Waste statistics - recycling of batteries and accumulators

Statistics Explained

Data extracted in November 2025
Planned article update: November 2026

Highlights

Close to one-half (49%) of the portable batteries and accumulators sold in the EU were collected for recycling in 2023. From 2009 to 2023, the collected amount has more than doubled.

In 2023, 231 000 tonnes of portable batteries were sold in the EU. In the same year, 117 000 tonnes of used portable batteries were collected for recycling.

This article provides an overview of statistics on sales, collection and recycling of batteries and accumulators in the European Union and each EU country.

The overall objective of the **Batteries Directive** (Directive 2006/66/EC on portable batteries and accumulators) is to minimise the negative impact of batteries and accumulators on the environment, contributing to the protection, preservation and improvement of the quality of the environment. Therefore, waste batteries and accumulators should be collected and recycled; a high collection and recycling rate should be achieved to ensure a high level of environmental protection and material recovery.

Sales and collection of portable batteries and accumulators

Sales (products put on the market) and collection (waste collected) of portable batteries and accumulators from 2009 to 2023 are presented in Tables 1a and 1b, covering data for the EU and available EFTA countries. In 2023, 231 000 tonnes of portable batteries and accumulators were put on the market (sales) in the EU, while 117 000 tonnes of used portable batteries and accumulators were collected as recyclable waste. Thus, slightly less than half (49%) of the average annual sales of portable batteries (calculated on the period 2021-2023) were collected for recycling in 2023.

Table 1a: Sales of portable batteries and accumulators, 2009–2023
(tonnes)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
EU (1)	*162,000*	*176,000*	*173,000*	*173,000*	*169,000*	*172,000*	177,000	177,000	188,000	191,000	206,000	*229,000*	*245,000*	*243,000*	*231,000*
Belgium	4,061	4,381	4,401	4,259	4,398	4,222	4,566	4,585	4,786	4,920	5,413	5,611	6,239	6,024	6,179
Bulgaria	520	1,052	624	602	677	730	760	750	815	690	942	940	1,002	1,046	1,105
Czechia	2,638	3,281	3,393	3,716	3,672	4,000	3,965	4,047	4,064	4,048	4,293	4,963	5,206	5,209	5,395
Denmark	3,613	3,062	3,347	3,704	3,132	3,637	3,762	3,944	3,698	4,475	4,034	4,932	5,106	4,765	4,724
Germany	37,298	42,531	43,334	43,549	42,441	43,979	43,902	45,511	50,643	52,159	55,905	65,368	63,211	63,133	55,197
Estonia	406	411	475	525	403	417	464	479	489	483	475	542	520	653	634
Ireland	2,017	2,181	2,096	1,951	1,913	2,378	2,703	1,968	2,991	2,336	2,666	3,543	3,692	3,528	3,734
Greece	:	:	:	:	:	:	1,657	1,599	1,692	1,646	1,798	1,850	2,872	2,732	2,590
Spain	12,090	13,023	11,331	10,514	10,662	10,815	12,669	11,915	12,017	12,774	12,949	14,364	15,547	14,842	14,719
France	29,921	32,914	33,458	33,458	32,227	31,330	31,383	29,936	31,482	31,329	33,003	35,268	38,132	36,271	36,412
Croatia	:	:	332	407	394	347	266	395	568	674	906	1,052	1,049	1,355	1,334
Italy	27,843	30,313	29,507	29,407	27,939	26,944	28,440	25,197	25,268	24,807	24,829	27,859	32,356	31,812	27,985
Cyprus (2)	*180*	280	272	237	226	189	206	211	233	202	175	203	197	189	217
Latvia	289	412	478	483	516	553	509	628	490	512	562	666	685	788	824
Lithuania	734	831	708	782	795	686	700	748	832	762	750	817	929	1,088	1,151
Luxembourg (2)	*214*	159	183	185	192	171	172	196	201	209	242	261	285	273	293
Hungary	2,087	1,858	1,798	1,046	1,192	1,726	1,804	1,684	2,357	2,842	2,920	2,519	3,125	3,302	4,568
Malta	:	108	87	104	89	103	74	75	68	81	172	143	164	137	145
Netherlands	7,672	7,824	7,971	7,322	6,786	7,687	8,031	8,830	8,890	9,578	*8,762*	*10,888*	11,871	11,138	10,851
Austria	3,272	3,642	3,614	3,717	3,892	4,087	4,547	4,708	4,746	5,449	5,760	6,347	6,139	7,153	5,936
Poland	:	9,866	9,771	10,599	11,264	11,799	12,304	12,813	13,426	13,338	19,400	19,557	20,846	21,845	21,524
Portugal	3,630	1,317	1,381	1,615	1,727	1,807	1,547	1,778	2,241	2,456	2,598	2,623	2,757	2,785	2,568
Romania	2,079	3,447	2,696	2,740	:	2,730	2,646	2,340	3,625	2,802	4,276	4,964	6,874	6,846	
Slovenia	915	1,053	670	*722*	*720*	719	663	872	790	823	833	826	884	890	886
Slovakia (3)	*900*	*950*	*980*	*1,000*	*950*	842	*939*	1,236	1,460	1,534	1,748	2,030	2,270	2,430	2,337
Finland	2,569	2,814	2,763	2,752	2,703	2,651	2,864	3,026	3,180	3,460	3,616	3,626	4,066	3,738	3,609
Sweden	5,168	6,197	5,708	5,641	5,602	6,046	5,812	7,634	6,913	6,834	7,386	7,558	8,875	:	:
Iceland	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Liechtenstein	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Norway	:	1,940	1,980	2,015	2,025	1,965	1,965	2,230	3,599	3,122	4,367	3,526	3,530	3,976	3,802

(:) Data not available
(1) Eurostat estimates 2009-2014 and 2022-2023
(2) 2009: data estimated
(3) 2009-2013, 2015: data estimated
Source: Eurostat (online data code: env_waspb)

Table 1a: Sales of portable batteries and accumulators, 2009–2023 Source: Eurostat (env_waspb)

Table 1b: Collection of portable batteries and accumulators, 2009–2023
(tonnes)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
EU (1)	*50,000*	*55,000*	*60,000*	*64,000*	*65,000*	*68,000*	74,000	82,000	83,000	90,000	100,000	*98,000*	*109,000*	*111,000*	*117,000*
Belgium	2,525	2,232	2,229	2,273	2,298	2,343	2,438	3,153	2,813	2,935	3,385	3,149	3,392	3,517	3,706
Bulgaria	13	54	108	261	247	303	322	362	388	402	392	408	448	478	522
Czechia	409	525	855	1,010	1,114	1,195	1,407	2,082	1,890	1,921	2,042	2,154	2,433	2,571	2,540
Denmark	1,405	1,393	1,589	1,511	1,403	1,544	1,591	1,683	1,985	1,979	2,249	2,655	2,619	2,578	2,569
Germany	16,555	16,953	17,728	18,157	18,599	19,142	19,678	20,524	21,037	23,569	27,625	26,343	29,624	32,411	30,473
Estonia	:	:	72	123	293	107	173	127	156	163	140	196	229	250	291
Ireland	212	283	613	574	616	678	773	1,129	1,328	1,227	1,259	1,461	1,592	1,655	1,795
Greece	:	:	:	:	:	:	567	632	571	553	610	601	636	719	980
Spain	1,919	3,320	3,626	3,961	3,697	3,876	4,710	4,511	4,670	4,592	5,740	5,482	7,473	6,648	5,853
France	10,442	10,791	11,621	11,776	11,366	11,989	12,296	13,678	13,981	14,400	15,524	15,124	20,060	18,499	20,147
Croatia	:	:	:	:	76	72	98	337	476	525	651	596	737	787	717
Italy	4,670	6,188	7,446	8,050	8,429	9,585	10,105	9,495	9,488	10,432	10,968	10,476	10,499	9,554	10,912
Cyprus (2)	6	25	33	31	39	41	55	57	64	77	84	80	89	86	81
Latvia	223	113	127	129	133	147	130	169	225	232	266	310	317	355	372
Lithuania	193	212	213	253	276	248	309	375	347	363	354	354	396	445	500
Luxembourg	*111*	116	133	128	117	121	106	114	109	140	156	163	165	164	164
Hungary	408	434	451	527	520	607	746	922	990	1,071	1,459	1,270	1,331	1,393	1,309
Malta	:	:	18	20	39	21	35	23	23	26	30	35	35	29	36
Netherlands	3,122	3,385	3,321	3,298	3,157	3,261	3,430	3,944	4,000	4,309	*4,595*	*4,683*	4,548	4,718	5,248
Austria	1,705	1,647	1,738	1,909	1,976	2,097	2,299	2,188	2,117	2,270	2,376	2,829	2,770	2,854	3,006
Poland	:	1,775	2,230	2,933	3,170	3,710	6,474	9,615	8,311	10,706	11,178	10,974	9,082	9,151	13,897
Portugal	497	476	411	448	486	489	527	711	732	669	753	388	427	481	609
Romania	12	35	159	312	:	779	506	766	1,407	1,540	1,881	2,092	3,187	4,072	:
Slovenia	:	:	257	273	228	210	247	268	271	320	307	343	346	347	352
Slovakia (3)	:	:	*422*	*592*	*468*	617	*482*	478	1,104	813	891	922	954	1,088	1,199
Finland	1,039	877	968	920	1,127	1,252	1,293	1,306	1,370	1,466	1,679	1,748	2,094	1,964	1,885
Sweden	1,420	2,383	3,028	3,585	3,620	3,381	3,532	2,931	3,475	3,192	3,696	3,437	3,722	:	:
Iceland	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Liechtenstein	5	7	8	10	6	5	6	7	17	21	17	19	20	19	36
Norway	:	380	454	664	815	879	650	1,777	1,059	1,170	1,941	2,321	2,323	1,745	2,397

(:) Data not available
(b) Break in time series
(1) Eurostat estimates 2009-2014 and 2022-2023
(2) 2009: data estimated
(3) 2015: data estimated
Source: Eurostat (online data code: env_waspb)

Table 1b: Collection of portable batteries and accumulators, 2009–2023 Source: Eurostat (env_waspb)

The amount of portable batteries and accumulators put on the market varies strongly across the EU countries, with

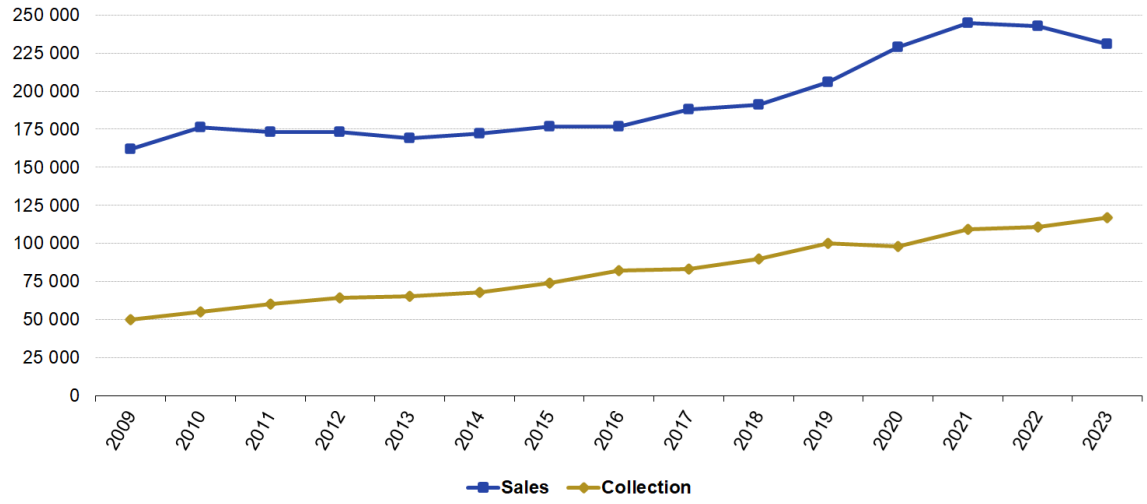
sales in individual EU countries ranging from 145 tonnes in Malta to more than 55 000 tonnes in Germany in 2023. Overall, country-specific sales have increased over the period from 2009 (or the year an EU country first reported) to 2023, with volumes increasing for most countries. Only 2 countries (Portugal and Slovenia) reported a decrease over this period.

The amount of waste portable batteries and accumulators collected, measured in tonnes, is lower than the average sales over the last 3 years. Between 2009 and 2023, collection of waste batteries increased steadily in almost all countries. All EU countries reported a larger collected tonnage in 2023 than in 2009 (or the year an EU country first reported).

Figure 1 shows the development of the collection and sales of portable batteries and accumulators in the EU. The amount put on the market rose from 2009 to 2010, reaching 176 000 tonnes, before falling slightly to 169 000 tonnes in 2013. Steady growth followed from 2014 to 2018, before accelerating to 206 000 tonnes in 2019 and a new peak of 245 000 tonnes in 2021. Since 2021, the amount put on the market has decreased slightly, falling to 243,000 tonnes in 2022 and further again to 231,000 tonnes in 2023.

By contrast, the collection of waste batteries and accumulators in the EU has increased steadily since 2009. Starting from a level of around 50 000 tonnes in 2009, collection increased to around 117 000 tonnes by 2023. The tonnage collected has increased in each year, except for between 2019 and 2020, where the tonnes of portable batteries and accumulators fell by 2,000 tonnes.

Sales and collection of portable batteries and accumulators, EU, 2009–2023
(tonnes)



Note: Eurostat estimates 2009-2014 and 2022-2023
Source: Eurostat (online data code: env_waspb)

Figure 1: Sales and collection of portable batteries and accumulators, European Union, 2009–2023 Source: Eurostat (env_waspb)

The 'Batteries Directive' defines targets for the collection rates of portable batteries and accumulators. The target for 2012 was a collection rate of 25%, rising to 45% by 2016. In 2023, 17 of the EU countries recorded a collection rate of portable waste batteries of 45% or more while Cyprus reported a collection rate in the range 40% to 45% (see Table 2). 7 EU countries (Greece, Italy, Malta, Hungary Portugal, Slovenia, and Spain) reported collection rates below 40%, whilst data was not available for a further 2 countries (Romania and Sweden). Collection rates are calculated based on the sales data in Table 1a and the collection data in Table 1b, as a ratio of the weight of the collected batteries in a reference year divided by the average of the weight of the batteries sold during the reference year and the previous two years.

Table 2: Collection rates for portable batteries and accumulators, 2011–2023
(% of sales)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
EU (¹)	*35.2*	*36.6*	*37.8*	*39.9*	*43.0*	*46.5*	46.1	48.5	51.4	47.0	48.1	46.2	*48.8*
Belgium	52.0	52.0	53.0	54.6	55.6	70.7	60.6	61.6	67.2	59.3	59.0	59.0	60.3
Bulgaria	15.0	34.0	39.0	45.3	44.6	48.5	50.0	53.5	48.1	47.6	46.6	48.0	49.6
Czechia	26.0	29.0	31.0	31.5	36.3	52.0	47.0	47.4	49.4	48.6	50.5	50.2	48.2
Denmark	:	45.0	41.0	44.3	45.6	44.5	52.2	49.0	55.3	59.3	55.8	52.8	52.8
Germany	:	42.0	43.0	44.2	45.3	46.2	45.1	47.7	52.2	45.6	48.2	50.7	50.4
Estonia	17.0	26.0	63.0	22.8	39.9	27.9	33.2	33.9	29.1	39.1	44.8	43.7	48.3
Ireland	:	28.0	31.0	32.6	33.2	48.0	52.0	50.5	47.3	51.3	48.2	46.1	49.2
Greece	:	:	:	:	34.4	38.9	34.6	33.6	35.6	34.1	29.3	28.9	35.9
Spain	30.0	34.0	34.0	36.4	41.4	38.2	38.3	37.5	45.6	41.0	52.3	44.6	38.9
France	36.0	35.0	34.0	36.8	38.5	44.3	45.2	46.6	48.6	45.6	56.3	50.4	54.5
Croatia	:	:	20.0	19.0	29.3	100.2	116.2	96.2	90.9	67.9	73.5	68.3	57.5
Italy	:	27.0	29.0	34.1	36.4	35.3	36.1	41.6	43.9	40.6	37.0	31.1	35.5
Cyprus	:	12.0	16.0	19.0	27.0	28.0	30.0	36.0	41.1	41.5	46.4	43.6	40.2
Latvia	32.0	28.0	27.0	28.4	25.0	30.0	45.8	45.4	50.9	53.5	49.7	49.8	48.6
Lithuania	28.0	33.0	36.0	32.8	42.5	52.7	45.6	46.5	45.3	45.6	47.5	47.1	47.4
Luxembourg	*72.0*	73.0	63.0	65.0	60.2	63.4	57.3	69.3	71.7	68.5	62.9	60.1	57.8
Hungary	24.0	34.0	39.0	37.0	43.7	53.1	50.8	46.7	53.9	46.1	46.4	47.2	36.1
Malta	:	20.0	41.0	21.3	39.4	27.2	32.2	35.2	28.3	26.5	21.7	19.5	24.5
Netherlands	42.0	43.0	44.0	45.0	45.7	48.2	46.6	47.4	50.6	48.1	43.3	41.8	*46.5*
Austria	50.0	52.0	53.0	53.8	55.1	49.2	45.4	45.7	44.7	48.3	45.5	43.6	46.9
Poland	23.0	29.0	30.0	33.0	55.0	78.0	64.7	81.2	72.6	63.0	45.6	44.1	64.9
Portugal	22.0	31.0	31.0	28.0	31.1	41.6	39.5	31.0	31.0	18.9	16.1	17.7	22.5
Romania	6.0	11.0	:	31.9	20.6	29.8	49.0	52.7	52.7	52.1	59.3	65.4	:
Slovenia	29.0	33.0	32.0	29.0	35.0	35.7	35.0	38.6	37.7	41.4	40.8	40.0	39.7
Slovakia (²)	*45.0*	*61.0*	*48.0*	*66.0*	*53.0*	47.6	*91.1*	57.7	56.4	52.1	47.3	48.5	51.1
Finland	50.0	33.0	41.0	46.0	47.0	46.0	45.0	45.0	49.1	49.0	55.6	51.5	49.5
Sweden	53.0	61.0	64.0	59.0	61.0	45.1	51.2	44.8	52.5	47.4	46.9	:	:
Iceland	86.8	90.3	83.5	74.9	68.4	57.5	62.4	68.8	70.6	76.9	:	:	:
Liechtenstein	:	:	:	:	:	:	:	:	:	:	:	:	:
Norway	:	34.0	41.0	43.9	32.0	80.0	40.8	39.2	52.5	63.2	61.0	47.5	63.6

(:) Data not available
(b) Break in time series
(¹) Eurostat estimates 2011-2016 and 2022-2023
(²) 2015: data estimated
Source: Eurostat (online data code: env_waspb)

Table 2: Collection rates for portable batteries and accumulators, 2011–2023 Source: Eurostat (env_waspb)

Recycling of batteries and accumulators

Due to the wide range of batteries that exist and the different type of metals and compounds of which they are made, there are specific recycling processes for each battery type. In this respect, the Batteries Directive differentiates between the type of applied technology based on*lead-acid* ,*nickel-cadmium* (Ni-Cd) and*other* elements and compounds.

In contrast to sales and collection data, no distinction is made between portable and industrial / automotive batteries when it comes to recycling of batteries and accumulators. Thus, it is not possible to determine the type of batteries once they are shipped to the recycling facility. Consequently, the quantities of waste batteries and accumulators entering the recycling process are much higher than the recorded sales and collection amounts, which only include portable batteries and accumulators (see Tables 1a and 1b above and Tables 3a, 3b and 3c below).

Table 3a: Lead-acid batteries – input fractions to the recycling process, 2009–2023
(tonnes)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Belgium	:	:	33,601	33,127	33,384	13,209	32,002	30,788	32,288	31,723	30,785	27,400	34,616	32,020	30,070
Bulgaria	22,586	32,512	25,532	12,553	13,962	18,368	15,366	18,772	17,755	19,353	19,209	17,062	21,303	17,608	17,498
Czechia	9,512	20,853	18,981	23,678	24,761	47,686	40,055	31,585	44,183	44,427	42,658	41,765	45,574	40,860	42,689
Denmark (¹)	13,993	13,197	18,586	15,297	16,922	17,114	17,021	16,993	21,146	22,226	19,527	12,922	4,336	4,336	18,746
Germany	234,560	181,228	183,027	182,973	208,929	199,067	213,522	207,261	215,953	200,410	205,254	150,943	201,519	177,812	185,285
Estonia	:	:	:	2,947	2,947	3,129	2,956	2,755	3,762	3,592	3,781	3,986	4,386	4,808	4,326
Ireland	8,248	10,287	10,974	9,080	10,504	:	:	:	:	:	:	:	:	:	867
Greece	:	:	:	:	:	:	28,016	24,584	23,786	27,389	31,820	21,044	28,176	28,348	33,727
Spain	81,053	79,618	79,872	85,203	145,547	:	121,661	161,253	184,970	197,191	196,054	193,302	254,286	269,603	277,016
France	191,274	213,140	205,218	223,604	190,577	180,197	170,750	168,131	176,422	172,867	154,931	146,890	180,976	163,634	166,959
Croatia	:	:	:	:	7,208	6,658	6,538	9,251	10,338	11,899	13,794	11,507	12,389	10,868	12,392
Italy	156,554	176,147	186,431	197,906	221,246	118,930	144,772	179,139	194,578	176,967	163,202	159,724	112,188	69,114	97,279
Cyprus	:	:	5	:	7	3,850	3,891	3,412	3,731	3,916	4,491	3,068	3,915	3,546	3,444
Latvia	1,917	:	747	273	741	1,033	892	1,199	1,117	2,052	2,079	1,937	2,622	2,583	2,519
Lithuania	11,741	15,870	16,889	15,917	757	19,011	16,910	17,232	17,023	13,893	14,221	11,714	13,625	14,252	11,669
Luxembourg	1,294	1,085	1,049	1,357	1,314	1,647	1,364	1,358	1,668	1,842	1,808	1,604	1,906	1,970	1,774
Hungary	22,660	21,791	19,627	20,549	17,074	21,870	17,443	16,910	18,965	33,652	27,639	31,450	28,404	29,229	27,044
Malta	:	1,040	666	942	1,079	1,162	1,953	1,595	1,950	1,767	:	:	:	:	:
Netherlands	599	720	697	523	447	:	14,930	14,762	25,147	18,732	20,537	22,152	23,229	18,095	18,157
Austria	:	:	:	9,994	14,185	18,854	19,773	20,798	20,151	13,246	19,080	17,812	20,156	18,246	18,786
Poland	:	96,161	86,453	87,112	87,028	65,200	84,507	82,444	80,512	98,368	110,699	100,468	129,913	129,057	122,044
Portugal (²)	:	30,738	30,249	31,571	28,734	17,613	*24,850*	*29,966*	*28,876*	*27,083*	*28,691*	*26,559*	32,776	30,773	31,251
Romania	16,831	24,678	33,090	39,683	:	38,114	41,687	42,899	45,218	44,401	42,443	42,050	47,746	47,976	
Slovenia (³)	:	:	5,143	5,124	5,592	4,932	5,848	6,353	5,836	6,884	7,202	6,712	6,996	13,946	15,746
Slovakia	3,894	3,569	4,884	8,741	5,591	7,130	6,980	6,870	6,240	7,279	6,372	5,276	5,678	5,602	6,505
Finland	:	:	:	:	:	20,498	18,110	21,928	18,947	23,663	21,756	19,704	19,280	22,337	23,597
Sweden	30,901	32,318	32,139	31,956	32,419	54,028	58,393	56,398	69,729	62,669	64,698	53,005	56,688	:	:
Iceland	1,180	1,244	997	1,220	1,167	1,112	1,064	1,219	1,538	1,593	1,570	1,631	:	:	
Liechtenstein	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
Norway (⁴)	:	10,783	10,230	10,481	11,124	17,824	14,305	19,584	17,543	18,681	16,298	15,553	18,453	17,162	21,799

(:) Data not available
(¹) 2023: data is provisional
(²) 2015-2023: data estimated
(³) 2022: break in time series
(⁴) 2014: data estimated
Source: Eurostat (online data code: env_wasbat)

Table 3a: Lead-acid batteries – input fractions to the recycling process, 2009–2023 Source: Eurostat (env_wasbat)

Table 3b: Nickel-cadmium batteries – input fractions to the recycling process, 2009–2023
(tonnes)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Belgium	231	256	296	251	229	201	306	168	160	198	159	359	349	252	262
Bulgaria	0	0	19	9	5	12	:	0	0	0	0	7	9	0	0
Czechia	523	449	544	520	447	71	143	286	143	274	183	166	150	180	166
Denmark	76	110	115	113	40	59	19	45	50	79	90	50	49	50	53
Germany	1,085	1,358	1,173	1,323	1,374	904	1,120	1,334	1,264	1,221	1,353	1,048	1,045	1,329	1,138
Estonia	:	:	:	5	5	:	0	20	4	0	0	0	0	0	0
Ireland	15	18	47	88	40	:	:	62	76	68	67	63	63	51	61
Greece	:	:	:	:	:	:	40	38	85	44	0	0	14	8	4
Spain	:	:	:	:	:	:	327	184	375	376	390	272	365	365	374
France	946	1,016	790	1,239	1,320	:	:	:	:	:	:	:	:	:	:
Croatia	:	:	:	:	12	18	29	20	34	14	33	18	67	56	105
Italy	629	362	521	555	790	90	107	259	:	245	550	474	234	148	218
Cyprus	:	:	2	:	2	1	1	12	1	4	4	4	6	4	4
Latvia	31	:	17	13	14	8	14	13	7	12	12	27	1	3	4
Lithuania	2	0	0	1	0	93	82	91	115	156	172	149	102	0	5
Luxembourg	4	0	0	0	19	16	7	17	17	14	17	16	12	8	8
Hungary	153	0	0	64	180	190	0	174	86	245	120	135	142	33	44
Malta	:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	252	293	258	271	263		524	498	519	445	399	438	464	421	399
Austria (1)(2)	:	:	:	189	176	176	211	267	98	104	127	129	109	88	81
Poland	:	26	77	8,081	530	504	367	358	291	305	270	317	207	163	138
Portugal (2)	:	0	0	0	18	:	5	:	:	:	:	:	:	:	:
Romania	0	0	0	0	:	:	79	52	39	26	37	10	9	8	:
Slovenia (1)(3)(4)	:	:	43	:	0	17	8	10	9	9	9	31	16	:	:
Slovakia	0	0	0	0	169	140	91	93	87	87	84	70	106	107	103
Finland	:	:	:	:	:	:	79	179	117	3	18	53	162	126	256
Sweden	247	425	343	259	304	404	354	497	557	379	424	362	470	:	:
Iceland (5)	11	11	15	6	16	3	4	5	6	1	9	7	:	:	:
Liechtenstein	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Norway (1)	:	141	171	168	168	97	189	191	194	194	194	296	148	243	143

(:) Data not available
(1) 2014: data estimated
(2) 2015: data estimated
(3) 2018-2019: data estimated
(4) 2022: break in time series
(5) 2009-2012: data estimated
Source: Eurostat (online data code: env_wasbat)

Table 3b: Nickel-cadmium batteries – input fractions to the recycling process, 2009–2023 Source: Eurostat (env_wasbat)

Table 3c: Other batteries – input fractions to the recycling process, 2009–2023
(tonnes)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Belgium	1,527	1,655	1,575	1,517	1,880	1,629	1,664	2,134	1,803	2,106	2,019	2,007	2,218	2,870	2,896
Bulgaria (1)	8	11	*80*	47	115	186	246	265	343	364	296	307	342	362	386
Czechia	149	277	763	538	749	148	369	66	163	82	131	127	116	437	588
Denmark	1,106	1,206	526	906	620	1,357	1,501	1,498	3,060	1,822	2,087	2,333	2,486	2,488	2,562
Germany	12,654	13,502	16,420	14,363	16,346	18,925	17,389	14,799	16,222	17,424	22,315	29,620	37,100	33,594	27,172
Estonia	:	:	:	32	32	118	43	31	48	15	20	78	164	235	112
Ireland	190	44	358	299	355	415	:	:	:	:	:	566	942	855	1,055
Greece	:	:	:	:	:	:	10	31	551	577	556	592	501	658	510
Spain	1,644	2,817	3,170	3,430	:	:	4,183	8,254	6,851	8,581	10,070	8,952	8,426	8,609	8,854
France	8,850	12,086	11,193	11,278	10,939	9,132	12,142	15,070	17,850	19,424	25,274	12,852	17,718	16,005	20,148
Croatia	:	:	:	:	0	47	85	34	61	22	12	103	2	69	2
Italy (2)	5	1,834	1,763	3,060	5,608	1,924	1,830	2,178	:	*6,010*	4,823	4,384	2,196	3,392	5,433
Cyprus	:	:	51	:	56	20	46	48	54	70	75	72	114	77	77
Latvia	91	:	61	53	42	103	90	98	102	81	88	87	323	365	377
Lithuania	153	102	57	358	143	594	508	497	375	480	417	388	394	361	464
Luxembourg	0	0	0	0	0	131	110	129	125	126	146	141	163	178	184
Hungary (3)	1	129	422	:	:	510	566	655	880	831	893	718	1,571	6,633	461
Malta	:	19	19	0	0	0	0	0	0	1	0	0	0	0	0
Netherlands	1,410	1,489	1,405	1,334	1,295	:	2,747	2,976	3,202	3,688	3,807	3,901	4,015	4,465	5,267
Austria (4)(5)	:	:	:	733	1,454	*1,317*	*1,412*	876	2,094	1,848	900	2,692	2,314	2,370	1,990
Poland	:	1,217	1,955	3,602	387	2,935	5,378	5,541	12,063	14,172	18,882	19,512	12,149	23,474	28,058
Portugal (6)	:	486	219	393	500	:	*314*	:	:	:	:	:	:	:	:
Romania	0	0	0	16	:	:	:	157	248	212	193	166	246	260	:
Slovenia (2)(4)(6)(7)	:	:	528	638	91	*213*	216	:	121	*160*	*170*	225	244	:	:
Slovakia	:	:	404	538	450	357	229	218	356	229	181	166	198	227	280
Finland	:	:	:	:	:	868	1,383	1,044	1,738	2,225	1,393	1,617	1,782	1,792	1,827
Sweden	1,139	1,906	2,236	2,238	2,614	:	:	4	1	1	0	529	1,752	:	:
Iceland	36	38	34	56	:	45	50	42	66	19	105	133	:	:	:
Liechtenstein	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Norway (4)	:	:	:	:	:	879	843	879	843	910	910	124	67	234	387

(:) Data not available
(1) 2011: data estimated
(2) 2018: data estimated
(3) 2023: data is provisional
(4) 2014: data estimated
(5) 2015: data estimated
(6) 2019: data estimated
(7) 2022: break in time series
Source: Eurostat (online data code: env_wasbat)

Table 3c: Other batteries – input fractions to the recycling process, 2009–2023 Source: Eurostat (env_wasbat)

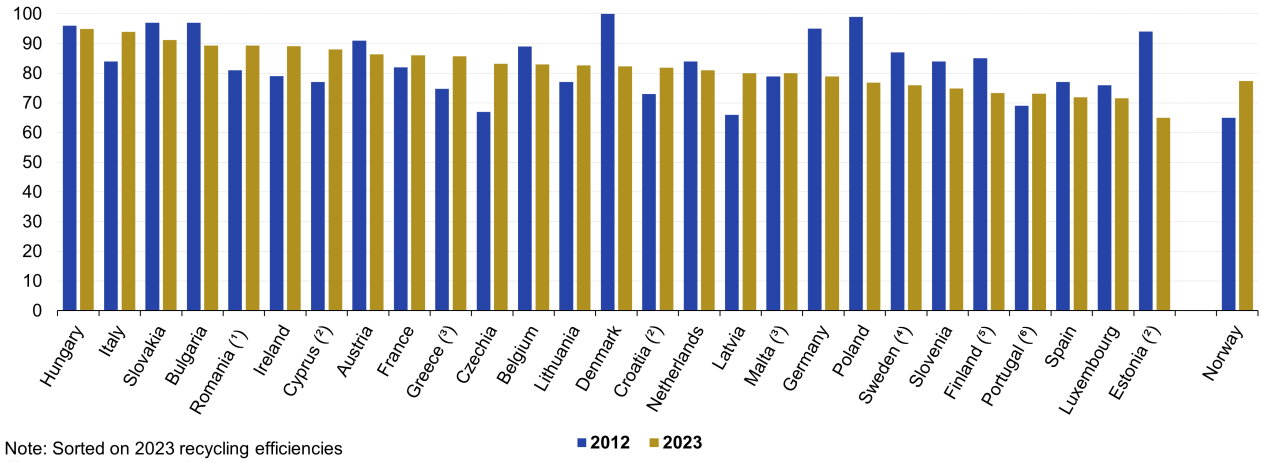
Recycling efficiency for lead-acid batteries

Recycling efficiencies for lead-acid batteries for reference years 2012 and 2023 are presented in Figure 2. In 2023, all EU countries achieved the target of 65% recycling efficiency for lead-acid batteries and accumulators.

In 2023, almost all EU countries reported recycling efficiencies of lead-acid batteries that were well above the target. 3 EU countries (Hungary, Italy, and Slovakia) reported a recycling efficiency of more than 90% and 15 EU countries reported a recycling efficiency in the range between 80% and 90%. In addition, 8 EU countries reported a recycling efficiency in the range between 70% and 80%, and 1 EU country (Estonia) in the range between 65% and 70%.

However, when comparing the recycling efficiencies for 2023 with those of 2012, there was no clear trend in the development of the recycling efficiency for lead-acid batteries and accumulators across the countries. For 15 EU countries, the recycling efficiency was lower in 2023 than in 2012. By contrast, the recycling efficiency was higher in 2023 than in 2012 for 12 EU countries.

Recycling efficiencies for lead-acid batteries, 2012 and 2023
(useful recycled materials in % of input fractions)



Note: Sorted on 2023 recycling efficiencies
(1) 2022 data instead of 2023
(2) 2013 data instead of 2012
(3) 2015 data instead of 2012
(4) 2021 data instead of 2023
(5) 2012 data estimated
(6) 2023 data estimated
Source: Eurostat (online data code: env_wasbat)

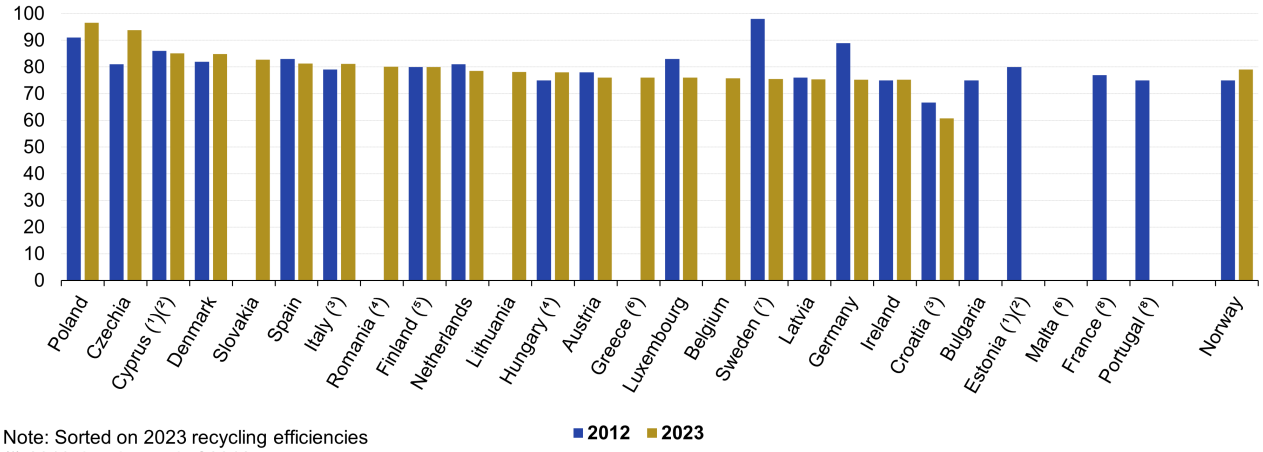
Figure 2: Recycling efficiencies for lead-acid batteries, 2012 and 2023 Source: (env_wasbat)

Recycling efficiency for Ni-Cd batteries

Recycling efficiencies for Ni-Cd batteries are presented in Figure 3. Most of the EU countries achieved the recycling efficiency target of 75% in both 2012 and 2023. Among the 24 EU countries for which 2023 data are available, 20 achieved this target. In comparison, of the 24 EU countries for which data were available for 2012, 19 achieved the target.

Out of the 22 EU countries for which both 2023 and 2012 data are available, 10 had higher recycling efficiencies for Ni-Cd batteries in 2023 than in 2012. However, 4 of these countries (Belgium, Lithuania, Romania, and Slovakia) had reported a recycling efficiency of 0% in 2012. The remaining 12 EU countries reported lower recycling efficiencies in 2023 than in 2012, however, 3 countries (Bulgaria, Malta, and Estonia) reported a recycling efficiency of 0% in 2023.

Recycling efficiencies for nickel-cadmium batteries, 2012 and 2023
(useful recycled materials in % of input fractions)



Note: Sorted on 2023 recycling efficiencies
(1) 2013 data instead of 2012
(2) 2013: data estimated
(3) 2014 data instead of 2012
(4) 2022 data instead of 2023
(5) 2012: data estimated
(6) 2012: data not available
(7) 2021 data instead of 2023
(8) 2023: data not available
Source: Eurostat (online data code: env_wasbat)

Figure 3: Recycling efficiencies for nickel-cadmium batteries, 2012 and 2023 Source: Eurostat (env_wasbat)

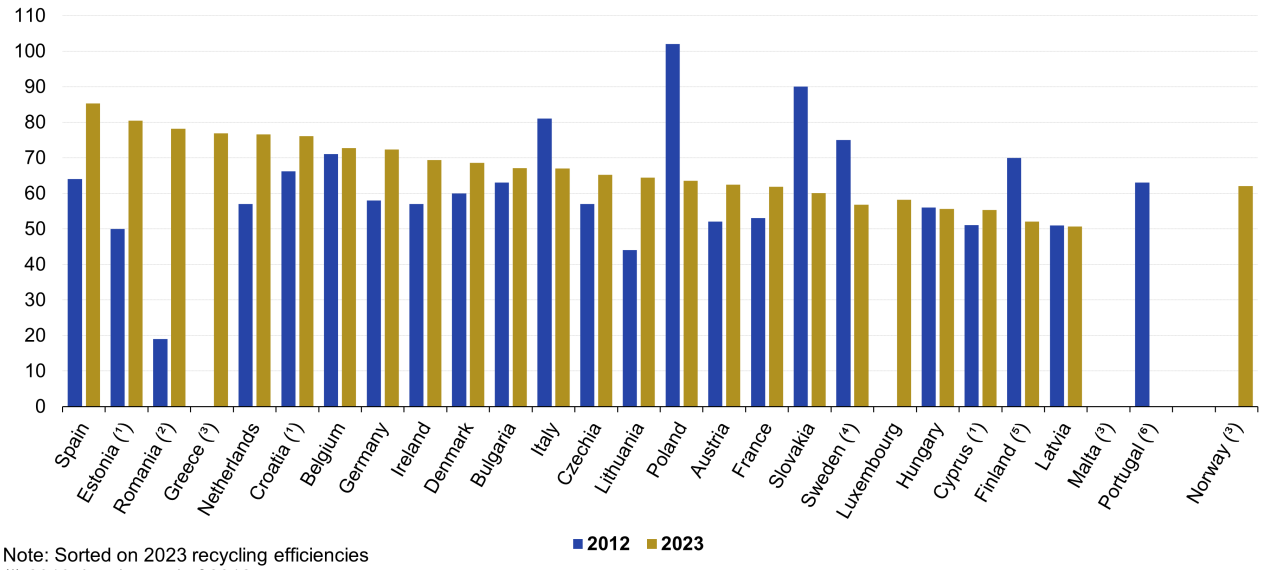
Recycling efficiency for other batteries

For other batteries, the recycling efficiency target of 50% was reached by all EU countries, which reported data in 2023, except for Malta (see Figure 4). No data was available for Portugal. The recycling efficiencies for other batteries spanned from 50.7% (Latvia) to 85.3% (Spain) across the countries for which 2023 data are available. This range (34.6 percentage points) is wider than that for lead-acid batteries (29.9 percentage points) and similar to the range in recycling efficiencies for Ni-Cd batteries (35.8 percentage points). In 2012, 21 of 24 EU countries reported recycling efficiencies above the 50% target.

Data for both 2023 and 2012 are available for 23 EU countries. Among these, the recycling efficiencies for ’other batteries’ were higher in 2023 than in 2012 for 16 EU countries, while for 7 EU countries it was lower in 2023.

One factor behind the differences in recycling efficiencies for ’other batteries’, over time and across EU countries, may be that different types of batteries are more or less frequent among the ’other batteries’ in different EU countries or that this composition changes over time within the individual countries.

Recycling efficiencies for other batteries, 2012 and 2023
(useful recycled materials in % of input fractions)



Note: Sorted on 2023 recycling efficiencies
(1) 2013 data instead of 2012
(2) 2022 data instead of 2023
(3) 2012: data not available
(4) 2021 data instead of 2023
(5) 2012: data estimated
(6) 2023: data not available

Figure 4: Recycling efficiencies for other batteries, 2012 and 2023 Source: Eurostat (env_wasbat)

Source data for tables and graphs

- Recycling of batteries and accumulators (up to reference year 2023)

Data sources

The reported data are available in Eurostat's reference database. Reporting generally started in 2012 and include reference years back to 2009.

The analysis generally focuses on the most recent data on sales, collection and recycling of batteries and accumulators (lead-acid, nickel-cadmium and others).

Definitions

The key definitions used in this article have been laid down by Directive 2006/66/EC on portable batteries and accumulators (the 'Batteries Directive'):

(1) **Battery or accumulator** means any source of electrical energy generated by direct conversion of chemical energy and consisting of 1 or more primary battery cells (non-rechargeable) or consisting of 1 or more secondary battery cells (rechargeable);

(2) **Portable battery or accumulator** means any battery, button cell, battery pack or accumulator that:

- is sealed; and
- can be hand-carried; and
- is neither an industrial battery or accumulator nor an automotive battery or accumulator;

(3) **Automotive battery or accumulator** means any battery or accumulator used for automotive starter, lighting or ignition power;

(4) **Industrial battery or accumulator** means any battery or accumulator designed for exclusively industrial or professional uses or used in any type of electric vehicle;

(5) **Waste battery or accumulator** means any battery or accumulator which is waste within the meaning of Article 1(1)(a) of Directive 2006/12/EC;

(6) **Annual sales of portable batteries and accumulators** to end-users should be expressed as the weight of the portable batteries and accumulators placed on the market in the territory of the country in the year concerned, excluding any portable batteries and accumulators that have left the territory of that country in that year before being sold to end-users;

(7) **Placing on the market** means supplying or making available, whether in return for payment or free of charge, to a third party within the Community and includes import into the customs territory of the Community;

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

(9) **Recycling efficiency** of a recycling process means the ratio obtained by dividing the mass of output fractions accounting for recycling by the mass of the waste batteries and accumulators input fraction expressed as a percentage.

Context

The information and data presented in this article stem from the reporting obligations laid down in Directive 2006/66/EC on portable batteries and accumulators (the 'Batteries Directive' for short) and in Commission Regulation (EU) No 493/2012 laying down rules for calculation of recycling efficiencies for waste batteries and accumulators . The Batteries Directive sets collection targets for portable batteries and accumulators and recycling targets for all batteries and accumulators, differentiated by type.

Reliable and comparable data on the quantities of batteries and accumulators are necessary for monitoring whether the objectives of the Batteries Directive have been achieved. The Directive distinguishes between:

- portable batteries and accumulators; and
- industrial and automotive batteries and accumulators.

EU countries report data on the sale and collection of*portable* batteries and accumulators and on the recycling of*all* batteries and accumulators. With regard to recycling, the Batteries Directive differentiates between the following three battery types:

- lead-acid batteries and accumulators,
- nickel-cadmium batteries and accumulators, and
- other batteries and accumulators.

Recycling efficiency

The Batteries Directive defines targets for the recycling efficiencies of batteries and accumulators. Recycling efficiencies address the recycling process only; they do not consider the efficiency of the collection, which is covered by the collection target for portable batteries and accumulators.

According to the Batteries Directive, recycling processes should achieve the recycling efficiencies:

- recycling of 65% by average weight of lead-acid batteries and accumulators;
- recycling of 75% by average weight of nickel-cadmium batteries and accumulators;
- recycling of 50% by average weight of other batteries and accumulators.

Commission Regulation (EU) No 493/2012 specifies in Article 2 (3): *'recycling efficiency' of a recycling process means the ratio obtained by dividing the mass of output fractions accounting for recycling by the mass of the waste batteries and accumulators input fraction expressed as a percentage.*

Starting with the reference year 2014, recycling efficiencies have to be calculated according to Commission Regulation (EU) No 493/2012. Details are given in Annexes I, IV, V and VI and in the Guidelines on the application of this Commission Regulation.

Explore further

Other articles

- Municipal waste statistics
- Packaging waste statistics
- Waste shipment statistics
- Waste statistics
- Recycling – secondary material price indicator
- Waste shipment statistics
- Waste statistics - electrical and electronic equipment

Database

- Database - Eurostat , see:
  - Waste streams (env_wasst)
    - Sales and collection of portable batteries and accumulators (env_waspb)
    - Recycling of batteries and accumulators (env_wasbat)

Thematic section

- Eurostat's website on waste statistics

Publications

- Publications on waste issued by Eurostat.

Methodology

- Sales, collection and recycling of portable batteries and accumulators (ESMS metadata file - env_waspb_esms)

External links

- European Commission – DG Environment: Waste and Recycling: Batteries

Legislation

- Waste statistics — Legislation
- Data for monitoring of compliance with targets
- Directive 2006/66/EC on portable batteries and accumulators
- Commission Regulation (EU) No 493/2012 laying down detailed rules regarding the calculation of recycling efficiencies of the recycling processes of waste batteries and accumulators
- Summaries of EU legislation: Disposal of spent batteries and accumulators