnes (1,000)	Tonnes (1,000)	Tonnes (1,000)
Waste suitable for incineration	164	234	342
Organic waste	42	47	42
Paper incl. newsprint and packaging paper	16	0[54]	13
Packaging cardboard and other cardboard	14	1[55]	19
Packaging glass	33	34	38
Flat glass	17	21	20
Packaging plastics	10	9	4
Plastics	2	1	6
Ferrous and non-ferrous metals	182	93	247
Electronics and refrigerators	1	2	3
Sludge - other	179	250	224
Tyres	6	1	24
Residues from coal and biomass fired energy plants	0	147	140
Other wastes	115	157	220
Total	813	1,015	1,380

As described above, quantities of waste imported in the period 2012 to 2014 are increasing. In the above table it is seen that the increase in 2014 is primarily due to an increase in imports of sludge (mainly hazardous sludge), other hazardous waste, ferrous and non-ferrous metals, and waste suitable for incineration. Imported waste in the form of residues from coal-fired energy plants consists of fly ash that is recovered in Denmark.

As to the increases in 2014, the increase in imports of waste suitable for incineration to the Danish waste incineration plants[56] can be related, among others, to the Danish increase in recycling, in particular for waste from households; this results in a decrease in national waste quantities going to incineration. This trend has been seen since 2012. This has meant that the Danish incineration plants have seen an increase in their excess capacity. Table 4.3 presents imports of waste suitable for incineration received at the Danish incineration plants and broken down on country of export.

[54] It is assessed that the stated quantity of imported paper in 2013 is too low compared with actual quantities imported, which is primarily due to lack of reporting on imports by one major Danish player within paper and cardboard.

[55] It is assessed that the stated quantity of imported cardboard in 2013 is too low compared with actual quantities imported, which is primarily due to lack of reporting on imports by one major Danish player within paper and cardboard.

[56] Danish incineration plants cover dedicated plants (24 plants) and multi-fuel firing units (3 plants), respectively. Plants handling either special waste by incineration (e.g. EkoKem), or using waste as a fuel in their production (e.g. Aalborg Portland), are not included. This waste consists of RDF waste, cf. also note 59.

Table 4.3. Imports of waste for incineration by country of export

Imports of waste suitable for incineration	2012	2013	2014
	Tonnes (1,000)	Tonnes (1,000)	Tonnes (1,000)
Germany	14	8	13
Great Britain	74	99	231
Ireland	-	33	11
Norway	15	20	11
Total	104	159	267
Rate of total waste incineration[57]	3.1%	4.8%	7.6%

Developments show that in particular Great Britain is exporting waste for incineration in Denmark[58]. This reflects the fact that at the moment Great Britain has a lack of treatment capacity for household waste and that as a consequence gate fees are on the increase.

In addition to the presentation of countries of export of waste suitable for incineration to Denmark, Table 4.4 shows the most frequent countries of export from where waste is generally imported to Denmark.

Table 4.4. Imports of waste to Denmark by country of export

Imports	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Germany	111	14%	124	12%	133	10 %
Great Britain	94	12%	164	16%	312	23%
Italy	19	2%	159	16%	151	11%
Norway	226	28%	298	29%	367	27%
Sweden	190	23%	117	12%	269	19%
Netherlands	28	3%	30	3%	29	2%
Other	144	18%	123	12%	118	9 %
Total	813	100%	1,015	100%	1,380	100%

It is seen above that in 2014 a substantial increase took place regarding waste from Great Britain and Sweden; this is primarily due to a larger import of waste suitable for incineration for Danish incineration plants and waste ferrous and non-ferrous metals, respectively. Norway is that country from which Denmark imports most waste; this waste is primarily aqueous liquid waste containing dangerous substances.

As to treatment of imported waste it is seen in Table 4.5 that in the period 2012 to 2014 23-27% is disposed and 73-77% is recovered. It is seen that quantities of waste imported for disposal increase; this is primarily due to higher imports of hazardous waste.

[57] Danish incineration plants cover dedicated plants (24 plants) and multi-fuel firing units (3 plants), respectively. Plants handling either special waste by incineration (e.g. EkoKem), or using waste as a fuel in their production (e.g. Aalborg Portland), are not included. Total waste incineration in this context covers waste for incineration and temporary storage (2012; 3,306,000 tonnes; 2013: 3,347,000 tonnes; 2014: 3,534,000 tonnes. Source: ADS.

[58] RDF waste (refuse derived fuel); where mixed waste from industry, the service sector, construction, and households is coarsely separated for recyclables, in particular metal and glass, and waste is dewatered.

Table 4.5. Imports of waste to Denmark by treatment form

Imports	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Disposal	188	23%	272	27%	324	23%
Recovery	625	77%	744	73%	1,056	77%
Total	813	100%	1,015	100%	1,380	100%

Waste imported for disposal is presented in more detail in the below Table 4.6. As it is seen in the table imported waste is primarily disposed under D8 Biological treatment or D10 Incineration without energy recovery. Both cases cover disposal of hazardous waste.

Table 4.6. Imports of waste to Denmark by disposal option

Imports - Disposal	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
D8 – Biological treatment	111	59%	152	56%	165	51%
D10 - Incineration without energy recovery	76	40%	118	44%	80	25%
Other	1	1%	2	1%	79	24%
Total	188	100%	272	100%	324	100%

Table 4.7 shows imports of waste for recovery. The increase in quantities of waste for recovery is due to higher imports of waste for R1 incineration with energy recovery, i.e. imports to Danish incineration plants of waste suitable for incineration.

Table 4.7. Imports of waste to Denmark by recovery option

Imports - recovery	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
R1 - Use principally as a fuel or other means to generate energy	165	26%	227	31%	326	31%
R3 - Recycling/reclamation of organic substances	147	23%	149	20%	142	13%
R4 - Recycling/reclamation of metals and metal compounds	174	28 %	90	12%	250	24%
R5 - Recycling/reclamation of other inorganic materials	90	14%	225	30%	260	25%
R6 - Regeneration of acids or bases	6	1%	4	1%	0	0%
R9 - Oil re-refining or other reuses of oil	26	4%	21	3%	39	4%
R10 - Land treatment resulting in benefit to agriculture or ecological improvement	3	0%	7	1%	4	0%
R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11	11	2%	8	1%	14	1%
R13 - Storage of waste pending any of the operations numbered R 1 to R 12	3	0%	12	2%	22	2%
Total	625	100%	744	100%	1,056	100%

4.2 Exports of waste

Exports of waste are presented at the level of waste fractions in Table 4.8.

Table 4.8. Exports of waste by waste fraction

Exports - waste fractions	2012	2013	2014
	Tonnes (1,000)	Tonnes (1,000)	Tonnes (1,000)
Paper incl. newsprint and packaging paper[59]	223	207	189
Packaging cardboard and other cardboard[60]	225	262	278
Packaging glass	27	28	25
Flat glass	12	14	25
Wood	57	71	84
Packaging plastics	14	17	20
Plastics	13	15	19
Packaging metal	7	8	9
Ferrous and non-ferrous metals	1,282	1,026	1,173
Electronics	45	38	32
Refrigerators containing freon	3	3	2
Sludge - other	21	9	10
Tyres	2	4	2
Mixed construction and demolition waste	23	0	3
Impregnated wood	38	40	46
PVC	1	1	2
Residues from incineration	237	412	283
Other wastes	167	95	163
Total	2,398	2,252	2,365

Exports are dominated by waste types that are used as recyclable materials in the manufacturing industry, particularly paper and cardboard as well as ferrous and non-ferrous metals. Exports of these waste types also reflect that Denmark has no steelworks using scrap just as we have only few and relatively small paper and cardboard mills.

The increase in exports in 2014 covers a number of different movements, including an increase in *ferrous and non-ferrous metals* and contaminated soil under *Other wastes*.

In Table 4.9 exports of waste from Denmark are shown by country of import. In addition to a general increase in exports of waste in 2014 it should be noted that the largest quantities are exported to Germany. Quantities to Turkey make up the second largest export and consist primarily of waste metals.

59 It is assessed that the stated quantity of exported paper is too low compared with actual quantities exported, which is primarily due to lack of reporting on exports.

60 It is assessed that the stated quantity of exported cardboard is too low compared with actual quantities exported, which is primarily due to lack of reporting on exports.

Table 4.9. Exports of waste from Denmark by country of import.

Exports	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Germany	810	34%	856	38%	897	38%
Netherlands	235	10 %	170	8 %	209	9 %
Norway	172	7 %	232	10 %	191	8 %
Sweden	333	14%	227	10 %	304	13%
Turkey	287	12%	410	18%	404	17%
Estonia	112	5%	41	2%	41	2%
Other and EU[61]	448	19%	316	14%	319	13%
Total	2,398	100%	2,252	100%	2,365	100%

As to treatment of exported waste it is seen in Table 4.10 that in the period 2012 to 2014 4-7% is disposed and 93-96% is recovered. It should be noted that quantities for disposal have dropped steeply in 2014; this is primarily due to a decrease in exports of residues from coal-fired power plants for disposal.

Table 4.10. Exports of waste to Denmark by treatment form.

Exports	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
Disposal	162	7 %	157	7 %	87	4%
Recovery	2,236	93%	2,095	93%	2,278	96%
Total	2,398	100%	2,252	100%	2,365	100%

Waste exported for disposal is presented in more detail in the below Table 4.11. The large increases and decreases in D 5 Landfilling in specially engineered landfill and D12 Permanent storage are primarily due to a change in the use of the codes for reporting. Fractions in question are primarily hazardous waste and slag from mainly power plants and incineration; these fractions are exported to Germany and Norway[62].

Table 4.11. Exports of waste to Denmark by disposal options.

Exports - Disposal	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
D3 - Deep injection	9	6%	1	0%	1	1%
D5 - Landfilling in specially engineered landfill	100	61%	137	87%	51	59%
D9 - Physico-chemical treatment	33	20%	14	9 %	13	15%
D10 - Incineration without energy recovery	0	0%	0	0%	2	2%
D12 – Permanent storage	21	13%	5	3%	19	22%
D15 - Storage pending any of the operations numbered D 1 to D 14	0	0%	0	0%	1	1%
Total	162	100%	157	100%	87	100%

[61] EU means a broad range of countries within the EU. This means that Germany, the Netherlands etc. may also be found in this quantity.
[62] In its communication of 7 July 2015 the Danish Environmental Protection Agency has noted that alkaline waste used by NOAH at Langøya in Norway for the neutralisation of waste acid in the future may be classified as recovery instead of disposal.

Waste exported for recovery is presented in more detail in the below Table 4.12. It is seen in the table that the primary treatment options used are R3 Recycling/reclamation of organic substances, R4 Recycling/reclamation of metals and metal compounds and R5 Recycling/reclamation of other inorganic materials; this is logically due to the large export of cardboard, paper, ferrous and non-ferrous metals and residues from, primarily, coal-fired power plants. The largest increase in 2014 is seen in the treatment option R4 Recycling/reclamation of metals and metal compounds, which is due to the increase in the exports of ferrous and non-ferrous metals.

Table 4.12. Exports of waste to Denmark by recovery option

Exports - recovery	2012		2013		2014	
	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent	Tonnes (1,000)	Percent
R1 - Use principally as a fuel or other means to generate energy	41	2%	46	2%	50	2%
R3 - Recycling/reclamation of organic substances	220	10 %	489	23%	328	14%
R4 - Recycling/reclamation of metals and metal compounds	1,283	57%	1,007	48%	1.231	54%
R5 - Recycling/reclamation of other inorganic materials	521	23%	334	16%	501	22%
R9 - Oil re-refining or other reuses of oil	11	1%	10	0%	15	1%
R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11	111	5%	133	6%	84	4%
R13 - Storage of waste pending any of the operations numbered R 1 to R 12	49	2%	75	4%	69	3%
Total	2,236	100%	2,095	100%	2,278	100%

5. Resource plan for waste management: Denmark without waste

The primary purpose of “Denmark without waste - Resource plan for waste management 2013 - 2018” is to increase the rate of recycling. Waste must be considered as a resource and it should be avoided that valuable materials are lost.

This section has as its only focus the Resource plan’s national target of 50% recycling of waste from the source households (RS 50% target), which must be met in 2022. The target covers seven selected waste fractions: Organic waste (food waste), paper, cardboard, glass, wood, plastics and metal waste from the source households; thus, it does not cover all waste from households. Appendix 5 to the Danish Environmental Protection Agency’s Guidelines no. 4 from 2014 (Denmark without waste) defines in more detail how to calculate the 50% recycling rate. In the following, this calculation is clarified and detailed. The selected waste fractions included in the calculation are presented in the following table:

Table 5.1. Selected waste fractions contained in the RS 50% target for households[63]

Selected waste fractions[64]		
Waste fraction code	Waste fraction name	LoW combination[65]
H01	Domestic waste	-
H02	Organic waste	-
H03	Suitable for incineration	-
H05	Paper incl. newsprint	-
H06	Cardboard	-
H07	Glass	-
H08	Plastics	-
H09	Packaging paper	-
H10	Packaging cardboard	-
H11	Packaging glass	-
H12	Packaging metal	-
H13	Packaging plastics	-
H15	Wood	-
H19	Ferrous and non-ferrous metals	-
H27	Bulky waste	-
H30	Packaging wood	-
H29	Other wastes	15 01 06 Mixed packaging

[63] Primary waste generated under the LoW group 16 01 ** *End-of-life vehicles* has been excluded despite the fact that these quantities may be combined with the waste fraction codes from Table 5.1.
[64] “Seven focus materials” (Paper, cardboard, metal, glass, plastics, wood and food waste).
[65] More information on LoW codes can be found in Appendix 1.

Since the publication of the guidelines the Danish Environmental Protection Agency has decided to include the waste fraction H29 *other wastes* in a locked combination with the European List of Waste code (LoW) 15 01 06 *mixed packaging*[66] in addition to the originally selected waste fractions in Appendix 5 of the Danish Environmental Protection Agency's guidelines no. 4, 2014. This addition covers different types of packaging, e.g. packaging of metal and plastic, that are collected commingled in the households. It has also been decided in this context to exclude waste quantities under the LoW group 16 01 ** End-of-life vehicles, if the quantity is combined with the selected waste fraction codes. Finally it should be mentioned that waste from recycling centres in the relevant waste fractions is calculated as coming 100% from households and that single-use packaging under the deposit-refund system collected from households is also part of the calculation.

The calculation of the rate of recycling is made by dividing primary waste generated going to recycling from the selected waste fractions with total quantities of primary waste generated from the selected waste fractions.

$$\frac{\textbf{Primary waste generated going to recycling}}{\textbf{Primary waste generated in total}} = \textbf{Rate of recycling}$$

For the calculation of the rate of recycling raw data[67] from the Waste Data System (ADS) are used. The waste data are in some cases adapted and supplemented with external sources[68]. More details on data adaptations can be found in Appendix 1. The rate of recycling calculated for all of Denmark can be seen in Figure 5.1 and Table 5.2.

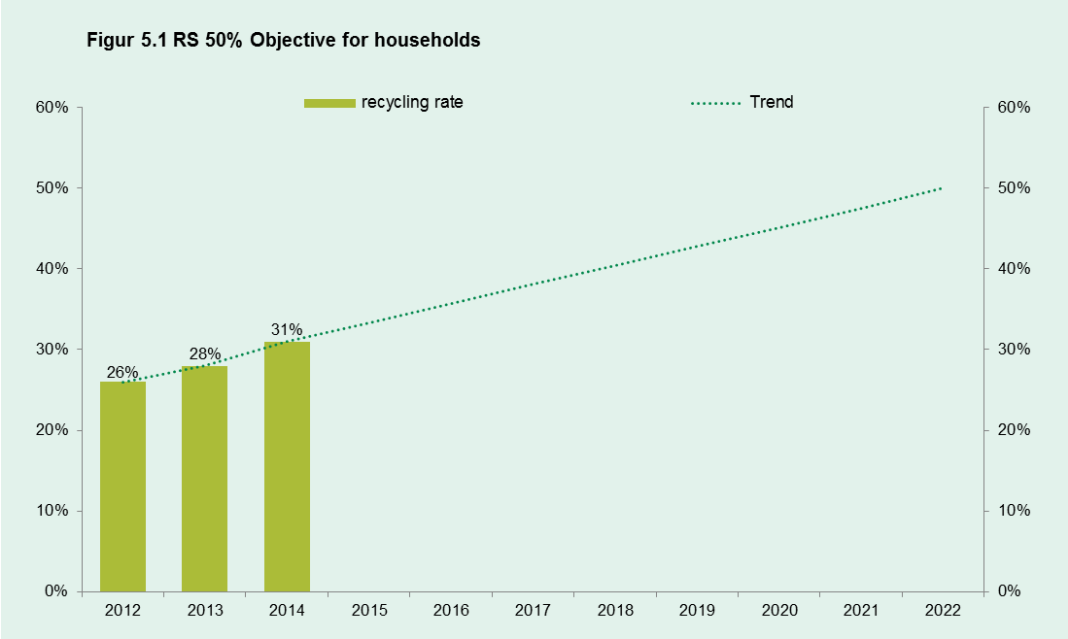


Figure 5.1. RS 50% target for households

[66] Only waste for recycling

[67] Compared with section 3 of the statistics on waste sources, waste from households related to codes on building and construction activities (LoW group 17 ** **) in the calculation of the RS 50% target has not been moved from the source *households* to the source *building and construction*, where waste from households belongs to the selected waste fractions that are included in the RS 50% target. For example, this applies to ferrous metals that may be combined with LoW group 17 ** ** and that are therefore included in the calculation of the 50%.

[68] Waste collected from mixed residential and commercial areas and industrial and commercial waste similar to domestic waste collected in a municipal collection scheme is in practice registered mainly as waste from households. Therefore, this waste will be included in the RS 50% target if the waste has been reported under the selected waste fractions. It is assessed that an adaptation of the calculation in the form of an exclusion of that part of the waste that originates from companies in mixed residential and commercial areas and companies covered by a municipal collection scheme for industrial and commercial waste similar to domestic waste will have a minor positive effect on the rate of recycling since this waste is expected to consist of waste going to incineration, such as domestic waste or waste suitable for incineration.

It appears from Figure 5.1 that the national rate of recycling for waste from households (RS 50%) has increased by 5 percentage points in the period 2012 to 2014. With the resource plan further recycling initiatives are expected in the future in the local authorities of Denmark; this will enhance the positive development in the period 2015-2022. Figure 5.1 also shows that the present rate of increase in the period 2013 to 2014 should continue if the 50% recycling rate is to be met in 2022.

Table 5.2 and Figure 5.2 present the rate of recycling in the different Danish regions[69]. The highest rates of recycling are found in the Region of Southern Denmark and the Region of Central Denmark. By contrast, the largest increase in percent over the three-year period is seen in the Capital Region; here the rate of recycling in 2014 is slightly higher than the rate in Region Zealand and the Region of North Denmark.

Table 5.2. RS 50% target for households

RS 50% target	2012			2013			2014		
	Waste, total:	Recycling		Waste, total:	Recycling		Waste, total:	Recycling	
	Tonnes (1,000)	Tonnes (1,000)	Percent	Tonnes (1,000)	Tonnes (1,000)	Percent	Tonnes (1,000)	Tonnes (1,000)	Percent
Denmark	2,607	676	26%	2,635	735	28 %	2,678	836	31%
Capital Region	741	148	20%	738	169	23%	780	227	29%
Region of Central Denmark	553	167	30%	561	179	32%	587	207	35%
Region of North Denmark	299	68	23%	305	72	23%	303	79	26%
Region Zealand	413	108	26%	414	109	26%	402	109	27%
Region of Southern Denmark	565	148	26%	575	167	29%	606	214	35%
Without regional division	37	37	100%	41	41	100%	0	0	100%

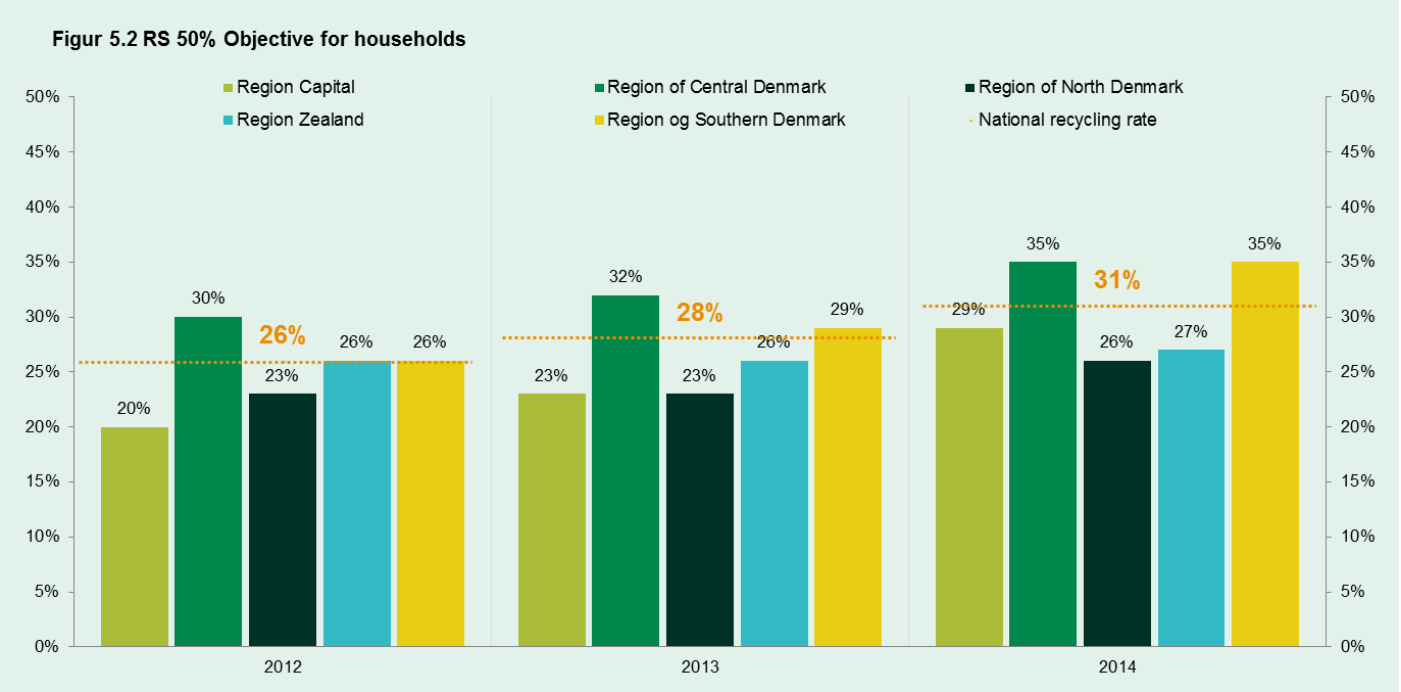


Figure 5.2. RS 50% target for households

[69] The results for the regions have been stated without the quantities of household waste in the form of single-use packaging under the deposit-return system. This quantity has been included in total quantities for Denmark.

Appendix 1 Waste Data System

Data behind this publication have been collected through the Waste Data System of the Danish Environmental Protection Agency. In the following a description is given of the design of the Waste Data System and the data collected in it.

Reporters
All waste collectors, receivers, exporters and importers of waste must report to the system. All reports must state information about the source of the waste and the receiver of the waste. For waste from businesses and public institutions the CVR and P numbers of that business/institution[70] must identify the producer. Also, the CVR and P numbers of the receiver must be stated.

Data Model Principle
In the following figure the principle of reporting to the Waste Data System is illustrated. Waste producers must not report to the system unless they export waste or if a business treats its own waste. Waste collectors must always state the source of the waste and the receiver of the waste. Reception facilities must state from where they receive waste. If a reception facility receives waste from a waste collector the reception facility must state the waste collector as being the waste producer. If the reception facility receives waste directly from the original waste producer this reception facility must state this producer as the waste producer.

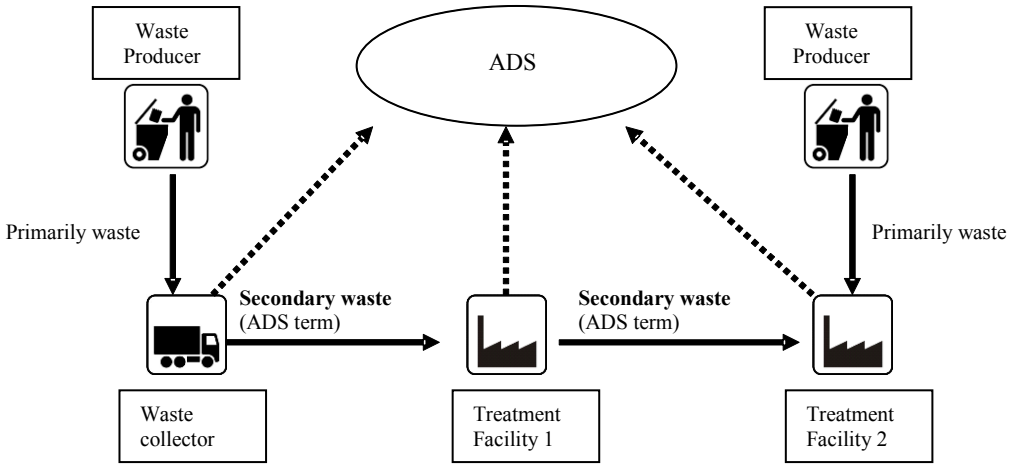


Figure B1. Diagram of waste flow (black arrows) and reporting to the Waste Data System (broken line arrows).

Primary and secondary quantities
Potentially, the same load of waste can be reported several times to the system; this happens, for instance, when the waste collector registers to have collected a load of waste and the reception facility registers to have received the same load of waste from the waste collector. Naturally, this has to be taken into consideration when the primary quantity (net waste generation) is stated. Therefore, all P numbers of the businesses having reported to the system are labelled as "waste actor". The P numbers of businesses stated as waste receivers are also labelled as "waste actors". Waste stated as generated by a "waste actor" is automatically calculated as secondary waste and does not count in the statement of primary waste generated. However, waste from businesses exclusively exporting waste and not collecting or receiving waste is included in the primary quantity.

[70] Each business in the Central Business Register (CVR) has a CVR number and one or more P numbers. For instance, a supermarket chain may have one CVR number and several underlying P numbers - i.e. one P number for each store. A P number is sometimes referred to as a P unit.

Data reported

A report must contain the following information:

- Quantity
- Waste fraction (made up by 31 household waste codes and 35 industrial waste codes)[71] as well as an LoW code[72]
- Treatment (6 Danish treatment codes, 13 recovery codes (R codes) and 15 disposal codes (D codes))[73]. For actors not treating waste themselves, e.g., only collecting or exporting waste the expected treatment to which waste is subjected is stated.
- Final treatment. The actors must state whether they subject the waste to a final treatment. Final treatment means that waste is taken out of the waste flow. This may happen, among others, by incineration, landfilling, recycling or export.

How

Information in the CVR register is used to decide to which sector the waste producer belongs according to the categories of the Danish Sector Code 07[74] and his geographical location. In view of creating a clear overview the Danish Environmental Protection Agency has aggregated the different sectors in a number of general classes[75].

Supervision of reporting

The rules on the Waste Data System were described in a stand-alone Statutory Order in 2012[76]. It is stated in the Order that businesses not reporting in due time or form may be subject to a fine. With the Order the duty of supervision was moved from the local authorities to the Danish Environmental Protection Agency.

Quality assurance of waste data

Waste data reported to the Danish Environmental Protection Agency are subject to quality assurance both before and after reporting. Reporting templates and automatic validity control of, among others, P numbers contribute to ensuring validated and standardised waste data prior to reporting. The quality assurance after reporting has focus on deviations in waste data and general errors in the reports. Each individual reporter is contacted when problems are found in the reports and a solution is agreed on. This individual contact minimises the risk of repetition of the same problem.

To ensure even higher data quality guidance primarily in the selection of codes is given, and information meetings are organised in cooperation with reporters and local authorities. The purpose is to improve the knowledge about correct and streamlined reporting.

In addition to improving 2014 waste data, this year's quality assurance has resulted in improvements of 2012 and 2013 waste data. Thereby, the quality assurance also has repercussions on previous reporting years.

[71] Statutory Order on the Waste Data System (Order no. 1306 of 17/12/2012) - https://www.retsinformation.dk/Forms/R0710.aspx?id=144615
[72] Statutory Order on Waste (Order no. 1309 of 18/12/2012) - https://www.retsinformation.dk/Forms/R0710.aspx?id=144826
[73] Statutory Order on Waste (Order no. 1309 of 18/12/2012) - https://www.retsinformation.dk/Forms/R0710.aspx?id=144826
[74] Read more on the website of Statistics Denmark: http://www.dst.dk/da/Statistik/dokumentation/Nomenklaturer/DB.aspx
[75] See Appendix 2
[76] Statutory Order on the Waste Data System (Order no. 1306 of 17/12/2012)

Appendix 1.2 Meta data and adaptations

To form the data basis for Waste Statistics 2014 raw data extracts have been made from the Waste Data System (ADS). For all sections of the statistics, with the exception of the sections on soil, imports and exports, data have been extracted on primary quantities without import and soil. Waste quantities imported do not reflect waste generation in Denmark, which is why these quantities are only included in the section on imports. Waste soil quantities are too volatile to really give a picture of developments in total waste arisings. Therefore, also waste soil is discussed in a separate section.

The distinction between primary waste and secondary waste generated is exclusively based on whether the producer is a waste actor, i.e. makes his own reporting to ADS from that P number. If the waste producer himself does not report to ADS the quantities in question are considered as primary waste; vice versa, if the producer reports himself the quantities in question are considered as secondary waste. To avoid double counting only primary quantities are included in the statistics with the exception of the section on imports and exports.

The very foundation of the statistics is the raw data from ADS; it is, however, assessed to be necessary to make certain adaptations in order that data at a more detailed level reflect reality as far as possible[77]. Quality assurance of waste data has high priority in the Danish Environmental Protection Agency and it is therefore expected that in the future the major part of adaptations will have been integrated in the ADS database.

In the statistics some of the waste fractions have been aggregated in view of making it easier for the reader to get an overview; also, some of the fractions make up a very small quantitative proportion of total waste arisings, see also Appendix 4. Furthermore, the treatment options of landfilling and tax-exempt landfilling have been aggregated. The same applies to the treatment options of incineration and tax-exempt incineration.

In addition to the aggregation of waste fractions the NACE codes[78] have also been aggregated both at the general and the more detailed levels. The division into NACE codes at the general and detailed levels has been carried out by the Danish Environmental Protection Agency based on the division that is found most expedient in relation to waste generation, see also Appendix 3. In addition, adaptations of data have been made in a way that in a few cases the original NACE code has been changed to provide a more true and fair picture of the waste sources.

In cases where no P number of the producer has been stated and the waste in question is from commercial and industrial activities no NACE code has been stated; therefore this waste will not automatically be categorised in a sector. This has been taken into consideration in the statistics and waste from commercial and industrial activities is therefore related to a relevant sector, if possible.

Some actors report waste from a landfill and a recycling centre under the same P number. In this case, waste from the recycling centre will appear as secondary quantities and will therefore not directly be included in the extract for primary quantities. For this reason, adaptations have been made to make these quantities primary waste - and vice versa in the opposite case.

In the reporting of imports/exports it is possible to state more than one LoW code per line. In view of creating correlation to the rest of the report, the section on imports and exports has been adapted to only select one LoW code.

Due to outstanding or incorrect reports, the Danish Environmental Protection Agency has obtained conformation of lacking quantities under specific waste fractions and sectors or has in a few cases made a concrete assessment.

[77] An adaptation of raw data from ADS may be, for instance, the addition of an outstanding report from a bankrupt company

[78] Sector codes - See Appendix 2 (Danish Sector Code 07)

All construction and demolition waste has been assigned to the building and construction sector; this also applies to construction and demolition waste from households.

Appendix 2 Sector division

General division of sectors	Two digit NACE-code
Households	-
Service sector	45-99
Industry	5-33
Building and construction	41-43
Power, gas and district heating supply	35
Agriculture, hunting and forestry	1-3
Waste water treatment plants	37
Other	36 og 38-39
Waste from commercial and industrial activities without sector	-

Service sector - main subgroups	Two digit NACE-code
Wholesale and retail trade and repair of motor vehicles and motor-cycles	45
Wholesale of waste and scrap (four digit NACE-code)	46.77
Wholesale trade	46
Retail trade	47
Transporting and storage	49, 50, 51, 52 og 53
Hotels and restaurants	55-56
Communication, culture, financial services and private services	58, 59, 60, 61,62, 63, 64, 65, 66, 68, 69, 70, 71,72, 73, 74, 75, 77, 78, 79, 80, 81, 82, 90,91, 92, 93, 94, 95, 96 og 99
Public administration, education, human health and social work activities	84, 85, 86, 87 og 88
Unspecified service sector waste	Other NACE-codes (45-98)

Industry sector - main subgroups		Two digit NACE-code
I-1	Mining and quarrying	5,6,7,8,9
I-2	Manufacture of food products	10
I-3	Manufacture of beverages and tobacco products	11 og 12
I-4	Manufacture of textiles, wearing apparel, leather and related products	13-15
I-5	Manufacture of wood and of products of wood, cork and straw, except furniture	16
I-6	Manufacture of paper and paper products	17
I-7	Printing and reproduction of recorded media	18
I-8	Manufacture of coke and refined petroleum products	19
I-9	Manufacture of chemical products	20
I-10	Manufacture of pharmaceutical products	21
I-11	Manufacture of rubber and plastic products	22
I-12	Manufacture of other non-metallic mineral products	23
I-13	Manufacture of basic metals	24
I-14	Manufacture of fabricated metal products, except machinery and equipment	25
I-15	Manufacture of computer, electronic and optical products and of electrical equipment	26 og 27
I-16	Manufacture of machinery and equipment n.e.c.	28
I-17	Manufacture of other transport equipment	29 og 30
I-18	Manufacture of furniture	31
I-19	Other manufacturing	32
I-20	Repair and installation of machinery and equipment	33

Industribranchen		Tocifret NACE-kode
I-1	Råstofindvinding	5,6,7,8,9
I-2	Fremstilling af fødevarer	10
I-3	Fremstilling af drikkevarer og tobaksprodukter	11 og 12
I-4	Fremstilling af tekstil, beklædning og læder	13-15
I-5	Fremstilling af varer af træ, kork og strå undtagen møbler	16
I-6	Fremstilling af papir og papirvarer	17
I-7	Trykning og reproduktion af indspillede medier	18
I-8	Fremstilling af koks og raffinerede mineralolieprodukter	19
I-9	Fremstilling af kemiske produkter	20
I-10	Fremstilling af farmaceutiske råvarer og præparater	21
I-11	Fremstilling af gummi- og plastprodukter	22
I-12	Fremstilling af andre ikke-metalholdige mineralske produkter	23
I-13	Fremstilling af metal	24
I-14	Jern- og metalvareindustri, undtagen maskiner og udstyr	25
I-15	Fremstilling af elektrisk og elektronisk udstyr	26 og 27
I-16	Fremstilling af maskiner og udstyr i.a.n.	28
I-17	Fremstilling af transportmidler	29 og 30
I-18	Fremstilling af møbler	31
I-19	Anden fremstillingsvirksomhed	32
I-20	Reparation og installation af maskiner og udstyr	33

Other	Two-digit NACE code
Water collection, treatment and supply	36
Waste collection, treatment and disposal activities	38 and 39

Appendix 3 Translation of fraction codes

Use of waste fractions in Waste Statistics	Danish Waste Fraction Code
Batteries	H22 and E22
Mixed construction and demolition waste	H24, E24, H25, E25 and E34
Mixed residual waste	H01 and E01
Waste suitable for landfill	H04 and E04
Tyres	H31 and E33
Electronics	H23 and E23
Packaging glass	H11 and E11
Packaging metal	H12 and E12
Packaging cardboard and other cardboard	H06, E06, H10 and E10
Packaging plastics	H13 and E13
Packaging wood	H30 and E32
Waste suitable for incineration	H03, E03 and H27
Gypsum	H28 and E30
Glass	H07 and E07
Garden waste	H17 and E17
Impregnated wood	H16 and E16
Ferrous and non-ferrous metals	H19 and E19
Refrigerators containing freon	H18 and E18
Organic waste	H02 and E02
Paper incl. newsprint and packaging paper	H05, E05, H09 and E09
Plastics	H08 and E08
PVC	H14 and E14
Residues from coal and biomass fired energy plants	E35
Sludge - other	E26, E27 and E28
Wood	H15 and E15
Other wastes	H26, E29, H29 and E31
Sludge from wastewater treatment plants	E28
Uncontaminated soil	H20 and E20
Contaminated soil	H21 and E21

Appendix 4 Hazardous waste – LoW codes

Hazardous waste	European List of Waste code
Wastes from mineral excavation and processing	All codes starting with 01 01xx, 01 03xx and 01 04 xx
Drilling muds and other drilling wastes	All codes starting with 01 05 xx
Sawdust, shavings etc. containing dangerous substances from wood processing and the production of panels and furniture	03 01 04
Wastes from petroleum refining	All codes starting with 05 01 xx
Wastes from the manufacture, formulation, supply and use of acids and bases	All codes starting with 06 01 xx and 06 02 xx
Wastes from the manufacture, formulation, supply and use of salts and their solutions and metallic oxides containing cyanides and heavy metals	06 03 11, 06 03 13 and 06 03 15
Metal-containing wastes containing mercury	06 04 04
Metal-containing wastes containing others heavy metals	06 04 05
Organic halogenated wastes and other wastes from organic chemical processes	All codes starting with 07 01 xx, 07 04 xx, 07 05 xx, 07 06 xx and 07 07 xx
Wastes from the manufacture of paint and varnish	All codes starting with 08 01 xx, 08 03 xx and 08 04 xx
Wastes from the photographic industry	All codes starting with 09 01 xx
Acids and bases from chemical surface treatment	11 01 05, 11 01 06 and 11 01 07
Phosphatising sludges from chemical surface treatment	11 01 08
Sludges and filter cakes from chemical surface treatment	11 01 09 and 11 01 10
Other hazardous wastes from chemical surface treatment	11 01 11, 11 01 12, 11 01 13, 11 01 15, 11 01 16, 11 01 98 and 11 01 99
Wastes containing cyanide and other wastes from tempering processes	11 03 01 and 11 03 02
Machining oils, emulsions and solutions free of halogens	12 01 07 and 12 01 09
Wastes from hydraulic oils	All codes starting with 13 01 xx
Waste engine, gear and lubricating oils	All codes starting with 13 02 xx
Bilge oils	All codes starting with 13 04 xx
Oil, sludges and other wastes from oil/water separators	All codes starting with 13 05 xx
Other oil wastes	All codes starting with 13 03 xx, 13 07 xx and 13 08 xx
Waste organic solvents and refrigerants	All codes starting with 14 06 xx
Oil filters, brake fluids, antifreeze fluids and other hazardous waste from end-of-life vehicles	All codes starting with 16 01 xx except 16 01 04
Waste electronics containing PCBs	16 02 09 and 16 02 10
Waste electronics containing CFC, HCFC or HFC	16 02 11 and 20 01 23
Other waste electronics	16 02 13, 16 02 14, 16 02 15, 16 02 16 , 20 01 35 and 20 01 36
Fluorescent tubes and other mercury-containing waste	20 01 21
Discarded chemicals	16 05 06, 16 05 07, 16 05 08 and 16 05 09
Lead accumulators, Ni-Cd batteries and mercury-containing batteries	16 06 01, 16 06 02 and 16 06 03
Lead accumulators, Ni-Cd batteries and mercury-containing batteries from households	20 01 33
Other batteries	16 06 04 and 20 01 34
Concrete, bricks, tiles and ceramics containing dangerous substances	17 01 06
Glass, plastic and wood containing or contaminated with dangerous substances	17 02 04
Bituminous mixtures, coal tar and tarred products	17 03 01, 17 03 02, 17 03 03
Cables containing oil, coal tar and other dangerous substances	17 04 10
Insulation materials and asbestos-containing materials	All codes starting with 17 06 xx
Construction and demolition wastes containing PCB	17 09 02
Other hazardous construction and demolition wastes	All codes starting with 17 yy xx except 17 01 06, 17 02 04, 17 03 01, 17 03 02, 17 03 03, 17 04 10, 17 06 xx and 17 09 02
Wastes from hospitals, medicare, dental care and research	All codes starting with 18 01 xx and 18 02 xx
Solvents, acids, alkalines and photochemicals from households and the service sector	20 01 13, 20 01 14, 20 01 15 and 20 01 17
Pesticides from households and the service sector	20 01 19
Paint, inks, adhesives and resins from households and the service sector	20 01 27 and 20 01 28
Medicines from households and the service sector	20 01 31 and 20 01 32
Wood containing dangerous substances from households and the service sector	20 01 37
Other	Other European List of Waste codes

Appendix 5 Construction and demolition waste - LoW codes

Building and construction waste- European List of Waste codes	
Concrete	17 01 01
Bricks	17 01 02
Tiles and ceramics	17 01 03
Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics	17 01 06 and 17 01 07
Wood	17 02 01, 19 12 06, 19 12 07, 20 01 37 and 20 01 38
Glass	17 02 02 and 20 01 02
Plastics	17 02 03 and 20 01 39
Bituminous mixtures, coal tar and tarred products	17 03 01, 17 03 02 and 17 03 03
Copper, bronze, brass, aluminium	17 04 01 and 17 04 02
Iron and steel	17 04 05, 19 10 01, 19 12 02 and 20 01 40
Lead, zinc, tin, mixed metals and other metals	17 04 03, 17 04 04, 17 04 06, 17 04 07, 17 04 09 and 19 12 03
Cables	17 04 10 and 17 04 11
Track ballast	17 05 07 and 17 05 08
Insulation materials	17 06 01, 17 06 03 and 17 06 04
Construction materials containing asbestos	17 06 05 and 17 06 06
Gypsum-based construction materials	17 08 01 and 17 08 02
Construction and demolition wastes containing PCB	17 09 02
Mixed construction and demolition wastes	17 09 04
Mixed residual waste	20 03 01
Other wastes from building and construction activities	Other European List of Waste codes

Appendix 6 Power, gas and district heating supply - LoW codes

Waste from power, gas and district heating supply	European List of Waste codes
Bottom ash, slag and boiler dust	10 01 01
Coal fly ash	10 01 02
Calcium-based reaction wastes from flue gas desulphurisation (gypsum waste)	10 01 05 og 10 01 07
Fly ash from co-incineration	10 01 16 og 10 01 17
Other wastes from gas cleaning	10 01 18 og 10 01 19
Other wastes	Other European List of Waste codes

Waste Statistics 2014

The statistics give a detailed description of the quantity of waste generated in Denmark in 2014 broken down on waste types and treatment options. Waste Statistics 2014 contain detailed infor-mation about the sources generating the waste. The statistics also present information about quantities of waste imported and exported. In addition, at the end of the publication a section provides the status for compliance at the national and regional levels with the 2022 objectives of the Danish Resource Strategy regarding recycling of waste from households (50% objective).

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