Our request: Legislative promotion of "circular material use"

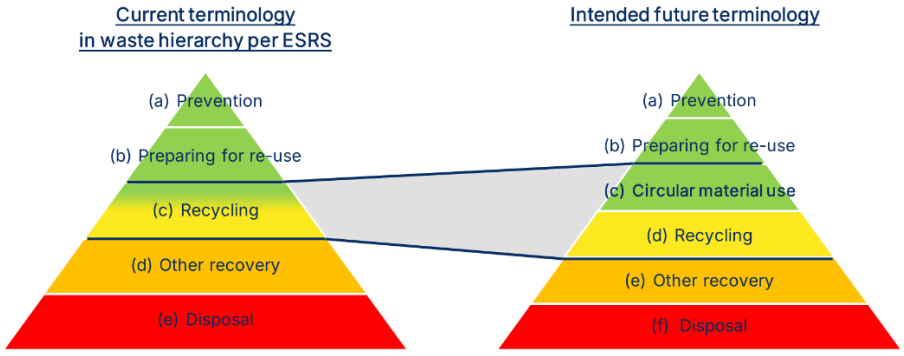
The EU Circular Economy Act is intended to "increase the supply of high-quality recycled materials". For demanding applications, current corporate waste management practice is not sufficient to create an availability of secondary resources for the same application. In particular in polymer recycling, materials of different quality get mixed to large volumes for low cost processing, which is resulting in reduced material quality and control of potentially critical contaminants.

Therefore, **there is a lack in availability of suitable recycled materials enabling the replacement of virgin material in demanding applications**. This includes applications with high polymer quality across industries and hygiene-critical applications such as in pharma, food, diagnostics.

To counteract, we demand adaptation of regulations to reward companies thinking end-to-end and run additional efforts in their waste management to support material recovery at the same quality.

In particular, we request policy makers to …

- **Adapt the waste hierarchy** in European legislations by introduction of a "circular material use" category. This category shall reflect volumes forwarded from their end-of-life location into a controlled, separated waste stream delivering secondary raw material at the same specification compared to explicit inflow material volumes.
- Adapt waste reporting metrics and guidance to explicitly **foresee deduction of "circular material use" volumes from the total amount of waste** generated (ESRS E5-5 37(a)).



By the introduction of "circular material use" into the logics of circular economy legislations, we believe to …

- Emphasize resource thinking rather than waste removal in corporate waste management
- Reward companies for thinking end-to-end and taking direct responsibility for maximized maintenance of quality of the materials within their waste streams
- Link corporate waste management with infeed material planning
- Support future availability of recycled material volumes for demanding applications
- Strengthen small- and midsize members of the recycling industry in the EU by promotion of business cases characterized by higher value, lower volume compared to standard recycling
- Create circular economy solutions for hard-to-transition industries and thus to prepare a future reduction of exemptions in legislations

Background

Current polymer recycling practice results in continuous reduction of quality and control

In standard recycling, waste streams of different quality get pooled for processing at large volume to minimize cost. Unfortunately, this practice inherently leads to a mix of material of different quality. Hence those recycled materials don't match the high-quality applications anymore. Moreover, this practice is not supporting a surveillance against contamination with uncontrolled substances or uncontrolled outgassing behavior.

In consequence, **demanding applications** with high-quality material specifications or requirement for high control of biocompatibility or sensitivity to volatile organic compounds (VOCs) **lack in availability of suitable recycled materials today**.

The solution: controlled circular material use

The limitations of current recycling practice can be overcome via specific pooling of prequalified waste streams, continuous separation from other waste streams and encompassing surveillance across the reverse value chain. Such a controlled circular material processing can prevent the mix of material qualities, include process controls against contamination and explicitly validate process impacts to the material specification.

By fulfilling specific material specifications and traceability requirements such controlled circular materials are of higher value compared to standard recycled materials. As such, those circular materials can balance the higher cost resulting from smaller waste stream volumes and longer distances in collection.

Despite designed for high value and lower volume, the financial competitiveness to virgin material use of such specific circular systems still scales with volume and high participation of the members of the respective ecosystem. Participation in such systems often requires additional efforts to provide their waste in separated streams compared to operation of mixed waste bins. Therefore, our request aims to reward engaging companies by building a recognized metric that quantifies their contribution to circular material use.

A metric to shift mindsets in corporate waste management

Today, corporate waste management is steered based on two metrics: total volume of waste and a recycling quota indicating the fraction diverted from disposal. Therefore, the mindset is linear: It only matters to receive a certificate from the next member in the chain as evidence to proof waste materials has been handled and managed in legal compliance by a reputable company and not having directly forwarded the material to landfill or incineration without energy recovery. In consequence this practice forwards the responsibility for the waste problem and identification of a beneficial follow-up application of the associated resources to independent 3rd parties and the society, respectively.

With explicitly rewarding circular material use, companies get rewarded for thinking end-to-end and taking direct responsibility to maintain the quality of materials as well as to prepare refeeding them to their inflowing supply chain. By explicit quantification of circular material use and the ability to subtract those volumes from the total waste value, companies can reflect their direct contribution to replace virgin material needs and reduce related Scope 3 emissions in a recognized metric.

Our proposal for a definition of "circular material use"

We propose to define "circular material use" volumes as the volumes forwarded into a controlled, separated waste stream with traceability per EN 15343 that is delivering secondary raw material at the same specification compared to explicit inflow volumes. Those explicit inflow volumes can be in the form of raw materials, components or products. The end-of-life location can be either linked to corporate waste management or material volumes reclaimed by a take-back program. All companies involved in this related circular value chain shall be able to claim their respective volumes as circular material use, independent of whether they represent the end-of-life location or are part of the supply or reprocessing chain.

With such a definition we intend to include two different pathways in the metric of "circular material use":

- **Specific closed-loop systems,** which are operating exclusively based on separated waste streams of materials with same specification (mechanical and chemical properties) originating from equal end-of-life locations. Such specific closed-loop systems only bundle waste streams from equal applications to match sector specific requirements. → See use case example
- **Generalized closed-loop systems**, which are bundling waste streams of equal material specification across sectors and applications.

A demonstrated, financially viable use case

Parenteral packaging goods for storage and administration of drugs or vaccines are typically delivered to pharmaceutical companies in single use plastic trays. To match the requirements for extrusion of low-density corrugated wall structures, those trays require polymer granulates characterized by long chain lengths. And, as those trays are used to feed pharmaceutical filling, a high control of potentially outgassing elements is required. Together, those requirements lead to the explicit use of virgin materials of very high polymer quality and documented process control of food grade.

In 2024, SCHOTT Pharma and Corplex demonstrated a closed-loop solution with pilot collection at Takeda and Pfizer, respectively. The closed-loop system has been designed for continuous separation of the reprocessing chain from the end-of-life at the pharmaceutical companies to transport, recycling and production of new trays. Trays manufactured from this closed-loop system were successfully verified for equivalent applicability for delivery of parenteral packaging goods without impairing product or patient safety. A third party executed LCA study calculated an approximately 50% carbon emission reduction for trays manufactured from 70% recyclate originating from this closed-loop system.

Despite the extra efforts in collection and operation at smaller scale, the closed-loop operation was able to manufacture granulate at the same cost as the purchasing price of virgin material. In this case, this was promoted by the comparably high granulate prices linked to the application-specific requirements.

For more details: https://ondrugdelivery.com/pioneering-pharmaceutical-packaging-a-push-for-decarbonisation-and-circularity/

About the authors

Alliance to Zero- The coordinators of this request

The Alliance to Zero is a non-profit membership association that aims to facilitate the transition of the supply chain of injection devices and the pharma sector to compliance with net-zero emissions. Formed by key representatives of the supply chain of injection devices with high ambition in decarbonization, the Alliance runs working groups, engages with academia, customers and other industry partners to create solutions from an ecosystem perspective.

One of its first results was a cross supply chain product carbon footprint analysis showing more than 50% of the emissions to result from either end of life or raw materials. With circular material use acting as mitigation to both dominant emission sources, the conclusion was obvious: circular material use an imperative to reach net-zero supply chains. Since this conclusion, the Alliance engages in solution design and stakeholder engagement for promotion and realization of circular economy practices in the context of the highly regulated, patient-safety focused environment of the pharmaceutical industry.

For more details, see: https://alliancetozero.com/

Further supporter of this request

The idea behind this request evolved over the last years from exchange between industry experts within the pharmaceutical industry and beyond. To reflect this broader consensus in this request, the Alliance to Zero shared this request and asked for support of this request initiative. All listed supporters confirmed acceptance of being explicitly named in this public document.

Company	Country	Contact name, function
SCHOTT Pharma	Germany	Reinhard Mayer, CFO