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Technical support to the adoption of delegated acts and Commission reports related to the new Batteries Regulation between 2024 and 2027

Deposit Return Systems for Batteries

Stakeholder Workshop 1, 28. April 2026,
13.30-17.30

Disclaimer

The drafts and suggestions presented here have not been adopted or endorsed by the European Commission; any recommendations shared in connection with this stakeholder consultation are the preliminary views of Oeko-Institut and Ramboll and may not in any circumstance be regarded as an official position of the European Commission.

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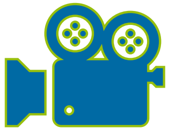
Meeting Code of Conduct



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- Event sessions will be **video/audio recorded** for project use only. It is assumed that by participating in this event, **YOU AGREE with the recordings.**
- **Mute yourself** and **turn-off the camera** when not speaking.
- To participate in the discussions, either **raise your hand** or type your comments into the **chat** window.
- Please be sure that your **affiliation followed by name** are clearly noted in WebEx. You may adjust your own screen-name in the **WebEx participant list window**.
- Please **state your name** and **affiliation** before speaking.
- Participants are expected to exchange thoughts and ideas in a respectful manner.
- The participation of AI-meeting assistants or similar is **not allowed**.

Objectives of this workshop

The objectives of this stakeholder workshop are:

- To present where we stand with our work
- To present the initial prioritisation of specific battery categories / chemistries in which DRS could be expected to deliver benefits in addition to existing collection systems
- To present initial design considerations for DRS per prioritised battery category / chemistry
- Last but most importantly: To receive input on opportunities, challenges and preferences and guide the further development of proposals.
- Therefore, there will be a Q&A/discussion session after each major content section.
- Please provide any written input by 26 May 2026 to **batteryDRS@oeko.de**

Agenda

Welcome and Introduction: Batteries Regulation

Article 63 of the Batteries Regulation (EC) 2023/1542

By 31 December 2027, the Commission shall assess the feasibility and potential benefits of establishment of deposit return systems for batteries, in particular for portable batteries of general use. To that end, the Commission shall submit a report to the European Parliament and to the Council and consider taking appropriate measures, including the adoption of legislative proposals.

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Welcome and Introduction: Context for this work

Pursuant to Article 63, Oeko-Institut and Ramboll have been contracted by DG Environment under service request “Technical support to the adoption of delegated acts and Commission reports related to the new Batteries Regulation between 2024 and 2027”

Tasks consists of external technical support to the Commission for the assessment of the feasibility and benefits of establishment of a deposit return system (DRS) for batteries, consisting of in-depth analysis per battery category, and covering analysis of national DRS as well as of a European DRS:

- Task 1: comprehensive survey on positions in Member States on DRS
- Task 2: Report on feasibility and advantages and disadvantages of DRS for batteries

Agenda

Member State Survey – Background and approach

- **Objective**: Understand the Member States positions and views towards the implementation of a national or EU-wide DRS for batteries (different categories and chemistries)
- **Approach**: Online survey among EU Member State (MS) representatives
- **Timeline**: 08 July to 5 October 2025.
- **Participants**: 15 MS + Norway

- **58 Questions about:**
  1. The status quo within the MS: Past, present or planned DRS systems for batteries (implemented, piloted or researched)
  2. Anticipated benefits and feasibility of battery DRS
  3. Anticipated obstacles of battery DRS
  4. Non-battery DRS within the MS
- **Follow-up interviews ongoing**

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Extract of questionnaire

Status quo - Existing DRS for batteries

No.	Question
5	Is there currently any private or publicly organized deposit return system (DRS) in place for any type of batteries in your country?
6	How is the scope of the DRS implemented in your MS defined?
7	Please specify
8	For which battery categories is a DRS implemented?
9	Please specify
10	For which battery sub-categories is a DRS implemented?
11	Please specify
12	In the DRS implemented in your Member State, where can consumers or businesses return their waste batteries?
13	Please specify
14	What were the main reasons and objectives for implementing a DRS for batteries? (most important reason = highest ranking)
15	Were there other reasons and objectives for implementing a DRS for batteries? Please provide further details
16	Has a DRS for other batteries than the ones ticked above already been piloted or researched in your country?
17	For which battery categories or chemistries?
18	Please specify
19	Please specify
20	What were the main reasons and objectives for implementing a DRS for batteries? (most important reason = highest ranking)
21	Were there other reasons and objectives for implementing a DRS for batteries? Please provide further details
22	What were the main reasons for NOT implementing a DRS for batteries?
23	Please upload any studies or research available to you on the topic of DRS for batteries

Status Quo: Past, present, or planned DRS pilots

No.	Question
24	Has a DRS for batteries already been planned, piloted or researched in your country?
25	For which battery categories or chemistries?
26	Please specify
27	Please specify
28	What were the main reasons and objectives for planning, piloting or researching the implementation of a DRS for batteries? (highest benefit = highest ranking)
29	Were there other reasons and objectives for implementing a DRS for batteries? Please provide further details
30	What were the main reasons for NOT implementing a DRS for batteries?

Anticipated benefits and feasibility of battery DRS

No.	Question
31	What would you consider to be the biggest benefits of a DRS for batteries? (highest benefit = highest ranking)
32	What other reasons and objectives for implementing a DRS for batteries do you consider relevant? Please provide further details
33	Do any of the anticipated benefits specifically apply to a certain battery category or chemistry?
34	Please specify battery category/ chemistry and reasoning
35	Do you find that portable batteries of general use in particular are more suitable for a DRS and that such a DRS would bring more benefits than DRS for EV batteries, SLI, or industrial batteries?
36	Please specify your reasoning
37	How effective do you find an EU single market approach for setting up a battery DRS?
38	If you see any advantages or disadvantages, please share them
39	If a national or EU wide DRS for batteries existed, who do you think would benefit most?
40	Please specify

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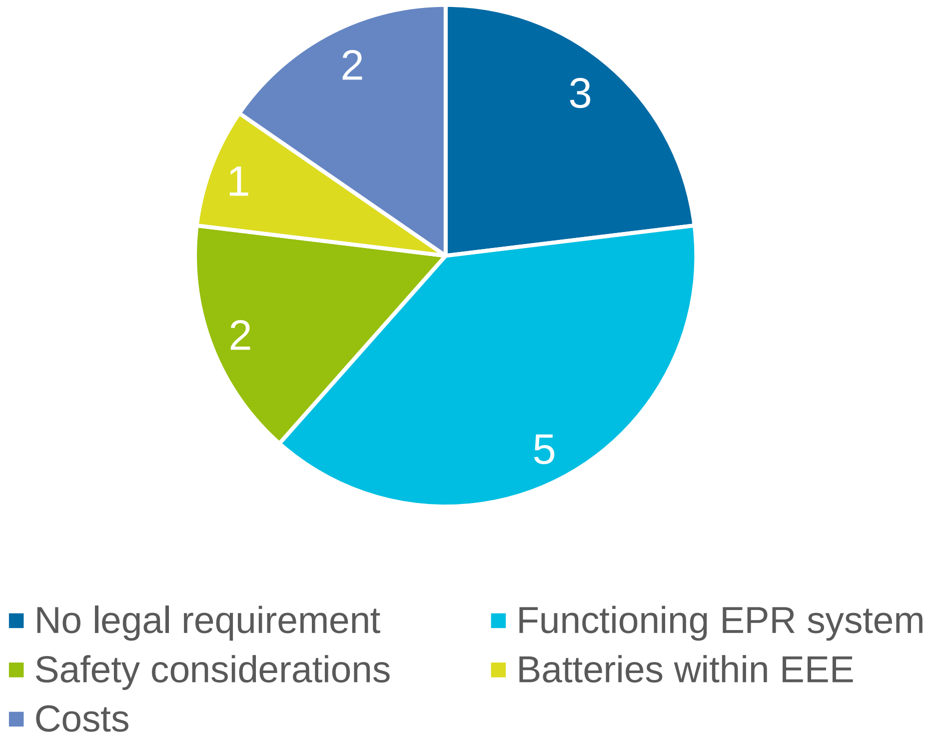
Member State Survey – Results (1/4)

1. The status quo within the MS: Past, present or planned DRS systems for batteries

- DRS systems for batteries currently exist in Germany and Poland for SLI batteries (lead-acid) exclusively
- The major reason for implementing these were to control hazardous substances and meet collection targets, least important was to remove the batteries from the residual and WEEE waste streams.
- Research and pilot studies on various battery types have been conducted in Austria (portable batteries), Germany (Li-ion batteries (LIB)), Norway and Italy (both portable batteries of general use)
- Some Member States cite absence of legal requirements and well functioning Extended Producer Responsibility (EPR) systems as key reasons for not implementing DRS for batteries.

What were the main reasons for NOT implementing a DRS for batteries?



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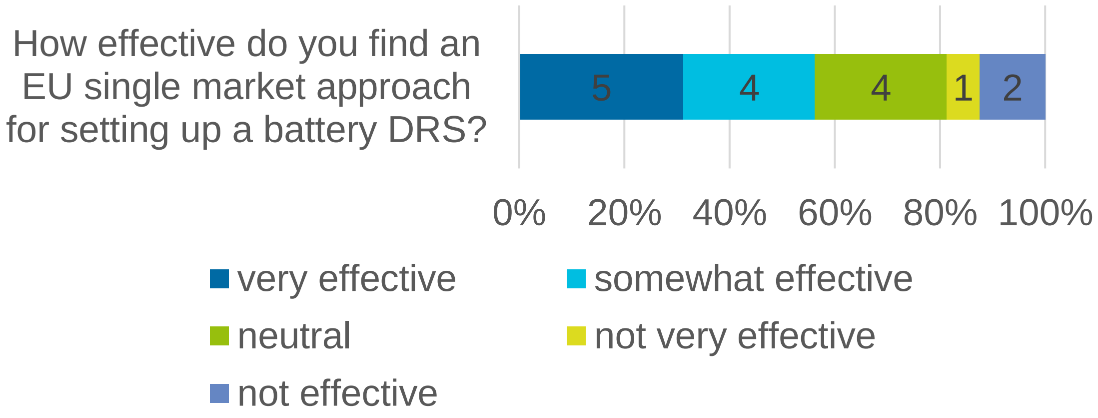
Member State Survey – Results (2/4)

2. Anticipated benefits and feasibility of battery DRS

- The biggest benefit of a DRS for batteries is seen in an increased collection rate to reduce fire risks (4 Member States considered this most important), particularly relevant to LiB, followed by improved control of hazardous Substances (4 Member States considered this quite important), particularly relevant to lead acid batteries. Other benefits mentioned were improved customer awareness.
- 9 of the 16 responding countries are of the opinion that a DRS for portable batteries of general use particularly would be suitable (because of their low value, high volumes, and low consumer awareness about sound disposal leading to challenges to reach collection targets)
- If there was a DRS to be established, 13 of the 16 responding countries favour an EU wide approach compared to national approaches, despite challenges like deposit tourism, complex implementation, and administrative and political obstacles.

How effective do you find an EU single market approach for setting up a battery DRS?



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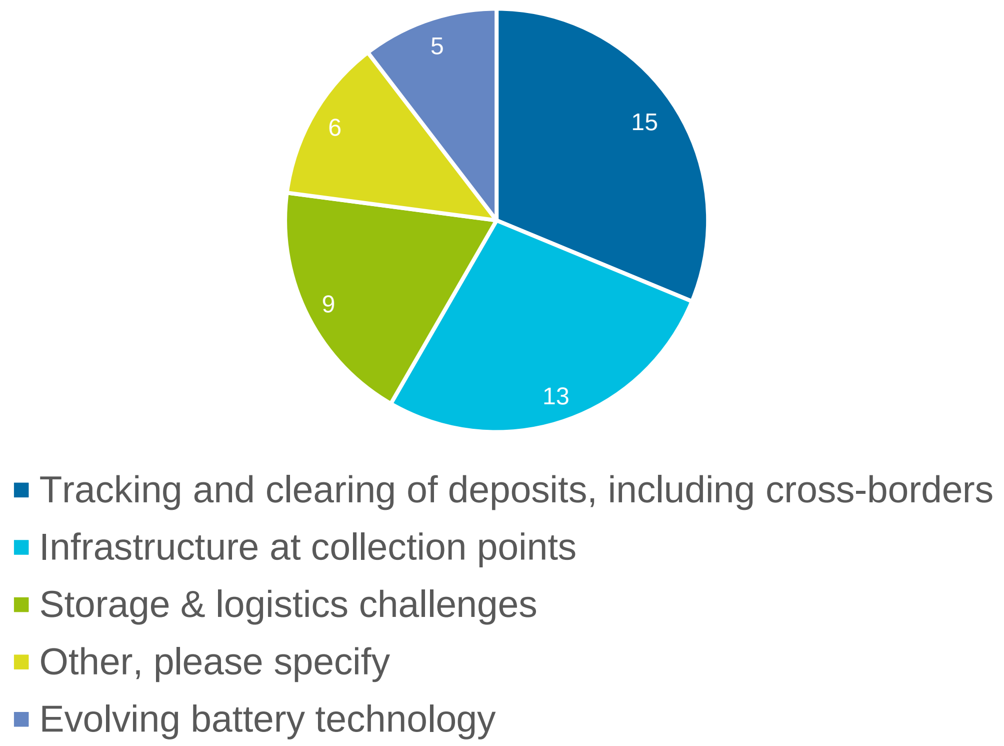
Member State Survey – Results (3/4)

3. Anticipated obstacles of battery DRS

- Raised **technical** obstacles include infrastructure challenges at collection points, tracking and clearing deposits, safety concerns like fire risks, ADR*-compliant collection and transport, logistical issues with reverse vending machines, retail resistance, and marking small batteries.
- Mentioned **economic** barriers consist of administrative costs for integrating DRS into Member States' systems and complexities in cross-border deposit clearing and coordination among actors.
- **Other** obstacles involve cross-border issues potentially affecting collection objectives, retailer resistance, and end-user safety risks from battery removal, especially concerning lithium-ion batteries.

*Agreement concerning the International Carriage of Dangerous Goods by Road

What technical obstacles do you foresee in the implementation of DRS for batteries in your country?



Member State Survey – Results (4/4)

4. Non-battery DRS within the MS and transfer of its learnings

- While beverage container DRS systems are well-established in Europe, opinions differ on applying these insights to battery DRS due to complexity and hazards.
- Effective beverage container DRS principles, like clear responsibility, accessible return points, and consumer education, can apply to battery DRS, but additional safety measures are needed due to batteries' hazardous nature.
- Stakeholder communication and public familiarity are considered crucial for successful DRS implementation.
- Survey participants advocate for comprehensive assessments of DRS to address system scope, administration, safety, and battery types covered.

Discussion and Q&A

Your input and/or questions are most appreciated!

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Agenda

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Overview of different DRS models

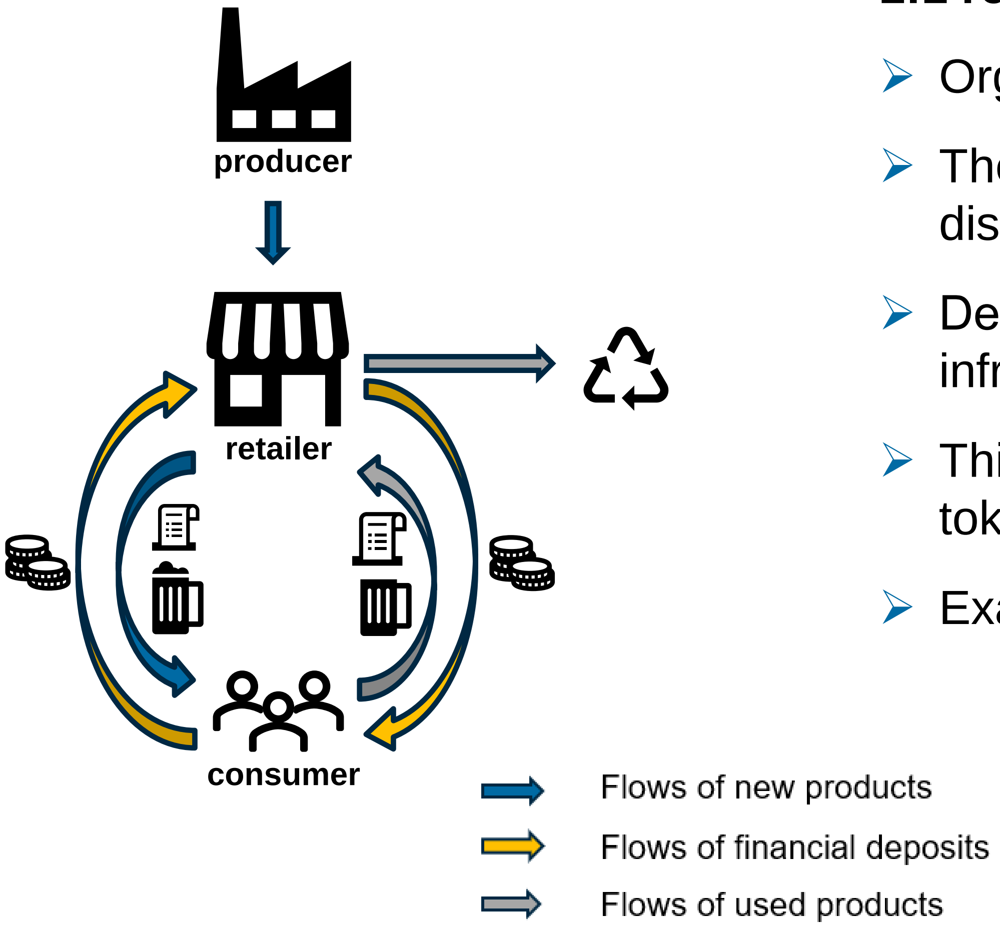
DRS Models

- Retailer-based DRS
- Producer-based DRS
- Industry-based DRS

Variations to full-fledged DRS systems

- Collection incentives
- Producer fees for collection
- Deposit return for equivalent products

Retailer-based DRS



1:1 relationship between retailer and consumer:

- Organised individually by an economic operator (mostly retailers)
- The deposit is only collected at the last step of the product distribution chain
- Deposit can only be cashed at the operator's own return infrastructure
- This usually requires a proof of purchase (e.g. receipt, deposit-token)
- Example: Beverage cups at festivals

Main strengths & limitations

✓ Low complexity & low administrative burden

\- Geographically constrained

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DRS for SLI batteries in Germany

Variation of retailer-based DRS

- Mandatory deposit of 7,50 € (inc. VAT) per sold SLI battery.
- Anyone distributing automotive batteries to final user obliged to collect deposit and pay it back upon return.
- If user returns battery to a different collection point, they receive a certificate which can be used to collect the deposit from the original retailer within two weeks (also allowing for return of batteries purchased online).
- In cases where buyer returns an old SLI battery when purchasing new, no deposit is collected (as in most cases).
- Deposit value is in a similar range as a batteries' scrap value → the DRS discourages that batteries are sold to informal channel

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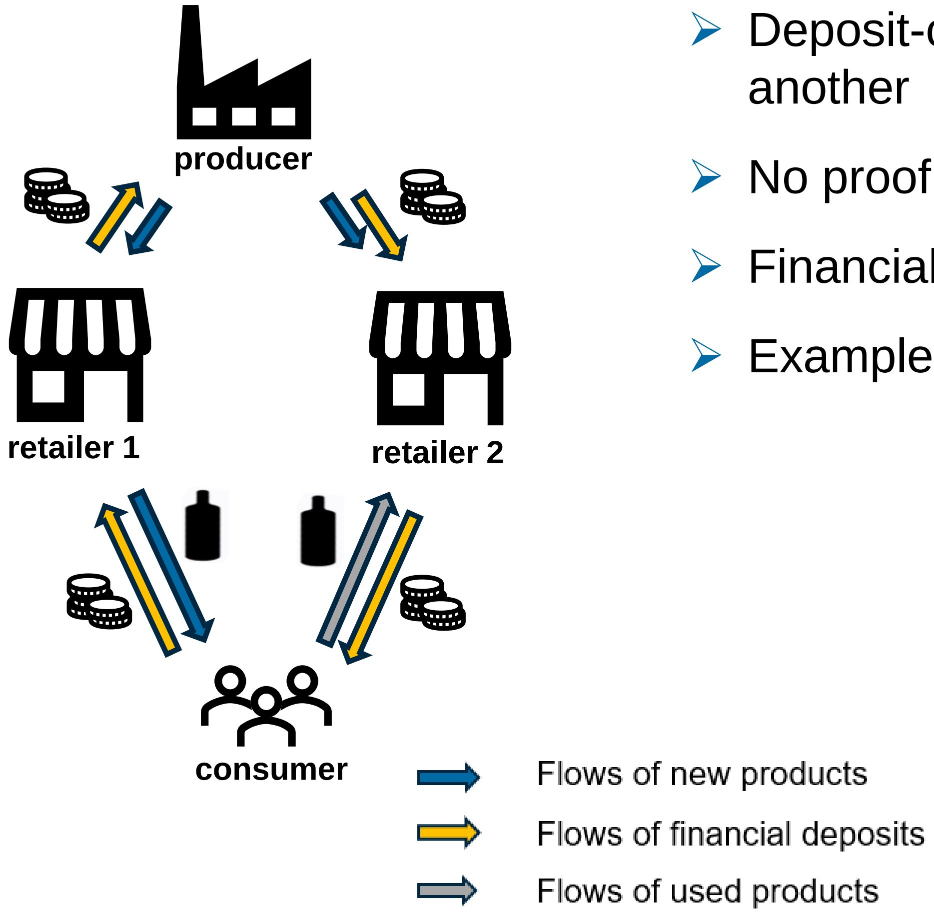
Producer-based DRS



Organised by individual producers involving the distribution chain:

- Deposit-covered product can be purchased in one shop and returned to another
- No proof or purchase needed – proof of brand usually sufficient
- Financial flows are balanced out by the producer
- Examples: cylinders for camping gas

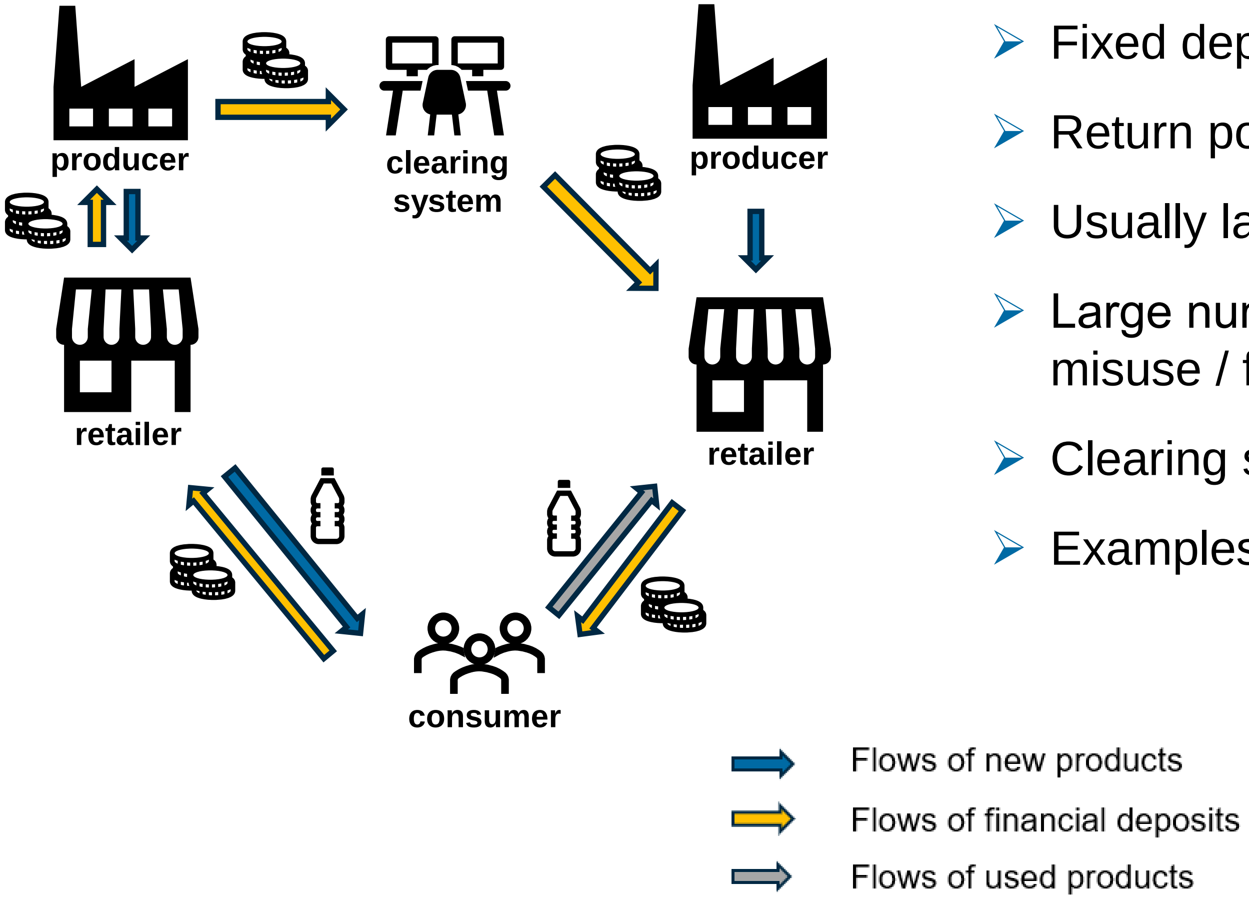
Main strengths & limitations

✓ Various return options for consumers (but limited to proprietary distribution channels)

– In segments with many brands / producers → inconveniently high number of different DRS

– Rising complexity for retailers (depending on the number of brands)

Industry-based DRS



Participation of all producers of a defined product segment

- Fixed deposit value
- Return possible to any retailer
- Usually labelling / marking of products covered by DRS
- Large number of involved players → measures to avoid misuse / fraud necessary
- Clearing system required
- Examples: beverage packaging

Main strengths & limitations

✓ Very convenient for consumers

– High system complexity

Industry-based DRS example: Beverage bottles

15 EU countries have implemented DRS for beverage packaging (Reloop, 2024)

Typically achieve collection rates ranging from 80% to 95% (compared to non-DRS rates often below 60%), attributed to:

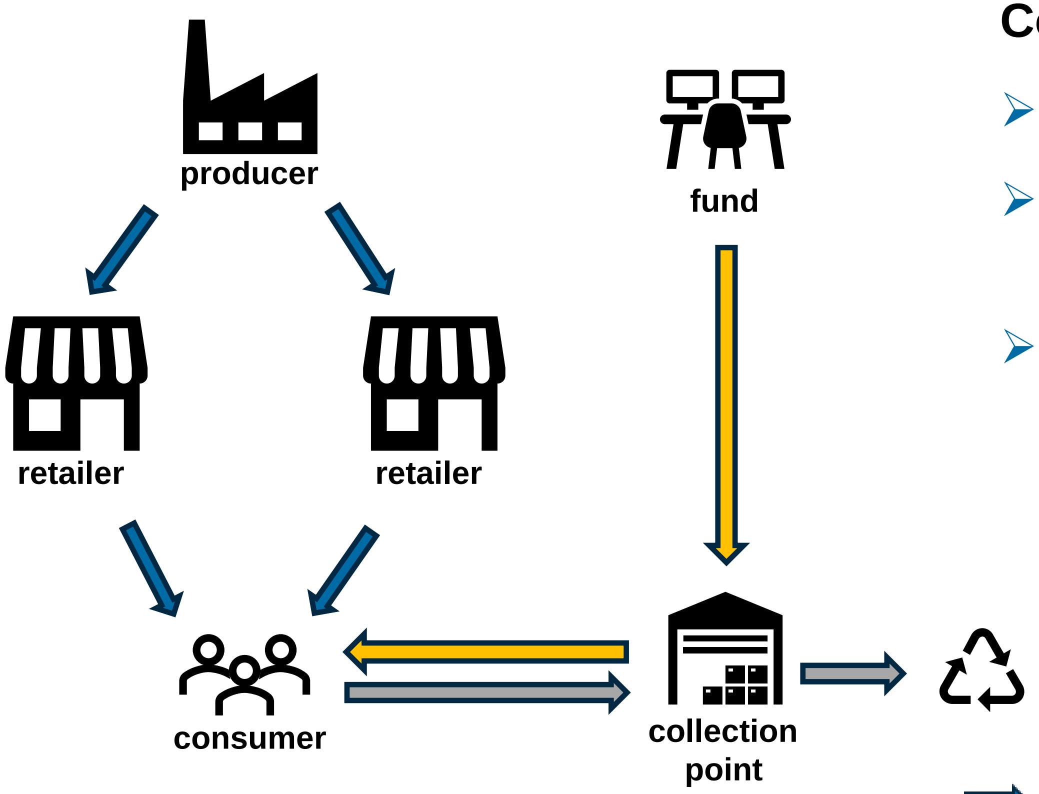
- Financial incentive of deposit
- Convenience of return
- Public awareness

Usually involve automated solutions (i.e. Reverse Vending Machines) which scan products and issue receipt or voucher which can be redeemed for cash or used as discount at point of sale.

Some variations to full-fledged DRS systems

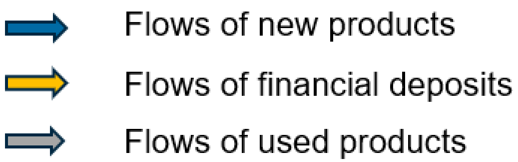
1) Collection incentives
2) Producer fees for collection
3) Deposit return for equivalent products

Collection incentives



Consumers receive (financial) reward on return of product:

- From other financial sources - no previous deposit payment
- Often used in pilots to test the effects of incentives and return modalities on consumer behaviour
- Examples: larger Li-ion batteries (Feldbach, Austria), WEEE (Hungary – national and Romania – retail based)



Financial incentive example: Feldbach, Austria

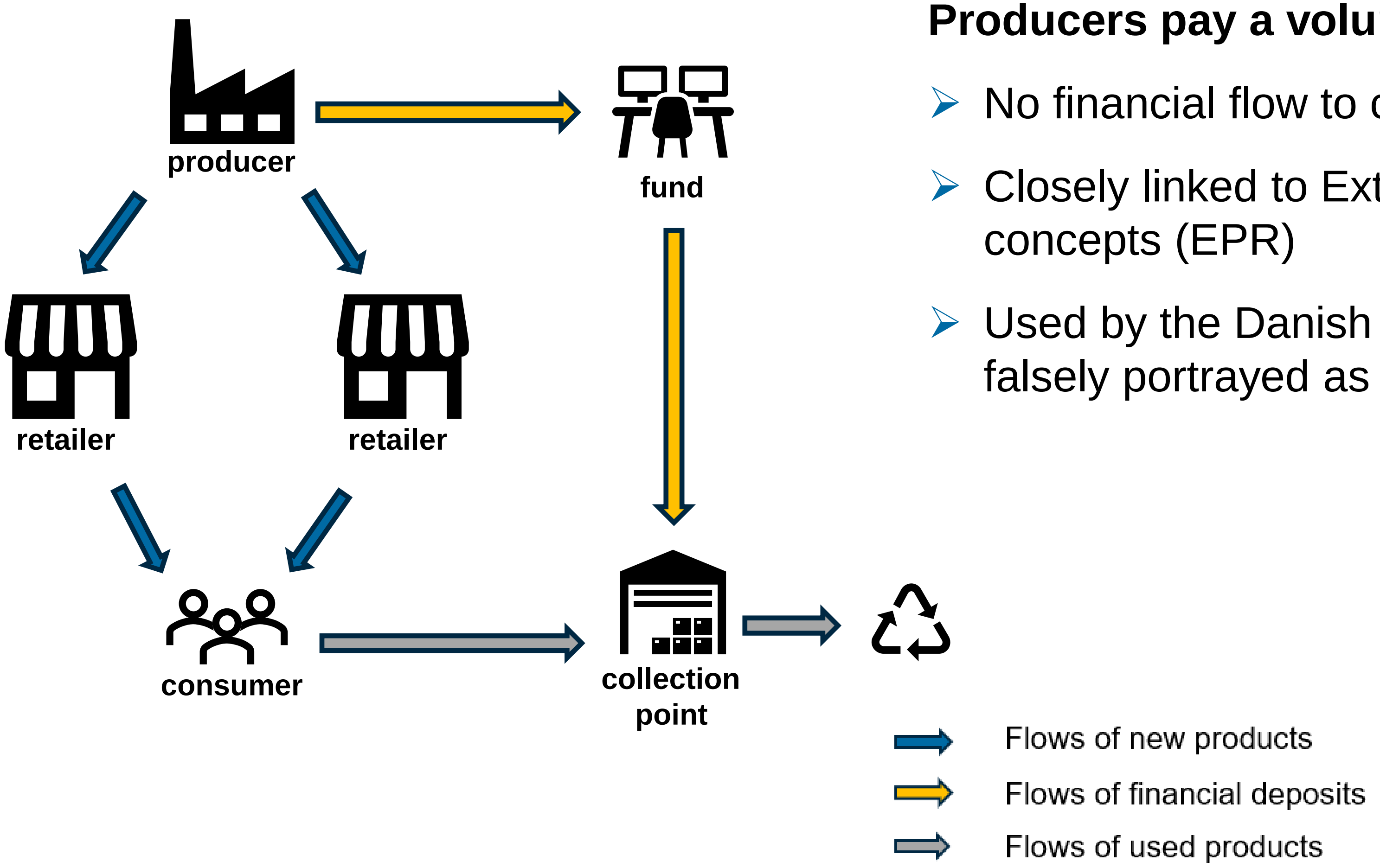
Pilot conducted between Apr-Nov 2023 on the collection of "fist-sized" Li-ion batteries or end-of-life device batteries (including batteries from laptops, vacuum cleaners, garden machinery, power tools and e-bikes)

Collection points: retailers and municipal waste collection station

Return incentive: 10 € voucher per returned battery via app

Results: 4x higher collection than previous year and neighboring municipalities (no data available on diversion from improper waste streams).

Producer fees for collection



Producers pay a volume related fee to finance collection:

- No financial flow to consumers
- Closely linked to Extended Producer Responsibility concepts (EPR)
- Used by the Danish system for NiCd batteries (sometimes falsely portrayed as DRS)

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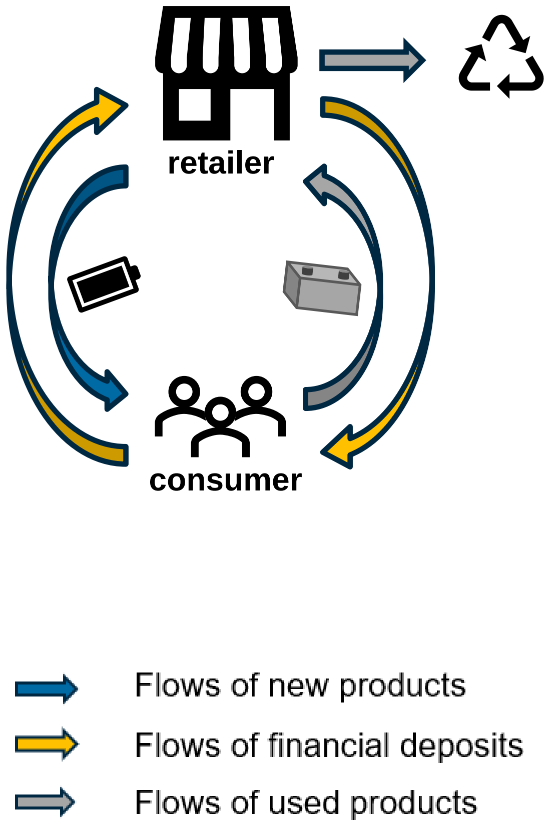
Deposit return for equivalent products



Possible variation to many DRS designs:

- Consumers pay a deposit when purchasing a product / device
- The deposit is refunded when returning a product / device that is considered equivalent to the purchased one
- Approach used in German DRS for SLI batteries for discount on new SLI batteries
- Also used in store-based portable battery DRS pilot in Milan, Italy (ECOSWEEE project)

Main strengths & limitations

✓ Can shorten the period until a deposit is returned (relevant for durable products)

– It can be challenging to define & implement equivalence criteria

Overview of existing and pilot return incentive systems for battery and WEEE collection

STATUS	TYPE	COUNTRY	PORTABLE	SLI	Li-ion	WEEE
Implemented	DRS (retailer-based)	Germany (national)		X		
Implemented	DRS (retailer-based)	Poland (national)		X		
Implemented	Collection incentives (industry-based)	Hungary (national)				X
Pilot	DRS + collection incentives (retailer based)	Italy (Milan)	X			X
Pilot	Collection incentives	Norway (Oslo)	X			
Pilot	Collection incentives	Austria (Feldbach)			X	
Pilot	Collection incentives	Romania (Retailer based)				X

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Discussion and Q&A

Your input and/or questions are most appreciated!

Refreshment break

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Agenda

Overview of prioritization approach

Prioritisation exercise based on *impact potential* (based on current and future projections)*:*

1. Potential to increase battery collection (for example, through reduction of wrong disposal or hoarding behaviour)
2. Potential to prevent accidents i.e. fire risks as well as broader risks to environmental and human health
3. Critical Raw Material (CRM) and Strategic Raw Material (SRM) relevance

Validation of assessment of impact potential

Assessment: expert-based assessment based on categories clustered according to collection obligations.

Workshop goal: validate and/or elaborate on expert assessment, and identify battery categories where improvements upon current collection system are possible/desired, as focus for the development of return incentive proposals.

= Stakeholder Feedback Request

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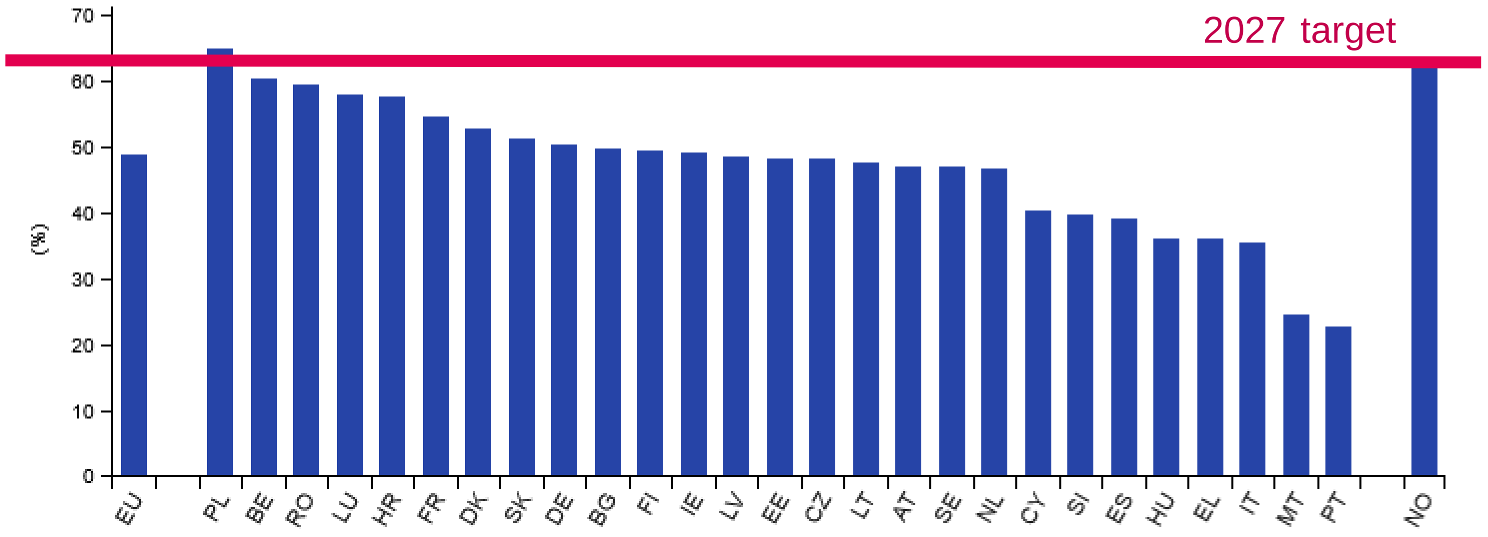
Collection obligations and rates: Portable Batteries

Portable Batteries
Article 59

Target for separate collection:
63% end of 2027
73% end of 2030

No collection data on 'general use' vs. other portable batteries

Portable batteries and accumulators collected for recycling, 2023



Eurostat estimates:EU.

2022 data: Romania

2021 data: Sweden.

Source: Eurostat (online data code: env_waspb)

eurostat

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Collection obligations and rates: LMT Batteries

LMT Batteries
Article 60

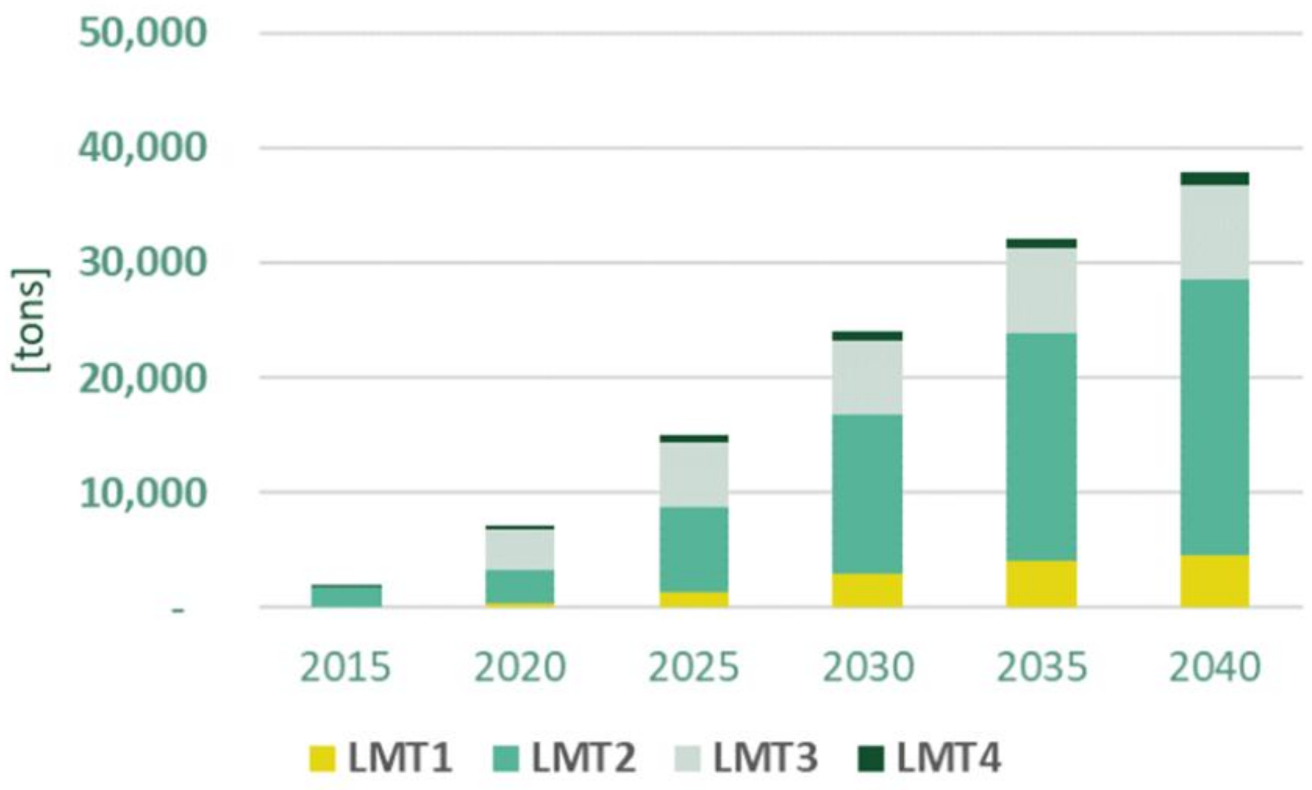
Target for separate collection:
51% end of 2028
61% end of 2031

No data on current LMT collection

Battery Passport from Feb 2027

LMT1 = E-moped & e-motorcycle batteries; LMT2 = E-cycle batteries; LMT3 = e-kickscooters batteries; LMT4 = other LMT batteries.

Tonnage of waste LMT batteries generated per group between 2015 and 2040 (EU)



Source: Bobba et al. (2024) Technical specification for a harmonized methodology to calculate appropriate collection rates for waste portable and Light Means of Transport (LMT) batteries, Publications Office of the European Union

Collection obligations and rates: SLI, EV and Industrial Batteries

SLI, EV and Industrial
Article 61

Producers, or producer responsibility organisations, have to ensure that **all** are collected separately.

Current collection assumed to be high (Stahl et al. 2018)

Battery Passport from Feb 2027

Study report in support of evaluation of Directive 2006/66/EC

- 491 000 tonnes of industrial batteries (including EV) were placed on the EU market in 2015, with estimated loss of 11%.
  - long lifespan of industrial batteries (up to 20 years);
  - export of used batteries or of used products containing batteries.
- 1.1 million tonnes of SLI (Pb-acid) batteries placed on the EU market in 2015 and 1.08 million tonnes entered recycling.
  - Losses occur through the export of used vehicles.
  - No other forms of losses were identified

Source: Stahl et al., (2018) Study report in support of evaluation of the Directive 2006/66/EC on batteries and accumulators – Final evaluation report, Publications Office of the European Union

Potential to increase battery collection

Assessment Criteria	Portable batteries	LMT	SLI/EV/Industrial
Potential to increase battery collection	(✓✓) *Collection rates in most MS below 2027 target. Primary batteries make significant proportion of wrongly disposed batteries (Dornbusch et al., 2020).*	(✓✓) *Current targets (i.e. 51% by 2028) plus high growth suggest potential improvement*	(?) *High collection rates presumed*

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Key: In comparison to existing collection systems:

✓✓ Strong impact expected

✓ Impact expected

— No impact expected

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Potential to prevent accidents – chemistry types

Battery Category	Typical Chemistries
Portable batteries	Chemistries dependent on application (see next slide)
LMT	Primarily **Li-ion** (Bobba et al., 2024)
SLI	Almost completely **Pb-acid**, with a small proportion of Li-ion in special applications (i.e. high performance sport cars) (Stahl et a., 2018).
EV	Almost exclusively **Li-ion** batteries. While in 2020 a few percentage points of NiMH batteries were still PoM, their share is assumed to drop towards zero in the next few years (Stahl et al., 2022)
Industrial	Industrial batteries: almost 90% of market is **Pb-acid** batteries, although this share is expected to decrease, with **Li-ion** growing in importance. A roughly equal share of lead-acid and Li-ion is expected by 2035 (Stahl et al., 2022).

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Potential to prevent accidents – portable battery chemistry

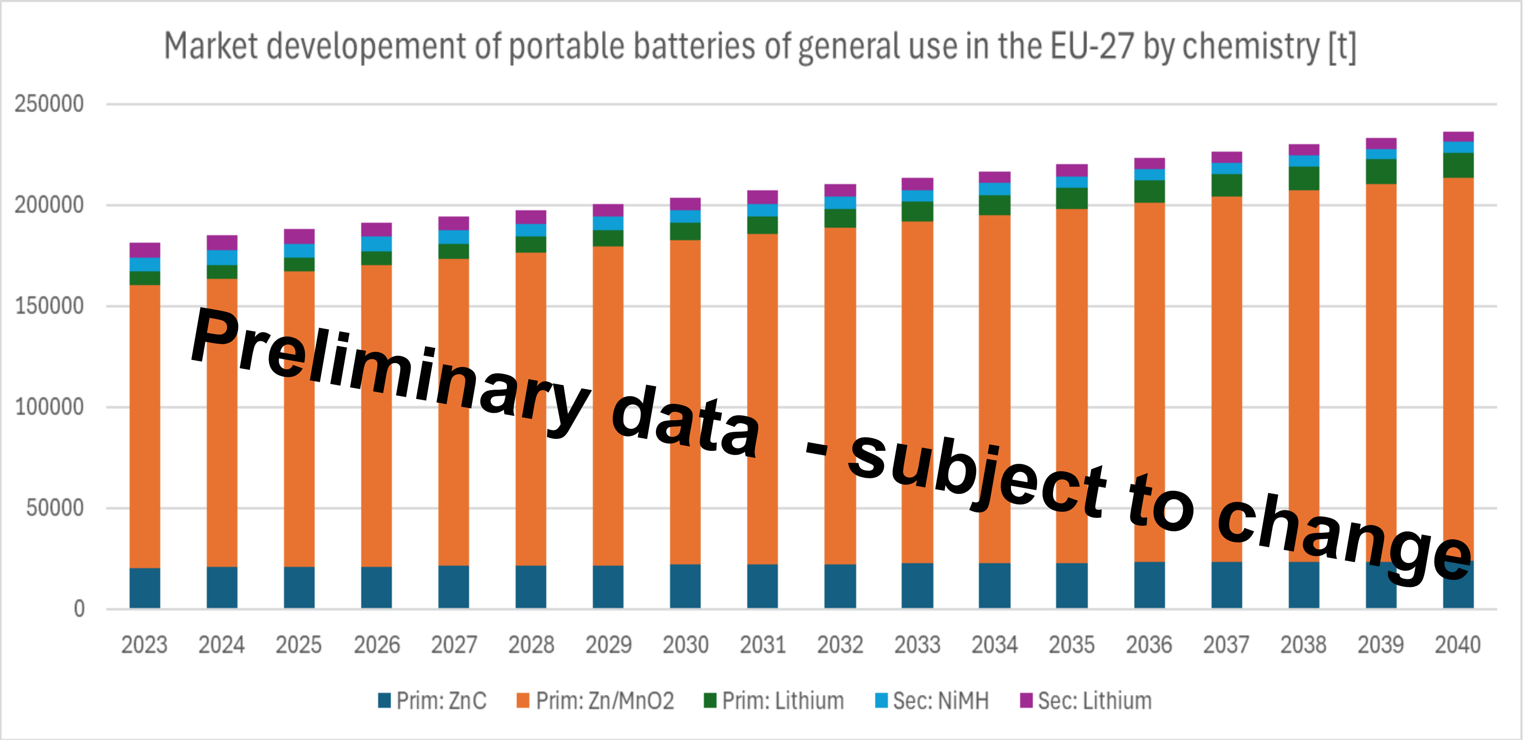
Data on 'general use' vs. other portable batteries not available

Primary (as shown)

- Zn/Mn02
- ZnC
- Lithium

Rechargeable (data upcoming):

- Li-ion
- NiMH



Source: Preliminary data from Task 4 Draft Report, Economic assessment for minimum value for performance/durability for portable batteries of general use

Potential to prevent accidents – chemistry risks

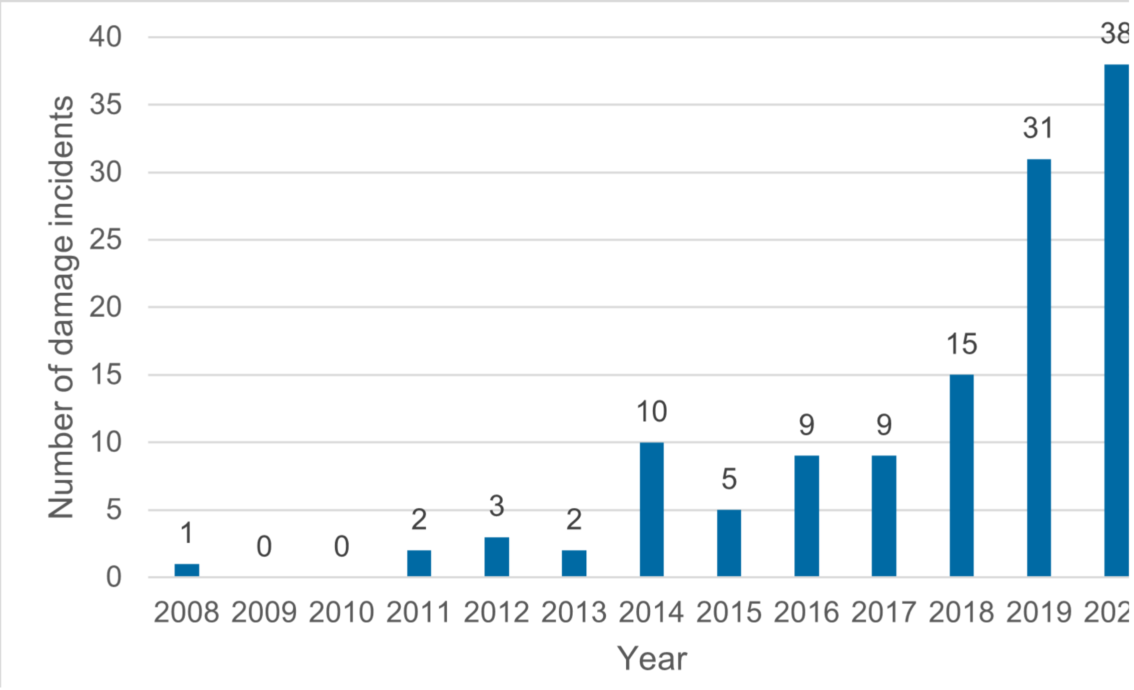
Chemistry	Impact
Lead-acid	CLP classification: toxicity to reproduction (H362, H360FD), toxic to aquatic life (H400, H410), harmful if swallowed or inhaled (H302, H332), causing damage to organs through prolonged or repeated exposure (H372), causing cancer (H351), causes severe skin burns and eye damage (H314) (Stahl et al., 2018). REACH: ‘Persistent Bio-accumulative and Toxic (PBT)’ **Restricted from 18 Aug 2024 for portable batteries (Regulation 2023/1542/EU)**
Alkaline- & zinc-based	CLP classification: harmful if swallowed or if inhaled (H3012, H332), toxic to the aquatic environment (H400, H410), flammable (H250, H260) and causing severe skin burns and eye damage (H314)
Lithium-based	CLP classification: lithium causes severe skin burns and eye damage (H314), in contact with water, releases flammable gases which may ignite spontaneously (H260). Dimethylcarbonat - highly flammable liquid and vapour (H225). LNMC and LNCA - causing cancer (H351) and allergic skin reaction (H317). Lithiumhexafluorophosphat (LiPF6) (H301, H314, H318, H372) **Well-documented fire risks**
NiCD	CLP classification: very toxic to aquatic life (H400, H410), harmful if swallowed, inhaled or in contact with skin (H3012, H332, H312) **Restricted for portable batteries (Regulation 2023/1542/EU)**

Potential to prevent accidents – Li-ion and fire risks

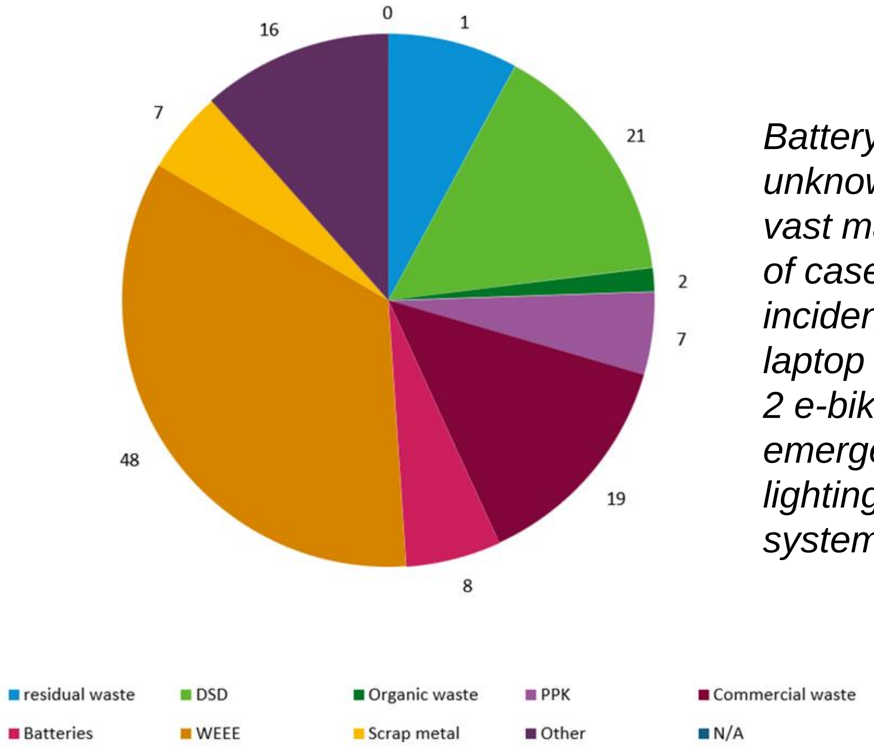
Evidence of increasing fire risks in waste management across EU MS (FEAD, 2025)[1].

Example: Fire instances in German Waste Management Companies (n=139) (Brüning et al. 2023)[2]

Number of damage events per year



Number of damage events per waste stream

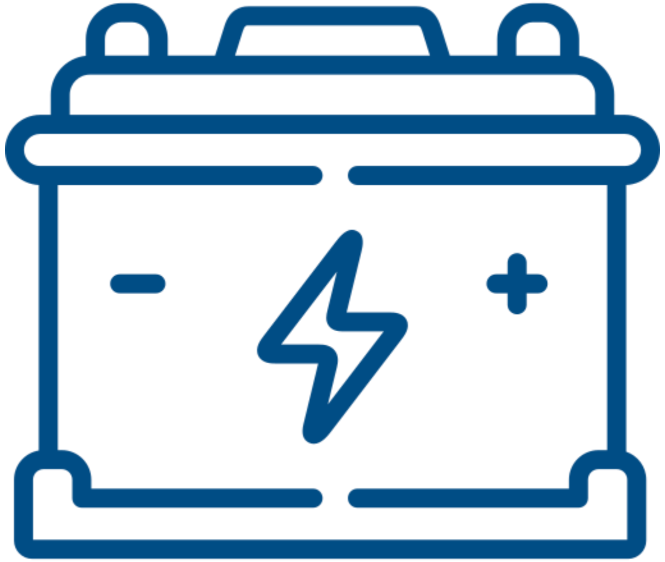


Battery type unknown in vast majority of cases (9 incidents of laptop battery, 2 e-bike, 1 emergency lighting system)

Sources:
[1]FEAD (2025) Joint call for EU action to protect waste management from surging lithium battery fires
´[2]Brüning et al. (2023) Prüfung der Einführung einer Pfandpflicht für lithiumhaltige Batterien und Akkumulatoren, Umweltbundesamt

Relevance to CRMs/SRMs

CRMs/SRMs used in Li-ion batteries



- copper
- natural graphite
- manganese
- silicon metal
- titanium metal
- nickel
- cobalt
- lithium
- niobium
- aluminum/bauxite

Red = SRM, Orange = CRM

Other relevant CRMs/SRMs (EC, 2023):

- Antimony (Lead-acid)
- Coking coal (battery electrodes)
- Light Rare Earths (LREE)

Source. Own illustration based on: European Commission (2023) Study on the critical raw materials for the EU; European Commission (2020) Critical raw materials for strategic technologies and sectors in the EU
Icon: Freepik

Potential to prevent accidents and CRM Relevance

Assessment Criteria	Portable batteries	LMT	SLI/EV/Industrial
Potential to increase battery collection	(✓✓)	(✓✓)	(?)
Potential to prevent accidents	(general use - ✓) *Li-ion batteries only a very small share of general use* (Li-ion - ✓✓) *Increase in damage due to Li-ion especially in WEEE (Brüning et al., 2023)*	(✓✓) *Primarily Li-ion chemistries, with evidence of wrong disposal leading to fire incidents, potentially increasing in future*	(✓) *Limited evidence of wrong disposal leading to fire incidents*
CRM/SRM relevance	(general use - ✓) *Al or ZnC batteries are less relevant from a resource perspective (Stahl et al., 2022)* (Li-ion - ✓✓)	(✓✓) *Li-ion batteries contain many CRM/SRMs and are a strategic technology for EU (European Commission 2023; European Commission 2020)*	(✓) *Li-ion almost 100% of EV market, expected to account for 50% industrial battery market by 2035 (Stahl et al., 2022) Antimony in Pb-acid (declining relevance) (Stahl et al., 2018)*

Overview of impact potentials

Assessment Criteria	Portable batteries	LMT	SLI/EV/Industrial
Potential to increase battery collection	(✓✓)	(✓✓)	(?)
Potential to prevent accidents	(general use - ✓) (Li-ion - ✓✓)	(✓✓)	(✓)
CRM/SRM relevance	(general use - ✓) (Li-ion - ✓✓)	(✓✓)	(✓)

Battery categories to be considered further?

- Portable
  - *General use only*
  - *Li-ion only*
- LMT

Combined Portable+ LMT (Li-ion only?)

Excluded from further consideration?

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Discussion and Q&A

Your input and/or questions are most appreciated!

Agenda

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Overview of considerations for potential DRS options

1. Long life-times of batteries
2. Incentive levels
3. System transition
4. Legacy batteries (not covered by DRS)
5. Heterogeneity of battery sizes, chemistries and end-of-life conditions
6. Some batteries are embedded in electrical and electronic equipment (EEE) and its waste
7. Risks of system misuse and fraud
8. Freeriders from online marketing & sales
9. Efforts & costs to ensure safe collection, storage & handling
10. Administrative efforts

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Challenges linked to DRS for batteries

1) Long life-times of batteries

Description:

- Consumers pay deposits and may get it back only months or years after purchase
- Such delays may cause sub-optimal return rates as some consumers may have forgotten about the deposit, some logistic aspects of the DRS may have changed…

Considerations on challenge mitigation:

- Deposit return when retuning an ‘equivalent’ battery (e.g. similar size & chemistry)
- Similar to a 1:1 exchange

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Challenges linked to DRS for batteries

2) Incentive levels

Description:

- Low deposit levels may lead to unsatisfactory return rates
- High deposit levels would have tangible impacts on consumer expenditure on batteries
- In addition, high deposit level may increase the risks of system misuse & fraud

Considerations on challenge mitigation:

- Incentive levels must be high enough to effectively motivate used battery returns
- Additional safeguards to mitigate fraud risks needed

Challenges linked to DRS for batteries

3) System transition

Description:

- Battery collection systems are established in all EU countries, but mostly without financial deposits and return incentives
- Introduction of DRS may lead to a situation in which these systems may operate in parallel
- It is not intended to undermine other established systems for battery collection

Considerations on challenge mitigation:

- Transition to DRS based collection needs to be well coordinated (or even steered) by existing collection systems (e.g. Producer Responsibility Organisations)

Challenges linked to DRS for batteries

4) Legacy batteries (not covered by DRS)

Description:

- After switching to a DRS, there would still be many batteries in use that are not covered by any deposit
- These ‘legacy’ batteries also require sound collection and management

Considerations on challenge mitigation:

- Various options possible:
  - Accept DRS coverage gap as necessary part of the transition
  - Cover legacy batteries by accepting ‘equivalent batteries’ (1:1 exchange)
  - Set-up of EPR fund to cover extra-cost

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Challenges linked to DRS for batteries

5) Heterogeneity of battery sizes, chemistries and end-of-life conditions

Description:

- Apart from the segment *portable batteries of general use*, a wide range of battery shapes and sizes exists
- This is complicated by different chemistries and the fact that some used batteries may be damaged (swollen Li-ion pouch cells, leaking electrolyte)

Considerations on challenge mitigation:

- Batteries covered by a DRS may have to be marked as such (e.g. colour sign, chip)
- Modern technology (e.g. optical scanners combined with AI) may help to identify if a battery is eligible for a deposit return
- Collection systems must be designed to mitigate health & safety risks

Challenges linked to DRS for batteries

6) Some batteries are embedded in electrical and electronic equipment (EEE) and its waste

Description:

- As unintended effect, a DRS may motivate consumers to conduct unsafe EEE or WEEE dismantling operations
- Alternatively, a DRS may be designed to also accept (small) WEEE, which would likely further complicate the system

Considerations on challenge mitigation:

- Identify ways to exclude batteries not meant to be removable by consumers from deposit refund
- Article 11 of the Battery Regulation on removability & replaceability of portable batteries & LMT batteries
- It is assumed that removability requirements will resolve the risks from unrecommended WEEE dismantling for most equipment and batteries brought onto the EU market starting in 02 2027

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Challenges linked to DRS for batteries

7) Risks of system misuse and fraud

Description:

- DRS may stimulate the import of waste batteries from other (non-EU) countries.
- High deposit levels may even stimulate the production of fake units for the purpose of systematic deposit scams

Considerations on challenge mitigation:

- Various risk mitigation measures possible:
  - Fraud resistant marking of DRS covered batteries
  - Limit of deposit return actions

    (e.g. not more than 5 returns per person and day)

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Challenges linked to DRS for batteries

8) Freeriders from online marketing & sales

Description:

- Producers selling batteries through online marketing and sale may evade a DRS system with negative consequences:
  - Batteries outside DRS systems may appear to be cheaper for consumers (unfair competitive advantage)
  - Funds for collection incentives would be missing / collection rates sub-optimal

Considerations on challenge mitigation:

- Making online platforms responsible to check DRS compliance of all traders offering batteries (and battery containing products) on their platform.

Note: This challenge is not only linked to DRS, but also to any collection system based on Extended Producer Responsibility (EPR)

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Challenges linked to DRS for batteries

9) Efforts & costs to ensure safe collection, storage & handling

Description:

- Fire risks from waste batteries are relevant at all collection and storage points, as well as subsequent transport and handling.
- As battery collection points should be accessible for all citizen, a dense network of safe collection points is needed.

Considerations on challenge mitigation:

- The topic is relevant, but not only limited to DRS based collection. Any type of battery collection must take steps to mitigate fire and other health and safety risks.
- Due to growing numbers of Li-ion batteries, this risk is increasing, independent from the question how batteries are to be collected (with of without DRS)

Challenges linked to DRS for batteries

10) Administrative efforts

Description:

- Industry-based DRS system require a clearing system that conducts monitoring, balancing of financial flows
- Administrative efforts are substantial and associated with costs (linked to system set-up costs, as well as operational costs)

Considerations on challenge mitigation:

- DRS will in any case have cost implications for various stakeholders, notably producers, retailers and consumers
- Costs savings may result from reduced fire risks through higher collection rates of (Li-based) batteries

Requirements for Deposit Return Systems

The societal perspective

Requirements	Main practical elements
High collection rates	• Step-change in battery collection • Tangible societal benefits (reduced fire risks, better control of hazardous substances, higher raw material recovery)
Safe battery handling & return process	• No elevated fire or other health & safety risks anywhere in the distribution & return process
Level playing field	• Same rules & costs for all obliged parties in the EU (producers, retailers…) and from outside the EU
Sound cost-benefit ratio	• Overall economic costs are outweighed by socio-economic benefits
Reliability and stability	• Long term system stability

Requirements for Deposit Return Systems

The consumer perspective

Requirements	Main practical elements
Low (justifiable) effects on consumer prices	• Reasonable deposit levels • DRS design so that a) most consumers get back their deposit b) within a reasonable timeline after purchase (no prolonged consumer money lock-in) • Limited overall system costs (as costs would likely be added to product prices)
Clear / unambiguous consumer interaction	• Clear messaging on system modalities
Convenient return process	• Simple process • Dense return infrastructure • Accessible to all population groups

Requirements for Deposit Return Systems

The system perspective

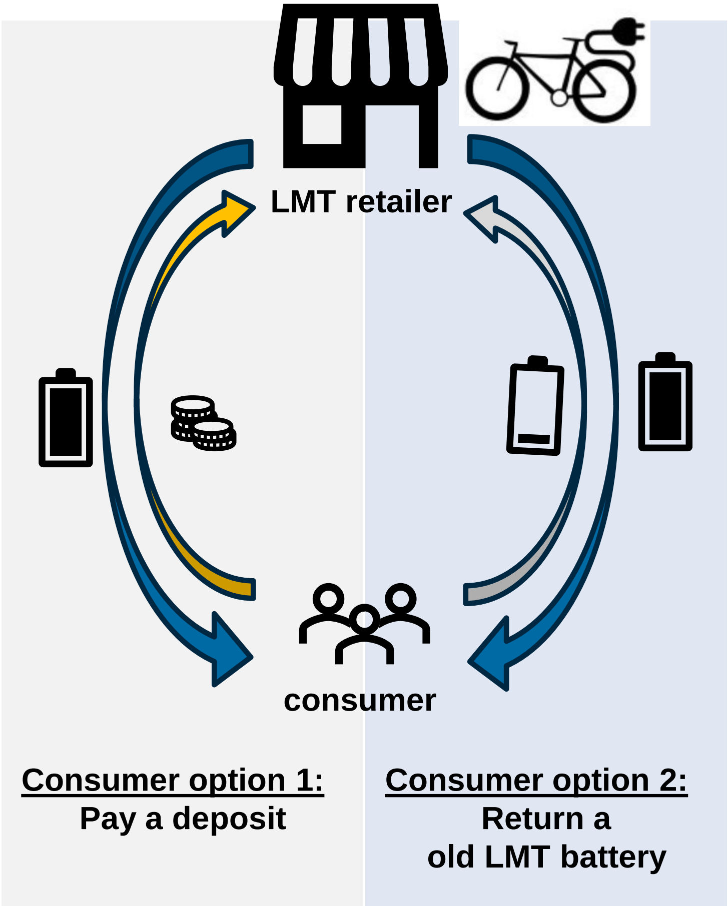
Requirements	Main practical elements
Administratively slim	• Monitoring & administration possible with justifiable efforts
Sound integration in other collection & management obligations	• No competition with other battery collection systems • Clear role within EPR frameworks • Organised & realistic phase-in (transition plans)
Limited risks of misuse / fraud	• Effective system design to avoid: - Impots of EoL batteries ("deposit tourism") - Deposit-return scams e.g. by battery dummies • Effective market surveillance & sanctioning systems for free riders
Operation on national and/or EU level	• Identical or similar approaches throughout the EU

First thoughts on options (slide 1 of 2)

Option 1: Retailer-based DRS for LMT batteries

- Retailers of LMT-equipment (e.g. e-bikes, scooters) are required to charge a defined deposit on each sold battery (embedded in a product or not)
- In case a consumer hands-in a LMT battery at purchase, no deposit is collected.
- Effectively, this may be regarded as a discount
- The deposit can be cashed at the retailer by returning the used battery or by providing evidence of sound disposal (receipt from a collection point)

➢ Very similar to DRS for SLI batteries in Germany & Poland
➢ Producer-based DRS design may also be considered (cashing of deposit at any retailer where the brand is sold)
➢ System may interlink with battery passport information (e.g. on manufacturer specification)



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First thoughts on options (slide 2 of 2)

Option 2: Industry-based DRS for batteries

- Mandatory deposits are collected on different classes of portable batteries (e.g. button cells / AA + AAA batteries / larger portable batteries)
- Used batteries can be returned in reverse vending machines equipped with scanners & software to identify battery types and pay-out returns (cash, vouchers…)

2a Same battery

- DRS covered batteries are marked
- Deposit can only be cashed when returning a marked battery

2b 1:1 return

- Deposit is returned when returning an equivalent battery
- Limited to the number of battery purchases

2c 0:1 return

- A collection incentive is paid for each returned battery
- All batteries fulfilling technical eligibility criteria (size, chemistry…) are included
- The number of incentivised returns is limited (e.g. per person & week)

➢ Consider to limit this option(s) to batteries with elevated fire risks (predominantly Li-based batteries)
➢ Consider to extend this option(s) to include LMT

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Discussion and Q&A

Your input and/or questions are most appreciated!

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Agenda

Main takeaways?

Main thoughts from today's meeting…

Next Analytical Steps

Selection of priority battery categories and possible DRS models per prioritized battery category

Determine which batteries have greater impact potential and assess extent to which DRS models meet the defined requirements when applied to prioritized battery categories > selection of possible models

Structured comparison of strengths weaknesses of possible DRS models

- Estimated benefits (collection rates, reduction of fire risks, CRM capture)
- Estimated costs (according to stakeholder type)
- Level of administrative complexity
- Technical and practical implementation considerations
- Potential unintended side-effects

Analysis of options to harmonize systems at EU level

Including analysis of impact of harmonized system on identified strengths and weaknesses of preferred DRS models

Indicative timeline

26 May
- Deadline for stakeholder comments

Late Aug
- Draft report sent to stakeholders

Late Sept
- Workshop 2

Late Oct
- Deadline for stakeholder comments

Dec 2026
- Final Report submitted to EC

Please submit written comments to batteryDRS@oeko.de by 26th May

Thank you for your attention!

For further questions, please contact
batteryDRS@oeko.de.