Selected waste management indicators in the area of batteries and accumulators and waste batteries and accumulators for 2023

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Circular Economy and Waste Department

Evaluation of annual reports for 2023

On 1 January 2021, Act No. 542/2020 Coll. on end-of-life products (hereinafter referred to as the "ELP Act") came into effect, which deals with selected products, whether they are placed on the market separately or as part of or accessories to other products (from production through placing on the market to the processing of waste generated from them).

The issue of battery and accumulator take-back is then covered by Sections 75 to 90 of the ELW Act. The Act incorporates the relevant European Union regulations, Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC (hereinafter referred to as the "Batteries Directive and Accumulators Directive"). On 18 February 2024, the Batteries and Accumulators Directive was replaced by the new Regulation (EU) No 2023/1542 of the European Parliament and of the Council of 12 July 2023 on batteries and waste batteries.

On 1 February 2022, Decree No. 16/2022 Coll. on details of the handling certain end-of-life products (hereinafter referred to as the "Decree"), which includes batteries and accumulators. Section 33(1) "Transitional Provisions" of the Decree states that for the years 2021 to 2023, the "Annual Report on the Fulfilment of Take-Back Obligations and separate collection of batteries and accumulators" (hereinafter referred to as the "Annual Report") in accordance with Decree No. 170/2010 Coll.

Until 2021, the reported data was processed and evaluated in the ISOH1 Waste Management Information System. Since 2023, the Waste Management Information System with new ISOH2 application support has been used to evaluate the data. In the reporting year 2023, producers were required to submit reports in accordance with the Waste Management Act by 31 March 2024 and collective systems by 30 June 2024 to the Ministry of the Environment (MŽP). Manufacturers' annual reports are the main source of data for evaluating battery and accumulator management.

In the reporting year 2023, manufacturers of portable batteries and accumulators fulfilled their take-back obligations only through collective systems. Manufacturers of industrial and automotive batteries and accumulators fulfilled their obligations either individually or, since 2021, also through collective systems. In 2022, only ECOBAT s.r.o. received an extension of manufacturers' obligations to include industrial and automotive batteries and accumulators and a valid decision from the Ministry of the Environment authorising it to operate a collective system (the decision is valid from 6 January 2023). In the portable batteries and accumulators group, two annual reports were submitted by the collective systems ECOBAT, s.r.o. and REMA Battery, s.r.o. (on behalf of all manufacturers placing batteries and accumulators on the market).

Table 1 contains basic indicators relating to the take-back and separate collection of individual groups of batteries and accumulators in 2023. **Figure 1** shows the individual weight shares of batteries and accumulators placed on the market in the Czech Republic. The largest share is

accounted for by industrial batteries (30,263.653 tonnes), followed by automotive batteries and accumulators (2 2 ,328.682 tonnes), with portable batteries and accumulators accounting for the smallest share (5,394.760 tonnes).

The greatest attention is usually paid to portable batteries and accumulators, given their overall large quantity in terms of number of items, high variability of chemistries, and the greatest risk that they will be disposed of as part of mixed municipal waste due to their small size and purchase price. The Directive on portable batteries a n d accumulators has also placed the most requirements onportable batteries and accumulators. One of the basic requirements for portable batteries and accumulators is to achieve a minimum level of take-back.

Awareness of the take-back obligations for portable batteries and accumulators is increasing over time, and the collection network for their separate collection is expanding, thereby increasing the take-back rate. The number of producers who duly fulfil their legal obligations through collective systems is also growing. For 2023, collective systems submitted annual reports for a total of 2,850 producers of portable batteries and accumulators (in 2022 for a total of 2,489 producers), i.e. 361 more producers in 2023 than in 2022.

However, the take-back rate in the Czech Republic fell slightly between 2022 and 2023, by 1.2%. In 2023, 5,394.760 tonnes of portable batteries were placed on the market, which is only 186.22 tonnes more than in 2022 (in 2022, 5,208.540 tonnes of portable batteries were placed on the market). In 2023, 2,539.824 tonnes of portable batteries and accumulators were collected for recycling, which is 30.958 tonnes less than in 2022 (in 2022, 2,570.782 tonnes were collected for recycling).

The ECOBAT s.r.o. and REMA Battery, s.r.o. collective systems account for a share of the take-back of portable batteries and accumulators.

Table 1: Evaluation of the take-back of batteries and accumulators according to Annex 3 to Decree No. 170/2010 Coll. for 2023

Batteries and accumulators (group)	Quantity of products placed on the market [t]	Quantity of products taken back [t]	Number of producers
Portable	5,394.760	2,539.824	1,743 + 1,107 units**
Industrial	30,263.653	2,219,075	189 IS*
Automotive	22,328.682	20,059.636	114 IS*
Total	**57,987.095**	**24,818.535**	3,153

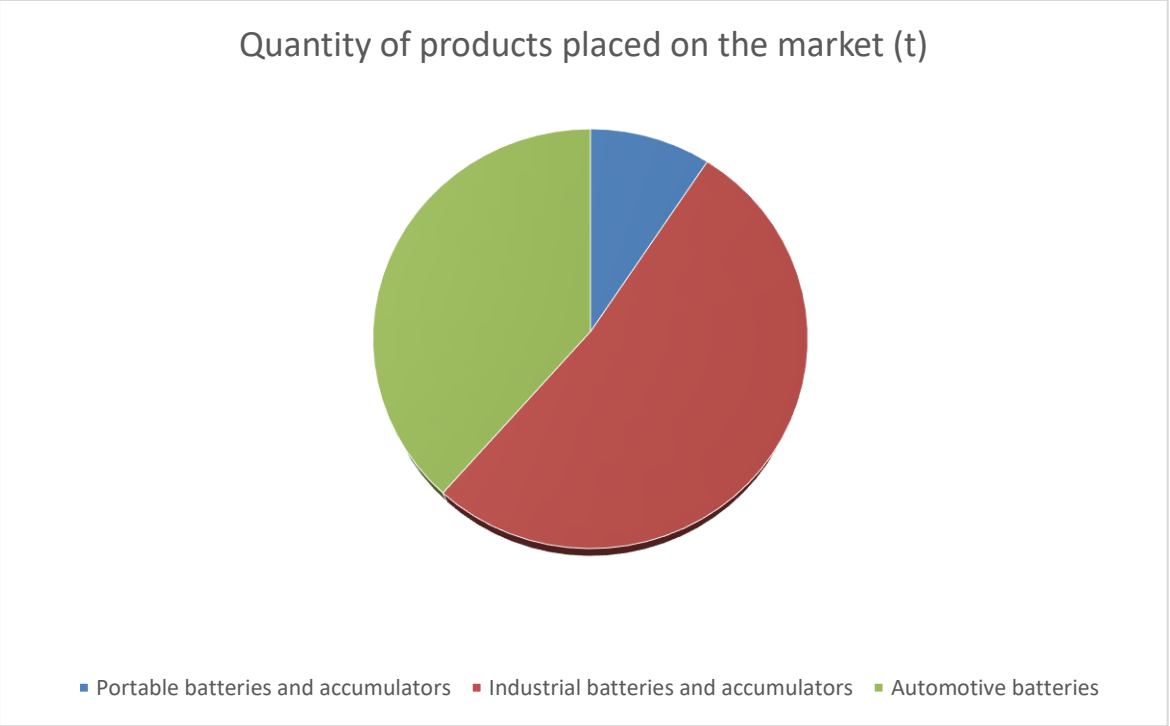
Note: KS – collective system, IS – manufacturer fulfilling its obligations individually

* 41 individual manufacturers submit one annual report for industrial and automotive batteries and accumulators. In the table, such manufacturers are counted for both industrial and automotive batteries and accumulators

** KS ECOBAT s.r.o. submitted a report for 1,743 manufacturers and KS REMA Battery, s.r.o. submitted a report for 1,107 manufacturers.

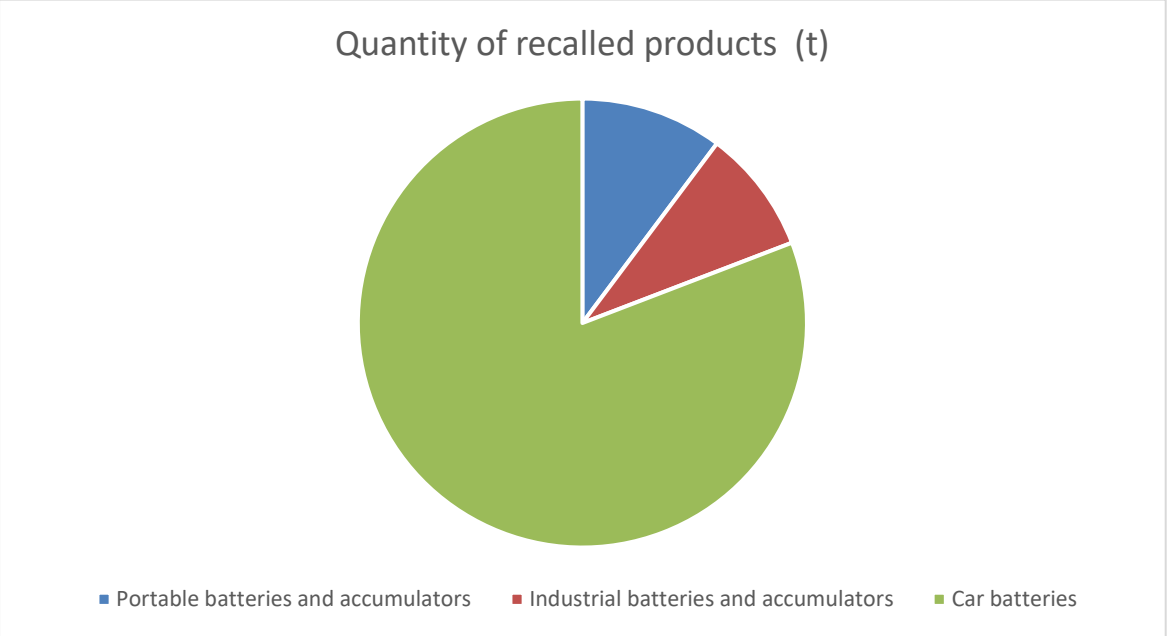
Source: Ministry of the Environment and CENIA (ISOH2)

Fig. 1: Quantity of batteries and accumulators placed on the market in the Czech Republic (t) in 2023 by individual groups



Source: Ministry of the Environment and CENIA (ISOH2)

Fig. 2: Quantity of batteries and accumulators taken back and separately collected in the Czech Republic (t) in 2023 by individual groups



Source: Ministry of the Environment and CENIA (ISOH2)

The reported data for 2023 again confirmed that the largest number of batteries

and accumulators (evaluated for all groups), whose market share in 2023 compared to other electrochemical types of batteries and accumulators placed on the market in the same year is 59.94%. There were 31,084.146 tonnes of lead batteries in 2022. In 2023, the quantity of lead batteries decreased by 7.29% (see **Table 2)**.

Table 2: Quantity of all batteries and accumulators placed on the market in the Czech Republic not exported from the Czech Republic in the reporting year 2023 by electrochemical type

Electrochemical type	Total placed on the market in the Czech Republic (t)	Total placed on the market in the Czech Republic (%)
Lead	34,759.226	59.94
Nickel-cadmium	169.822	0.29
Other	23,058.047	39.77
Total	**57,987.095**	**100.00**

Source: Ministry of the Environment and CENIA (ISOH2)

The group of portable batteries and accumulators is divided into primary cells (cells that cannot be recharged) and secondary cells (cells that can be reused after recharging). From an environmental point of view, rechargeable batteries (secondary cells) are considered much more suitable because, unlike disposable batteries, the service life of most of these batteries is in the order of hundreds of charging/discharging cycles. In accordance with the Czech Republic's Waste Prevention Programme, it is desirable to increase consumer interest in using these accumulators at the expense of disposable batteries. In the reporting year 2023, there was a slight decrease in primary batteries and an increase in the number of secondary batteries placed on the market. However, over the entire period monitored since 2010, the quantity of primary batteries has been declining, while the quantity of secondary batteries has been increasing.

An overview of the individual electrochemical types in the group of portable batteries and accumulators placed on the market in the Czech Republic is provided in **Tables 3 and 4**, which continue to show the dominance of primary alkaline (2,032.401 tonnes) and zinc-chloride/zinc-carbon cells (767.642 tonnes), i.e. commodities with the fastest turnover.

The trend towards replacing primary cells with secondary cells (rechargeable, i.e. with a longer retention period for end users) may have an impact on the achievement of the collection targets set for portable batteries and accumulators. An overview of the values for placing on the market for other electrochemical types of portable batteries and accumulators is given in **Tables 3 and 4.**

Table 3: Share of primary cells in the total quantity of portable batteries and accumulators placed on the market between 2010 and 2023 and their distribution by electrochemical type

Year	Share of primary cells in the total quantity of portable batteries placed on the market [%]	Primary cells by electrochemical type				
		Alkaline [%]	Zinc [%]	Lithium [%]	Button cells [%]	Other [%]
2010	65.1	47.5	50.4	1.0	1.0	0.1
2011	61.9	52.8	44.8	1.3	1.1	0.0
2012	63.8	56.7	41.1	1.1	1.1	0.0
2013	64.5	59.7	38.2	0.9	1.2	0.0
2014	61.3	64.7	33.1	1.1	1.1	0.0
2015	58.1	67.4	30.1	1.0	1.4	0.0
2016	63.7	65.1	31.4	2.3	1.3	0.0
2017	62.8	68.4	28.5	1.6	1.5	0.0
2018	66.1	66.8	29.6	1.9	1.6	0.0
2019	64.0	69.1	27.3	2.0	1.6	0.0
2020	64.9	66.5	27.6	4.5	1.4	0.0
2021	61.31	70.6	24.9	3.0	1.53	0.0
2022	61.56	72.35	19.18	4.82	3.65	0.0
2023	60.03	62.76	23.70	10.25	3.29	0

Source: Ministry of the Environment and CENIA (ISOH2)

Table 4 shows that, compared to 2022, the share of Ni-Cd and Li-lon/Li-pol batteries placed on the market is decreasing. On the contrary, there is an increase in Pb and NiMH batteries and accumulators.

While the share of NiMH batteries and accumulators increased only slightly compared to 2022 (by 0.37%), the share of Pb batteries and accumulators increased significantly (by 3.32%). There was a noticeable decline in "Other batteries" (by 2.05%) and a slightly less noticeable decline in Li-lon / Li-Pol batteries and accumulators (by 1.31%) and NI-Cd batteries and accumulators (by 0.33%) . Over the entire period monitored since 2010, there has been a significant increase in Li-lon / Li-Pol batteries, by 46.07%. On the contrary, the share of Ni-Cd, NiMH and Pb batteries has decreased significantly overall.

Table 4: Share of secondary cells in the total quantity of portable batteries and accumulators placed on the market between 2010 and 2023 and their distribution by electrochemical type

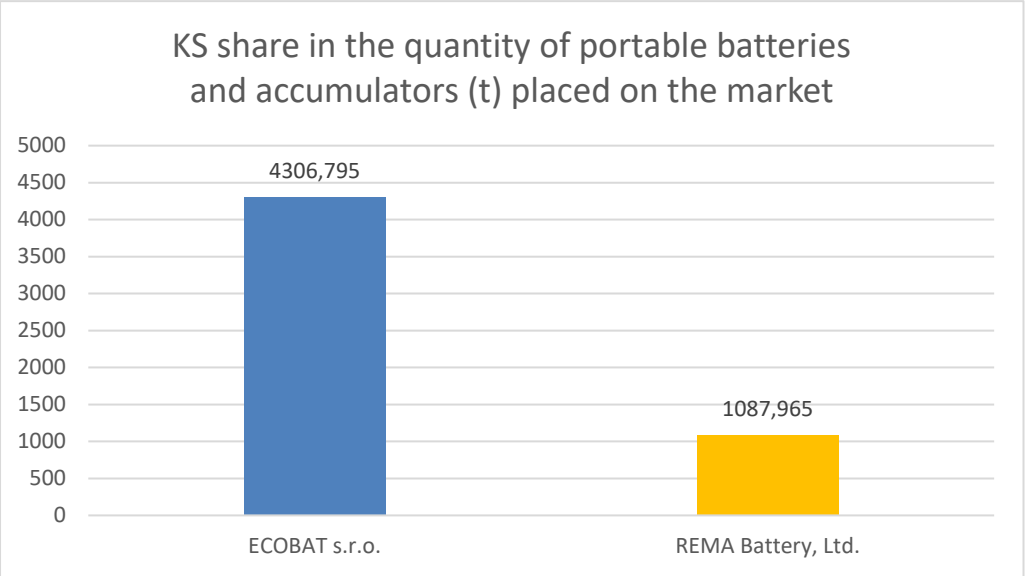
Year	Share of secondary cells in the total quantity of portable batteries placed on the market [%]	Secondary cells by electrochemical type				
		Ni-Cd [%]	NiMH [%]	Li-Ion / Li-Pol [%]	Pb [%]	Other [%]
2010	34.9	16.9	20.5	32.5	29.5	0.6
2011	38.1	12.4	16.2	34.6	36.3	0.6
2012	36.2	12.6	14.1	32.2	40.7	0.4
2013	35.6	10.1	14.1	34.8	36.7	4.3
2014	38.7	8.5	17.9	34.4	39.0	0.3
2015	41.9	7.8	16.2	37.8	37.6	0.6
2016	36.3	8.4	14.2	45.8	29.4	2.2
2017	37.2	2.7	18.3	56.1	21.9	1.0
2018	33.9	2.3	14.5	60.3	22.4	0.5
2019	36.0	1.4	12.8	64.0	21.1	0.7
2020	35.1	0.8	14.0	65.9	18.2	1.1
2021	38.69	1.49	11.10	75.84	10.38	1.19
2022	38.44	1.40	7.54	79.86	7.98	3.22
2023	39.97	1.07	7.91	78.55	11.30	1.17

Source: Ministry of the Environment and CENIA (ISOH2)

In 2023, as in 2022, the take-back of portable batteries and accumulators was ensured by two collective systems. According to the statistics, the operator of the ECOBAT s.r.o. collective system clearly dominates in terms of inputs and outputs.

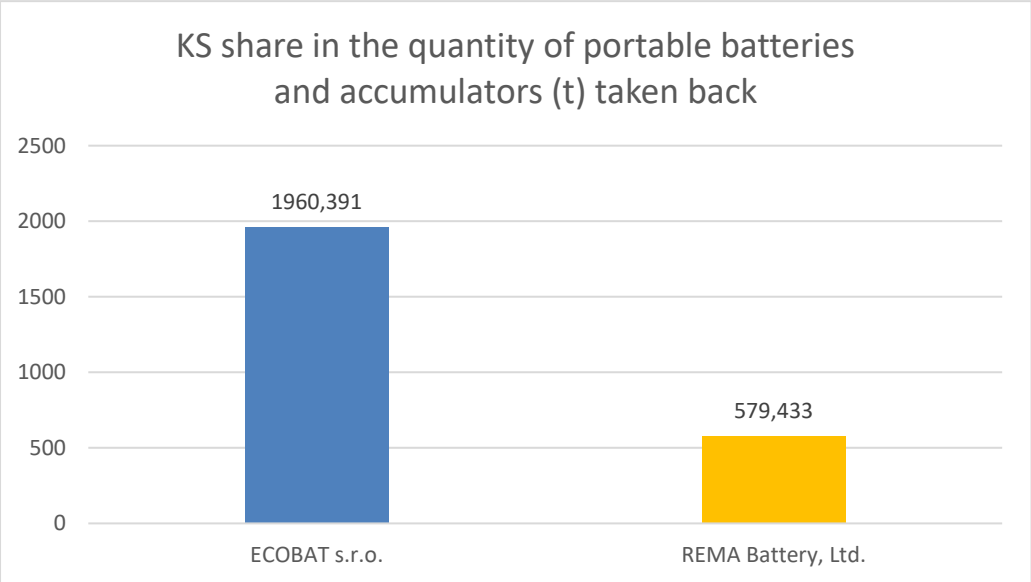
Take-back in the Czech Republic was introduced in 2002. Important data on the take-back of portable batteries and accumulators from 2005 to 2009 was provided by the annual reports of ECOBAT s.r.o. Since 2010, information on take-back has been obtained for the Czech Republic from several obligated entities. Thanks to an increase in the level of take-back, the collection target was exceeded one year earlier than stipulated by the Batteries and Accumulators Directive, i.e. by 0.6% (25.6%) in 2011. In 2012, the collection rate for portable batteries and accumulators reached 29.2%. The collection of portable batteries and accumulators in 2015 again recorded an increase, both in absolute terms (by weight) and in percentage terms. Despite the figures achieved in previous years and the assumption that the target of a 45% collection rate for portable batteries and accumulators would not be met in 2016, the target was achieved.

Fig. 5: Share of systems in the quantity of portable batteries and accumulators (t) placed on the market in 2023



Source: Ministry of the Environment and CENIA

Fig. 6: Share of systems in the quantity of portable batteries and accumulators (t) that were taken back in 2023

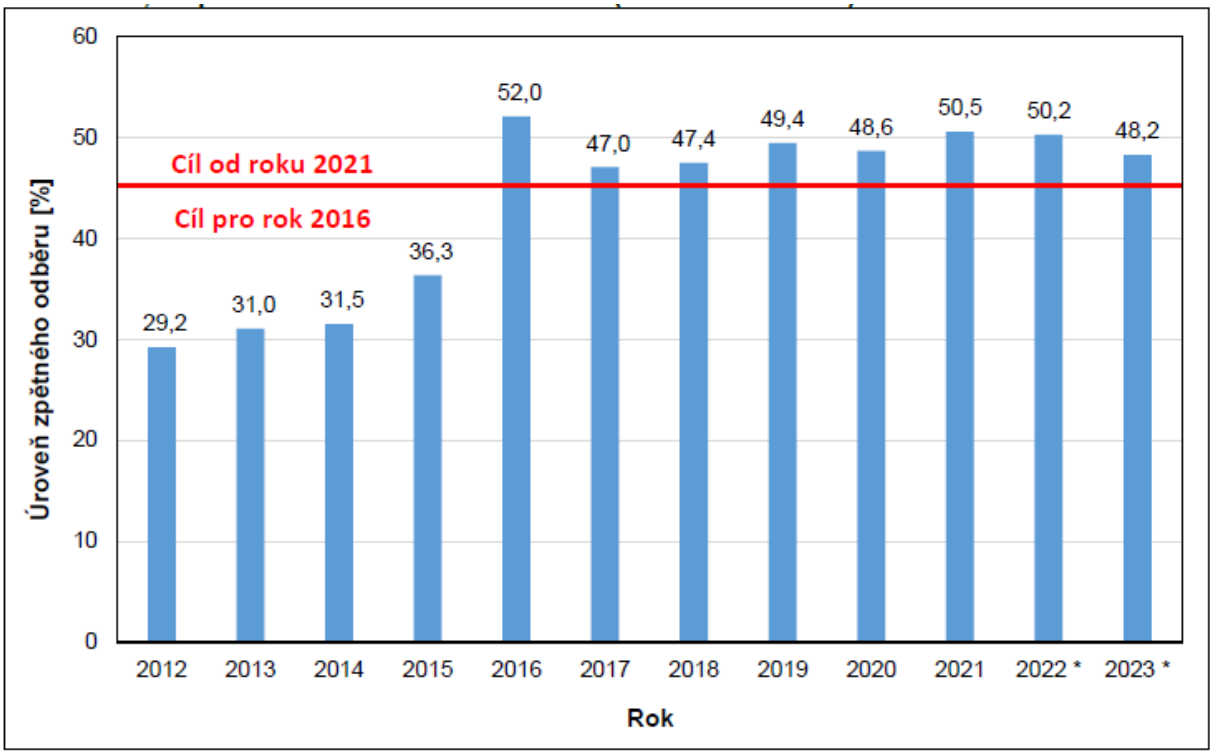


Source: Ministry of the Environment and CENIA

In 2022, there was a sharp increase in the take-back level at REMA Battery, s.r.o. by 12.5%, followed by a sharp decline at the same company in 2023. In contrast, ECOBAT, s.r.o. saw a slight decline of 2.7% in the same period, which continued in 2023. However, the take-back target was met in both 2022 and 2023.

Figure 7 shows the development of the take-back level for portable batteries and accumulators in the Czech Republic between 2012 and 2023**.**

Fig. 7: Development of the level of take-back of portable batteries and accumulators between 2012 and 2023 – summary data for the whole of the Czech Republic

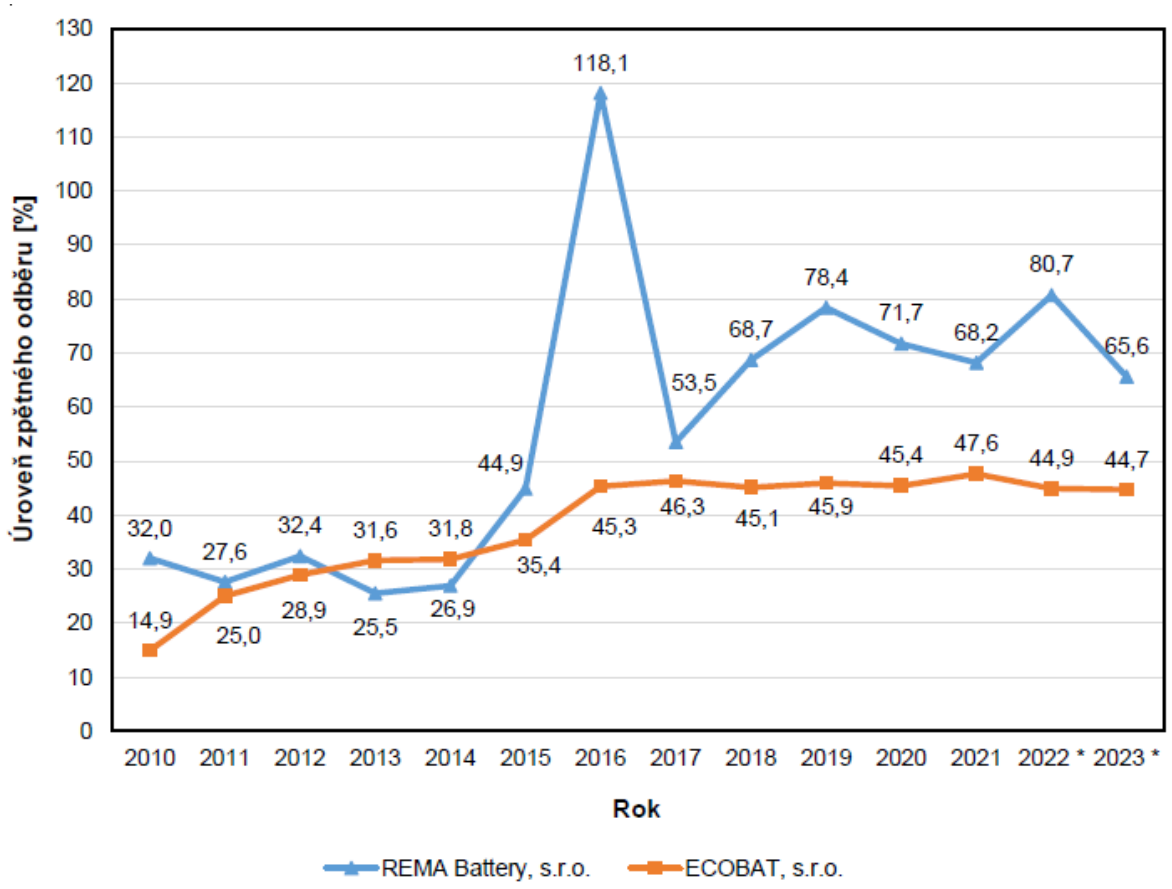


Source: Ministry of the Environment and CENIA

* Target for 2016 – take-back rate target set by the Batteries and Accumulators Directive.
* Target from 2021 – take-back level target set by Annex 2 to the Act on Waste Management

Fig. 8 shows the development of the take-back level for portable batteries and accumulators in the Czech Republic in 2010–2023 for the collective systems REMA Battery, s.r.o. and ECOBAT, s.r.o. At ECOBAT, s.r.o., the take-back rate has been gradually increasing throughout the period under review. Although the REMA Battery, s.r.o. collective system shows a similar trend during the same period, there was a sharp fluctuation in 2016 and 2017. The take-back rate in 2016 rose to 118.1%. In the following year (2017), the take-back level fell to 53.5%. In 2022, there was another significant increase in the take-back level at REMA Battery, s.r.o. by 12.5%, followed by another decline of 15.1% in 2023. Between 2022 and 2023, the ECOBAT, s.r.o. collective system recorded a slight decrease (by 0.2%).

Fig. 8: Development of the take-back rate for portable batteries and accumulators between 2010 and 2023 – separate data for individual collection points



Source: Ministry of the Environment and CENIA

In the field of batteries and accumulators, key information also includes data on the efficiency of recycling processes in accordance with Commission Regulation (EU) No 493/2012, which lays down implementing rules for calculating the recycling efficiency of waste battery and accumulator recycling processes. Since 2014, the calculation of the efficiency of recycling processes has been a binding methodology for processors, who have been sending reports annually since 2015. The deadline for submitting these reports is 30th April.

The recycling efficiency of the lead battery and accumulator recycling process in 2023 was 83.2%, with the proportion of recycled lead amounting to 98.4%. NiCd batteries and accumulators were processed with 93.85% efficiency, with the proportion of recycled cadmium amounting to 93.88%. The processing of other electrochemical types of batteries and accumulators in 2023 can be further divided into button, lithium, alkaline and Li-Ion batteries and accumulators.

As in previous years, the Czech Republic has met the requirements of EU legislation in this area.

Lead batteries and accumulators are all processed in the Czech Republic (Kovohutě Příbram nástupnická, a.s.). Other electrochemical types, with the exception of NiCd (Nimetal spol. s r.o.), are exported for recycling outside the Czech Republic.

The collective system REMA Battery, s.r.o. (ID No. 28985681) exports lead batteries and accumulators that have been taken back and are not processed in the Czech Republic to Hungary and Germany. Nickel-cadmium batteries and accumulators are exported to France. The collective system ECOBAT s.r.o. (ID No. 26725967) exports collected batteries and accumulators, except those processed in the Czech Republic, to China, Germany, Poland and France.

In 2023, the Czech Republic met the quantitative target for the collection of portable batteries and accumulators (48.2%) and the qualitative targets set for the processing and recycling of the most important electrochemical types of batteries and accumulators.

The Czech Republic has processing facilities for lead, nickel-cadmium, alkaline and nickel-metal hydride batteries and accumulators. Since 2021, so-called "pilot programmes" for the processing of lithium batteries and accumulators have also been used in the Czech Republic.

Tables **5 and 6** show data on the quantity of batteries and accumulators that were actually handled in 2023, including stock from the previous year.

Table 5: Quantity of batteries and accumulators handled in the Czech Republic in 2023 under the take-back and separate collection system

Group	Quantity of batteries and accumulators handled in the Czech Republic in 2023 [t]
Portable batteries and accumulators	3,293.505
Industrial batteries and accumulators	2,467.032
Car batteries	20,065.760

Source: Ministry of the Environment and CENIA (ISOH2)

Table 6: Method of disposal of returned and separately collected batteries or accumulators in 2023

Group	Material recovery [%]	Energy recovery [%]	Disposal D1, D5, D12 [%]	Disposal incineration D10 [%]	Remaining in stock [%]	Export to EU – code N7 [%]	Exports outside the EU – code N17 [%]
Portable batteries and accumulators	42.26	0.00	0.00	0.10	23.30	28.61	5.73
Industrial batteries and accumulators	89.69	0.00	0.00	0.40	6.50	3.23	0.18
Automotive batteries	99.87	0.00	0.00	0.00	0.06	0.07	0.00

Source: Ministry of the Environment and CENIA (ISOH-BAT)

Method of collection

Municipalities and final sellers are only significantly involved in the take-back of portable batteries and accumulators. The take-back assessment is broken down individually for each battery group according to the take-back location.

In 2023, compared to 2022, there was an increase in the share of take-back of portable batteries and accumulators at final retailers from 26.61% to 30.28% and a decrease in the so-called "other methods of collection" from 36.51% to 32.23%. In the case of industrial batteries and accumulators there was a slight decrease in the take-back of products (hereinafter referred to as "ZOV") by final sellers from 18.34% to 19.21%. Other methods of take-back remained at a similar level. In many cases, manufacturers of industrial and automotive batteries and accumulators were unable to determine the method of collection and classified the collection as "other methods of take-back". These manufacturers' lack of interest in specifying take-back methods results in inaccurate information being provided in the Ministry of the Environment's annual report. For portable batteries and accumulators, too, the largest share (i.e. 32.23%) is classified as "other ZOV methods".

For more information, see Table 7, which lists the individual methods of collecting batteries and accumulators in the Czech Republic for the reporting year 2023.

Table 7: Reported methods of battery and accumulator collection in the Czech Republic, broken down by place of take-back and separate collection in 2023

Group	Municipalities [%]	Last sellers [%]	Other method of ZO [%]	From electrical equipment processors [%]	From car wreck processors [%]
Portable batteries and accumulators	31.71	30.28	32.23	5.78	0.00
Industrial batteries and accumulators	0.87	19.21	79.70	0.22	0.00
Automotive batteries	0.08	7.28	92.64	0.00	0.00

Source: Ministry of the Environment and CENIA

Take-back points can be found on the Ministry of the Environment website https://visoh2.mzp.cz/RegistrMistZO/RegistrMistZOPublic/MapaMistZpetOdberu, or on the websites of individual collective systems and individually compliant manufacturers, to which the Ministry of the Environment website provides links.