AI Wearables & Battery Circularity — Concept Note

1. Overview

The EU Batteries Regulation requires all portable batteries to be readily removable and replaceable by end users from February 2027. While this requirement serves legitimate environmental objectives for many product categories, it is technically counterproductive for AI wearables — smart glasses, smart rings, and AI-enabled sensors — where it forces larger, heavier, less capable devices and paradoxically increases e-waste rather than reducing it.

In our recent exchange, you asked whether a compromise could be found that maintains the environmental objectives of the Batteries Regulation while accommodating the specific technical constraints of AI wearables — in particular, whether a mechanism could ensure that devices and raw materials remain in the circular economy without requiring battery replaceability. We believe such an approach could work.

We have already made the case that the replaceability obligation should be waived for products where requiring removal and replacement of the battery would have a material negative impact on a product's weight, dimensions, or form factor — to the extent that the product experiences degradation in performance, safety, or durability.

One approach might be to ensure that to take advantage of this exemption, manufacturers of relevant devices would commit to operating a mandatory product programme that ensures devices and raw materials remain in the circular economy, including through consumer incentives that encourage end users to return devices at end-of-life rather than discarding them. This could include a trade-in or a voucher programme. Such an approach would preserve the environmental goals of the Batteries Regulation while removing an innovation barrier for one of Europe's most promising technology sectors.

The Environmental Omnibus currently under negotiation at Council level could provide the legislative vehicle for such an adjustment.

2. The Consumer Incentive Model for Device Collection

This section sets out one potential consumer incentive model as a proof-of-concept. It is not an endorsement or commitment to adopt this approach.

2.1 Who Bears Responsibility

The obligation would rest with the **manufacturer, and the programme can be presented directly by the manufacturer or through its authorised distributors or retailers.** While the manufacturer retains overall accountability for programme design, the consumer incentives

can
be supplied by the manufacturer directly to the consumers, or to consumers through authorised distributors or retailers.

2.2 Collection of Products with Degraded Batteries (also outside device warranty)

Manufacturers of AI wearables, or their authorised distributors or retailers, as specified by law, would be required to:

- **Offer a free, convenient return pathway** for end-of-life devices — including postal return (prepaid shipping), in-store drop-off at authorised retail partners, and/or designated collection points.
- **Partner with approved vendors** to handle non-functional, damaged, and end-of-life devices, as well as surplus materials and equipment.
- **Operate return centres** or cooperate with such return facilities where returned devices are assessed and routed for either **refurbishment** (extending product life) or **certified recycling** (recovering raw materials), depending on their condition.

2.3 Consumer Incentive Mechanism

To maximise return rates and ensure devices and raw materials demonstrably stay in the circular economy, manufacturers would be required to implement **active consumer incentive schemes**, such as:

- **Trade-in credit or voucher**: Consumers receive a credit toward a new or next-generation device upon returning their end-of-life device. Credits could be structured as a percentage of the new device's purchase price (e.g., up to 30%) or as a fixed amount depending on the condition and model of the returned device.
- **Loyalty programme integration**: Credits redeemable within the manufacturer's or retailer's ecosystem, encouraging continued engagement and repeat returns.

The specific incentive model would be at the manufacturer's discretion, provided it meets **minimum effectiveness criteria** — for example, achieving a verified return rate target set by the Commission or Member States.

2.4 Certified Recycling and Material Recovery

- Returned devices must be processed through certified recycling facilities that meet EU standards for the safe, ethical, secure and sustainable recovery and reuse of electronic equipment to support circularity in the critical raw material value chain.
- In line with the waste hierarchy, returned devices could be assessed for potential preparation for re-use / refurbishment before being routed for recycling.
- Manufacturers should ensure that **batteries embedded in returned devices are extracted and recycled separately** in accordance with the Batteries Regulation's material recovery targets.

2.5 Reporting and Transparency

Manufacturers benefiting from the exemption would be subject to **annual reporting obligations**, including:

- Percentage of units sold that are returned through the programme
- Breakdown of returned devices by outcome: refurbished, recycled, or other
- Material recovery rates for key battery components
- Description of consumer incentive mechanisms deployed

2.6 Consumer Information at Point of Sale

- At the point of sale, consumers must be **clearly informed** that the device contains a non-replaceable battery and that a consumer incentive programme exists for the return of those devices.
- Product packaging, documentation, and/or online sales materials must include **clear instructions** on how to return the device at end-of-life.
- Digital channels (manufacturer website, app) must provide an easily accessible return request function.

3. Legal Mechanism

Building on the amendment to Article 11 paragraph 3 of the Batteries Regulation as outlined in our amendment proposal (see 1-Pager), which introduces a new exemption under **(b)** for products where requiring removal and replacement of the battery would have a material negative impact on the product's weight, dimensions, or form factor, a possible legal approach could be to extend this provision with a conditional consumer incentive obligation. Alternatively, and potentially more preferred, this new provision (b) could be rephrased to define AI Wearable devices and their accessories, such that if they are subject to this consumer incentive program, they would qualify for a full derogation provided the criteria for the program are otherwise met.

This approach would simplify the understanding and application of this new subparagraph (b). An example of a new definition for AI wearables could be: “ ‘AI Wearable devices’ are electronic devices powered by artificial intelligence technology that are worn on or near the body, which wirelessly connect to the internet or networks, and provide daily, on-the-go assistance, communication, and multimedia functions to users, including their accessory components and devices.”

Specifically, the exemption under (b) could be made contingent on the manufacturer operating a collection and recovery programme as described in this document — ensuring that devices and raw materials remain in the circular economy. This could be achieved by adding a **"provided that"** clause directly within Article 11 paragraph 3 (b), linking the exemption to a collection

commitment that includes the elements outlined in the chapter 2, which could be provided in more detail via updated Article 11 guidance.

Alternatively, the collection obligations and their detailed requirements could be specified in a **separate paragraph within Article 11 or a separate provision within the Batteries Regulation** that cross-references the Article 11 paragraph (b) exemption, keeping the exemption clause itself concise while housing the programmatic detail elsewhere in the Regulation.

4. Why This Is Better for the Environment

	Replaceable Battery (status quo)	Incentive Programme (proposed)
Device lifespan	Shorter — weaker seals, larger form factor	Longer — optimised design, better durability + packaging waste
Battery lifespan	Replacement batteries often stored improperly, degrade	Professional handling ensures proper recovery
Material recovery	Consumer discards old battery — often in household waste	Certified recycling with high recovery rates
E-waste volume	More — shorter device life	Less — longer device life + closed-loop system
Consumer behaviour	Passive — relies on correct disposal by consumer	Active — incentive-driven return behaviour
Accountability	None — no reporting or tracking obligation	Full — annual reporting on return rates and recovery

5. Conclusion

This proposal offers a pragmatic, innovation-friendly path that **strengthens rather than weakens the environmental objectives of the Batteries Regulation.** By replacing a technically counterproductive requirement with a robust, accountable consumer incentive framework, it delivers better circularity outcomes while preserving Europe's competitive position in AI wearables.

We believe this approach can serve as a credible basis for Germany's position in the Council negotiations on the Environmental Omnibus.