

Challenges for waste legislation in the circular economy

Classification is creating hurdles to the reuse of waste



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Qi Wang
Project manager, Dr Knoell Consult

On 16 January, the European Commission announced its first **strategy for plastics in a circular economy**, following on from China's waste import ban at the end of 2017. On the same day, another **Communication** from the Commission made it clear that some challenges on the interface between chemical, product and waste legislation need to be discussed. The accompanying **staff working document** described these in more detail. The Commission aims for actions to be initiated in 2019.

Secondary raw material and circular economy

The aim of the circular economy is to maintain the value of materials in the economy for as long as possible via closed-loop product lifecycles, thus contributing to achieving the UN's sustainable development goals (SDGs). The recycling and reuse of waste as secondary raw materials benefit both the environment and the economy. Therefore, the circular economy is one of the key parts of the EU's **industry strategy**.

Over many years, the EU has constructed a legislative framework to reduce landfill and to prepare for greater reuse and recycling of waste. In December 2015, the Commission adopted an **action plan** to support the transition to a circular economy. A key step in this is developing a well-functioning single market for secondary raw materials. Thus, a legislative framework that functions at all stages through the material lifecycle is highly necessary.

One possible barrier to recycling and reuse is the presence of certain 'substances of concern' that are hazardous to humans or the environment, or which can reduce the quality of secondary raw materials. Since waste regulations are not consistent with chemical regulations, there are some interface issues when a material moves to a different stage in the life cycle, for example from product to waste, or from waste to raw material.

In its Communication, the Commission identified the four most critical issues in the interface between chemical, product and waste legislation and analysed how these can affect the implementation of a circular economy. Based on this, it proposed some options supported by consultation with stakeholders, but these

are not the Commission's final position and discussions will continue.

Substances of concern and information flow

Substances of concern contained in a waste stream can affect the use of recycled material, because this must be compliant with the REACH and CLP Regulations when it is put back on the market. However, the information flow about the presence of such substances often ends when a product becomes waste.

Incidental contamination throughout the product's lifecycle – for instance, by persistent organic pollutants (POPs) – sometimes plays an even bigger role in decision making if the waste can be recycled or must be eliminated. The absence of information about possible substances of concern causes uncertainties, so recyclers have difficulties in guaranteeing an efficient information flow.

To reduce the information deficit and make the transition from waste to product smoother, the Commission identified several challenges in practice. One is to make sure that the existence of substances of concern is communicated throughout the lifecycle and the loop is closed. The first thing to determine is which

substances raise concerns and what effects they have. This can be carried out generally for all chemical substances or for a specific sector and application.

Next, the objects in scope must be tracked. The Commission will evaluate different options and find a balance between costs for shareholders and protecting health and the environment. Tracking on a voluntary basis could not be effective in preventing loss of information, while tracking all substances or preserving all information through analytics would generate high costs. Therefore, sector-specific tracking seems like a good compromise.

Some 'legacy substances' have become substances of concern in recent years. These would be a major barrier to recycled waste being used as a raw material. The Commission will therefore develop a specific decision making methodology to determine their recyclability.

The discussion as to whether secondary materials should fulfil the same requirement as primary materials is important, because the ultimate goal is not promoting recycling at all costs, but recovering materials as much as possible to the level of comparable primary materials. Secondary materials must be used so that recycling remains attractive. Application-oriented or sector-specific regulations would be desirable.

An additional issue is that there is no standardised communication document through the waste stage. The reason might be the difficulty of identifying the party responsible for preparing the document, especially in private households. Nevertheless, a standardised data sheet, mandatory for certain parties or on a voluntary basis, would help the information flow to achieve some parity across products.

Differences in classification

Even if the information flow is closed-loop – that is, there is enough information for the waste available – information loss would still be a hindrance for the sustainable reuse of waste. This is because of a discrepancy between chemical and waste classification, caused by a different principle in the respective sets of rules.

While substances and mixtures are assessed under the CLP Regulation as

a whole, waste is assessed by the component-based Commission Regulation [1357/2014](#). Therefore, the classification of waste as hazardous is based on the GHS classification of single components.

However, the specific concentration limits and multiplying factors (M-factors) in Annex VI of the CLP Regulation used for the GHS classification of mixtures are not waste classification criteria. As a result, a mixture can be classified as a hazardous waste product under the CLP Regulation, but as non-hazardous waste under hazardous property (HP) criteria, and vice-versa.

One of the significant differences between CLP and waste classification under HP criteria is hazard class sensitisation. A mixture containing at least 0.1% of a sensitising component is classified as a sensitising mixture under CLP. However, waste is hazardous only if it contains at least 10% of one individual sensitising component. This means it is uncertain whether a recycled material from non-hazardous waste really contains no allergens.

In some cases, the situation is the other way around. Boric acid, which is classified as category 1B reprotoxic, is also a preservative (E284) that can be used in caviar at up to 4g/kg. In a mixture, a 1B classification is necessary when the boric acid concentration is not less than 5.5%.

Thus, caviar is not a hazardous mixture. However, if it becomes waste, the maximum dose of boric acid (0.4%) would fulfil the HP 10 and the waste caviar would be deemed a hazardous waste. Balsamic vinegar containing 5-6% acetic acid would also be hazardous, because pure acetic acid is classified as category 1A for skin corrosion and the HP 8 criterion is met, even though it would not be classified as a hazardous mixture under CLP at all.

With respect to environmental hazard, waste regulation is slightly different from chemical regulation. Although the HP 14 criterion should reflect the ecotoxicity of an item of waste, it does not consider any M-factor. Waste containing very hazardous substances to aquatic organisms (M-factor >1) can be erroneously classified as non-hazardous. If the waste is not disposed of correctly according to the

environmental hazard, it could have an unexpected impact on the disposal site.

Furthermore, some of the hazards in the CLP Regulation are not considered in waste regulations, for example reproductive toxicity via lactation (H362) and metal corrosion (H290). EUH-statements are not included in HP criteria for waste, other than EUH001, EUH019 and EUH044. The missing assignment of certain hazard statements to HP criteria can lead to confusion and misunderstandings.

A further issue is communication on the hazards of waste. No compulsory EU-wide information exchange exists among the different parties involved in waste management about fulfilled HP criteria of waste material. This causes difficulties in deciding on personal protective equipment (PPE). In serious cases, worker safety is at risk.

The discrepancy between the different regulations can cause problems for the circular economy. As such, the recovery and reuse of non-hazardous waste as non-hazardous products cannot be assured. Furthermore, the classification of waste may especially impact the decision on whether to recycle.

Solutions for sustainable future

The above-mentioned challenges are important for implementing the circular economy and achieving sound waste management. Economic effort, beyond question, should not take priority over human health and the environment. For this reason, an intelligent level of waste regulation is needed.

At the same time, regulatory overkill would be undesirable from an economic perspective, particularly if this leads to most waste becoming incinerated rather than recycled. The European Commission is responsible for the development of appropriate solutions for these challenges. Among others, sector-specific approaches and usage relevant regulations are options. The Commission intends to tackle those problems in 2019.

Linda Springer, project manager at Dr Knoell Consult, also contributed to this article. The views expressed are those of the expert authors and are not necessarily shared by Chemical Watch