

## **End-of-life vehicle reuse/recycling/recovery rates in Germany for 2008 pursuant to Art. 7 (2) of the End-of-life vehicles Directive 2000/53/EC**

Quality Report: Description of the data used in accordance with Article 1 of  
COM Decision 2005/293/EC on end-of-life vehicles

### **0 General**

#### *GENERAL INFORMATION*

- **Country: Germany**

- *Issue: "Description of the data submitted according to Commission Decision 2005/293/EC on the monitoring of the reuse/recovery and reuse/recycling targets on ELVs "*
- *Organisation submitting the data and the description:*

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- *We agree to make our Quality Report available to the national experts via circa (Y/N):* Y

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## 1 Tables pursuant to COM Decision 2005/293/EC for Germany 2008

**Note:** According to the guide “How to report on end-of-life vehicles according to Commission Decision 2005/293/EC”, p. 9-10 and p. 22-23, all metals are to be entered in Table 2 if the “metal content assumption” is applied. To avoid double counting, Table 1 and Table 3 must therefore contain non-metals only.

**Materials from de-pollution and dismantling (in tonnes per year) of end-of-life vehicles arising in the Member State and treated within the Member State**

<b>COM Table 1 (dismantling) for Germany 2008 Non-metals only!! (see above)</b>					
<b>Materials from de-pollution and dismantling</b>	<b>Reuse</b>	<b>Recycling</b>	<b>Energy recovery</b>	<b>Total recovery</b>	<b>Disposal</b>
	<b>(A)</b>	<b>(B1)</b>	<b>(C1)</b>	<b>(D1=B1+C1)</b>	<b>E1</b>
	<b>[t]</b>	<b>[t]</b>	<b>[t]</b>	<b>[t]</b>	<b>[t]</b>
<b>Batteries</b>	76	2,633	0	2,633	21
<b>Liquids (excluding fuel)</b>	90	2,061	688	2,748	1,919
<b>Oil filters</b>	1	0	38	38	2
<b>Other materials arising from de-pollution (excluding fuel)</b>	5	0	23	23	4
<b>Catalysts</b>	16	212	0	212	4
<b>Metal components <sup>1)</sup></b>	0	0	0	0	0
<b>Tyres</b>	701	12,282	0	12,282	554
<b>Large plastic parts</b>	172	765	0	765	15
<b>Glass</b>	100	744	0	744	178
<b>Other materials arising from dismantling</b>	4,303	17	1,353	1,370	32
<b>Total</b>	<b>5,464</b>	<b>18,713</b>	<b>2,101</b>	<b>20,815</b>	<b>2,729</b>

Source: from Federal Statistical Office data, Tables 1 and 15 of the waste management survey 2008.

<sup>1)</sup> For metals see COM Table 2

**Materials from shredding (in tonnes per year) of end-of-life vehicles arising in the Member State and treated within the Member State**

<b>COM Table 2 (shredders) for Germany 2008 including all metals (see above)</b>				
Materials from shredding	Recycling	Energy recovery	Total recovery	Disposal
	(B2)	(C2)	(D2 =B2+C2)	(E2)
	[t]			
Ferrous scrap (steel)	257,905	0	257,905	0
Non-ferrous materials (Al, Cu, Zn, Pb, etc.)	27,526	0	27,526	0
Shredder light fraction (SLF)	32,542	11,254	43,796	37,574
Other	0	0	0	0
<b>Total</b>	<b>317,973</b>	<b>11,254</b>	<b>329,227</b>	<b>37,574</b>

Source: from Federal Statistical Office data, Table 15 of the waste management survey 2008.

**Monitoring of (parts of) end-of-life vehicles arising in the Member State and exported for further treatment (in tonnes per year)**

<b>COM Table 3 (Export) for Germany 2008 Non-metals only!! (see above)</b>					
Components/ materials exported for further treatment	Total weight of end-of-life vehicles exported, per country	Total recycling of (parts of) end-of-life vehicles exported	Total recovery of (parts of) end-of-life vehicles exported	Total disposal of (parts of) end-of-life vehicles exported	Remarks
Total weight, broken down by countries		(F1)	(F2)	(F3)	
		[t]	[t]	[t]	
<b>1) End-of-life vehicles (Waste code 160104*)</b>	0	0	0	0	No exports in 2008 according to the statistics on "Transboundary shipments of waste requiring notification" *)
Breakdown by countries:	-- not applicable --				
<b>2) Body shells from dismantling plants (Waste code 160106)</b>	3,400	2,702	3,378	22	Share of <u>ultimate</u> recovery/ disposal unknown
Breakdown by countries:	-- not known --				
<b>3) Components from dismantling plants</b>	155	142	154	1	Batteries, tyres, large plastic parts, glass etc.
Breakdown by countries:	-- not known --				
<b>4) SLF from shredders</b>	1,597	914	1,218	379	
Breakdown by countries:	-- not known --				
<b>Total</b>	<b>5,153</b>	<b>3,758</b>	<b>4,750</b>	<b>402</b>	

Source: Federal Statistical Office waste management survey 2008 and waste exports data:

\*) <http://www.umweltbundesamt.de/abfallwirtschaft/abfallstatistik/dokumente/ZeitreiheExportAbfallarten.pdf>,

end-of-life vehicles are listed under No. 8.11 "Ausrangierte Personenkraftwagen" (scrapped passenger cars). The 2,610 t of waste exports shown under No. 8.12 "Andere ausrangierte Kraftfahrzeuge" (Other scrapped motor vehicles) relates to ships, not cars.

**Total reuse, recovery and recycling (in tonnes per year) of end-of-life vehicles arising in the Member State and treated within or outside the Member State**

<b>COM Table 4 (Rates) for Germany 2008</b>					
<b>From ...</b>	<b>Reuse</b>	<b>Total recycling</b>	<b>Total recovery</b>	<b>Total reuse and recycling</b>	<b>Total reuse and recovery</b>
	<b>(A)</b>	<b>(B1 + B2 + F1)</b>	<b>(D1 + D2 + F2)</b>	<b>(X1=A+B1+B2+F1)</b>	<b>(X2=A+D1+D2+F2)</b>
	<b>[t]</b>	<b>[t]</b>	<b>[t]</b>	<b>[t]</b>	<b>[t]</b>
<b>Table 1: Dismantling (A,B1,D1) (non-metals)</b>	5,464	18,713	20,815	24,177	26,278
<b>Table 2: Shredder (B2, D2) (incl. <u>all</u> metals)</b>		317,973	329,227	317,973	329,227
<b>Table 3: Exports (F1, F2) (non-metals)</b>		3,758	4,750	3,758	4,750
<b>Total</b>	<b>5,464</b>	<b>340,445</b>	<b>354,792</b>	<b>345,908</b>	<b>360,256</b>
				<b>Recycling and recovery rates 2008</b>	
<b>W (total number of end-of-life vehicles)</b>	<b>417,534 vehicles</b>			<b>89.2%</b>	<b>92.9%</b>
<b>W1 (total vehicle weight)</b>	<b>387,693 tonnes</b>			<b>X1/W1</b>	<b>X2/W1</b>

## **2 Quality Report: Description of the data submitted according to Commission Decision 2005/293/EC on the monitoring of the reuse/recovery and reuse/recycling targets on ELVs**

### **2.1 Chapter A) Information according to Article 1(1) – Description of data used to determine ELV recycling/recovery rates for Germany 2008**

#### **2.1.1 Section 1: Sources of information**

The data used as a basis for determining end-of-life vehicle recycling and recovery rates in accordance with the End-of-life Vehicles Directive 2000/53/EC consists of the waste statistics collected for the whole of Germany from ELV treatment facilities (dismantling facilities and shredder plants) by the Statistical Offices of the Länder and the Federal Statistical Office under the Environmental Statistics Act (*Umweltstatistikgesetz*)<sup>1</sup> (Section 3 (1) No. 1). Tables 1.1, 14 and 15 of the “Waste Disposal Survey 2008” were used.

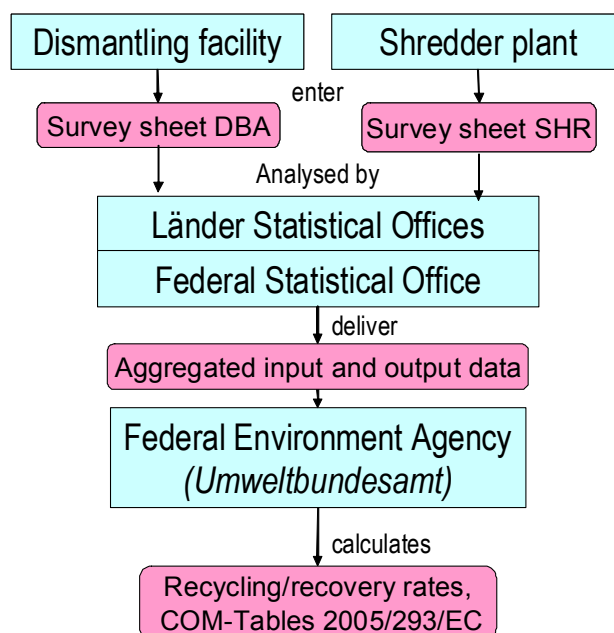
After the end of each reporting year, the ELV treatment facilities (more than 1000 dismantling facilities and several dozen shredder plants) enter their operational input and output quantities for the waste management survey in the statistical survey sheets DBA (dismantling facilities)<sup>2</sup> and SHR (shredder plants)<sup>3</sup>. These are then analysed, anonymised and summarised by the Statistical Offices of the Länder and subsequently by the Federal Statistical Office (see Fig. 1). From the aggregated data, the Federal Environment Agency (*Umweltbundesamt*) determines the national recycling and recovery rates for end-of-life vehicles.

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<sup>1</sup> [http://www.gesetze-im-internet.de/bundesrecht/ustatg\\_2005/gesamt.pdf](http://www.gesetze-im-internet.de/bundesrecht/ustatg_2005/gesamt.pdf)

<sup>2</sup> Example: Form AE/DBA for Bavaria for 2009:  
<http://www.statistik.bayern.de/medien/statistik/erhebungen/abfallwirtschaft/dba.pdf>

<sup>3</sup> Example: Form AE/DBA for Bavaria for 2009:  
<http://www.statistik.bayern.de/medien/statistik/erhebungen/abfallwirtschaft/shr.pdf>



**Figure 1 Data streams for determining recycling/recovery rates under the ELV Directive**

The statistical questionnaires differentiate the output of the facilities on the following basis:

- for recycling/recovery in Germany,
- for recycling/recovery abroad,
- for disposal in Germany,
- for disposal abroad,
- for transfer to treatment facilities, secondary materials recovered and products.

The “metal content assumption” is used to determine metals recovery, see Section 2.2.

In the case of dismantling facilities, only waste types originating from the end-of-life vehicles (excluding fuel) are included in the rate calculation.

In the case of shredder plants the recovery of the shredder light fraction (waste code numbers 19 10 03\* and 19 10 04) is integrated – beyond the metal recovery which is included in the “metal content assumption”. Since shredder plants also treat items other than end-of-life vehicles, the shredder light fraction is split: 25% of the weight of the body shells (from within Germany) that are treated in the shredder is allocated to ELV treatment and therefore entered in COM Table 2. Statistical information is recorded as to whether the shredder light fraction sent for recovery is ultimately recycled as material, recovered as energy, or disposed of.

### 2.1.2 Section 2: Quality of information sources

Coverage: The data was collected for the whole of Germany. The level of completeness is correspondingly high (all 1,189 dismantling facilities for end-of-life vehicles and 48 shredder plants with body shell treatment). Comparison with the number of end-of-life vehicle

treatment facilities certified under the ELV Ordinance (*AltfahrzeugV*) shows a good measure of agreement with the facilities covered by the statistics: According to GESA, 1,225 dismantling facilities and 36 shredder plants were recognised under the Ordinance as of the reference date 28.11.2008. No information exists regarding any treatment of end-of-life vehicles in non-recognised treatment facilities.

Data quality: Since 2008 is the fifth reporting year for which the survey has been conducted, it may be assumed that any initial problems that the facilities experienced with the survey have been eliminated. The quality of the data is considered to be good.

The survey yields plausible figures for average vehicle weight (929 kg). The shares of the components and materials recovered from dismantling (e.g. recovery of waste tyres - 3.4%, operating fluids - 0.7%, batteries (non-metallic component) - 0.7%, large plastic parts and other non-metallic components - 1.8%) are largely within the range of values expected on the basis of average vehicle composition.

The quantity of oil filters recorded in the statistics tallies with the expected figure, having regard to statistical spread: treating approx. 420,000 end-of-life vehicles theoretically results in approx. 168 t of oil filters for disposal, with a weight of 0.4 kg per filter. The statistics show the relevant output of oil filters from the dismantling facilities as 136 t.

There are occasional reports of problems with on-site data collection. Correct determination of end-of-life vehicle weights (empty weight as shown in vehicle registration document) sometimes causes problems; in some cases it is made more difficult by lack of vehicle documents. Precise determination of the quantities of operating fluids is sometimes difficult because of global waste management agreements. Delimitation of output resulting from additional inputs into the facility (e.g. HGVs) is difficult in practice. Moreover, waste streams that are not disposed of annually give rise to non-representative annual balances.

The breakdown of the dismantled components and materials into recycling and energy recovery is based on material types and a knowledge of the recovery paths that are usual in Germany. Various waste types consist of both metals and non-metals. The metal components had to be deducted because of applying the "metal content assumption". Average figures were therefore estimated for the metal content of the relevant waste types.

Imports: In the statistical questionnaires, the treatment facilities state whether the vehicles accepted come from within Germany or outside. On this basis, 2,495 t (0.6%) of the 390,188 t end-of-life vehicles accepted came from outside Germany. The 387,693 t of end-of-life vehicles accepted from within Germany are entered as W1. In view of the extremely low import share of less than 1%, it was decided to dispense with a "correction factor" for the output, since this would make a difference of only 0.04% to the rate calculated.

Metal content assumption: The determination of the metal content of the vehicles and the breakdown into ferrous and non-ferrous metals which was made for the first time in 2008 are based on extensive data from German and foreign vehicle manufacturers; see Section 2.2. The quality of this estimate can therefore be rated very good. In an ELV recovery test in



Germany in 2006, 98.3% of the metal content was recovered. Thus the assumed figure of 97% is on the safe side.

Shredder light fraction: These days, end-of-life vehicles account for only about 10% of the input of the 48 shredder plants in the survey. The most important additional input materials are iron and steel (61%), ferrous metals (14%) and miscellaneous (8%). The fact that the shredder plants handled other input materials in addition to the body shells was taken into account when allocating the shredder light fraction. This was done by allocating to the treatment of body shells a share of the shredder light fraction amounting to 25% of the weight of the treated body shells (approx. 83,000 t of approx. 500,000 t).

### 2.1.3 Section 3: Determination of the weight

In the statistical survey, the dismantling facilities state the total of the vehicle empty weights in accordance with Section 2 No. 23 of the ELV Ordinance (*AltfahrzeugV*). In practice, as already mentioned, correct determination of the empty weight can sometimes cause problems.

According to Section 2 No. 23 of the German ELV Ordinance, the vehicle empty weight is defined as follows:

*“Vehicle empty weight” means the relevant empty weight of a vehicle for the purpose of identifying the recycling targets; it is determined as follows:*

- *for class M1 motor vehicles first registered up until 31 December 1996: empty weight according to registration book minus weight of the contents of the tank filled at 90 %,*
- *for class M1 motor vehicles first registered on or after 1 January 1997: empty weight according to registration book minus weight of the contents of the tank filled at 90 % and minus the weight of the driver (75 kg),*
- *for class N1 motor vehicles: empty weight according to registration book minus weight of the contents of the tank filled at 90 % and minus the weight of the driver (75 kg).*

### 2.1.4 Section 4: Recycling or recovery of exported ELVs or parts of ELVs

Recycling or recovery of exported end-of-life vehicles: no end-of-life vehicles were exported in 2008.

In terms of quantity, exports of body shells and ELV parts from Germany play no more than a minor role: exports of non-metals account for only 1.2% of the recovery rate.

Recycling or recovery of exported body shells: The quantities of body shells recycled abroad and of body shells disposed of abroad can be seen from the statistics. No information is available about body shell components ultimately recycled abroad. As in Germany, the metal content assumption of 73.6% is used for calculation. Also as in Germany, recovery of non-metals is broken down into 80% recycling as material and 20% energy recovery.

Recycling or recovery of exported components/materials from dismantling facilities: For each type of dismantling facility output, the statistics show whether recovery/recycling or disposal took place in Germany or abroad. The breakdown into recycling and energy recovery is made in the same way as for recovery within Germany (see 2.1.5 c).

Recycling or recovery of shredder light fraction: The statistics show the quantity of shredder light fraction recycled/recovered outside Germany. They also differentiate the “recovered” shredder light fraction on the basis of “ultimate fate” into recycled, recovered as energy, and disposed of. In calculating rates, this breakdown is applied to disposal both within Germany and abroad.

### 2.1.5 Section 5: Other comments

#### ***a) Explanations on export of shredder output in Table 2.***

As a result of the metal content assumption, Table 2 – in line with the notes in the guidelines – contains all metals recovered, i.e. including those recovered abroad. In the case of the shredder light fraction, Table 2 contains only the shredder light fraction disposed of within Germany. The shredder light fraction disposed of abroad is included in Table 3.

#### ***b) Description of actions undertaken by the country to avoid double counting of ELVs and components.***

In accordance with Section 4 of the German ELV Ordinance (*AltfahrzeugV*), end-of-life vehicles pass through a two to three-stage disposal process in the following order:

(→ optional: acceptance or collection facility,)

→ dismantling facility for pre-treatment,

→ shredder plant.

As a result of this predetermined treatment sequence, it may be assumed that the nationwide statistical surveys do not include any double counting of the end-of-life vehicles and components reported.

For the entries in Tables 1 to 4, care has been taken to ensure that no double counting takes place: all metals (in line with the metal content assumption) are entered in lines 1 and 2 of Table 2, and Tables 1 and 3 contain only non-metals, including in the reuse column (A). As far as non-metals are concerned, Tables 1 and 2 contain only output for Germany. All outputs of non-metals destined for other countries are covered in Table 3.

**c) Description of estimations / calculations conducted (e.g. factors based on ELV treatment and recovery trial, data provided by manufacturers).**

There are various points at which calculations are performed or assumptions made.

As mentioned above, the statistics do not provide any breakdown of the metallic / non-metallic fraction of the dismantled components and materials or the recovery path (recycling or energy recovery). It was therefore necessary to take decisions. For many materials, the breakdown follows from the type of material (e.g. glass and metal not recoverable as energy). For the remaining waste types, the breakdown is made on the basis of the recovery paths which are usual in Germany.

**Table Example of classification of dismantled materials**

Waste type	Share recycled as material (as percentage of non-metal component)	Share recovered as energy	Waste type	Metal share	Non-metal share
Waste oil	75%	25%	Lead batteries	60%	40%
Oil filters	33%	67%	Catalysts	80%	20%
Components not otherwise specified, no differentiation possible (16012200)	0%	100%	Components not otherwise specified, no differentiation possible (16012200)	50%	50%

Regarding the realistic assumption that the shredder light fraction originating from end-of-life vehicles amounts to 25% of the body shell input, see the remarks in Section 2.1.2.

For the “metal content assumption”, see Section 2.2. In line with the guidelines, only non-metals are entered in Table 1 and Table 3. Accordingly, all metals are shown in Table 2 in accordance with the “metal content assumption”.

**d) Description of missing mandatory information; what measures are taken to provide all mandatory information in future?**

One item is missing from the mandatory information in COM Tables 1 to 4: No information is provided about the export countries which are to be specified in Table 3 (Exports).

Since no end-of-life vehicles (waste code number 16 01 04\*) were exported in the years 2004 to 2008, the question of the export countries is not relevant here. In the body shells category the percentage of body shells exported is very low, at 3.3% of total vehicle weight W1. The same is true of exported components and materials from dismantling (0.5%) and shredder light fraction (0.4%).

In view of these small proportions, there are currently no plans for measures to obtain such data in future.

**e) Description of validation process (How do you establish the validity of the data?)**

The statistical questionnaires are checked for plausibility by the Statistical Offices of the Länder and the Federal Statistical Office. The statistical offices use their established statistical test routines for this purpose (e.g. input/output check, expected waste types, comparison with previous year). The Federal Environment Agency checks the information from a technical point of view, e.g. on the basis of the quantities to be expected as a result of vehicle composition. For example, see Section 2.1.2 above, remarks on plausibility.

**f) Description of changes in methodology relative to the previous data delivered.**

There are no changes in methodology compared with the previous year. The breakdown into ferrous and non-ferrous metals on the basis of the "metal content assumption" has been added. For a number of waste types, the breakdown into recycling and energy recovery or the question of origin from the end-of-life vehicles has been updated.

**g) Description on the discrepancy between the number of ELVs with and without CoD and measures to be taken in order to improve the situation.**

Under Section 4 of the German ELV Ordinance (*AltfahrzeugV*), end-of-life vehicles must be transferred to a dismantling facility (or alternatively an acceptance or collection facility, which passes the ELV on to the dismantling facility). Dismantling facilities issue certificates of destruction for the end-of-life vehicles accepted and are required to treat the end-of-life vehicles in accordance with the provisions of the Ordinance. Thus legally speaking, certificates of destruction must be issued for all end-of-life vehicles.

There are no indications that end-of-life vehicles are being disposed of in dismantling facilities without a certificate of destruction being issued.

**2.1.6 Input-output balance**

The recommended mass balance  $X2+E1+E2+F3 = W1$  revealed the following for 2008:

X2 =	360,256 t	(Total reuse and recovery)
E1 =	3,028 t	(Disposal from dismantling)
E2 =	37,574 t	(Disposal shredder light fraction)
F3 =	465 t	(Disposal by export)

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Total	401,323 t
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Comparison with  $W1 = 387,693$  t: difference =  $13,630$  t = 3.5%. This is quite justifiable within the limits of statistical spread. For comparison: the difference for the input-output balance for 2007 was also 3.5%.

## 2.2 Chapter B) Information according to Article 1 (2) – Fixed Metal Content Assumption

According to COM Decision 2005/293/EC, the “metal content assumption” is based on data on

- a) the percentage of metal content of the vehicles and
- b) the percentage of reuse, recovery and recycling of this metal content.

### a) What investigations / data have been used (sources / quality / coverage) to derive the metal content?

At this point we repeat the remarks from the reports on recycling/recovery rates for 2006 and 2007, as the same data basis is used.

The data basis is class M1 and N1 vehicles first registered in Germany in 1995 and their metal contents by manufacturer (anonymised), weighted with the individual volume of registrations, see Table 1. 1995 is the average year of first registration of the end-of-life vehicles arising in the years 2006 / 2007 / 2008, since the average age of the vehicles at the time of final deregistration is approximately 12 years<sup>4</sup>.

**Table 1** Average metal content of vehicles, class M1 and N1 first registered in Germany in 1995, anonymised, in ascending order.

Vehicle manufacturer	Metal content	Vehicle manufacturer	Metal content
Manufacturer 1	74.7%	Manufacturer 9	75.3%
Manufacturer 2	74.9%	Manufacturer 10	75.9%
Manufacturer 3	75.0%	Manufacturer 11	76.2%
Manufacturer 4	75.1%	Manufacturer 12	76.2%
Manufacturer 5	75.2%	Manufacturer 13	76.4%
Manufacturer 6	75.2%	Manufacturer 14	76.4%
Manufacturer 7	75.2%	Manufacturer 15	77.2%
Manufacturer 8	75.3%	<b>Weighted average</b>	<b>75.9 %</b>

The quality of the data is considered very good, since it was derived by the manufacturers from the metal content figures for 1995 models, which were for example determined by means of dismantling studies.

<sup>4</sup> Cf. Federal Motor Transport Authority (*Kraftfahrtbundesamt*): “Fahrzeugzulassungen – Außerbetriebsetzungen - Alter der Fahrzeuge - Jahr 2008”, page 5:

[http://www.kbashop.de/wcsstore/KBA/Attachment/Kostenlose\\_Produkte/a\\_alter\\_fahrzeuge\\_2008.pdf](http://www.kbashop.de/wcsstore/KBA/Attachment/Kostenlose_Produkte/a_alter_fahrzeuge_2008.pdf) .

With effect from 2007 this information is no longer available as a result of a change in the statistics (from “final deregistration” to “off/road notification”).

According to the vehicle manufacturers, the figures for all German and 8 international manufacturers cover 89% of the vehicles registered in 1995 (3,095,305 out of 3,483,517 first registrations).

This yields an **average metal content of 75.9%**.

#### a1) Breakdown into ferrous and non-ferrous metals

According to the EU Commission's guidelines for the quality report (as of 20 April 2010, p. 6 and p. 10), recycling/recovery of the metals in COM Table 2 is to be broken down into ferrous and non-ferrous metals even in cases where the "metal content assumption" is used.

To determine these figures, nine vehicle manufacturers broke down their figures on the average metal content of their vehicles first registered in 1995; see the anonymised manufacturer information in Table 2.

**Table 2 Breakdown of metal content into ferrous and non-ferrous metals for various vehicle manufacturers and their new vehicles in Germany in 1995, anonymised, in ascending order of ferrous metal content.**

<b>Vehicle manufacturer</b>	<b>Ferrous metal content</b>	<b>Non-ferrous metal content</b>
Manufacturer A	60.9%	15.0%
Manufacturer B	65.0%	9.7%
Manufacturer C	65.2%	9.7%
Manufacturer D	67.7%	7.6%
Manufacturer E	67.8%	7.5%
Manufacturer F	69.3%	7.1%
Manufacturer G	70.2%	6.0%
Manufacturer H	70.8%	5.6%
Manufacturer I	70.9%	6.3%
<b>Weighted average</b>	<b>68.5%</b>	<b>7.4%</b>

The quality of the data is also rated very good, since it was derived by the manufacturers from the metal content figures for 1995 models, which were for example determined by means of dismantling studies. The vehicle manufacturers have consented to these data being forwarded to the EU Commission in anonymised form only.

According to the vehicle manufacturers, the figures for the nine manufacturers cover 74.0% of the vehicles registered in 1995 (2,577,463 out of 3,483,517 first registrations).

Weighting yields an **average breakdown of the metal content** of the vehicles (total 75.9%) **into 68.5% ferrous metals and 7.4% non-ferrous metals.**

b) What investigations / data / calculations have been used to derive the assumed percentage of reused, recycled and recovered metals?

Reuse/recycling/recovery of the metal content was put at 97%, as was also the case in the narrative to the German ELV Ordinance (*AltfahrzeugV*) of 2002.

b1) "Metal content assumption"

Using the formula

"metal content assumption" = metal content of ELVs \* recycling/recovery of metal content

the figure for metal content recycled/recovered in Germany comes to:

**"Metal content assumption" in Germany = 75.9% \* 97% = 73.6%**

Taking into account the recycling/recovery of the metal content of 97%, the breakdown yields 66.5% ferrous metals and 7.1% non-ferrous metals recycled/recovered, in relation to the vehicle empty weight, see Table 3.

**Table 3 "Metal content assumption", broken down into ferrous and non-ferrous metals**

<b>Metal content</b>	<b>Total metals</b>	<b>Ferrous metals</b>	<b>Non-ferrous metals</b>	<b>Remarks</b>
Average metal content of vehicles	75.9%	68.5%	7.4%	Figure for metal content valid for 88.9% of German market 1995, figures for ferrous and non-ferrous metal content valid for 74.0% of German market 1995
<b>Allowing for a yield of 97%:</b>				
<b>"Metal content assumption"</b>	<b>73.6%</b>	<b>66.5%</b>	<b>7.1%</b>	Metal content recycled/recovered

c) How does the Member State ensure that it meets the required coverage of 95%?

As already mentioned, the figures for the metal content assumption cover 89% of vehicles first registered in 1995, while the figures for the breakdown into ferrous and non-ferrous metals so far cover 74%. Since the breakdown into ferrous and non-ferrous metals was undertaken for the first time for the reporting year 2008, not all the information from manufacturers had been received by the copy deadline for the report. Every effort will be made to ensure complete data for the next reporting period (2009).

We would point out that it is the total metal content recycled/recovered which is relevant for the ELV recycling/recovery rates, and this is substantiated for 89% of the market in

Germany. By contrast, a shift in the ratio of ferrous to non-ferrous metal recycling/recovery is not relevant to the result. The coverage of 74% for the breakdown into ferrous and non-ferrous metals is therefore considered to be basically meaningful.

*d) How have these data been broken down for Tables 1 to 3?*

In line with the guidelines for the quality report (as of 20 April, p. 10 and p. 20-21), all recycled/recovered metals resulting from the calculation for the “metal content assumption”, are entered in Table 2. Tables 1 and 3 contain information about non-metals only.



## 2.3 Chapter C) Information according to Article 1(3) – vehicle market, exports

### 2.3.1 Section 1: Information on the national vehicle market

**Table 4 Information on the national vehicle market**

National vehicle market Germany	Unit	Reference year 2008
Motor vehicles newly registered in 2008 <sup>5</sup> , total	Number	3 650 180
of which: passenger cars		3 090 040
Vehicles registered in Germany <sup>6, 7</sup>	Number	49 330 037
of which: passenger cars		41 183 594
Average age of fleet <sup>8,7</sup> (motor vehicles, total)	Years	9.1
of which: passenger cars		8.0
Passenger cars, taken out of service <sup>9</sup> (deregistrations and temporary layups)	Number	7 526 911
Final deregistrations in 2008, passenger cars		approx. 3 000 000 <sup>10</sup>
CoDs issued in Germany	Number	417 534
ELVs arising in the Member State	Number	417 534
Average age of ELVs	Years	not known (approx. 15 years)

<sup>5</sup> Federal Motor Transport Authority: Neuzulassungen von Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 1950 bis 2009 nach Fahrzeugklassen.  
[http://www.kba.de/cln\\_016/nn\\_277816/DE/Statistik/Fahrzeuge/Neuzulassungen/FahrzeugklassenAufbauarten/n\\_fzkl\\_zeitreihe.html](http://www.kba.de/cln_016/nn_277816/DE/Statistik/Fahrzeuge/Neuzulassungen/FahrzeugklassenAufbauarten/n_fzkl_zeitreihe.html)

<sup>6</sup> Federal Motor Transport Authority: Bestand an Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 1955 bis 2010 nach Fahrzeugklassen.  
[http://www.kba.de/cln\\_016/nn\\_191172/DE/Statistik/Fahrzeuge/Bestand/FahrzeugklassenAufbauarten/b\\_fzkl\\_zeitreihe.html](http://www.kba.de/cln_016/nn_191172/DE/Statistik/Fahrzeuge/Bestand/FahrzeugklassenAufbauarten/b_fzkl_zeitreihe.html)

<sup>7</sup> Reference date 1.1.2008, only registered vehicles excluding temporary layups/off-road notifications.

<sup>8</sup> Federal Motor Transport Authority: Bestand an Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 2001 bis 2010 nach Fahrzeugklassen mit dem Durchschnittsalter der Fahrzeuge in Jahren.  
[http://www.kba.de/cln\\_016/nn\\_191188/DE/Statistik/Fahrzeuge/Bestand/Fahrzeugalter/b\\_alter\\_kfz\\_z.html](http://www.kba.de/cln_016/nn_191188/DE/Statistik/Fahrzeuge/Bestand/Fahrzeugalter/b_alter_kfz_z.html)

<sup>9</sup> Federal Motor Transport Authority: Außerbetriebsetzungen von Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 2007 bis 2009 nach Fahrzeugklassen.  
[http://www.kba.de/cln\\_016/nn\\_191240/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/FahrzeugklassenAufbauarten/a\\_fzkl\\_zeitreihe.html](http://www.kba.de/cln_016/nn_191240/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/FahrzeugklassenAufbauarten/a_fzkl_zeitreihe.html)

<sup>10</sup> Final deregistrations have not been included in the statistics since 2007, as there are now only “off-road notifications”. Final registrations account for about 40% of off-road notifications. Source: Federal Motor Transport Authority: Jahresbilanz der Außerbetriebsetzungen 2009.  
[http://www.kba.de/cln\\_016/nn\\_125264/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/ausserbetriebsetzungen\\_node.html? nnn=true](http://www.kba.de/cln_016/nn_125264/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/ausserbetriebsetzungen_node.html? nnn=true)

The waste statistics do not provide any information about the average age of end-of-life vehicles. According to two ELV treatment and shredder trials performed in Germany in 2006, the average age of the scrapped vehicles was around or over 15 years. No figures are known for the following years, but there is not likely to have been any significant change in the average age.

As described in Section 2.1.5 g), the dismantling facilities have to issue a certificate of destruction for every end-of-life vehicle in accordance with the German ELV Ordinance (*AltfahrzeugV*).

### **2.3.2 Section 2: National market information on export of used vehicles, ELVs and de-polluted body shells**

**Exports to EU states:** The number of used cars exported from Germany to other EU Member States is determined from the number of vehicles formerly registered in Germany that have been re-registered in other Member States. These re-registrations are recorded by the Federal Motor Transport Authority through the international procedure for the information exchange on re-registrations of vehicles previously registered in another Member State, which is based on EU Directive 1999/37/EC. On this basis some 1.5 million used cars were exported to other EU Member States in 2008, see Table 5

**Exports to non EU states:** Exports to non EU states were small compared with exports to EU countries. The foreign trade statistics showed a total of about ¼ million used cars exported (passenger cars and motorhomes), nearly half of them to the states of the former Soviet Union (excluding the Baltic States), see Table 6. In view of the fairly low notification thresholds, it can be assumed that the statistics cover a relatively large proportion of actual exports.

**Table 5** Notifications to the Federal Motor Transport Authority about vehicles formerly registered in Germany (REGINA database) [KBA 2008]<sup>11</sup>

EU-10	Number 2008	EU-15	Number 2008
Poland	<b>702,030</b>	Finland	17,874
Czech Rep.	<b>171,657</b>	Denmark	10,937
Slovakia	27,316	Sweden	8,388
Hungary	20,606	United Kingdom	1,730
Lithuania	60,531	Netherlands	57,564
Latvia	35,996	Belgium	22,791
Estonia	12,656	Luxembourg	7,244
Romania	<b>208,637</b>	Austria	2,812
Bulgaria	83,619	Spain	23,847
		Italy	25,755
<b>Total EU</b>		<b>at least 1 500 000</b>	

**Table 6** Exports of used cars to non EU states according to foreign trade statistics, cars and motorhomes with petrol or diesel engine [Destatis 2008]<sup>12</sup>

Country \ Year	2008
<b>Non EU total</b>	<b>243 294</b>
<b>of which: CIS<sup>13</sup></b>	<b>112 548</b>
of which: Russia	40 758
of which: Belarus	24 518
<b>of which: West Africa<sup>14</sup></b>	<b>59 815</b>

Thus the overall picture regarding the fate of cars deregistered in Germany is as follows, see Figure 2.

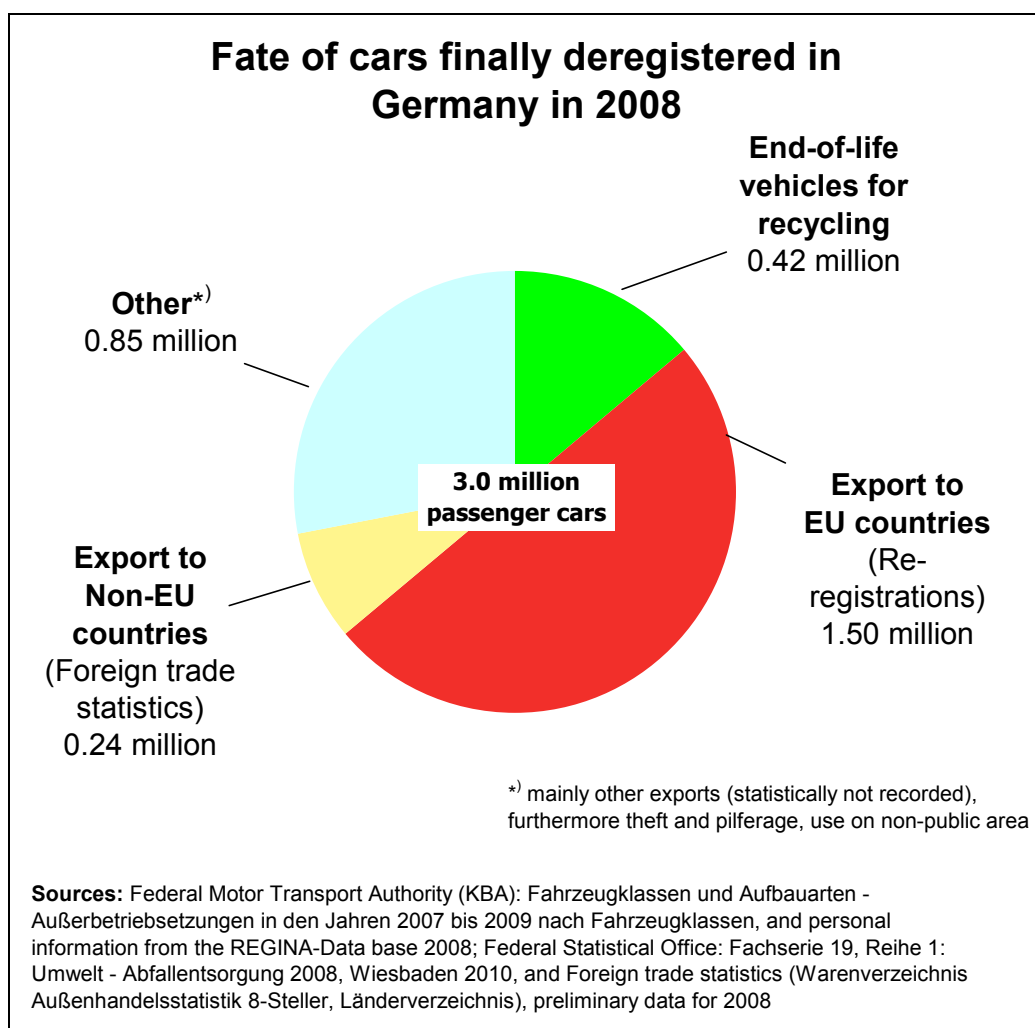
<sup>11</sup> [KBA 2008] Personal communication dated 23.4.2009 from Federal Motor Transport Authority

<sup>12</sup> [Destatis 2008] Federal Statistical Office: Warenverzeichnis Außenhandelsstatistik 8-Steller, Länderverzeichnis, vorläufige Daten für 2008. Wiesbaden 2009

<sup>13</sup> Commonwealth of Independent States, i.e. states of former Soviet Union excluding Baltic states

<sup>14</sup> Collective term for 18 West African states: Angola, Benin, Burkina Faso, Cameroun, Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Liberia, Morocco, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo

**Figure 2** Fate of cars finally deregistered in Germany<sup>15</sup> in 2008  
[KBA 2008], [Destatis 2008], [Destatis 2008b]



- In 2008, the dismantling facilities in Germany accepted 420 221 end-of-life vehicles, of which 417 534 came from within Germany (=W).
- According to the statistics on "Transboundary shipments of waste requiring notification"<sup>16</sup> no end-of-life vehicles (16 01 04\*) were exported from Germany in 2008.

<sup>15</sup> The number of final deregistrations has no longer been recorded since the change to off-road notifications in 2007. The number of final deregistrations is therefore based on the estimate in Table 4 (approx. 40% of off-road notifications).

[KBA 2008] see Footnote 11 and Table 5, [Destatis 2009] see Footnote 12 and Table 7.  
[Destatis 2008b]: Federal Statistical Office: Table 14 of the 2008 Waste Management Survey

<sup>16</sup> See COM Table 3 and the waste export statistics:  
<http://www.umweltbundesamt.de/abfallwirtschaft/abfallstatistik/dokumente/ZeitreiheExportAbfallarten.pdf>.

**Table 1 Exports of used cars, end-of-life vehicles and pre-treated body shells from Germany**

Reference year 2008	Unit	To other EU countries	To non-EU countries
Used vehicles exported (see Table 5 and Table 6)	Number	approx. 1,500,000	243 294
Average age of used vehicles exported	Years	not known	not known
ELVs exported (see COM Table 3)	Number	0	0
De-polluted (and dismantled) body shells exported (Waste code 16 01 06)	Number	approx. 17 000 <sup>17</sup>	
	Tonnes	12 891	

### 2.3.3 Section 3: Elements related to methods and quality of Sections 1 and 2

a) *How do you assess the quality of the information on both the national vehicle market and the export market?*

#### National vehicle market

The sources of data on the national vehicle market are stated in the footnotes to Table 4. The figures on new registrations, total registered fleet, average age and off-road notifications originate directly from the Federal Motor Transport Authority and are based on the official vehicle registrations. Their quality is therefore considered very good. Since the sum for vehicles classes M1 and N1 cannot be read off directly from these sources, the data are given for all motor vehicles and, in addition, for the subset "cars".

Since the changeover from final and temporary de-registrations to off-road notifications, the number of final registrations can no longer be determined directly from the statistics. The conversion is therefore based on the Federal Motor Transport Authority's estimate that about 60% of off-road notifications are temporary. Since the calculated number of approx. 3.0 million cars agrees very well with the statistics for the previous years (e.g. 2006 = 3.2 million), it may be assumed that this recalculation gives a good picture of the real situation.

The number of end-of-life vehicles arising comes from the waste statistics of the Federal Statistical Office, which originate from a full-coverage survey of all dismantling facilities. This indicates good quality (see also the remarks on the data quality of the figures for end-of-life vehicles in Section 2.1.2.)

<sup>17</sup> The waste statistics show only the weight of the body shells exported, not the number. The weight is converted to numbers by applying the conversion factor 753 kg/body shell (= 929 kg vehicle empty weight – 18.9% dismantled materials = 929 kg \* 81.1%).

## Used car exports

The data on exports of used cars to EU Member States come from the exchange of information under Directive 1999/37/EC. As this exchange has been steadily developing in recent years, it may be assumed that by now it provides a relatively full picture of re-registrations of used cars in the EU Member States. The figures cover 19 of the 26 possible EU Member States. The figure of 1.5 million must therefore be regarded as the lower limit of actual exports. Since the list of countries not covered includes France, and also Greece and Portugal, the volume of exports can be expected to be rather higher.

The figures for exports of used cars to non-EU countries come from the foreign trade statistics. While these include all countries worldwide, they suffer from the familiar problem of notification thresholds. Since these are lower than for exports within the EU, it may be assumed that the figures cover a fairly large proportion of actual exports.

Cases of used car transits from Germany through another EU state to a non-EU state would not be covered by the extra-EU foreign trade statistics. Neither would such exports be covered by the exchange of information under Directive 1999/37/EC if the car was not re-registered in the transit country. No information is available about any informal exports for purposes other than reuse.

It will be seen from Figure 2 that there is no statistical evidence of the fate of approx. 850 000 out of 3 million vehicles finally deregistered in 2008.

However, since there is no concrete indication of the size of the share missing from the statistics, it was decided not to extrapolate the actual exports from the figures in the statistics. The export figures must therefore be regarded as lower limits.

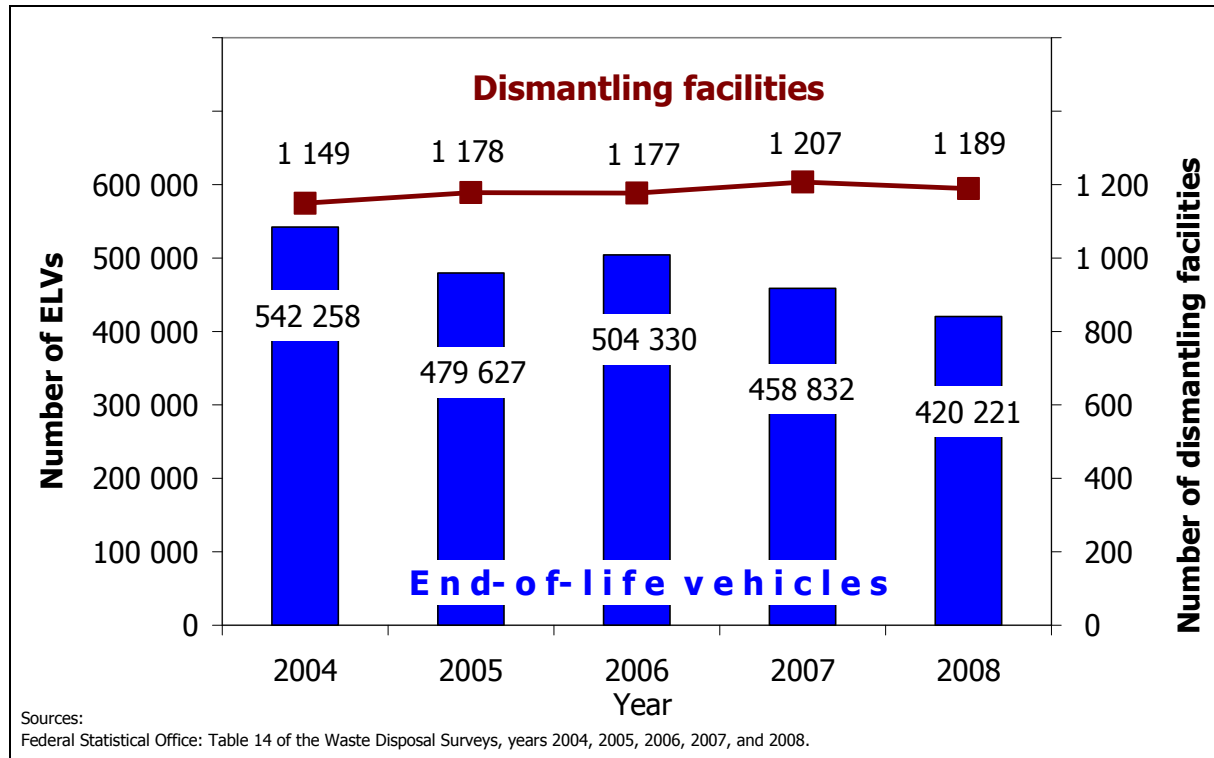
- b) *Describe the source of information, the quality of sources, the completeness (coverage rate) and the validation process.*
- c) *If Foreign Trade Statistics (FTS) are used as a source for the reporting of export of used cars, please explain how you estimate the amount which is not reported due to the (monetary) reporting thresholds for export.*
- d) *How did you correct for unofficial imports and exports, e.g. where used cars are exported but not for reuse as a car?*

For information on items b) to d), see under a)

### 3 Supplement: Development of end-of-life vehicle disposal and recycling/recovery rates since 2004

#### Development of ELV quantities

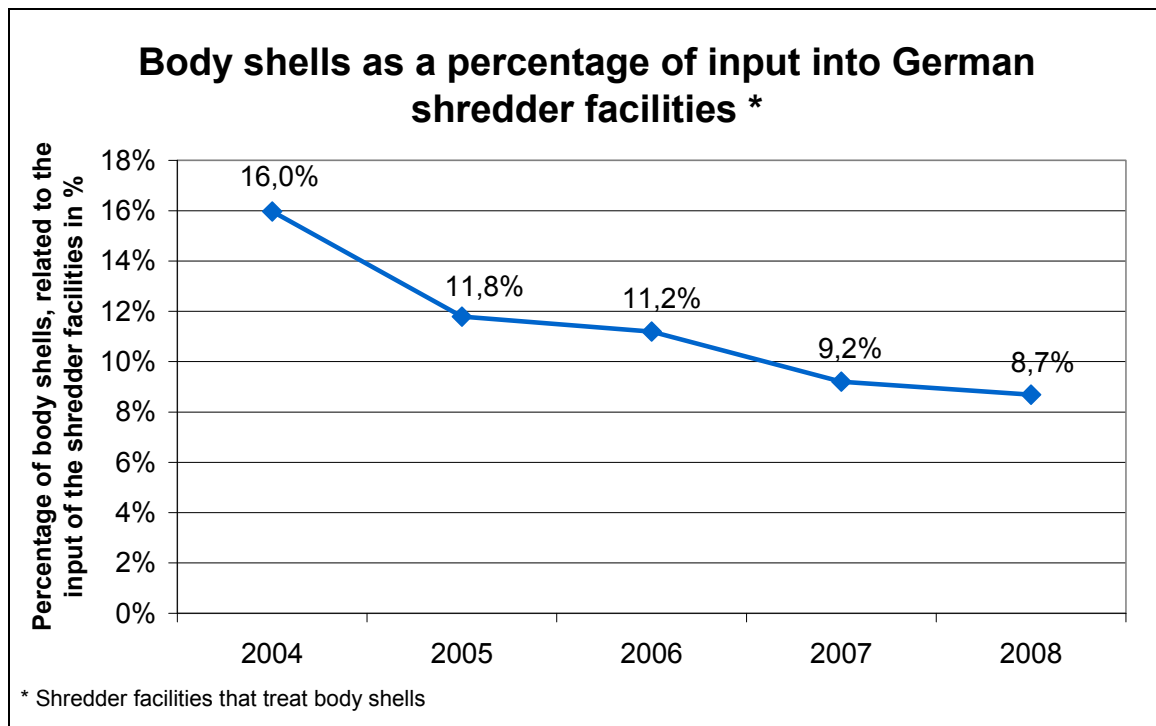
Between 2004 and 2008 the number of end-of-life vehicles fell from 0.54 million to 0.42 million, see Figure 3.



**Figure 3** Development of ELV quantities (total, delivered from within Germany and abroad) and the number of dismantling facilities in the waste statistics, Germany since 2004<sup>18</sup>

Body shells as a share of input into shredder plants that treat body shells fell by half during the same period (from 16% to 8.7%), see Figure 4.

<sup>18</sup> Note: Figure 3 shows the total number of end-of-life vehicles treated in the dismantling facilities. The figure W (total number of ELVs) which is relevant for calculating the rates is lower, as the ELVs received from abroad are deducted first. The number of dismantling facilities corresponds to the information in the waste statistics of the Federal Statistical Office. Slight discrepancies are possible compared with the number of dismantling facilities certified under the ELV Ordinance (*AltfahrzeugV*) as determined by GESA, for example because some certified facilities may not actually have accepted any end-of-life vehicles.



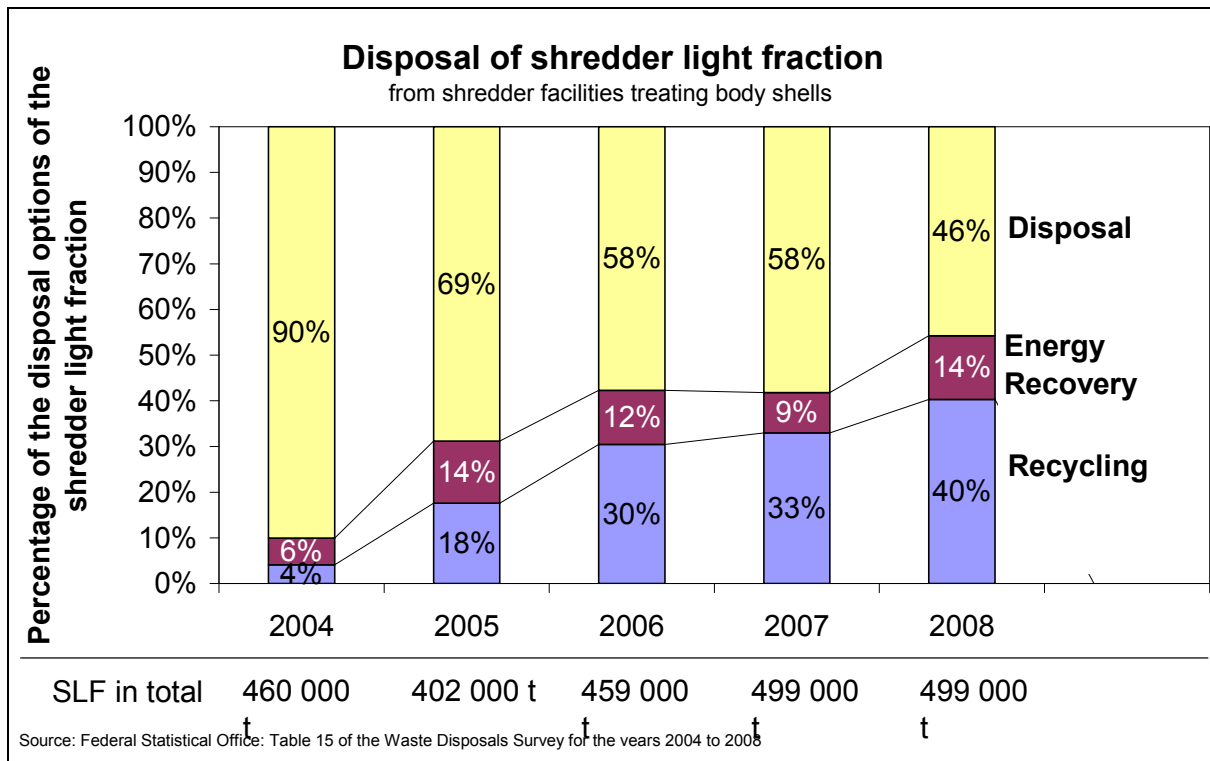
Source: Federal Statistical Office, Table 1 of the waste management surveys from 2004 to 2008

**Figure 4**      **Development of body shells as a percentage of input into German shredder plants, 2004 to 2008**

### Recycling/recovery of shredder light fraction

One important non-metallic waste stream from the treatment of end-of-life vehicles is the shredder light fraction. Whereas 90% of the shredder light fraction was still being disposed off in 2004, by 2008 the figure had fallen to 46%, see Figure 5. The diagram shows the total quantity of shredder light fraction “produced” in shredder plants that treat body shells. A certain proportion of this is due to body shells (2008: approx. 83,000 t out of approx. 500,000 t).

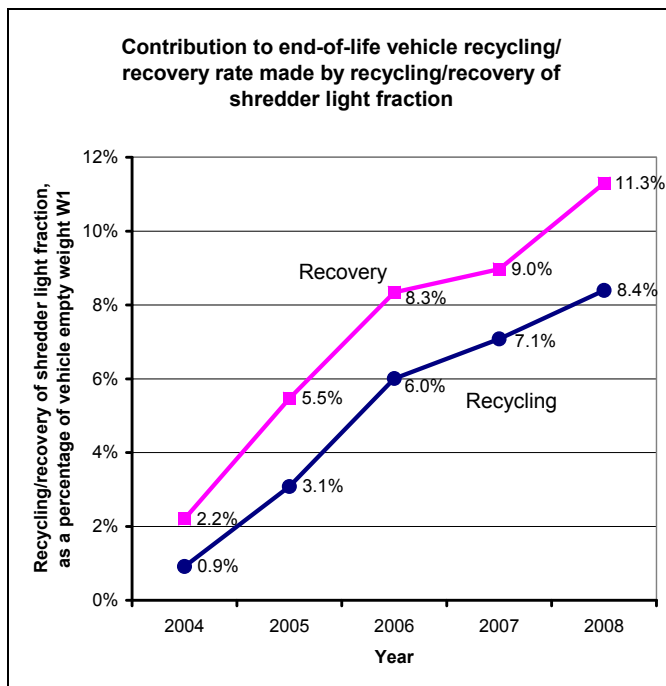




Source: Federal Statistical Office: Table 15 of the waste management surveys for the years 2004 to 2008.

Ultimate fate of shredder light fraction.

**Figure 5** Disposal of shredder light fraction from shredder plants treating body shells in Germany during the period 2004 to 2008



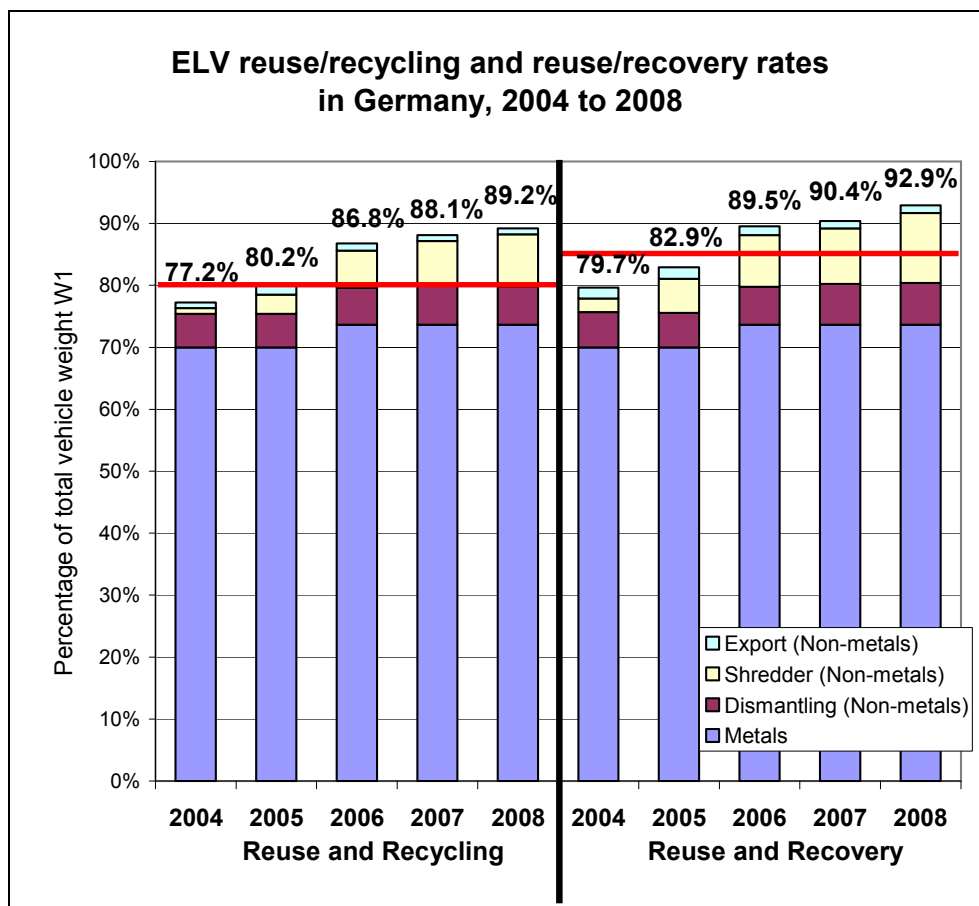
As a result of the steady increase in recycling/ recovery of shredder light fraction, the contribution of non-metallic shredder residues to the ELV recycling/ recovery rate has increased from about 2% in 2004 to more than 10%.

**Figure 6** Contribution to end-of-life vehicle recycling/ recovery rate made by recycling/recovery of shredder light fraction; figures, as a percentage of vehicle empty weight

**Development of ELV recycling/recovery rates**

On the basis of the statistical data in combination with the other described parameters, e.g. regarding the metal content assumption (73.6%), Germany has reached or exceeded the EU-wide required targets of 80% for reuse/recycling since 2005 and 85% for reuse/recovery since 2006.

As expected, the metallic fraction made the largest contribution to the recycling/recovery rates in 2008 with a share of 73.6%. The contribution by dismantling facilities as a result of reuse/recovery of non-metals (within Germany) came to 6.8% (in relation to vehicle empty weight) (Figure 7), whereas recovery of the shredder light fraction contributed 11.3 % to the reuse/recovery rate (see also Figure 6). Recycling/recovery of ELV parts or fractions outside Germany was of minor importance in 2008 (rather more than 1% of the rate).



**Figure 7 Contribution of dismantling facilities, shredder plants and recycling/recovery abroad to ELV reuse/recycling and reuse/recovery rates 2004 to 2008**