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Study on behalf of the
European Portable Battery Association (EPBA)

The collection of waste portable batteries in Europe in view of the achievability of the collection targets set by Batteries Directive 2006/66/EC

Full report published first August 2013

Short Update (covering 2018 data) Mar-20

Introduction

The collection of portable primary and rechargeable batteries in Europe is mandated by Directive 2006/66/EC which requires Member States to achieve a collection rate of 25% in 2012 and 45% in 2016. The European portable power industry commissioned consultants Perchards/Sagis to carry out a study investigating and advising on the achievement of mandatory collection rates for portable primary and rechargeable batteries in EU Member States, plus Iceland Norway and Switzerland. In 2014/5/6/7, EPBA commissioned an update of the study taking into account the previous year's data. For 2017 and **2018 data, a short update was agreed.** Industry intends to use the study as a basis for dialogue with the European Commission, Member State Governments, their agencies and other stakeholders to highlight the limitations of the current regulations and practices as a basis for suggested improvements.

Methodology

The study's findings rely on primary research of publications of collection organisations (notably annual reports) and national authorities, supported by questionnaires and interviews with representatives from these organisations between May-12 to Aug-13. The consultants have attempted to explain the stated collection rates quantitatively by collecting hundreds of data points for each country and trying to identify correlations between them. This has proven challenging for several reasons: A) The sheer magnitude of variables with multiple interdependencies; B) Incomplete and incomparable historical data. (Prior to Batteries Directive 2006/66/EC there were no requirements at EU level to report on portable batteries, and if data were collected they were based on varying definitions); C) Diverging national terminology for key parameters of the schemes and organisations, such as collection sources; and D) Ongoing changes in national legislation and rapid development of scheme implementation as a result of the short time since the transposition of the Directive.

Data sources and accuracy

Accuracy of portable battery collection rates in this report: In the absence of the official collection rates that may be adjusted by statistically significant estimates[1], the collection rates used in this report are calculated using unadjusted POM and collection volume data released by member states and / or organisations. Where current data are not available, earlier data or estimates based on earlier years or partial data from organisations are used. In September 2016, EUROSTAT released portable batteries data reported by member states to the European Commission. A new section in this report compares these data with those in previous versions of this report[2].

Per capita volume data: To allow for meaningful cross-country comparisons, it is necessary to use battery collection and POM data on a per capita basis. For consistency, this report only uses EUROSTAT population data to arrive at per capita volumes. Battery organisations and national authorities often use other data sources or data from a single base year. Thus per capita data in this report may vary slightly from those released nationally. In the 2016 update, the underlying EUROSTAT population dataset of 2012 was replaced with the latest dataset: Over all countries covered, the new set shows a 1% lower population in 2012. However, for some countries the numbers deviate significantly[3], which affects the per capita POM and collection data in this report.

Sources for WEEE data: Eurostat EEE and WEEE data are used for comparison purposes.

Acknowledgements

The authors would like to thank the numerous individuals and organisations that have provided data and valuable input to this study. Any errors or omissions remain the responsibility of the authors.

1 Batteries Directive 2006/66/EC requires member states to calculate the collection rate for the first time for the calendar year 2011 and report results of the four-year period 27 September 2008 to 26 September 2012 to the Commission by 26 June 2013. Commission Decision 2008/763/EC allows Member States to base their calculation of battery sales (POM, placed on the market) volumes on 'collected data or statistically significant estimates based on collected data'. For many countries these estimates may have a significant impact on the official collection rates, especially in those that did not have POM reporting procedures for batteries in EEE in place throughout the period 2009-2012 and those with high uncertainty about the reported collection volumes.

2 EUROSTAT data on portable batteries had not been available until the 2016 version of this report (only a dataset for waste from all batteries from 2004 to 2010 without breakdown into portable batteries).

3 CY +4%, HR -3%, LV -7%, LT -6% and RO -6%.

Terminology

'Scheme'	is used to refer to the overarching regime in view of the parties responsible for the management (consumer awareness, collection and treatment) of waste portable batteries.
'Scheme models'	can be distinguished by the parties held financially and/or organisationally responsible for waste battery management. For the purpose of this study, the following main scheme models are identified: 'State fund model', a 'Single organisation model' (also 'Environmental agreement model') and a 'Competing organisations model'.
'Organisation'	is used to refer to entities engaged in coordinating waste battery management and involved in assisting to fulfil producer responsibility obligations. Subject to the national context, 'organisations' may be referred to as 'compliance systems', 'producer compliance schemes', 'producer compliance organisations', 'collective schemes' or 'approved waste managers' which may be subject to licensing or approval requirements, restriction on their ownership, profit objective and business activities, etc.
'POM'	(Placed On the Market) refers to sales volumes of portable batteries that producers are obligated to report.
'Collection rate'	refers to the use of the calculation methodology of Directive 2006/66/EC which divides the collection volume in the current year by the average weight placed on market in current and two preceding years. If, due to unavailability of 3 years of POM data, only the current year POM is used, the text states 'collection rate on current year basis'.
'Batteries Directive'	refers to Batteries Directive 2006/66/EC.

Country short codes

Austria	AT	Greece	GR	Poland	PL
Belgium	BE	Hungary	HU	Portugal	PT
Bulgaria	BG	Iceland	IC	Romania	RO
Croatia	HR	Ireland	IE	Slovakia	SK
Cyprus	CY	Italy	IT	Slovenia	SI
Czech Republic	CZ	Latvia	LV	Spain	ES
Denmark	DK	Lithuania	LT	Sweden	SE
Estonia	EE	Luxembourg	LU	Switzerland	CH
Finland	FI	Malta	MT	UK	UK
France	FR	Netherlands	NL		
Germany	DE	Norway	NO		

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COLLECTION RATE ACHIEVEMENT

Development of EEA[4] wide reported POM and collection volumes

Data available for this study suggest that around **239,000** tonnes (or an estimated 11 billion units) of portable batteries were reported to have been placed on the market in the EEA plus Switzerland in **2018 (+0.8% over 2017). Over 110,000** tonnes of waste portable batteries were reported as collected in **2018 (+6.2% over 2017)**. This corresponds to a collection rate of **47.4%, up from 45.5% in 2017 and 46.3% in 2016.**

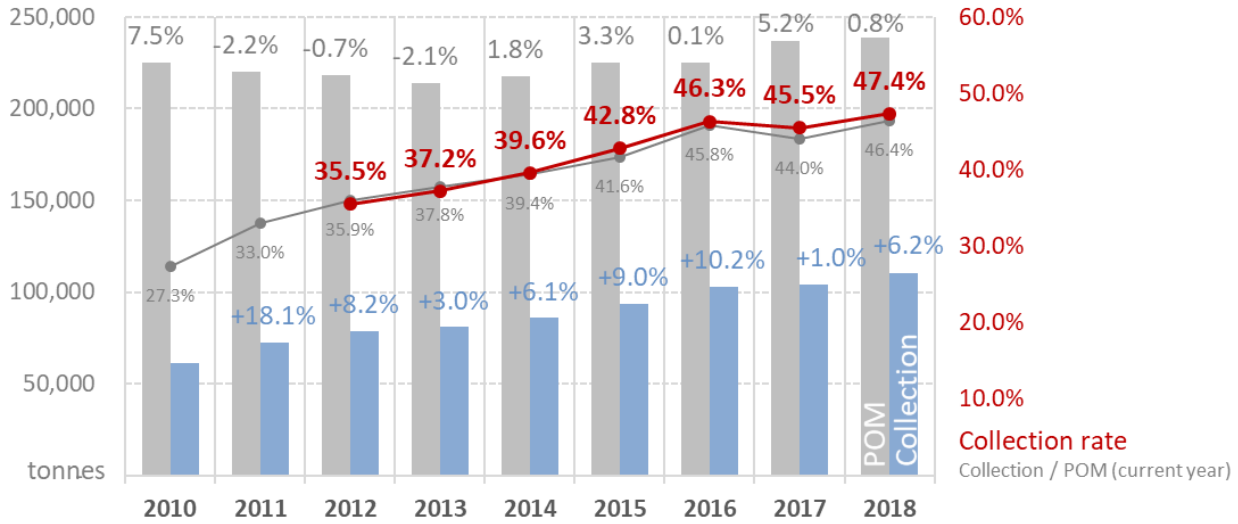


Figure 1: EEA + Switzerland, portable battery POM and collection tonnages 2010 – 2018

POM: **From 2010 to 2018, the total mass of portable batteries POM increased by an annual average of 0.7% (the population of the included countries grew by 0.3%). Following the 2008 global financial crisis, POM declined to a low of 412g per capita in 2013. It has since increased and reached 453g per capita in 2018.** In unit terms, around **22** portable batteries per capita were placed on the market in 2018, up from 19 in 2013.

Collection: **From 2010 to 2018, reported collection has increased consistently and by an annual average of 7.3%**: From 119g in 2010 per capita to **198g in 2018**. **The fastest year-on-year growth took place in 2011 and 2012 (+18.1% and 8.2%), as well as in 2015 and 2016 (+9% and +10.2%), the slowest in the years following these two sets: 2013 (+3%) and 2017 (+1%). 2018 saw again strong growth (+6.2%).** Few data are available about the number of units of waste portable batteries collected. Estimates suggest that in terms of units, around **4.5** units per capita or **20%** of battery units POM are collected.

Portable Batteries, EEA + Switzerland	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*
POM (*Grams per capita*)	437	427	422	412	418	431	430	450	**453**
Collection (*Grams per capita*)	119	141	152	156	165	175	197	198	**210**
Collection / POM	27.3%	33.0%	35.9%	37.8%	39.4%	41.6%	45.8%	44.0%	**46.4%**
Collection rate[5]			*35.5%*	*37.2%*	*39.6%*	*42.8%*	*46.3%*	*45.5%*	***47.4%***

Table 1: EEA + Switzerland, portable battery POM and collection, gram and units per capita

[4] 31 countries are signatories to the European Economic Area (EEA) agreement. However, EEA member **Liechtenstein** is part of the Swiss customs territory and as such subject to a large part of Swiss legislation, including waste legislation, and the Swiss producer responsibility organisations operate on its territory. **Switzerland** is not a member of either the EU or the EEA but has adopted broadly similar rules on batteries as the EU. It is included in this study for the sake of completeness.

[5] Collection rate calculation methodology of Batteries Directive: Collection / avg. POM of current year and past two years

National portable batteries collection rates 2018

In 2018, of the 31 countries investigated:

- **Nineteen** (2017: twenty) appear to have **reached or exceeded a collection rate of 45%**[6]:
  - Since before 2011, Austria, Belgium, Luxembourg, Sweden and Switzerland have consistently reached or exceeded 45%.
  - In 2011, Denmark and Slovakia reached 45% for the first time.
  - In 2014, Bulgaria, Finland, Hungary and the Netherlands first reached 45%.
  - In 2015, Germany and, according to data revised in 2018, Poland exceeded 45% for the first time.
  - In 2016, Croatia, the Czech Republic, France, Ireland and Lithuania first reached 45%.
  - In 2017, Iceland and the UK exceeded 45% for the first time.
  - **In 2018, no further countries surpassed 45%, while Iceland's collection rate fell to 33%.**

  It is worthy of note that all countries have consistently achieved rates above 45% once they first exceeded this threshold with 2 exceptions: Iceland, whose collection rate fluctuate strongly due to low volumes, and Norway, due to changes in calculation methodology.

- **Two** (2017: 1) reached rates **between 40 and 45%**: **Latvia and, for the first time, Italy.**

- **Three** (2017: 5) reached rates **between 35% and 40%: Spain, and for the first time Malta and Cyprus. Italy left the group by moving above 40%. Estonia, Greece and Portugal left the group by falling below 35%.**

- **Seven** (2017: 6) countries reached **between 25% and 35%:** Norway, Slovenia and **probably Romania (no data available since 2015), as well as Estonia, Greece, Iceland and Portugal, who saw their rates fall below 35%.**

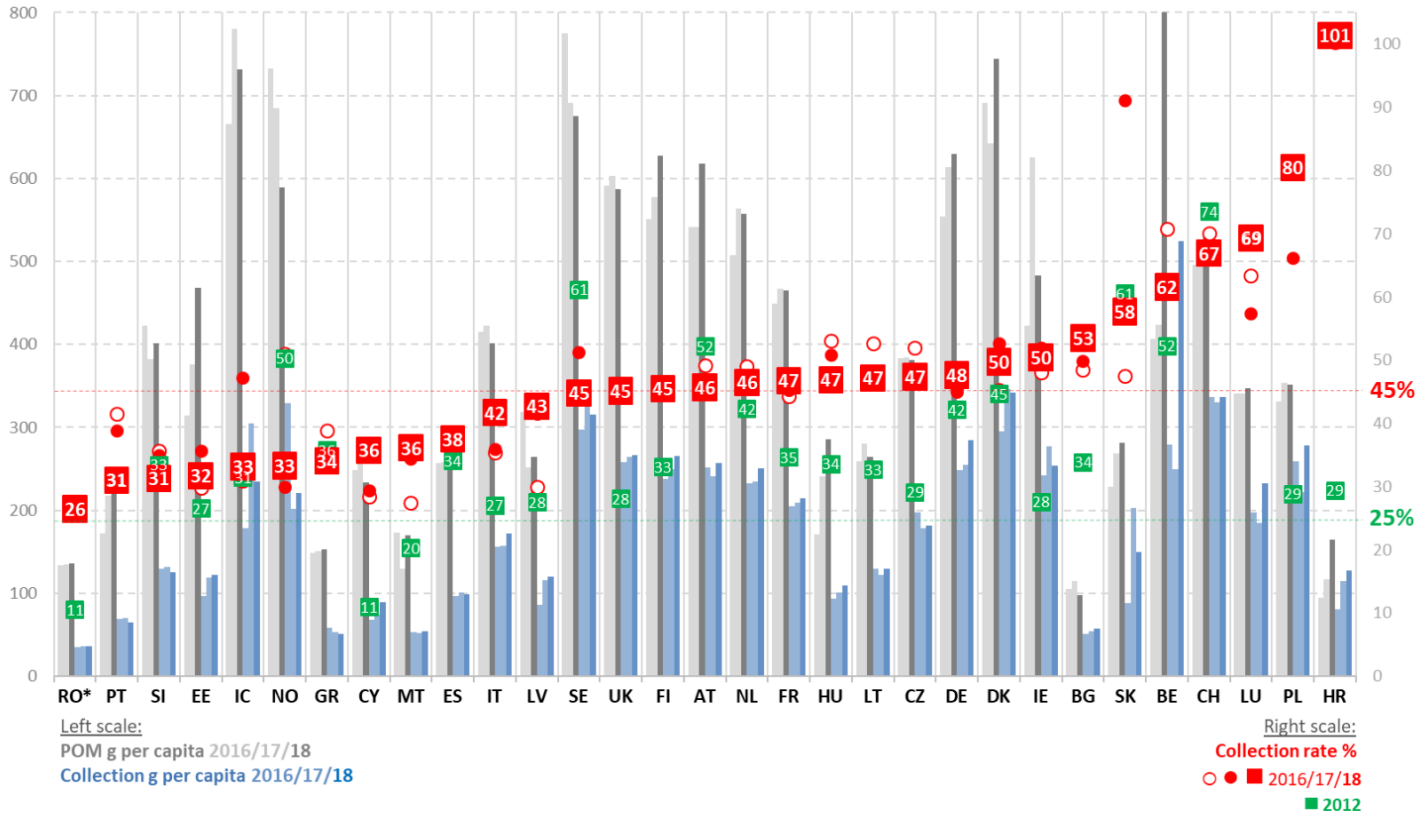


Figure 2: EEA + Switzerland, portable battery POM and collection per capita and collection rates 2012 – 2018

[6] Taking into account rounded percentages: e.g. 44.5% is counted as 45%

Uncertainties of the collection rate and subjective assessment

National collection rates are subject to inherent limitations and uncertainties, which limit them as a tool to compare the performance of collection schemes:

- Rates would be substantially lower in some countries if measures were taken to ensure that only waste lead batteries are counted towards the collection rate that were declared as 'portable lead batteries' when POM.
- Substantial uncertainties exist about the weight of batteries embedded in EEE, for which data are not available in some countries.
- The increase of lithium accumulators and different national practices of counting them as either portable or industrial batteries at the POM and/or collection stages.
- Rates would vary by up to an estimated +/- 3% if a common interpretation of the term 'portable battery' was applied in terms of the weight thresholds for portable batteries used in some countries;

Countries' shares of EEA POM and collection volume

Largely correlating to population size, seven countries (DE, UK, FR, IT, PL, ES, NL, SE) account for 80% of POM and collection of portable batteries. Adding the next five (AT, BE, CH, CZ, DK) brings the total to over 90%:

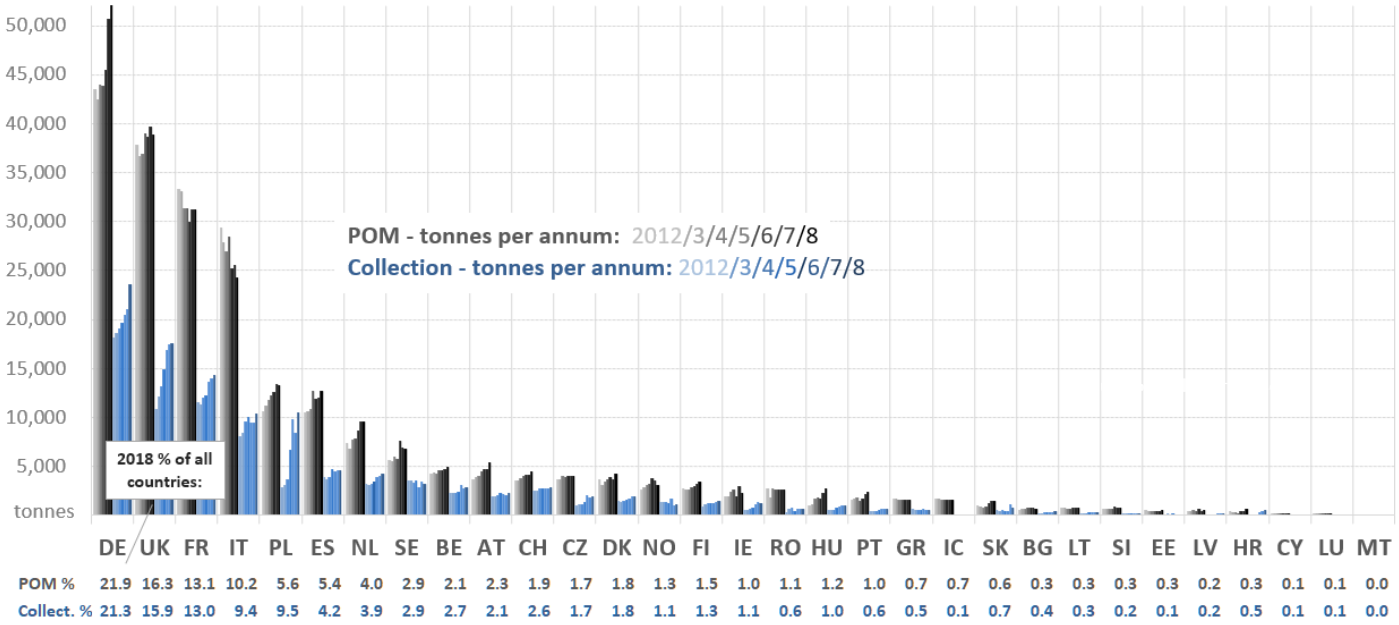


*Figure 3: EEA + Switzerland, portable battery POM and collection tonnages per country 2012 – **2018***

COUNTRY ANALYSES

AUSTRIA

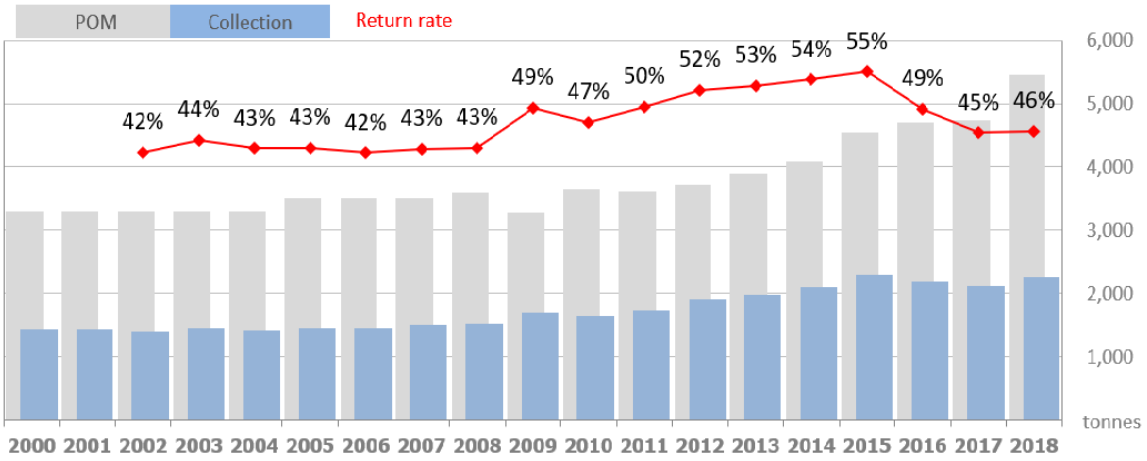
Legal and organisational developments: The Austrian battery collection scheme has been built up since the early nineties. In 2008, it transitioned from a single organisation model to competing organisations: Around 900 producers comply though four WEEE compliance organisations who all contract waste management company *Saubermacher AG*, which takes back batteries from retailers and around 1,600 municipalities. Municipalities continue to play a key role in collection. The clearing house organises awareness creation measures effectively.

Government guidance on the demarcation of battery categories, issued in Nov-17, categorises *industrial* batteries used in household EEE as *portable* batteries to ensure the financing of their waste management. This requires batteries used, for example, in e-bikes or wheelchairs to be classified as portable batteries from 2018.

In Oct-17, a new Waste Treatment Ordinance set out specific technical requirements for handling of lithium batteries: Lithium batteries must be removed from WEEE at the collection point if removable by the end-user. Moreover, certain lithium batteries, incl. those weight of over 500 gr, must be collected and stored separately from all other batteries, including from other lithium batteries.

As such, a new separate collection infrastructure for lithium batteries became necessary (notably at retailers of IT and mobile phones, tools and garden tools as well as e-bike retailers) and battery compliance organisations now require POM declarations (and recycling fee payments) to be split into lithium containing and other batteries. Lithium battery collection is also operated by Saubermacher. In Sep-18, the company established a lithium battery recycling plant in Bremerhaven, Germany and established a joint venture with German Interseroh to provide waste management services to end users of industrial lithium batteries in Germany.

Collection rate: In 2016, the collection rate fell to 49% largely due a 5% lower collection volume. Clearing house EAK assumes that the drop is partly due to the increasing share of rechargeable batteries that remain in the market longer. In 2017, the collection rate fell to 45% as collection fell again, by 3%, while POM increased by 1% over 2016. **POM increased by 15% to 618 g per capita in 2018, probably supported by the categorisation of industrial batteries used in household EEE as portable batteries (for example batteries used in e-bikes or wheelchairs), which was applied from Jan-18. Collection increased by 7%.**



Source: From 2011 EAK

Other issues: A February 2018 survey found a striking difference between younger and older respondents: 71% of over 50-year-olds said they always dispose of expired batteries in collection boxes at retailers or municipalities while only 38% of under 30-year-olds claimed to do so.

BELGIUM

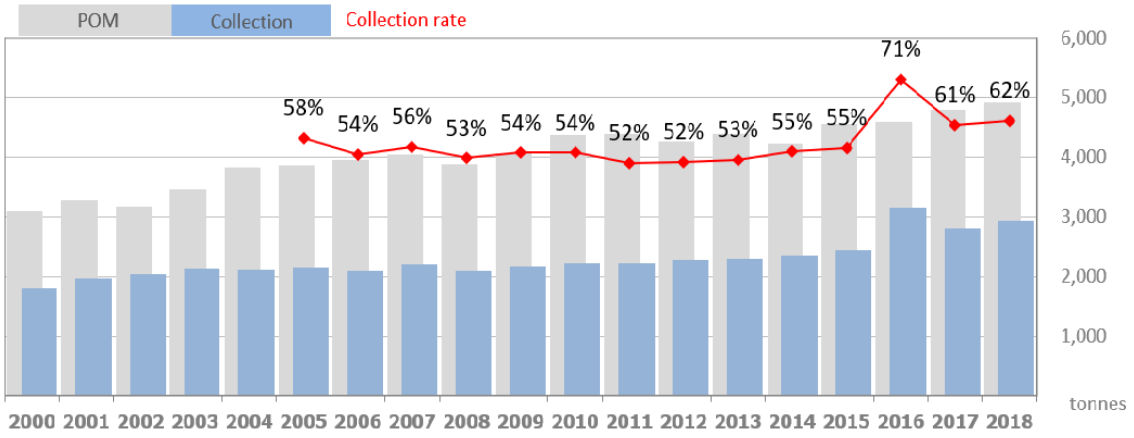
Legal and organisational developments: Backed up by an eco-tax from 1996 until the end of 2012, single organisation BEBAT has been in operation since 1996 and has achieved a high consumer participation (87%). BEBAT's operations are based on an Environmental Agreements (MBOs) between each of the three regional governments and sector associations.

In December 2016, Bebat merged with Recybat, which had been the single organisation managing automotive batteries to streamline service for obligated producers. Bebat is now the only organisation responsible for all three battery categories (portable, industrial and automotive).

Since 2010, when Bebat established its sorting facility in Flanders, Wallonia has introduced various measures aimed at restricting Bebat's operation in the region, notably 2016 legislation that would significantly change the waste batteries regime, but which has yet to be enforced. In Mar-18, the Constitutional Court made it clear that Wallonia must consult with the other regions before doing so. In Jun-18, Flanders and Brussels Capital region signed 5-year MBOs governing Bebat. The Flanders MBO was published and came into force in Oct-18. The new MBOs now cover all battery types, after Bebat's merger with Recybat. In addition, the Flanders Region signed an MBO for electric vehicle batteries governing organisation Febelauto. Producers of EV batteries now have a choice between Febelauto and Bebat.

From around 2015, the Flemish and Walloon Government charged an annual tax of 3% on the financial reserves of BEBAT and WEEE compliance organisation Recupel to accelerate their reduction. However, the collected taxes had to be returned after the constitutional court annulled them in 2017 and 2018. The Court i.a. argued that the regions did not have the authority to levy organisations not established on their territory and that the origin of the funds taxed cannot be traced to these territories only.

Collection rate: In 2016, the collection rate increased sharply to 71% (2015: 55%) due to exceptional events: According to Bebat, the increase is mainly due to doubling of collection in Flemish schools (+548 tonnes – schools contributed 28% to total battery collection in 2016, vs 16% in 2015) and collection by companies (+35%) due, in part, to the acquisition of a battery brand. In 2017, the collection rate was 61%: POM increased by 4% over 2016 while collection fell 11% below the 'exceptional event' driven volume in 2016 but was still 12% higher than in 2015. **In 2018, POM increased by 2.8% to 424 g per capita and collection by 4.3%, raising the collection rate to 61.6%. According to Bebat, only 1 battery is found in every 100kg of residual household waste in Belgium, which means that Bebat collects 90% of all batteries that are available for collection as discarded by consumers.**

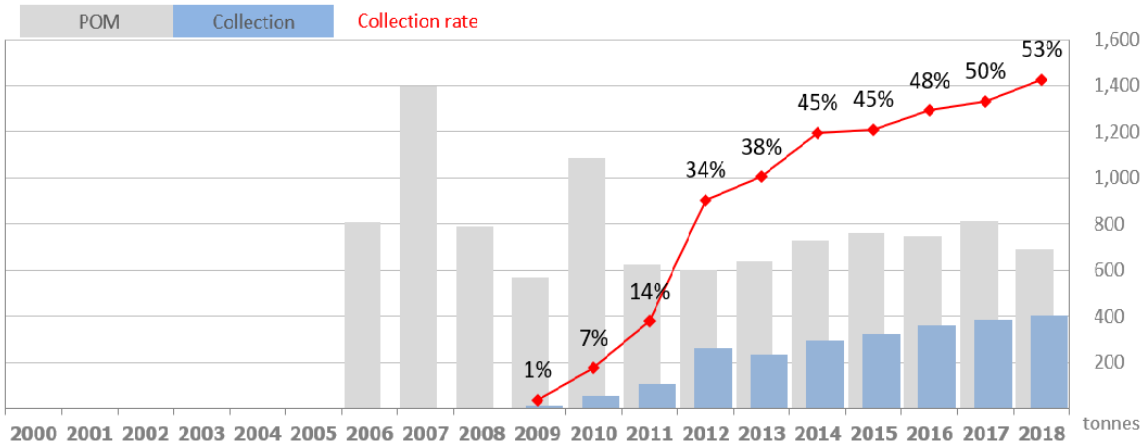


Source: BEBAT; Note: Pre-2010 BEBAT collection data are adjusted by us to account for portable batteries only: Based on confirmed data from 2010-12, the portable batteries share of all collected batteries by BEBAT is assumed to have been 86% in all years.

BULGARIA

Legal and organisational developments: Although batteries have been subject to mandatory take-back legislation and product fee legislation since 2006, the first battery compliance organisations were only approved in January 2009. Their number grew to 20 by 2011. Measures to reduce this number and ensure the targets are properly achieved came into force in 2013. Due to comprehensive legal requirements and good supervision, the regulatory mechanism appears to function solidly. In Apr-16, a new Product Fee Ordinance replaced the 2008 ordinance but left the high product fee – to be paid if collection targets are missed – unchanged. As of 2016, around 350 registered portable battery producers comply collectively through eight approved battery compliance organisations. All eight organisations cover all battery types (**still valid Feb-20**).

Collection rate: Volumes of portable batteries POM rose incrementally from 76g per capita in 2009 to a peak of 115g in 2017. The share of lead batteries in POM is low (2% in 2013). Collection volumes increased steadily from 2g per capita in 2009 to **57g in 2018**. From 2009 to 2011, Bulgaria missed its national collection targets. Although the overall collection rate has been above 45% since 2014, not every compliance organisation has met its assigned target. **In 2018, POM decreased by 9% to 98 g per capita, collection increased by 4%.**



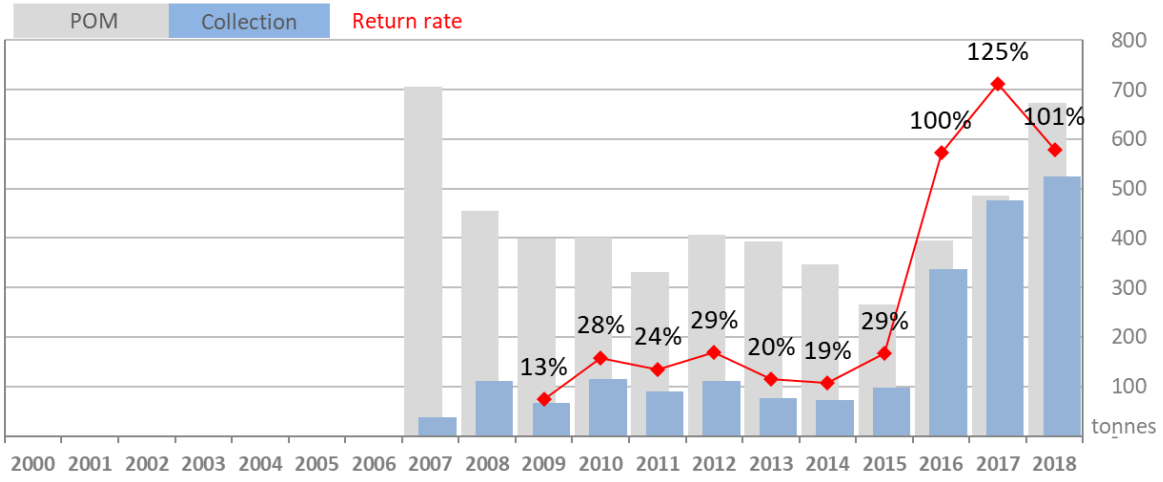
Source: Before 2013 EEA Register and Ministry of Environment; 2013/2014 EEA report; 2015 Eurostat (sum of Gov. order approved collection volumes for each compliance organisation results in 2% higher collection rate 2015).

CROATIA

Legal and organisational developments: Since late 2007, portable batteries (including those integrated into EEE) have been subject to fee payments to the Environmental Protection and Energy Efficiency Fund (EPEEF). In 2013, the option for producers to comply collectively or individually was implemented in framework legislation. In October 2015, a new Waste Batteries Ordinance removed industrial and automotive batteries from the fund financing regime. The new legislation lowers fees for portable batteries, but they remain subject to the fund regime. Croatia's failure to produce a new national waste management plan (due to political instability) has been under scrutiny by the European Commission. A National waste management plan (2016-2022), which focuses on improving municipal waste management and foresees investments of EUR 669 million, was adopted in January 2017.

Eight waste management companies are authorised to collect waste portable batteries and 3 of those companies are also authorised for waste battery treatment/export (all waste portable batteries are exported).

Collection rate: In 2015, the collection rate was 29% after 4 years of falling POM. The 100% collection rate in 2016 was supposed to be exceptional due to transition issues resulting from regulatory changes in 2015 and from the inclusion of 80 tonnes of waste portable batteries collected prior to 2016 and sorted out from the automotive, industrial batteries waste stream. **However, the implausible collection rate has persisted, presumably because declared POM volumes were far too low. POM increased from 63 g per capita in 2015 to a plausible 164 g per capita in 2018.**



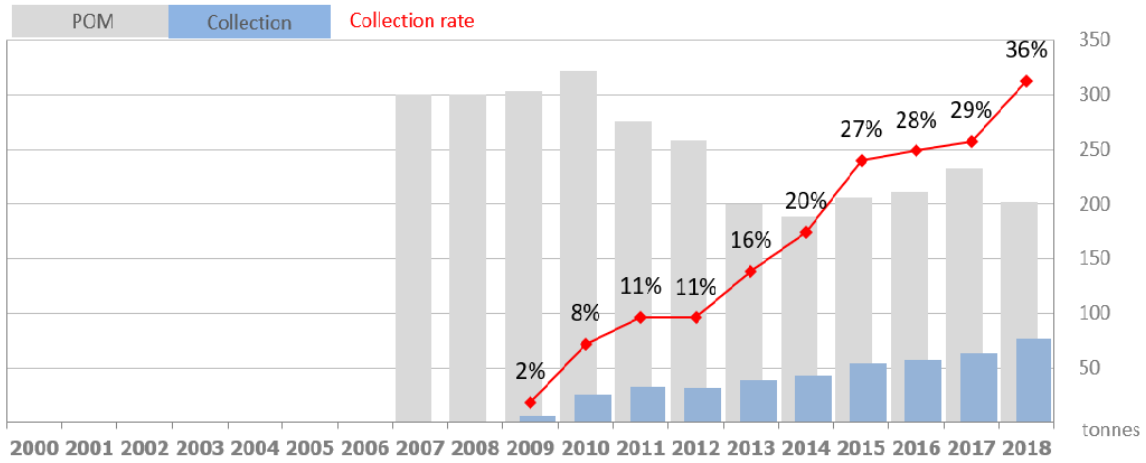
Source: Environment Agency

CYPRUS

Legal and organisational developments: The single organisation, AFIS, only began collection in late 2009 and collection facilities at municipalities 'green points' have been delayed and are yet to become fully available.

Collection rate: The collection rate climbed from 11% in 2012 to 29% in 2017 **and 36% in 2018 as collection increased by +21% and POM fell by 13% to 234g per capita.**

Note: We have revised the 2015 collection rate in the 2015 update of this report (25%) to 27% as newer data submitted to EUROSTAT have become available that show 15% lower POM for 2015.



Source: AFIS; 2014/5/6: EUROSTAT; 2017: Collection: AFIS, POM: Sagis estimate (+5% over 2016)

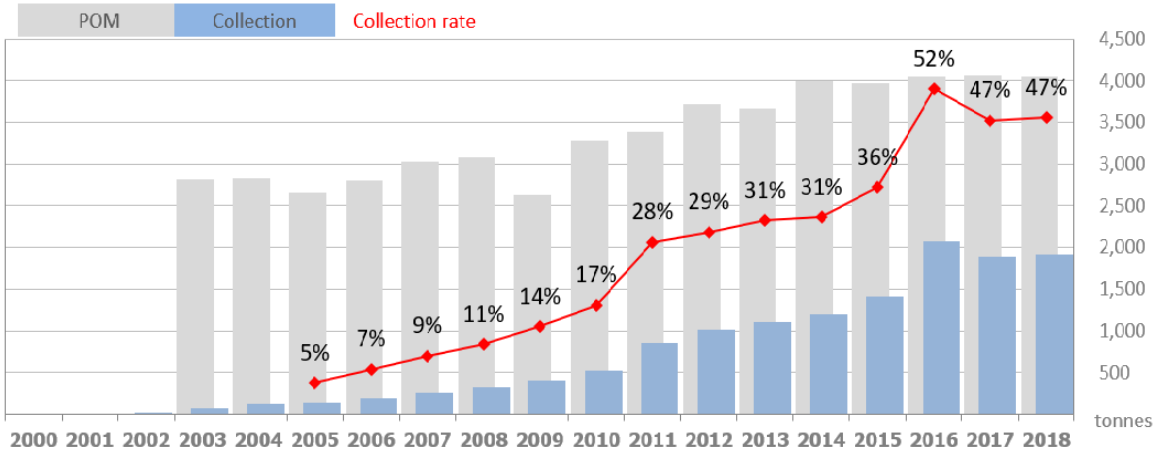
CZECH REPUBLIC

Legal and organisational developments: On the basis of a 2001 voluntary agreement between the Government and industry, Ecobat was the single battery organisation from 2003 to 2009. Under legislation transposing batteries Directive 2006/66/EC, REMA Battery – related to WEEE organisation REMA - was approved as a second battery collection organisation. A new draft Act on End-of-life Products – originally proposed in 2014 - aims to improve conditions for re-use and recycling. To this end, the Act notably removes end-of life products from the requirements of the Waste Act before they are delivered to a waste treatment facility or exported. At the end of Jan-17, the Government's Legislative Council recommended that the 'Draft Act on selected EoL products' should be returned to the Ministry of Environment 'for completion'. Inter-ministerial discussions on the new Act and related texts began in Dec-18. **On 31-Jan-20, the Government submitted the drafts to Parliament.**

Ecobat's share of POM and collection continues to be around 90%, with REMA Battery responsible for most of the remainder. Ecobat has about 820 members, REMA about 450 (2015). There was one individual complier, Goldtime, a watch distributor (POM: 300kg in 2014). In 2014, a second individual complier emerged: Online battery distributor Baterie Centrum (POM 26 tonnes, or 0.7% of total in 2015).

Collection rate: The collection rate increased strongly to 52% in 2016 (2015: 36%) due to a 32% increase in collection. From 2010 to 2016 POM increased by an annual average of 3%, collection by an annual average of 27%. In 2017, the collection rate was 47%. 2017 POM remained flat compared to 2016. Collection – while 9% below its 2016 peak – was still 34% higher than in 2015. In 2018, **POM was flat at 382g per capita and collection increased by 2%.**

Source: EUROSTAT; Before 2009: Ecobat data, partial data from other organisations



Other issues: A survey conducted by Ecobat in mid-2016 discovered that 69% of Czech's were correctly separating their waste batteries from other household waste. 70% of those that said they did not separately dispose of waste batteries said they were too lazy to do so. The remainder commented that they believed their volumes to be insignificant and would not impact overall collection.

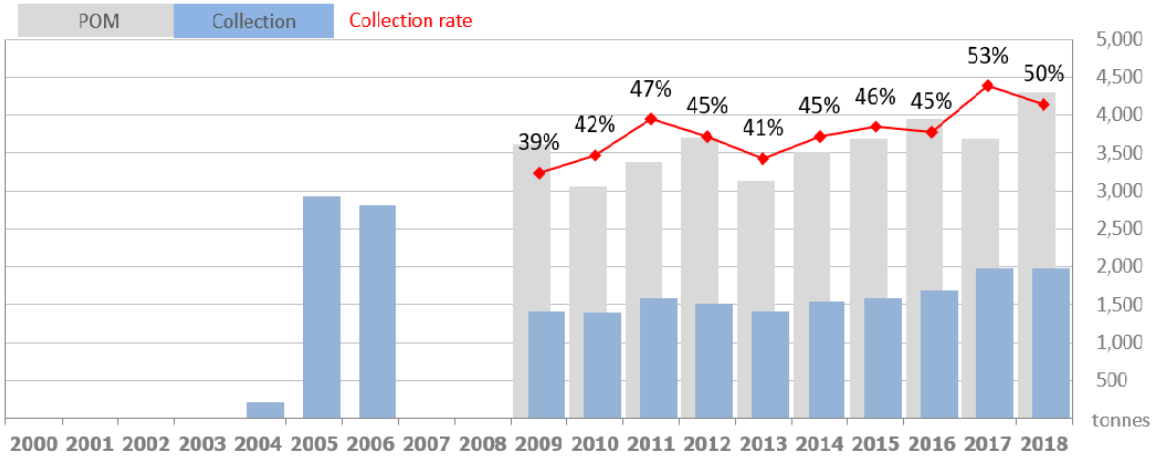
DENMARK

Legal and organisational developments: Municipalities have traditionally been responsible for the handling of household waste, including batteries. From the mid-nineties, the municipal collection of NiCd batteries was financed by producers. The implementation of the Batteries Directive in 2009 continued this approach: Municipalities have been made explicitly responsible also for collection of all portable batteries, while producers finance the municipal collection by a tax of DKK 2,750 (EUR 370) per tonne put on the market.

Three battery compliance organisations – Elretur, ERP Denmark, and since Sep-17 Recipo (owned by Swedish WEEE organisation EAF) – take-back waste batteries from municipalities and from voluntarily-collecting retailers and other organisations. The compliance organisations also finance and organise public awareness measures.

About one third of portable battery producers - all small producers - comply individually, as the allocation scheme is unable to allocate very small quantities of waste portable batteries to them.

Collection rate: The collection rate for all portable batteries declined from 47% in 2011 to 41% in 2013. Since then collection increased and the collection rate peaked at 53% in 2017, driven by a POM decline of 6% and a collection increase of 18% over 2016. It should be noted that annual fluctuations of around +/- 15% for POM and +/- 8% for collection volumes have been common. Over 90% of waste batteries derive from municipal collection points. Retailers are not obligated to take back waste batteries. **In 2018 POM increased by 18% to 744g per capita while collection remained flat.**



Source: Data after 2009: DPA organisation

Other: Elretur in 2015 ran an unusual awareness campaign entitled 'Do not throw your batteries in the trash!' (website), with the slogan 'Skal du f**** med grundvandet!' (You shall not f****with groundwater!, emphasised in a 45 sec youtube spot), arguing an important message must be communicated strongly. The campaign gained significant publicity but was met with mixed opinion.

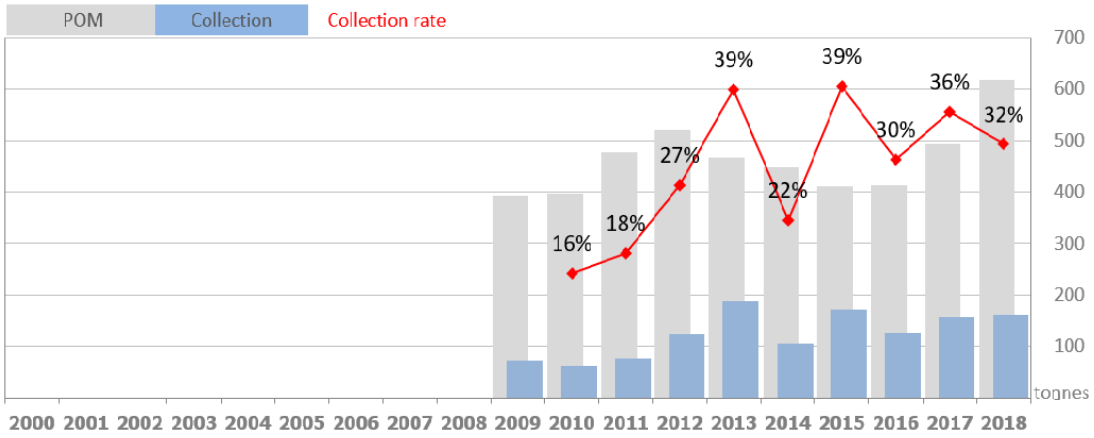
ESTONIA

Legal and organisational developments: Separate collection for portable batteries has been in place since the end of the 1990s. Batteries could be returned free of charge to around 100 hazardous waste collection points managed by the municipalities. Since May-04, producers have been legally responsible for waste portable batteries. However, no compliance organisations had been estqablished until 2009, when two WEEE management organisations - EES-Ringlus and Elektroonikaromu - were approved as waste battery organisations.

In Oct-17, the Government proposed the draft of a new Waste Act which i.a. would prohibit individual compliance for producers of portable batteries and tires. The Government argued that it does not have the capacity to inspect individual collection networks. However, the draft was not adopted.

All portable battery producers comply through two collective compliance organisations, EES-Ringlus and Elektroonikaromu. EES-Ringlus' POM share dropped from 80% in 2013 to about 25% in 2015 due to an exit of a large foreign producer (P&G). The Estonian importers that subsequently assumed the producer's obligations joined Elektroonikaromu.

Collection rate: The collection rate more than doubled between 2011 and 2013 (from 18% to 39%). Since then, collection showed strong annual fluctuations. The collection rate was 36% in 2017 on strongly increasing POM (+24%). **In 2018, POM increased again strongly - by 25% to 468g per capita - as collection edged 3% higher.**



Source: EES-Ringlus, various; 2012-4: MoE; from 2015 Eurostat,

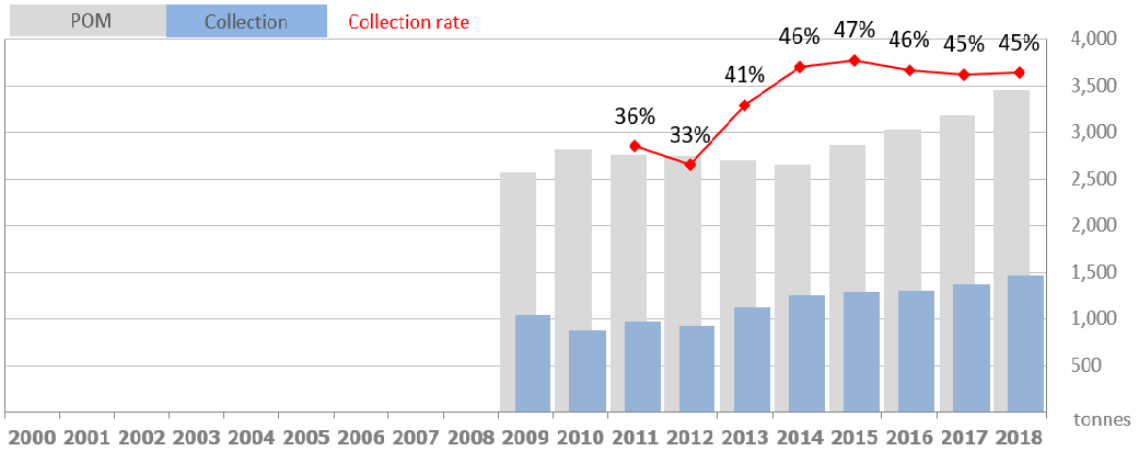
FINLAND

Legal and organisational developments: Though producer responsibility for batteries containing mercury, cadmium and lead has existed since 2004, take-back organisations were set up only under legislation transposing Batteries Directive 2006/66/EC.

Since 2009, two producer-controlled organisations, Recser and ERP, have been approved as battery organisations. Recser alone manages waste battery collection and awareness campaigns whose costs are shared between the organisations.

The retailer take-back obligation plays an important role as municipalities have no obligation or right to collect waste batteries.

Collection rate: The collection volume increased by 18% in 2013 and 10% in 2014, while POM decreased by -2% in both years. In 2015, the negative POM trend reversed (+7%) and collection increased by 3%. The collection rate climbed from 33% in 2012 to 47% in 2015. In 2016, the collection rate fell slightly to 46% as POM increased by 6% and collection only by 1%. In 2017, the collection rate edged lower to 45% as both POM and collection increased both by 5%. **In 2018, POM increased by +9% to 628g per capita, while collection increased by +7%.**



Source: From 2015 Eurostat; Pirkanmaan ELY-keskus;

FRANCE

Legal and organisational developments: Since Jan-01, producers have had to take-back waste batteries collected by distributors, municipalities and other final holders. While large retailers initially ran individual compliance programs, by 2012, only two producer-controlled battery compliance organisations remained: Corepile and Screlec. The licences of compliance organisations for the period 2016 to 2021, issued in Sep-15, enable the Government to set a collection target above 45% if one of the organisation exceeds 45% (Cahier des charges IV.1). According to ADEME's annual battery report for 2016, the organisations are committed to reach a collection target of 50% by 2021.

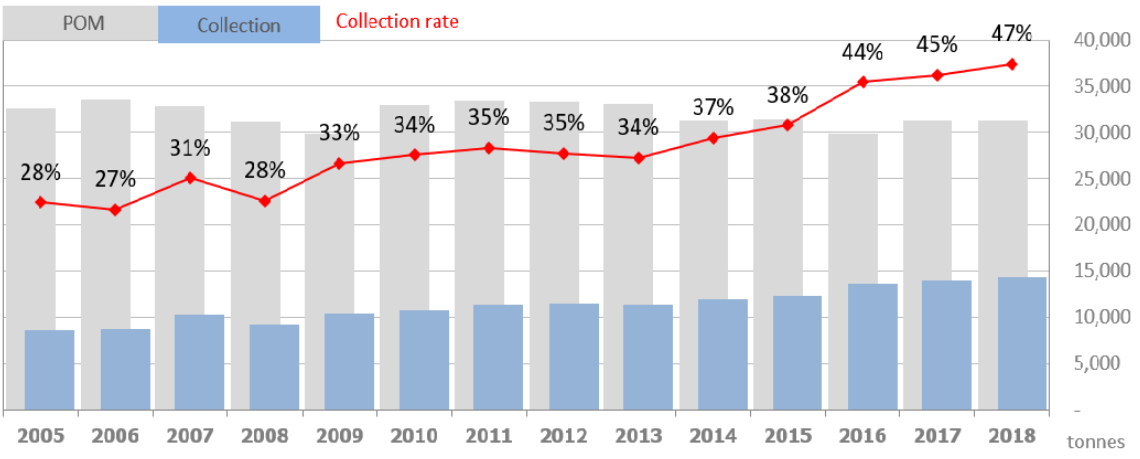
POM: From 2010 to 2016, POM decreased by an annual average of 1.8% by weight, largely due to lower weight reductions per unit of primary batteries (which increased by 2.5% in unit terms). In 2017, POM increased 6%.

Collection increased by 11% (about 1,400 tonnes) in 2016. Half of the increase is the result of an increase in collection volumes of battery compliance organisations, as in 2016, both organisations continued to develop 'multi-waste-stream collection partnerships' with other ERP organisations. Corepile executed 3-4 times more marketing measures in 2016 than in 2012 and Screlec changed the branding of its Batribox collection boxes to 'shock-pink'.

Lead: Half of the 2016 collection increase results from the Government's decision to add 682 tonnes of portable lead batteries - that were collected and processed by French recyclers - outside of the compliance organisations' network. This decision took into account a 2016 study by consultants Terra which estimated that 3,500 tonnes of waste portable lead batteries are treated annually outside of the compliance organisations' network. In 2017, 833 tonnes of portable lead batteries managed outside of the compliance organisations were added. However, this does not affect the plausibility of the return rate of lead portable batteries which is around 100% in 2017.

Lithium portable batteries: In 2017, lithium batteries contributed 26% to POM in terms of weight and 17% in terms of units (up from 15% and 11% in 2010). The return rate by weight for lithium batteries was 9% in 2017, down from 14% in 2015/16.

Collection rate: From 2009 and 2013, the collection rate has remained at 33%-35%. Since 2014, it has consistently increased and **reached over 46.7% in 2018 - on flat POM (465g per capita) and +3% collection volumes – as the 2 PROs prepare to meet the 50% national collection target imposed on them in 2021.**



Source: ADEME annual battery reports (example: 2016 report). Note: ADEME reports frequently make adjustments to previous years' data. For example, ADEME revised 2015 POM by -0.6% in the its 2016 report due corrected producer declarations, etc. For 2016, the sum of POM listed in the compliance organisations' annual reports is 3% higher than POM in the ADEME report.

GERMANY

Legal and organisational developments: From 1988 industry operated a voluntary organisation collecting only 'environmentally hazardous' batteries. In response to the 1998 Batteries Ordinance, producer organisation GRS was established and its special role as the 'joint' organisation was confirmed under the 2009 Waste Batteries Act. In addition, three "producers' own take-back systems" are operating. POM shares of the organisations have remained quite stable from 2011 **to 2017**, with GRS over 75%, CCR Rebat about 19%, ERP 3.5%and ÖcoReCell 0.3%. **In 2018, GRS' share fell to 69% while ERP's increased to 9.9%**. The organisation reached different return rates (annual collection/POM) for primary and secondary batteries which reflects differences in their collection network.

In late 2015, an amendment to the Batteries Act required municipalities to hand over free-of-charge waste batteries - which they collect voluntarily or which they remove from WEEE (which they are obligated to collect) – to the 'joint battery organisation' GRS who must take them back. At the same time, the revised WEEE Act required municipalities to remove batteries from WEEE that are 'not enclosed' by the WEEE (municipalities collect about 90% of household WEEE).

Alos in 2015, the legal option to require "producers' own take-back systems" to participate in the financing of GRS information campaigns was activated for the first time: Under the neutral branding 'Die Ruecknahme Systeme' (the take back systems) campaigns are carried out by GRS or jointly with municipalities.

In January 2017, GRS called for a change of the Batteries Act: **Due to the financing imbalances that arise when producers switch compliance organisations and the collection targets of these organisations are calculated using the methodology of the Batteries that is based on the average of 3-years of POM,** GRS would be obligated to take-back over 1,500 tonnes (about 9% of its annual collection) above its market share of POM in 2018. ERP for its part also called for a change to the Batteries Act: It argued that it did not have access to enough waste portable batteries because battery collectors (municipalities, recyclers, distributors) may only end their contract with GRS at yearend (note: battery producers may change their affiliation to a battery compliance organisation at any time). The dispute arose after a large battery importer associated with a large retailer terminated its affiliation with GRS.

In Apr-18, the Federal Environment Ministry (BMU) released an outline paper for a completely revised EPR regime for portable batteries: Producers would no longer contract the 'joint' battery organisation GRS but would comply only through the "producers' own take-back systems". The "producers' own take-back systems" would finance GRS, which would only serve as a safety net by taking back batteries from collection points not serviced by the "producers' own take-back systems". **In Jul-19, this model was detailed in a draft amendment to the Batteries Act. It did not convince any of the stakeholders.**

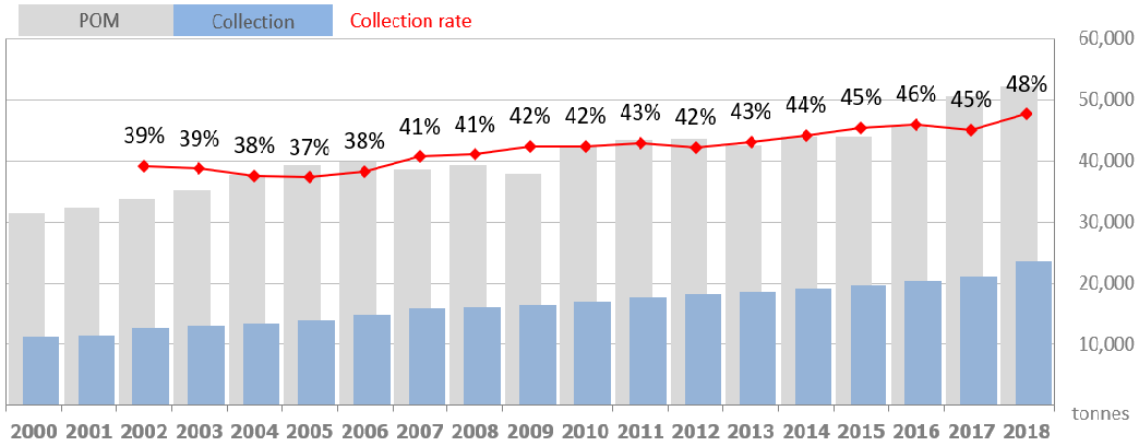
GRS for its part decided to create a level the playing field by relinquishing its status as 'joint' system and to seek approval as a 'producer's own take-back system'. This was granted by the state authorities in Hamburg on 6-Jan-20 and is valid nationwide. No longer required to ensure nationwide take back, GRS reverted back to its previous recycling fees, which it had increased in Jul-19 by around 50%, the first increase since 2002, to cope with financing imbalances. Note: at the end of each year, GRS credited excess income to producers' clients).

On 27-Jan-20, the BMU released a new draft amendment to the Batteries Act for comments. It no longer foresees a 'joint system' and subjects all 'take-back organisations' to identical requirements. It also does not include a clearing mechanism for them, nor provisions that would ensure that all battery collectors are serviced by the organisations.

Lithium portable batteries: In 2017, lithium batteries contributed 29% to POM in terms of weight (up from around 16% in 2010). The return rate (by weight) for lithium was 14% in 2017, down from 17% in 2016.

Lead portable batteries: The return rate (collection/POM) of lead batteries in total waste portable collection volumes was a still plausible **115% in 2018** (2017: 98%; 2016: 96%2015: 103%) though the two smallest organizations again massively exceed plausible return rate for lead batteries **(up to 188 times more lead batteries collected than POM)**.

Collection rate: Since 2012, the annual growth of POM has averaged 1.2% and that of collection 3.2%. The collection rate increased gradually from 37% in 2005 to 46% in 2016, before falling back to 45% in 2017, driven by an 11% increase in reported POM. **In 2018, POM increased by 3% to 630g per capita, and collection by 12% (driven by Rebat, who achieved a 55% collection rate)**



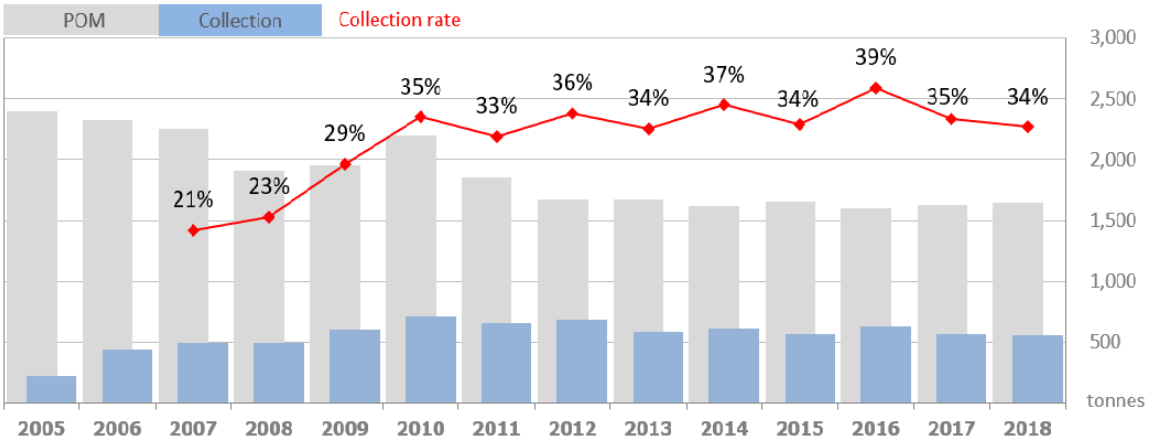
Source: Summary of volumes in annual reports of the compliance organisations

GREECE

Legal and organisational developments: A 2004 Presidential Decree required producers to set up battery organisations and achieve a collection rate of 30% by 2006. In response, AFIS, the only collective compliance organisation for batteries, was established by battery importers as a non-profit company. A new Decree transposed Batteries Directive 2006/66/EC in 2010. It initiated a register of battery producers and allowed producers of batteries integrated into EEE to comply through the WEEE organisation, which meant that the weight of batteries placed on the market in EEE was no longer reported from 2011. 2016, AFIS membership had increased to 116, however 36 of these entities did not place any batteries on the market in 2016. **A new operating approval, issued in Mar-20, sets AFIS' collection target at 45% in 2020/1, followed by 47.1% in 2022 and annual increases to 52% in 2025.**

There are over **69,000** of AFIS' waste portable battery collection points (**about 2,000 new in 2018)**, or one per 160 residents. To boost collection in 2016, AFIS increase promotional spending to EUR 0.07 per capita, an increase of nearly 450% over 2015. However, the spending increase raised collection volumes by only 11%. **AFIS noted that even its very high collection point density still needs to be supported by awareness campaigns to increase collection volumes and quadrupled its ad budget for 2019 to EUR 0.04 per capita (EUR 400 K total).**

Collection rate: The collection rate increased to 39% in 2016 as POM was 5% and collection 10% higher than in 2015. In 2017 the collection rate continued its biennial pattern to a low 35%, mainly due to limited advertising in 2017 according to AFIS. **In 2018, POM edged 1% higher to 151g per capita, while collection decreased by 3%. To account for POM of embedded batteries (producers are not obligated to declare them separately), AFIS added 9.6% of the mass of separately sold batteries in 2018 to arrive at total POM**.



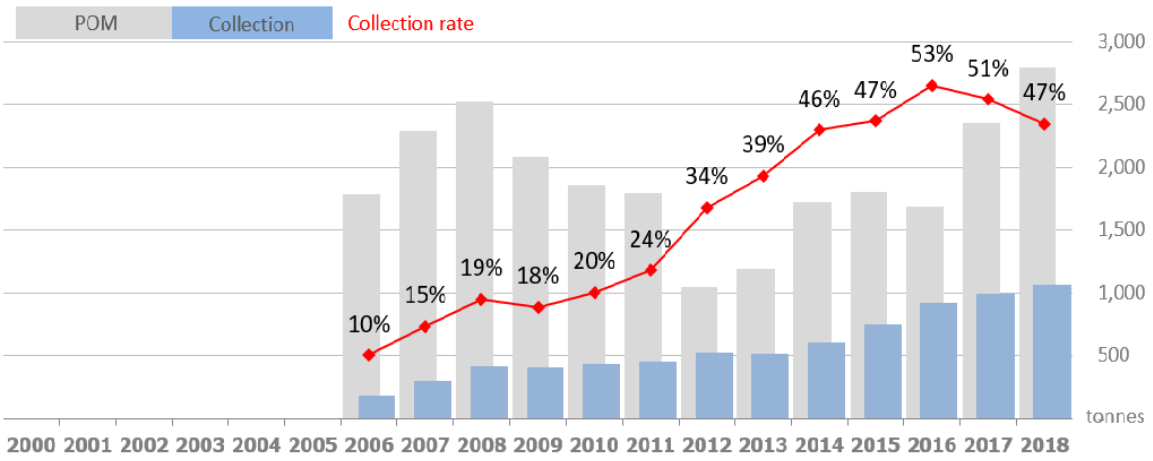
Source: AFIS

HUNGARY

Legal and organisational developments: Since 2000, the **Product Fee Act** has applied to accumulators (but not single charge batteries). From 2005, collective compliance became feasible as a compliance option and three producer's organisations, RE'LEM, Re-bat and CCR Rebat have been operational since then. The management of waste batteries by 'producer responsibility organisations' has been working well, leading the Government to keep the waste producer responsibility scheme for batteries as it is when it replaced the competing organisation model applied to most other waste streams with state fund model from 2012.

Collection rate: Data reported by the Hungarian government to Eurostat show that collection increased strongly from 2014 (2014: +14%, 2015 +19%, 2016 +19%), following the introduction of the obligation for producers to ensure at least one collection point in communities with over 100 inhabitants. The collection rate increased to 53% in 2016 and fell back to 51% in 2017 as a 40% POM increase offset the strong collection growth. **In 2018, POM increased by 19% to 286g per capita, while collection increased by 8%.**

Note: Our estimate of the collection rate in 2016/7 remains inconclusive: While RE'LEM (estimated POM share about 75%) notes that it has achieved the 45% collection target, we could not obtain any nominal POM or collection volumes that could be used to assess the Eurostat data.



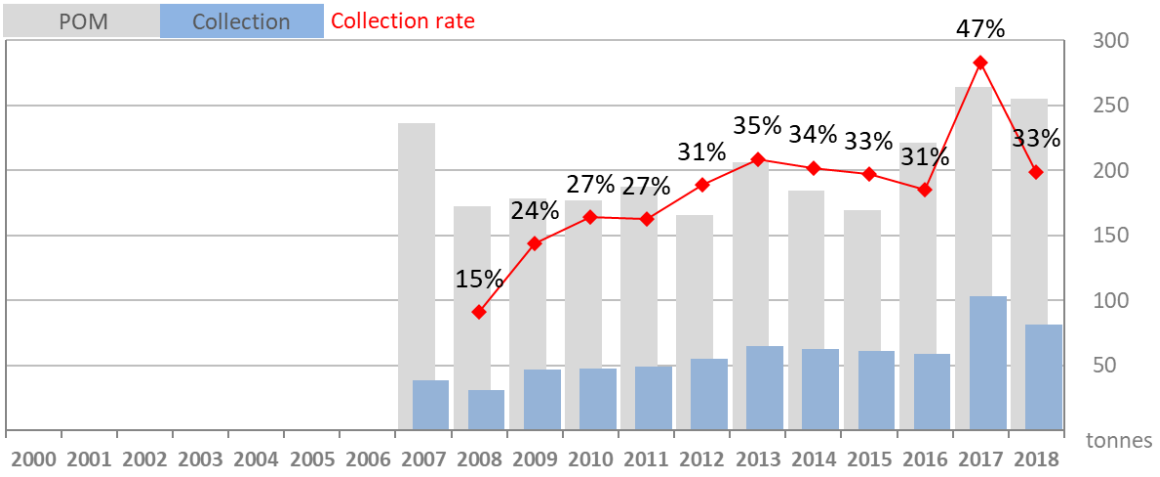
Source: 2009-2018 Eurostat

ICELAND

Legal and organisational developments: Iceland's 1999 Regulation on Batteries imposed eco-fees on batteries, to be charged by customs on import of batteries. This was to fund the separate collection of hazardous wastes, including waste batteries, by the government's Icelandic Recycling Fund. Legislation transposing Batteries Directive 2066/66/EC extended the scope of batteries covered and maintained the existing financing and collection mechanisms. The Fund must ensure that battery collection targets are met. A November 2015 amendment to the Batteries Regulations notably does not revise the scope of the Batteries Regulation in view of explicitly including batteries POM in EEE. From 2017, the Recycling Fund increased recycling fees for batteries by 120% as it had run into a deficit.

The Customs Authority's latest list (2015) of producers shows 803 companies registered as battery producers, of which 555 are also registered as EEE producers.

Collection rate: In 2016, the collection rate decreased to 31% due to a 23% increase in POM increase. In 2017, the collection rate exceeded 45% for the first time, driven by a 74% increase in collection over 2016 as funding became available again. POM increased by 19% in 2017 (31% in 2016) to 780g per capita, making Iceland the country with the highest per capita POM of the countries investigated. **In 2018, a slightly lower but still very high POM (731g per capita) and a 21% decrease in collection pushed the collection rate down to 33%.**



Source: Icelandic Recycling Fund

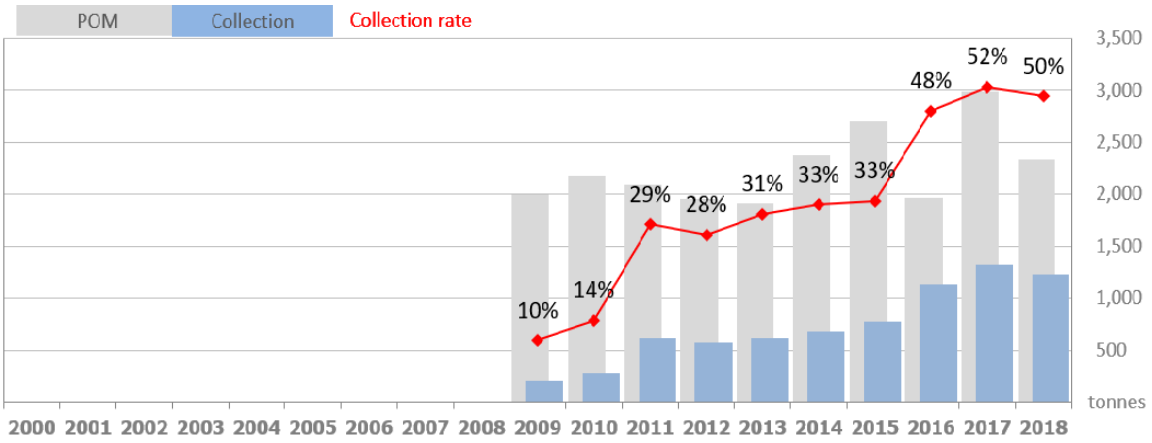
IRELAND

Legal and organisational developments: Though producer responsibility for waste portable batteries has existed since 2004, no compliance organisation was set up until September 2008, when the two Irish WEEE organisations - WEEE Ireland and ERP Ireland - were also approved as the only two battery organisations (three years after their approval as WEEE organisations).

To avoid duplication, each organisation was given responsibility for WEEE in different Irish counties and Dublin city districts. The allocated areas are adjusted periodically to reflect changes in POM share of the organisations. For 2016, WEEE Ireland data suggest its POM share was 77% and its collection share 76%.

Collection rate: Data reported by the Irish government to EUROSTAT show a collection rate increase from 33% in 2015 to 48% in 2016, due to a fall in POM of 27% and an increase in collection of 46% over 2015. In 2017, POM continued the growth trend it had shown prior to 2016 and increased 52%. Collection continued to increase (+18%), resulting in a collection rate of 52%. **In 2018, the POM remained volatile, falling 22% to 483g per capita, while collection declined by 8%.**

Note: Based on partial data from compliance organisations, we estimated the collection rate reached 45% in 2016, after a not quite as strong fall in POM (-23%) and a similar increase in collection (+27%).



Source: Eurostat

ITALY

Legal and organisational developments: Decree 188/2008 transposing Batteries Directive 2006/66/EC entered into force on 18 December 2008. Subsequently, 13 organisations for portable batteries emerged, of which all except COBAT (established in 1988 as a national consortium for lead batteries and later extending its scope to other chemistries) originated from WEEE organisations. The organisations are legally obligated to join a single Coordination Centre to ensure homogenous battery collection throughout Italy. However, the Centre (CDCNPA) became operational only in late 2012 after it had signed with the association of the Italian regions ANCI which defined the operational parameters and for take-back from and the compensation paid to municipalities. A revised agreement with ANCI was signed in July 2016.

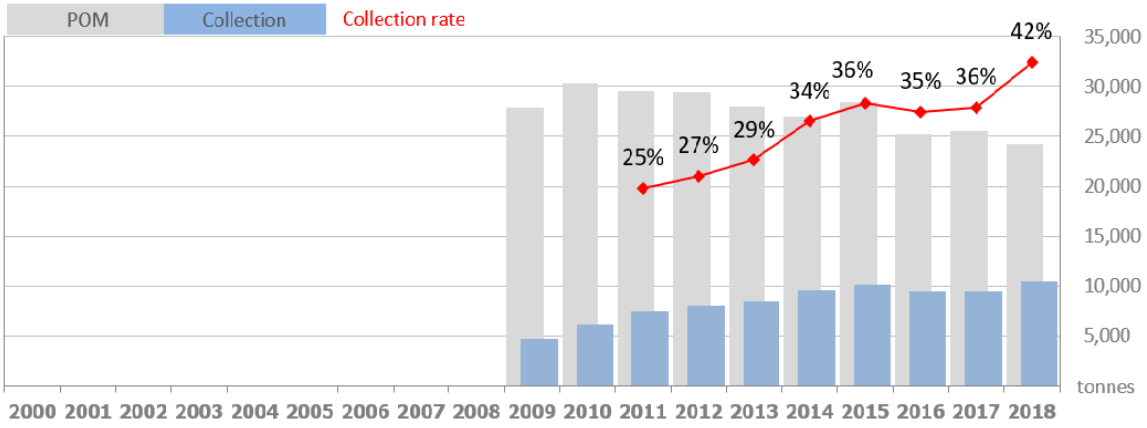
As of 2017, around 2,450 of the 3,380 registered portable battery producers comply through 16 compliance organisations. The three largest - COBAT, ERP and REMEDIA - represent a combined POM share of around 76% (2014). COBAT retains the largest POM share (27% in 2016) as it acquired large WEEE producers during the market exit of RAECYCLE, which ceased to provide compliance services in early 2016.

Around 900 producers are registered as individual compliers, but have not joined the Coordination Centre as legally required. They appear to be responsible for 4-8% of POM but do not contribute to national collection volumes.

By the end of 2016 there were 5,283 CDCNPA registered waste portable battery collection points, or one per 11,270 residents. (**2018: 7,448, 2019: 10,168**). About 80% of collected batteries originate from municipalities, of which 30% (2016) derive from municipal waste management companies and 50% from voluntary collectors. **In 2018, CDCNPA re-launched 'Una Pila alla Volta' (one battery at a time) targeted at 10-14 year olds.** Another campaign **used popular youtube comedian Casa Surace.**

Collection rate: National authorities' data show a collection rate of 25% in 2011, increasing to 36% in 2015. **In 2018, the collection rate reached to 42% in 2017 as POM fell by 5% to 401g per capita and collection increased by 10%. The collection increase was driven by the centre region (+21%), following CDCNPA's re-allocation of regions to PROs. Collection in the South decreased 5%. It edged up slightly in the North (+1.6%).**

Note: Since the 2016 update, we have replaced the data of the Battery Coordination Centre (CDCNPA) with those from Eurostat. As the Coordination Centre's data do not reflect the POM of around 900 individual compliers, the Centre's collection rate is 2 to 4 percentage points higher.



Source: Eurostat, 2018 CDCNPA

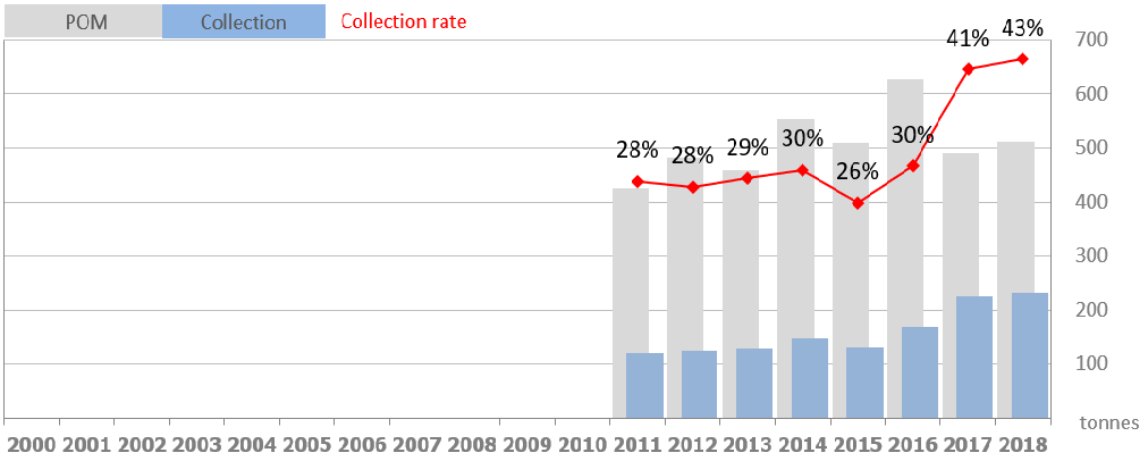
LATVIA

Legal and organisational developments: A separate collection organisation for batteries from households was introduced in 2001, managed by hazardous waste management company BAO. A Natural Resources Tax (NRT) has applied to separately sold batteries since July 2006 and since Jan-11, also to batteries in EEE. Producers can be exempted from the tax by achieving collection targets. Legislation transposing Batteries Directive 2006/66/EC came into force in May-11, while the NRT – significantly increased from 2014 – continues to be maintained as enforcement instrument.

In 2017, most of the 650 registered producers comply through 15 organisations - both waste management companies, such as BAO, and producer-controlled organisations – that may act as battery compliance organisations for producers by having been granted an exemption from the NRT. There is no distinction between waste management companies and producer-controlled compliance organisations (of which the largest were ZAĻĀ JOSTA, Green Dot Latvia and Latvia Green Electronics - LZE) so the latter compete with the same companies that they subcontract collection and treatment operations to.

In 2018, LZE and Nordic Recycling (Kuusakoski) approval as battery organisations were withdrawn, following fines of a total of EUR 22 million for failing to properly recycle packaging and hazardous waste, mostly tires but also batteries (10 x the amount of the natural resource tax that would have applied). In Jun-18, the Administrative District Court rejected LZE's appeal against the fine and the company appears to have closed. Nordic Recycling continues to operate.

Collection rate: Government data show the collection rate was back at 30% in 2016 (after a drop to 26% in 2015). From 2011 to 2016, POM increased by an annual average of 7 %, collection by 6%. **In 2018, POM increased by 4% to 265 g per capita, collection by 3%, raising the collection rate to 42.7%.** ***[Note: Eurostat data show a collection rate 45.4% due to a calculation error].***



Source of underlying tonnage data: 2015-18 Eurostat; before Compliance organisations, MoE

Other: *There are 2 reporting obligations for all battery types: The natural resources tax is calculated based on chemistries (lead accumulators, Ni-Cd and Fe-Ni accumulators; Primary batteries; Other) but not battery type (portable, industrial, automotive), while the producer responsibility organisation requires distinction by battery type to be exempt from the NRT. As the NRT law is the overriding legislation, collection reporting focuses on the chemistries.*

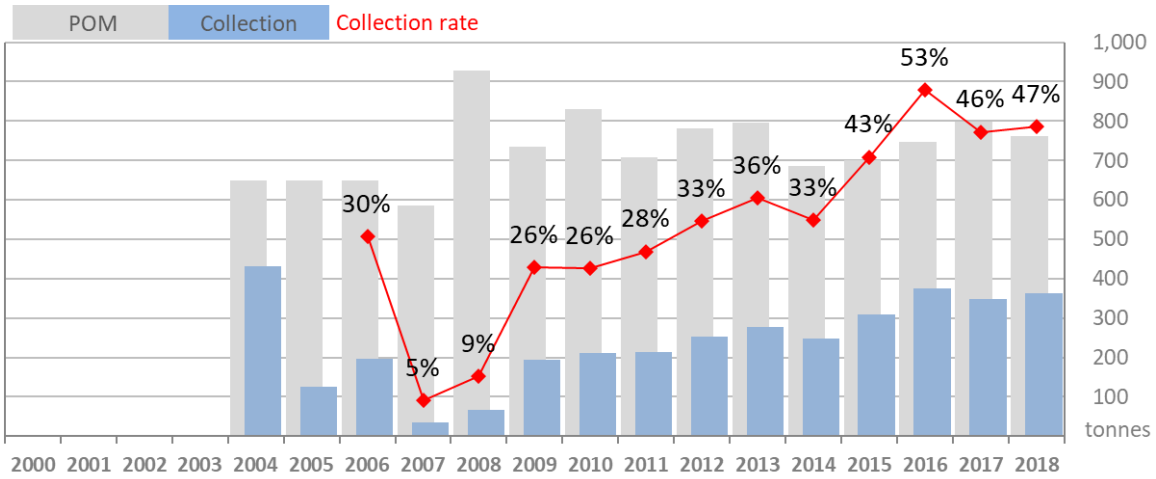
LITHUANIA

Legal and organisational developments: Since 2003, producers have had to pay an **environmental pollution tax** (EPT) on batteries. From 2008, producers could avoid the tax if they achieved collection targets by buying recycling notes from recyclers or through collective organisations. The collection target was lowered from 80% in 2011 to 25% in 2012, but the tax effectively increased by a factor of 6, which boosted the membership of the two producer-controlled compliance organisations. Since 2010, over 20 amendments and new legal texts have optimised the batteries EPR regime.

Prior to 2012, due to the low tax rate on batteries at the time, producers preferred to pay the tax rather than support organisations' investments in collection infrastructure. Following a substantial increase in the tax in 2012 (and 2016) and the abolition of purchasing recovery notes (PRNs) as a compliance option from 2013, many producers joined collective compliance organisations.

In 2017, nearly all portable battery producers comply through three licensed compliance organisations: EEPA and GIA, originating from WEEE compliance organisations, and AGIA, licensed in June 2016 for all battery types and controlled by four automotive/industrial battery producers. Following a disputed temporary suspension of EEPA's WEEE licence in 2016, GIA's membership increased significantly and its POM share of portable batteries grew to 43% in 2016 (up from 30% in 2014 and 2015).

Collection rate: The collection rate climbed from 26% in 2010 to 53% in 2016 as collection increased 21% over 2015, while POM grew by 7% only. **In 2018, POM fell by 5% to 271 g per capita, collection increased by 5%, raising the collection rate to 47.2%.**



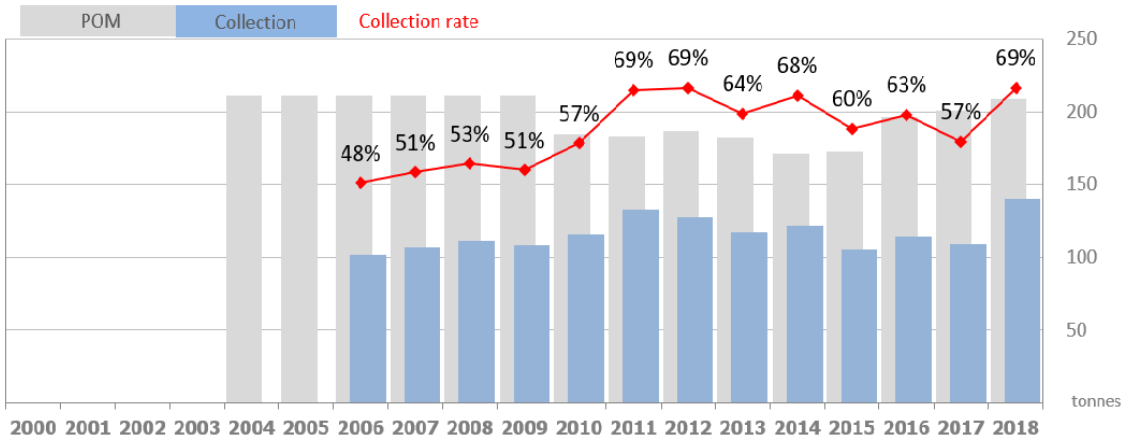
Source: MoE[7] and other government sources

[7] The Ministry of Environment attributes the wide fluctuation of collection data before 2009 to changes in the reporting organisation.

LUXEMBOURG

Legal and organisational developments: The 1994 Waste Management and Prevention Law, replaced by the 2012 Waste Management and Prevention Law, made local authorities responsible for separately collecting the new waste category of 'problematic wastes' needing special treatment. This category included batteries and accumulators. The 2008 Law on Batteries and Waste Batteries, transposing Batteries Directive 2006/66/EC, required the existing public collection of batteries through the SuperDrecksKëscht programme to be preserved while now requiring producers to fund the organisation. Producer controlled battery compliance organisation Ecobatterien, established in 2009, thus replaced municipalities as the contracting party to the agreements with the private waste collection companies that operate the SuperDrecksKëscht programme. In January 2015, Ecobatterien was approved for another 5-year period.

Collection rate: Since 2006, a collection rate of over 48% has been achieved. **In 2018, the collection rate was 69% as collection increased by 28%**. The Government appears to adjust POM reported to compliance organisation Ecobatterien by +5% to reflect the amount of batteries being 'imported' through purchases by Luxembourg residents in neighbouring countries. Luxembourg's comparatively **low POM - 347g per capita in 2018**, versus over 600g in Germany and around 500g in France - suggests that the 5% adjustment maybe too low to fully reflect the private 'imports.



Source: 2010-14 Ecobatterien; 2015-8 Eurostat

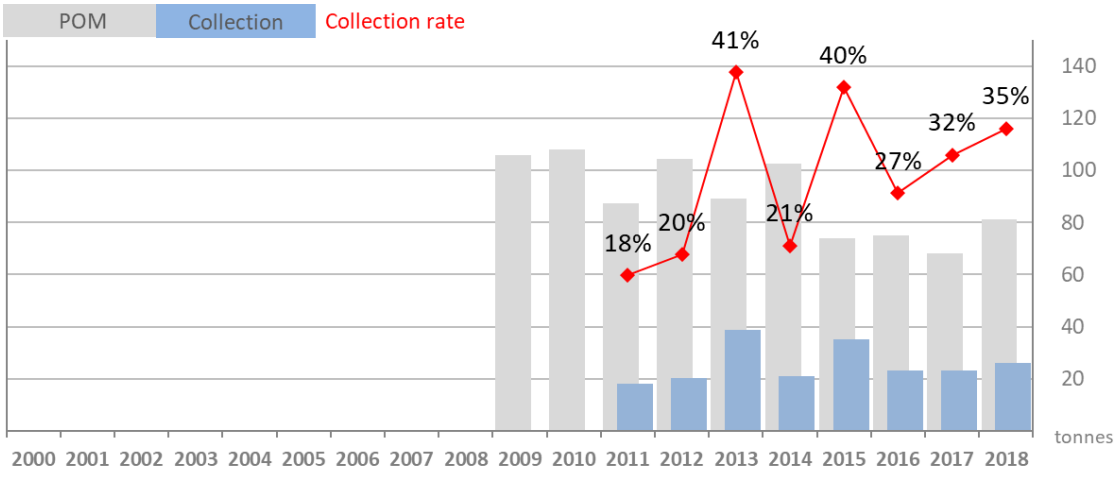
MALTA

Legal and organisational developments: From Sep-04 to Oct-16, the Eco-Contribution Act applied an eco-contribution to non-rechargeable batteries with a weight below 35g at a rate of EUR 0.06 per unit and to rechargeable batteries with a weight above 35g at a rate of EUR 1.63. It did not apply to batteries integrated into EEE. Batteries regulations of 2008 provide for exemptions from the tax for members of an approved battery organisation. However, the regulations never came into force.

In **2010 Batteries Regulations** transposing Batteries Directive 2006/66/EC came into force, while the existing waste batteries management arrangement was maintained in parallel (Government controlled and financed WasteServ organises battery collection). In consequence, industry did not establish battery compliance organisations, arguing that doing so would mean paying twice for battery waste management. From October 2016, the eco-contribution was eventually removed from batteries.

In Dec-16, a compliance organisation geared towards portable batteries was approved: 'GreenPak Battery Recycle', an initiative of packaging compliance organisations GreenPak COOP. In Mar-17, GreenPak announced the nationwide initiative BATREE to replace WasteServ's collection network and Batterina battery collection campaign. By Jan-18, about 350 collection points were available.

Collection rate: POM and collection volumes have fluctuated strongly in the small market, typically between 20% and 40%, at a comparatively low POM (around 170g per capita). Collection data were uncertain in 2016/7 as a consequence of the transition from WasteServ to a new collection scheme, which became a certainty around mid-2016. **In 2018, POM increased by 19% to 170 g per capita and collection by 13%, raising the collection rate to 35%.**

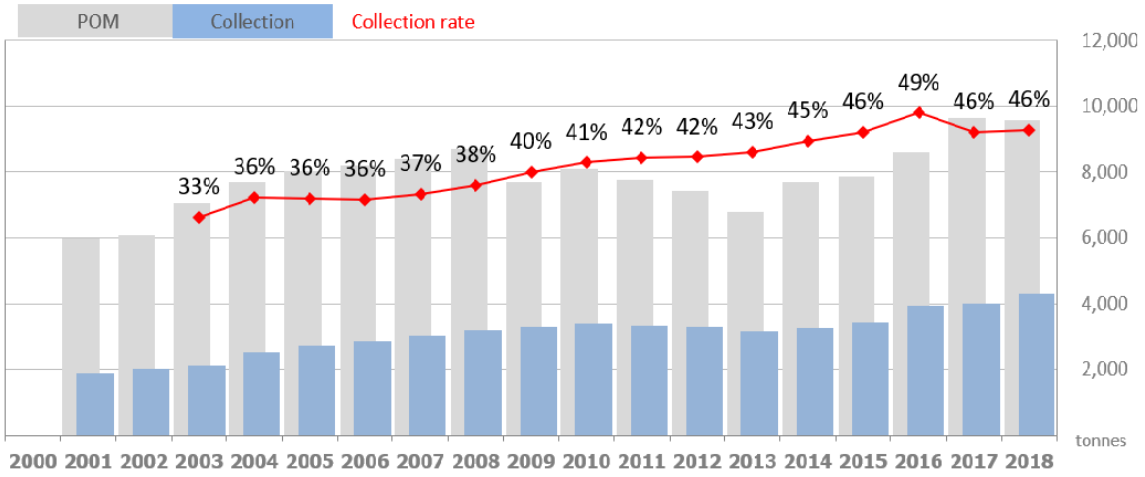


Source: Since 2015: Eurostat, before MEPA;

NETHERLANDS

Legal and organisational developments: A Government Decision of 1995 held producers of batteries weighing 1kg or less responsible for collecting 90% of waste batteries by 1999 through approved waste plan(s). In mid-1995 the Battery Foundation (Stichting Batterijen, or Stibat) set up a collective organisation to take back waste batteries. In 2008, a **Batteries Regulation** transposed Directive 2006/66/EC and obliged retailers to take back batteries, and producers to reach the 25% collection target in 2012. **From 2020, Stibat introduced the option of a simplified POM declaration for producers whose recycling fees in the past 12 months were below EUR 2,500.**

Collection rate: From 2010 to 2016, the collection rate increased steadily from 41% to 49%. POM and collection decreased from 2010 to 2013, but increased in 2014, 2015 and especially in 2016 (POM +10%, collection +15% over 2015). In 2017, the collection rate fell to 46% as POM continued to increase strongly (+12% in 2017), while collection increased much slower (+2%). **In 2018. POM slightly declined to 557 g per capita while collection increased 7%.**



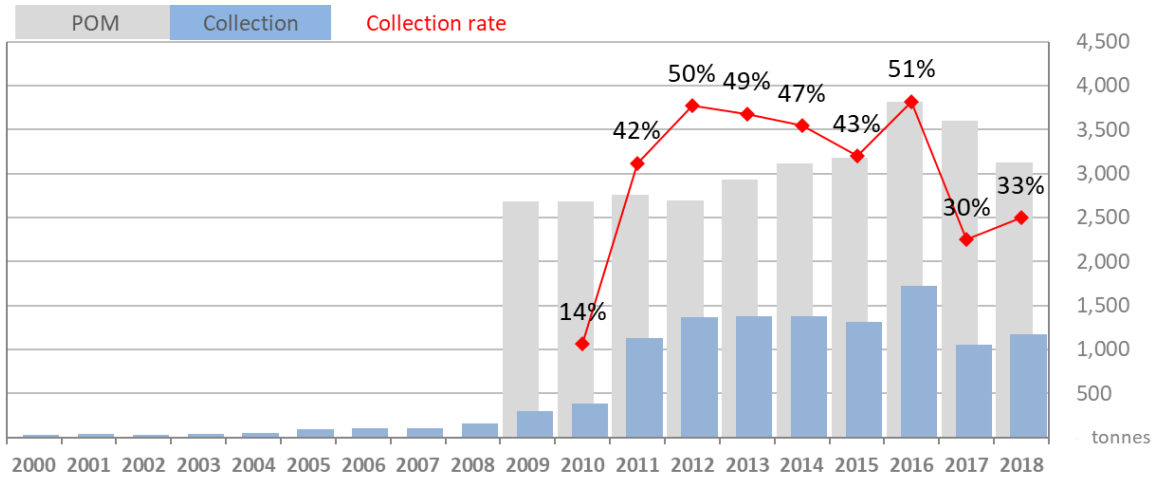
Source: Stibat

NORWAY

Legal and organisational developments: Since Jul-00, Regulations on Waste Recycling have imposed take-back and reporting obligations on producers of lead-acid, industrial nickel cadmium and rechargeable batteries only. An amendment of October 2012 included an extension of the take-back obligations to all waste batteries and set a collection target of 30% for portable batteries placed on the market in the previous year. As of 2017, the 30% collection target remains applicable to portable batteries. However, the collection rate cannot be calculated for batteries embedded in EEE as there are no requirements to report them separately.

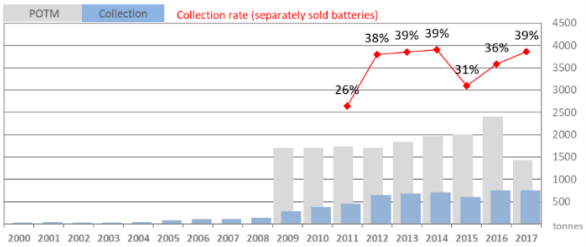
Since 1999, Rebatt AS has remained the only collective compliance organisation for separately sold portable batteries. It shares its management with and operates collection under the name of Batteriretur, which has been the organisation for automotive lead-acid batteries since 1993. In 2014, a second battery organisation was approved: Batterigjenvinning (Battery Recycling) is a subsidiary of EEE producer-controlled Norsirk, which offers joint WEEE and packaging compliance services through Elretur and Emballasjegjenvinning. In Oct-17, Rebatt/Batteriretur joined forces with WEEE organisation RENAS and packaging Organisation GreenPointNorway to offer compliance services under the brand RETURFELLESSKAPET (Take-back Community). Since mid-2016, all compliance organisations have charged fees directly to producers. Previously, the organisations had contracted this task to the customs authority who charged the fees on import.

Collection rate: The collection rate has been subject to significant uncertainties about volumes of batteries in EEE and WEEE: We estimate the collection rate at 51% in 2016, falling to 31% in 2017 (Note: EUROSTAT data for Norway result in a collection rates 33%/87%/41%/**39%**[8] in 2015/6/7/**8**. (Note: In our view, EUROSTAT POM before 2017 does not account for the weight of embedded batteries POM, hence the higher collection rates). **In 2018 Eurostat data show that POM fell by 13% to 590 g per capita while collection increased 10%.**



Source: Annual POM and collections volumes: 2008-16 Sagis estimates assuming embedded portable batteries contribute 36% to total portable battery POM. 2017/8 Eurostat

The collection rate of separately sold batteries as reported by Elretur members was around 36% in 2016 and 39% in 2017, as reported POM dropped 40% while collection remained flat.



Source: Collection data: Batteriretur; POM estimates based on Batteriretur communication

[8] **Calculated using the tonnages which Eurostat lists. Note that Eurostat shows a collection rate of 74% for 2018 which does not correspond to the volumes listed.**

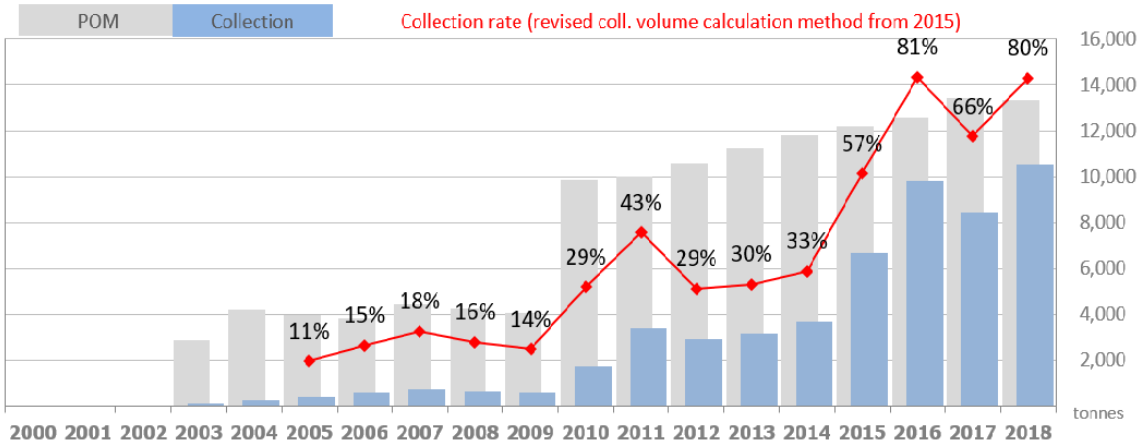
POLAND

Legal and organisational developments: Since 2002, the Act on Entrepreneurs' Obligations has required producers to individually achieve collection targets and pay a product fee if the targets are not met. The Batteries and Accumulators Act of 2009 left the collection target cum product fee mechanism in place and did not define or regulate compliance organisations. A 2013 amendment to the Waste Act called upon municipalities to contribute to the battery collection network from 2015, and a 2014 amendment to the Municipal Cleanliness and Waste Disposal Act required them to include batteries in the list of wastes for which municipalities must provide collection points, which reportedly led to a significant increase in battery collection points. A 2014 amendment to the Batteries Act introduced i.a. a formal role for compliance organisations, allowing them to take legal responsibility for member producers' obligations.

As of **2018, 3,390** (2017: 2,856) portable battery producers complied through 84 registered 'collectors/service providers' (compliance organisations) of which 29 have 10 or more producer clients. The organisations include REBA, set up in 2003 and whose sole shareholder since around 2016 is battery manufacturer GP Batteries, as well as entities set up by WEEE organisations, such as ERP Poland, whose market share increased from 10% in 2012 to 28% in 2013. .

Each year since 2013, about 25% (30% in 2017, **but only 3.7% in 2018**) of producers – respectively their compliance service provider - fail to fulfil the national collection target. Environment Agency GIOS suggests that collection could increase significantly by increasing the product fee. However, this has not yet been acted upon yet.

Collection rate: From 2010 to 2016, POM volumes increased steadily by an annual average of 4%. Collection volumes grew particularly strong in 2014 and 2015 (+18% annually) when municipalities were held responsible for separate collection of batteries. The official collection rate reported by GIOS from 2011 to 2016 increased from 29% in 2011 to 39% in 2016. However, in its report for 2017, GIOS states that collection volumes in earlier reports only included collection volumes declared by collectors on behalf of producers and that the necessary revision (all batteries declared by collector should be counted) would result in return rates of 55% in 2015 and 78% in 2016 (current year basis). Actual tonnage data are not provided. We follow GIOS correction by adjusting our collection values to arrive at the revised return rates. The results show a collection rate of 81% in 2016, easily exceeding the 45% target, and collection rate of 66% in 2017, as collection decreased 15% and POM increased 5%. **In 2018, POM remained flat at 351 g per capita. Collection increased by 25% over 2017 and exceeded the previous peak in 2016 by 7%. GIOS attributes the strong 2018 collection to increased educational campaigns and awareness creation measures.**



Source: 2010-2017 GIOS (Environmental Inspectorate) reports; Pre 2010: REBA collection only

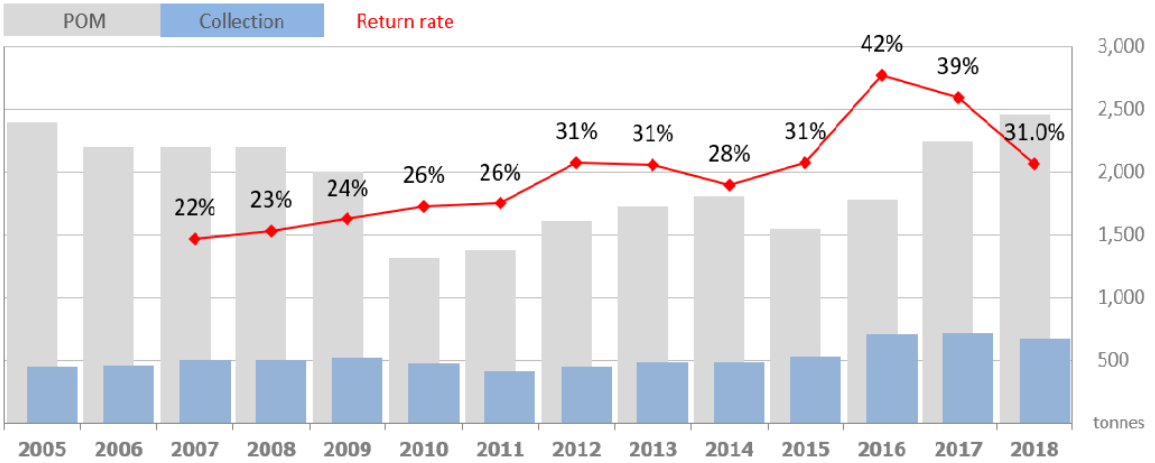
PORTUGAL

Legal and organisational developments: In response to the 2001 Decree on Batteries, which required producers to take-back waste batteries through a licensed recovery organisation, not-for-profit battery organisation Ecopilhas was set up in 2002. Under the 2009 Batteries Decree Law - transposing Batteries Directive 2006/66/EC - the two WEEE organisations AMB3e and ERP Portugal were licenced as battery organisations, in addition to Ecopilhas in Mar-10. Organisations are tightly regulated. In Dec-17, all three organisations were granted new licences for the period 2018 ending 2021. Municipalities remain responsible for collecting waste batteries and must be compensated by the organisations for their services.

A new Decree Law, in force from Jan-18, consolidated 13 legal texts related to products subject to EPR (including batteries) to reduce legal uncertainty for producers and waste operators. As regards batteries, the Decree Law largely maintains the previous provisions but i.a. foresees an allocation and compensation mechanism to be defined by the Commission for the Monitoring of Waste Management (CAGER) - if more than one compliance organisation is active for a given waste stream.

All producers currently comply through the three licensed compliance organisations that achieve different collection rates. Most producers of separately sold portable batteries have joined Ecopilhas, while producers of portable batteries integrated into EEE comply for batteries through their WEEE organisation (AMB3E and ERP).

Collection rate: As a result of the economic crisis, POM had decreased by nearly a quarter between 2008 and 2011, then increased slowly until 2014, dropped 18% in 2015 and increased again in 2016 (+13%). Estimated[9] collection increased slowly between 2005 and 2010, strongly in 2011 (+14%) before falling 19% in 2012[10] and remaining at that level until 2015. In 2016, collection volumes increased 35%, leading to an all-time high collection rate of 42%. **In 2018, POM increased by 10% to 239 g per capita as collection fell by 7%, resulting in a collection rate of 31%, down from the 42% peak in 2016.**



Source:2016: Reports of compliance organisations; 2015/7 EUROSTAT; Before: Estimates from organisations, notably Ecopilhas (difference to EUROSTAT data 2013/4 minor)

9 Due to the two licensed producer registers (Ecopilhas as well as ANREE - used by ERP and AMB3E), POM data are uncertain: Our estimate is based on collection data released by producer register ANREE and data from Ecopilhas, which preferred to announce collection data in battery units (8 million in 2004, 16 million in 2005, 20 million 2009, 2010).

10 Quercus data (see previous page) suggest 2015 POM was only 7% lower than in 2014. This is more in line with previous years and result in a 2015 collection rate of 30%.

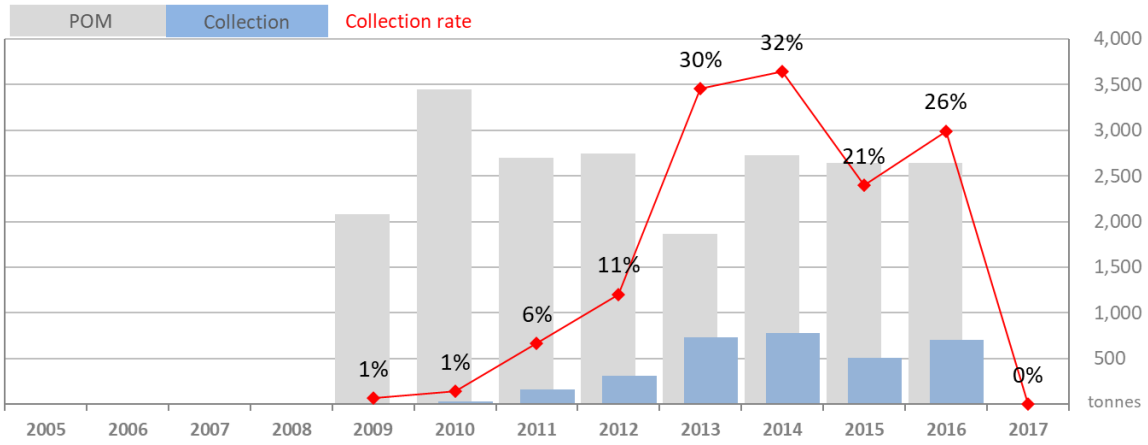
ROMANIA

Legal and organisational developments: Romania is one of a the few 'new' member states that *initially* transposed the Batteries Directive without a state-fund financing mechanism. The 2008 Batteries Decision transposed the EU Batteries Directive 2006/66/EC but required extensive implementing legislation. Ministerial Orders in July and October 2009 defined registration and reporting procedures for producers. A 2012 amendment to the 2008 Decision – much delayed due to stakeholder concerns – defined the approval requirements for individual and collective compliance.

A 2016 amendment to the 2008 Batteries Decision eventually introduced a state-fund financing mechanism: Penalties payable to the Environmental Fund were introduced for not reaching the collection target (from 2018) and for erroneous reporting. A Jul-16 amendment to the 2011 Waste Law on Waste and to the 2008 Batteries Decision i.a. introduced an obligation for local authorities to collect waste batteries and tightened controls of battery compliance organisations by removing the possibility for operating under 'tacit' (but not explicit) approval.

As of late 2017, about 550 producers of portable batteries were complying through five authorised compliance organisations.

Collection rate: EUROSTAT data available for 2015 show much lower collection volumes than in previous updates of this report. According to these data, the collection rate in 2015 was 21% rather than 32% as estimated by us. There are no conclusive data available for 2016, 2017 **and 2018**. For the purpose of this report, we assume volumes POM to be unchanged and collection increasing to 700 tonnes in 2016, leading to collection rate of 26%.



Source: Ministry of Environment (MoE); 2015 Eurostat; 2016 estimate

SLOVAKIA

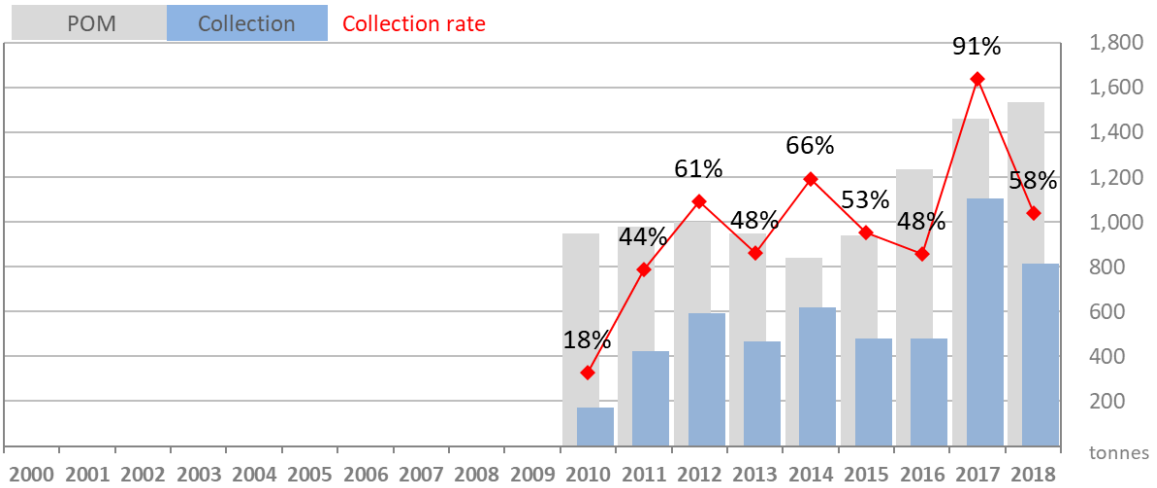
Legal and organisational developments: From 2001 to Jun-16, the Product Fee Act subjected separately sold batteries to fees of the Recycling Fund on 100% of batteries placed on the market less the amount of batteries collected by producers themselves or collected on their behalf. The Recycling Fund was a non-state body run by a Government-appointed Board of Directors. Waste management companies Mach Trade and Elektrorecyling are two of four companies mandated to operate battery collection organisations for municipalities, financed by local taxes and the Recycling Fund.

A new Waste Act, in force from 2016, introduced full EPR (competing organisations with a clearing house – for batteries it has yet to be established), requires producers to comply though approved compliance organisations (that must be controlled by producers) or through waste management companies authorised as 'third parties" and abolished the Recycling Fund. Implementing regulations, including a 'Decree on EPR and management of selected product waste streams, provide detailed registration requirements, authorisation and reporting requirements.

In Feb-18, Environment Minister László Sólymos (**resigned in Jan-20**) confirmed plans to replace the producer responsibility organisations with a monopoly agency that would be established and managed by producers under Government supervision. **These plans have not progressed.**

As of 2017, about 1,000 producers of portable batteries comply through eight entities: Compliance organisations Asekol, SEWA (ERP), Natur-pack, Slovmas, E-cycling and Spoločný baterkový systém (SBS) as well as two waste management companies which are authorised to provide compliance services as 'third parties': Mach Trade and Insa. All authorised entities hold operating licenses that will expire at the end of 2020.

Collection rate: MoE data show that the collection rate climbed from 18% in 2010 to 66% in 2014 before falling to 48% in 2016 and climbing again to 91% in 2017. The exceptionally high collection rates were supported by comparatively low POM. However, the **82%** increase in POM between 2014 to **2018** has changed this **(SK POM was 282 g per capita in 2018, compared to PL 351 g, CZ 382 g)**. The MoE data are based on data provided by producers involved in authorised battery compliance organisations. Data are not verified by a third party and provide no breakdown of chemistries.



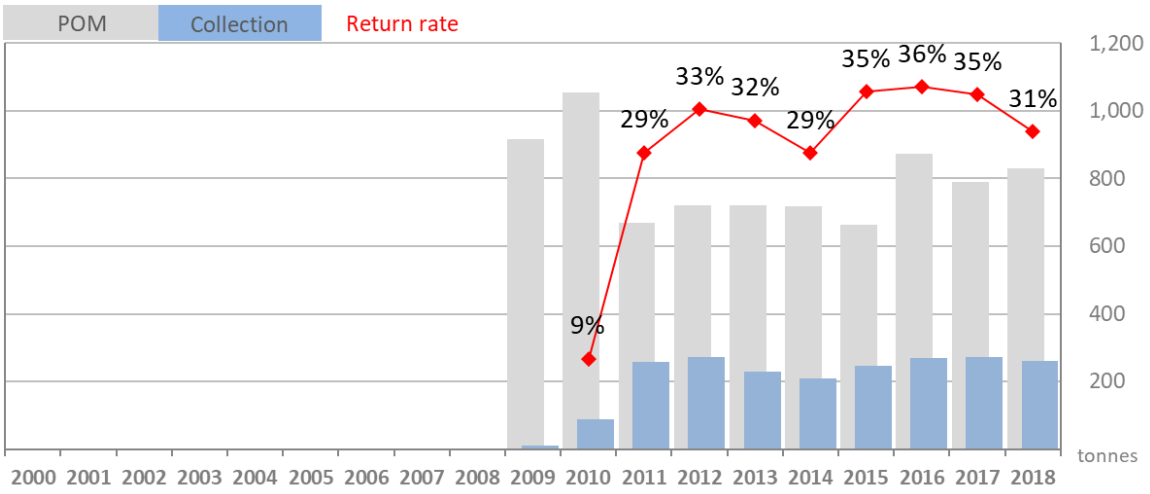
Source: 2018 Eurostat; 2016/7 Ministry of Environment

SLOVENIA

Legal and organisational developments: Since 2003, municipalities have been obliged to separately collect hazardous wastes including batteries. They remain responsible for financing their collection infrastructure. In 2008 and 2010, Decrees transposing Batteries Directive 2006/66/EC required individual producers of separately sold batteries to achieve collection targets by taking back waste batteries from retailers, municipalities and their own collection points through approved waste management plans. Producers of EEE with integrated batteries do not need a separate waste management plan for batteries, but rather, comply through their WEEE management plan.

As of late 2017, over 500 producers of separately sold portable batteries complied through the 5 joint plans (compliance organisations).

Collection rate: In 2016, POM increased by 24% over 2015 (to 420g per capita), collection by 8%, leading to a peak in the collection rate of 36%. **In 2018, the collection rate fell to 31% as POM increased by 5% to 402 g per capita and collection declined by 4%.**



Source: Republic of Slovenia Statistical Office

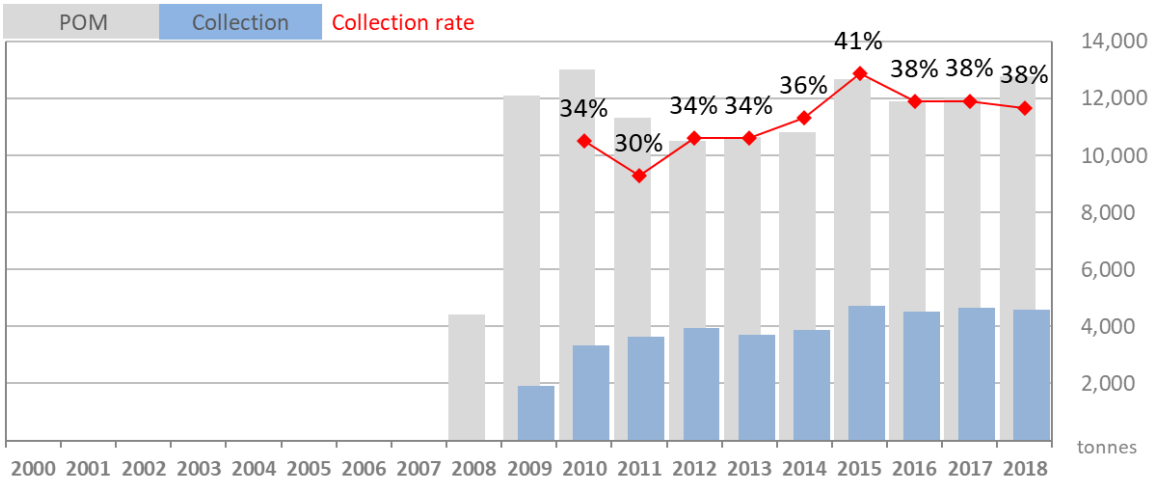
SPAIN

Legal and organisational developments: Royal Decree 45/1996 held the Autonomous Communities responsible for separately collecting waste batteries. Royal Decree 106/2008 transposing Batteries Directive 2006/66/EC made producers responsible for taking back waste batteries and left each Autonomous Community responsible for authorising organisations operating on their territory which slowed the implementation of producer compliance organisations and complicated waste flow monitoring. The 2011 framework Law on Waste established a much-needed Coordination Commission on Waste, comprising members from all Autonomous Communities, to implement waste policies more effectively. An amendment to the Law in May-12 strongly simplified authorisation requirements for collective compliance organisations by making the authorisation in their home region valid for the entire national territory. In 2015, a new WEEE Decree extended EEE reporting and take back obligations to 'batteries that the end-user cannot manually remove from WEEE'. The (unknown) POM weight of these batteries is reflected in the WEEE collection target calculation. A Jul-15 amendment to the Battery Decree i.a. harmonised the Decree with the 2011 Law on Waste and the 2015 WEEE Decree and introduced collection targets to 2020.

Four authorised compliance organisations are currently operating: Ecopilas (POM share about 53% in 2016), set up in 2000 by battery producers, WEEE compliance organisations ERP (POM share 40% in 2016), Ecolec and recently established Unibat (national coverage from 2014). WEEE compliance organisation Eco-RAEE has ceased to offer waste battery management services.

Collection rate: In 2016, POM fell by 6% and collection by 4%, according to Eurostat data. As a result, the collection rate peaked in 2015 at 41% and declined to 38% in 2016. **In 2018, the collection rate remained at 38% as POM increased 6% to 274 g per capita and collection fell 2% over 2017.**

Note: *Based on data from the battery register and the compliance organisations, we estimated that in 2016 POM fell by -13%, while collection increased +15%. This results in a higher 2016 collection rate of 41% (Eurostat 38%). Eurostat data suggest the collection increase already took place in 2015. Our estimate of the 2015 collection rate was therefore lower (37% vs 41% Eurostat).*



Source: Eurostat.

SWEDEN

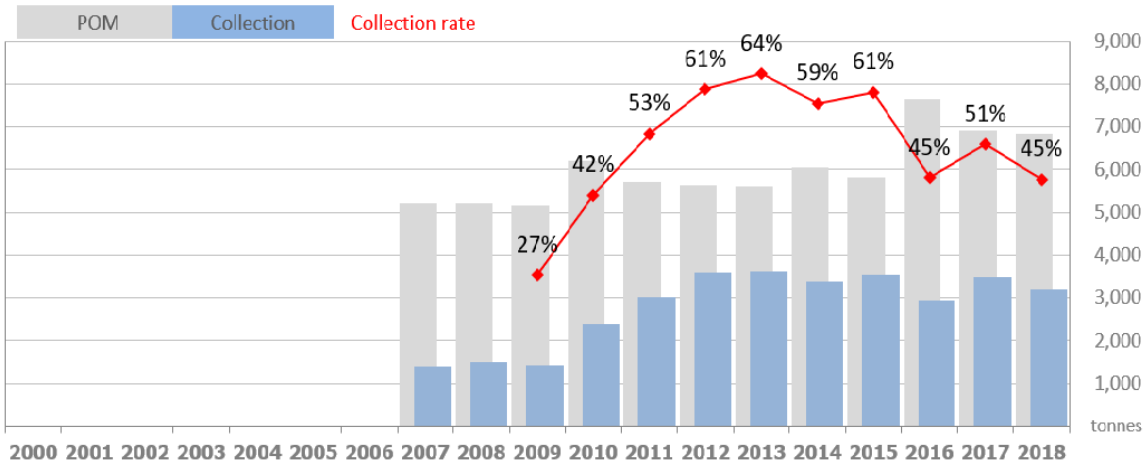
Legal and organisational developments: Following the 1997 Batteries Order, all of Sweden's 290 municipalities had to set up their own battery collection, while producers of certain hazardous batteries financed these organisations through fees paid into a recycling fund managed by environment agency SNV. Batteries Ordinance 2008:834 transposed Batteries Directive 2006/66/EC, and from January 2009 de facto shifted the collection responsibility to producers.

Around 1,100 battery producers comply through two authorised WEEE organisations which, by way of their WEEE authorisation, qualify as battery compliance organisations: 960 battery producers are signed up to El-Kretsen - set up in 2001 by 21 trade associations - and around 100 producers are signed up to Recipo (until May 2017 Elektonikåtervinning Förening, EAF) - established in 2007 as a not-for-profit organisation by SIBA, a large EEE retailer. Recipo claimed a market share of 25% of EEE and batteries POM in 2016[11]. An estimated 200 individual B2B EEE compliers also cover integrated portable batteries in their WEEE programmes. **In 2018, El-Kretsen serviced 50,000 collection containers for WEEE and around 5,000 for batteries. During 2017/8 all were replaced by smaller, closable bins to reduce fire risks from expired Lithium batteries.**

Until the end of 2015, El-Kretsen charged battery fees only on separately sold batteries, while integrated batteries were covered by the WEEE fee, thus ensuring that producers of integrated batteries do not pay for two collection infrastructures. However, from 2016, El-Kretsen began charging for batteries put on the market in EEE at the same rates as those for separately sold batteries.

Lithium portable batteries: In 2016, POM increased by 31%, exclusively due to a 123% increase in lithium batteries (presumably from e-bikes, hover boards and power packs). The increase means that 46% of total battery POM consisted of lithium batteries in 2016, up from 28% in 2015.

Collection rate: In 2016, the collection rate fell to 45% (2015: 61%) due to a 17% decrease in collection (no conclusive explanations for the decrease, we suspect a clearing dispute) and the afore mentioned 31% POM increase due to a doubling of lithium POM. In 2017, the collection rate was 51% as both POM and collection volumes receded from the unusual 2016 values (POM - 10%, collection +18% over 2016). **In 2018, POM declined 1% to 675 g per capita. Collection fell by 8%.**



Source: SNV, 2017/8: Eurostat

[11] **Since 2017, the battery collection volume reported to Eurostat closely corresponds to that reported by El-Kretsen only.**

SWITZERLAND

Legal and organisational developments: Legal requirements for the take-back of batteries have been in force since 1986, and voluntary financing by producers began in 1991. A 2001 Ordinance made the financing obligation mandatory through an Advance Recycling Fee (ARF) and a 2010 revision aligned the Ordinance with Batteries Directive 2006/66/EC. From 2016, new provisions for handling lithium containing WEEE in the ADR regulations came into place.

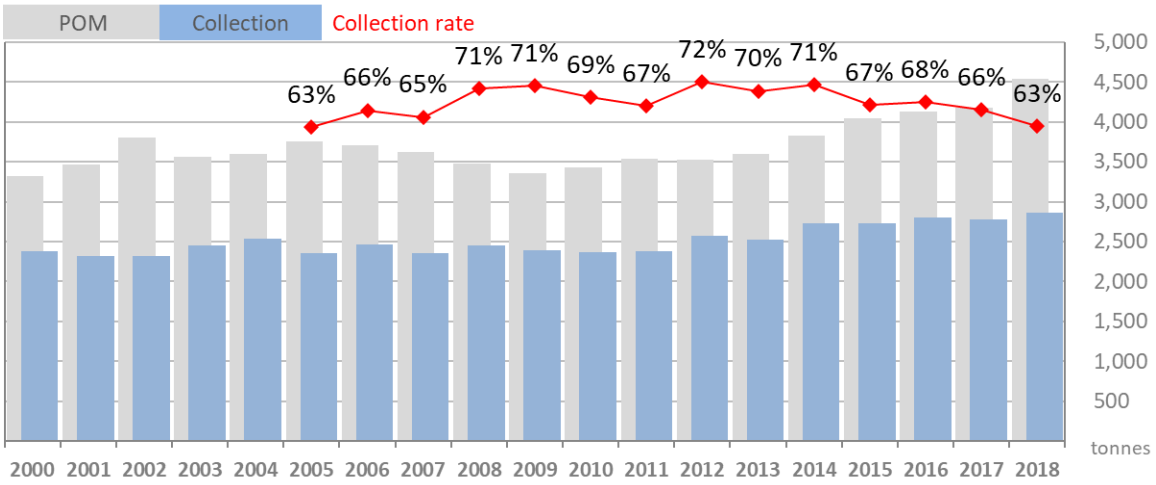
From 2001 to 2016, the Government-appointed producer-controlled non-profit INOBAT to manage the ARF and waste battery management. INOBAT later outsourced its operations to ATAG, a privately held public-services management company. From 2017, the Government appointed ATAG only to manage the ARF, required INOBAT to transfer the rights to the name INOBAT to the federal government and the owners of the non-profit INOBAT to remove the word INOBAT from the organisation's name from 2017. INOBAT mainly collects waste batteries from voluntary municipal collection points and obligated retailers.

POM of embedded and lithium batteries: INOBAT's annual reports show that consistent POM increases (2011-16) are largely due to increased volumes of embedded batteries. As producers of EEE with embedded batteries do not report battery weight POM, the POM of embedded batteries is based on calculation: This resulted in a share of embedded batteries in total POM of 15% in 2009, peaking at 25% in 2015 and decreasing to around 23% of POM in 2017. INOBAT's POM consists of about 37% lithium batteries in 2017 **and 40% in 2018**, up from 21% in 2012. The lithium share is higher than elsewhere (DE: **26% in 2018**) as INOBAT includes lithium accumulators that would qualify as industrial batteries under the EU Batteries Directive, such as lithium batteries in industrial vehicles.

Improved calculation methodology for the collection rate: Due to concerns that the increasing share of lithium batteries would depress collection rates as they become available for collection only after a 7-12-year lifecycle, INOBAT will be publishing 3 collection rates to more accurately reflect collection performance:

1. First, the **current collection rate methodology** is maintained to ensure transparency (this rate is shown in our graph below) (note: INOBAT uses 2-year avg. POM, unlike the EU's 3 years);
2. For **non-Lithium batteries** subject to the ARF, a collection rate based on **2-year avg. POM** and collection in current year is calculated: This results in a collection rate of 76%, 82%, 84% and **82%** for 2015/6/7**/8** respectively.
3. For **lithium batteries** subject to the ARF, a collection rate based on **7-year avg. POM** and collection in current year will be calculated. The dataset for calculating the full 7-year POM will be complete for the first time in 2021. Using 2-year avg. POM, the lithium return rates are 16%, 16%, 18.8% and **19.5%** for 2015/6/7**/8** respectively.

Collection rate: A collection rate[12] well above 60% has been achieved every year since 2000. The collection rate declined from 71% in 2014 to 68% in 2016 as POM increased POM (+6% in 2015, + 2% in 2016) faster than collection. **In 2018, POM increased 10% to 533 g per capita, collection increased by 3%.**



Source: Inobat

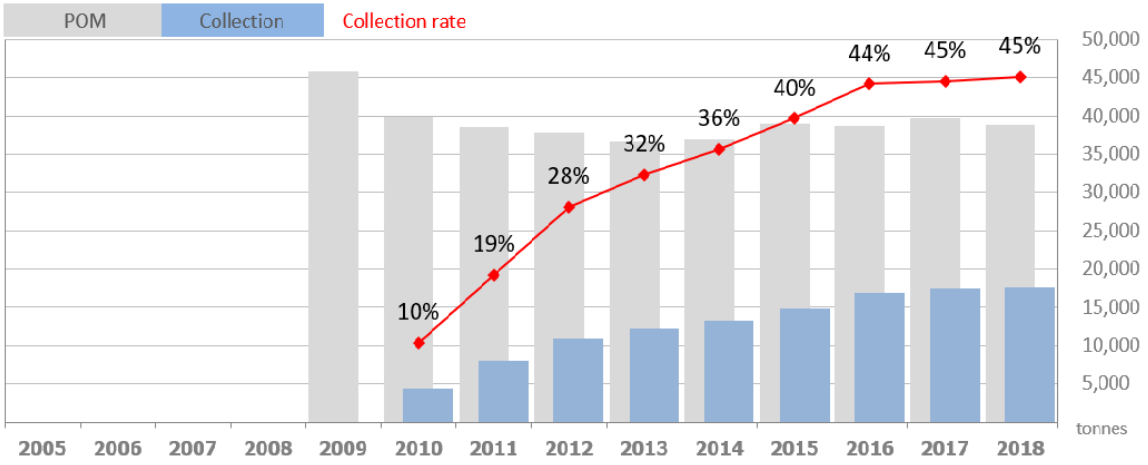
[12] POM volumes (and the collection rate shown here) reflect the average of the current and the preceding year.

UNITED KINGDOM

Legal and organisational developments: The Waste Batteries and Accumulators Regulations of Apr-09 introduced the producer responsibility provisions. The first compliance period (of one year) began on 1-Jan-10. Compliance organisations are free to choose how they collect batteries but must 'co-operate' to ensure that waste batteries are picked up from local authorities and those retailers that are obliged to take back waste batteries. Small producers (POM < 1 tonne) only have registration and reporting obligations and are not required to join a compliance organisation.

As of 2017, 520 producers comply through five approved battery compliance organisations. In addition, there are about 1,400 **small producers**, who jointly represent around 0.6% of POM. As of 2016, BatteryBack remained the largest compliance organisation (2015 share of POM 39%), followed by Valpak (33%) and Ecosurety (19%). ERP and REPIC each have a POM share of about 4%.

Collection rate: The collection rate increased from 10% in 2010 – the first 'compliance period' for battery collection organisations – to 39% in 2015 and 44% in 2016. **In 2018, POM decreased by 2% to 587 g per capita, as collection remained flat.**



Source: Derived from batteries data published on Environment Agency's National Packaging Waste Database

Relevance of the collection rate in view of lead share in collection volumes: The relevance of the collection rate as a measure of scheme performance can be disputed:

- The weight of lead 'portable' batteries collected has – since 2011 – been a multiple of lead portable batteries POM (**peaking in 2019 at 8.8 times POM**). An implausible amount of waste lead batteries first appeared in BatteryBack volumes in 2011 (after it tripled its POM share by signing a large producer and needed to increase collection) as well as EcoSurety. In 2012, Repic and Valpak followed suit. ERP bucked the trend until 2016.
- The **collection rate of all other chemistries** increased to a peak of 21% in 2016 **and fell back to 15% in 2019.**
- Assuming a plausible scenario in which all lead batteries POM are collected (100% return rate), a **plausible collection rate** would have peaked at 26% in 2016 **and fallen to 20% in 2019.**

The lead share in the UK's portable batteries POM has been higher than in most countries (8% until 2012, 6% in following years, and 5% in 2016/7). The 4 kg threshold per portable battery introduced in 2016 decreased POM and collection of *lead* portable batteries by nearly 20% and their share of total portable batteries collected fell to 51%.

Collection rate, current year basis	***2010***	***2011***	***2012***	***2013***	***2014***	***2015***	***2016***	***2017***	***2018***	***2019***
All chemistries	11%	21%	29%	33%	36%	40%	44%	44%	**46%**	**44%**
Lead	55%	179%	295%	478%	423%	461%	457%	556%	**684%**	**878%**
All chemistries except Lead	7%	6%	6%	5%	8%	12%	21%	18%	**20%**	**15%**
All batteries, assuming plausible lead collection volume: Lead collected = Lead POM	**15%**	**14%**	**14%**	**11%**	15%	18%	26%	24%	**25%**	**20%**

Source: Derived from batteries data published on Environment Agency's National Packaging Waste Database