



Annual report on end-of-life vehicle reuse/recycling/recovery rates in Germany for 2016

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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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

Organisation submitting the data and the description

Umwelt
Bundesamt

**UBA – Umweltbundesamt
(German Environment Agency)**

Section III 1.6, Wörlitzer Platz 1, D-06844 Dessau-
Roßlau

and



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

**BMU – Bundesministerium für Umwelt,
Naturschutz und nukleare Sicherheit
(Federal Ministry for the Environment, Nature
Conservation and Nuclear Safety)**

Division WR II 3, Robert-Schuman-Platz 3, D-53175
Bonn

Contact person / contact details

Regina Kohlmeyer

Umweltbundesamt, Section III 1.6, Wörlitzer Platz 1, D-06844 Dessau-Roßlau,

phone: +49 (0)340- 2103-3320, fax: +49 (0)340- 2104-3320, e-mail: regina.kohlmeyer@uba.de

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

Yes



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1 COM tables:

Tables pursuant to COM Decision 2005/293/EC for Germany 2016

Notes:

- According to the 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, 2016 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)}	20	2,195	0	2,195	312
Liquids (excluding fuel)	48	2,494	192	2,687	900
Oil filters ^{a)}	0	18	20	38	3
Other materials arising from de-pollution (excluding fuel) ^{a)}	1	2	110	112	7
Catalysts ^{a)}	5	303	0	303	7
Metal components ^{a) b)}	0	18	18	36	0
Tyres ^{a)}	478	5,626	3,909	9,535	296
Large plastic parts	67	908	0	908	4
Glass	106	844	0	844	6
Other materials arising from dismantling ^{a)}	3,874	39	896	935	134
Total	4,598	12,446	5,145	17,592	1,669

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 2016.

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, 2016. Including all 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)}	271,590	0	271,590	727
Non-ferrous materials (aluminium, copper, zinc, lead etc.)	42,423	0	42,423	0
Shredder light fraction (SLF) ^{b)}	40,073	27,717	67,790	5,156
Other	0	0	0	0
Total	354,086	27,717	381,803	5,883

Explanatory comments:

- a) The 727 t of metal scrap listed in the "Disposal" column originates from the metal portions of materials and components disposed of after dismantling.
- b) Shredder light fraction and other non-metal shredder residues

Source:

From Federal Statistical Office data, Table 15 of the Waste Management Survey 2016.



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, 2016. 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
	in t	in t	in t	in t	
1) End-of-life vehicles (WC 160104*)	0	0	0	0	No exports in 2016 according to the statistics on "Transboundary movements of waste requiring consent" ^{a)}
Breakdown by countries: -- not applicable --					
2) Body shells from dismantling facilities (WC 160106)	6,240	2,534	5,005	1,235	Exported body shells: 24,708 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	282	143	251	32	Batteries ^{o)} , 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:			
- 130205*	Non-chlorinated machine oils etc.	to Switzerland, Finland			
- 160113*	Brake fluids	to Belgium			
- 160601*	Lead batteries	to Belgium, the Netherlands, Austria, Poland, Slovenia, Czech Republic			
- 160807*	Catalysts	to Belgium, UK, Italy, Netherlands, USA			
4) SLF from shredders	2,543	1,427	2,471	72	Total SLF exported: WC 191003*: 4,813 t, WC 191004: 7,453 t. Of which 20.7% 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 Netherlands, Austria			
Total	9,065	4,103	7,726	1,339	

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



Explanatory comments:

WC = Waste Code

This table contains a number of minor rounding differences because quantities have been rounded up or down to the nearest whole tonne and percentages are only rounded to one place after the decimal point.

- a) Possible ELV exports are recorded in the waste export statistics (see Sources below).
According to these statistics, in 2016, some 16,239 t were exported to Turkey and 2,577 t to the Netherlands under waste code 160104* (end-of-life vehicles). In the time series approach, these waste exports are assigned to no. 8.12 "Other scrapped vehicles". The exported vehicles refer to boats, and as such do not fall within the scope of the ELV Directive.
- b) Calculation of non-metals from exported body shells recovered/recycled and disposed of:

		Total weight	Of which recycled	Of which recovered	Of which disposed of
			Acceptance in line with the statutory provisions		
1	Body shells, from dismantling facilities, exported for further treatment abroad	100% = 24,708 t	85% = 21,002 t	95% = 23,473 t	5% = 1,235 t
2	Of which recovered metal content	74.7% of 24,708 t = 18,468 t	18,468 t	18,468 t	0 t
3	Of which non-metals (line 1 minus line 2)	6,240 t	2,534 t	5,005 t	1,235 t

This table contains a number of minor rounding differences because quantities have been rounded up or down to the nearest whole tonne and percentages are only rounded to one place after the decimal point. As there is no data available on recycling and recovery levels of body shells abroad, the targets of the EC ELV Directive of 85% (recycling) and 95% (recovery) respectively have been assumed for calculation purposes.

The recovered metal portion in body shells is approximately 75.5%*99% (= 74.745%), see metal content assumption Table 4 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 2016" (Waste Management Survey, 2016), Table 15, Federal Statistical Office.
- German Environment Agency (UBA): "Grenzüberschreitende Verbringung von zustimmungspflichtigen Abfällen 2016 - Export" (Transboundary shipments of waste requiring consent, 2016 - Exports), https://www.umweltbundesamt.de/sites/default/files/medien/2503/dokumente/grenzueberschreitende_verbringung_von_zustimmungspflichtigen_abfaellen_2016_-_export.pdf,
- German Environment Agency (UBA): "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_0.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, 2016					
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) (non-metals only)	4,598	12,446	17,592	17,045	22,190
COM Tab 2: Shredders (B2, D2) (incl. <u>all</u> metals)	0	354,086	381,803	354,086	381,803
COM Tab 3: Exports (F1, F2) (non-metals only)	0	4,103	7,726	4,103	7,726
Total	4,598	370,636	407,121	375,234	411,720
				Recycling and recovery rates 2016	
W (total number of end-of-life vehicles)	412,801 vehicles			89.3%	98.0%
W1 (total vehicle weight)	420,113 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, 2016

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 2016" were used.

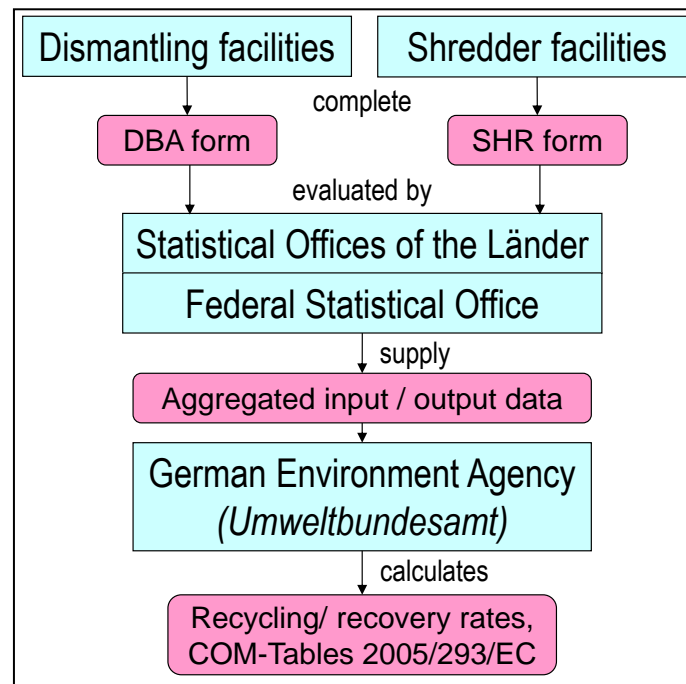
At the end of each reporting year, the ELV treatment facilities (1,153 dismantling facilities and 51 shredder facilities with body shell treatment in 2016) enter their operational input and output quantities for the waste management survey in the statistical survey sheets DBA (dismantling facilities)³ 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/ustatg_2005/UStatG.pdf

³Sample waste disposal form 2017 - DBA for Bavaria:
https://www.statistik.bayern.de/medien/statistik/erhebungen/abfallwirtschaft/dba_a022fiu.pdf

⁴Sample waste disposal form 2017 - SHR for Bavaria:
https://www.statistik.bayern.de/medien/statistik/erhebungen/abfallwirtschaft/shr_a028fiu.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 77.8% metallic fraction and approximately 22.2% non-metal shredder residues. Consequently, a shredder light fraction / non-metallic shredder residues portion totalling 22.2% of the weight of the body shells (originating from 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 (such as sand, stones),
- 19 12 10 Combustible waste (refuse-derived fuel).

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

After-effects of the Environmental Premium until 2014

In the years 2010 to 2014, more end-of-life vehicles were treated than had been incurred in the 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. In 2015, for the first time, the number of ELVs treated did not exceed the number incurred; see previous year's report. As the situation normalised, from 2015 onwards 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 1,153 dismantling facilities for end-of-life vehicles and 51 shredder facilities with body shell treatment. The level of completeness is correspondingly high.

Data quality:

To determine the ELV vehicle recovery/recycling rates for 2015, the previously used assumptions and estimates were updated based on the provisional results of a study on monitoring methods - see footnote 10 and number 2.1.5, letter f) of the previous year's report⁵. To calculate the 2016 rates, a number of assumptions were further modified compared with 2015 to reflect the final results of the study, see number 2.1.5, letter f). The

⁵ Annual Report on end-of-life vehicle reuse/recycling/recovery rates in Germany for 2015. 24 August 2017 www.bmu.de/N50180-1/



well-established data collection process remained unchanged. The quality of the data is considered good.

The survey yields plausible values for the average vehicle weight; for the second time, the achieved figure of 1,018 kg is around 2% higher than the previous year's figure, reflecting the gradual rise in the average weight of vehicles generally. In relation to the empty weight of ELVs arising in 2016, once again, a slightly smaller percentage of components and materials (17.3%) was dismantled by the dismantling facilities than in the previous years 2015 (18.2%) and 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 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. The updated breakdown into recycling and energy recovery used for reporting in 2015 was retained; see number 2.1.5, letter f) of the previous year's report, and is therefore of good quality. Based on industry association figures on the recovery and recycling of waste tyres in 2016 (excluding reuse), this has been updated to 59% recycling and 41% 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 were updated when calculating the rates for 2015 – see number 2.1.5, letter f) of the previous year's report. 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 424,518 t (417,129 vehicles) of end-of-life vehicles accepted, 4,405 t (1.04%, or 4,328 vehicles) came from outside Germany. The 420,113 t (412,801 vehicles) of end-of-life vehicles accepted for treatment from within Germany were entered as W1 (total vehicle weight). Given the low import share of one percent, it was decided to dispense with a "correction factor" to eliminate ELVs accepted from outside Germany, since this would only reduce the overall recovery rate by 0.07%.



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, for the reporting year 2016 we continued to use the weighted average metal content of ELVs as updated in 2013. This covers 95% of the vehicle market.

Based on the final results of a shredder trial in 2016, the recycled portion of the metal content of ELVs was updated from 98% the previous year to 99%, see number 2.1.5, letter f).

Shredder light fraction:

The input from the 51 body shell shredders totalled around 3.4 million tonnes in 2016. The proportion of input attributable to body shells decreased slightly again, from 10.8% in 2015 to 10.6% in 2016. The other principal input materials of the ELV shredders in 2016 were iron and steel (57%), ferrous metals (15%), (mixed) metals (6%) and used electrical and electronic appliances (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 22.2% 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 to calculate the rates for 2015, and further slightly modified to calculate the rates for 2016, to reflect the final results of the aforementioned study⁶. The 364,949 t (approximate figure) of body shells (accepted from Germany and) shredded in 2016 produced approximately 75,500 t of shredder light fraction. This equates to 20.7% of the 364,132 t (approximate figure) of shredder light fraction incurred in total⁷; 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.

⁶ See footnote 10

⁷ 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).



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

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

In 2016, no ELVs falling within the scope of the EC ELV Directive were exported; see the explanatory comments on COM Table 3.

Recycling or recovery of exported body shells:

In terms of quantity, exports of body shells and ELV parts from Germany played a more significant role in 2016 than in prior years. Some 24,708 t of body shells (5.9% of the total vehicle weight W1) were recovered or recycled abroad. Overall, however, the share of exported body shells and parts of ELVs remained low: In 2016, the recycling or recovery of non-metals from exported body shells accounted for just 1.8% 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 destination countries and proportions of body shell components that are ultimately recycled or recovered abroad. As in Germany, a metal content assumption of 74.7% was used for calculation purposes. Overall recycling and recovery rates of 85% / 95% respectively were used as minimum levels in accordance with the targets of the ELV Directive applicable since 2015, since these 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:

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 (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 methods⁸ – 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. The provisional results from the study used in the previous year’s report were further refined as the study was completed. The study found that shredder light fraction originating from end-of-life vehicles accounts for 22.2% of body shell input – see number 2.1.5, letter f). The metal yield in the “metal content assumption” was updated from 98% the previous year to 99%, based on the final 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 falling within the scope of the ELV Directive (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 was at a higher level than in previous years, but remained low overall, at 24,708 t or 5.9% of the total vehicle weight W1 (420,113 t). The same applies to the exported shredder light fraction (2,543 t; 0.6% of W1). The small proportion of components and materials from dismantling exported for disposal (metals and non-metals: 5,867 t; or 1.4%) remains unchanged against the previous year.

For some of the exported dismantled fractions and for the shredder light fraction, we were able to specify destination countries; see COM Table 3. Although the statistics used⁹ do not

⁸ See footnote 10

⁹ Refer to source information below COM Table 3.



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 types, comparison with the previous year). The German Environment Agency checks the information from a technical perspective, 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 remained unchanged in the reporting years 2004 to 2014. As the technical and legal conditions had evolved in the interim, in 2015 the Federal Ministry for the Environment (BMU) 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 Vehicles Directive 2000/53/EC¹⁰. 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). Having previously used the provisional results of the study to update the basic data and assumptions for the 2015 report, the finalised results are now available, and are currently being signed off and prepared for publication. After the project has been signed off, the Commission will be notified of the results of the ELV recycling/recovery and shredder campaign.

The results from the study were used to update the following basic data and assumptions, most of which had already been applied when calculating the rates for 2015. As the study was completed, a few minor tweaks and refinements emerged, which were incorporated into the calculation of rates for 2016.

- Basic dismantling data (unchanged against the previous year's report):

¹⁰ "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)



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

- Metal content of waste tyres: 16.5%. Metal content of cables: 35%.
- Oil content of waste oil in waste code 13 02 05*: 90.5%, of which 95% recycling.

– Metal yield (updated from previous year's report):

The recovered metal portion or metal yield in the "metal content assumption" was further updated from 98% to 99% based on the finalised results of the study, see number 2.2, letter b.

– Proportion of shredder light fraction from body shells (updated from previous year's report):

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. From 2004 to 2014, we operated on the assumption that the shredder light fraction incurred equates to 25% of the body shell weight. In order to list the shredder outputs in COM Table 2 in full, the line "shredder light fraction" in the table should be interpreted as "non-metal shredder residues", i.e. as the sum total of shredder light fraction and the non-metal portion of the shredder heavy fraction.

The aforementioned study carried out mono-shredder trials with body shells at two shredder facilities in 2016. The provisional results of the shredder trials found that on average, 23.5% non-metal shredder residues in relation to vehicle shell input were incurred, see Table 1 of the previous year's report. As the final report for the study was prepared, this figure was updated by additionally extracting the non-metal portion of the shredder light fraction, see Table 1.

The mean of the two shredder trials was therefore updated to 22.2% non-metal residues (shredder light fraction and non-metal shredder heavy fraction) overall in relation to body shell weight. When calculating the rates, therefore, the provisional assumption for 2015 of 23.5% was revised downwards to 22.2%.



**Table 1: Mono-shredder trials with body shells in Germany, 2016:
Share of non-metal shredder residues,
updated from the previous year's report**

Fraction	Shredder 1			Shredder 2		
	Fraction share of body shell weight	Proportion of non-metals in fraction	Non-metal residues in body shell weight	Fraction share of body shell weight	Proportion of non-metals in fraction	Non-metal residues in body shell weight
Shredder light fraction	16.4%	94%	15.4%	19.2%	92.1%	17.7%
Shredder heavy fraction	11.6%	50%	5.8%	11.1%	50.2%	5.6%
Total non-metal shredder residues			21.2%			23.3%
Mean of non-metal residues from both shredders			22.2%			

Red figures = Figures updated from the previous year's report, which was still based on the provisional results from the ELV monitoring study¹⁰.

- Waste code of shredder residues (unchanged from previous year's report):

As the relevant waste codes were extended for the reporting year 2015, for 2016 the waste codes shown in Table 2 were once again considered when determining the disposal paths of the shredder light fraction.



Table 2: Relevant waste codes for the disposal of shredder light fraction from the treatment of body shells

Waste code	Waste description	Recovered as	
		Material	Energy
191003*	Fluff-light fraction and dust containing dangerous substances	Partly ^{a)}	Partly ^{a)}
191004	Fluff-light fraction and dust other than those mentioned in 19 10 03	Partly ^{a)}	Partly ^{a)}
191209	Minerals (e.g. sand, stones),	Yes	
191210	Combustible waste (refuse-derived fuel)		Yes

a) The final fate of shredder light fraction sent for recovery/recycling is covered by the waste statistics.

Vehicle market / fate of vehicles

There were no methodological changes compared with the previous year's report. The method used in the previous year's report for determining the fate of vehicles was applied to the year 2016.

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, 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.

To date, this information has only been recorded in the Central Vehicle Register (ZFZR) at the Federal Motor Transport Authority (*Kraftfahrt-Bundesamt [KBA]*) for some of the certificates of destruction issued. 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 2017¹¹ implemented a number of measures with a view to improving this situation. These measures entered 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 study¹² and the study commissioned by the EU Commission¹³ into the fate of vehicles in order to further narrow 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

For 2016, the recommended mass balance $X2+E1+E2+F3 = W1$ revealed very good consistency between the output volumes from ELV treatment (difference +0.1%) and the mass of ELVs incurred; the two figures are almost completely balanced, see Table 3.

Table 3: Mass balance, input and output of ELV treatment in Germany, 2016

The abbreviations match the designations in the four COM Tables, see number 1.

Material flow output	Output volume in tonnes	Explanation
X2 =	411,720 t	Total reuse and recovery
E1 =	1,669 t	Disposal from dismantling, excluding metals
E2 =	5,883 t	Disposal of shredder light fraction and disposal of metals
F3 =	1,339 t	Disposal by export, excluding metals
Total	420,610 t	Total output
By way of comparison: Input	420,113 t	ELV input (total vehicle weight W1)
Difference	0.1%	Percentile difference, output – input

This table contains one rounding difference (of one tonne) because quantities were rounded up or down to the nearest whole tonne.

¹¹ Quick-access to source: Federal Law Gazette (*Bundesgesetzblatt*) Part I 2017, no. 14 of 29/03/2017, page 522 – website: www.bgbl.de

¹² 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>.

¹³ Öko-Institut: Assessment of the implementation of Directive 2000/53/EU on end-of-life vehicles (the ELV Directive) with emphasis on the end of life vehicles of unknown whereabouts. December 2017. Commissioned by the EU Commission. http://ec.europa.eu/environment/waste/elv/pdf/ELV_report.pdf



The good level of consistency also indicates that the assumptions made (see number 2.1.5, letter f) are accurate. In particular, it suggests that the further correction made to the proportion of shredder light fraction in relation to body shell weight – from 25% to 23.5% (for 2015) to 22.2% (for 2016) – accurately reflects the current reality for shredder facilities.



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 years 2012 and 2013, the assumed metal content of ELVs was updated based on new registrations of M1¹⁴ and N1¹⁵ motor vehicles in 2000, weighted according to the respective registration volumes per manufacturer; see annual report for the year 2013¹⁶.

At the time of preparing the annual reports for 2012 and 2013, the average vehicle age was known to be around 14 to 15 years. At this average vehicle age, 2000 is the mean year of first-time registration for ELVs arising in the years 2014/2015. 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.

However, as the ELV monitoring methodology study¹⁷ revealed an average vehicle age of around 17 to 18 years (see Table 6), the year 2000 represents the average year of first-time registration for ELVs arising in the years 2017/2018. This means that we can continue using the data on new registrations for the year 2000 for longer (probably until the reporting year 2019).

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 vehicle registration volumes for the various brands in the year 2000 and the metal content of vehicles. Table 1 of the 2013 annual report¹⁶ 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 for 2013.

The calculated weighted average metal content is 75.5%, of which 65.3% of which are ferrous metals and 10.2% non-ferrous metals (weighted averages), see Table 4.

¹⁴ Vehicle class M1: see footnote 18.

¹⁵ Vehicle class N1: see footnote 19.

¹⁶ Annual Report on end-of-life vehicle reuse/recycling/recovery rates in Germany, 2013, German: www.bmu.de/N50180/, English: www.bmu.de/N50180-1/

¹⁷ See footnote 10



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?

In the reporting year 2015, for the first time, the metal yield was backed up with data from the 2016 end-of-life vehicle recycling/recovery and shredder campaign (see footnote 10). The provisional results of the shredder trial indicated a metal yield of more than 99%, see numbers 2.1.5 and 2.2, letter b) of the previous year's report. This figure was confirmed following completion of the study, justifying a further increase in the assumption to 99% (having previously been increased to 98% for 2015).

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% * 99 % = 74.7%

Allowing for 99% recycling/recovery of the metal content, this yields 74.7% for the "metal content assumption", broken down into 64.6% ferrous metals and 10.1% non-ferrous metals recycled/recovered, relative to the vehicle empty weight (see Table 4).

Table 4: "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 for the year 2013
Allowing for a recycling/recovery rate of 99%:				
"Metal content assumption"	74.7%	64.6%	10.1%	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 can 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

2.3.1 Section 1: Information on the national vehicle market

In 2016, the number of new registrations of M1¹⁸ and N1¹⁹ motor vehicles rose by 10% compared with 2015. As in prior years, the number of motor vehicles registered increased further, totalling 47.3 million M1 and N1 motor vehicles as at 1 January 2016. Over the course of 2016, the number increased by a further 1.7% to more than 48 million M1 and N1 motor vehicles. The number of ELVs (arising in Germany) fell by 12.8% compared with 2015, to just under 413,000 ELVs, the lowest level since reporting began in 2004.

The final deregistration figures for M1 and N1 motor vehicles were calculated using the same method and parameters, see Table 5. Initially, around 4% was deducted from the total to allow for motor vehicles taken out of service multiple times during 2016. This produces the number of motor vehicles taken out of service for that year. This number was multiplied by the deregistration rates of 33.3% (M1 motor vehicles) and 41.4% (N1 motor vehicles) respectively. In 2016, some 2.88 million passenger cars (M1) and light commercial vehicles (N1) were finally deregistered.

¹⁸ 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.

¹⁹ 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.



Table 5: Off-road notifications and final deregistrations in Germany, 2016

	Off-road notifications Q1)	Multiple off-road notifications E1), Q2)	Motor vehicles taken out of service	Deregistration rate Q3)	Final deregistrations
Column 1	Column 2	Column 3	Column 4 = col. 2 * (100% - col. 3)	Column 5	Column 6 = col. 4 * col. 5
M 1 – Passenger cars	8,537,343	approx. 4%	8,195,849	33.3%	2,729,218
N 1 – Light commercial vehicles	389,180	approx. 4%	373,613	41.4%	154,676
Total M1+N1	8,926,523		8,569,462		2,883,894

Explanatory comments:

E1) Multiple off-road notifications = proportion of motor vehicles with more than one off-road notification in 2016.

Data sources:

Q1) For column 2 (number of off-road notifications):

Federal Motor Transport Authority (*Kraftfahrt-Bundesamt [KBA]*): *Außerbetriebsetzungen von Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 2008 bis 2017 nach Fahrzeugklassen* (Off-road notifications of motor vehicles and trailers, 2008 to 2017, 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 2007 bis 2016 nach zulässiger Gesamtmasse* (Off-road notifications of trucks, 2007 to 2016 by permissible total mass), http://www.kba.de/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/Groessenklassen/a_groessenklassen_lkw_zeitreihe.html?nn=664174.

Q2) For column 3 (correction factor for multiple off-road notifications):

Data source: Study into the fate of end-of-life vehicles, see footnote 12.

The correction factor equates to the rounded figure of 4% recommended by the research team, refer to the relevant paragraph above Tables 35 and 36 in chapter 5.1.1 of the study, and recommendation 1a in chapter 6.1 of the study.

Q3) For column 5 (deregistration rate):

Data source: Study into the fate of end-of-life vehicles, see footnote 12.

The deregistration rates correspond to the rates calculated by the research team of 33.3% (M1 motor vehicles) and 41.4% (N1 motor vehicles) (see Tables 41 and 42 in chapter 5.1.2 of the study).



Table 6: Information about the German vehicle market, 2016

National vehicle market Germany Reference year 2016	Unit	M1 and N1 motor 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)}	Number	3,603,511	3,351,607	251,904
Motor vehicles registered on 1 January of the reference year ^{Q2), E1)}	Number	47,346,971	45,071,209	2,275,762
Motor vehicles registered on 1 January of the subsequent year ^{Q2), E1)}	Number	48,186,954	45,803,560	2,383,394
Average age of fleet ^{Q3), E1)}	Years		9.2	Trucks, total 7.8
Deregistrations ^{Q4)} (calculation see Table 5)				
Total (deregistrations and temporary layups) ^{Q4)}	Number	8,926,523	8,537,343	389,180
Final deregistrations ^{E2)}	Number	2,883,894	2,729,218	154,676
End-of-Life Vehicles				
CoDs issued in Germany	Number	412,801		
ELVs arising in Germany ^{Q5)}	Number	412,801		
Average age of ELVs ^{E3) Q6)}	Years	approx. 17 to 18		

Explanatory comments:

- E1) Reference dates 1/1/2016 and 1/1/2017, only registered motor vehicles excluding temporary layups.
E2) Calculation of finally deregistered motor vehicles, see Table 5:
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 de-registration rate of 33.5% (M1) and 41.4% (N1) respectively.
E3) 17.3 years as the mean of a random sample of 3,677 end-of-life vehicles from the years 2014 and 2016 from six dismantling facilities for end-of-life vehicles in Germany.

Sources:

- Q1) Federal Motor Transport Authority (KBA): *Neuzulassungen von Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 1960 bis 2017 nach Fahrzeugklassen* (New registrations of motor vehicles and trailers, 1960 to 2017, 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 2007 bis 2016 nach zulässiger Gesamtmasse* (New registrations of trucks, 2007 to 2016, by permissible total mass), http://www.kba.de/DE/Statistik/Fahrzeuge/Neuzulassungen/Groessenklassen/n_grossenklassen_lkw_zeitreihe.html?nn=657738.
- Q2) Federal Motor Transport Authority: *Bestand an Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 1960 bis 2018 nach Fahrzeugklassen* (Registered motor vehicles and trailers, 1960 to 2018, by vehicle class), https://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 2008 bis 2017 nach zulässiger Gesamtmasse* (Registered trucks, 2008 to 2017, by permissible total 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 2009 bis 2018 nach ausgewählten Fahrzeugklassen mit dem Durchschnittsalter der Fahrzeuge in Jahren* (Registered motor vehicles and trailers 2009 to 2018, by selected vehicle classes, with the average age of the vehicle in years), http://www.kba.de/DE/Statistik/Fahrzeuge/Bestand/Fahrzeugalter/b_alter_kfz_z.html?nn=645784.
- Q4) Federal Motor Transport Authority: *Außerbetriebsetzungen von Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 2008 bis 2017 nach Fahrzeugklassen* (Off-road notifications of motor vehicles and trailers, 2008 to 2017, 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 2007 bis 2016 nach zulässiger Gesamtmasse* (Off-road notifications of trucks, 2007 to 2016, by permissible total mass), http://www.kba.de/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/Groessenklassen/a_groessenklassen_lkw_zeitreihe.html?nn=664174.
- Q5) Federal Statistical Office, survey of waste disposal in 2016, Table 14 "Input recovery/recycling of end-of-life vehicles". Wiesbaden 2018
- Q6) Study on ELV monitoring methods, see footnote 10.
-

The waste statistics do not provide any information about the average age of end-of-life vehicles. The aforementioned study on ELV monitoring methods¹⁰ calculated an average age of 17.3 years for 3,677 ELVs from the years 2014 and 2016.

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 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 7.

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, 1,387,062 used vehicles were exported to other EU countries in 2016 and re-registered there. For 2016, 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 commodity codes (for used passenger cars, motor homes, trucks up to 5 t²⁰) 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 1,417,734 used vehicles exported from Germany to other EU countries in 2016, see Table 7.

²⁰ For commodity codes, please refer to Table 4 of the annual report for 2014. 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 goods transportation is "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 7: Exports of used vehicles from Germany to other EU countries, 2016.

Calculated from two sources: Re-registration statistics (“RRS”) from the Federal Motor Transport Authority and foreign trade statistics (“FTS”) from the Federal Statistical Office, arranged in the protocol order of Member States

EU Member State (with country code)	Source	No. of vehicles	EU Member State (with country code)	Source	No. of vehicles
BE - Belgium	RRS	25,852	LU - Luxembourg	RRS	10,389
BG - Bulgaria	RRS	49,444	HU - Hungary	RRS	67,103
CZ - Czech Republic	RRS	25,766	MT - Malta	RRS	84
DK - Denmark	FTS	9,361	NL - Netherlands	RRS	120,471
EE - Estonia	RRS	10,158	AT - Austria	FTS	19,646
IE - Ireland	RRS	449	PL - Poland	RRS	602,478
EL - Greece	FTS	1,609	PT - Portugal	RRS	20,895
ES - Spain	RRS	25,005	RO - Romania	RRS	145,859
FR - France	RRS	90,513	SI - Slovenia	RRS	10,026
HR - Croatia	RRS	26,481	SK - Slovakia	RRS	22,127
IT - Italy	FTS	25,606	FI - Finland	RRS	13,366
CY - Cyprus	FTS	38	SE - Sweden	RRS	4,711
LV - Latvia	RRS	37,366	UK - United Kingdom	RRS	1,415
LT - Lithuania	RR	51,516			
Total EU		1,417,734			

Sources:

- Personal communications from the Federal Motor Transport Authority dated 04/04/2017 and 12/04/2018.
- Federal Statistical Office: *Warenverzeichnis Außenhandelsstatistik 8-Steller (gebrauchte Pkw, Wohnmobile, Lkw bis 5 t) Länderverzeichnis, Daten für 2016* (Commodity classification, foreign trade statistics, 8-digit (used passenger cars, motor homes, trucks up to 5 t), country directory, 2016 figures). Wiesbaden 2017

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 vehicles¹² 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. For this reason, we have included an additional estimate of incomplete data on used vehicle re-registrations. For details of the approach used, please refer to the comments in the previous year's report and the explanatory comments on Table 8.

The additional estimate of used vehicle exports to EU countries in 2016 is around 240,000 vehicles, see Table 8. The additional estimate is shown in light green hatching in Figure 3.

Table 8: Additional estimate of used vehicles exported from Germany to EU Member States not covered by the statistics, 2016

EU Member State	Statistically documented exports ^{a)}	Scope of new estimate	New estimate	Additional estimate (= New estimate – statistically documented exports)
Denmark, Greece, Cyprus	11,008	Factor RRS / FTS ^{b)} = 6.24	68,690	57,682
Austria Italy	19,646 25,606	Extrapolation of 2013 figures ^{c)}	105,945 44,185	86,299 18,579
Czech Republic	25,766	Extrapolated from 3 to 12 months ^{d)}	103,064	77,298
Additional estimate total				239,858
Additional estimate for EU Member States, rounded				240,000

Sources:

- Personal communications from the Federal Motor Transport Authority dated 04/04/2017 and 12/04/2018.
- Federal Statistical Office: *Warenverzeichnis Außenhandelsstatistik 8-Steller (gebrauchte Pkw, Wohnmobile, Lkw bis 5 t) Länderverzeichnis, Daten für 2016* (Commodity classification, foreign trade statistics, 8-digit (used passenger cars, motor homes, trucks up to 5 t), country directory, 2016 figures). Wiesbaden 2017

Explanatory comments:

- Foreign trade statistics, see Table 7.
Exception: For Czech Republic, figures from the re-registration statistics
- RRS = Re-registration statistics, FTS = Foreign trade statistics.
For 2016: RRS = 1,387,062, FTS = 222,342. RRS / FTS = 6.24
- Used vehicle exports 2013: Information for **Austria** (54,326) and estimate for **Italy** (23,000), see Table 48 in chapter 5.2.2 of the study on the fate of finally deregistered vehicles¹². As in 2014 and 2015, these figures were again updated for 2016 proportionate to the development of foreign trade statistics (2013: Austria 10,074, Italy 13,329).
- Czech Republic:** The data report for 2016 covers 3 months. For the additional estimate, we extrapolated this figure from 3 to 12 months on a pro rata basis. The figure of 103,064 vehicles is roughly on a par with the previous year's figure (2015: 103,110).

Overall, the total number of statistically verified exports of used vehicles to EU countries and the additional estimate of undocumented exports totals some 1.66 million vehicles in 2016.



Exports of used vehicles to non-EU countries

Exports to non-EU countries were small compared with exports to EU Member States, see Table 9. For 2016, the German foreign trade statistics and analysis of the 11 commodity codes indicate a total of 166,813 exports of used vehicles (passenger cars, motor homes, trucks up to 5 t) to non-EU countries. This decrease of around 27% compared with 2015 indicates a continuation of the declining number of exports to non-EU countries observed since 2013. In 2012, almost twice as many vehicles (around 391,000) were exported. Exports to West African countries showed a particularly sharp decrease. The major destination for used vehicles outside of Europe is still West Africa (around 36%), while the states of the former Soviet Union accounted for just 18%, see Table 9.

Table 9: Exports of used vehicles from Germany to non-EU countries, 2016

In accordance with the foreign trade statistics,
passenger cars, motor homes and trucks < 5 t, in each case with petrol or diesel engine

Country	No. of vehicles			
To non-EU countries, total	166,813			
Of which West Africa ²¹	59,699	Of which:	Nigeria	13,352
			Ghana	7,346
			Cameroon	7,195
Of which former Soviet Union countries (excluding Baltic States)	30,173	Of which:	Georgia	13,978
			Ukraine	12,998
			Rep. of Moldova	1,800
Of which Norway, Switzerland	19,408			

Source: Federal Statistical Office: *Warenverzeichnis Außenhandelsstatistik 8-Steller (gebrauchte Pkw, Wohnmobile, Lkw bis 5 t) Länderverzeichnis, Daten für 2016* (Commodity classification, foreign trade statistics, 8-digit (used passenger cars, motor homes, trucks up to 5 t), country directory, 2016 figures). Wiesbaden 2017

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 not systematically recorded by the German customs statistics (and hence are not included in the foreign trade statistics). Therefore, using the same method as in the previous year, we have included an additional estimate for these used

²¹ 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



vehicles exported to non-EU countries not yet included in the foreign trade statistics. Applying an additional estimate of 54.4% of the statistically verified exports, as in the previous year, produces a figure of around 90,000 vehicles for 2016, see Table 10. These additional estimates are shown in dark green hatching in Figure 3.

Table 10: Additional estimate of used vehicles exported from Germany to non-EU countries not covered by the statistics, 2016

	Factor	No. of vehicles
Based on: Statistically verified exports of used vehicles M1+N1 from Germany to non-EU countries (see Table 9)		166,813
Additional estimate factor in relation to documented exports	54.4%	
Amount of additional estimate		90,746
Additional estimate for non-EU countries, rounded		≈ 90,000

Overall, the total of statistically verified exports of used vehicles to non-EU countries plus the additional estimate of statistically unverified exports totals some 260,000 vehicles in 2016.

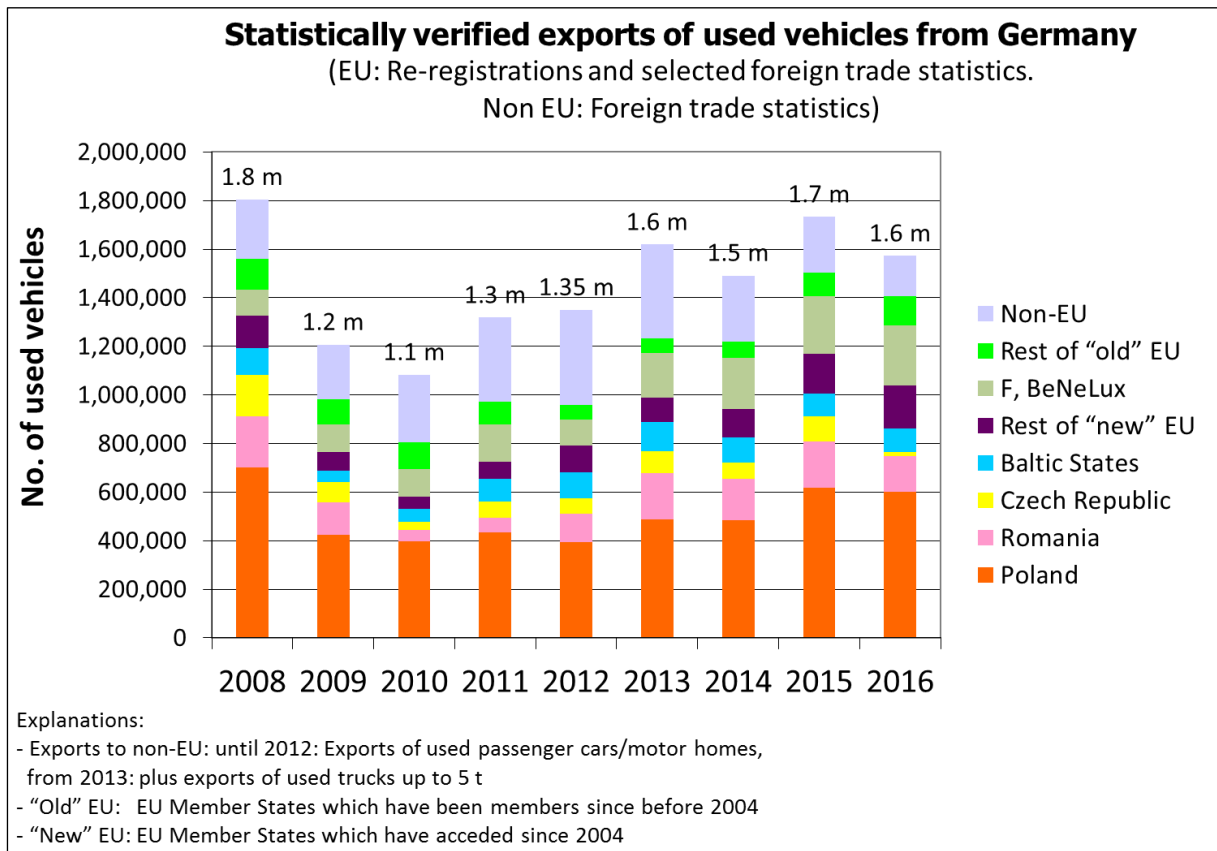
Total exports of used vehicles:

Figure 2 illustrates the development over time of statistically verified exports of used vehicles from 2008 onwards. Compared with 2015, a slight decrease in the statistically verified exports of used vehicles to around 1.6 million was recorded.

The statistically verified exports of used vehicles are supplemented with reasoned estimates of used vehicle exports not covered by the statistics outlined above, of approximately 0.33 million vehicles in 2016.



Figure 2: Statistically verified exports of used vehicles from Germany, 2008 to 2016



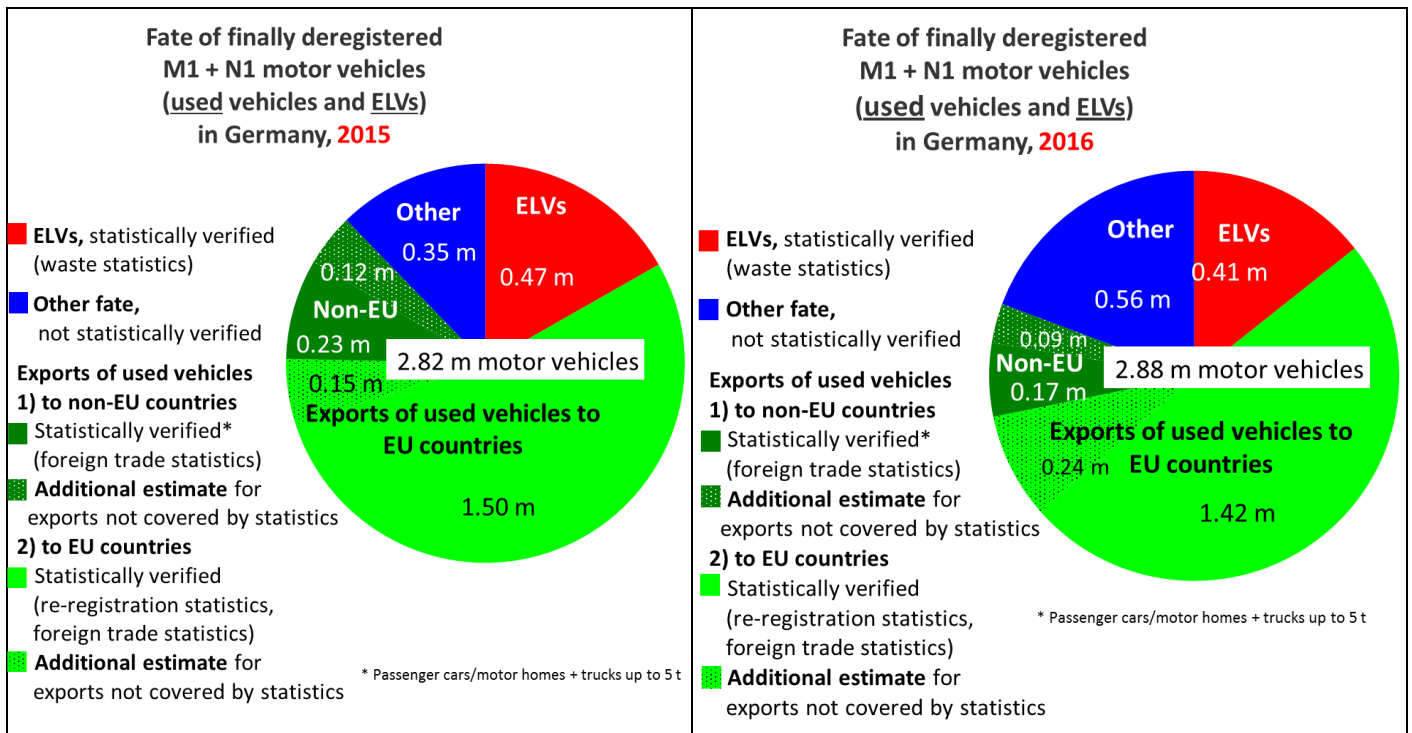
Sources: Federal Motor Transport Authority: Information from 2009 to 2018. Federal Statistical Office: Foreign trade statistics, 2008 to 2016.

Fate of finally deregistered M1 and N1 motor vehicles, 2015 and 2016

Based on the number of final deregistrations in 2016 of around 2.88 million M1 and N1 motor vehicles (see Table 5), the various statistical sources and the qualified additional estimates of used vehicle exports not covered by the statistics produces the following picture regarding the fate of finally deregistered M1 and N1 motor vehicles in Germany from 2015 and 2016, see Figure 3.



Figure 3: Fate of finally deregistered M1 and N1 motor vehicles (used vehicles and end-of-life vehicles) in Germany, 2015 and 2016



Sources:

- Federal Motor Transport Authority: Working figures on the volume of used vehicles re-registered abroad. Personal communications from the Federal Motor Transport Authority dated 2/05/2016 and 12/04/2018.
- Federal Motor Transport Authority: *Außerbetriebsetzungen von Kraftfahrzeugen und Kraftfahrzeuganhängern in den Jahren 2008 bis 2017 nach Fahrzeugklassen* (Off-road notifications of motor vehicles and trailers, 2008 to 2017, by vehicle class), https://www.kba.de/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/FahrzeugklassenAufbauarten/a_fzkl_zeitreihe.html, and Federal Motor Transport Authority: *Außerbetriebsetzungen von Lkw in den Jahren 2007 bis 2016 nach zulässiger Gesamtmasse* (Off-road notifications of trucks, 2007 to 2016, by permissible total mass). https://www.kba.de/DE/Statistik/Fahrzeuge/Ausserbetriebsetzungen/Groessenklassen/a_groessenklassen_lkw_zeitreihe.html
- Federal Statistical Office: *Außenhandelsstatistiken 2015 und 2016, 8-Steller, Gebrauchtwagenexport aus Deutschland (11 Warennummern)* (Foreign Trade Statistics 2015 and 2016, 8-digit, exports of used vehicles from Germany) (11 commodity codes).
And: Federal Statistical Office: Table 14 of the Waste Management Surveys, 2015 and 2016, Wiesbaden, 2017 and 2018

In 2015, based on the available data including the aforementioned additional estimates, the fate of some 0.35 million finally deregistered M1 and N1 motor vehicles could not be statistically verified. In 2016, this “statistical gap” increased to 0.56 million vehicles.



Exports of ELVs and body shells:

- According to the waste export statistics²², in 2016 no “end-of-life vehicles” (waste code 160104*) falling under the scope of the ELV Directive were exported from Germany.
- Exports of body shells for treatment abroad more than doubled in 2016 at 5.9% compared with 2015 (2.3%), but was roughly on a par with 2014 (5.7%) in terms of total vehicle weight (W 1).

Table 11: Exports of used vehicles, end-of-life vehicles and depolluted body shells from Germany, 2016

Reference year 2016	Unit	To other EU Countries	To non-EU countries
Used vehicles exported (see Table 7, Table 8, Table 9 and Table 10)	Number	1,417,734 (+ additional estimate 240,000)	166,813 (+ additional estimate 90,000)
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	30,348 ²⁴	
	Tonnes	24,708	

²² See COM Table 3 and:

German Environment Agency (UBA): “Grenzüberschreitende Verbringung von zustimmungspflichtigen Abfällen 2016 - Export” (Transboundary shipments of waste requiring consent, 2016 - Exports), https://www.umweltbundesamt.de/sites/default/files/medien/2503/dokumente/grenzueberschreitende_verbringung_von_zustimmungspflichtigen_abfaellen_2016_-_export.pdf

²³ This figure refers to 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 814 kg. The average weight was calculated from the total mass and the total number of body shells that left shredder facilities in 2016 (to Germany and abroad): Total mass 349,834 t / total number 429,694 units = 814 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 6. 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 de-registrations:

The new decommissioning rates and correction factors calculated as part of the aforementioned study by the Federal Motor Transport Authority into the fate of finally deregistered vehicles have significantly improved the quality of data compared with pre-2015 reports, and final deregistrations will no longer be over-estimated. This directly influences the size of the “statistical gap”. As the deregistration rate can change slightly over time, we plan to update it again for the next reporting year.

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. Data quality is therefore 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, and the quality and level of coverage are continuously improving. For 2016, figures were available for all 27 other EU Member States. Overall, this figure should be viewed as a minimum number; the Federal Motor Transport Authority believes that the figures are incomplete for some countries.

Exports of used vehicles to EU countries with re-registration not currently covered by the available statistics are estimated at 240,000 units for 2016, see Table 8. The sharp increase in the additional estimate for 2015 (150,000 vehicles) is primarily attributable to the fact that for 2016, unlike 2015, information about re-registrations in the Czech Republic was only available for three months of the year, so a further additional estimate of around 77,000 vehicles was included for the year 2016.



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 vehicles registered in Germany for export to a non-EU country.

However, as the transit of used vehicles from Germany via another EU country to a non-EU country is not systematically recorded by the German customs authorities (and hence not included in the foreign trade statistics) when used vehicles are exported in the single-stage process or by customs agents from another EU Member State (customs office of exit), an additional estimate was undertaken for such cases, by applying the results of the aforementioned study into the fate of vehicles to the 2016 data. It is estimated that some 90,000 extra-EU exports were not recorded in the German foreign trade statistics in 2016, see Table 10.

Summarised view of vehicle fate

Figure 3 shows that there is a lack of statistical evidence for the fate of some 0.56 million of the 2.88 million vehicles finally deregistered in 2016.

- 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.

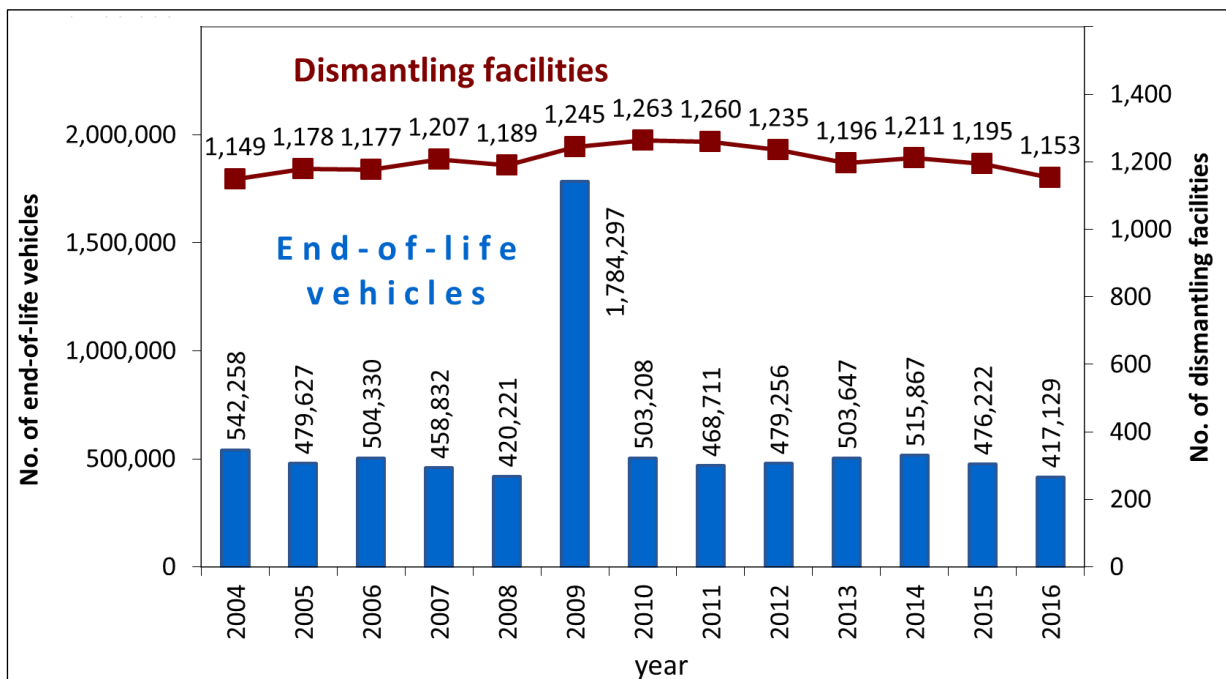


3 Supplement: Development of end-of-life vehicle disposal and recycling/recovery rates since 2004

3.1 Development of ELV quantities

The number of end-of-life vehicles accepted from Germany and abroad decreased by 12% (see Figure 4) against 2015, having already fallen by 8% the previous year. This figure stood at around 417,000 end-of-life vehicles, the lowest level since reporting began more than 10 years ago. The number of ELV dismantling facilities decreased slightly, to 1,153 facilities.

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 2016²⁵



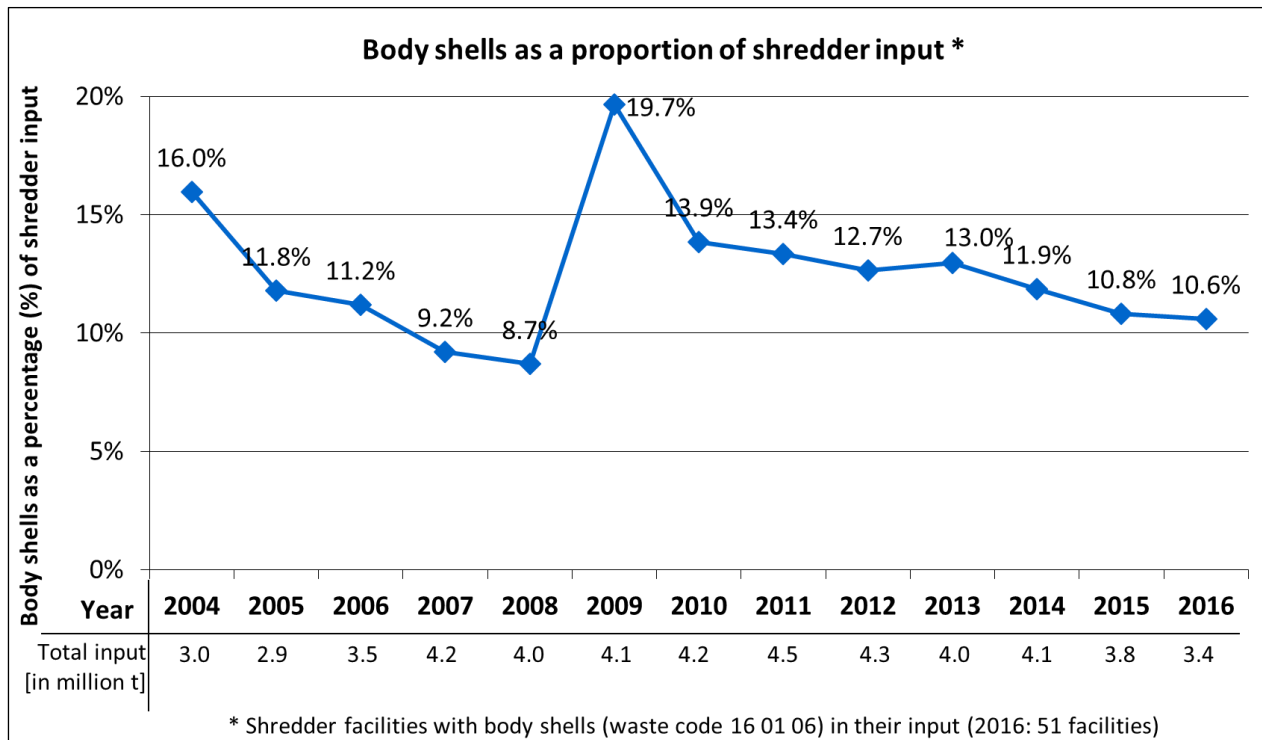
Source: Federal Statistical Office: Table 14 of the Waste Management Surveys, 2004 to 2016.

In 2009, the year of the Environmental Premium, body shells as a share of input into shredder facilities reached a new high of 19.7%. Since then, their proportion has fallen steadily, and in 2016 totalled 10.6%, 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 recognised 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 recognised facilities may not actually have accepted any end-of-life vehicles.



Figure 5: Development of body shells as a percentage of input into German shredder facilities, 2004 to 2016



Source: Federal Statistical Office, Table 1 of the Waste Management Survey, 2004 to 2016

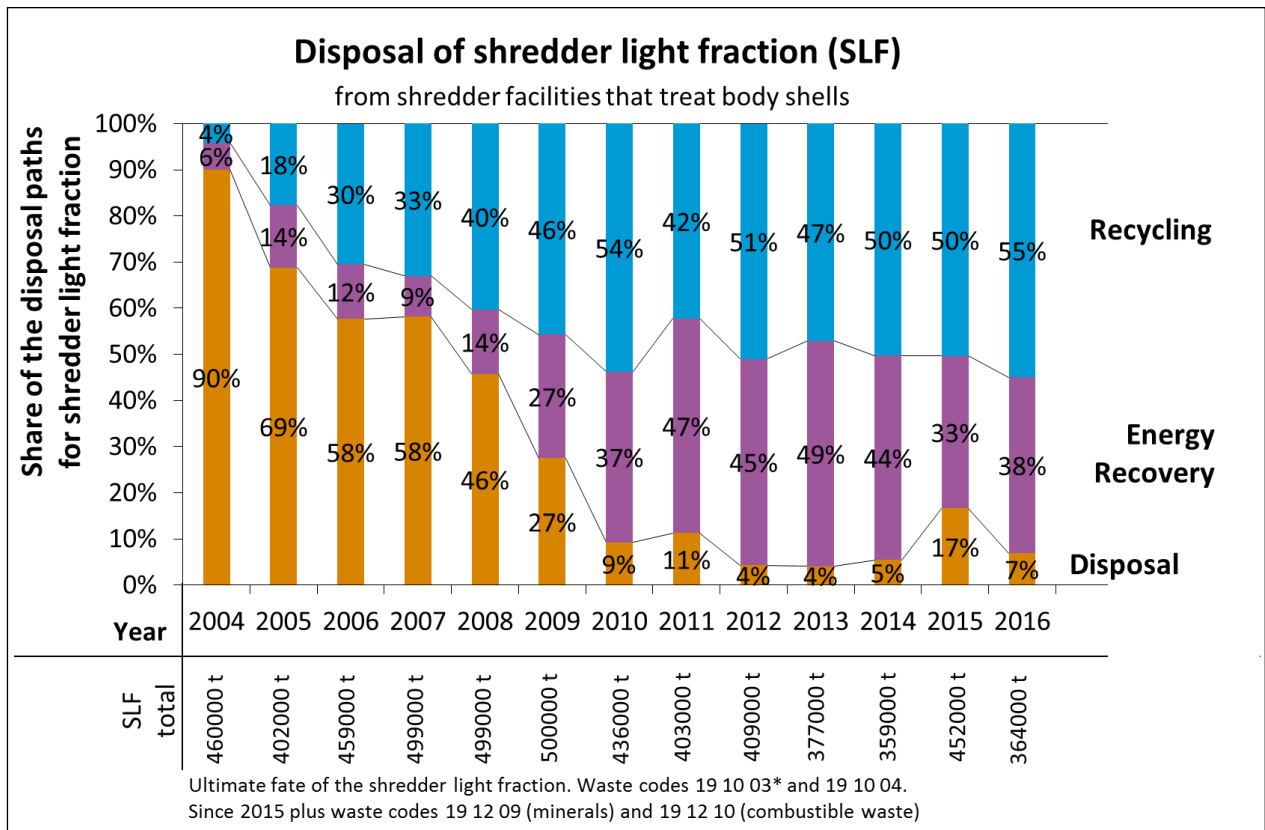
3.2 Recycling / recovery of shredder light fraction

The most important non-metal waste stream from the treatment of end-of-life vehicles, in volume terms, is the shredder light fraction. Whereas 90% of the shredder light fraction (waste codes 19 10 03* and 19 10 04) was still being sent for disposal in Germany in 2004, the proportion recycled or recovered increased continuously until 2010, when it totalled 91%. Since then, the volume sent for disposal has fluctuated between 4% and 17%, and in 2016 totalled 7%, see Figure 6. As more shredder light fraction is being disposed of under different waste codes, in the 2015 reporting year we began evaluating waste codes for minerals (19 12 09) and for combustible wastes (19 12 10) in addition to disposal of the two waste codes for fluff-light fraction (19 10 03* and 19 10 04).

Figure 6 shows the total quantity of shredder light fraction generated in shredder facilities that accept body shells. In 2016, around one-fifth (20.7%, or approximately 75,500 t out of a total of 364,000 t shredder light fraction produced) originated from body shells.



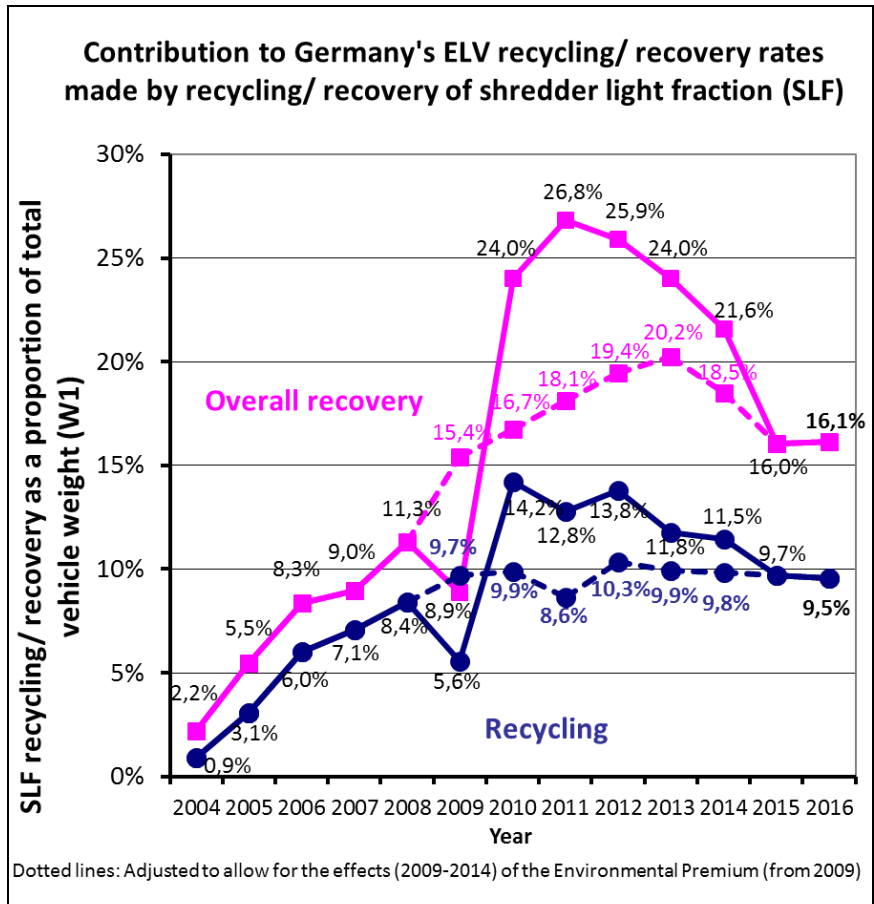
Figure 6: Disposal of shredder light fraction from shredder facilities that treat body shells in Germany, 2004 to 2016



Source: Federal Statistical Office: Table 15 of the Waste Management Surveys, 2004 to 2016.



Figure 7: Contribution of the recycling/recovery of shredder light fraction (SLF) to Germany's end-of-life vehicle recycling/recovery rates, 2004 to 2016.



Figures in relation to total vehicle weight (W1)

The contribution of shredder light fraction recovered/recycled in Germany to the overall ELV recovery quota was 16.1%, on a par with the previous year. Despite a lower disposal rate than in 2015, this is attributable to the computational reduction in the proportion of shredder light fraction from 23.5% to 22.2% of body shell weight, see number 2.1.5, letter f).

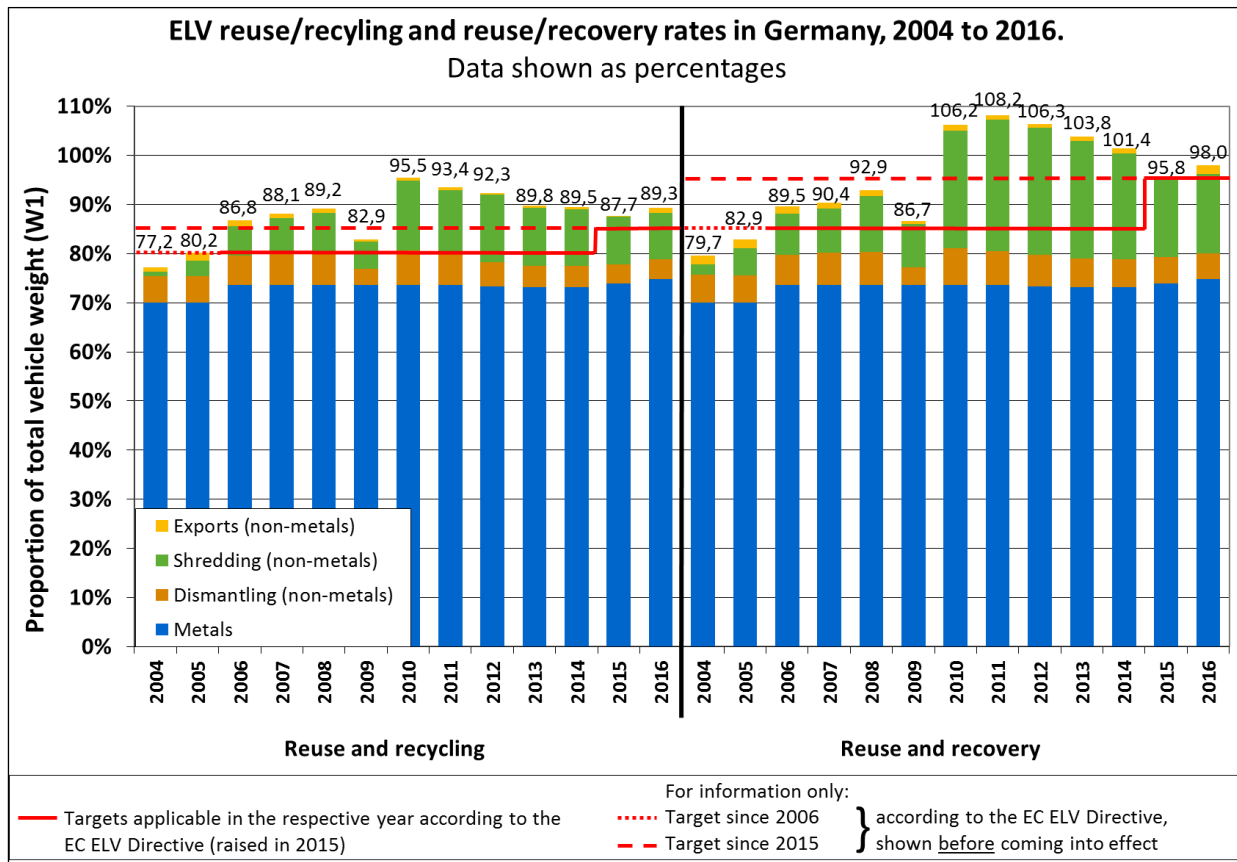
No further after-effects of the Environmental Premium have been observed since 2015. However, for the years 2009 to 2014, additional calculations were carried out to “eliminate” or adjust for the effects of the Environmental Premium, shown as dotted lines in Figure 7. Explanatory comments on this can 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 (74.7%), in 2016 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 2016



In 2016, the reuse and recycling rate was 89.3%, slightly up on the previous year's level of 87.7%.

The overall recovery rate remains high at 98%, around two percentage points up on the previous year.

In the years 2009 to 2014, ELV recycling/recovery rates were influenced by the 2009 Environmental Premium. During this period, additional calculations were therefore included to "eliminate" or adjust for the impacts and after-effects of the Environmental Premium, because the achieved recovery/recycling rates of more than 100% were not a true reflection of the actual level of ELV recovery/recycling. Explanatory comments on this can be found in the previous years' reports. Figure 9 shows the development of recovery/recycling rates including adjustments to allow for the effects of the Environmental Premium between 2009 and 2014.



4 Appendix: COM Tables with allocation of metals 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 2016. Metals + non-metals					
Materials from de-pollution and dismantling	Reuse	Recycling	Energy recovery	Total recovery	Disposal
	(A)	(B1)	(C1)	(D1=B1+C1)	E1
	in t	in t	in t	in t	in t
Batteries	49	5,922	0	5,922	312
Liquids (excluding fuel)	48	2,494	192	2,687	900
Oil filters	0	75	20	95	7
Other materials arising from de-pollution (excluding fuel)	1	88	110	197	12
Catalysts	20	1,262	0	1,262	27
Metal components	11,953	22,889	18	22,907	628
Tyres	572	7,510	3,909	11,419	355
Large plastic parts	67	908	0	908	4
Glass	106	844	0	844	6
Other materials arising from dismantling	4,098	222	896	1,118	134
Total	16,914	42,214	5,145	47,359	2,385

Explanation:

This table contains one rounding difference (of one tonne) 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 2016.



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, 2016. 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)	214,399	0	214,399	0
Non-ferrous materials (aluminium, copper, zinc, lead etc.)	33,490	0	33,490	0
Shredder light fraction (SLF)	40,073	27,717	67,790	5,156
Other	0	0	0	0
Total	287,961	27,717	315,678	5,156

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 recovered/recycled metals (total) = 74.7% (metal content assumption, see Table 4 in number 2.2, letter b) * 420,113 t (total vehicle weight W1) = 314,013 t.
2. Deduction of metals already recorded in COM Table 1 (dismantling of metals: re-use and recycling/recovery) and COM Table 3 (metal exports).
3. Breakdown into ferrous/non-ferrous on a ratio of 64.6% : 10.1%

Source:

From Federal Statistical Office data, Table 15 of the Waste Management Survey 2016.



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 2016. 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 by country	Total recycling of (parts of) end-of-life vehicles exported	Total recovery of (parts of) end-of-life vehicles exported	Total disposal of (parts of) end-of-life vehicles exported	Remarks
		(F1)	(F2)	(F3)	
	in t	in t	in t	in t	
1) End-of-life vehicles (WC 160104*)	0	0	0	0	No exports in 2016 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)	24,708	21,002	23,473	1,235	Basic figures: 24,708 t body shells exported. Assumption: 85% thereof recycled / 95% recovered ^{b)} .
Breakdown by countries: -- unknown --					
3) Components from dismantling facilities	5,867	5,717	5,825	42	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:			
- 130205*	Non-chlorinated machine oils etc.	to Switzerland, Finland			
- 160113*	Brake fluids	to Belgium			
- 160601*	Lead batteries	to Belgium, the Netherlands, Austria, Poland, Slovenia, Czech Republic			
- 160807*	Catalysts	to Belgium, UK, Italy, Netherlands, USA			
4) SLF from shredders	2,543	1,427	2,471	72	Total SLF exported: WC 191003*: 4,813 t, WC 191004: 7,453 t. Of which 20.7% 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, Austria			
Total	33,118	28,145	31,768	1,350	

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



Explanatory comments:

WC = Waste Code

This table contains a number of minor rounding differences, because quantities have been rounded up or down to the nearest whole tonne and percentages are only rounded to one place after the decimal point.

- a) Any ELV exports are recorded in the waste export statistics (see Sources below).
According to these statistics, in 2016, some 16,239 t were exported to Turkey and 2,577 t to the Netherlands under waste code 160104* (end-of-life vehicles). In the time series approach, these waste exports are ascribed to no. 8.12 "Other scrapped vehicles". The exported vehicles refer to boats, and as such are not ELVs falling within the scope of the ELV Directive.
- b) As there is no data available on recycling and recovery levels of body shells abroad, the targets of the EC ELV Directive of 85% recycling and 95% recovery has been assumed for calculation purposes.

Sources:

- Exports of body shells and other waste from end-of-life vehicle dismantling facilities:
"Erhebung über die Abfallentsorgung im Jahr 2016" (Waste Management Survey, 2016), Table 15, Federal Statistical Office.
- German Environment Agency (UBA): "Grenzüberschreitende Verbringung von zustimmungspflichtigen Abfällen 2016 - Export" (Transboundary shipments of waste requiring consent, 2016 - Export),
https://www.umweltbundesamt.de/sites/default/files/medien/2503/dokumente/grenzueberschreitende_verbringung_von_zustimmungspflichtigen_abfaellen_2016_-_export.pdf,
- German Environment Agency (UBA): "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_0.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, 2016					
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)	16,914	42,214	47,359	59,128	64,273
COM Tab 2: Shredders (B2, D2) (metals + non-metals)	0	287,961	315,678	287,961	315,678
COM Tab 3: Exports (F1, F2) (metals + non-metals)	0	28,145	31,768	28,145	31,768
Total	16,914	358,320	394,806	375,234	411,720
				Recycling and recovery rates 2016	
W (total number of end-of-life vehicles)	412,801 vehicles			89.3%	98.0%
W1 (total vehicle weight)	420,113 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.