

Annual report on end-of-life vehicle reuse/recycling/recovery rates in Germany for 2015

pursuant to Art. 7 (2) of the End-of-Life Vehicles Directive 2000/53/EC

COM tables and Quality Report (description of data used)

pursuant to Articles 1 and 3 of Commission Decision 2005/293/EC on end-of-life
vehicles and the COM guidance document "How to report on end-of-life vehicles
according to Commission Decision 2005/293/EC"

(English translation)

0 General information

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Germany

Title

"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"

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

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Contents

0	General information	1
	Contents	2
	List of tables.....	3
	List of figures	4
1	Tables	
	pursuant to COM Decision 2005/293/EC for Germany, 2015	5
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	10
2.1	Chapter A) Information according to Article 1 (1) of COM Decision	
	2005/293/EC – Description of data used to determine ELV recycling/ recovery rates for Germany, 2015	10
	2.1.1 Section 1: Source of information	10
	2.1.2 Section 2: Quality of information sources.....	12
	2.1.3 Section 3: Determination of the weight	14
	2.1.4 Section 4: Recycling or recovery of exported ELVs respectively parts of ELVs.....	14
	2.1.5 Section 5: Other comments	15
	2.1.6 Input/output balance	20
2.2	Chapter B) Information according to Article 1 (2) of COM Decision	
	2005/293/EC – Metal content assumption	22
2.3	Chapter C) Information according to Article 1 (3) of COM Decision	
	2005/293/EC – Vehicle market, exports.....	25
	2.3.1 Section 1: Information on the national vehicle market.....	25
	2.3.2 Section 2: National market information on export of used vehicles, ELVs and de-polluted body shells	30
	2.3.3 Section 3: Elements related to methods and quality of Section 1 and 2	39
3	Supplement:	
	Development of end-of-life vehicle disposal and recycling/recovery	
	rates since 2004	41
3.1	Development of ELV quantities	41
3.2	Recycling / recovery of shredder light fraction	42
3.3	Development of ELV recycling/recovery rates	44
4	Appendix:	
	COM Tables with allocation of metals also to Tables 1 and 3.....	46

List of tables

Tables pursuant to Commission Decision 20025/293/EC (“COM tables”)

COM Table 1 (dismantling) for Germany, 2015. Non-metals only!	5
COM Table 2 (shredders) for Germany, 2015. Including all metals	6
COM Table 3 (exports) for Germany 2015. Non-metals only!	7
COM Table 4 (rates) for Germany, 2015	9
Appendix: COM Table 1 (dismantling) for Germany, 2015. Metals + non-metals	46
Appendix: COM Table 2 (shredders) for Germany, 2015. Proportionate metal shares only ..	47
Appendix: COM Table 3 (exports) for Germany, 2015. Metals + non-metals	48
Appendix: COM Table 4 (rates) for Germany, 2015.....	50

Additional tables can be found in the report

Table 1	Mono-shredder trials with body shells in Germany, 2016: Shredder light fraction and non-metal residues incurred, provisional results	18
Table 2	“Metal content assumption”, broken down into ferrous and non-ferrous metals.....	23
Table 3	Off-road notifications and final deregistrations in 2013 and 2014 (both updated from the previous year’s report) and in 2015	26
Table 4	Information on the national vehicle market.....	28
Table 5	Exports of used vehicles from Germany to other EU countries, 2015.	31
Table 6	Additional estimate for used vehicle exports from Germany to EU States not covered by the statistics in 2013 and 2014 (both updated) and 2015.....	33
Table 7	Exports of used vehicles from Germany to non-EU countries, 2015	34
Table 8	Additional estimate of used vehicle exports from Germany to non-EU countries not covered by the statistics in 2013 and 2014 (both updated) and 2015	35
Table 9	Exports of used vehicles, end-of-life vehicles and depolluted body shells from Germany.....	38



List of figures

Figure 1	Data streams for determining Germany's recycling/recovery rates under the ELV Directive	11
Figure 2	Statistically verified exports of used vehicles from Germany, 2008 to 2015 ...	36
Figure 3	Fate of finally deregistered M1 and N1 motor vehicles (used vehicles and end-of-life vehicles) in Germany, 2013 and 2014 (both updated) and 2015 ...	38
Figure 4	Development of ELV quantities (total, delivered from within Germany and abroad) and number of dismantling facilities in the waste statistics, Germany, 2004 to 2015	41
Figure 5	Development of body shells as a percentage of input into German shredder facilities, 2004 to 2015	42
Figure 6	Disposal of shredder light fraction from shredder facilities that treat body shells in Germany, 2004 to 2015	43
Figure 7	Contribution of the recycling/recovery of shredder light fraction (SLF) to Germany's end-of-life vehicle recycling/ recovery rates, 2004 to 2015.....	43
Figure 8	Contributions of dismantling facilities, shredder facilities and recycling/recovery abroad to Germany's ELV reuse/recycling and reuse/recovery rates, 2004 to 2015	44
Figure 9	Contributions of dismantling facilities, shredder facilities and recycling/recovery abroad to Germany's ELV reuse/recycling and reuse/recovery rates, 2004 to 2015, with figures for 2009 to 2014 adjusted to allow for the effects and after-effects of the Environmental Premium.	45

1 Tables

pursuant to COM Decision 2005/293/EC for Germany, 2015

Notes:

- According to the Commission's guidance document "How to report on end-of-life vehicles according to Commission Decision 2005/293/EC"¹ (as at: 28 April 2017), pages 9-10 and 21-22, **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.
- The COM tables are repeated in the **Appendix** to this Report, in this instance with allocation of the respective metals to Tables 1, 2 and 3.

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

COM Table 1 (dismantling) for Germany, 2015. Non-metals only! (see above)					
Materials from de-pollution and dismantling	Reuse	Re-cycling	Energy recovery	Total recovery	Disposal
	(A)	(B1)	(C1)	(D1=B1+C1)	E1
	in t	in t	in t	in t	in t
Batteries ^{a)}	29	2,086	0	2,086	280
Liquids (excluding fuel)	70	2,707	210	2,917	989
Oil filters ^{a)}	0	17	19	36	10
Other materials arising from de-pollution (excluding fuel) ^{a)}	1	0	46	46	5
Catalysts ^{a)}	4	351	0	351	4
Metal components ^{a) b)}	0	43	43	86	0
Tyres ^{a)}	686	5,449	4,458	9,907	113
Large plastic parts	45	1,285	0	1,285	26
Glass	110	1,002	0	1,002	17
Other materials arising from dismantling ^{a)}	4,183	0	2,677	2,677	6
Total	5,129	12,940	7,452	20,392	1,450

Explanatory comments and source details for this table may be found on the following page.

¹ <http://ec.europa.eu/eurostat/documents/342366/351811/ELV-Guidance/57d66ed3-dec2-4e93-8dbc-4084a89a0fd8>

Explanatory comments:

This table contains a few rounding differences (in each case of one tonne) because quantities were rounded up or down to the nearest whole tonne.

- a) Non-metal portion only. For metals see COM Table 2
- b) Non-metals from cable fractions are also recorded under the heading of metal components.

Source:

From Federal Statistical Office data, Tables 1 and 15 of the Waste Management Survey 2015.

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

COM Table 2 (shredders) for Germany, 2015. Including <u>all</u> metals (see above)				
Materials from shredding	Recycling	Energy recovery	Total recovery	Disposal
	(B2)	(C2)	(D2 =B2+C2)	(E2)
	in t	in t	in t	in t
Ferrous scrap (steel) ^{a)}	303,574	0	303,574	176
Non-ferrous materials (aluminium, copper, zinc, lead etc.)	47,419	0	47,419	0
Shredder light fraction (SLF) ^{b)}	45,892	30,141	76,034	15,265
Other	0	0	0	0
Total	396,885	30,141	427,027	15,441

Explanatory comments:

This table contains a few rounding differences (in each case of one tonne) because quantities were rounded up or down to the nearest whole tonne.

- a) The 176 t of metal scrap listed in the "Disposal" column originates from the metal portions of materials or components disposed of after dismantling.
- b) Shredder light fraction and other non-metallic shredder residues

Source:

From Federal Statistical Office data, Table 15 of the Waste Management Survey 2015.



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

COM Table 3 (exports) for Germany, 2015. Non-metals only! (see above)					
End-of-life vehicles, body shells, components and materials disposed of abroad	Total weight of end-of-life vehicles which are exported per country	Total recycling of (parts of) end-of-life vehicles exported (F1)	Total recovery of (parts of) end-of-life vehicles exported (F2)	Total disposal of (parts of) end-of-life vehicles exported (F3)	Remarks
1) End-of-life vehicles (WC 160104*)	0	0	0	0	No exports in 2015 according to the statistics on "Transboundary shipments of waste requiring consent" ^{a)}
Breakdown by countries: -- not applicable --					
2) Body shells from dismantling facilities (WC 160106)	2,796	646	1,183	1,612	Exported body shells: 10,749 t in total. Calculation of non-metals from body shells recovered and disposed of abroad, see explanation b)
Breakdown by countries: -- unknown --					
3) Components from dismantling facilities	221	104	214	7	Batteries ^{c)} , tyres, large plastic parts, glass etc.
Breakdown by countries, where known					
WC	Waste	Destination countries for waste exports (total, not just from dismantling facilities) included in the waste export statistics:			
- 160216	Components from used appliances	to Romania, Singapore			
- 160601*	Lead batteries	to Belgium, Slovenia, Spain, Czech Republic			
- 160801	Catalysts	to South Africa			
- 160807*	Catalysts	to Belgium, UK, Italy, USA			
4) SLF from shredders	610	402	586	24	Total SLF exported: WC 191003*: 1,678 t, WC 191004: 1,262 t. Of which 20.3% from ELVs.
Breakdown by countries, where known					
WC	Waste	Destination countries for waste exports according to waste export statistics (total, not just originating from ELVs)			
- 191003*	Fluff-light fraction	to Belgium			
- 191004	Fluff-light fraction	to the Netherlands			
Total	3,627	1,152	1,984	1,644	

Explanatory comments and source details for this table may be found on the following page.

Explanatory comments:

WC = Waste Code

This table contains a few rounding differences (in each case of one tonne) because quantities were rounded up or down to the nearest whole tonne.

- a) Possible ELV exports are recorded in the waste export statistics (see sources below).
According to these statistics, in 2015, no end-of-life vehicles were exported under waste code 160104* (end-of-life vehicles). Similarly, there are no exports ascribed to no. 8.11 "Scrapped passenger cars".
- b) Calculation of recycled/recovered and disposed of non-metals from exported body shells:

		Total weight	Of which recycled (minimum)	Of which recovered (minimum)	Of which disposed of (maximum)
1	Body shells, from dismantling facilities, exported for further treatment abroad	100% = 10,749 t	80% = 8,599 t	85% = 9,137 t	15% = 1,612 t
2	Of which recovered metal content	74.0% of 10,749 t = 7,953 t	7,953 t	7,953 t	0 t
3	Of which non-metals (line 1 minus line 2)	2,796 t	646 t	1,183 t	1,612 t

This table contains a few rounding differences (in each case of one tonne) because quantities were rounded up or down to the nearest whole tonne.

As there was no data available on recycling and recovery levels of body shells abroad, a minimum value ("to be on the safe side") has been assumed for calculation purposes: Despite the increased targets under the EC End-of-Life Vehicle Directive with effect from 2015 to 85% and 95% respectively, the old targets of 80% and 85% have been assumed, as in prior years.

The recovered metal portion in body shells is approximately 74.0%, see metal content assumption in Table 2 in number 2.2, letter b).

- c) Non-metal portion only. For metals see COM Table 2

Sources:

- Exports of body shells and other waste from end-of-life vehicle dismantling facilities:
"Erhebung über die Abfallentsorgung im Jahr 2015" (Waste Management Survey, 2015), Table 15, Federal Statistical Office.
- German Environment Agency (Umweltbundesamt [UBA]): "Grenzüberschreitende Verbringung von zustimmungspflichtigen Abfällen 2015 - Export" (Transboundary shipments of waste requiring consent, 2015 - Exports), https://www.umweltbundesamt.de/sites/default/files/medien/378/dokumente/export_2015.pdf
- German Environment Agency: "Grenzüberschreitende Verbringung von zustimmungspflichtigen Abfällen. Zeitreihe Export nach Abfallarten - Mengen in 1000 t. 2007-2016" (Transboundary shipments of waste requiring consent. Time series: Exports by waste category - Volumes in 1,000 t. 2007-2016), https://www.umweltbundesamt.de/sites/default/files/medien/2503/dokumente/zeitreihe_export_notifizierungspflichtiger_abfaelle_nach_abfallarten.pdf.

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

COM Table 4 (rates) for Germany, 2015					
From ...	Reuse	Total recycling	Total recovery	Total reuse and recycling	Total reuse and recovery
	(A)	(B1 + B2 + F1)	(D1 + D2 + F2)	(X1=A+B1+B2+F1)	(X2=A+D1+D2+F2)
	in t	in t	in t	in t	in t
COM Tab 1: Dismantling (A, B1, D1) (non-metals only)	5,129	12,940	20,392	18,069	25,520
COM Tab 2: Shredders (B2, D2) (incl. <u>all</u> metals)		396,885	427,027	396,885	427,027
COM Tab 3: Exports (F1, F2) (non-metals only)		1,152	1,984	1,152	1,984
Total	5,129	410,977	449,402	416,106	454,531
				Recycling and recovery rates 2015	
W (total number of end-of-life vehicles)	473,386 vehicles			87.7%	95.8%
W1 (total vehicle weight)	474,379 tonnes			X1/W1	X2/W1

Explanation:

This table contains a few rounding differences (in each case of one tonne) because quantities were rounded up or down to the nearest whole tonne.

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) of COM Decision 2005/293/EC – Description of data used to determine ELV recycling/ recovery rates for Germany, 2015

2.1.1 Section 1: Source 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 facilities) by the Statistical Offices of the Länder and the Federal Statistical Office under the Environmental Statistics Act (*Umweltstatistikgesetz*)² (Section 3 (1) No. 1). Tables 1.1, 14 and 15 of the "Waste Management Survey 2015" were used.

At the end of each reporting year, the ELV treatment facilities (1,195 dismantling facilities and 49 shredder facilities in 2015) enter their operational input and output quantities for the waste management survey in the statistical survey sheets DBA (dismantling facilities)³ and SHR (shredder facilities)⁴. These are then analysed, anonymised and summarised by the Statistical Offices of the Länder and subsequently by the Federal Statistical Office (see Figure 1). From the aggregated data, the German Environment Agency (*Umweltbundesamt [UBA]*) determines the national recycling and recovery rates for end-of-life vehicles.

² http://www.gesetze-im-internet.de/bundesrecht/ustatg_2005/gesamt.pdf

³ Sample waste disposal form 2015 - DBA for Bavaria:
https://www.statistik.bayern.de/medien/statistik/erhebungen/abfallwirtschaft/fbdba_fiu_201603.pdf

⁴ Sample waste disposal form 2015 - SHR for Bavaria:
https://www.statistik.bayern.de/medien/statistik/erhebungen/abfallwirtschaft/fbshr_fiu_201603.pdf

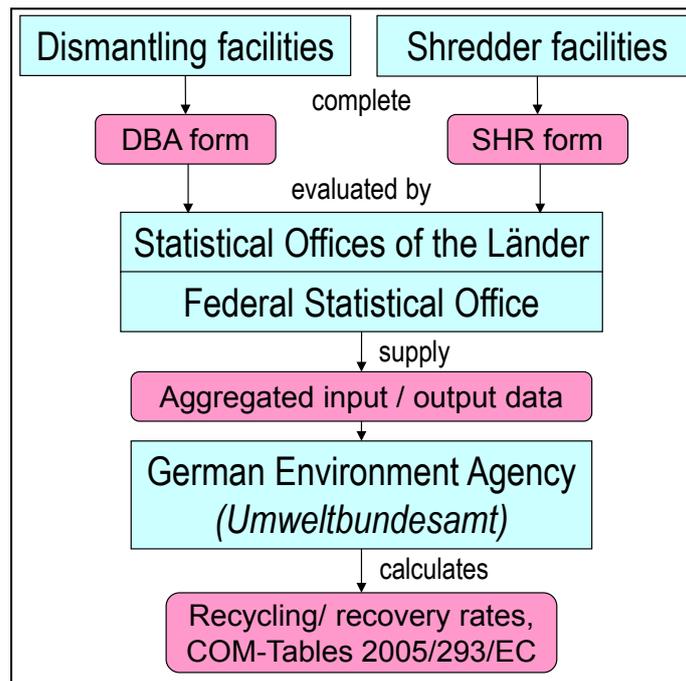


Figure 1 Data streams for determining Germany's recycling/recovery rates under the ELV Directive

The statistical questionnaires differentiate the facilities' output as follows:

- 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.

In the case of shredder light fraction (waste codes 19 10 03* and 19 10 04), the statistical questionnaires are also used to obtain information as to whether the shredder light fraction sent for recovery is ultimately recycled as material, recovered as energy, or disposed of.

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

The treatment of waste containing metals in shredder facilities produces, firstly, metallic fractions and secondly, non-metallic fractions (shredder light fraction and the non-metallic portion of the shredder heavy fraction). Since shredder facilities also treat other metal waste apart from end-of-life vehicle body shells, the fractions produced were split into one portion originating from body shell treatment, and one portion originating from other input fractions. Only the portion originating from body shell treatment may be included when calculating the ELV reuse/recycling/recovery rates.

- Metals:

The quantity of recovered/recycled metals originating from body shells is included in the "metal content assumption".

– Non-metals:

The quantity of shredder light fraction and non-metallic shredder residues originating from body shells was determined as follows:

The shredding of body shells produces approximately 76.5% metallic fractions and approximately 23.5% shredder light fraction. Consequently, a shredder light fraction / non-metallic shredder residues portion totalling 23.5% of the weight of the body shells (originating from within Germany) treated in the shredder was allocated to ELV treatment and therefore entered in COM Table 2.

The following waste codes were considered:

- 19 10 03* Fluff-light fraction and dust containing dangerous substances,
- 19 10 04 Fluff-light fraction and dust other than those mentioned in 19 10 03,
- 19 12 09 Minerals (for example sand, stones),
- 19 12 10 Combustible waste (refuse derived fuel).

Regarding methodological changes against the previous year, please refer to number 2.1.5 letter f).

After-effects of the Environmental Premium absent for the first time

In the years 2010 to 2014, more end-of-life vehicles were treated than had been incurred in that respective year, since the treatment of ELVs stockpiled by dismantling facilities following the 2009 Environmental Premium was delayed until subsequent years. Each year, the reduction of stockpiled ELVs slowed down. For 2015, for the first time, the number of ELVs treated (466,004) did not exceed the number incurred (473,386 from within Germany). As the situation normalised, for the first time since 2010, the calculated total ELV recovery rate dropped back below 100%. As such, it was no longer necessary to additionally calculate an “adjusted” rate to allow for the effects of the Environmental Premium.

2.1.2 Section 2: Quality of information sources

Coverage:

The data was collected from the whole of Germany from all 1,195 dismantling facilities for end-of-life vehicles and 49 shredder facilities with body shell treatment. The level of completeness is correspondingly high.

Data quality:

While the ELV recycling rates from 2004 to 2014 were calculated according to the same methodology, the assumptions and estimates used were updated for 2015, see number 2.1.5 letter f). The well-established data collection process remained unchanged. The quality of the data is considered good.

The survey yields plausible values for average vehicle weight, and the figure of 1,002 kg is on a par with the figure for 2011 (1,005 kg) and 2.1% higher than the previous year. In relation to the empty weight of ELVs arising in 2015, a slightly smaller percentage of

components and materials (18.2%) was dismantled by the dismantling facilities than in 2014 (19.0%).

There are no new findings regarding the quality of on-site data collection by the facilities compared with previous years.

The breakdown of the dismantled components and materials into material recycling and energy recovery, which is not evident from the waste statistics, is based on material types and a knowledge of the customary recovery paths in Germany. Previously used breakdowns have been updated (see number 2.1.5, letter f)), and are therefore of good quality. Based on industry association figures on the recovery and recycling of waste tyres in 2015 (excluding reuse), this has been updated to 55% material recycling and 45% energy recovery.

Various waste types comprise both metals and non-metals. The metal portions were deducted due to application of the "metal content assumption". The average metal contents for the affected waste types have been updated; see number 2.1.5, letter f). Thanks to the update, the data quality remains good.

Imports:

In the statistical questionnaires, the end-of-life vehicle treatment facilities state whether the ELVs accepted come from outside of Germany or within Germany. Of the 477,221 t (476,222 vehicles) of end-of-life vehicles accepted, 2,842 t (0.60%, or 2,836 vehicles) came from outside Germany. The 474,379 t (473,386 vehicles) of end-of-life vehicles accepted for treatment from within Germany were entered as W1 (total vehicle weight). In view of the extremely low import share of less than one percent, it was decided to dispense with a "correction factor" for the output, since this would make a difference of only 0.03% to the rate calculated.

Metal content assumption:

The metal content of the vehicles and the breakdown into ferrous and non-ferrous metals are calculated based on extensive data from German and foreign vehicle manufacturers; see number 2.2. The quality of this estimate can therefore be considered very good. Given the short time that had elapsed, we continued to use the 2013 "Metal content assumption" for the 2015 reporting year. This covers 95% of the vehicle market.

The recycled portion of the metal content of vehicles was updated from 97% to 98%; see number 2.1.5, letter f). The estimate which had been used for many years, derived from the explanatory memorandum to the 2002 German End-of-Life Vehicle Ordinance, has therefore been replaced with a higher figure based on the results of a shredder experiment.

Shredder light fraction:

The input from the 49 body shell shredders totalled approximately 3.8 million tonnes in 2015. The proportion of input attributable to body shells decreased slightly again, from 11.9% in 2014 to 10.8% in 2015. The principal other input materials of the ELV shredders in 2015 were iron and steel (55%), ferrous metals (17%), (mixed) metals (5%) and used electrical and electronic appliances (likewise 5%).

To calculate the ELV recovery/recycling rates, it was necessary to determine the proportion of shredder light fraction originating from the treatment of body shells. As such, a quantity of shredder light fraction equivalent to 23.5% of the weight of treated body shells was allocated to ELV recovery/recycling; see numbers 2.1.1 and 2.1.5, letter f). This proportion was updated from prior years. The 391,103 t (approximate figure) of body shells (accepted from Germany and) shredded in 2015 produced approximately 91,900 t of shredder light fraction. This equates to 20.3 % of the 451,838 t (approximate figure) of shredder light fraction incurred in total⁵; see also pages 42/43.

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 (1), no. 23 of the German ELV Ordinance (*Altfahrzeug-Verordnung*). For a definition of the vehicle empty weight in accordance with Section 2 (1), No. 23 of the Altfahrzeug-Verordnung, refer to the 2009 Report.

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

Recycling or recovery of exported end-of-life vehicles:

No end-of-life vehicles were exported in 2015, refer to explanatory comments on COM Table 3 in section 1.

Recycling or recovery of exported body shells:

In terms of quantity, exports of body shells and ELV parts from Germany play only a minor role: Recycling or recovery of non-metals from exported body shells accounts for only 0.4% of the overall recovery rate.

The quantities of body shells exported abroad for recovery can be taken from the statistics. No information is available concerning the proportion of body shell components that is ultimately recycled or recovered abroad. For metal recycling, a metal content assumption of 74.0% was used, as in Germany. For total recycling and total recovery, as in previous years, the target figures of 80% and 85% applicable until 2014 were used as minimum levels to be “on the safe side”, since figures were not available from abroad.

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 applied in the same way as for recovery within Germany (see number 2.1.5, letter c)).

Recycling or recovery of exported shredder light fraction:

⁵ As well as waste codes 19 10 03* and 19 10 04, waste codes 19 12 09 and 19 12 10 were also added as shredder light fraction; see numbers 2.1.1 and 2.1.5, letter f).

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. When 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 COM Table 2

Application of the metal content assumption means that COM Table 2 – in line with the notes in the COM guidance document – 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 COM 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 (*Altfahrzeug-Verordnung*), end-of-life vehicles pass through a two- to three-stage disposal process in the following order:

(→ optional: acceptance or collection facility,)

→ dismantling facility,

→ shredder facility.

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

For the entries in COM Tables 1 to 4, care has been taken to eliminate the possibility of double counting: All metals (in line with the metal content assumption) are entered in lines 1 and 2 of COM Table 2, and COM Tables 1 and 3 contain only non-metals; this is also true of the reuse column (A). Regarding non-metals, COM Tables 1 and 2 contain only output for Germany. All outputs of non-metals destined for other countries are covered by COM Table 3.

As an alternative, the data from COM Tables 1 and 3 has also been presented in such a way that it includes the metal portions. The resultant representation of COM Tables 1 to 4 is included in the Appendix to this Annual Report. Even with this alternative grouping, the final outcome is the same.

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 were performed or assumptions made.

As mentioned above, the waste statistics do not provide a breakdown of the metallic fraction of the dismantled components and materials or the recovery path (material recycling or energy recovery). It was therefore necessary to make certain assumptions. For many materials, the breakdown is derived from the type of material (e.g. glass and metal not recoverable as energy). For other waste types, existing knowledge was updated within the context of a study on ELV monitoring methods⁶ – see number 2.1.5, letter f).

Within the context of this study, the volume of shredder light fraction per body shell and the metal yield of the “metal content assumption” were also updated. Provisional results from the study suggest that the shredder light fraction originating from end-of-life vehicles accounts for 23.5% of body shell input – see number 2.1.5, letter f). The metal yield in the “metal content assumption” was updated from 97% to 98% based on the provisional results of the study, see number 2.2.

In line with the COM guidance document, only non-metals are entered in COM Table 1 and COM Table 3. COM Table 2 shows all metals 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: Information is incomplete regarding the destination countries in COM Table 3 (Exports).

Since no end-of-life vehicles (waste code 160104*) have been exported since these records began, destination countries are irrelevant here. In the body shells category, the percentage of body shells exported is once again very low, at 10,749 t or 2.3% of the total vehicle weight W1 (474,379 t). The same applies to exported components and materials from dismantling (metals and non-metals: 6,663 t, i.e. 1.4% of W1) and shredder light fraction (610 t; 0.1%).

For some of the exported dismantled fractions and for the shredder light fraction, we were able to obtain data on destination countries; see COM Table 3. Although the statistics used⁷ do not give separate data on the volumes from ELV treatment and their destination countries, they do indicate the total quantities exported from Germany for selected waste fractions (generally considerably more than the quantities exported by the ELV treatment facilities) and the destination countries.

e) Description of validation process (How does Germany 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 comparison, anticipated waste

⁶ Refer to footnote 8 for the full title of this study.

⁷ Refer to source information below COM Table 3.

types, comparison with the previous year). The German Environment Agency checks the information from a technical point of view, e.g. on the basis of the anticipated quantities as a result of vehicle composition, see number 2.1.2 above, remarks on plausibility.

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

ELV recycling and recovery rates

The method of calculating the recycling and recovery rates has remained unchanged since the reporting year 2004. Since the technical and legal conditions have evolved in the interim, in 2015 the Federal Ministry for the Environment and the German Environment Agency initiated a study under the departmental research plan (REFOPLAN) to update the databases and assumptions for the monitoring of ELV recycling and recovery rates under the End-of-Life Vehicle Directive 2000/53/EC⁸. As part of this study, an ELV recycling/recovery and shredder campaign was also conducted in 2016 with 425 end-of-life vehicles (with a mass of 437 metric tonnes). The final results of the study are currently being finalised. After the project has been signed off, the Commission will be notified of the results of the ELV recycling/recovery and shredder campaign.

The provisional results of the study were used to update the following basic data and assumptions:

– Basic dismantling data:

The breakdown into the metal portion of dismantled components and materials and their recovery path (material recycling or energy recovery), which is not apparent from the waste statistics, was researched as at 2015.

Examples:

- Provisional new metal content of waste tyres (16.5% instead of the simplified figure of 0% in prior years) and cables (35% instead of 100%).
- Provisional waste oil data: Oil content of waste oil in waste code 13 02 05*: 90.5%, of which 95% material recycling.

– Metal yield:

The recovered metal portion or metal yield in the “metal content assumption” was updated from 97% to 98% based on the provisional results of the study, see number 2.2, letter b.

– Proportion of shredder light fraction from body shells:

As shredder facilities treat other input materials as well as body shells, it is not possible to ascertain directly from ongoing operation the volume of shredder light fraction incurred per body shell. Since reporting on ELV recycling/recovery rates began, we have operated

⁸ “Evaluating and updating the method to determine the ELV recycling and recovery rates by shredder trials under the EC End-of-life Vehicle Directive 2000/53/EC” (REFOPLAN research code [FKZ] 3715 33 305 0)

on the assumption that the shredder light fraction incurred equates to 25% of the body shell weight.

In the aforementioned study, mono-shredder trials with body shells were conducted at two shredder facilities in 2016.

As some of the ELVs from the shredder experiment were incurred in 2015 and the rest in the initial months of 2016, and shredder technology has not changed since 2015, the results from the shredder trial are also applicable to 2015.

The provisional results of the shredder experiments found that 16.4% and 19.2% respectively of shredder light fraction in relation to body shell input were incurred, see Table 1. The non-metal portion, accounting for approximately half of the shredder heavy fraction (5.8% and 5.6% respectively), should be added to these fractions in order to fully cover the shredder outputs in COM Table 2. As such, the line “shredder light fraction” in COM Table 2 should be interpreted as “non-metal shredder residues”.

Table 1 Mono-shredder trials with body shells in Germany, 2016: Shredder light fraction and non-metal residues incurred, provisional results.

Fraction	Shredder 1: Non-metal residues incurred in relation to body shell weight	Shredder 2: Non-metal residues incurred in relation to body shell weight
Shredder light fraction	16.4%	19.2%
Non-metal portion of shredder heavy fraction^{a)}	11.6% * approx. 50% = 5.8%	11.1% * approx. 50% = 5.6%
Total non-metal residues	22.2%	24.8%
Mean from both shredders	23.5%	

a) Roughly half of the shredder heavy fraction is comprised of non-metals.

As the mean of both shredder trials, therefore, a total of 23.5% non-metal residues (shredder light fraction and non-metal shredder heavy fraction) in relation to body shell weight was incurred. When calculating rates, therefore, the previous assumption of 25% was updated to the provisional result from the trial of 23.5%.

– Waste code of shredder residues

To date, when calculating rates, the disposal paths (material recycling, energy recovery, disposal) of the waste fractions were considered under the heading “Fluff-light fraction” (waste codes: 19 10 03* and 19 10 04, waste generation in 2015: 390,162 t), see Figure 6. However, as post-shredder activities continue to grow, more differentiated fractions are being produced from the shredder residues, some of which are disposed of under additional waste codes. In particular, the aforementioned shredder trials revealed the use of the following additional relevant waste codes for the shredder light fraction:

- 19 12 09 minerals (for example sand, stones),
Recovery of this fraction refers to material recycling.
- 19 12 10 combustible waste (refuse derived fuel).
Recovery of this fraction refers to energy recovery.
- 19 12 12 other waste (including mixtures of materials) from mechanical treatment of
wastes other than those mentioned in 19 12 11.

The first two fractions, 19 12 09 and 19 12 10 (total incurred in 2015: 61,676 t), were included in the calculation of the shredder light fraction recovery/recycling rates for the first time (see Figure 6).

Fraction 19 12 12 undergoes either material recycling or energy recovery, depending on its composition. The waste statistics from the Federal Statistical Office do not supply any information on the nature of recovery/recycling. As such, our current knowledge did not permit a reasoned breakdown for calculating rates.

Vehicle market / fate of vehicles

Already within the annual report on the year 2014, the method for accounting the fate of vehicles and completing the data on the whereabouts was updated, based on the provisional results from the study into the fate of vehicles; see previous year's report, number 2.3. The results of the study into the fate of vehicles were published this year⁹. The previous year's method was carried forward to 2015. There were a few minor amendments to the data and calculations compared with the provisional results presented the previous year.

Regarding finally deregistered motor vehicles, new this year, according to the calculations of the Federal Motor Transport Authority (*Kraftfahrt-Bundesamt [KBA]*), is the deduction of approximately 4% in each case from the total number of M1¹⁰ and N1¹¹ motor vehicles taken out of service, to allow for motor vehicles that were deregistered more than once within one year and eliminate double counting. In a second computational stage, as in the previous year, the number of finally deregistered motor vehicles was calculated from the total number of motor vehicles taken out of service based on the deregistration rates of 33.3% (M1 motor vehicles) and 41.4% (N1 motor vehicles) respectively.

For exports of used vehicles (to EU countries and non-EU countries) not covered by the statistics, the additional estimates calculated for the base year 2013 were updated (generally proportionately).

⁹ Knut Sander, Lukas Wagner, Joachim Sanden, Henning Wilts: Development of proposals, including legal instruments, to improve the data situation on the whereabouts of end-of-life vehicles. Hamburg, February 2017. On behalf of the German Environment Agency. Research code (FKZ) 3714 33 315. Report in German: <https://www.umweltbundesamt.de/publikationen/entwicklung-von-loesungsvorschlaegen>, English version: <https://www.umweltbundesamt.de/publikationen/development-of-proposals-including-legal-in>.

¹⁰ Vehicle class M1: Passenger cars (motor vehicles predominantly for the carriage of passengers and comprising no more than eight seats, not including the driver's seat). Definition: See Annex II, section A, no. 1 of Framework Directive 2007/46/EC establishing a framework for the approval of motor vehicles and their trailers.

¹¹ Vehicle class N1: Light commercial vehicles (motor vehicles predominantly for the carriage of goods and having a maximum mass not exceeding 3.5 tonnes). Definition: See Annex II, section A, no. 1 of Framework Directive 2007/46/EC establishing a framework for the approval of motor vehicles and their trailers.

g) Description of 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 (*Altfahrzeug-Verordnung*), end-of-life vehicles must be transferred to a dismantling facility (or alternatively, to an acceptance or collection facility, which is required to pass the ELV on to a dismantling facility). Dismantling facilities are required to issue certificates of destruction for the end-of-life vehicles they accept and to treat them in accordance with the provisions of the Ordinance. Certificates of destruction must therefore be issued for all end-of-life vehicles.

As already mentioned under number 2.1.1, the annual notifications from dismantling facilities about their input volumes (i.e. the end-of-life vehicles accepted) are incorporated into the waste statistics prepared by the Federal Statistical Office.

Until now, however, the information on only some of the certificates of destruction issued has been recorded in the Central Vehicle Register (ZFZR) at the Federal Motor Transport Authority. The “Third Ordinance Amending the Vehicle Registration Ordinance and Other Road Traffic Regulations” (*„Dritte Verordnung zur Änderung der Fahrzeug-Zulassungsverordnung und anderer straßenverkehrsrechtlicher Vorschriften“*) of 23 March 2017¹² implements a number of measures with a view to improving this situation. These measures will enter into force on 1 October 2017.

Additionally, the Federal Ministry for the Environment and the German Environment Agency are currently evaluating recommendations from the German study into the fate of vehicles⁹ aimed at further narrowing the “statistical gap” concerning the fate of finally deregistered vehicles (see Figure 3). Building on this, suitable measures are to be derived in discussions with all affected players and then implemented.

2.1.6 Input/output balance

The recommended mass balance $X2+E1+E2+F3 = W1$ revealed the following for 2015:

X2 =	454,531 t	(Total reuse and recovery)
E1 =	1,450 t	(Disposal from dismantling, excluding metals)
E2 =	15,441 t	(Disposal of shredder light fraction and disposal of metals)
F3 =	1,644 t	(Disposal by export, excluding metals)
<hr/>		
Total	473,066 t	(Total output)

¹² Quick-access to source: Federal Law Gazette (*Bundesgesetzblatt*) Part I 2017, no. 14 of 29/03/2017, page 522 – website:

https://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl#_bgbl_%2F%2F*%5B%40attr_id%3D%27bgbl117s0522.pdf%27%5D_1498126076092

Comparison with the total end-of-life vehicles weight W1 (474,379 t):

Difference = $-1,313 \text{ t} = -0.3\%$.

For the first time since 2009, the output volumes closely matched (difference -0.3%) with the mass of end-of-life vehicles incurred; the figures are therefore almost balanced. Since 2010, output had always been higher, as facilities continued to reduce the stockpiled end-of-life vehicles from the 2009 Environmental Premium (difference in 2012: $+8.5\%$, 2014: $+3.8\%$), whereby the after-effects of the Environmental Premium became progressively weaker over time. 2015 is therefore the first year with no discernible after-effects from the Environmental Premium.

The delayed treatment and recovery/recycling of stockpiled end-of-life vehicles as an after-effect of the environmental premium led to a statistical overall recovery/recycling rate of more than 100% between 2010 and 2014 (maximum in 2011: 108.2%) relative to the number of end-of-life vehicles incurred in the reporting year. In 2015, for the first time, the recycling/recovery rate dropped back to below 100% (95.8%).

2.2 Chapter B) Information according to Article 1 (2) of COM Decision 2005/293/EC – Metal content assumption

According to Article 1, paragraph (2) of Commission Decision 2005/293/EC, the "metal content assumption" is based on data relating to

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

a) Metal content of the vehicles:

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

For the reporting year 2012, the assumed metal content of ELVs was updated based on new registrations of M1¹³ and N1¹⁴ motor vehicles in 2000, weighted according to the respective registration volumes per manufacturer. The database for this update was further improved in the 2013 reporting period, and now once again covers 95% of the vehicle market; see annual report on the year 2013¹⁵.

With an average ELV age of around 15 years (or 17 to 18 years¹⁶) (see Table 4), 2000 is the mean year of first-time registration for ELVs arising in 2015 (or 2017/2018). As the average metal content of new vehicles only changes very slowly over time, the calculated data should be applied over 5 years, from the reporting year 2012 to the reporting year 2016.

The metal content of vehicles and breakdown into ferrous and non-ferrous metals is calculated from extensive data material from the German and international vehicle manufacturers on the vehicle registration volume for the various brands in the year 2000 and the metal content of vehicles. Table 1 of the annual report on the year 2013¹⁵ shows the average metal content of new registrations (M1 and N1 motor vehicles) for the year 2000 by manufacturer (anonymised). The metal contents were further sub-divided into ferrous and non-ferrous metal contents, see Table 2 of the annual report on the year 2013.

The calculated weighted average metal content is 75.5%, 65.3% of which are ferrous metals and 10.2% non-ferrous metals (weighted averages).

b) Reuse/recycling/recovery of the metal content

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

Since reporting began, reuse/recycling/recovery of the metal content was estimated at 97%, as outlined in the explanatory memorandum to the German ELV Ordinance (*Altfahrzeug-Verordnung*) of 2002. For 2015, for the first time, the metal yield was backed up with data

¹³ Vehicle class M1: see footnote 10.

¹⁴ Vehicle class N1: see footnote 11.

¹⁵ Annual Report on end-of-life vehicle reuse/recycling/recovery rates in Germany, 2013, German: www.bmub.bund.de/N50180/, English: www.bmub.bund.de/N50180-1/

¹⁶ According to the provisional results of the study on ELV monitoring methods (see footnote 8).

from the end-of-life vehicle recycling/recovery and shredder campaign (see number 2.1.5 and footnote 8).

The provisional results of the metal flow analysis at one of the two shredders indicated 100% recovery/recycling of metals from dismantling and of the iron/steel fraction obtained in the shredder. Of the shredder heavy fraction, only 0.1% (relative to the total mass of end-of-life vehicles used for this trial) was disposed of as iron dust. Following an additional metal separation process, around 0.7% of metals remained in the shredder light fraction, part of which was disposed of. Hence, the provisional results of the shredder trial point to a metal yield of more than 99%. Increasing the previous assumption of 97% to (at least) 98% is therefore considered justified.

Using the formula

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

produces the following figure for metal content recycled/recovered in Germany:

"Metal content assumption" in Germany = 75.5% * 98% = 74.0%

Allowing for 98% recycling/recovery of the metal content, this yields 74.0% for the "metal content assumption", broken down into 64.0% ferrous metals and 10.0% non-ferrous metals recycled/recovered, relative to the vehicle empty weight (see Table 2).

Table 2 "Metal content assumption", broken down into ferrous and non-ferrous metals

Metal content	Total metals	Ferrous metal	Non-ferrous metal	Remarks
Weighted average metal content of M1 and N1 motor vehicles	75.5%	65.3 %	10.2%	Statement on metal content valid for 95% of the German vehicle market in 2000; see annual report on the year 2013
Allowing for a recovery/recycling rate of 98%:				
"Metal content assumption"	74.0%	64.0%	10.0%	Metal content recycled/recovered

c) Coverage rate:

How does Germany ensure that it meets the required coverage of 95%?

The data supplied by 21 vehicle manufacturers on the metal content assumption covers 95.2% of new registrations in the year 2000 (3,406,164 out of 3,576,206 new registrations). This level of coverage therefore meets the minimum requirement of 95% as specified in Article 1 (2) of Commission Decision 2005/293/EC.

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

In line with the COM guidance document (page 10 and pages 21-22), all recycled/recovered metals resulting from the calculation for the "metal content assumption" are entered in COM Table 2. COM Tables 1 and 3 contain information about non-metals only.

Notes on the Appendix to this Annual Report: As an alternative, the data from COM Tables 1 and 3 has also been presented in a format which includes the metals. The resultant representation of COM Tables 1 to 4 may be found in the Appendix to this Annual Report. In this instance, COM Table 2 only contains metals from the shredder output, calculated as the difference between the "metal content assumption", less the metals reused and recovered from dismantling and exports, see COM Tables 1 (dismantling) and 3 (exports).

Consequently, as well as non-metal portions, COM Tables 1 and 3 also include the metal portions of components and materials from dismantling and export that were reused, recycled and disposed of.

2.3 Chapter C) Information according to Article 1 (3) of COM Decision 2005/293/EC – Vehicle market, exports

Results of the study into the fate of vehicles

Last year, the data situation on the vehicle market and the fate of vehicles improved, based on the provisional results of a study into the fate of finally deregistered vehicles. The results of the study were published this year⁹. The method for calculating the fate of vehicles outlined in the previous year's report was carried forward to the year 2015, apart from a few updates (see number 2.1.5, letter f) associated with the final results of the study.

Using the final results of the study, the “statistical gap” of around 1.2 million used cars and end-of-life vehicles for the year 2013 (see annual report for 2013) was reduced to around 0.28 million (2013), 0.47 million (2014) and 0.35 million (2015) used vehicles and end-of-life vehicles¹⁷, see Figure 3. The key factor in closing this gap was a recalculation of the actual number of finally deregistered motor vehicles, together with qualified estimates to supplement the statistical data on the export of used vehicles (into EU and non-EU countries). The final results of the study are currently being evaluated, so that expedient and pertinent measures may be derived.

2.3.1 Section 1: Information on the national vehicle market

In 2015, the number of new registrations of M1 and N1 motor vehicles¹⁸ rose by 5.5% compared with 2014. The average age of the vehicle fleet and the number of motor vehicles registered continued to rise slowly, as in previous years, and on 1 January 2015 totalled 9.0 years for passenger cars and (unchanged) 7.7 years for trucks, with a total of 46.6 million M1 and N1 motor vehicles. The number of ELVs was down 7.6% against 2014, dropping to below half a million.

Since both M1 and N1 motor vehicles (light commercial vehicles) had been included in final deregistration figures for the previous year, and the proportion of final deregistrations has been recalculated by the Federal Motor Transport Authority, this report has deducted an additional 4% of motor vehicles taken out of service to eliminate double counting of multiple deregistrations of the same motor vehicle in one year. Analogously, the final deregistration figures for 2013 and 2014 were also retrospectively updated. In 2015, 2.82 million passenger cars (M1) and light commercial vehicles (N1) were finally deregistered, see Table 3 and Table 4.

¹⁷ Based on the provisional results of the study, the previous year's report had calculated a statistical gap of 0.35 million motor vehicles for 2013 and 0.54 million motor vehicles for 2014. The updated figures were derived using a new methodology compared with the provisional results of the study, by eliminating the 4% (approximate figure) of vehicles that were deregistered more than once per year from the statistics.

¹⁸ For a definition of M1 and N1 motor vehicles, refer to footnotes 10 and 11.



Table 3 Off-road notifications and final deregistrations in 2013 and 2014 (both updated from the previous year's report) and in 2015

	Off-road notifications ^{a)}	Multiple off-road notifications ^{b)}	Motor vehicles taken out of service	Deregistration rate ^{c)}	Final deregistrations
Column 1	Column 2	Column 3	Column 4 = col. 2 * (100 % - col. 3)	Column 5	Column 6 = col. 4 * col. 5
2013 – Updated calculation					
M 1 – Passenger cars	8,149,973	4.3%	7,799,524	33.3%	2,599,841
N 1 – Light commercial vehicles	361,499	3.9%	347,401	41.4%	143,824
Total M1+N1 2013	8,511,472		8,146,925		2,743,665
2014 – Updated calculation					
M 1 – Passenger cars	8,138,212	4.3%	7,788,269	33.3%	2,593,494
N 1 – Light commercial vehicles	369,438	3.7%	355,769	41.4%	147,288
Total M1+N1 2014	8,507,650		8,144,038		2,740,782
2015					
M 1 – Passenger cars	8,370,981	approx. 4%	8,036,142	33.3%	2,676,035
N 1 – Light commercial vehicles	368,652	approx. 4%	353,906	41.4%	146,517
Total M1+N1 2015	8,739,633		8,390,048		2,822,552

Explanatory comments:

Red figures = Updated figures

Data sources for table columns 2, 3 and 5 – see following page.

Data sources:

- a) Data source (for column 2) for the number of off-road notifications:
Federal Motor Transport Authority (*Kraftfahrt-Bundesamt [KBA]*): *Außerbetriebsetzungen von Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 2007 bis 2016 nach Fahrzeugklassen* (Off-road notifications of motor vehicles and trailers, 2007 to 2016, by vehicle class), http://www.kba.de/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/FahrzeugklassenAufbauarten/a_fzkl_zeitreihe.html?nn=664274, and
Federal Motor Transport Authority: *Außerbetriebsetzungen von Lkw in den Jahren 2006 bis 2015 nach zulässiger Gesamtmasse* (Off-road notifications of trucks, 2006 to 2015, by permissible maximum mass), http://www.kba.de/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/Groessenklassen/a_groessenklassen_lkw_zeitreihe.html?nn=664174.
- b) Multiple off-road notifications = proportion of motor vehicles with more than one off-road notification in the respective base year.
Data source (for column 3) for the correction factors: Study into the fate of end-of-life vehicles, see footnote 9.
- For 2013: Correction factors from tables 41 and 42 in chapter 5.1.2 of the study. The correction factors evidently represent the mean of the correction factors calculated for 2010 and 2014.
 - For 2014: Correction factors calculated by the research team of 4.3% (M1 motor vehicles) and 3.7% (N1 motor vehicles) (refer to the respective paragraph above Tables 35 and 36 in chapter 5.1.1 of the study).
 - For 2015: Rounded value of 4% recommended by the research team as a correction factor (refer to the respective paragraph above Tables 35 and 36 in chapter 5.1.1 of the study and recommendation 1a in chapter 6.1 of the study), because the correction factor was not updated for the year 2015.
- c) Data source (for column 5) for the deregistration rate:
Deregistration rate calculated by the research team of 33.3% (M1 motor vehicles) and 41.4% (N1 motor vehicles) (refer to Tables 41 and 42 in chapter 5.1.2 of the study).

Table 4 Information on the national vehicle market

National vehicle market Germany	Unit	Reference year 2014 (updated)			Reference year 2015		
		M1 and N1 motor vehicles			M1 and N1 motor vehicles		
		Total	Of which vehicle class M1 (passenger cars)	Of which vehicle class N1 (light commercial vehicles)	Total	Of which vehicle class M1 (passenger cars)	Of which vehicle class N1 (light commercial vehicles)
New Registrations and Fleet							
Motor vehicles newly registered ^{Q1)}	Num- ber	3,260,310	3,036,773	223,537	3,438,810	3,206,042	232,768
Motor vehicles registered ^{Q2), E1)}	Num- ber	45,951,065	43,851,230	2,099,835	46,579,737	44,403,124	2,176,613
Average age of fleet ^{Q3), E1)}	Years		8.8	trucks, total 7.7		9.0	trucks, total 7.7
Deregistrations ^{Q4)} (see new calculation in Table 3)							
Total (deregistrations and temporary layups)	Num- ber	8,507,650	8,138,212	369,438	8,739,633	8,370,981	368,652
Final deregistrations ^{E2)}	Num- ber	2,740,782	2,593,494	147,288	2,822,552	2,676,035	146,517
End-of-Life Vehicles							
CoDs issued in Germany	Num- ber	512,163			473,386		
ELVs arising in Germany	Num- ber	512,163			473,386		
Average age of ELVs ^{E3)}	Years	approx. 14 to 15			approx. 17 to 18		

Explanatory comments:

Red figures = Updated figures

E1) Reference dates 1/1/2014 and 1/1/2015, only registered motor vehicles excluding temporary layups.

E2) Calculation of finally deregistered motor vehicles, see Table 3:

Initially, 4% must be deducted from the number of off-road notifications to allow for motor vehicles taken out of service multiple times within one year. This produces the number of motor vehicles taken out of service in a year. This number is multiplied by the deregistration rate of 33.3% (M1) and 41.4% (N1) respectively. As the 4% correction for multiple off-road notifications was not implemented in the calculations for 2014, the data for 2014 is presented again, this time with the data correction.

E3) Figure for 2015: 17.3 years as the mean of a sample of 3,677 end-of-life vehicles from the years 2014 and 2016 from six dismantling facilities for ELVs in Germany.

Data sources for this table see following page.

Sources for Table 4:

- Q1) Federal Motor Transport Authority (KBA): *Neuzulassungen von Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 1960 bis 2016 nach Fahrzeugklassen* (New registrations of motor vehicles and trailers, 1960 to 2016, by vehicle class), http://www.kba.de/DE/Statistik/Fahrzeuge/Neuzulassungen/FahrzeugklassenAufbauarten/n_fzkl_zeitreihe.html?nn=652406, and
Federal Motor Transport Authority: *Neuzulassungen von Lkw in den Jahren 2006 bis 2015 nach zulässiger Gesamtmasse* (New registrations of trucks, 2006 to 2015, by permissible maximum mass), http://www.kba.de/DE/Statistik/Fahrzeuge/Neuzulassungen/Groessenklassen/n_groessenklassen_lkw_zeitreihe.html?nn=657738.
- Q2) Federal Motor Transport Authority: *Bestand an Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 1960 bis 2017 nach Fahrzeugklassen* (Motor vehicles and trailers registered, 1960 to 2017, by vehicle class), http://www.kba.de/DE/Statistik/Fahrzeuge/Bestand/FahrzeugklassenAufbauarten/b_fzkl_zeitreihe.html?nn=652402, and
Federal Motor Transport Authority: *Bestand an Lkw in den Jahren 2007 bis 2016 nach zulässiger Gesamtmasse* (Trucks registered, 2007 to 2016, by permissible maximum mass), http://www.kba.de/DE/Statistik/Fahrzeuge/Bestand/Groessenklassen/b_groessenklassen_lkw_zeitreihe.html?nn=662728.
- Q3) Federal Motor Transport Authority: *Bestand an Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 2008 bis 2017 nach ausgewählten Fahrzeugklassen mit dem Durchschnittsalter der Fahrzeuge in Jahren* (Motor vehicles and trailers registered, 2008 to 2017, by selected vehicle classes with the average age of the vehicles in years), http://www.kba.de/DE/Statistik/Fahrzeuge/Bestand/Fahrzeualter/b_alter_kfz_z.html?nn=645784.
- Q4) Federal Motor Transport Authority: *Außerbetriebsetzungen von Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 2007 bis 2016 nach Fahrzeugklassen* (Off-road notifications of motor vehicles and trailers, 2007 to 2016, by vehicle class), http://www.kba.de/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/FahrzeugklassenAufbauarten/a_fzkl_zeitreihe.html?nn=664274, and
Federal Motor Transport Authority: *Außerbetriebsetzungen von Lkw in den Jahren 2006 bis 2015 nach zulässiger Gesamtmasse* (Off-road notifications of trucks, 2006 to 2015, by permissible maximum mass), http://www.kba.de/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/Groessenklassen/a_groessenklassen_lkw_zeitreihe.html?nn=664174.
-

The waste statistics do not provide any information about the average age of end-of-life vehicles. The aforementioned study on ELV monitoring methods⁸ calculated an average age of 17.3 years for 3,677 end-of-life vehicles, around three years more than the estimate used in previous years' reports.

As described in number 2.1.5, letter g), under the German ELV Ordinance (*Altfahrzeug-Verordnung*), dismantling facilities are required to issue a certificate of destruction for every end-of-life vehicle.

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

Exports of used vehicles to other EU countries:

As in prior years, exports of used vehicles from Germany into other EU countries are taken from two sources: the re-registration statistics of the Federal Motor Transport Authority (*Kraftfahrt-Bundesamt [KBA]*) and the foreign trade statistics of the Federal Statistical Office. In order to determine the total number, the higher of the two values for each individual EU country were combined into an overall total, see Table 5.

Re-registration statistics

The majority of used vehicles exported to other EU countries were ascertained from re-registrations in those countries, and recorded in the re-registration statistics by the Federal Motor Transport Authority. The data originates from an information exchange between Member States regarding the re-registration of motor vehicles previously registered in another EU Member State, based on Directive 1999/37/EC on the registration documents for vehicles. According to this, 1,476,058 used vehicles were exported to other EU countries and re-registered there. For 2015, figures were available for all 27 other EU Member States. The recorded figures should be seen as minimum numbers.

Foreign trade statistics

Additionally, data from the foreign trade statistics was also consulted where a higher level of exports was indicated. As in the previous year's report, exports of the 11 relevant merchandise numbers (for used passenger cars, motor homes, trucks up to 5 t¹⁹) were evaluated to ascertain the total number of used vehicles exported.

An evaluation of the re-registration statistics and foreign trade statistics produce a statistically verified total of 1,503,314 used vehicles exported from Germany to other EU countries in 2015, see Table 5.

¹⁹ For commodity codes, refer to Table 4 in the previous year's report. The classification of commodity codes under the Combined Nomenclature of the Common Customs Tariff is not fully consistent with the definition of EC vehicle classes as set out in Annex II, section A, no. 1 of Directive 2007/46/EC establishing a framework for the approval of motor vehicles and their trailers. Under Framework Directive 2007/46/EC, the total mass of a motor vehicle in class N1 must not exceed 3.5 tonnes. By contrast, under the Combined Nomenclature, the lowest grade of motor vehicles for the carriage of goods is defined as "5 t or less". This produces a certain degree of data uncertainty; however, it can be assumed that the vast majority of trucks up to 5 tonnes are class N1 motor vehicles.



Table 5 Exports of used vehicles from Germany to other EU countries, 2015.
Calculated from two sources: Notifications to the Federal Motor Transport Authority (*Krafftahrt-Bundesamt [KBA]*) concerning motor vehicles formerly registered in Germany (“KBA”) and data from the foreign trade statistics (“FTS”), arranged in the protocol order of Member States

EU Member State (with country code)	Source	Number in 2015	EU Member State (with country code)	Source	Number in 2015
BE - Belgium	KBA	28,549	LU - Luxembourg	KBA	10,729
BG - Bulgaria	KBA	40,058	HU - Hungary	KBA	58,604
CZ - Czech Republic	KBA	103,110	MT - Malta	FTS	141
DK - Denmark	FTS	7,315	NL - Netherlands	KBA	100,949
EE - Estonia	KBA	11,837	AT - Austria	FTS	15,035
IE - Ireland	KBA	22	PL - Poland	KBA	617,272
EL - Greece	FTS	1,283	PT - Portugal	KBA	22,335
ES - Spain	KBA	8,600	RO - Romania	KBA	190,864
FR - France	KBA	97,659	SI - Slovenia	KBA	6,309
HR - Croatia	KBA	35,778	SK - Slovakia	KBA	21,140
IT - Italy	FTS	22,104	FI - Finland	KBA	13,603
CY - Cyprus	FTS	170	SE - Sweden	KBA	5,277
LV - Latvia	KBA	28,133	UK - United Kingdom	KBA	2,228
LT - Lithuania	KBA	54,210			
Total EU					1,503,314

Sources:

- Personal communication from the Federal Motor Transport Authority dated 02/05/2016.
- Federal Statistical Office: *Warenverzeichnis Außenhandelsstatistik 8-Steller (gebrauchte Pkw, Wohnmobile, Lkw bis 5 t) Länderverzeichnis, Daten für 2015* (commodity classification, foreign trade statistics, 8-digit (used passenger cars, motor homes, trucks up to 5 t), country directory, 2015 figures). Wiesbaden 2016

Additional estimate for other exports of used vehicles into EU countries with re-registration not covered by the statistics

The aforementioned study into the fate of finally deregistered motor vehicles⁹ included an assessment by the Federal Motor Transport Authority of the quality of the re-registration data from the individual EU countries that supply data. It concluded that some of the data, particularly from countries whose exports according to the foreign trade statistics exceed the number of exports cited in the re-registration statistics, is incomplete. The number of incomplete used vehicle re-registrations was estimated in a four-stage process:

1. Calculation of the correction factor:

Re-registrations of used vehicles recorded by EU Member States were compared with used vehicle exports to EU Member States as per the foreign trade statistics. For 2015, this produces a recorded total of 1,476,058 re-registrations, compared with

192,031 exports of used vehicles according to the foreign trade statistics, or a quotient of around 7.7.

2. Application of the factor:

The factor of 7.7 is applied to

- those EU Member States whose exports according to the foreign trade statistics, exceeded the re-registration data of the Federal Motor Transport Authority. In 2015, this applied to: Denmark, Greece, Italy, Cyprus, Malta, Austria, see Table 5.
- plus any other Member States where the Federal Motor Transport Authority feels that data records are incomplete. In 2015, this applied to: Ireland, United Kingdom.

Multiplying data from the foreign trade statistics for these countries by the correction factor produces the computational maximum number of used vehicles exported with re-registration. By deducting the statistically verified number of vehicles (according to the foreign trade statistics) from the extrapolated figure obtained using the factor, we arrive at the additional estimate.

3. Possible individual corrections based on other information sources:

Where additional information is available, this is taken into consideration on an individual basis. This concerns Austria and Italy.

- Austria: The 2013 export figure of 54,326 motor vehicles researched as part of the aforementioned study into the fate of vehicles was updated to 64,917 motor vehicles (2014) and 81,079 motor vehicles (2015) respectively, proportionate to the development of exports as per the foreign trade statistics.
- Italy: The 2013 export estimate of 23,000 motor vehicles researched as part of the aforementioned study into the fate of vehicles was updated to 28,396 motor vehicles (2014) and 38,142 motor vehicles (2015) respectively, proportionate to the development of exports as per the foreign trade statistics.

4. Rounding:

The sum total of computed additional estimates is rounded up or down, as it entails a certain degree of uncertainty.

The **additional estimate** calculated in this way for **2015** is **approximately 150,000 motor vehicles**, see Table 6. The updated additional estimate for 2014 of around 120,000 motor vehicles deviates from the additional estimate cited in the annual report for 2014 (140,000), because the provisional calculation for 2014 did not allow for the corrections for Italy and Austria. The additional estimates are shown in light green hatching in Figure 3.



Table 6 Additional estimate for used vehicle exports from Germany to EU States not covered by the statistics in 2013 and 2014 (both updated) and 2015

Line	Parameter	2013	2014	2015
1	Total of re-registrations of used vehicles to all EU countries according to the Federal Motor Transport Authority	1,215,945	1,200,811	1,476,058
2	Total of used vehicle exports to all EU countries according to the foreign trade statistics	138,614	165,120	192,031
3	Factor: Re-registrations / foreign trade statistics (line 1/line 2)	8.77	7.27	7.69
4	Member States whose re-registration data is thought to be incomplete.	Austria, Italy, Croatia, Spain, Portugal, Cyprus, Greece, Ireland, United Kingdom	Austria, Italy, Croatia, Spain, Cyprus, Malta, Greece, Ireland, United Kingdom	Austria, Italy, Denmark, Cyprus, Malta, Greece, Ireland, United Kingdom
5	Exports of used vehicles to the countries listed in line 4 according to the foreign trade statistics ^{a)}	34,202	38,438	48,298
6	New estimate of actual used vehicle exports to the countries in line 4			
6a	• For Austria ^{b)}	54,326	64,917	81,079
6b	• For Italy ^{c)}	23,000	28,396	38,142
6c	• For the other Member States from line 4. (Extrapolation: data of foreign trade statistics multiplied by the factor in line 3)	91,397	67,007	74,214
7	Total new estimated exports (Total from lines 6a, 6b, 6c)	168,723	160,320	193,435
8	Additional estimate for the countries in line 4 (= New estimate from line 7 minus exports already covered by the statistics in line 5)	134,521	121,882	145,137
9	Additional estimate from line 8, rounded	140,000	120,000	150,000

Sources:

- Personal communication from the Federal Motor Transport Authority dated 02/05/2016.
- Federal Statistical Office: *Warenverzeichnis Außenhandelsstatistik 8-Steller (gebrauchte Pkw, Wohnmobile, Lkw bis 5 t) Länderverzeichnis, Daten für 2015* (commodity classification foreign trade statistics, 8-digit (used passenger cars, motor homes, trucks up to 5 t), country directory, 2015 figures). Wiesbaden 2016

Explanatory comments:

- For Ireland and the United Kingdom: Re-registration data according to the Federal Motor Transport Authority, because this figure is higher than the foreign trade statistics.
- Austria: Information about used vehicle exports in 2013 from Austrian statistics, please refer to the study into the fate of vehicles⁹ (Table 48 in chapter 5.2.2 of the study). Updated for 2014 and 2015 proportionate to the development of foreign trade statistics.
- Italy: Estimate for 2013 from the study into the fate of vehicles⁹ (Table 48 in chapter 5.2.2 of the study). Updated for 2014 and 2015 proportionate to the development of foreign trade statistics.

Exports of used vehicles to non-EU countries

Exports to non-EU countries were small compared with exports to EU countries, see Table 7. For **2015**, the German foreign trade statistics and analysis of the 11 commodity codes indicate a total of **229.496** exports of used vehicles (passenger cars, motor homes, trucks up to 5 t). Having fallen by around 30% between 2013 and 2014, recorded exports therefore decreased by a further 15% (approximate figure), dropping back to the low level of the Environmental Premium year (2009). Once again, the decrease was particularly sharp in exports to former Soviet Union countries. The principal destination regions outside of Europe are still West Africa (around 41 %), while the states of the former Soviet Union accounted for around 14 %, roughly on a par with Norway and Switzerland, see Table 7.

Table 7 Exports of used vehicles from Germany to non-EU countries, 2015
in accordance with the foreign trade statistics,
passenger cars, motor homes and trucks < 5 t, in each case with petrol or
diesel engine

Country	Number in 2015	
Non-EU total	229,496	
Of which West Africa²⁰	94,838	Of which Benin 30,408 Nigeria 18,646 Niger 8,467
Of which former Soviet Union countries (excluding Baltic States)	31,022	Of which Georgia 16,320 Ukraine 7,875 Rep. of Moldavia 2,168
Of which Norway, Switzerland	33,044	

Source: Federal Statistical Office: *Warenverzeichnis Außenhandelsstatistik 8-Steller (gebrauchte Pkw, Wohnmobile, Lkw bis 5 t) Länderverzeichnis, Daten für 2015* (commodity classification, foreign trade statistics, 8-digit (used passenger cars, motor homes, trucks up to 5 t), country directory, 2015 figures). Wiesbaden 2016

Additional estimate for other exports of used vehicles into non-EU countries not covered by the statistics

As outlined in number 2.3.3 of the previous years' reports, cases of transits of used vehicles from Germany via another EU country into a non-EU country are not always covered by the non-EU foreign trade statistics: Used vehicles from Germany which are exported in the single-stage process or exported by customs agents from another EU Member State (customs office of exit) are systematically not recorded by the German customs statistics (and hence are not included in the foreign trade statistics). Using Belgium as an example, the aforementioned study into the fate of vehicles ascertained that in 2013, the exports of at least

²⁰ Collective term for 18 West African states: Angola, Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Liberia, Morocco, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo

116,732 used passenger cars in vehicle class M1, last registered in Germany, were not included in the statistics. If these undocumented exports via Belgium are extrapolated to the customs offices of the other countries, this would produce a total of between around 184,000 and around 363,000 exports of used vehicles in vehicle classes M1 and N1 to non-EU countries which are not covered by the statistics. The aforementioned study into the fate of vehicles⁹ suggests that the trend is heading towards the bottom end of this range. We therefore estimated the additional used vehicles exported to non-EU countries and not yet included in the foreign trade statistics at around 210,000 vehicles for 2013²¹. Updating the ratio between the additional estimate and the foreign trade statistics (for 2013: 210,000 / 385,708 = around 54.4%) produces an **additional estimate for 2015 of around 120,000** motor vehicles. By analogy, this produces an updated additional estimate for 2014 of around 150,000 motor vehicles, thus downgrading slightly the provisional additional estimate from the previous year's report (180,000 motor vehicles)²¹. These additional estimates are shown in dark green hatching in Figure 3.

Table 8 Additional estimate of used vehicle exports from Germany to non-EU countries not covered by the statistics in 2013 and 2014 (both updated) and 2015

	2013 (updated)	2014 (updated)	2015
Based on: Statistically verified exports of used vehicles M1+N1 from Germany to non-EU countries^{a)}	344,551 + 41,157 = 385,708	271,349	229,496
Proportionality factor of additional estimate	54.4%	Factor transferred from 2013: 54.4%	
Additional estimate, for 2014 and 2015 proportionate to the statistically verified data	210,000	147,737	124,950
Additional estimate, proportionate, rounded	≈ 210,000	≈ 150,000	≈ 120,000
Total: Statistically verified + additional estimate, rounded	≈ 590,000	≈ 420,000	≈ 350,000

Explanatory comments:

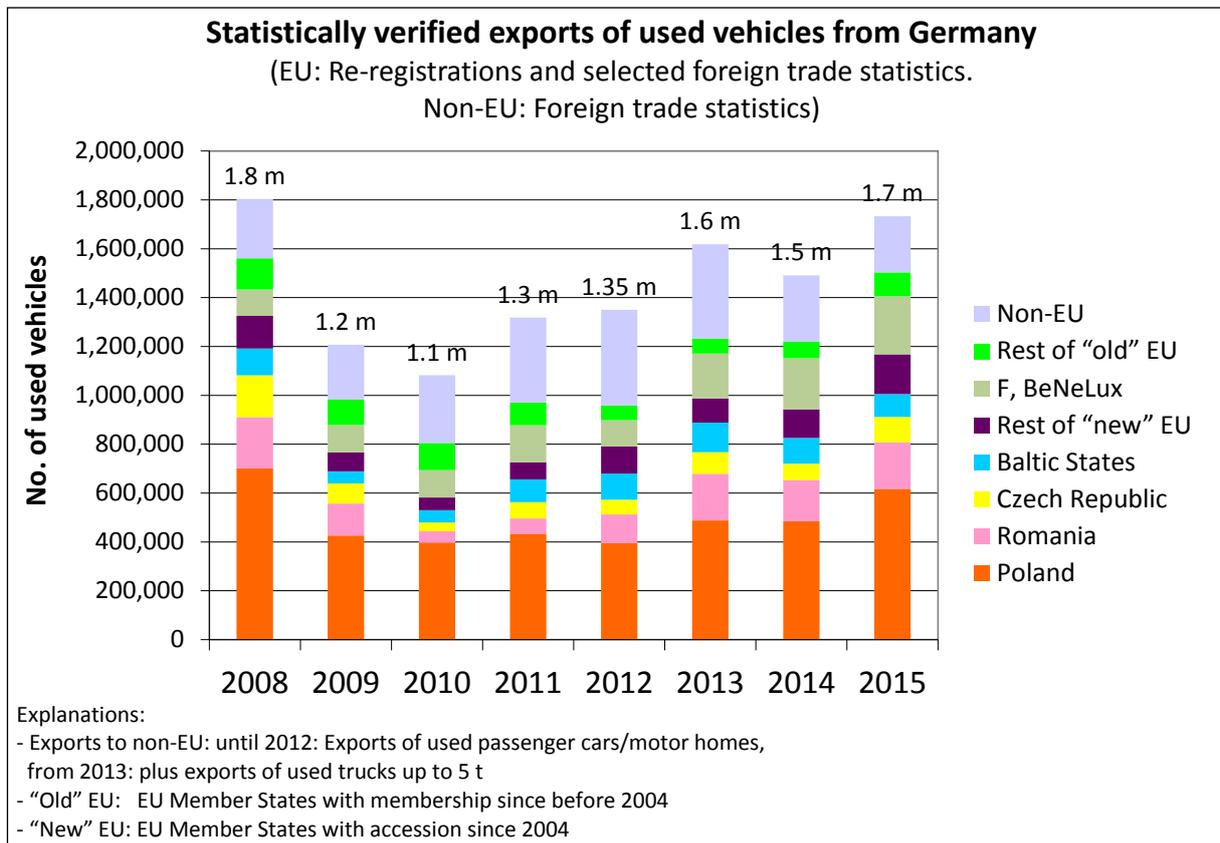
Red figures = Updated figures

a) See annual reports for 2013 and 2014 and Table 7 for 2015.

²¹ The previous year's report used the provisional results from the study into the fate of end-of-life vehicles (pages 30 to 32 of the previous year's report [English translation]): For 2013, the additional estimate was 260,000 vehicles (excluding N1 motor vehicles). Accordingly, for 2014, a proportional additional estimate of 180,000 vehicles was used. Based on the lower additional estimates for 2013 in the study's final report (refer to chapter 5.2.1 of the report) (250,000 – 41,157 ≈ 210,000), the additional estimate for 2014 must likewise be downgraded from 180,000 to 150,000.

Total exports of used vehicles:

Figure 2 illustrates the development over time of statistically verified exports of used vehicles from 2008 onwards. Compared with 2014, an increase in the statistically verified exports of used vehicles to around 1.7 million was recorded.



Sources: Federal Motor Transport Authority: Information from 2009 to 2016. Federal Statistical Office: Foreign trade statistics, 2008 to 2015.

Figure 2 Statistically verified exports of used vehicles from Germany, 2008 to 2015

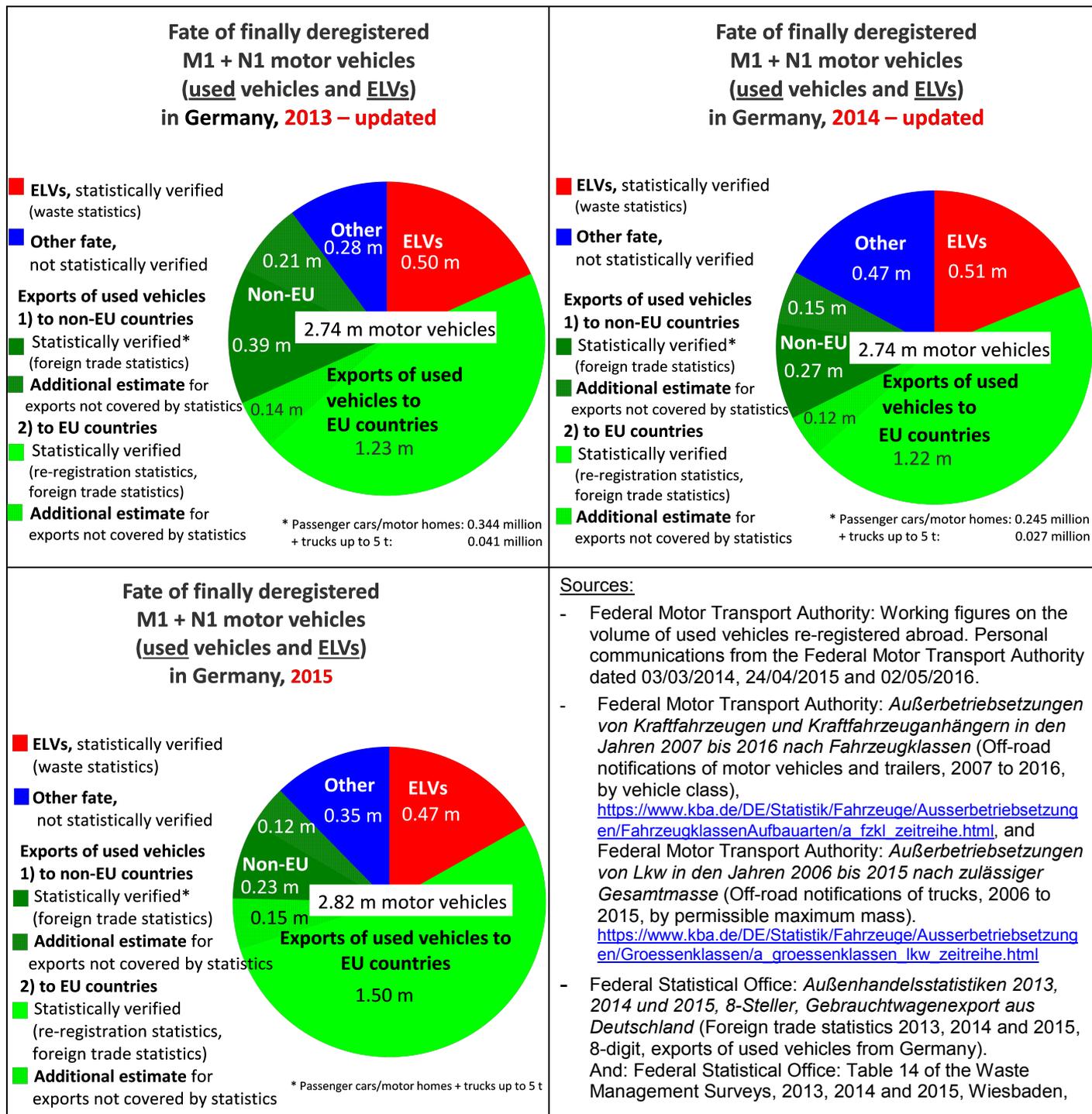
The statistically verified exports of used vehicles are supplemented with reasoned estimates of used vehicle exports not covered by the statistics of approximately 0.27 million vehicles in 2015. For preceding years, the updated additional estimates are approximately 0.35 million (2013) and 0.27 million (2014) respectively.

Fate of finally deregistered M1 and N1 motor vehicles, 2013 and 2014 (both updated) and 2015

As outlined above (see number 2.3.1), the proportion of final deregistrations has been recalculated. By eliminating multiple off-road notifications from the calculation (see Table 3), the number of M1 and N1 motor vehicles finally deregistered in 2013 and 2014 was

retrospectively updated from the previous year's report, and for 2015 was calculated using the new method.

We also added qualified estimates of known data gaps concerning used vehicle exports, see above. Once again, the figures for 2013 and 2014 were updated from the previous year's report. Overall, the various statistical sources and the qualified additional estimates produce the following picture regarding the fate of finally deregistered M1 and N1 motor vehicles in Germany in 2013 and 2014 (both updated) and 2015 – see Figure 3.



2015, 2016 and 2017

Figure 3 Fate of finally deregistered M1 and N1 motor vehicles (used vehicles and end-of-life vehicles) in Germany, 2013 and 2014 (both updated) and 2015

In 2015, based on the available data including the additional estimates outlined above, there were no statistics available on the fate of some 0.35 million finally deregistered M1 and N1 motor vehicles. For 2013 and 2014, the updates produced a “statistical gap” of around 0.28 million and 0.47 million motor vehicles respectively.

Exports of ELVs and body shells:

- According to the statistics and time series²², in 2015 no “ELVs” (waste code 160104*), “Discarded passenger cars” (no. 8.11) or “Other discarded motor vehicles” (no. 8.12) were exported from Germany.
- Exports of body shells for treatment abroad were comparatively low in 2015 compared with 2014 (5.7%) at 2.3% of total ELV weight (W 1).

Table 9 Exports of used vehicles, end-of-life vehicles and depolluted body shells from Germany

Reference year 2015	Unit	To other EU countries	To non - EU countries
Used vehicles exported (see Table 5 and Table 7)	Number	1,503,314 (+ additional estimate 150,000)	229,496 (+ additional estimate 120,000)
Average age of used vehicles exported	Years	(7.3) ²³	
ELVs exported (see COM Table 3)	Number	0	0
Depolluted (and dismantled) body shells exported (WC 16 01 06)	Number	13,781 ²⁴	
	Tonnes	10,749	

²² See COM Table 3 and:

German Environment Agency: “Grenzüberschreitende Verbringung von zustimmungspflichtigen Abfällen 2015 – Export” (Transboundary shipments of waste requiring consent 2015 - Exports),

https://www.umweltbundesamt.de/sites/default/files/medien/378/dokumente/export_2015.pdf, and

German Environment Agency: “Grenzüberschreitende Verbringung von zustimmungspflichtigen Abfällen. Zeitreihe Export nach Abfallarten - Mengen in 1000 t. 2007-2016” (Transboundary shipments of waste requiring consent. Time series: Exports by waste category, volumes in 1,000 t, 2007-2016),

https://www.umweltbundesamt.de/sites/default/files/medien/2503/dokumente/zeitreihe_export_notifizierungspflichtiger_abfaelle_nach_abfallarten.pdf

²³ This figure refers to motor vehicles with export licence plates in 2011. There are no more recent figures available. Source: Personal communication from the Federal Motor Transport Authority dated 9 July 2012.

²⁴ Converted with the average weight of body shells of 780 kg. The average weight was calculated from the total mass and the total number of body shells that left shredder facilities in 2015 (to Germany and abroad): Total mass 363.479 t/ total number 466.004 units = 780 kg/unit.

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

a) How does Germany 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 beneath 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 official vehicle registrations. Their quality is therefore considered very good. The data includes vehicle classes M1 and N1.

Final deregistrations: The aforementioned study into the fate of finally deregistered vehicles allowed us to update the deregistration rate to 33.3% for M1 motor vehicles, instead of 40%, and 41.4% for N1 motor vehicles. Compared with the previous year's report, furthermore, double countings of multiple deregistrations within the first year were eliminated from the calculations. The data quality has been significantly improved thanks to these new calculations, and final deregistrations will no longer be over-estimated. This directly influences the size of the "statistical gap". For further details, see number 2.3.1.

End-of-life vehicles: The number of end-of-life vehicles arising is taken from the waste statistics of the Federal Statistical Office, derived from a full-coverage survey of all dismantling facilities. The quality can therefore be assumed to be good.

Exports of used vehicles

The data on exports of used vehicles to other EU countries originates from two independent sources: The exchange of information under Article 9 of Directive 1999/37/EC on the registration documents for vehicles with information on re-registrations of used vehicles in other EU countries, plus foreign trade statistics. The exchange of information under Directive 1999/37/EC is being expanded year on year, so that the quality and level of coverage are continuously improving. For 2015, figures were available for all 27 other EU Member States. This figure should be viewed as a minimum number; the research carried out by the aforementioned study into the fate of vehicles found incomplete data for some countries. Exports of used vehicles to EU countries with re-registration not currently covered by the available statistics are estimated at 150,000 units for 2015, see Table 6.

The figures for exports of used vehicles to non-EU countries are taken from the foreign trade statistics. This includes every country worldwide. We can assume a good level of coverage for motor vehicles registered in Germany for export to a non-EU country.

Research by the aforementioned study into the fate of vehicles identified those cases where the transit of used vehicles from Germany via another EU country to a non-EU country is not covered by the German foreign trade statistics: Used vehicles from Germany which are exported in the single-stage process or exported by customs agents from another EU Member State (customs office of exit) are systematically not recorded by the German

customs authorities (and hence not included in the foreign trade statistics). This was quantified using Belgium as an example. Extrapolation for 2013 produced an updated figure of around 210,000 cases in which these exports were not recorded in the German foreign trade statistics, around 150,000 cases for 2014 (updated), and around 120,000 cases for 2015 (see Table 8).

Summarised view of vehicle fate

Figure 3 shows that there is a lack of statistical evidence for the fate of some 0.35 million of the 2.82 million motor vehicles finally deregistered in 2015. Compared with the annual report for 2013, which indicated a “statistical gap” of 1.18 million passenger cars, the data situation has been significantly improved and the gap reduced to a fraction of this amount.

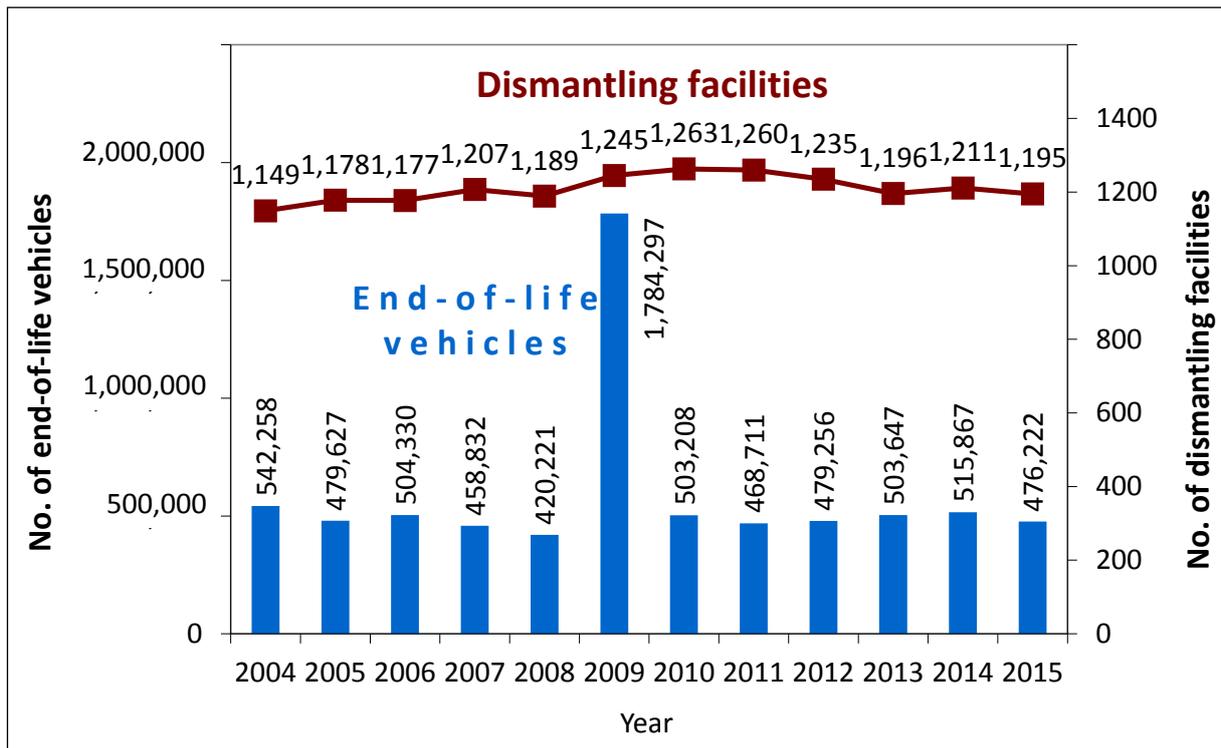
- b) Describe the source of information, the quality of sources, the completeness (coverage rate) and the validation process.**
- c) If Foreign Trade Statistics (FTS) are used as a source for the reporting of export of used cars, please explain how Germany estimates the amount which is not reported due to the (monetary) reporting thresholds for export.**
- d) How did Germany 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), please refer to letter a) above.

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

3.1 Development of ELV quantities

For the first time, the number of end-of-life vehicles accepted from Germany and abroad fell, following an increase between 2011 and 2014 (see Figure 4), dropping to below the half-a-million mark. The number of ELV dismantling facilities has remained more or less unchanged at around 1,200 for many years.

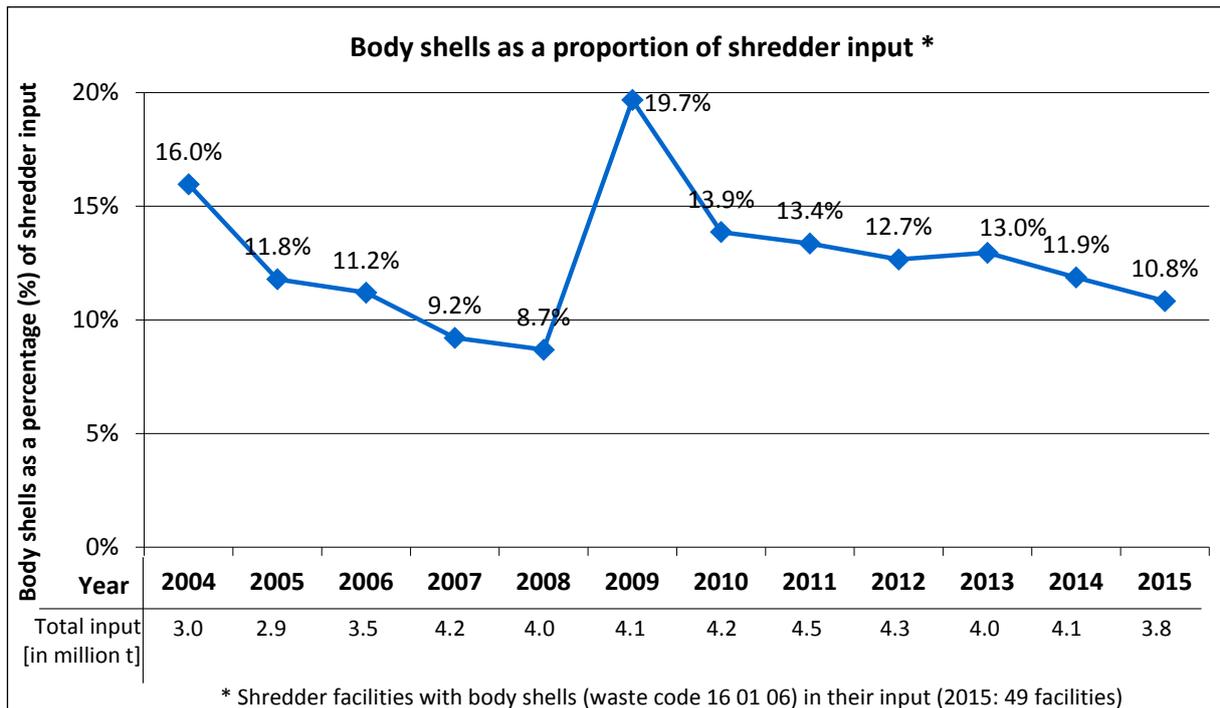


Source: Federal Statistical Office: Table 14 of the Waste Management Surveys, 2004 to 2015.

Figure 4 Development of ELV quantities (total, delivered from within Germany and abroad) and number of dismantling facilities in the waste statistics, Germany, 2004 to 2015²⁵

In 2009, the year of the Environmental Premium, body shells as a share of input into shredder facilities that treat body shells reached a new high of 19.7%. Since then, their proportion has fallen, and in 2015 totalled 10.8%, see Figure 5.

²⁵ Note: Figure 4 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. Discrepancies are possible compared with the number of dismantling facilities authorised under the German ELV Ordinance (*Altfahrzeug-Verordnung*) as determined by GESA (*Gemeinsame Stelle Altfahrzeuge / Joint Agency for End-of-Life Vehicles*) of the Federal Länder, for example because some authorised facilities may not actually have accepted any end-of-life vehicles.

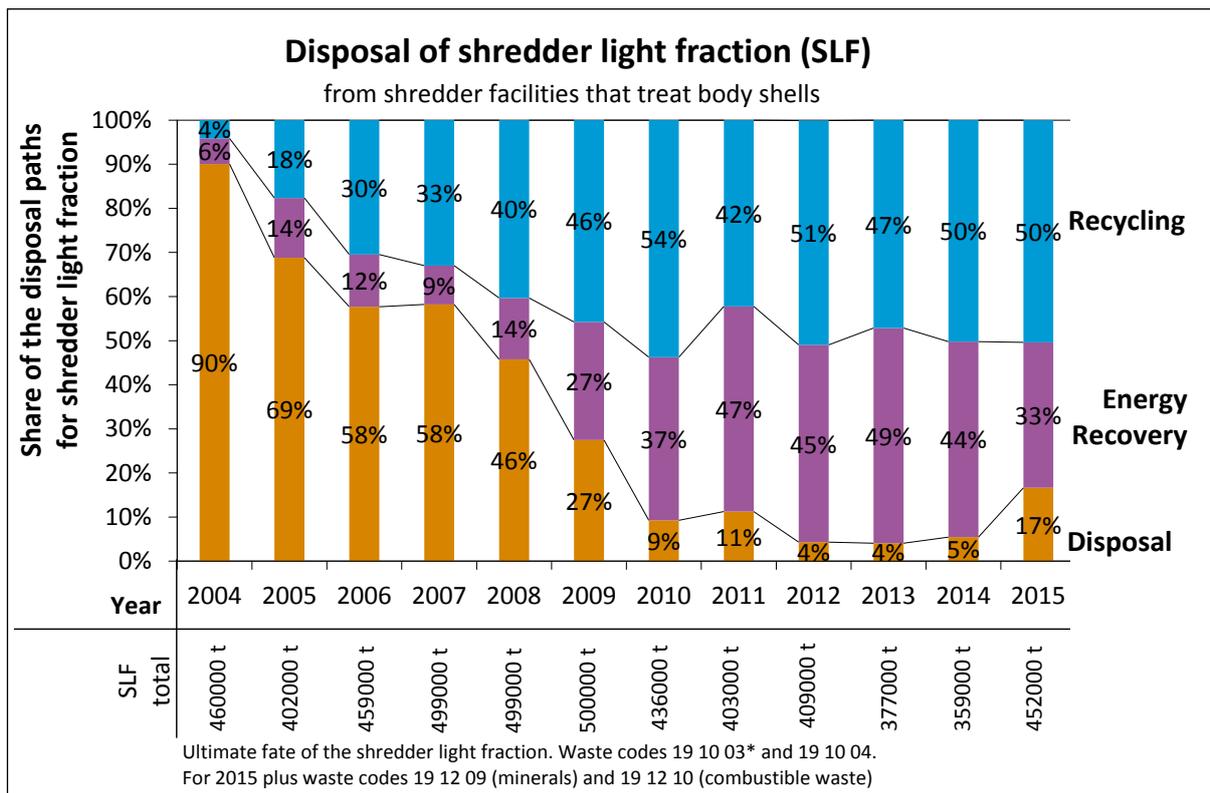


Source: Federal Statistical Office, Table 1 of the Waste Management Survey, 2004 to 2015

Figure 5 Development of body shells as a percentage of input into German shredder facilities, 2004 to 2015

3.2 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 sent for disposal in Germany in 2004 (waste codes 19 10 03* and 19 10 04), the proportion that is recycled or recovered has increased continuously year on year, and by 2012 - 2014 only 4% / 5% respectively was sent for disposal – see Figure 6. In 2015, contrary to this trend, the disposal of shredder light fraction increased to 17%. As more shredder light fraction is being disposed of under different waste codes, we not only evaluated disposal of the two waste codes for fluff-light fraction (19 10 03* and 19 10 04) but also the waste codes for minerals (19 12 09) and for combustible wastes (19 12 10). Figure 6 shows the total quantity of shredder light fraction generated in shredder facilities that accept body shells. A certain proportion of this originates from body shells (2015: 20.3% or approximately 91,900 t out of a total of 452,000 t shredder light fraction produced).



Source: Federal Statistical Office: Table 15 of the Waste Management Surveys, 2004 to 2015.

Figure 6 Disposal of shredder light fraction from shredder facilities that treat body shells in Germany, 2004 to 2015

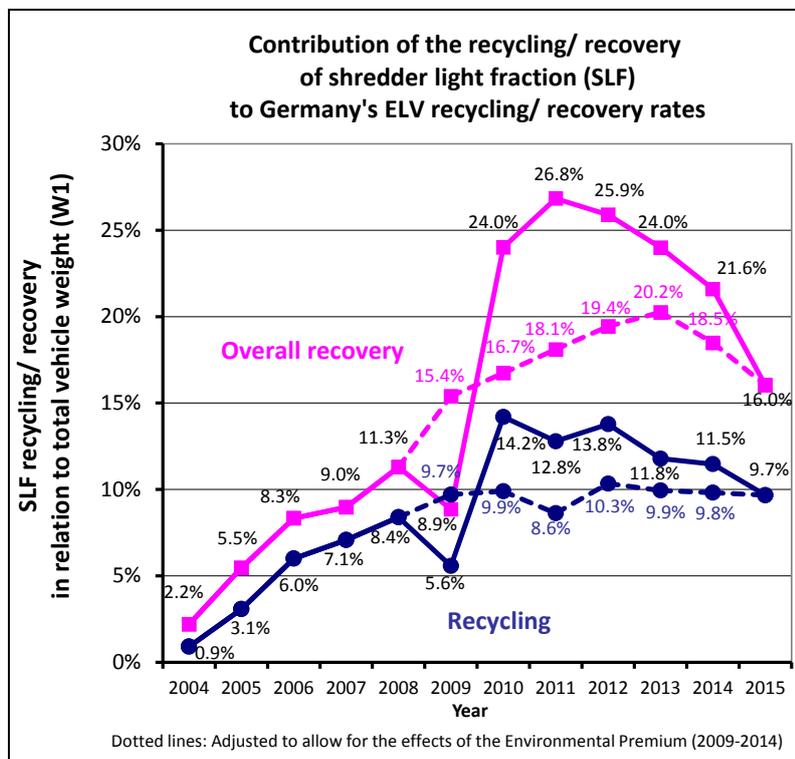


Figure 7 Contribution of the recycling/recovery of shredder light fraction (SLF) to Germany's end-of-life vehicle recycling/ recovery rates, 2004 to 2015. Figures in relation to total vehicle weight (W1)

The contribution of shredder light fraction to the total ELV recovery rate decreased sharply to 16%. This can only partially be attributed to the discontinued after-effects of the Environmental Premium; other factors include the update of the proportion of the shredder light fraction from 25% to 23.5% of body shell weight, see number 2.1.5, letter f), and the rise in the proportion of disposal.

As no further after-effects of the Environmental Premium were observed in 2015, it was no longer necessary to include an additional calculation to “eliminate” or adjust the after-effects of the Environmental Premium, as in prior years. Explanatory comments on the adjustments to allow for the effects of the Environmental Premium, which are shown in Figure 7 for the years 2009 to 2014, can be found in the previous years’ reports. Since 2009, the shredder light fraction has contributed around 10% to the recycling rate each year, having been adjusted to allow for the effects of the Environmental Premium in the years 2009 to 2014.

3.3 Development of ELV recycling/recovery rates

On the basis of the statistical data in combination with other documented parameters, such as the metal content assumption (74.0%), in 2015 Germany once again met or exceeded the new increased (as of 2015) EU-wide targets of 85% for reuse/recycling and 95% for reuse/recovery. The development of these rates over time is depicted in Figure 8.

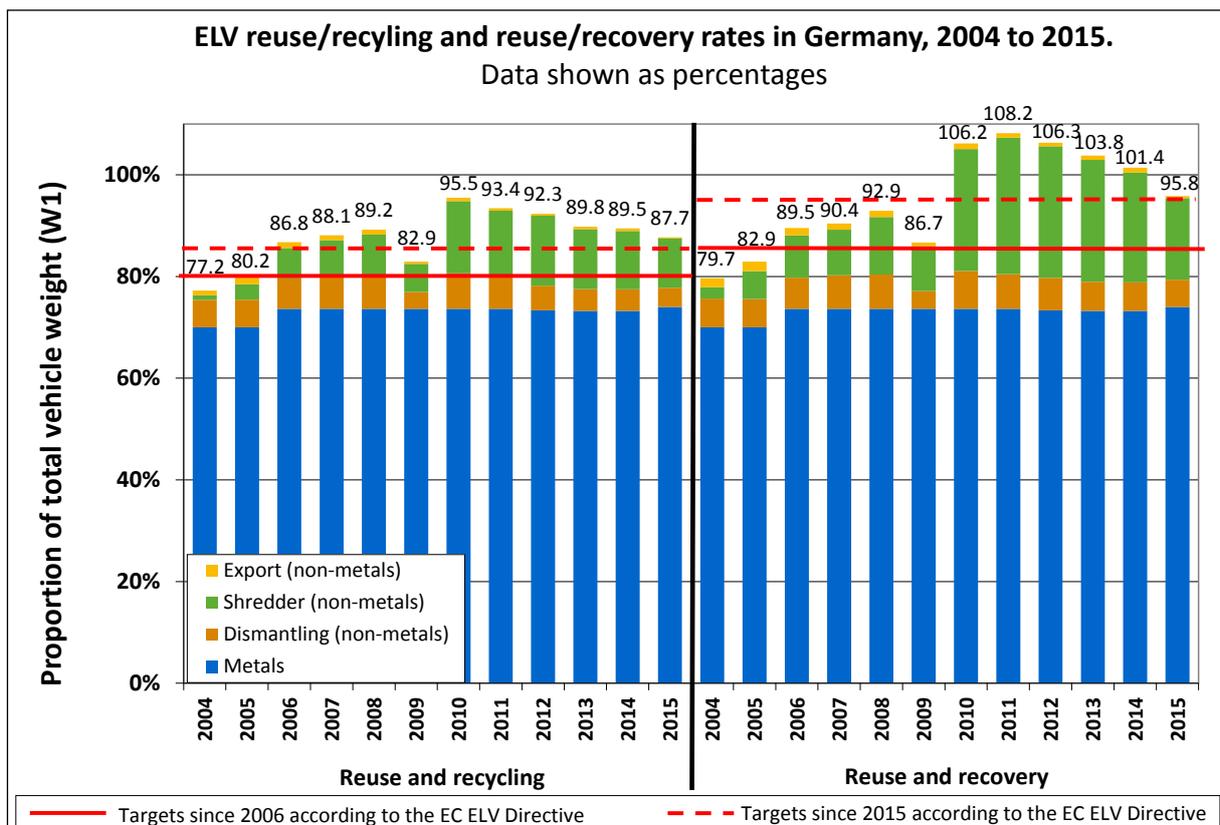


Figure 8 Contributions of dismantling facilities, shredder facilities and recycling/recovery abroad to Germany’s ELV reuse/recycling and reuse/recovery rates, 2004 to 2015

It is important to note that in the years 2009 to 2014, the reuse/recycling of ELVs was influenced by the Environmental Premium. As no further after-effects of the Environmental Premium were observed in 2015, the additional calculation to “eliminate” or adjust the after-effects of the Environmental Premium conducted in prior years was no longer necessary. Explanatory comments on the adjustments made to allow for the effects of the Environmental Premium, which are shown in Figure 9 for the years 2009 to 2014, can be found in the previous years’ reports.

The rate for reuse and recycling was 87.7%, on a par with the “adjusted” recycling rates since 2011.

The overall recovery rate is around 96%, slightly down on the previous year, see Figure 9. This is attributable in particular to the reduced contribution of shredder light fraction to the overall recovery rate.

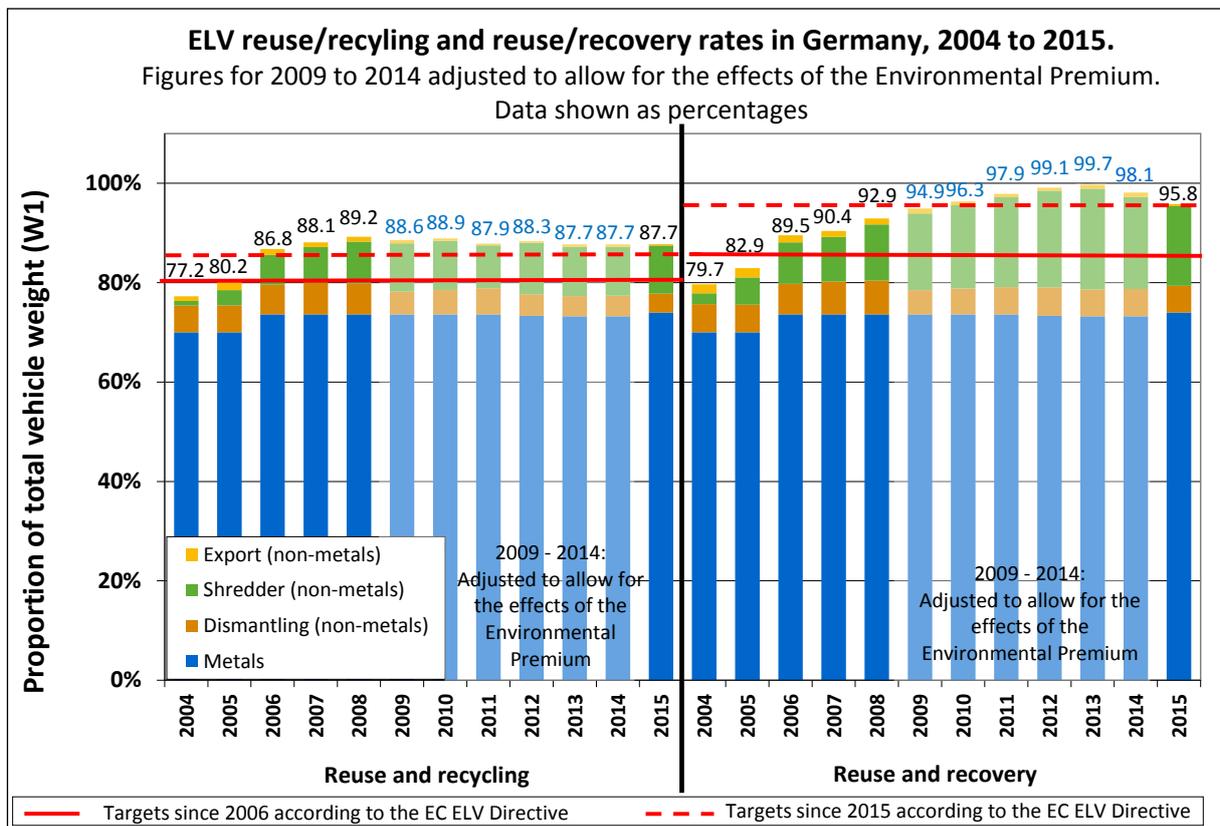


Figure 9 Contributions of dismantling facilities, shredder facilities and recycling/recovery abroad to Germany’s ELV reuse/recycling and reuse/recovery rates, 2004 to 2015, with figures for 2009 to 2014 adjusted to allow for the effects and after-effects of the Environmental Premium.

4 Appendix: COM Tables with allocation of metals also to Tables 1 and 3

According to the COM guidance document, all recovered/recycled materials are to be entered in COM Table 2 (Shredders) if the "metal content assumption" is applied. However, this representation is not suitable for certain interpretations, such as calculating the specific dismantled battery mass per vehicle. For this reason, an alternative representation of COM Tables 1 to 4 is included in this Appendix, showing the distribution of recovered/recycled metals among COM Tables 1 to 3.

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

Appendix: COM Table 1 (dismantling) for Germany, 2015. Metals + non-metals					
Materials from de-pollution and dismantling	Reuse	Re- cycling	Energy recovery	Total recovery	Disposal
	(A)	(B1)	(C1)	(D1=B1+C1)	E1
	in t	in t	in t	in t	in t
Batteries	72	5,648	0	5,648	280
Liquids (excluding fuel)	70	2,707	210	2,917	989
Oil filters	1	71	19	90	26
Other materials arising from de-pollution (excluding fuel)	1	27	46	72	9
Catalysts	17	1,442	0	1,442	16
Metal components	13,344	31,900	43	31,943	117
Tyres	822	7,407	4,458	11,865	135
Large plastic parts	45	1,285	0	1,285	26
Glass	110	1,002	0	1,002	17
Other materials arising from dismantling	4,551	295	2,677	2,971	6
Total	19,033	51,782	7,452	59,234	1,622

Explanation:

This table contains a few rounding differences (in each case of one or two tonnes) because quantities were rounded up or down to the nearest whole tonne.

Source:

From Federal Statistical Office data, Tables 1 and 15 of the Waste Management Survey 2015.



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

Appendix: COM Table 2 (shredders) for Germany, 2015. Proportionate metal shares only				
Materials from shredding	Recycling	Energy recovery	Total recovery	Disposal
	(B2)	(C2)	(D2 =B2+C2)	(E2)
	in t	in t	in t	in t
Ferrous scrap (steel)	245,507	0	245,507	0
Non-ferrous materials (aluminium, copper, zinc, lead etc.)	38,349	0	38,349	0
Shredder light fraction (SLF)	45,892	30,141	76,034	15,265
Other	0	0	0	0
Total	329,748	30,141	359,889	15,265

Explanatory comments:

This table contains a few rounding differences (in each case of one tonne) because quantities were rounded up or down to the nearest whole tonne.

Calculation of metal proportions for COM Table 2:

1. Calculation of recycled/recovered metals (total) =
74.0% (metal content assumption, see Table 2 in number 2.2, letter b) * 474,379 t (total vehicle weight W1)
= 351,040 t.
2. Deduction of metals already recorded in COM Table 1 (dismantling of metals: reuse and recycling/recovery) and COM Table 3 (metal exports).
3. Breakdown into ferrous/non-ferrous on a ratio of 64.0%: 10.0%

Source:

From Federal Statistical Office data, Table 15 of the Waste Management Survey 2015.



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

Appendix: COM Table 3 (exports) for Germany, 2015. Metals + non-metals					
End-of-life vehicles, body shells, components and materials disposed of abroad	Total weight of end-of-life vehicles which are exported per country	Total recycling of (parts of) end-of-life vehicles exported (F1)	Total recovery of (parts of) end-of-life vehicles exported (F2)	Total disposal of (parts of) end-of-life vehicles exported (F3)	Remarks
	in t	in t	in t	in t	
1) End-of-life vehicles (WC 160104*)	0	0	0	0	No exports in 2015 according to the statistics on "Trans-boundary shipments of waste requiring consent" ^{a)}
Breakdown by countries: -- Not applicable --					
2) Body shells from dismantling facilities (WC 160106)	10,749	8,599	9,137	1,612	Basic figures: 10,749 t body shells exported. Assumption: 80% thereof recycled/ 85% recovered ^{b)} .
Breakdown by countries: -- Unknown --					
3) Components from dismantling facilities	6,663	6,542	6,652	11	Batteries, tyres, large plastic parts, glass etc.
Breakdown by countries, where known					
WC	Waste	Destination countries for waste exports (total, not just from dismantling facilities) included in the waste export statistics:			
- 160216	Components from used appliances	to Romania, Singapore			
- 160601*	Lead batteries	to Belgium, Slovenia, Spain, Czech Republic			
- 160801	Catalysts	to South Africa			
- 160807*	Catalysts	to Belgium, UK, Italy, USA			
4) SLF from shredders	610	402	586	24	Total SLF exported: WC 191003*: 1,678 t, WC 191004: 1,262 t. Of which 20.3% from ELVs.
Breakdown by countries, where known					
WC	Waste	Destination countries for waste exports according to waste export statistics (total, not just originating from ELVs)			
- 191003*	Fluff-light fraction	to Belgium			
- 191004	Fluff-light fraction	to the Netherlands			
Total	18,022	15,543	16,374	1,648	

Explanatory comments and source details for this table may be found on the following page.

Explanatory comments:

WC = waste code

This table contains a few rounding differences (in each case of one tonne) because quantities were rounded up or down to the nearest whole tonne.

- a) Possible ELV exports are recorded in the waste export statistics (see sources below).
According to these statistics, in 2015, no end-of-life vehicles were exported under waste code 160104* (end-of-life vehicles). Similarly, there are no exports ascribed to no. 8.11 "Scrapped passenger cars".
- b) As there was no data available on recycling and recovery levels of body shells abroad, a minimum value ("to be on the safe side") has been assumed for calculation purposes: Despite the increased targets under the EC End-of-Life Vehicle Directive with effect from 2015 to 85% and 95% respectively, the old targets of 80% and 85% have been assumed, as in prior years.

Sources:

- Exports of body shells and other waste from end-of-life vehicle dismantling facilities:
"Erhebung über die Abfallentsorgung im Jahr 2015" (Waste Management Survey, 2015), Table 15, Federal Statistical Office.
- German Environment Agency: "Grenzüberschreitende Verbringung von zustimmungspflichtigen Abfällen 2015 - Export" (Transboundary shipments of waste requiring consent, 2015 - Exports),
https://www.umweltbundesamt.de/sites/default/files/medien/378/dokumente/export_2015.pdf
- German Environment Agency: "Grenzüberschreitende Verbringung von zustimmungspflichtigen Abfällen. Zeitreihe Export nach Abfallarten - Mengen in 1000 t. 2007-2016" (Transboundary shipments of waste requiring consent. Time series: Exports by waste category - Volumes in 1,000 t. 2007-2016),
https://www.umweltbundesamt.de/sites/default/files/medien/2503/dokumente/zeitreihe_export_notifizierungspflichtiger_abfaelle_nach_abfallarten.pdf.



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

Appendix: COM Table 4 (rates) for Germany, 2015					
From ...	Reuse (A)	Total recycling (B1 + B2 + F1)	Total recovery (D1 + D2 + F2)	Total reuse and recycling (X1=A+B1+ B2+F1)	Total reuse and recovery (X2=A+D1+ D2+F2)
	in t	in t	in t	in t	in t
COM Tab 1: Dismantling (A, B1, D1) (metals + non-metals)	19,033	51,782	59,234	70,815	78,267
COM Tab 2: Shredders (B2, D2) (metals + non-metals)		329,748	359,889	329,748	359,889
COM Tab 3: Exports (F1, F2) (metals + non-metals)		15,543	16,374	15,543	16,374
Total	19,033	397,073	435,498	416,106	454,531
				Recycling and recovery rates 2015	
W (total number of end-of-life vehicles)	473,386 vehicles			87.7%	95.8%
W1 (total vehicle weight)	474,379 tonnes			X1/W1	X2/W1

Explanation:

This table contains a few rounding differences (in each case of one tonne) because quantities were rounded up or down to the nearest whole tonne.