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Directorate E: Sectoral and regional statistics  
Unit E2: Environmental Statistics and Accounts; Sustainable Development



## How to report on end-of-life vehicles according to Commission Decision 2005/293/EC

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### CONTACT

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## 1. Introduction

The aim of this guidance document is to assist the Member States in their efforts to produce high quality and harmonised data on end-of-life vehicles (ELVs) in accordance with the requirements of the Commission Decision 2005/293/EC<sup>1</sup>. This guidance is not legally binding but focuses on aspects of harmonisation and quality, based on the experience with the reporting for the reference year 2006 and 2007 and the related data collection and evaluation conducted by the Member States.

The transmission of data and the use of the data transmission tool (eDAMIS web forms) are explained in a separate document. Furthermore, guidance related to shredder campaigns and the statistical aspects involved is given in a separate document too.

The guidance document aims primarily at national experts involved in the production of national statistics on ELVs. Experts are invited to provide comments so that the document can be improved.

## 2. Scope and definitions

### ***Scope of the ELV Directive (2000/53/EC)***

The ELV Directive (2000/53/EC)<sup>2</sup> covers, as set out in Article 3 (1), vehicles and ELVs including their components and materials. Vehicles are defined, according to Article 2 (1), as “any vehicles designated as category M1 or N1 defined in the Annex IIA to Directive 70/156/EEC and 3 wheel motor vehicles as defined in Directive 92/61/EEC but excluding motor tricycles.”

The Commission Decision 2005/293/EC provides further explanations in the notes to the Annex, where it is explained in note (5) “The total number of end-of-life vehicles (W) shall be calculated on the basis of the number of end-of-life vehicles arising in the Member State, which is when a national authorised treatment facility (ATF) issues a certificate of destruction” (CoD).

However, it may happen that no CoD is issued for an end-of-life vehicle, so, there may be more ELVs than CoDs. In order to cover all ELVs the reporting guidance in this document differs from the instruction given in note 5, for more details see the “Explanations to the notes of Commission Decision 2005/293/EC” in Chapter 6 related to note 5.

### ***Note: Recovery and recycling definition – observed discrepancies***

Article 2 (7) and Article 2 (8) of the ELV Directive 2000/53/EC provide definitions for recycling, energy recovery and recovery:

Article 2 (7): ‘recycling’ means the reprocessing in a production process of the waste materials for the original purpose or for other purposes but excluding energy recovery. Energy recovery means the use of combustible waste as a means to generate energy through direct incineration with or without other waste but with recovery of the heat;

Article 2(8): ‘recovery’ means any of the applicable operations provided for in Annex IIB to Directive 75/442/EEC;

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<sup>1</sup> OJ L 94, 13.4.2005, p. 30

<sup>2</sup> OJ L 269, 21.10.2000, p.34

A different definition for recycling is established in Article 3 (17) of the Waste Framework Directive (WFD, 2008/98/EC)<sup>3</sup>. All references in the ELV Directive to Directive 75/442/EEC automatically refer to the WFD 2008/98/EC. As a result, the definitions of “recovery” and “disposal” in the ELV Directive are harmonized with the WFD. However, the definition for “recycling” in the ELV Directive will remain as it currently is until it will be formally harmonised with the definition of the WFD.

***Backfilling:***

Article 3 (17) of the Waste Framework Directive (WFD, 2008/98/EC) provides the definition for recycling explicitly excluding backfilling.

Article 3 (17): ‘recycling’ means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations;

Hence, backfilling is not regarded by the WFD as recycling but as recovery.

**3. Rationale for the submission of a Quality Report**

Article 1 (1) of the Commission Decision 2005/293/EC stipulates that “...Member States shall complete tables 1 to 4 set out in the Annex to this Decision together with an appropriate description of the data used.”

Article 1 (2) stipulates for the cases where Member States apply the so-called *metal content assumption*, that this assumption “... shall be supported by detailed data explaining the assumed percentage of metal content, as well as the assumed percentage of the metal reuse, recovery and recycling. ...”

Furthermore, Article 1 (3) establishes criteria to be covered by the data to be submitted as follows:

“In the data, Member States shall include a breakdown of the following:

- (a) the current national vehicle market;
- (b) the end-of-life vehicles on their territory; and
- (c) the vehicle materials and components included in this assumption, in order to avoid double counting.”

The subsequent sections shall provide guidance on how to address these requirements.

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<sup>3</sup>OJ L 312, 22.11.2008, p. 3

## 4. Guidance on how to draft the Quality Report

### 4.1 General information

Please put the following general information on the cover page of the Quality Report

- Country: \_\_\_\_\_
- 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: \_\_\_\_\_
- Contact person / contact details: \_\_\_\_\_
- Reference period (e.g. "data for the year 2015"): \_\_\_\_\_
- Delivery date / version: \_\_\_\_\_
- We agree to make our Quality Report available to the national experts via circa (Y/N):  
\_\_\_\_\_

### 4.2 Recommended outline of the Quality Report

#### Chapter A) Information according to Article 1(1)

Section 1: Source of information

Section 2: Quality of information sources

Section 3: Determination of the weight

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

Section 5: Other comments

#### Chapter B) Information according to Article 1(2)

#### Chapter C) Information according to Article 1(3)

Section 1: Information on the national vehicle market

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

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

### **4.3 Recommended content and other remarks to the outline of the Quality Report**

#### **Chapter A) Information according to Article 1(1):**

##### **Section 1: Source of information**

Description of the source of information (e.g. census / national statistics / reporting obligations of business or certified business units / agencies / associations / surveys of waste composition/ specific related implications of national laws and relevant regulations).

##### **Section 2: Quality of information sources**

Description of the quality of information sources / completeness (coverage): Is the information on ELVs collected complete? (Is information collected from all dismantlers / shredders in the market, or is there a known or unknown portion not covered by the reporting scheme, e.g. dismantling / shredding by not authorised treatment facilities? How do you avoid taking imports into account when calculating the target rates?).

##### **Section 3: Determination of the weight**

Description of how the ELV weight was determined (for instance: registration weight, certificate of conformity, manufacturer's specifications, others).

##### **Section 4: Recycling or recovery of exported ELVs respectively parts of ELVs**

Describe what evidence is provided to take export into consideration for recycling (F1) or recovery (F2).

##### **Section 5: Other comments**

Please provide information related to the data filled in the tables 1 - 4, if appropriate, e.g.:

- a) Explanations on export of shredder output in Table 2.
- b) Description of actions undertaken by the country to avoid double counting of ELVs and components.
- c) Description of estimations / calculations conducted (e.g. factors based on ELV treatment and recovery trial, data provided by manufacturers).
- d) Description of missing mandatory information; what measures are taken to provide all mandatory information in future?
- e) Description of the validation process: how do you establish the validity of the data?
- f) Description of changes in methodology relative to the previous data delivered.
- g) Description on the discrepancy between the number of ELVs with and without CoD and measures to be taken in order to improve the situation.

#### **Chapter B) Information according to Article 1(2)**

This sections needs to be completed if the "metal content assumption" is applied. According to Article 1(2) of the Commission Decision, a detailed explanation on the assumed percentage of metal content of ELVs arising and treated in the Member State, as well as the

assumed percentage of the metal reuse, recovery and recycling from de-pollution, dismantling, and shredding, shall be provided.

Please note that the application of the “metal content assumption” does not imply an exemption to complete all (obligatory) cells in table 1 to 4. Advice how to complete the tables in practice is given in Annex A-2 “Guidance on the application of the “metal content assumption”, section 4.

If the “metal content assumption” is applied, detailed explanations in the Quality Report shall at least provide the following information:

- a) What investigations / data have been used (sources / quality / coverage) to derive the metal content?
- b) What investigations / data / calculations have been used to derive the assumed percentage of reused, recycled and recovered metals?
- c) How does the Member State ensure that they meet the required coverage of 95%?
- d) How have these data been broken down for Tables 1 to 3?

**Chapter C) Information according to Article 1(3):**

The aim of the description of the national vehicle market for M1 and N1 vehicles is to get a better understanding of the whereabouts of the vehicles in the national market and the share of deregistered and exported vehicles. The tables (Section 1 and Section 2) below are therefore indicative only and other appropriate methodologies to describe the national vehicle market are appreciated as well. They should be completed, if data are available.

It is possible that not all information is nationally available for the time being. In the section below entitled “Further information on completion of Section 1 to 3” some proposals are mentioned, where data might be available.

**Section 1: Information on the national vehicle market:**

	Unit	Reference year: _____
Vehicles registered	Number	
Average age of fleet	Years	
Final de-registrations per year	Number	
CoDs issued in the Member State <sup>*)</sup>	Number	
ELVs arising in the Member State <sup>*)</sup>	Number	
Average age of ELVs	Years	

<sup>\*)</sup> Differences between CoD issued and ELV arising might appear due to:

- not yet fully implemented ELV Directive or
- illegal operators or
- e.g. Notification of Destruction issued in UK in cases where not all information is present or clear to issue a CoD (for instances where the vehicle has been burned out either accidentally or deliberately, or significantly defaced).

Please provide details on the difference between CoDs issued and ELVs arising in the Quality Report and explain the estimation procedure to cover these ELVs in the reporting.

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

Reference year: _____	Unit	To other EU Countries	To non - EU Countries
Used vehicles exported	Number		
Average age of used vehicles exported	Years		
ELVs exported	Number		
De-polluted (and dismantled) body shell exported	Number		
	Tonnes		

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

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

**Further information on completion of Section 1 to 3**

Countries asked for support regarding potential sources of information on the national vehicle market. In addition to the following sources (national statistics and national associations) there will be an opportunity to identify the required figures or, at least, to identify the responsible national expert in charge.

- **EUCARIS**, the **EU**ropean **CAR** and driving licence **I**nformation **S**ystem. EUCARIS is a unique system that provides opportunities to countries to share their car and driving licence registration information, helping to fight car theft and registration fraud. EUCARIS is developed by and for governmental authorities. It enables identification of the national responsible authority which holds the information of re-registered cars in Europe, thus enabling identification of vehicles which have been exported from the country to other EU27 Countries. <https://www.eucaris.net/index.php>
- **EReg** is the Association of European Vehicle and Driver Registration Authorities. EReg maintains a Topic Group on ELVs. The aim of the Topic Group (beside others) was to look at ways to increase the lower than expected number of Certificate of Destructions (CoD) that were issued throughout the Member States. Another Topic Group is

established for the item Re-registration of vehicles within the EU.  
<https://www.ereg-association.eu/about/index.php>

- **Eurostat Transport Statistics** provides for instance the information on passenger cars (fleet) by age (database: road\_eqs\_carage). However, the information is also provided by national sources and should therefore be available at national level as well.  
<http://epp.eurostat.ec.europa.eu/portal/page/portal/transport/data/database>
- **Foreign Trade Statistics (FTS)**: Foreign trade statistics might be used to identify the cross border trade of used cars. Previous investigations demonstrate that the data quality for the export to other EU27 countries is weak (mainly due to different reporting thresholds from country to country and the effects of “micro-trade”). Therefore it is recommended to investigate further into registration data (EUCARIS, Ereg, information exchange on re-registration) for the Intra EU27 trade. For the export to non-EU27 countries it is most likely that FTS will be the only source to identify the number of exported cars. As mentioned before (see elements of methods and quality) it is important to know how countries estimate the amount below the reporting thresholds for export.
- **European Automobile Manufacturers Association (ACEA)** is providing consolidated statistics for some of the mentioned items. <http://www.acea.be/index.php>
- Information exchange between Member States on re-registrations based on Council Directive 1999/37/EC of 29 April 1999 on the registration documents for vehicles (Art. 9).

Once the Member States agree to publish their Quality Reports, other national examples might provide further guidance and “best practice”.

## 5. Guidance for the completion of the Tables 1 - 4

This section describes how to complete the cells of the tables and what needs to be considered. Where necessary, notes of the Annex to the Commission Decision 2005/293/EC are mentioned and explained.

### **In general**

All obligatory cells shall be filled without exemption. If this is not possible, please explain in the Quality Report (Chapter A, Section 5) why and what measures are foreseen to achieve complete reporting in the future. Further information is provided in Annex A-2 Guidance for the application of the “metal content assumption”.

### **Reporting unit**

The reporting unit to be used is 1 tonne; no decimal position and no thousands separator should be used.

Rates for recovery and recycling are to be reported as a value between 0 and 100 with maximally one decimal position.

### **Table 1**

In Table 1 materials arising from de-pollution and dismantling which are treated within the Member State shall be reported. ELVs, de-polluted ELVs and parts of ELVs sent for treatment (for recycling, recovery or disposal) to other states shall be reported in Table 3 (F1, F2, F3) and not in Table 1.

All reused parts (Reuse A) shall be reported in Table 1 regardless whether parts are exported for reuse or not. The reason for this is that in Table 3, dedicated to reporting on exports, no reporting cell/column is foreseen for *reuse*. This might apply to, for example, gears and engines and similar spare parts sent to the manufacturer for reconditioning.

Missing parts are considered to be reused and this amount is to be filled in the column named Reuse (A), see Note (4) on the determination of reuse if the subtraction method is applied.

If the metal content assumption is used, Reuse (A) shall be determined on the basis of declarations from the authorised treatment facilities for non-metal components only, see Note (4) on the metal content assumption.

However, in order to increase comparability it is recommended to report the missing parts in both cases (subtraction method and metal content assumption) as reuse (A) in Table 1.

### **Table 2**

In Table 2 materials arising from ELV shredding which are treated within the Member State shall be reported. In general, shredder output is not recovered totally; in particular the shredder light fraction is still disposed of at least partially. Therefore, reporting is incomplete if disposal took place, but no amount for disposal is reported in the tables. If shredder output

is exported as part of ELVs for further treatment, it should be reported in Table 3. In order to facilitate validation such export of shredder output should be mentioned in the Quality Report in Chapter A, Section 5.

Difficulties might appear in cases of import of ELVs, de-polluted ELVs, carcasses or parts of ELVs where the shredding facility is not aware that these (shredder input-) materials are imported. Article 2 (1) of the Commission Decision stipulates that import shall not be taken into account for the target rates but the export shall be attributed to the exporting country. The countries shall address this issue in the Quality Report regarding the correct coverage (Chapter A, Section 2).

In cases where the metal content assumption is used, the Recycling (B2) shall be determined ferrous scrap (steel) and non-ferrous materials (aluminium, copper, zinc, lead etc). The total mass of reused and recycled metal should be filled in table 2.

### **Table 3**

In Table 3 the export of ELVs<sup>4</sup> and parts of ELVs shall be reported. The term “ELVs and parts of ELVs” does not only cover

- entire ELVs

but also

- de-polluted / pre-treated ELVs (hulks).

and

- parts of ELVs (= waste from ELV treatment: material and components arising from dismantling and shredder output (both, scrap and shredder residues).

Both, ELVs and parts of ELVs, shall be reported in Table 3 in all columns. Export of used cars, which are not exported for reuse as cars, but mainly for final disposal, is an issue of enforcement (illegal export). The Quality Report shall address this issue with respect of the coverage of the reported data in Chapter C, Section 3.

Table 3 should be completed taking into account the following plausibility conditions:

- F1 (ELVs recycled)  $\leq$  (smaller or equal) F2 (ELVs recovered).  
F1 is a subpart of F2, hence it is not possible to report F1 without reporting F2;
- Total ELVs (and ELV waste) exported = F2 (ELVs recovered) + F3 (ELVs disposed of).  
The volume of ELVs exported is the sum of F2 plus F3;
- Vehicles can never be completely recovered. If entire ELVs or de-polluted body shells are exported (and not just parts of ELVs from dismantling, exported for recycling or recovery), then the total weight can not be completely recovered, some materials still have to be disposed of (F3). As direct sources will be often missing in case of export, the report on the methods should specify how the percentage of material disposed was estimated.

Recycling of ELVs and parts of ELVs exported (F1) is of the same type as B1 (recycling, Table 1) and B2 (recycling, Table 2);

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<sup>4</sup> The export of entire ELVs requires a notification under the Waste Shipment Regulation 1013/2006/EC. The export of used cars is reported in the quality report, chapter C.

Recovery of ELVs and parts of ELVs exported (F2) is of the same type as, D1 (recovery, Table 1) and D2 (recovery, Table 2).

Under the “Total weight of ELVs exported” the total weight of exports shall be reported, both complete ELVs and ELV parts/ ELV waste.

In the Quality Report (Chapter A, Section 4) the Member States shall report on the system providing evidence (see Article 2 (2)) on the kind of treatment ((recycling (F1) / recovery (F2) / disposal (F3)) in the case of export. If no evidence for recycling (F1) or recovery (F2) is established, the exported material shall be regarded as disposed of (F3).

There is no cell in Table 3 to report on exported material for reuse. As mentioned in the explanations to Table 1, reuse shall be reported in Table 1 regardless of whether the material for reuse is exported or not.

The breakdown by country in Table 3 on the export of ELVs for further treatment does not fit the electronic reporting tool; that is why the Member States are requested to supply this information in the report on the sources and methods. In the electronic reporting tool Table 3 is reduced to the total amounts exported and treated only.

The wording of Table 3’s heading might indicate that the column for “total weight of ELVs exported” shall not include “parts of” ELVs. For the purpose of better comparability Eurostat recommends to include “parts of” in this column as well.

Please enter the countries to which ELVs are exported in the first column and complete the following four columns in Table 3.

<b>Table 3. Monitoring of (parts of ) end-of-life vehicles arising in the country and exported for further treatment (tonnes)</b>				
Country exported to	Total weight of ELVs exported **	Recycling of ELVs and parts* of ELVs exported	Recovery of ELVs and parts* of ELVs exported	Disposal of ELVs and parts* of ELVs exported
		F1	F2	F3
<enter country>				
<b>Total</b>				

\* Parts of ELVs shall include the parts from de-pollution and dismantling exported for treatment, dismantled body shells (carcass) exported for treatment and the output of shredders exported for treatment. If no evidence is provided on the portion of recycling, recovery and disposal the export shall be taken as disposal. Reuse shall not be reported in Table 3 regardless of whether parts are exported or not, all reuse shall be reported in Table 1.

\*\* including “parts of”

#### **Table 4**

In Table 4, the relevant recovery and recycling rates are calculated. Therefore, the total reuse, total recycling and total recovery are taken from Tables 1 to 3 establishing the total reuse + recycling (X1) and the total reuse + recovery (X2).

**W1 (total vehicle weight):** The derivation of the denominator W1 (total vehicle weight) is described in notes (4) and (5). According to note (5) W1 shall be calculated as the sum of the individual vehicle weights (Wi). According to note (4) Wi is not the measured weight of the ELVs but the weight defined in the registration documents / certificate of conformity / manufacturers' specifications, without weight of driver (75 kg) and average fuel (40 kg).

**W (number of ELVs):** The total number of ELVs (W) shall, in principle, be calculated on the basis of the number of ELVs arising in the Member State, which is according to note (5) when a national authorised treatment facility (ATF) issues a Certificate of Destruction (CoD). However, as there may be more ELVs than CoDs issued, reporting should be done on the total number of ELVs; and differences, if any, should be explained in the Quality report, in Chapter A, Section 2 and Section 5, g (see also Chapter 6, explanations to note 5).

If shredding campaigns or methodologies to derive the metal content generate an “average vehicle weight” (also considering the deduction of the weight of driver and average fuel), this “average vehicle weight” can be used to cross-check the value of W1 divided by W.

It is recommended that a cross check of the total balance as  $X2 + E1 + E2 + F3 = W1$  is undertaken to verify completeness (and avoid double counting) of Tables 1 - 4. As the figures for W1 and the other figures are derived by different sources and methodologies (e.g. W1 derived from registration documents) it is not a mathematical function but a plausibility check only.

## 6. Explanations to the notes of Commission Decision 2005/293/EC

### **Explanations to note 2:**

See Annex 2: Guidance for the application of the “metal content assumption”

### **Explanations to note 3:**

List of Waste (LoW) codes can be applied in the data collection to clarify waste types or for the reporting obligations of the receiving authorised treatment facilities.

Official waste statistics or national reporting based on the LoW are not suitable sources of information as the coverage of the waste code for ELVs differs from ELVs as defined by the ELV Directive.

### **Explanations to note 4:**

Note (4) is a rather comprehensive note. It addresses several issues:

- a) how to derive Reuse (A) by the “*subtraction method*” or alternatively by applying the “*metal content assumption*”
- b) stipulates that the “recycling / recovery / disposal shall be determined on the basis of bookkeeping from the receiving recycling / recovery or collection company, weighting notes, other forms of book-keeping or disposal notes”<sup>5</sup>
- c) defines the sources and the deductions for the calculation of the individual vehicle weight (Wi). Accordingly Wi is not the measured weight of the ELVs but the weight, defined in the registration documents / certificate of conformity / manufacturers’ specifications, without weight of driver (75 kg) and average fuel (40 kg)
- d) defines that the “weight of the de-polluted and dismantled ELV (body cell) (Wb) shall be determined on the basis of information from the receiving treatment facility.

### **Explanations to note 5:**

Note (5) stipulates how to calculate the total vehicle weight (W1) and the total number of ELVs (W). The total number of end-of-life vehicles shall be calculated on the basis of the number of certificates of destruction (CoD) issued by national authorised treatment facilities. However, it may happen that for an ELV no CoD has been issued, hence, reporting on CoDs issued may not cover all ELVs generated. Therefore, W should be established based on the total number of ELVs arising instead of the number of CoDs. A difference between ELVs arising and the number of CoDs shall be addressed in the Quality Report

### **Explanations to note 6:**

Guidance for the conduction of “shredding campaigns” is given in a separate document on this website.

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<sup>5</sup> Whilst Article 1, paragraph 2 stipulates: When completing the tables 1 to 4 of the Annex to this Decision, Member States may also use a data-based assumption concerning the average percentage of reused recycled and recovered metals of ELVs, hereinafter the “metal content assumption”

## **Annex: Guidance for the application of the “Metal content assumption”**

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## 1. Introduction

Commission Decision 2005/293/EC lays down “detailed rules on the monitoring of the reuse/recovery and reuse/recycling targets set out in Directive 2000/53/EC of the European Parliament and of the Council on end-of life vehicles”.

Commission Decision 2005/293/EC states:

Recital (4):

“Balancing the risks of inaccuracies and the administrative efforts of achieving precise information, Member States are allowed to use a **metal content assumption** for the determination of the amount of metals from end-of-life vehicles which will be recovered.”

and

Article 1 (2):

“... Member states may also use a data-based assumption concerning the average percentage of reused, recycled and recovered metal of end-of-life vehicles, hereinafter the **metal content assumption**”.

Applying the metal content assumption, the data for ferrous metal and non-ferrous metal shall not be collected separately from each treatment operator by the Member State, because there are existing recycling loops for metals in all markets. Commission Decision 2005/293/EC explicitly allows to balance “[...] administrative efforts of achieving precise information [...]”.

This document shall support an appropriate and aligned approach of the Member States, applying the “**metal content assumption**”.

## 2. Scope and abbreviations

The Scope of this document is to explain the details which are relevant for the Member States under Art. 7(2) of the ELV Directive when preparing the reuse, recovery and recycling performance report by using the metal content assumption. General monitoring procedures which are relevant for both calculation methods (using and not using the metal content assumption) are not part of this description. Only deviations to the standard reporting procedure are explained and backed up with a justification.

### Abbreviations

ATF	Authorized Treatment Facility for End-of-Life vehicles.
ETRT	End-of-Life vehicle Treatment and Recovery Trial, which considers the complete treatment chain of ELVs from take back to recovery of material after PST.
OEM	Original-Equipment-Manufacturer.
PST	Post Shredder Technology. It refers to separation technologies after shredding of End-of-Life vehicles.
SR	Shredder residue.

### 3. Data collection

In order to be able to reflect all relevant data in the final calculation, a proper collection of data from all operators in the treatment chain has to be assured. This includes both the determination of the metal content and the collection of non-metallic recovery data from all ATFs, which is explained in detail in the following paragraphs.

#### 3.1. Determination of the “Metal Content Assumption”

According to Article 1(2) of Commission Decision 2005/293/EC, the “metal content assumption” is the average percentage of reused, recycled and recovered metals from end-of-life vehicles. It can be calculated, using the following equation:

Equation 1

„ <b>Metal content assumption</b> “ (see 3.1.3)	=	Metal content of ELVs (see 3.1.1)	*	Output factor (see 3.1.2)
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The validity of those figures shall be valid for 95% of ELVs arising in a Member State.

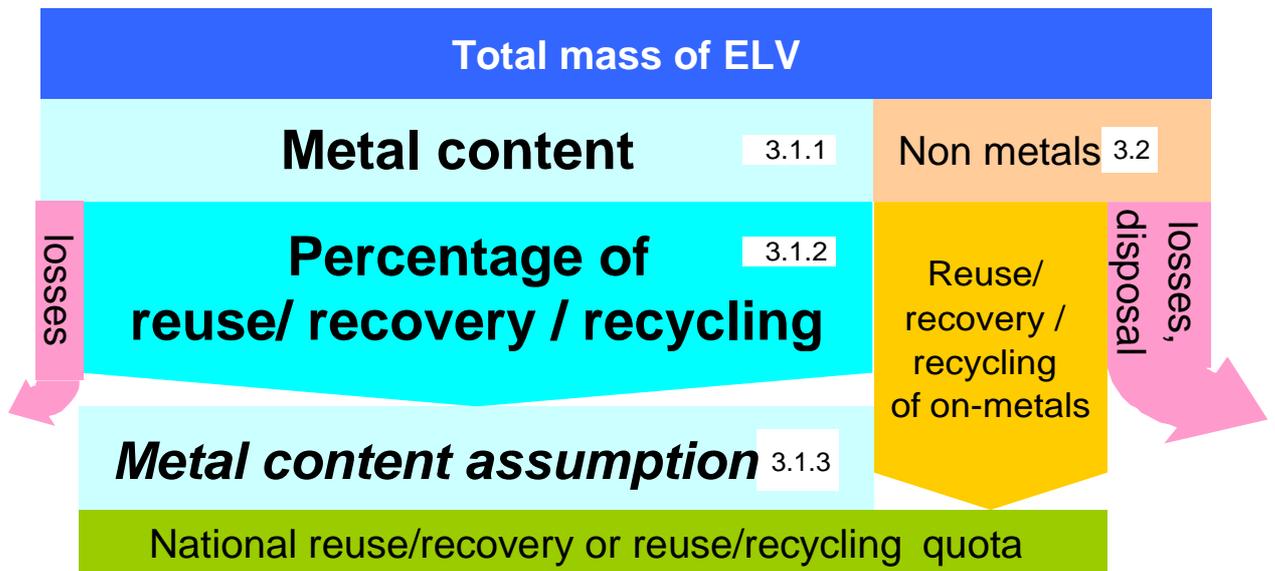


Figure 1: The metal content assumption as a part of the ELV recycling and recovery quota

In Recital (4) it is defined that there is one assumption for all metals recovered in the complete treatment process of ELVs: “[...] MS are allowed to use a metal content assumption for the determination of the amount of metals from end-of-life vehicles which will be recovered.” This metal content assumption includes also metallic reuse, as stated in Art. 1(2): “[...] That assumption shall be supported by data explaining [...] the assumed percentage of metal reuse, recovery and recycling.”

### 3.1.1. Calculation of the metal content / input

The metal content of the ELVs arising in the Member State has to be determined first. This is the average metal percentage of the ELVs, entering the ELV treatment chain and is the basis for further calculations. Based on internal dismantling studies and design data, the car manufacturers know the metal content of all their individual models. This is a very reliable data source.

A detailed breakdown of ELVs on brand, model and age might be dispensable, if there is evidence that no significant effect on the final results is expected. It might be sufficient to use data on the market shares and volumes of newly registered cars in a certain year, which are usually available in the MS. If the average age of the ELVs in the MS is known (e.g. 14 years), the metal content of today's ELVs can be approximated by the metal content of the newly registered cars (M1 and N1) e.g., 14 years ago, see Equation 2.

#### Equation 2

<p><b>Average metal content of all ELVs of year(i)</b></p>	<p>&gt;&gt;</p>	<p>Average metal content of all cars M1 and N1 registered in year (i – a) with a = average age of ELVs in year (i)</p>
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That means that data of vehicles put on the market, e.g. 14 years ago might define the basis for the calculation. The average metal content of that year can be derived from the metal contents of the car models put on the market in that year, weighted by their respective market shares in that year, see Equation 3.

#### Equation 3

<p>Average metal content of all cars registered in year (i – a)</p>	<p>=</p>	$\sum_{k=1}^n \text{Metalcontent}(\text{producer } k) * \frac{\text{number of registrations of producer } k \text{ in year}(i - a)}{\text{total number of registrations in MS in year}(i - a)}$	
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The described approach is an approximation, as the real ELV mix in general differs from the market shares of the models 14 years ago.

The calculation should be carried out by all (at least the main) car manufacturers and importers for their models with the highest market volumes in the reference year, ideally (and in conformity with Art. 1(2) of Commission Decision 2005/293/EC) including 95 % of their sales. Attention should be paid, that both, M1 and N1 vehicles, are included in the calculation.

It seems to be useful for each car manufacturer to determine its specific average metal content of its fleet and then sum up the weighted metals contents of the brands.

However the Member States shall provide evidence that the applied calculated average metal content results in recycling data valid for 95% of ELVs arising in a Member State.

With an average ELV age of 14 years, the metal content assumption for the calculation of the ELV recycling and recovery quotas in 2009 should refer to metal content data of vehicles put on the market in 1995, see Table 1.

**Table 1: Example of an approximation of the metal content of today's ELVs by the metal content of formerly registered cars**

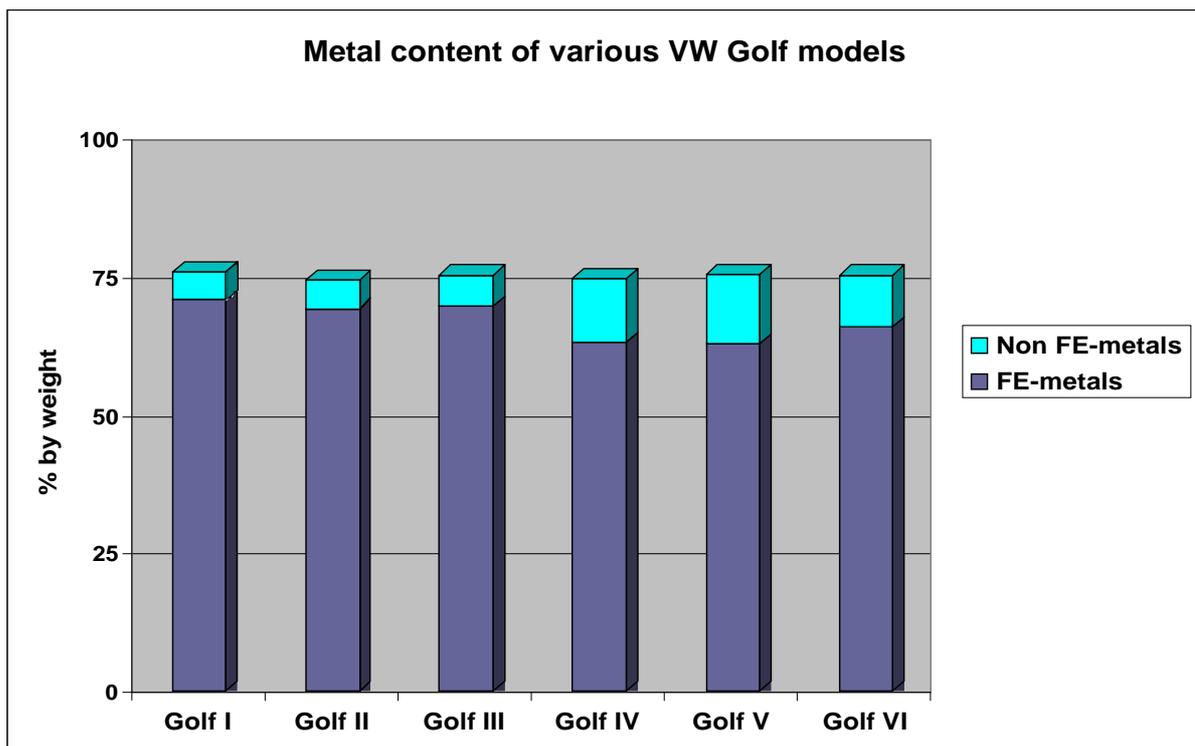
Average age of ELVs in MS	Year of the monitoring of the ELV recycling and recovery quotas	Reference year for metal content of new cars	Metal content assumption may be valid for quota determination of the years ...
14	2009	1995	2007 – 2011
	2012	1998	2010 – 2014

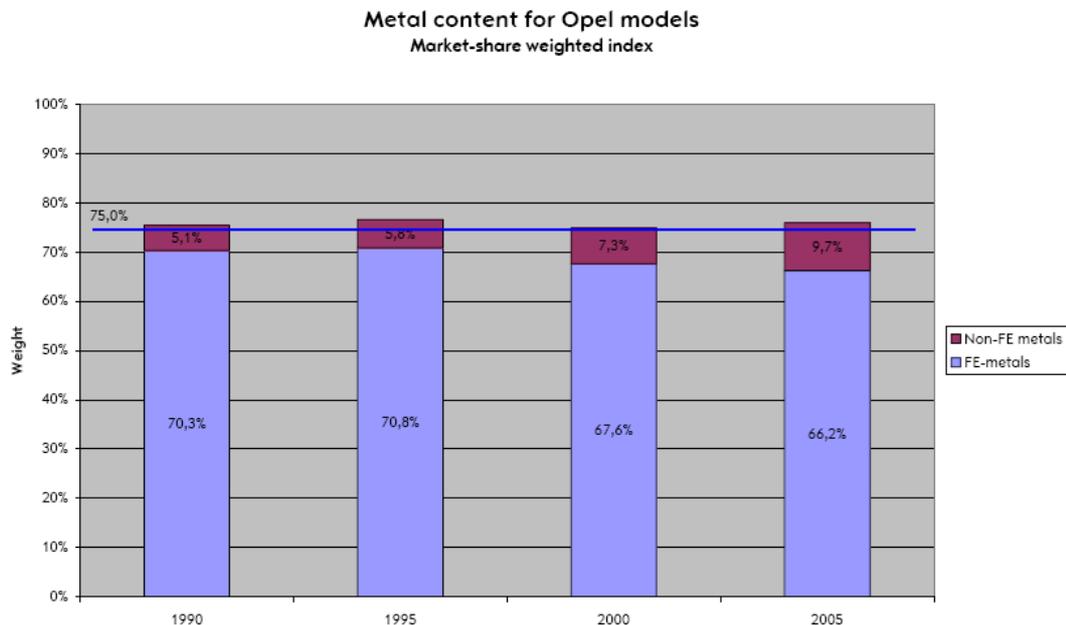
It does not seem to be necessary to determine the average metal content every year, because no significant change is expected from one year to another. The determination period shall not exceed the average lifetime of a model, which is approximately 5 years, see Table 1.

For the reporting year 2015 an updated approximation shall be used to reflect the latest status of separation technologies.

Additionally it can be stated, that the metal content of models over years is relatively constant, although the mix of ferrous and non-ferrous content might vary. This is also shown in Figure 2 and Figure 3, showing the metal content of VW Golf and Opel models over the years.

**Figure 2: Development of the metal content of various VW Golf models**





**Figure 3: Development of the metal content of various Opel models**

### 3.1.2. Determination of the percentage of reuse/recovery/recycling of the ELV metals/output factor

After the determination of the metal content of the ELVs, the percentage of this metal content, which is reused, recovered or recycled, has to be determined (as an output factor). Most of the metals from the ELVs are recovered, but there are still some losses. Shredder residues, for example, contain a certain amount of metals. This may vary with the shredder technology. Only with an appropriate post-shredder treatment, this metal fraction is recovered (see “losses” in Figure 1).

There are several alternatives, how the output factor (percentage of reuse/recovery/recycling of the ELV metals, see Figure 1) can be determined. Please note that a split into ferrous and non-ferrous metals is requested.

#### a) Consideration of all metal output streams

Based on one representative or several ETRTs the average metal output of the ELV treatment chain in a Member State shall be determined. Results from Member States with similar infrastructure (i.e. similar shredder and post shredder technologies) shall be accepted as well, in order to reduce the number of trials undertaken throughout the EU. In this case a detailed explanation shall describe the similarity of respective infrastructures. Based on a defined and representative input and taking into account all various streams of metal output in the ETRT (e.g. spare parts, batteries, dismantled components, shredder scrap, shredder heavy fraction, metals from post shredder treatment), which will be separately described in detail, the output factor can be derived.

b) Consideration of metal disposal only – determination of the “losses”

An ETRT could also help to determine the percentage of metal, which is not reused and recovered in the trial and ends up in disposal (= losses, see Figure 1). The metal output factor (for reuse/recovery / recycling) can be easily derived from the percentage of the losses, because the metal output factor and the metal losses (for disposal) sum up to 100 % of the metal content of ELVs.

The losses have to consider metal residues within the shredder residues (shredder light fraction, shredder heavy fraction), which are not recovered. The residual metal content of the (post) shredder residues should be determined by analysis of the composition of the (post) shredder residues.

With this percentage of metal losses, the metal output factor of the ETRT can be calculated (metal output factor = 100 % - metal losses percentage), which is then the basis for multiplication with the metal content of the OEM calculation.

*Virtual example of the determination of the metal output via metal losses:*

- Metal content of ELV = 76.0 % of the ELV weight.
- 100 % of the dismantled metals are reused/ recovered.
- Shredder residue (SR) = 20 % of the ELV weight.
- Average metal content (SR)= 12 % of SR (e.g. from analysis of composition of SR)  
→ Total metal content (SR)= $0.2 \times 0.12 = 2.4$  % of the ELV weight.
- Metal recovery from SR by post-shredder treatment = 40 % of total metal content (SR)  
→ Metal recovery by post shredder treatment =  $2.4$  % \* 40 % = 0.96 % of ELV weight
- Metal loss =  $2.4$  % - 0.96 % = 1.44 % of the ELV weight
- Reused/ recovered metal =  $76.0$  % - 1.44 % = 74.56 % of the ELV weight
- Metal output factor = reused/recovered metal / metal content  
**Metal output factor =  $74.56$  % /  $76.0$  % = 98.1 %**

Note that Member States shall provide evidence that the methodology applied generates recycling figures valid for 95% of ELVs arising in a Member State.

### 3.1.3. Final determination of the “Metal Content Assumption”

a) Through calculation with metal content and output factor

The metal output factor (see chapter 3.1.2.) multiplied by the metal content, specified by manufacturers, (see 3.1.1.) is equal to the average percentage of output of metal in the Member State, the so-called **metal content assumption** (see Equation 1). It is an assumption which includes **all** metal output of the complete treatment chain, which was reused and recovered/ recycled.

b) As result of a trial

A representative ETRT could also help to determine an average national metal content assumption by analysing the input and output of a representative mix of ELVs. In this case the mass of the metallic output of the ETRT has to be determined and then set against the

reference weight (type approval weight without driver and fuel). The resulting quotient/percentage can be defined as the “metal content assumption”, too.

### **3.2. Collection of non-metallic data**

As stated in Recital (4), with the metal content assumption the amount of **all** metals recovered from ELVs is counted. Therefore all other data collected from ATFs shall only refer to non-metallic material.

This is in line with Note 4 Para1: “Member States using the metal content assumption shall determine A (excluding the metal components) on the basis of declarations from the authorized treatment facilities”. Explicitly it is stated, that ATFs shall only report data on non-metallic material streams. This quoted sentence mainly applies to parts dismantled.

There is an equally valid requirement for the shredder companies in Note 6: “The actual recycling/recovery of the calculated output (other than metals) must be accounted for on the basis of declarations [...]”. Again metals shall not be reported by shredders and PST plants because they are already regarded as covered by the “metal content assumption”.

Therefore the Member States must collect from all their treatment operators, data on non-metallic reuse, recycling and recovery for all ELVs treated on an annual basis.

## **4. Guidance for the compilation of the Tables 1 – 4**

When filling in the compiled data into tables 1 – 4 of Commission Decision 2005/293/EC, there shall be no metallic content included in the figures, except the specific metal content assumption, which shall be filled in the specific cells for ferrous and non-ferrous metal for “Recycling (B2)” in Table 2. There shall be no allocation of the mass of metal, determined with the metal content assumption, to the different tables. This allocation would not be in line with Note 2: “Member States using the metal content assumption, are obliged to use this in the parts of table 2 related to metals.”

For the specific tables, following details have to be considered during the preparation of the tables and the quality report:

### **Table 1**

It is stated in Note 4: “Member States using the metal content assumption shall determine A (excluding the metal components) on the basis of declarations [...]”. That means that all cells referring to the line “Metal components” shall not be filled out, because the metal is already counted in the metal content assumption. All other cells in table 1 shall only be completed with figures not including any metallic mass data (e.g. only non-metal components of the batteries: sulphuric acid, plastics, about 40% of the total battery weight). Metallic reuse has to be included into column 1 “Recycling” of table 2.

### **Table 2**

When filling in table 2, please be aware, that the respective mass of metal has to be filled in the cells referring to “Ferrous Scrap” and “Non-ferrous materials”. A differentiated allocation to ferrous and non-ferrous materials is required. Thus the metal content assumption shall be filled in the specific cells for “Ferrous Scrap” and “Non-ferrous materials” for “Recycling (B2)”

in Table 2. “Energy Recovery (C2)” in Table 2 is normally not applicable for metals. The metal losses, as described in the previous section, shall not be reported as “Disposal (E2)” of metal, because they are assumed to be included in the reported amount of Shredder Residues (to be reported as “Shredder Light Fraction (SLF)” or “Other”).

The portion of metallic reuse shall not be reported in table 1, but should be included in the column “Recycling (B2)” of table 2. The total mass of metal, which has to be filled in the table, is the reference weight W1 multiplied by the metal content assumption.

### **Table 3**

Figures being filled into table 3 shall not contain any metal, as this is already covered with the metal content assumption.

### **Table 4**

Table 4 aggregates the information from tables 1 to 3. Proposal for a structure to fill in the rows of table 4:

1. row: Metals according to the metal content assumption (i.e. Fe/Non-Fe of table 2)
2. row: Non-metals from dismantling facilities (i.e. results of table 1)
3. row: Non-metals from shredding facilities (i.e. non-metal rows of table 2)
4. row: Non-metals exported (i.e. results of table 3)

## **CONTACT**

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