Mixed Waste Sorting to meet the EU's Circular Economy Objectives

Evidence Paper Summary

When it comes to policies designed to accelerate the transition to a circular economy, the EU is considered a world leader. This report explains why taking a holistic approach to policies addressing packaging design for recyclability, separate collection systems—including deposit return for beverage containers—and further sorting of municipal mixed waste prior to thermal treatment or landfill, is necessary if the EU is to meet its recycling and carbon emissions reductions targets and achieve real circularity.

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Introduction

The European Union (EU) is considered a world leader on environmental matters, especially when it comes to policies that accelerate the transition to a circular economy. As its legislative landscape continues to evolve, reducing packaging waste, decarbonising waste management, and keeping valuable resources recirculating in the economy remains a key policy focus. In 2018, the Waste Framework Directive (WFD) and the Packaging and Packaging Waste Directive (PPWD) were both amended to include higher recycling targets. These targets, which include a plastic packaging waste recycling target of 55% by 2030 and a municipal waste recycling target of 60% by 2030 (increasing to 65% by 2035), were implemented in the context of wider EU goals to address the climate change impacts of consumption and waste management, as envisioned in the Green Deal and Circular Economy Action Plan 2.0. The EU also recently adopted a 55% net emissions reduction target by 2030, in line with the objective of achieving climate neutrality by 2050.

To help achieve these targets, a range of planned policies at EU level are aiming to improve the recyclability of packaging and to improve and harmonise separate collection systems for municipal waste across the EU. However, as this report demonstrates, improved separate collection—including the roll out of deposit return systems for beverage containers—and improved recyclability of plastics alone will not be sufficient to meet these objectives. If the EU is to meet its recycling and carbon reduction objectives and achieve real circularity, it will need to take a holistic approach that includes further sorting of municipal mixed waste for recycling prior to thermal treatment or landfill, i.e. “mixed waste sorting” (MWS).

Recommendations

- Either through the IED or the WFD (or both), mandate the use of MWS systems of a defined quality to remove recyclable materials prior to waste incineration.
- Define ‘treatment of waste prior to landfilling’ in the Landfill Directive to require sorting of mixed waste, with sorting defined through the process set out in the Waste Framework Directive.
- Require that in the case of use of mixed wastes for renewable energy generation, the operators are required to apply MWS systems which meet relevant performance criteria, aimed at removing materials so that the non-renewable share of energy generated from mixed waste is minimised.
- Remove the R1 formula in Annex II of the WFD so that municipal waste incineration is no longer able to be classified as ‘recovery’;
- Include incineration facilities within the EU Emissions Trading System (ETS) by 2028 as a means to encourage progress in the quality of sorting systems for removing plastics from the mixed waste remaining after separate collection.
- Ban incineration and disposal of recyclable /reusable materials through the revision of the PPWR or the WFD (or both).

Objective

In the context of the ongoing revision of key EU policies (the WFD, Industrial Emissions Directive [IED] and Renewable Energy Directive [RED]), this report by Eunomia determines whether (and to what extent) the EU targets can be met through separate collections of municipal waste—and if they couldn't, what measures could be taken to achieve them. More specifically, they sought to examine the limitations of separate collections in the EU and to consider whether higher levels of recycling and carbon emission savings can be achieved through the addition of MWS.

Methodology and scenarios

To demonstrate the potential role of MWS in helping the EU achieve its recycling and climate goals, a model of the relevant EU waste flows was developed. This focussed on plastic packaging, but also included flows of other packaging materials (paper, glass, etc.) and relative contributions to per capita municipal waste. A detailed model of the likely actual recycling rate for plastic packaging across the EU in 2019 was developed. These baseline figures were then used to estimate the EU recycling rates for packaging in 2030. The following scenarios were therefore developed:

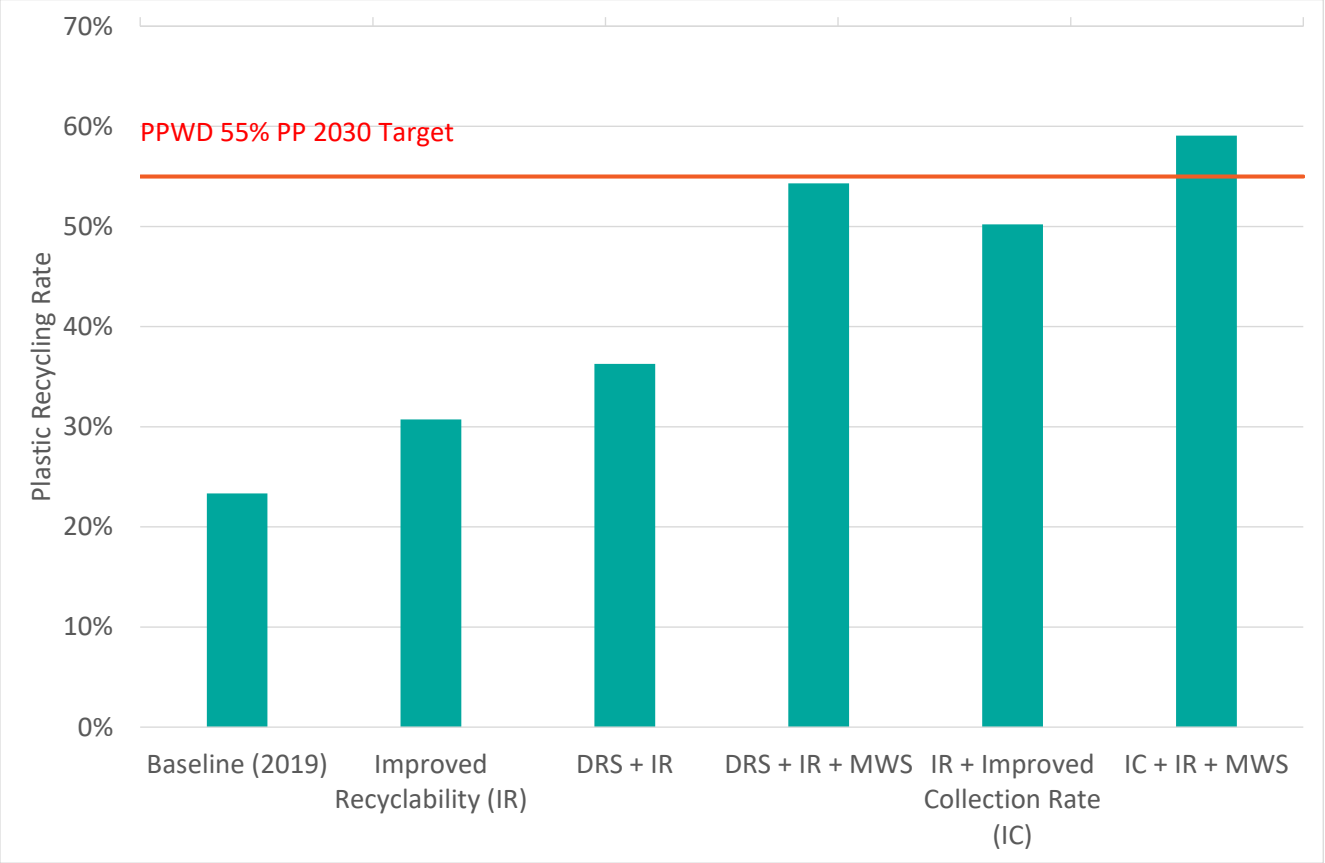
1. **Baseline (2019):** Considers estimates of actual current recycling performance in the EU 27 in 2019
2. **Improved recyclability (IR**): Considers the impact of improved recyclability of plastic packaging alone
3. **DRS +IR**: Considers the impact of improved recyclability of plastic packaging *over and above* a minimum improvement in collection rates that is expected as a result of implementing DRS for beverage containers across the EU by 2030.
4. **IR + improved collection rate**: Considers the impact of improving existing separate collection systems so that all Member States are achieving a 75% collection rate of plastic packaging, *over and above* the recyclability improvements in the IR scenario.

As a final step, the model estimated the **likely contribution of MWS** to the 2030 packaging recycling targets in each of the above scenarios. Using these results, alongside estimates of the amounts of non-packaging recyclables in municipal waste, a high-level estimate of the potential contribution of MWS to municipal waste targets was also calculated. The GHG impacts of mandatory MWS at EU level were also estimated.

Given that plastic packaging recycling rates vary widely across the EU, the same analysis was also undertaken for three of Europe's top waste management performers: Germany, Belgium, and Sweden. For the member state analysis, the focus was mainly on plastic packaging, and we did not consider GHG emissions nor the potential contribution that MWS could make to the municipal waste targets.

Top-line results

As shown in Figure 1, at the EU level, the only scenario in which the EU is estimated to meet the 55% plastic packaging recycling target in 2030 is through the inclusion of MWS prior to incineration or landfill alongside high performing separate collection systems and improved recyclability of plastic packaging (represented by the IC + IR + MWS scenario).



At an individual country-level, MWS could have the following effect on recycling rates in 2030:

- Germany: The addition of MWS is projected to raise recycling rates from 50% to 62%.
- Belgium: The addition of MWS is projected to raise recycling rates from 53% to 65%.
- Sweden: The addition of MWS is projected to raise recycling rates from ~44% to ~58%.

Conclusions

This report concludes that an EU-wide roll-out of effective MWS is likely necessary to meet existing recycling targets and almost certainly is important if climate change impacts of waste management are to be minimised and more ambitious recycling rates are to be achieved. With respect to current plastic and paper packaging recycling rates, it appears that even if separate collection rates are significantly improved (through a full roll out of DRS for beverage containers), that the average EU recycling rate as well as those in Belgium, Germany and Sweden will still be below the 2030 targets. Moreover, although improvements to plastic packaging recyclability are likely, the EU average recycling rates and those in Germany and Sweden are still expected to fall short of the targets. Only in Belgium does it appear that the plastic packaging target could be met, but this result would only be the case if several relatively optimistic Belgian assumptions were accurate. Only when effective MWS is rolled out across the EU and the case study countries is there any degree of confidence that plastic and paper packaging recycling targets will be consistently met. The introduction of mandatory MWS would also provide a useful contribution to the municipal waste recycling targets of between 3.4% and 6.8%.

Perhaps the most important contribution from MWS would be the reduction in GHG emissions associated with waste. It is reasonable to conclude that MWS would result in the reduction of between 10.2 and 28.0 $MtCO_2e$/annum. The EU-wide roll-out of effective MWS is likely necessary to meet existing recycling targets, and would also make a significant contribution to the EU's emissions reductions goals. This is an estimated saving of between 9% and 25% of the total 2020 waste sector emissions thanks to MWS.

Who is Reloop

Reloop is an international non-profit organisation that works at the centre of policy-making with governments, industry stakeholders, and NGOs. Our vision and mission are ambitious and focused on building a world free of waste, where our natural resources remain resources. Reloop's policy positions and recommendations are always based on data-driven research, real-world case studies and experience, best-in-class principles, and the collective expertise of our team.

Who is Zero Waste Europe

Zero Waste Europe is the European network of communities, local leaders, businesses, experts, and change agents working towards the same vision: phasing out waste from our society. We empower communities to redesign their relationship with resources, to adopt smarter lifestyles and sustainable consumption patterns, and to think circular.

How I can learn more

Reloop and Zero Waste Europe invite you to join the conference *Mixed Waste Sorting: The next frontier for managing residual waste for maximum circularity* aiming to bring together regional and national governments, MWS operators, recyclers, experts, and technology providers from countries across Europe to offer their expertise on the introduction of MSW as an additional tool for the recovery and re-circulation of Europe´s valuable resources. The conference will take place on **21 March, 2023 in Brussels from 9 AM to 3:50 PM**. Please register here.