How to report Data for Directive 2006/66/EC and Regulation 493/2012 on batteries and accumulators

Eurostat, May 2020

1. Questions raised by Member States

1.1. Is the reference year for all quantitative reports the whole calendar year?

Answer: Generally, statistics follow waste data annually and it seems quite impossible to divide reports into periods 1.1.-26.9 and 27.9.-31.12 of a given year.

1.1. Sales and Collection are linked particularly to collection target in Art. 10 and Annex I. This target (collection rate) does not depend on electrochemical type of battery; it is just relevant for portable batteries. Why the form for the data report asks for a breakdown by electrochemical type of battery for sales and collection?

Answer: The statement above is correct. Stakeholders asked the Commission to consider a breakdown of the portable batteries by battery type for the data on sales and collection. This would enable a better distinction which kinds of batteries contribute to the related target in Art. 10. This approach was considered feasible since much of the data are actually provided by the industry and battery associations (respectively their national members).

In principle, the evaluation of the detailed breakdown should not be more difficult (data can easily sum up to total sales / collection of portable batteries). However, as no link exists between sales and collection (for portable only) on the one hand and recycling (for all) on the other hand, an evaluation of the volume collected and the volume treated / recycled is not feasible with these data.

In any event, please ensure that ‘Products put on the market’ (sales) and ‘Waste collected’ (collection) include ‘Portable Batteries and Accumulators’ only, excluding industrial and automotive batteries and accumulators. Portable ‘Lead-Acid Batteries’, ‘Ni-Cd Batteries’ and ‘Other Batteries’ are subcategories of ‘Portable Batteries and Accumulators’ which are the total amount and ideally the sum of ‘Lead-Acid Batteries’, ‘Ni-Cd Batteries’ and ‘Other Batteries’.

Reporting on **recycling**, however, shall **include** all kind of batteries and accumulators including industrial and automotive batteries and accumulators. Thus, it shall not distinguish

between portable and industrial or automotive batteries, as it is not possible to distinguish the origin once the batteries were shipped to the final recycling facility.

1.3. Could you explain the methodology according to Regulation 493/2012 for input/output fractions, recycling efficiency and rate of recycled content? We understand these indicators in the following way: The input fraction is the amount of Waste batteries collected and sent to recycling facility after sorting out according to Annex I. Before the new Regulation took effect, it was possible to use national methodologies for the calculation of recycling efficiencies, based for example on the amounts collected and certificates or evidence from facilities where these batteries were treated

Answer: The basis for the calculation is laid down by the COMMISSION REGULATION (EU) No 493/2012 of 11 June 2012 laying down detailed rules regarding the calculation of recycling efficiencies of the recycling processes of waste batteries and accumulators.

We recall the minutes of the Technical Advisory Committee meeting held on 28 March 2011 where it had been clarified that recycling level (as stipulated in directive 2006/66/EC) refers to the quantity of collected waste batteries sent for recycling, i.e. mass in tons of the input fractions entering the recycling process (as in Annexes I, II and III of the Regulation 493/2012; 'M_{input} Total' now replaces the former 'recycling level'), whereas "recycling efficiency" refers to the quality of the recycling process. The methodology for the calculation of Recycling Efficiencies and Rates of Recycled Content are detailed in its Annexes.

For additional information please refer to the summary record of the TAC meeting held on 5 November 2013.

1.4. How can we count stock supplies and exports?

Answer: Stocks of collected batteries shall be considered as collected but not as treated or recycled. As the link between collection (portable) and treatment (portable / industrial / automotive) is anyhow not evident, stock effects will not hamper the reporting. If changing stocks have a relevant level they should be reported in the quality report.

Article 15 of the Batteries Directive states that, when waste batteries and accumulators are exported for recycling, whether inside or outside the European Union, they must comply with the waste shipment laws specified in Regulation No 259/93. Since this Regulation was repealed on 12 July 2007, the transfer of waste batteries must now comply with Regulation No 1013/2006 on shipments of waste.

Under the terms of Regulation 1013/2006, Member States may adopt appropriate decisions at national level to ensure the compilation of the information needed to prove their compliance with respect to the obligations on recycling efficiencies.

In any event, the amounts of waste batteries collected in a given country but treated in a different one have to be considered for the calculation of recycling efficiencies of recycling processes. The responsibility to ensure treatment and recycling lies with the Member States within which the collection took place, even if treatment or recycling processes occur outside these Member States.[1]

In addition, for waste batteries exported outside the EU, Art 15 of the Batteries Directive applies:

> "Waste batteries and accumulators exported out of the Community … shall count towards the fulfilment of the obligations and efficiencies laid down in Annex III to this Directive only if there is sound evidence that the recycling operation took place under conditions equivalent to the requirements of this Directive."

1.5. Is the weight of a portable lead-acid battery supposed to be included both in "Portable Batteries and Accumulators" and in "Lead Acid Batteries"? Is the weight of a portable NiCd battery supposed to be included both in "Portable Batteries and Accumulators" and in "NiCd Batteries"? Is the weight of a portable 'Other battery' supposed to be included both in "Portable Batteries and Accumulators" and in "Other Batteries"?

Answer: 'Portable Batteries and Accumulators' is the total for sales and collection. Ideally the breakdown into 'Lead-Acid', 'NiCd' and 'Other' should sum up to this total if the breakdown is also reported. Automotive and industrial batteries are not considered for the reporting of sales and collection. Please refer also to the Answer to question 3.1.

1.6. Is the weight of all non-portable batteries (industrial and car batteries) supposed to be included in "Lead-Acid Batteries", "NiCd Batteries" and "Other Batteries" for the report on recycling?

Answer: The report on recycling shall not distinguish between portable and industrial / automotive batteries as it is not possible to distinguish their origin, once the batteries are shipped to the final recycling facility. Please refer also to the Answer to question 3.1.

1.7. What is "Recycling Level"?

[1] For further explanation, see note JRM/mc env.a.2(2015)644597 of 10 March 2015 on clarifications regarding reporting of recycling levels and efficiencies

Answer: The question was raised and answered at the TAC Meeting on 28 March 2011, the understanding being confirmed at other meetings.

‘As regards the level of recycling, the Commission recalled that at the Committee meeting held on 28 March 2011 it had been clarified that this referred to the quantity of collected waste batteries sent for recycling (i.e. mass of input fractions entering the recycling process), whereas "recycling efficiency" refers to the quality of the recycling process.’

Commission Regulation (EU) No 493/2012 of 11 June 2012 defines the input fractions entering the battery recycling process. ‘M_{input} Total’ is the mass of input fractions entering the recycling process and replaces the former concept of the recycling level. Please refer also to the Answer to question 1.8.

1.8. What are Minput, Moutput, Minput Total, Moutput Total, Recycling Efficiency (RE) and Rate of Recycled Content (RRC)?

Answer: It is assumed that:

- 'M_{input} Total' and 'M_{input}' are different names for the same concept.
- 'M_{output} Total' and 'M_{output}' are different names for the same concept.

The 'M_{input} Total' and 'M_{output} Total' are proposed to be used for these concepts: 'Minput total' is the mass of input fractions for all kind of batteries entering the recycling process per calendar year (Annexes IV, V and VI) in Tons'. This is an aggregated figure at Member State level from the Recyclers Reports excluding 'Elements or Components which are not part of the input fractions' as specified in the model report sheets from the Annexes.

'M_{output} total' is the mass of Output Fractions for all kind of batteries accounting for recycling per calendar year (Annexes IV, V and VI) in Tons. This is an aggregated figure at Member State level from the Recyclers Reports.

Likewise, it is also assumed that

- 'M_{output} Pb' and 'MPb output' are different names for the same concept
- 'M_{output} Cd' and 'MCd output' are different names for the same concept

In the Table 2 'M_{input} Total', 'M_{output} Total', 'M_{input} Pb', 'M_{output} Pb', 'M_{input} Cd' and 'M_{output} Cd' are proposed to be used so to ease the data reporting, as it is based on the reports of the recyclers according to Annexes IV, V and VI. 'M_{input} Pb' and 'M_{input} Cd' have to be reported as an aggregate figure at Member State level for Pb and Cd.

Below, the example for Pb, Cd and “Other Batteries and accumulators” on how to report data from Annexes IV, V and VI:

The figure for 'M_{input} Pb' is aggregated for all processes for all recyclers from the line 'Lead(Pb)' in Annex IV.

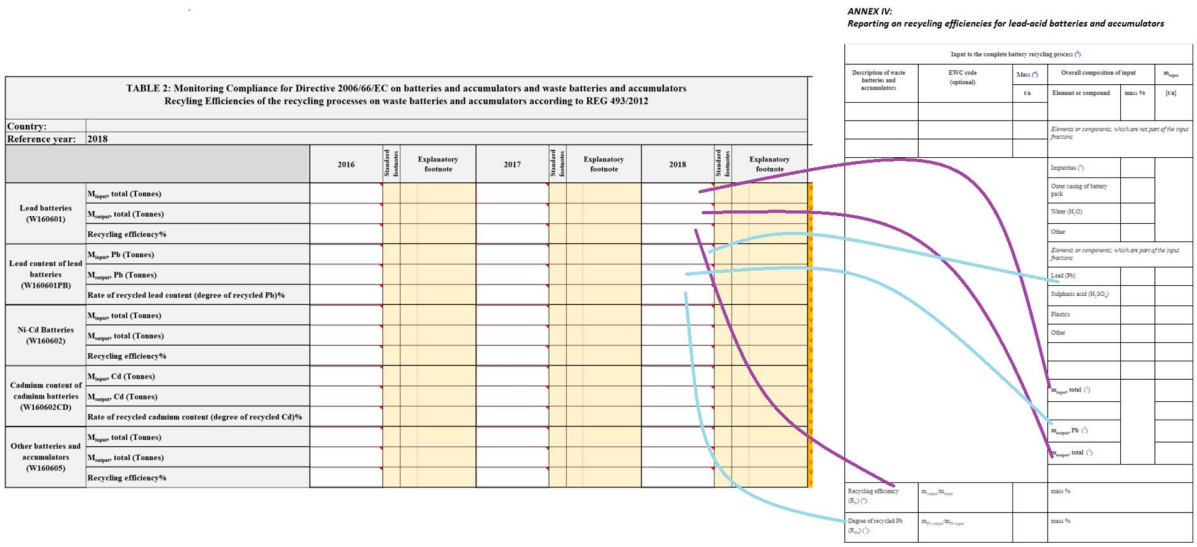

TABLE 2: Monitoring Compliance for Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators
Recyling Efficiencies of the recycling processes on waste batteries and accumulators according to REG 493/2012

Country:
Reference year: 2018

		2016	Standard footnotes	Explanatory footnote	2017	Standard footnotes	Explanatory footnote	2018	Standard footnotes	Explanatory footnote
Lead batteries (W160601)	M_{input}, total (Tonnes)									
	M_{output}, total (Tonnes)									
	Recycling efficiency%									
Lead content of lead batteries (W160601PB)	M_{input}, Pb (Tonnes)									
	M_{output}, Pb (Tonnes)									
	Rate of recycled lead content (degree of recycled Pb)%									
Ni-Cd Batteries (W160602)	M_{input}, total (Tonnes)									
	M_{output}, total (Tonnes)									
	Recycling efficiency%									
Cadmium content of cadmium batteries (W160602CD)	M_{input}, Cd (Tonnes)									
	M_{output}, Cd (Tonnes)									
	Rate of recycled cadmium content (degree of recycled Cd)%									
Other batteries and accumulators (W160605)	M_{input}, total (Tonnes)									
	M_{output}, total (Tonnes)									
	Recycling efficiency%									

ANNEX IV:
Reporting on recycling efficiencies for lead-acid batteries and accumulators

Input to the complete battery recycling process (1)

Description of waste batteries and accumulators	EWC code (optional)	Mass (1) t/a	Overall composition of input		m_{input} [t/a]
			Element or compound	mass %	
			Elements or components, which are not part of the input fractions		
			Impurities (1)		
			Outer casing of battery pack		
			Water (H_2O)		
			Other		
			Elements or components, which are part of the input fractions		
			Lead (Pb)		
			Sulphuric acid (H_2SO_4)		
			Plastics		
			Other		
			m_{input} total (1)		
			m_{output} Pb (1)		
			m_{output} total (1)		
Recycling efficiency (R_{eff}) (1):	m_{output}/m_{input}			mass %	
Degree of recycled Pb ($R_{eff,Pb}$) (1):	$m_{Pb\ output}/m_{Pb\ input}$			mass %	

The figure for 'M_{input} Cd' is aggregated for all processes for all recyclers from the line 'Cadmium (Cd)' in Annex V.

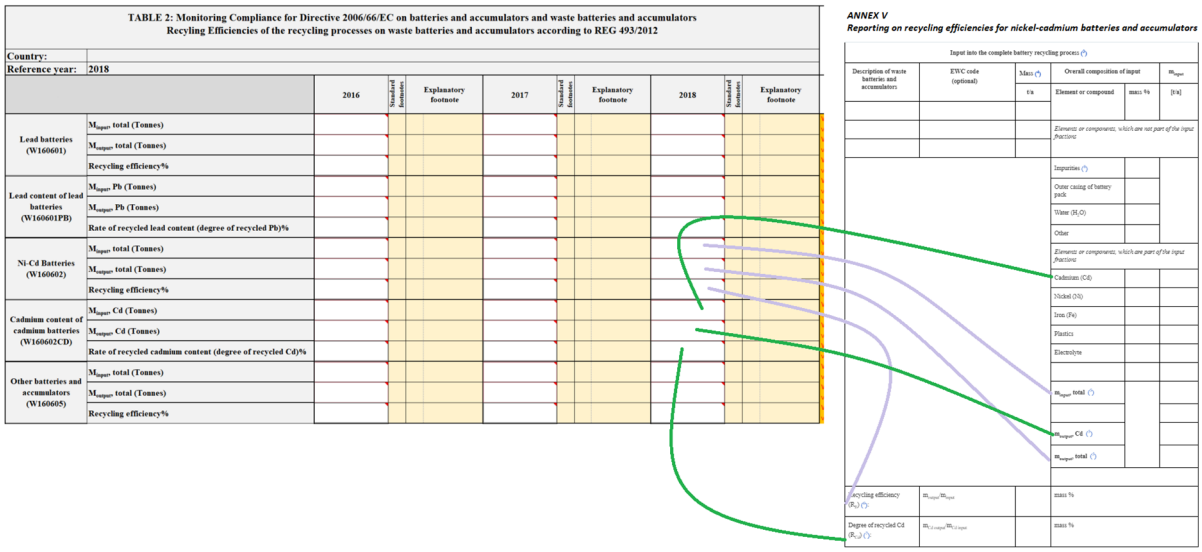

TABLE 2: Monitoring Compliance for Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators
Recyling Efficiencies of the recycling processes on waste batteries and accumulators according to REG 493/2012

Country:
Reference year: 2018

		2016	Standard footnotes	Explanatory footnote	2017	Standard footnotes	Explanatory footnote	2018	Standard footnotes	Explanatory footnote
Lead batteries (W160601)	M_{input}, total (Tonnes)									
	M_{output}, total (Tonnes)									
	Recycling efficiency%									
Lead content of lead batteries (W160601PB)	M_{input}, Pb (Tonnes)									
	M_{output}, Pb (Tonnes)									
	Rate of recycled lead content (degree of recycled Pb)%									
Ni-Cd Batteries (W160602)	M_{input}, total (Tonnes)									
	M_{output}, total (Tonnes)									
	Recycling efficiency%									
Cadmium content of cadmium batteries (W160602CD)	M_{input}, Cd (Tonnes)									
	M_{output}, Cd (Tonnes)									
	Rate of recycled cadmium content (degree of recycled Cd)%									
Other batteries and accumulators (W160605)	M_{input}, total (Tonnes)									
	M_{output}, total (Tonnes)									
	Recycling efficiency%									

ANNEX V
Reporting on recycling efficiencies for nickel-cadmium batteries and accumulators

Input into the complete battery recycling process (1)

Description of waste batteries and accumulators	EWC code (optional)	Mass (1) t/a	Overall composition of input		m_{input} [t/a]
			Element or compound	mass %	
			Elements or components, which are not part of the input fractions		
			Impurities (1)		
			Outer casing of battery pack		
			Water (H_2O)		
			Other		
			Elements or components, which are part of the input fractions		
			Cadmium (Cd)		
			Nickel (Ni)		
			Iron (Fe)		
			Plastics		
			Electrolyte		
			m_{input} total (1)		
			m_{output} Cd (1)		
			m_{output} total (1)		
Recycling efficiency (R_{eff}) (1):	m_{output}/m_{input}			mass %	
Degree of recycled Cd ($R_{eff,Cd}$) (1):	$m_{Cd\ output}/m_{Cd\ input}$			mass %	

Finally, the figure for “Other Batteries and accumulators” is reporting only the totals in Annex VI.

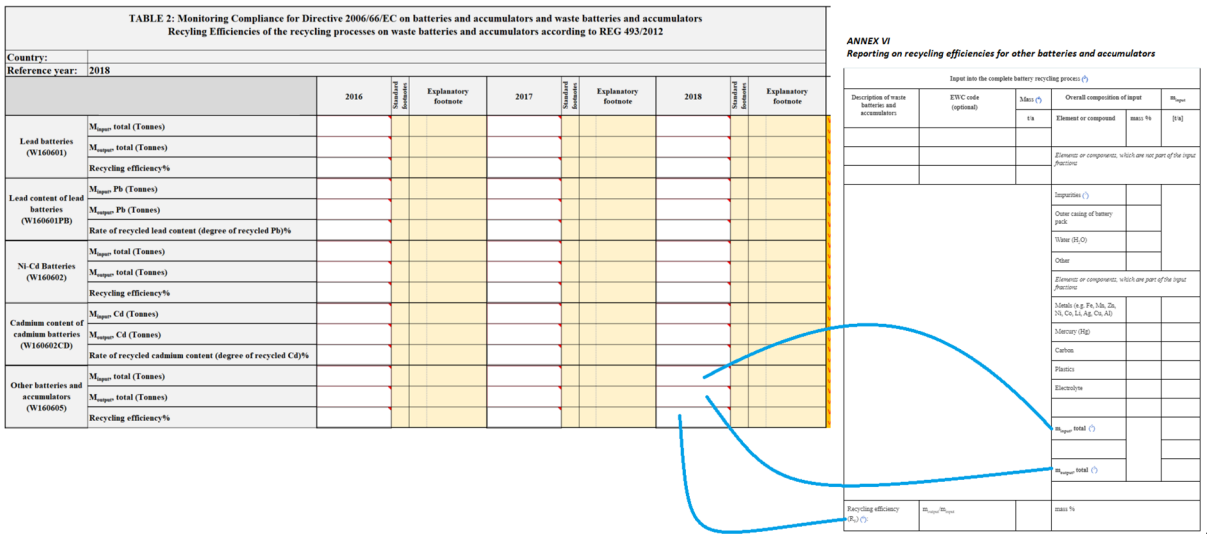

TABLE 2: Monitoring Compliance for Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators
Recyling Efficiencies of the recycling processes on waste batteries and accumulators according to REG 493/2012

Country:
Reference year: 2018

		2016	Standard footnotes	Explanatory footnote	2017	Standard footnotes	Explanatory footnote	2018	Standard footnotes	Explanatory footnote
Lead batteries (W160601)	M_{input}, total (Tonnes)									
	M_{output}, total (Tonnes)									
	Recycling efficiency%									
Lead content of lead batteries (W160601PB)	M_{input}, Pb (Tonnes)									
	M_{output}, Pb (Tonnes)									
	Rate of recycled lead content (degree of recycled Pb)%									
Ni-Cd Batteries (W160602)	M_{input}, total (Tonnes)									
	M_{output}, total (Tonnes)									
	Recycling efficiency%									
Cadmium content of cadmium batteries (W160602CD)	M_{input}, Cd (Tonnes)									
	M_{output}, Cd (Tonnes)									
	Rate of recycled cadmium content (degree of recycled Cd)%									
Other batteries and accumulators (W160605)	M_{input}, total (Tonnes)									
	M_{output}, total (Tonnes)									
	Recycling efficiency%									

ANNEX VI
Reporting on recycling efficiencies for other batteries and accumulators

Input into the complete battery recycling process (*)

Description of waste batteries and accumulators	EWC code (optional)	Mass (*) t/a	Overall composition of input: Element or compound	mass %	m_{input} [t/a]
			Elements or components, which are not part of the input fractions		
			Impurities (*)		
			Outer casing of battery pack		
			Water (H_2O)		
			Other		
			Elements or components, which are part of the input fractions		
			Metals (e.g. Fe, Mn, Zn, Ni, Co, Li, Ag, Cu, Al)		
			Mercury (Hg)		
			Carbon		
			Plastics		
			Electrolyte		
			m_{input}, total (*)		
			m_{output}, total (*)		
Recycling efficiency (R_E) (*)	m_{output}/m_{input}		mass %		

Recycling efficiency at Member State level should be calculated according to the formula in Annex I:

$$R_E = \frac{\sum m_{output}}{m_{input}} \times 100 \quad \text{, [mass \%]}$$

where:

R_E =calculated recycling efficiency of a recycling process [in mass %];

m_{output} = 'M_{output} Total' = the mass of output fractions accounting for recycling per calendar year;

m_{input} = 'M_{input} Total' = the mass of input fractions entering the battery recycling process per calendar year.

Rate of recycled content at Member State level should be calculated according to the formula according to the formula in Annex II for Pb and in Annex III for Cd:

Rate of recycled lead content:

$$R_{Pb} = \frac{\sum m_{Pb\,output}}{m_{Pb\,input}} \times 100 \quad \text{, [mass \%]}$$

where:

R_{Pb}=calculated rate of recycled lead (Pb) from a recycling process [in mass %];

$m_{Pb\ output}$ = 'M_{output} Pb' = the mass of Pb in output fractions accounting for recycling is the share of Pb contained in these fractions which results from the recycling of lead-acid batteries and accumulators per calendar year [in tonnes];

$m_{Pb\ input}$ = 'M_{input} Pb' = the mass of Pb in the input fraction entering the battery recycling process is defined as the yearly average Pb content of waste lead-acid batteries and accumulators multiplied by the input mass of lead-acid batteries and accumulators per calendar year [in tonnes].

Rate of recycled cadmium content:

$$R_{Cd} = \frac{\sum m_{Cd\ output}}{m_{Cd\ input}} \times 100$$, [mass %]

where:

R_{Cd} = calculated rate of recycled cadmium (Cd) from a recycling process for the purpose of Article 12(4) of Directive 2006/66/EC [in mass %];

$m_{Cd\ output}$ = 'M_{output} Cd' = the mass of Cd in output fractions accounting for recycling is the share of Cd contained in these fractions which results from the recycling of nickel-cadmium batteries and accumulators per calendar year [in tonnes].

$m_{Cd\ input}$ = 'M_{input} Cd' = the mass of Cd in the input fraction entering the battery recycling process is defined as the yearly average Cd content of waste nickel-cadmium batteries and accumulators multiplied by the input mass of nickel-cadmium batteries and accumulators per calendar year [in tonnes].

1.9. Is “Collection Rate” equal to “Collection” divided by “Sales”?

Answer: See Directive 2006/66/EC Art 3(17) and Annex I where calculations are explained:

(17) ‘collection rate’ means, for a given Member State in a given calendar year, the percentage obtained by dividing the weight of waste portable batteries and accumulators collected in accordance with Article 8(1) of this Directive or with Directive 2002/96/EC in that calendar year by the average weight of portable batteries and accumulators that producers either sell directly to end-users or deliver to third parties in order to sell them to end-users in that Member State during that calendar year and the preceding two calendar years.

1.10. Is “Recycling efficiency” equal to “Recovery” divided by “Collection” or “Recycling” divided by “Collection” or something else?

Answer: Please also refer to the Answer of question 1.3 of this document.

Please take note that for the reporting on data on recycling for the reference year 2014 (in 2015) the COMMISSION REGULATION (EU) No 493/2012 applies (Art. 1 of this regulation:

This Regulation shall apply to the recycling processes carried out to waste batteries and accumulators from 1 January 2014.).

2. Support

Should you have any questions please do not hesitate to contact us. The best way for contact is via our functional email address: estat-waste-statistics@ec.europa.eu. Please specify your contact details and indicate what your question is about: e.g. registration in ECAS, use of the eDAMIS system, waste concepts, etc.

If you have specific eDAMIS problems, please use the following address for support:

estat-support-edamis@ec.europa.eu Tel: (+352) 4301 33213.

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