ZERO WASTE EUROPE

Measures to minimise residual waste

Proposals for a Circular Economy Act

Policy Brief

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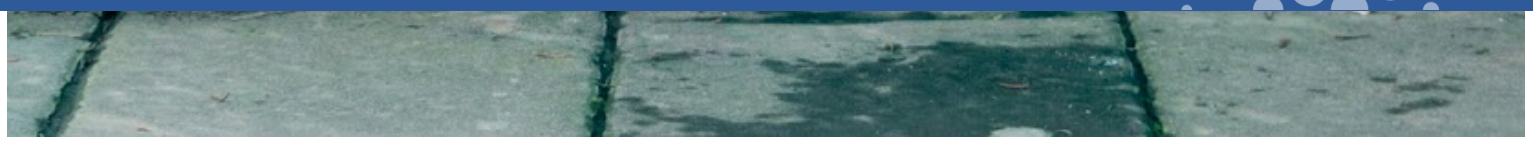

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Possible measures for inclusion in the new circular economy act

Background

The European Commission President, Ursula von der Leyen, noted in July 2024, that:[1]

> *Working to decarbonise our economy will be part of our continued shift to a more sustainable pattern of production and consumption, retaining the value of resources in our economy for longer.*
>
> *This will be the purpose of a new Circular Economy Act, helping to create market demand for secondary materials and a single market for waste, notably in relation to critical raw materials.*
>
> *We will put forward a new chemicals industry package, aiming to simplify REACH and provide clarity on "forever chemicals", or PFAS.*

Enrico Letta's report to the European Council considered the importance of embedding a circular economy approach within the Single Market framework:[2]

> *The absence of circular economy principles in the investment strategies and operational practices across the Single Market would perpetuate a linear economic model that is inherently unsustainable and inefficient.*
>
> *The foundation for achieving this goal lies in ensuring a level playing field for circular materials, products, and services, complemented by the provision of reliable information through digital product*

[1] Ursula von der Leyen (2024) Europe's Choice: Political Guidelines For The Next European Commission 2024–2029, Ursula von der Leyen, Candidate for the European Commission President, 18 July 2024, commission.europa.eu/document/download/e6cd4328-673c-4e7a-8683-f63ffb2cf648_en?filename=Political%20Guidelines%202024-2029_EN.pdf

[2] E. Letta (2024) Much more than a market – Speed, Security, Solidarity. Empowering the Single Market to deliver a sustainable future and prosperity for all EU Citizens, Report to the European Council, April 2024

passports. A key priority must be the diligent implementation of the Ecodesign for Sustainable Products Regulation, particularly its product-specific circularity criteria. This is crucial for mainstreaming sustainable products across the European market, with product design playing a pivotal role in extending product life cycles, enhancing energy and resource efficiency, and facilitating the safe recycling of raw materials

Furthermore, the EU must amplify access to circular materials by stimulating demand for high-quality recycled materials. This involves setting requirements for recycled content in critical areas, as demonstrated by the new battery regulation and the upcoming revision of packaging legislation for plastics.

It also alluded to the significance of augmenting supply of Critical Raw Materials, welcoming the Critical Raw Materials Act as: '*a pivotal move to acknowledge and mitigate the risks from this scenario. It introduces crucial measures aimed at facilitating diversification, stimulating the mining of critical raw materials within Europe, enhancing recycling efforts, and fostering global partnerships. Prompt implementation is essential.*'

The report by Mario Draghi to the European Council identified three key areas for action to shore up the EU's competitiveness in future.[3] The second of these was 'a joint plan for decarbonisation and competitiveness', and further develops some of the thoughts in the Letta report. As part of this plan, the report considers it critical to secure access to critical raw materials to ensure that 'green industries' flourish in the EU in response to supportive policies. A key component of the strategy to access critical raw materials is to ensure high rates of capture and use from the waste stream. As such, creating a more circular economy is seen as critical. Regarding this matter, the in-depth analysis noted:[4]

"Another obstacle is the lack of investment in infrastructure for circularity. This investment gap not only relates to product design, R&I and circular economy business models, but crucially also to the basic infrastructure for separate collection, sorting, preparing for re-use and recycling."

Mario Draghi

[3] Mario Draghi (2024) The future of European competitiveness: Part A | A competitiveness strategy for Europe, September 2024.
[4] Mario Draghi (2024) The future of European competitiveness: Part B | In-depth Analysis and Recommendations, Section 1 | Chapter 2 Critical Raw Materials, September 2024.

The first Circular Economy Action Plan of 2020 noted, as regards waste, a target '*to halve* ***the amount of residual (non-recycled) municipal waste by 2030*** (emphasis in original). It also noted that high quality recycling was reliant upon '*effective separate collection of waste'* and proposed to *'harmonise separate waste collection systems.'* The CEAP made no reference to sorting of leftover mixed waste, and did not seek to define 'high quality recycling'. As we note in the Appended assessment of the current state of policy and law in respect of separate collection, this term is only defined in non-statutory guidance produced in 2020. The ambition to '*harmonise separate waste collection systems*' is one which might be difficult if it strays much beyond seeking to define a minimum 'citizen experience' (as opposed to a design of 'the optimal service', which has the potential to be highly variable across the geography of the EU-27).

These are some elements that constitute the backdrop against which the new Circular Economy Act (CEA) will be developed, and which have a bearing on matters of separate collection, the potential role of sorting of leftover mixed waste (SLMW),and how best to ensure minimal conflict between the two, consistent with the likely objectives of the CEA. It seems likely that the CEA will, amongst other things:

1. Seek to reduce, as far as possible, the extent to which there is 'leakage' of materials into the residual waste stream. That implies minimising the quantities of material flowing not just to landfill, but also to incineration and co-incineration.
2. Address matters of quality, or the nature of end use of secondary materials, insofar as this is of concern. The above reports suggest that the 'downward cascade' of use of materials from waste should be slowed as far as possible.

On this basis, and reflecting on the content of Appendix 2, a number of possible measures for consideration in a CEA are set out below.

Measures for consideration

Option 1: Tighten Definition and Derogations Around 'Separate Collection'

Background

Some concerns have been expressed that measures that promote sorting of leftover mixed waste (SLMW) might have the effect of displacing separate collection. We discuss this in detail in Annex 2, and highlight that given the nature of the existing recycling targets, and the ability of different collection systems to achieve the quality required by recycling markets, the only material where this issue might arise is plastics. We note that the SUP Directive, and now, the PPWR, will require separate collection of plastic beverage containers, so that the issue relates mainly to plastics other than beverage containers.

The current definition of separate collection is in the Waste Framework Directive (and is the same as in the 2008 version of the Directive):[5]

> *where a waste stream is kept separately by type and nature so as to facilitate a specific treatment;*

Each of the terms / words, 'waste stream', 'type' and 'nature' raise questions as to what the definition actually means: for example, if 'household waste' is a 'waste stream', then could single-stream collection of 'household waste' be considered 'separate collection'? Non-statutory Guidance from 2020 sought to address these issues but we argue in Annex 2 that the interpretation of the terms in the Guidance is contestable (see Annex 2). [6]

If the intent is to push for more widespread separation of materials, or of wastes of a given material and format, then a more precise definition in law of separate collection would make sense. That definition would need to be mindful of (it could choose to include) the forms of comingled collection that do not, currently, fall under the definition of 'separate collection', but which are distinct from collections of 'leftover mixed waste' (understood as the wastes remaining after households and businesses have sorted materials intended for recycling). Presumably, in the context of a circular economy, the intention is to facilitate one or more of

[5] Directive 2008/98/EC of The European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives.

[6] EY, PlanMiljØ, ACR+, RWA and Öko-Institut (2020) Guidance for separate collection of municipal waste, Final deliverable of the study to support the Commission in establishing guidelines for separate collection of waste under Framework Contract N° ENV/B.3/FRA/2017/0005, April 2020.

remanufacturing, reuse, or recycling of a desired quality (not 'a specific treatment', which could be interpreted very broadly). On the other hand, the requirement in Article 20 of the WFD as per household hazardous waste might indeed be focused on specific treatment, as necessary: it may, therefore, be sensible for the definition to distinguish between these cases.

Attention should also be given to the drafting of Articles 10 and 11 of the Waste Framework Directive, which set out conditions for derogations from the general requirement for separate collection, and potentially (by extension), Article 48(3) of the PPWR which makes reference to these Articles (see Annex 2). Notwithstanding the attempt in the 2020 Guidance to elaborate conditions that should; apply in order to justify derogations from separate collection (which appear to over-reach the content of the Directive), the wording of Article 10(1) of the WFD is relatively permissive, whilst the scope of derogations under Article 10(3) of the WFD is broad, and arguably, broader than Guidance from 2012 suggested would be acceptable grounds for derogation at that time.

Proposed Approach

Define separate collection as:

> *where waste is separated by households, businesses or other entities into products, materials, or groups thereof such that following collection of the separated categories, and after subsequent sorting stages, the likelihood of its being remanufactured, reused, or used in high quality recycling is maximised. In the specific case of hazardous waste, including from households, separation may be driven by a desire to ensure suitability for specific treatment, or avoidance of inappropriate treatments where recycling is not possible.*

The intention here is to capture both what was previously described as 'separate collection', and what has been described as commingled collection, as long as the commingling does not undermine the objectives in the definition.

This above necessitates a definition of 'high quality recycling', which, until the PPWR was agreed recently, was a missing element in existing waste legislation. High quality recycling is defined as (this is an adapted form of wording from the PPWR's Article 3(41), Articles 6(2)(a) and Article 48(2)and (3)):

> *'for materials other than food wastes and garden waste, high quality recycling is recycling which enables the use of the resulting secondary raw materials in applications where it substitutes primary raw materials of the same type, with minimal loss of quality or function*
> *for food wastes and garden waste, high quality recycling is recycling which results from food and / or garden wastes that have been separately collected or are separated at source, and use of the outputs from which results in benefits to agriculture or ecological improvement.'*

The derogations in Article 10 of the WFD ought to be made more restrictive than they are. For reasons set out in Annex 2, the Article could set out that separate collection for food, paper and cardboard, glass, metals, textiles is mandated (not optional – it is already mandated for household hazardous waste). That Article *could* reference an Implementing Act (not non-statutory Guidance) that sets out minimum standards for separate collection of the different materials in different circumstances (demographics / housing density, climate), likely defined in terms of a 'citizen / customer experience' where municipal waste is concerned. This would help to overcome the widespread deployment of sub-optimal (separate) collection systems which are unlikely to achieve the existing recycling targets.

For plastics, clear conditions should be established in Article 10 that would need to hold wherever 'separate collection' is not being implemented. These should include:

a. a condition in relation to cost (only where costs are excessive would a derogation be permitted);
b. a condition regarding what 'alternative' would need to be in place where the derogation was taken. That could be (as per Norway / Netherlands) a condition that the leftover mixed waste is sent for SLMW facilities which meet specific criteria as regards the outputs obtained (see Annex 1: this could be implemented using the process set out at Article 27 of the WFD).

Potential Outcome

The outcome of this should be that everywhere is served by a form of separate collection, defined as per a 'citizen experience', for the core materials, with derogations only for plastics. These derogations would include a requirement to have SLMW in place to sort LMW.

This would not *minimise* the amount of waste being landfilled / incinerated / coincinerated. In order for that to happen, even where separate collection was in place, then additional materials would, most likely, remain to be extracted from LMW.

Option 1b: Define a Minimum Proportion of Recycling that Has to Meet the Definition of High-Quality Recycling

Background / Justification

If the intention is to achieve 'high quality recycling' then one way of achieving this would be to establish a definition of 'high quality recycling' (see above) and require a rising share of recycling to comply with that definition. A sensible definition would open the possibility for the inclusion of a 'quality' element within existing recycling targets.

Proposed Approach

The definition of 'high quality recycling' would be as above.

Targets would be set for a rising proportion of the recycling being achieved to lead to: *'the use of the resulting secondary raw materials in applications where it substitutes primary raw materials of the same type, with minimal loss of quality or function.'*

So, as regards municipal waste, the targets as per Article 11(c) to (e) would be adapted as shown in Table 1 (by way of example) below.

Table 1: Example of Use of 'High Quality Recycling' Target

	2025	**2030**	**2035**
Recycling Target (% MSW)	55%	60%	65%
Of which, High Quality Recycling	*85%*	*90%*	*95%*
Implied High-Quality Recycling (% MSW)	**47%**	**54%**	**62%**

It might also be of merit to consider specific targets for the recycling of plastic packaging.

Potential Outcome

If this were to happen, then the quality derogation, and in part, the environmental derogation from separate collection as per the existing Article 10(3) would effectively be dealt with through the target setting process. The point of this approach, however, is it focuses on outcomes to be achieved rather than on the way in which the outcome should be achieved. It could be argued that if 'high quality recycling' is the objective, and if the targets are set at relatively challenging levels, then the need to specify appropriately a 'requirement for separate collection' is rendered less important. It would become more important to set the target(s) at the appropriate level, and to ensure that the data required to monitor, report and verify that the targets are met is available.

This measure would not have the effect of minimising the amount sent to landfill or incineration. Its main effect would be to focus the attention of those collecting, sorting and recycling waste to ensure that the quality of what is made available to off-take markets is suitably high. The measure could complement measure 1, though there may be concerns regarding setting new targets given the fact that meeting existing ones is clearly presenting challenges to some Member States.

Option 2a: Amend Treatment Definition (Landfill)

Option 2b: Require SLMW prior to Incineration

Option 2a: Background / Justification

We have, in other documents, highlighted the lack of harmonisation in how Member States interpret the requirement for 'treatment' under Article 6 of the Landfill Directive.[7] This has had the effect of allowing the persistence of landfilling of untreated waste, and the associated methane emissions, in some Member States.

Proposed Approach

As a means to minimise the amount of waste being sent to landfill, the following are suggested:

[7] Equanimator (2021) *Rethinking the EU Landfill Target*, Report for Zero Waste Europe, October 2021, https://zerowasteeurope.eu/library/rethinking-the-eu-landfill-target/ .

1. **Elaborate a clear definition of 'treatment' as per Article 6 of the Landfill Directive.** It may be more appropriate to define this as '*treatment of waste prior to landfilling*', since the terms 'treatment' and 'pre-treatment' are used widely in documents concerning waste. This treatment would be defined to require:
    a. The sorting of LMW, with the relevant standard defined as per Annex 1, potentially using the process set out at Article 27 of the WFD;
    b. The subsequent biological stabilisation of any waste destined for landfill. Here, it should be considered that the way in which 'thresholds' have been set in the past have differed across countries. The objective should be to ensure the prospects for fugitive methane emissions are minimised through the combination of stabilisation, and the use of suitable oxidation layers at the receiving landfill.
        i. In respect of the former, a level of stability at, or equivalent to, the level considered in the Draft Biowaste Directive (of 2001), of 10mg O_2 / g dm, or equivalent measure, gives a suitable measure that would reduce the potential for methane generation to a significant degree without incurring excessive cost.
        ii. In respect of the latter, the General Requirements for all Classes of Landfills, set out at Annex I of the LFD, could be amended to consider appropriate cover layers, and para 4, regarding Gas Control, could be amended such that the need for gas control was linked to whether or not waste was treated, and the nature of the oxidation layer used.

    This definition would ensure that the 'landfill system' was comparable with, and potentially an improvement upon, incineration in terms of its climate change performance.

2. **Acknowledge, in the LFD, that waste which has been treated in the manner describe above is to be regarded as 'no longer biodegradable'**. This would make the link that is lacking in the LFD.
3. **Amend the Article 5(5) target in the LFD to read as follows**:
    - *Member States shall take the necessary measures to ensure that by 2030 the amount of municipal waste landfilled without treatment prior to landfilling, with treatment defined as per Article [X] is reduced to zero.*

    Art 5a(1) of the LFD, regarding measuring progress towards the target, would need to be amended accordingly (to align with the preceding target);

Potential Outcome

This above would have the following effects:

1. Other things being equal, reduce the amount of waste that would otherwise be sent for landfill (by capturing some recyclables, and potentially, some materials suitable for coincineration, from LMW);
2. rendering landfilling of untreated LMW no longer feasible;
3. allowing landfilling only of waste which has been treated to reduce its potential to generate methane, and in cells designed to oxidise remaining methane fluxes as they pass through the surface of the landfill;

Option 2b: Background / Justification

Currently, there is an unwarranted preference for incineration over landfill, even if landfilling is of waste which has undergone treatment aligned with the above definition.[8] This leads to unwarranted effort, and as importantly, expenditure in moving waste from landfilling to incineration.

Proposed Approach

We would propose:

1. **Removing the R1 formula in Annex II of the WFD so that municipal waste incineration is no longer able to be classified as 'recovery' on the basis of energy generation.** This is important since much of the legislation urges an unwarranted preference for 'other [i.e., non-material] recovery' over and above landfill, even if the waste is subject to 'treatment' as defined above. The easiest way to address this is to remove the formula, which has lost relevance in respect of the resources that might be displaced by incinerators in the context of a decarbonising energy system in the EU;[9]
2. **Either through Article 27 of the WFD, or through Article 44 of the IED[10] (or both), mandating the use of mixed waste sorting systems of a defined quality prior to incineration. All (municipal) waste sent for incineration / co-incineration would need to demonstrate that it had first been subject to SLMW in line with Annex 1**. This could also be defined as a requirement for the 'treatment of waste prior to incineration' (mirroring the requirement in respect of landfill – see above) with criteria for SLMW made common to landfills and incinerators.

Another possible approach would be to re-formulate R1 for municipal waste incinerators such that qualifying facilities would be only those which accept leftover mixed wastes from municipal sources where they have been through SLMW that meet specific criteria (see Annex 1).

[8] Equanimator (2021) *Rethinking the EU Landfill Target*, Report for Zero Waste Europe, October 2021, zerowasteeurope.eu/library/rethinking-the-eu-landfill-target

[9] We noted in a previous report, '*that of the 61 million tonnes of municipal waste sent for some form of incineration in the EU, less than 2% (just over a million tonnes) was sent to facilities that failed to meet the R1 criterion*' (see Equanimator (2023) *Debunking Efficient Recovery: The Performance of EU Incineration Facilities*, January 2023). Note that in reality, facilities might not have 'failed' to achieve the R1 status: they may, simply, not have sought that status (which might be of limited relevance given that there are no longer 'recovery' targets under the PPWR, and if a facility has no plans to import waste from other countries). zerowasteeurope.eu/wp-content/uploads/2023/01/Debunking-Efficient-Recovery-Full-Report-EN.docx.pdf

[10] Article 27 contains an outdated reference to the Directive on Integrated Pollution Prevention and Control which has been superseded by the Industrial Emissions Directive (IED). The WFD Article 27 indicates that where activities are covered by the IED, then they should be dealt with there. The IED, at Article 10, refers to a list, in Annex I, of activities within its scope. Annex I includes, at 5(3)(b)(iii), 'Recovery, or a mix of recovery and disposal, of non-hazardous waste with a capacity exceeding 75 tonnes per day involving [activities including] [...] pre-treatment of waste for incineration or co-incineration'. Given the reference above to 'treatment of waste prior to landfilling', then SLMW could be considered, here, as pre-treatment of waste for incineration or co-incineration. We would expect the capacity of most SLMW facilities to exceed the IED threshold.

Potential Outcome:

Where legislation makes appropriate requirements for separate collection / high quality recycling (see above), then the measure applied to incineration would:

1. Other things being equal, reduce the amount of waste that would otherwise be sent for incineration / co-incineration (by capturing some recyclables, and potentially, some materials suitable for coincineration, from LMW);
2. render incineration (/ co-incineration[11]) of untreated LMW no longer feasible;
3. allow incineration / co-incineration only of waste which has been subjected to SLMW that reduces its potential to generate its specific (per tonne) and absolute (total amount of) emissions of carbon dioxide, and specifically, the fossil carbon dioxide.

Option 3: Target for Residual Waste

Background / Justification

One of the potential drawbacks with recycling targets - especially in the context of moves to foster a less linear, and more circular, economy – is that the targets fail to incentivise waste prevention, which might occur through adoption of practices such as design of products for longer life, and activities such as remanufacture, repair, (preparation for) reuse, and adoption of refill models. This also has particular relevance as regards biowaste, where significant contributions to recycling targets can be made through enabling residents and businesses to set out large quantities of 'wastes' collected from gardens and parks, much of which might be avoidable (by planting suitable species), some of which may be amenable to being dealt with in-situ, and some of whose collection might be detrimental to wildlife (as a result of 'over-tidying').

As a way of reducing the pressure to collect more and more waste for recycling, and so as not to penalise those households where waste generation is lowered as a result of circular economy practices, the focus here is to shift to the amount of waste which remains after recycling.

Proposed Approach

As regards possible means to achieve further pressure to reduce incineration / landfilling, we would propose:

1. **Establish a target to reduce residual municipal waste to less than 175kg/inh, to be achieved on a similar schedule as the existing WFD recycling targets**. This quantity would be reported, for landfills, at the point prior to waste entering into the stabilisation process, or for incinerators, at the point it enters the incinerator furnace. The inclusion or exclusion of specific additional components

[11] It seems more likely that LMW would be treated prior to co-incineration, though not necessarily through a process akin to SLMW (the calorific value of plastics is likely to be sought after by co-incineration facilities).

might be considered (for example, wastes which are rejects from facilities sorting MSW should, ideally, be included in the figures).
Other adjustments to this target might be necessary, for example, to make allowances for the role of tourism in the economy of the Member States, and the role played by work-patterns in influencing the figures (Luxembourg providing, perhaps, an interesting example of this influence). This could occur by creating an adjustment in terms of a net change in 'inhabitant equivalents', linked to overnight stays for work / leisure, for example.
The target would be revisited prior to 2030 with a view to reflecting on the level of ambition in the light of more harmonised reporting on MSW, and progress in recycling and waste prevention. The review would anticipate tighter limits in future years.

Potential Outcome

This target is a key one, used by a number of leading jurisdictions. The Flemish Region of Belgium was an early pioneer, and others, such as Wales, have determined to track the quantity. The targets could be used to replace the existing recycling targets. Indeed, there might be some merit in considering a phased transition to such a target alongside a target for the proportion of recycling that is achieved which is of 'high quality' (see Option 1b above). Setting targets, and adjusting them downwards over time would support the drive towards a circular economy.

A Note on Effects of EU-ETS

It is worth noting that the inclusion of municipal waste incineration in the EU-ETS ought to have an impact on the introduction of SLMW in the EU. In practice, whether or not it does so may depend on whether or not, for example, EPR schemes are geared up to support the additional recycling that SLMW can offer, or on the nature of the contractual relationship between operators and the municipalities.

Operators of incineration facilities are unlikely to implement sorting schemes at the front of their facilities if these imply a loss of revenue which cannot easily be recovered. So, in cases where freeing up capacity (by use of SLMW) is unlikely to see new waste being made available to the facility, then given that the value of EUAs is unlikely to be certain over the medium-term (the period of the investment), operators are likely to be reluctant to invest, notwithstanding the potential reduction in the need to purchase EUAs.

Furthermore, if operators have contracts with municipalities whereby inclusion of incineration in the EU-ETS is governed by 'change of law' clauses, then incinerator operators may be able to argue the case for a pass through (to the municipality) of purchasing EUAs. That would remove any incentive to change behaviour on the part of the incinerator operator.

Taking the first matter, it would be sensible to clarify that EPR schemes should support SLMW to the extent that they contribute to meeting recycling targets. Article 8a(4)(a) of the WFD could usefully clarify that EPR schemes are expected to cover such costs as part of the expected cost coverage. Currently, the wording is as follows:

> *— costs of separate collection of waste and its subsequent transport and treatment, including treatment necessary to meet the Union waste management targets, and costs necessary to meet other targets and objectives as referred to in point (b) of paragraph 1, taking into account the revenues from re-use, from sales of secondary raw material from its products and from unclaimed deposit fees,*

The wording might be taken to restrict the cost coverage, by producers, to those which follow on from 'separate collection', though the clause '*treatment necessary to meet the Union waste management targets*' could be considered to extend to sorting and processing of LMW. It might be useful to amend this paragraph as follows:

> *— costs of separate collection of waste and its subsequent transport and treatment, ~~including~~* ***as well as the costs of any other*** *treatment necessary to meet the Union waste management targets, and costs necessary to meet other targets and objectives as referred to in point (b) of paragraph 1, taking into account the revenues from re-use, from sales of secondary raw material from its products and*

from unclaimed deposit fees,
[strikeout shown for existing text, our additions in blue]

Regarding the second matter (pass through of costs to municipalities), the details of how incineration will be included under the EU-ETS would appear to be important. In particular, if the approach to Monitoring, reporting and Verification is based on a system which assumes 'factors' for a tonne of MSW being incinerated, so the incentive to reduce emissions is further diminished, and the likelihood of full pass through of costs under contracts may be correspondingly enhanced.

Finally, it should be considered that although the life-cycle CO2 reduction from using SLMW at the front of incinerators is significant, not all of these reductions relate to the emissions of the incinerator itself. Some of the GHG saving (between a third and a half of the total GHG saving) relates to material recycling. That does not translate into a saving to the operator in terms of its outlay on EUAs.

For these reasons, in order to secure the optimal deployment of SLMW alongside separate collection, the EU-ETS alone is unlikely to deliver the sorts of change that would help support a more circular economy by reducing the amount of waste sent to landfill and incineration.

Annex 1: Possible Criteria for SLMW

In the above:

> *Leftover mixed wastes are defined as the waste remaining after businesses / households have taken part in separate collection or waste segregation (e.g., at containerparks / bring-in sites)*
>
> *Residual wastes are defined as the waste which remains unsorted after the application of mixed waste sorting to the leftover mixed waste stream.*

Criteria for SLMW would be defined as follows:

> *Qualifying SLMW facilities are mechanical sorting facilities which meet the following minimum performance criteria:*
>
> *Efficiency of sorting into streams achieves:*
>
> - *For plastics >75%, with non-target materials contributing no more than 10%;*
> - *For steel >80%, with non-target materials contributing no more than 4%; and*
> - *For aluminium >60%, with non-target materials contributing no more than 6%;*
>
> *These sorting efficiencies will be assessed on the basis of the weight of output material class as a proportion of the input to the sorting facility. The ratio shall be based on measurement of the quantity positively sorted into the output stream (Qp) and the quantity which evades sorting (in the residual stream) (Qr), as assessed using batch-based sampling of the residual waste left following the sorting of the measured quantity. The ratio shall be calculated as:*
>
> *Efficiency of sorting = Qp/(Qp + Qr)*
>
> *In the case of plastics, a further condition is that the plastics sorted via mixed waste sorting should be destined for recycling, and only where suitable markets do not exist should they be sent to either landfills (as a means to sequester the fossil-derived carbon), or to thermal processing facilities which are included under the EU-ETS. No more than:*
>
> - *15% of the sorted plastics in the years to 2027;*
> - *10% of the sorted plastics from 1 January 2028 to 31 December 2033;*
> - *5% of the sorted plastics from 1 January 2034 onwards,*

may be dealt with through the combination of these management routes.

Annex 2: Separate Collection and the Role of Sorting of Leftover Mixed Waste

Background

The urgency of the need to enhance recycling of packaging and other wastes has recently been underscored by the commencement, by the European Commission, of infringement procedures against all 27 EU Member States for falling short of legally binding collection and recycling targets.[12] The lowering of the use of energy, to which recycling can contribute, also highlights its potential relevance in respect of climate mitigation, whilst its impact on reducing demand for primary resources can also reduce pressure on ecosystems, and attendant impacts on biodiversity.

In the face of the apparently clear need to step up progress, there remain concerns regarding the role that could be played in respect of facilities designed to sort recyclables from what we have termed elsewhere 'leftover mixed waste'. The term 'leftover mixed waste' (LMW) was coined specifically to highlight the difference between 'waste remaining after the application of separate collection' and the genuinely 'residual waste' which might remain after the opportunity for sorting of leftover mixed waste (SLMW) has been taken up. Nonetheless, there are some who are nervous about the potential for SLMW to supplant separate collection systems, which already exist in many countries, and which function with varying degrees of success in those countries.

This paper is designed to highlight to what extent existing policy and law requires 'separate collection', and also, to what extent it allows for processes designed for sorting leftover mixed waste (SLMW). It considers what might be needed to ensure complementarity of the roles of separate collection (SC) and SLMW. In the

[12] Packaging Europe (2024) All 27 Member States miss collection and recycling targets and face infringement procedure, 1st August 2024.

discussion, we highlight where there is potential for the two to come more into conflict, or where there is a greater risk that SLMW might supplant SC. In doing so, we make reference to the existing policy and law, and where there may be some need for further clarification or elaboration, we highlight where we believe that to be necessary.

What Does EU Policy and Law Require as Regards Separate Collection?

The Waste Framework Directive

The Waste Framework Directive sets out, at Article 10, the desirability of separate collection as a means to assist recovery of waste, and in the preference ordering set out at Article 4 (the waste hierarchy). Paras 1 and 2 of Article 10 state:

> *1. Member States shall take the necessary measures to ensure that waste undergoes preparing for re-use, recycling or other recovery operations, in accordance with Articles 4 and 13.*
>
> *2. Where necessary to comply with paragraph 1 and to facilitate or improve preparing for re-use, recycling and other recovery operations, waste shall be subject to separate collection and shall not be mixed with other waste or other materials with different properties*

Article 10(3) goes on, however, to articulate conditions under which Member States may avail themselves of derogations from Art 10(2) above:

> *3. Member States may allow derogations from paragraph 2 provided that at least one of the following conditions is met:*
>
> *(a) collecting certain types of waste together does not affect their potential to undergo preparing for re-use, recycling or other recovery operations in accordance with Article 4 and results in output from those operations which is of comparable quality to that achieved through separate collection;*
>
> *(b) separate collection does not deliver the best environmental outcome when considering the overall environmental impacts of the management of the relevant waste streams;*
>
> *(c) separate collection is not technically feasible taking into consideration good practices in waste collection;*

(d) separate collection would entail disproportionate economic costs taking into account the costs of adverse environmental and health impacts of mixed waste collection and treatment, the potential for efficiency improvements in waste collection and treatment, revenues from sales of secondary raw materials as well as the application of the polluter-pays principle and extended producer responsibility.

Member States shall regularly review derogations under this paragraph taking into account good practices in separate collection of waste and other developments in waste management.

From the above, Article 10 requires separate collection where it is necessary 'to ensure that waste undergoes preparing for re-use, recycling or other recovery operations, in accordance with Articles 4 and 13', but even in these circumstances, it allows for derogations from the requirement. In other words, separate collection is not required wherever a) it is not necessary as per Article 10(1-2), or b) any of the derogations as per Article 10(3) are considered to apply.

Article 11 also makes reference to separate collection. 11(1) states:

Member States shall take measures to promote high-quality recycling and, to this end, subject to Article 10(2) and (3), shall set up separate collection of waste.

Subject to Article 10(2) and (3), Member States shall set up separate collection at least for paper, metal, plastic and glass, and, by 1 January 2025, for textiles.

It seems relevant at this point to highlight that nowhere in EU policy and law is the term 'high-quality recycling' defined. Below, we will see that the proposed Packaging and Packaging Waste Regulation introduces wording that might be considered as an attempt to give substance to the term, though without defining it explicitly. There is also an option offered in non-statutory guidance.

Article 11(2) sets specific targets that should be met (with Article 11(3) elaborating conditions where a 5-year postponement of the targets may be applied):

(a) by 2020, the preparing for re-use and the recycling of waste materials such as at least paper, metal, plastic and glass from households and possibly from other origins as far as these waste streams are similar to waste from households, shall be increased to a minimum of overall 50 % by weight; [...]

(c) by 2025, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 55 % by weight;

(d) by 2030, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 60 % by weight;

(e) by 2035, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 65 % by weight.

The latest of these targets will, in general, require Member States to take additional measures to those they currently deploy. This is especially true since the rules for calculating whether or not the recycling targets at Article 11(2) are met include, at Article 11a(1) and (2), the following:

(c) the weight of the municipal waste recycled shall be calculated as the weight of waste which, having undergone all necessary checking, sorting and other preliminary operations to remove waste materials that are not targeted by the subsequent reprocessing and to ensure high-quality recycling, enters the recycling operation whereby waste materials are actually reprocessed into products, materials or substances.

2. For the purposes of point (c) of paragraph 1, the weight of the municipal waste recycled shall be measured when the waste enters the recycling operation.

By way of derogation from the first subparagraph, the weight of municipal waste recycled may be measured at the output of any sorting operation provided that:

(a) such output waste is subsequently recycled;

(b) the weight of materials or substances that are removed by further operations preceding the recycling operation and are not subsequently recycled is not included in the weight of waste reported as recycled

Substance has been given to Article 11a by the relevant Implementing Decision.[13]

Because food wastes (and waste from parks and gardens) generally form a significant share of municipal waste (typically of the order 20% of municipal waste), it will likely be impossible for Member States to achieve these targets without ensuring recycling of (as much as possible of) these wastes. For that reason, Article 22 takes on particular significance. It reads:

1. Member States shall ensure that, by 31 December 2023 and subject to Article 10(2) and (3), bio-waste is either separated and recycled at source, or is collected separately and is not mixed with other types of waste.

[13] Commission Implementing Decision (EU) 2019/1004 of 7 June 2019 laying down rules for the calculation, verification and reporting of data on waste in accordance with Directive 2008/98/EC of the European Parliament and of the Council and repealing Commission Implementing Decision C(2012) --2384.

Member States may allow waste with similar biodegradability and compostability properties which complies with relevant European standards or any equivalent national standards for packaging recoverable through composting and biodegradation, to be collected together with bio-waste.

2. Member States shall take measures in accordance with Articles 4 and 13, to:

(a) encourage the recycling, including composting and digestion, of bio-waste in a way that fulfils a high level of environment protection and results in output which meets relevant high-quality standards;

(b) encourage home composting; and

(c) promote the use of materials produced from bio-waste.

3. By 31 December 2018, the Commission shall request the European standardisation organisations to develop European standards for bio-waste entering organic recycling processes, for compost and for digestate, based on best available practices.

Although derogations from Article 10(2) might seem to be applicable in Article 22(1) above, the relevance of the derogations afforded by Article 10(3) are far less clear from 2027 onwards since Article 11a(4), relating to the calculation of the recycling targets set out in Article 11(2), states:

4. For the purpose of calculating whether the targets laid down in points (c), (d) and (e) of Article 11(2) and in Article 11(3) have been attained, the amount of municipal biodegradable waste that enters aerobic or anaerobic treatment may be counted as recycled where that treatment generates compost, digestate, or other output with a similar quantity of recycled content in relation to input, which is to be used as a recycled product, material or substance. Where the output is used on land, Member States may count it as recycled only if this use results in benefits to agriculture or ecological improvement.

As from 1 January 2027, Member States may count municipal bio- waste entering aerobic or anaerobic treatment as recycled only if, in accordance with Article 22, it has been separately collected or separated at source.

The purpose of this measure appears to have been to reduce the extent to which the biological treatment of LMW or residual waste is used as a basis to meet the recycling targets set out in Article 11(2). That interpretation is supported by Article 4 of the relevant Implementing Decision.[14]

[14] Commission Implementing Decision (EU) 2019/1004 of 7 June 2019 laying down rules for the calculation, verification and reporting of data on waste in accordance with Directive 2008/98/EC of the European Parliament and of the Council and repealing Commission Implementing Decision C(2012) 2384.

Article 20 provides for the separate collection of household hazardous waste:

> *1. By 1 January 2025, Member States shall set up separate collection for hazardous waste fractions produced by households to ensure that they are treated in accordance with Articles 4 and 13 and do not contaminate other municipal waste streams.*

No reference is made to the Article 10 derogations, so this ought to be interpreted as a requirement, subject to the term 'separate collection' being clearly elaborated. The reference in the definition to 'specific treatment' also seems most relevant to household hazardous waste.

What do we Mean by 'Separate Collection'?

The term 'separate collection' is defined in the Waste Framework Directive under Article 3(11) as follows:

> *where a waste stream is kept separately by type and nature so as to facilitate a specific treatment;*

After the WFD was revised in 2008 (when the same definition was included), a Guidance document was produced which sought to clarify, for the purposes of implementation, the meaning of some of the terms in the Directive.

The 2012 Guidance

It is important to note that in the 2008 version, the wording of Article 10 was shorter, with Articles 10(2) and 10(3) presented as one paragraph. Nonetheless, the requirement where necessary, and where technically, environmentally and economically practicable (the derogations replicated in the new Article 10(3)) were present. The Guidance, which was not legally binding, referenced Recital 28 of the 2008 iteration of the Directive (2008/98/EC):[15]

> *The basic rationale behind the idea of separate collection is reflected in recital 28 WFD:*

[15] European Commission, DG Environment (2012) Guidance on the interpretation of key provisions of Directive 2008/98/EC on waste, June 2012, ec.europa.eu/environment/waste/framework/pdf/guidance_doc.pdf

> *'In line with the objective of helping move the EU closer to a recycling society, and as a means to facilitating or improving its recovery potential, waste should be separately collected before undergoing recovery operations that deliver the best overall environmental outcome'.*

Additionally, the recital outlines that the separation of hazardous compounds from waste streams may contribute to achieving environmentally-sound management. Thus, separate collection aims at facilitating recovery, and specifically recycling, and enhancing the quality of recovered products, as well as identifying and eliminating hazardous compounds in mixed waste in order to reduce impacts.

Recital 28 WFD refers to 'source separation', calling for separation at the moment when waste is generated for the first time, rather than separating already mixed waste.

In line with these objectives, separate collection is sought in order to ultimately achieve treatment, and in particular the recovery and recycling of separated fractions of waste. In practice, this would require separate storage and transport of separately collected waste fractions as well as an observance of the ban on mixing waste (see Chapter 5 below).

The Guidance proceeded to elaborate when separate collection might be necessary, and when -- given that the WFD does not require it in all cases (Articles 10(1-2)) and allows for derogations under Art. 10(3)(b)-(d) - it might not be.

In any event, Recital 41 of the currently applicable WFD (revised as of 2018) reads:

> *In order to avoid waste treatment which locks in resources at the lower levels of the waste hierarchy, increase preparing for re-use and recycling rates, enable high-quality recycling and boost the uptake of quality secondary raw materials, Member States should ensure enhanced compliance with the obligation to collect waste separately, as laid down in Articles 10(2) and 11(1) of Directive 2008/98/EC, including the obligation to set up separate collection for at least paper, metal, plastic and glass waste that Member States had to meet by 2015, and should introduce separate collection of bio-waste, hazardous waste produced by households and textile waste. Where appropriate, hazardous bio-waste and packaging waste containing hazardous substances should be subject to specific collection requirements.*

The first part of Recital 42 of the 2018 revision adds:

> *Separate collection could be achieved through door-to-door collection, bring and reception systems or other collection arrangements. While the obligation to separately collect waste requires that waste be kept separate by type and nature, it should be possible to collect certain types of waste together provided that this does not impede high-quality recycling or other recovery of waste, in line with the waste hierarchy.*

This recital again acknowledges that 'separate collection', as defined in the Directive, might not always be necessary. Since some materials can be collected together with others without affecting the likelihood of their being recycled, or the quality of the output, then in those cases, separate collection would not be required. In other words, the 'necessary' test, as per Article 10(2) would not be met, but that might not necessarily apply to all materials and all 'mixes' of materials being collected.

The Guidance document confirms the relevance of the test of whether separate collection is 'necessary':

> *Article 10(2) WFD encourages Member States to make use of separate collection of waste to facilitate or improve recovery. This provision applies to all waste streams. A precondition is that the separate collection is 'technically, environmentally and economically practicable' [...]*
>
> *Further, by referring to compliance with Member State's obligations under Article 10(1) WFD, Article 10(2) WFD makes it clear that the separate collection has to be a necessary measure to ensure that waste undergoes recovery operations in accordance with the principles set out in Articles 4 (waste hierarchy, see Chapter 3 above) and 13 (Protection of human health and the environment) WFD.*
>
> *In cases where the abovementioned preconditions are met, Member States are obliged to introduce separate waste collection by 2015 for paper, metal, plastic and glass.*

It goes on to states, as regards Article 11:

> *Article 11 is lex specialis in comparison with Article 10, meaning that in cases where separate collection is needed to facilitate waste recycling, Article 11 shall apply*

And:

> *Article 11(1), paragraph 3 WFD contains a direct obligation ('shall be set up') for Member States to introduce 'at least' separate collection for the four explicitly-listed waste streams — paper, metal, plastic and glass — by 2015. However, the provision contains a reference to Article 10(2) WFD, and by this to the condition that the separate collection of these waste streams is 'technically, environmentally and economically practicable' (see Chapter 4.4 below). The viability of separate collection of the dry fractions from household waste has been demonstrated by the longstanding practice and experience in many Member States. Therefore, separate collection of these waste streams should in principle also be introduced in the remaining Member States, provided the abovementioned preconditions are met*

The Guidance goes on, however, to support the wording of recital 42 in the current Directive:

> *On the other hand, setting up a separate collection is also subject to the principle of proportionality (subject to Article 10(2) WFD: necessity and technical, environmental and economic practicability).*

Considering that the aim of separate collection is high-quality recycling, the introduction of a separate collection system is not necessary if the aim of high-quality recycling can be achieved just as well with a form of co-mingled collection.

So, co-mingled collection of more than one single waste streams may be accepted as meeting the requirement for separate collection, but the benchmark of 'high-quality recycling' of separately collected single waste streams has to be examined; if subsequent separation can achieve high-quality recycling similar to that achieved with separate collection, then co-mingling would be in line with Article 11 WFD and the principles of the waste hierarchy. Practically, this usually excludes co-mingled collection of bio-waste and other 'wet' waste fractions with dry fractions such as e.g. paper. On the other hand, subject to available separation technology, the co-mingled collection of certain dry recyclables (e.g. metal and plastic) should be possible, if these materials are being separated to high quality standards in a subsequent treatment process.

The matter given primacy in the Guidance is that of quality, and the benchmark appears to be the quality achievable through separate collection: if it proves possible to deliver materials of equivalent quality, for the purposes of recovering the materials collected, then materials might not need to be collected as separate streams.

It is worth reflecting for a moment upon this: it might not necessarily be the establishment of a 'separate' collection itself that guarantees quality. For example, the quality of what is collected from litter bins that seek to collect one material separately from another might be very different to what may be achieved through a relatively frequent door to door collection where the collection of a given material separately from others takes place as part of a well-designed overall service offering.[16] The undefined objective of 'high quality recycling' might well be the aim of separate collection, but whether or not it is achieved as a result of attempts to separately collect waste will depend upon the specific circumstances in which separate collection takes place.

The more general derogations – represented in the 2008 Directive by whether separate collection was technically, environmentally and economically practicable, and in the revised Directive under Articles 10(3)(b), (c) and (d) - are dealt with in a somewhat dismissive manner by the Guidance:

'Technically practicable' means that the separate collection may be implemented through a system which has been technically developed and proven to function in practice. 'Environmentally practicable' should be understood such that the added value of ecological benefits justify possible negative environmental effects of the separate collection (e. g. additional emissions from transport). 'Economically practicable' refers to a separate collection which does not cause excessive costs in

[16] Another interesting comparison might be the separate collection, door-to-door, of food waste, and the separate collection, through bring systems, of biowaste. Indeed, should the latter – comprising food waste and waste from parks and gardens, be considered 'separate collection' at all?

comparison with the treatment of a non-separated waste stream, considering the added value of recovery and recycling and the principle of proportionality.

These do not give a clear basis for adjudication on the issues they address, though the technically practicable argument might be considered difficult to call upon as a basis for derogation.

Furthermore, a key change between the 2008 and 2018 versions was a strengthening of the wording of the derogations, and the terms under which they might be considered to apply: the 2018 formulation places greater weight on demonstrating why a derogation from separate collection might be necessary. It remains, nonetheless, unclear as to what test would be required to demonstrate that separate collection would (or would not) imply, for example, 'disproportionate economic costs taking into account the costs of adverse environmental and health impacts of mixed waste collection and treatment, the potential for efficiency improvements in waste collection and treatment, revenues from sales of secondary raw materials as well as the application of the polluter-pays principle and extended producer responsibility'.

The 2020 Guidance

The Guidance on separate collection from 2020 takes the matter further.[17] Chapter 2 of the Guidance sets out a view as to what the law requires, and when, and how, derogations should be considered eligible and acceptable. It is important to note, however, that the report notes:

'The guidance in this chapter is intended to assist MS and stakeholders, but it is not binding. The only binding requirements are those stipulated by the directive

This is important, not least since – in our view – the Guidance proposes a rather more stringent interpretation of the law than a reading of the Directive clearly warrants. This was less apparent in the 2012 Guidance, which – unlike the 2020 version – was not a report from consultants, but reflected the view of the Commission. The definition of separate collection had not changed between the two sets of Guidance, though Article 10 had changed.

The legal position is set out in Guidance starting from 10(2), which is unfortunate since 10(2) references 10(1), which includes the rather crucial clause 'where necessary' as a qualifier, implicitly, to the general requirement for separate collection. It goes on to interpret terms which are undefined in law, for example:

[17] EY, PlanMiljØ, ACR+, RWA and Öko-Institut (2020) Guidance for separate collection of municipal waste, Final deliverable of the study to support the Commission in establishing guidelines for separate collection of waste under Framework Contract N° ENV/B.3/FRA/2017/0005, April 2020.

The term 'waste stream' is not defined by the WFD. However, it is a term that is widely used and that can refer to the waste materials (e.g. plastics, metals) or to the products that originated the waste (e.g. packaging, electronics)9.

The waste streams can be linked to the 'types of waste' that have been codified in the List of Waste (LoW), Decision 2000/532/EC10. Based on the good practices presented in chapters 3-7, the waste types of the LoW can be clustered in order to determine the minimal waste streams that have to be collected separately in order to 'facilitate a specific treatment'.

It is questionable for Guidance to step beyond the Directive, and to effectively define these terms. The term 'Paper', for example, is taken to mean 'paper and cardboard'. Linking 'waste streams' to the List of Waste is not suggested anywhere by the Directive, and still less it suggested that some LoW codes should be linked to the 'waste streams' based on 'good practice'.

The derogations are considered, and it is suggested that these might be applied differently over time:

Article 10 (3) also stipulates that MS shall regularly review derogations taking into account good practices (from other countries) and technological evolutions. The waste management sector has proven to be an innovative sector that can realize technological breakthroughs. Consequently, technological progress may make accepted derogations for separate collection unjustified owing to new collection techniques. Conversely, new sorting or recycling techniques may generate an interest in new derogations.

The report recognises that 'high quality recycling' is not defined in the Directive.

Directive 2018/851 has also removed the rather vague reference to 'the necessary quality standards for the relevant recycling sectors'. As a consequence, the definition of 'high quality recycling' is not determined. The Directive also does not offer any help on how to calculate this concept.

Instead of accepting the limits to which the Directive's content can guide action, the report then proceeds to offer a definition of 'high quality recycling':

High-quality recycling can be understood as a subconcept of recycling. Actually, scholars quite commonly distinguish recycling subconcepts such as open-loop vs losed-loop14 or upcycling vs downcycling15. It highlights that resources due to technical deficiencies, mixed collection or contamination, often lose quality16 with every recycling cycle they go through17. For example, metals that are recycled in low-value alloys, plastics from packaging that are recycled as street furniture or flower pots, textiles that are recycled as rags. In this perspective, the high-quality recycling from Directive 2018/851 can be understood as recycling that does not cause the recycled resources to lose value over time. More formally:

High quality recycling is the reprocessing of waste into materials which have a similar or higher economic value in comparison to the products or applications from which the waste originates

Quite apart from this being a clear case of over-reach (vis a vis the Directive – arguably, the non-legally binding nature of this guidance makes this point less significant), the definition is problematic, based as it is on economic value, as opposed to functionality, and because the term 'similar' offers considerable latitude for interpretation.

The interpretation given to the Article 10(3) derogations in the Guidance also over-reaches the Directive. For each of the derogations under Article 10(3), a list of criteria is given, all of which are deemed necessary to apply in order for a derogation to be considered valid. Examples of the more extreme requirements are:

Article 10(3)(a):

There should be guarantees, contracts or concrete requests for the procurement and use of the recovered resources in high-value applications.

The process losses and contamination levels of the commingled process and of the applied sorting practices, including technology and infrastructure, should be equal or lower than the rates of resulting from separate collection schemes.

Article 10(3)(b):

If there are municipalities or regions with similar characteristics that have successfully implemented separate collection, then a derogation cannot be allowed.

A LCA or other structured environmental assessment that does an in-depth and quantified analysis is needed to motivate the use of the derogation. The scenarios taken into account for comparison should be appropriate and contain potential policy measures that give incentives for behavioral change (e.g. Pay-as-You-Throw). Moreover, the difference in results of the scenarios calculated by the LCA or alternative assessment should be significant to confirm that deviating from separate collection leads to a better environmental outcome.

Article 10(3)(d):

A CBA or other structured economic analysis should be available.

All internal and external costs/benefits should be taken into account and the economic flows should be correctly allocated and relevant for the analysis of the case.

If there municipalities or regions with similar characteristics that have implemented separate collection in a cost efficient way, then this derogation cannot apply.

Concluding that separate collection induces excessive costs for a specific case, can only occur if the good practices (see chapters 4-7) or success factors (see chapter 3) are properly implemented at regional or national scale. This includes considering to apply measures such as PAYT, EPR and disposal taxes.

The Guidance is somewhat more compelling in respect of hazardous waste, since there is no reference to derogations as per Article 10.

Summary

A summary view of the above might be that:

1. Separate collection of household hazardous waste should take place by January 2025;
2. separate collection of biowaste will be required as of 2027 for the simple reason that meeting the Article 11(2) targets will be impossible without it. Exactly how that happens – and in particular, the extent to which separate collection of food waste is prioritised over garden waste collections – is a matter of detail, but it seems likely that without tackling food wastes, the targets will be difficult to meet other than in Member States a small proportion of the population lives in urban areas;
3. for other key component (of municipal waste) materials, separate collection should be implemented wherever it is necessary to support the objectives of Articles 4 and 13, and where it is necessary to promote 'high-quality recycling';
4. The test of necessity might not necessarily require each individual material to be collected as a separated stream, in particular, where the alternative 'results in output from those operations which is of comparable quality to that achieved through separate collection'. There is no definition in the WFD (or elsewhere) of 'high-quality recycling', though the 2020 non-statutory Guidance seeks to provide one (see above). This type of collection, where more than one material might be separated from others, but not from each other, does not obviously, however, meet the formal definition of 'separate collection' in the Directive (and this is acknowledged in 2012 Guidance);
5. Separate collection might also not be necessary if the costs are deemed 'disproportionate', though the test for establishing that is rather vaguely worded (the derogation from the requirement of separate collection on 'technical' grounds seems more difficult, whilst the 'environmental' derogation seems closely bound up with the quality argument). Intriguingly, even if a derogation from the requirement for separate collection could still considered reasonable on cost grounds, Article 10(1) might suggest it would still need to be managed in line with Articles 4 and 13, but there is no clear indication as to any hierarchy as to what would be the form of management to which the system should 'derogate to' (i.e., if not separate collection, then what?). (The attempt in the 2020 Guidance to elaborate clear criteria which must all be met for a derogation to be claimed represent, in our view, over-reach vis a vis the Directive.)

Notwithstanding the above, the non-implementation of separate collection on economic grounds would not exempt a Member State from achieving its recycling and separate collection targets under Article 11(2), under the Packaging and Packaging Waste Directive, and under the Directive on the Reduction of the Impact of Certain Plastic Products on the Environment. It would follow that, to the extent that separate collection was not implemented in circumstances where it could otherwise be, on grounds of cost, then unless forms of

comingled collection (more than one material collected together, but not as LMW) are implemented, it would become more likely that SLMW was required, especially in order to achieve the highest recycling targets.

SLMW is not specifically outlawed by the WFD: Article 10(1), to which Art 10(2) refers, and which is the basis for the test of 'necessity' of separate collection, requires Member States to take measures to 'ensure that waste undergoes preparing for re-use, recycling or other recovery operations, in accordance with Articles 4 and 13.' If SLMW meets the Article 10(1) test, or if the derogations in Article 10(3) can be said to apply, then SLMW is a legitimate means to meet the requirements of Article 10(1), though Article 11(1) introduces the additional requirement to promote 'high quality recycling'.

Directive on the Reduction of the Impact of Certain Plastic Products on the Environment (often referred to as the Single-use Plastics Directive, or SUPD)

The Directive on the Reduction of the Impact of Certain Plastic Products on the Environment (the so-called Single-use Plastics Directive, or SUPD) also includes measures in relation to separate collection, at least as regards single use plastic beverage bottles (SUPBBs) under Article 9. [18] A specific Implementing Decision has been developed for the purposes of setting out how performance against the Article 9 targets is to be measured.[19]

Recital 27 of the preamble in the SUPD states:

> *Beverage bottles that are single-use plastic products are one of the marine litter items that are found the most on beaches in the Union. This is due to ineffective separate collection systems and low participation in those systems by consumers. It is necessary to promote more effective separate collection systems. Therefore, a minimum separate collection target should be established for beverage bottles that are single-use plastic products. While the obligation to separately collect waste requires that waste be kept separate by type and nature, it should be possible to collect certain types of waste together provided that this does not impede high-quality recycling in line with the waste hierarchy in accordance with Article 10(2) and point (a) of Article 10(3) of Directive 2008/98/EC.*

This refers to the WFD, and cites the specific derogation, set out in Article 10(3)(a) of the WFD, related to the achievement of quality outputs (see above).

The preamble to the SUPD (Recital 10) states:

> *This Directive is a lex specialis in relation to Directives 94/62/EC and 2008/98/EC. In the event of a conflict between those Directives and this Directive, this Directive should prevail within the scope of its*

[18] Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment.
[19] Commission Implementing Decision (EU) 2021/1752 of 1 October 2021 laying down rules for the application of Directive (EU) 2019/904 of the European Parliament and of the Council as regards the calculation, verification and reporting of data on the separate collection of waste single-use plastic beverage bottles.

application. That is the case for restrictions on placing on the market. In particular with regard to consumption reduction measures, product requirements, marking requirements and extended producer responsibility, this Directive supplements Directives 94/62/EC and 2008/98/EC and Directive 2014/40/EU of the European Parliament and of the Council (12).

It cannot be assumed, therefore, that derogations from Article 10(2) other than that at subparagraph (a) of Article 10(3) apply: only separate collection, or the type of collection envisaged at Article 10(3)(a) (i.e. that delivers equivalent quality), are acceptable. The same reference to Article 10(3)(a), and no other subparagraphs of Article 10(3), is made in Recital 5 of the Implementing Decision.

The wording of Article 2(4)(b) of the Implementing Decision includes, in the definition of separately collected waste single-use bottles those that:

have been collected together with other waste packaging fractions of municipal waste or with other non-packaging plastic, metal, paper or glass fractions of municipal waste collected separately for recycling,

Although imperfectly worded, the intent would appear to be to exclude cases other than those where fractions have been 'collected separately for recycling'. Waste single use bottles may be collected separately from mixed waste alongside other materials, subject to the presence of the other materials having no detrimental effect on the potential for the materials to be prepared for re-use or recycled. Furthermore, the first criterion in subparagraph (i) of Article 2(4)(b) requires that:

(i) the collection system does not collect waste likely to contain hazardous substances;

Given that the collection of leftover mixed waste could probably never guarantee that this criterion was met where it was reasonably applied (if hazardous substances are present in any municipal waste, then notwithstanding the existence of some schemes to collect (some) hazardous wastes separately, where do they go?), then it adds further weight to the view that SUPBBs separated from LMW are not to be counted towards the separate collection targets.[20]

The derogation under point (a) of Article 10(3) of Directive 2008/98/EC is subject to, as we have seen above, the condition that the alternative to separate 'results in output from those operations which is of comparable quality to that achieved through separate collection'. It seems reasonable to view this as giving substance to the requirement not to impede 'high-quality recycling', though recognising again that the term, 'high-quality recycling', is not defined anywhere in EU legislation.

[20] Of course, separately collected waste will contain hazardous substances if hazardous substances are a component of what is being separately collected. This would appear to simply reinforce the imperative of eliminating hazardous substances (for example, used as plasticisers or as additives for other reasons) from, for example, plastics.

The wording of Article 2(4)(b) of the Implementing Decision seems to re-interpret this (an alternative view would be that it supplements it). Instead of being explicit about the need to ensure that the quality of outputs are 'of comparable quality to that achieved through separate collection', the subparagraphs of Article 2(4)(b) require that:

> *(i) the collection system does not collect waste likely to contain hazardous substances;*
>
> *(ii) the collection of waste and the subsequent sorting are designed and carried out to minimise contamination of collected waste single-use bottles from waste plastics not originating from such bottles and other waste;*
>
> *(iii) quality assurance systems are set up by the waste operators in order to verify that the conditions set out in points (i) and (ii) are fulfilled.*

The question that arises from this is whether or not the subparagraphs under Article 2(4)(b) ensure that the outputs would be of comparable quality (in other words, do they reflect, or give adequate substance to, the derogation under Article 10(3)(a) of the WFD?). It is not clear that they do. Logically, given the Article 6(5) targets for recycled content under the SUPD, and recognising that the first of these (applicable in 2025) is linked to PET, the standard would be set with regard to EFSA's opinion. EFSA's Opinion (on the criteria to be used for safety evaluation of a mechanical recycling process to produce recycled PET intended to be used for manufacture of materials and articles in contact with food) includes a view that:

> *The Panel considered appropriate that the proportion of PET from non-food consumer applications should be no more than 5% in the input to be recycled.*

Nonetheless, broader considerations also apply: this italicised statement reflects the EFSA panel's view regarding how effective a process is in removing a conservatively set level of a surrogate contaminant, whether this leads to exposure levels that can be considered safe, and how this might be translated into an upper limit for PET from non-food consumer applications.

Note that this technical requirement does not necessarily require that all separately collected plastic bottles must be used in closed loops: it should, though, be the case that they could be so used with at least equal likelihood (if that were not the case, presumably it would reflect an inferior quality). It would follow that a test of any separate collection system would be whether or not:

1. it delivered outputs that would be acceptable to recyclers who deliver food grade rPET to the market;
2. the food grade rPET so delivered is acceptable to EU brandholders whose plastic bottles will need to integrate the rPET in a way that respects health and safety concerns, and so as to ensure the Article 6(5) targets are met.

This ought to require separate collection, or comingled collection, rather than collection and sorting from LMW.

Packaging and Packaging Waste Regulation (PPWR)

The PPWR is expected to have a significant impact on the management of packaging waste in the EU in the coming years. Given the preceding discussion, we consider now the implications of the PPWR in respect of separate collection, and the extent to which it is likely to lead to a change in the approach as regards separate collection, especially in respect of plastic packaging.

Recitals

The recitals to the PPWR suggest a strong preference for separate collection. Recital 31 states:

> *The producers, in the case of individual fulfilment of extended producer responsibility obligations, the entrusted producer responsibility organisations, or the packaging waste management operators when public authorities are responsible for the organisation of the management of packaging waste, should make sure that the packaging waste is collected separately, sorted and material recycled in installed infrastructure using established processes in a proven operational environment, and should provide the manufacturer with all the technical documentation ensuring that packaging is recycled at scale.*

Recital 46 states:

> *46) Separate collection of plastic waste is essential to have a direct, positive impact on the collection rate, on the quality of the collected material and the quality of the recyclates, It enables high-quality recycling and it boosts the uptake of quality secondary raw materials. Moving closer to a 'recycling society' helps to avoid waste generation and to use waste as a resource, avoiding to lock in resources at the lower levels of the waste hierarchy, with detrimental effects on the environment and disregarding environmentally sound management of waste. Separate collection also avoids the mix between hazardous and non-hazardous waste, ensuring the safety of the waste and of their shipment and avoiding pollution, as provided by international rules such as the Basel Convention of 22 March 1989 on the control of transboundary movements of hazardous wastes and their disposal(26), the United Nations Convention on the Law of the Sea of 10 December 1982(27), the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter of 29 December 1972 ('London Convention') and its 1996 Protocol ('London Protocol'), and Annex V to the International Convention for the Prevention of Pollution from Ships 1973 (MARPOL), as modified by the Protocol of 1978 relating thereto.*

This recital reflects, in our view, a slightly outdated view regarding the potential for achieving comparable quality, at least for plastic packaging, through SLMW, though we also note the issues raised above in relation to food contact packages.

Recital 47 mentions separate collection in the context of the Intergovernmental Negotiating Committee on Plastic Pollution:

> *(47) Furthermore, the discussion at international level within the different meetings of the Intergovernmental Negotiating Committee on Plastic Pollution to develop an international legally binding instrument on plastic pollution, including in the marine environment under the auspices of the UN Environmental Programme have demonstrated at international level the need to step up action concerning separate collection of plastics to limit its environmental impacts and to boost circular economy, in order to prevent the generation of waste and reduce the exploitation of natural resources, and the will of possible contracting parties to adopt measures in that direction.*

It is not clear that what the recital claims to have been demonstrated through this forum has indeed been demonstrated, notwithstanding that it might be desirable in many instances, and that given the complete absence of formal waste collection in many places, separate collection for recycling by waste pickers may be the only recycling that takes place in such locations.

Later recitals mentioning separate collection relate not just to plastics:

> *(137) Member States should provide for the measures implementing the extended producer responsibility, rules on separate collection of packaging waste and the labelling of waste receptacles where this Regulation does not provide for a full harmonisation on such measures. Furthermore, it should be possible for Member States to provide for additional requirements for the implementation of the extended producer responsibility, in accordance with Directive 2008/98/EC and this Regulation, provided such measures do not create barriers on the internal market. This Regulation does not regulate which operator is responsible for the collection of packaging waste and other national contractual arrangements for packaging waste collection. [...]*
>
> *(139) Member States might have already established separate waste collection and recycling systems, which are the basis for relevant national authorisations and contractual arrangements, when transposing Article 7 of Directive 94/62/EC in national law. Member States can continue to use these systems provided they correctly implement the obligations under this Regulation. [...]*
>
> *(142) It has been shown that well-functioning deposit and return systems ensure a very high collection rate and high-quality recycling, especially of beverage bottles and cans. In order to support the achievement of the separate collection target for single use plastic beverage bottles laid down in*

Directive (EU) 2019/904 and to further drive high collection rates and high-quality recycling of metal beverages containers, it is appropriate that Member States establish deposit and return systems. Those systems will contribute to the increase of the supply of good quality secondary raw material suitable for closed loop recycling and reduce beverage containers litter. [...]

(143) Deposit and return systems should be obligatory for single use plastic beverage bottles and metal beverage containers. Member States might also decide to include other packaging for other products or made of other materials in these systems, in particular single use glass bottles, and should ensure that deposit and return systems for single-use packaging formats, in particular for single use glass beverage bottles, are equally available for reusable packaging, where technically and economically feasible. They should consider establishing deposit and return systems also for reusable packaging. Member State should be allowed, while observing the general rules laid down in the TFEU and complying with the provisions set out in this Regulation, to adopt provisions which go beyond the minimum requirements set out in this Regulation, such as the charge of the deposit at the point of sale in the case of consumption in hospitality premises, or the obligation for all final distributors to accept the deposit bearing packaging regardless of the packaging material and format that they distribute or their sale surface area.

These statements seem sound, although one might highlight that recital 139 alludes to the fact that Member States already have separate collection systems in place, and it goes on to state that those States 'can continue to use these systems provided they correctly implement the obligations under this Regulation.' This is, perhaps, an important point: what if separate collection alone does not deliver the obligations of the Regulation as they are proposed? If separate collection systems cannot do so, should that then limit achievement? If there is a complementary approach that can further progress towards the obligations under the Regulation, might it not be sensible to deploy it (and under what conditions should it be deployed)?

As in the WFD, where metals separated post-incineration are concerned, the recitals make explicit allowance for a quality of recycling that falls below that achieved from separate collection:

(159) Member States should be enabled to take into account the recycling of metals separated after incineration of waste in proportion to the share of the packaging waste incinerated provided that the recycled metals meet certain quality criteria laid down in Commission Implementing Decision (EU) 2019/1004(45) laying down rules for the calculation, verification and reporting of data on waste in accordance with Directive 2008/98/EC.

If the argument is around the principle that separate collection ought to be the source of all recycling, then evidently, this recital, and the content of the Regulation itself (for example, see reference to Article 53 below) amounts to a partial rejection of that principle.

Articles

The recitals are not so significant unless the meaning of the Articles in the Regulation itself are not clear. Hence, the Articles take priority in determining what is likely to occur.

Taking the PPWD itself, Article 3 introduces some Definitions but applies the definition of separate collection in Directive 2008/98/EC (see above). Separate collection is invoked in other definitions - of 'recyclability', and 'packaging waste recycled at scale' – as follows:

> *(37) 'recyclability' means the compatibility of packaging with the management and processing of waste by design, based on separate collection, sorting in separate streams, recycling at scale and use of recycled materials to replace primary raw materials;*
>
> *(38) 'packaging waste recycled at scale' means packaging waste which is collected separately, sorted and recycled in installed infrastructure, using established processes proven in an operational environment which ensure, at Union level, an annual quantity of recycled material under each packaging category listed in Table 2 Annex II, equal to or greater than 30% for wood and 55% for all other materials; it includes packaging waste that is exported from the Union for the purpose of waste management and which can be considered to meet the requirements of Article 53(11);*

In Article 3(37), it is not clear what 'based on' is intended to imply, but an assessment of recyclability which assumed that separate collection had taken place, or that the items whose recyclability was to be assessed had been sorted from other items, might be reasonable. Article 3(38) could, however, prove more problematic if separate collection is considered an extremely expensive or difficult means via which to meet the 'recycled at scale' definition. On the other hand, closer inspection shows that the definition applies to categories set out in Table 2 of Annex II, and these are fairly 'aggregated' categories, so that the 'films/flexible' category includes everything from readily recycled materials such as clean PE films arising at the back of stores, to small format multi-material snack wrappers (which are included in 'Other flexible plastics including multi-materials – flexible' in the more detailed listing in Table 1 of Annex II). The fact that the categories are aggregated might weaken the significance of the reference to separate collection, and indeed, the meaning of 'recycled at scale' (given that it might be possible for this definition to be achieved for the aggregated category, even where packaging formats within that category might barely be recycled (if at all)). Much depends on the extent to which the assessment of recyclability takes place at a relatively aggregated level, or at the level of more accurately specified packaging formats.

Article 3(41) Article 3(41) of the PPWR introduced a definition as follows:

'high-quality recycling' means any recycling process which produces recycled materials that are of equivalent quality to the original materials, based on preserved technical characteristics, and that are used as a substitute to primary raw materials for packaging or other applications where the quality of the recycled material is retained'

This is suitable for packaging but might not be entirely appropriate for non-packaging materials (notably biowastes). The way in which the substitution is specified might also leave room for interpretation.

Article 6, which pertains to 'recyclable packaging', first makes the point (para 1) that all packaging placed on the market shall be recyclable. It then sets out the conditions which must hold in order for packaging to be considered recyclable. These rules are important since if they are not met, then packaging cannot be placed on the market from the relevant date.

Article 6(2) states the conditions for packaging to be considered recyclable:

(a) it is designed for material recycling, which enables the use of resulting secondary raw materials that are of sufficient quality when compared to the original material that it can be used to substitute primary raw materials, in accordance with paragraph 4;

(b) when it becomes waste, it can be collected separately in accordance with Article 48(1) and (3), sorted into specific waste streams without affecting the recyclability of other waste streams and recycled at scale, on the basis of the methodology set out in accordance with paragraph 5.

Packaging that is in compliance with the delegated acts adopted pursuant to paragraph 4 shall be deemed to comply with the condition set out in point (a) of this paragraph.

Packaging that is in compliance with the delegated acts adopted pursuant to paragraph 4 and implementing acts adopted pursuant to paragraph 5, shall be deemed to comply with both conditions set out in this paragraph.

Paragraph 2, point (a), shall apply from 1 January 2030 or two years after the date entry into force of the delegated acts referred to in paragraph 4, whichever is the latest.

Paragraph 2, point (b), shall apply from 1 January 2035 or five years after the date entry into force of the implementing acts referred to in paragraph 5, whichever is the latest.

Of note here is that Article 6(2)(a) appears to indicate a 'quality' of recycling, but it is not entirely consistent with Article 3(41):This could inform an alternative definition of 'high quality recycling'. Note also that the delegated acts referred to in the para 4 mentioned above would establish design for recycling criteria; indicate how to perform recyclability performance assessment; and propose a framework for modulation of fees paid

by obligated businesses under EPR. Importantly, the emphasis in the above is more on separability of materials, and on sortability, and somewhat less on collection per se. Only 6(4)(a)(i) and (ii) indicate a relevance of collection, though even here, the ability of the package to be sorted and recycled is given greater emphasis, presumably because the design of a package to enhance recyclability ought not to presume exactly how it is collected. Hence the DfR criteria shall:

> *(i) take into account the ability of packaging waste to be separated into different material streams for recycling, sorted and recycled, so that the resulting secondary raw materials are of sufficient quality compared to the original material and can be used to substitute primary raw materials for packaging or other applications where the quality of the recycled material is retained, where feasible;*
>
> *(ii) consider established collection and sorting processes proven in an operational environment and cover all packaging components;*

The criteria seem less strongly linked to separate collection than the wording in Article 3 (and Recitals) suggested it might be. Indeed, the repeated references to sorting suggest that it is accepted that packages that are not generally 'recycled as one stream' (it is not generally the case that all types of plastic packaging are sent to one reprocessing line, but rather, even if 'plastics' are collected as a single stream, sorting will be required). Not all packaging is envisaged as being separately collected, and whether packages are separately collected or not does not seem to affect the assessment of their recyclability. The collection service could, nonetheless, affect the nature of the material that a given otherwise-recyclable package may replace when it is recycled from that collection system. The package, though, cannot be designed for 'a form of collection', even if its use may affect whether it is likely to be collected at all.

Note that Article 48 paras (1) and (3), referenced in Article 6(2)(b) (see above), have relevance given that what is referenced is that a recyclable package 'can be collected separately in accordance with Article 48(1) and (3), sorted into specific waste streams without affecting the recyclability of other waste streams and recycled at scale'. This sentence itself bears closer examination since it again implies sorting of separately collected packages. It is also difficult to imagine why a package could not be 'separately collected' (so even if it might not be, surely it 'can be'). It is also unclear why it seems to be considered that separate collection of something affects 'recyclability of other waste streams' unless the 'other waste streams' are streams being collected alongside the packages being considered. That begs the question as to whether the packages being considered are being 'separately collected': there seems to be some confusion here between what is separately collected, as defined in Article 3 of the WFD, and what is collected commingled, separately from LMW. The latter is, interpreting existing law and guidance, a form of collection that is (or to be precise, may be) allowable under a derogation from Article 10(2) and (3) as long as the quality of any of the materials being collected commingled is not undermined by the others with which it is co-collected. Properly defined, separate collection would not

affect other waste streams. Just because the Commission's Guidance deems commingled collections to be acceptable given Article 10 of the WFD, it does not follow that commingled collection and separate collection are the same thing: they are not. There are also 'degrees' of commingling, and the Guidance anticipated some commingling that might lower the quality of recycling, and so might not, as a result, qualify for a derogation under the WFD criteria. In short, the wording is at least suggestive of some confusion between 'separate collection', and 'commingled collection' that occurs independently of SLMW.

Article 48, which is entitled 'Return and Collection Systems', and cross references, and falls under Section 4 on 'Return, collection, deposit return systems', reiterates elements of, Article 10 of the WFD:

> *1. Member States shall ensure that systems and infrastructures are set up to provide for the return and separate collection of all packaging waste from the end users, in order to ensure that it is treated in accordance with Articles 4, 10 and 13 of Directive 2008/98/EC, and to facilitate its preparation for re-use and high-quality recycling. Packaging complying with design for recycling criteria as established in delegated acts adopted under Article 6(4) of this Directive shall be collected for recycling. Incineration and landfill of such packaging is not to be allowed, with the exception of waste resulting from subsequent treatment operations of separately collected packaging waste for which recycling is not feasible or does not deliver the best environmental outcome.*
>
> *2. In order to facilitate high quality recycling, Member States shall ensure that comprehensive collection and sorting infrastructures are in place to facilitate recycling and to ensure availability plastic feedstock for recycling. Such systems may provide priority access to recycled materials for use in applications where the distinct quality of the recycled material is preserved or recovered in such a way that it can be recycled further and used in the same way and for a similar application, with minimal loss of quantity, quality or function.*
>
> *3. Member States may allow derogations from the return and separate waste collection obligation in paragraph 1 for certain formats of waste provided that collecting packaging or fractions of such packaging waste together or together with other waste does not affect the capacity of such packaging or fractions of packaging waste to undergo preparing for re-use, recycling or other recovery operations in accordance with Articles 4 and 13 of Directive 2008/98/EC and generates output from those operations which is of comparable quality to that achieved through separate collection.*

This confirms that Article 10 of the WFD retains its relevance, and as if to emphasise this, Article 48(3) more or less restates what is already in the WFD at Article 10(3)(a). The wording of Article 48(1) could be clearer: the use of the word 'managed' might be preferable to the term 'treated', but nonetheless, any reasonable reading would suggest that all derogations at Article 10(3) are still relevant, even if the PPWR feels the need to restate that from Article 10(3)(a). One might conclude from this that whatever the PPWR says about recyclability, or

recycling at scale, and whatever the role of separate collection may be in making the relevant determinations as regards, for example, recyclability, the PPWR changes rather little as regards a requirement for separate collection. Article 10 of the WFD still applies, and Member States are still entitled to the derogations from a requirement for separate collection contained therein.

At the end of Article 48(1), and also, at Article 48(7), there are statements that indicate not only the desirability of SLMW, but also, that it is likely to be required. Hence (see also above) Article 48(1):

> *Packaging complying with design for recycling criteria as established in delegated acts adopted under Article 6(4) of this Directive shall be collected for recycling. Incineration and landfill of such packaging is not to be allowed, with the exception of waste resulting from subsequent treatment operations of separately collected packaging waste for which recycling is not feasible or does not deliver the best environmental outcome.*

All packaging will need to comply with design for recycling criteria in future. To the extent that incineration and landfill of such packaging is 'not to be allowed', then how is this to be ensured? The wording suggests that if 100% of plastics were collected separately or commingled, then only the waste 'for which recycling is not feasible' - which, presumably, should be a diminishing fraction of what is placed on the market, and hence, collected - or for which recycling 'does not deliver the best environmental outcome' - in which case, we might ask, 'why design for recycling?' – can be incinerated or landfilled. If anything less than 100% of plastics are collected through separate collection or commingled collection, then what is the approach that will ensure that none is incinerated or landfilled?

In this respect, Article 48(7) might need strengthening:

> *7. Member States may ensure that packaging waste that is not collected separately is sorted prior to disposal or energy recovery operations to remove packaging designed for recycling.*

If anything, the wording of Article 48(1) makes this a requirement, not something which, voluntaristically, Member States 'may ensure'.

Article 48(1) also renders Article 53 somewhat contradictory once all packaging has to comply with the Design for Recyclability requirements. As in the existing WFD, Article 53 makes provision for the inclusion of metals in separated after incineration of waste in proportion to the share of the packaging waste incinerated provided that the recycled metals meet certain quality criteria laid down in Decision (EU) 2019/1004. If manifestly recyclable cans are extracted after incineration, then quite obviously, they have been sent there when they should not have been according to Article 48(1). Again, if Article 48(7) was strengthened, then that might fulfil the requirement of Article 48(1). This would be consistent with ensuring the quality of recycling is 'not low'.

Is It Likely that Separate Collection and SLMW are in Conflict, and if so, Where?

The 2012 Guidance document essentially invites us to consider three types of collection:

1. A collection where each 'material' is collected separately from all others – this would qualify as 'separate collection' as per Article 3 of the WFD;
2. A collection where a group of materials are collected together, by way of derogation from the requirements of Article 10(2) and (in the case of specified materials - paper, metals, plastics, glass and textiles) Article 11(1). In this case, the materials are not collected as LMW, but as a group of materials collected separately from LMW, but not as individual materials. The derogation from the requirement for separate collection could be on grounds of one or more of the 'necessity' argument, which seems closely linked to the Article 10(3)(a) derogation, and the other Article 10(3) derogations which relate, respectively, to grounds of technical feasibility, environmental impact, and cost;
3. A collection where there is no 'separation' – which might represent the collection of LMW, or in extremis, the collection of municipal waste which has not been subject to any sorting at all (so is simply MW – this, though, seems highly unlikely where municipal waste is concerned because of the Article 11 targets – see also below).

The 2020 Guidance refers to all derogations under Article 10(3)(a) as instances of 'commingling': yet this is a term typically reserved to collections of 'type 2' (in the list above), even though there are cases where the Article 10(3)(a) derogation might reasonably lead to derogations for deployment of 'type 3' (in the list above) collection. In short, the 2020 Guidance seems not

Biowaste

As we noted above, the WFD appears to require separate collection of biowaste in order for it to count towards recycling targets. Given that food waste is typically of the order 20% of municipal waste (with some variation around this figure), then forgoing a contribution to recycling from food waste would make meeting a 65% recycling target extremely difficult (the 65% would translate into a recycling rate of 81% of the remaining

waste). Although it could not be ruled out that biowaste might not be separately collected in future, the additional challenge that would pose to meeting the municipal waste recycling targets makes it likely that biowaste would be collected separately.

In any event, the potential for SLMW to 'compete' with separate collection is effectively ruled out by the fact that unless biowaste is separately collected, it would not count towards recycling targets. If SLMW is used as part of a recycling system, it seems highly unlikely that it would be 'as an alternative to' separate collection. On the contrary: to the extent that SLMW may have a role to play, the separate collection of biowaste, and especially, the targeted collection of food waste, is likely to make sorting of any useful materials for recycling from SLMW (see below) easier than would otherwise be the case.

It seems unlikely, therefore, that separate collection and SLMW are 'in conflict' where separate collection of biowaste is concerned, given the existing policy and law. That may have been the case as long as Member States 'counted' the 'recycling' of a biowaste fraction derived from LMW towards their targets, but the fact that this will not be allowable from 2027 makes this far less likely. That does not mean that there might not still be some organic materials extracted from LMW that are subsequently biologically treated, and which are then applied to land in restricted applications, but that material would not be derived from what has been separately collected, and so would not count towards recycling targets.

Paper (and Card)

The qualified requirement – at Article 11(1) for separate collection of paper is subject to Article 10(3). 'Paper' is not defined in the WFD: the Packaging and Packaging Waste Directive targets apply to 'paper and cardboard'. It is not clear, therefore, whether the Article 11(1) requirement, and the targets in Article 11(2)(a) are to apply only to 'paper' only, or to 'paper and cardboard'. Nonetheless, Article 10 would still apply to cardboard even if it were not included in the definition of 'paper', and the targets under Article 11(2)(c)-(e) would still need to be met.

Given that paper and cardboard, taken together, typically account for around 20% of municipal waste, then as with food waste, 'not attempting to recycle' paper and card would make meeting the relevant Article 11(2)(c)-(e) extremely difficult. Furthermore, as regards quality, in order to be effectively recycled in closed loop applications, there are some materials alongside which it would not be desirable to collect paper and card. In particular, collection alongside glass is considered problematic. The quality of collected paper and card is prone to be affected by co-collection with other materials, but especially glass.

Many municipalities in Member States will collect either separated streams of paper and of card, or a single stream of paper and card together, recognising that this maintains quality at a level where reprocessors are

likely to pay higher prices for the collected materials. Others may co-collect paper, or paper and card, alongside some other materials in a comingled fraction. To do this might already impinge somewhat on the quality of what is collected (for example, leftover materials in collected plastic containers might contaminate the fibre fraction), whilst including glass within this mix, lowering the quality of what is a large – and potentially (depending on prevailing commodity prices) valuable – fraction of the waste stream.

In many Member States, the balance of the paper+card mix may be shifting away from paper (fewer printed newspapers / magazines) and towards card (increasing share of purchases made on-line, and delivered to homes in cardboard packaging). This might be leading to a greater prevalence of separate collection since the volume of separately collected card is increasing (card has a lower bulk density, in the form in which it is collected, than paper), making its inclusion in comingled streams more awkward.

It is, in principle, possible to extract paper and card from LMW. It is also not forbidden, in policy and law, to count such material towards recycling rates, assuming that in doing so, the 2019 calculation rules are respected. The extent to which SLMW is likely to compete with separate collection, however, seems likely to be limited by the fact that reprocessors will generally, for reasons discussed above, consider SLMW as an inferior source of feedstock to separate collection. Furthermore, the arguments for a derogation from Articles 10(2) or 11(1) under any of the criteria listed under Article 10(3) are likely to be of limited merit, especially if the impacts of, at the margin, not harvesting timber for pulp preparation are considered (and it is not always the case that they are), and given the requirement to meet targets under Article 11(2) (c) to (e).

Any contribution made by SLMW to the overall level of paper and card recycling seems likely to be marginal, and SLMW will not be considered as a mechanism by which to replace separate collection of paper and card. There may be some commingled collections of paper and card, but the aim will be to capture as much paper and card for recycling, and this will be far more difficult from SLMW, and notwithstanding the lack of definition, it would, most likely, be relatively uncontroversial to demonstrate that the quality of what is sorted from SLMW was not as high as from well-operated separate collection.

Glass

The qualified requirement – at Article 11(1) for separate collection of glass – is widely applied across Member States, though with varying performance outcomes depending on the convenience of the collection services on offer. Reflecting on the above comments regarding paper (and card), glass is often collected on its own (i.e. separate collection), either door-to-door or via bring sites. The propensity of (one-way) glass to shatter makes it a difficult material to separate from other materials if is co-collected along with others (and it is especially

problematic to collect alongside with paper / paper and card as it leads to lower quality output of the paper and fibre fraction.

If it is collected along with other materials, it might not always be 'positively separated', so that it may suffer from contamination by the 'non-target materials' which are collected as part of that commingled stream. It should be noted that whereas some Member States might consider the use of glass in road construction as 'recycling', some do not (it may be considered as 'backfilling'). High quality recycling of glass ought to require that the resulting material could, in principle, be used to substitute primary cullet: whether it then is may, depending on Member State rules, determine whether the material is to be counted as recycled or not.

As regards SLMW, glass can, in principle, be sorted for recycling using SLMW, but this is technically difficult, and also expensive (when considered in terms of the 'incremental cost'). Given this, and the fact that much of the glass in municipal waste will be packaging, and that by 2030, the target recycling rate for glass packaging is 75%, then as with paper and card, it seems extremely unlikely that SLMW would be seen as a means to replace separate collection of glass. Where SLMW is implemented, it is also less likely to target glass for recycling because of the costs involved, but some (most likely limited) contribution from SLMW might be possible.

Metals

The qualified requirement – at Article 11(1) for separate collection of metals – should be considered alongside the implications of Articles 10 and 11 of the WFD, and with the recycling targets of the PPWD in mind. Metals are relatively valuable materials, though of course, the realisation of that value presumes that they are made available from waste.

Metals are relatively easily separable from other materials (whether from comingled collected wastes, or from LMW). Indeed, they may also be separated from bottom ash from incineration, though they may be significantly contaminated by the slag post combustion.

As long as there is a collection of, for example, paper and card from households and businesses, it would be difficult to argue that separate collection of metals should not take place. The reason for this is that the incremental costs of adding a large proportion of the metals would be very limited, and the quality would likely be high. Even if metals were not being separately collected in the strict sense of Article 3, their co-collection alongside one or more other materials would readily be justified, and quality would be maintained, so that even if metals are not 'separately collected', they are likely to be collected commingled with one or more other materials, separately from LMW. The rationale for a derogation for anything other than co-mingled collection

through reference to the criteria under Article 10(3) of the WFD would be difficult to substantiate, given the revenue upside relative to the costs involved.

As noted previously, metals could be readily separated using SLMW, and quality could be comparable with separate collection using appropriate sorting systems. SLMW would unlikely replace separate collection of metals: rather, it allows a 'second go' at the recycling of metals which, for various reasons, may not have been separated 'correctly' by householders. This might include metal packaging consumed as that part of the 'on-the-go' consumption by citizens, especially in situations where no deposit refund scheme is in place; or the non-beverage cans consumed in households which still contain food residues (and which households may be less inclined to clean, and to sort into separately collected streams of metals and other materials, for example, half-empty cans of baked beans). The contribution to metal recycling from SLMW is more likely, therefore, to supplement what is achieved though separate collection rather than replacing it.

It is of interest that even though the quality of metals extracted from incineration is likely to be lower than that derived from SLMW, Article 11a(6) of the WFD makes specific provision for the inclusion of the recycling of metals separated after incineration within the calculation of performance for the purposes of the recycling targets in Article 11(2) and Article 11(3) 'provided that the recycled metals meet certain quality criteria laid down in the implementing act adopted pursuant to paragraph 9 of this Article.' Furthermore, Article 11(7) allows for the incorporation of minerals in the co-incineration process of municipal waste to be counted towards recycling targets. These specific inclusions might not always appear to be entirely consistent with the objectives of Articles 10 and 11, not least given that they cross reference Article 4.

Plastics

The qualified requirement – at Article 11(1) for separate collection of plastics – is of interest in that it is clear that not all plastics are 'recyclable' in the absence of the expenditure of considerable time, effort and as a result, cost. Hence, separate collection of all 'plastics' would not necessarily guarantee that those plastics that were collected were recycled. For this reason, it is easy to see why the derogations under Article 10(3) might be (explicitly, or implicitly) invoked: whilst separately collecting 'plastics' is clearly technically possible, there are types of plastic for which inclusion within separate collection might be disproportionately costly, and where the environmental effect of doing so might be limited. For example, if some collected plastics are then sorted from the mix, only then to be sent for incineration, then to the extent that this may had been their fate had they not been separately collected and sorted, then the environmental impacts of doing so are unlikely to be positive and may be negative. The costs of doing so would also be disproportionate relative to those (potentially negative) benefits.

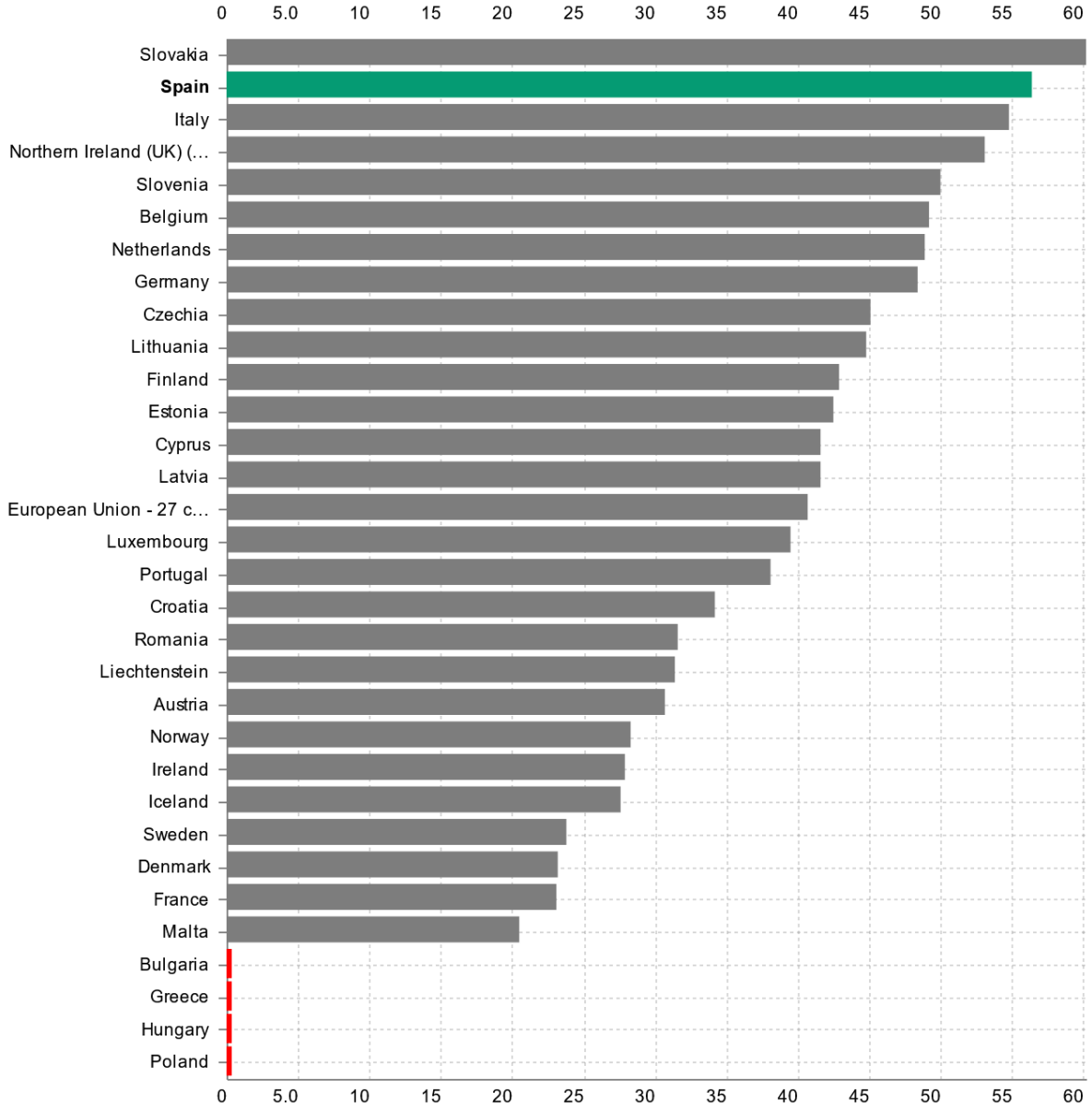
The issue here is in part related to the heterogeneity of the class of stuff subsumed under the heading 'plastics'. Even where 'plastics' are separately collected (or collected comingled, for example, with metal cans), it is sometimes the case that citizens are instructed to use the collection service only for a restricted range of plastics (for example, rigid packages). The 2020 Guidance notes that many jurisdictions seek not to collect black plastic packages since sorting systems are not equipped to 'positively sort' such plastics from a mixed plastics stream. Where a wider range of plastics are collected, the extent to which those collected are actually recycled may still be limited. Furthermore, the focus of some collections may be 'packaging', rather than the full range of consumer goods made from plastics, reflecting the scope of targets specifically related to recycling of plastics, and the fact that the prospects for recovering the costs of plastic recycling are likely to be strongest in the case of items covered by extended producer responsibility (EPR) schemes. The 2020 Guidance appears to envisage (as per Figure 9 in the document) that all non-packaging materials are taken to civic amenity sites.

Especially when the methodology set out in the Implementing Regulation of 2019 are taken into account, the proportion of plastics actually being recycled as a result of being collected either separately, or as part of a comingled fraction separated from LMW, may be a relatively small proportion of the total in the waste stream.

The argument for separately collecting plastics is strongest where the markets for recycling the collected material can be said to be well-functioning, so that there is a demand for the secondary materials that can be derived from recycling processes at a reasonable cost. Where consumer plastics are concerned, this is 'work in progress'. The most functional market for post-consumer waste plastics is for PET derived from bottles, with both beverage container manufacturers and textile companies keen to make use of higher recycled content in their products. As we have noted above, there are already separate collection targets for SUPBBs under the SUPD which will likely require if not the separate collection, as part of a deposit refund scheme, of SUPBBs, then the collection of SUPBBs as part of a comingled stream, subject to quality not being diminished.

Beyond PET bottle recycling, markets are developing for some plastic fractions, but the full net costs of recycling such plastics remain high. Partly for the above reason, the recycling rates for plastic packaging across the EU are generally lower than for packaging made from other materials (and the reported rates are below what is required under the PPWD). The quality of reported data remains low, and are likely to overstate recycling rates being achieved in many Member States.

Figure 1: Recycling rates of packaging waste for monitoring compliance with policy targets, by type of packaging



Source: Eurostat

The other complicating factor as regards SLMW is that the quality of materials extracted from the process is comparable, after hot washing, with what can be achieved through separate collection. This makes it possible to make the argument that separate collection might not be necessary (Article 10(2)), and that given there might be one or more cases for derogations as per Article 10(3), notably in respect of cost, then it could be argued that separate collection may not be necessary, even for those product and packaging formats that have a reasonable prospect of being recycled. Indeed, in some countries, including the Netherlands and Norway,

producer responsibility schemes acknowledge that where advanced schemes of SLMW are in place, the case for separate collection might be diminished, especially if, as in Norway, a deposit refund scheme (DRS) is in place which leads to recycling of a significant share of PET bottles at very high rates (there is also a DRS in operation in the Netherlands, but currently affecting only larger bottles). It seems clear, therefore, that some Member States are – either implicitly, or explicitly – availing themselves of derogations from a requirement to separately collect waste plastics as per Article 10(2) or / and (3) of the WFD. It should be noted that Member States may derogate from the requirement for some types of plastics even where no SLMW is in place.

As noted above, existing policy and law already allows for derogations from the requirement to separately collect wastes, and has done so for some time. That policy and law is especially likely to be applicable to plastics.

Not all Member States have collected all plastics separately, and some still do not. That they do not do so has not, in general, been because SLMW has become ubiquitous. Some Member States will have availed themselves of those derogations with no prospect of LMW being sorted, typically, with some plastics not being collected separately or commingled, and not being sent for SLMW. That could be considered a partial derogation if, for example, a sub-set of plastics are being separately collected (or collected comingled with others where the co-collection of materials does not undermine their recycling).

Some Member States may have begun deploying SLMW in order to achieve an uplift in reported recycling rates, alongside either full or partial separate / comingled collection of plastics. In still other situations, SLMW may be used where it is believed to offer better performance relative to one where separate collection operates alone (without SLMW), not least where the system costs may be lowered.

Finally, it should be considered that the rationale for deployment of SLMW is not 'just' to increase recycling: it is considered also as a way to reduce CO2 emissions from incinerators by reducing the carbon content of the waste being combusted (as well as reducing emissions associated with the production of materials). Hence, especially where municipalities own and operate incineration facilities, and where they have set themselves / been set challenging GHG reduction targets, so the use of SLMW becomes a GHG mitigation technology of value in its own right, though clearly, that value increases the more that the extracted plastics (and other materials) can be recycled. [21]

The question which then needs to be considered is whether, or to what extent, separate collection should be required, and / or whether or not the existing derogations are in need of revision given the current state of play. Specific considerations apply in the case of plastics extracted through SLMW that are worthy of consideration:

[21] This does not necessarily imply that all facilities will face a set of incentives that would deliver SLMW in response to a carbon price.

1. With appropriate washing, the quality achieved through sorting of SLMW may be comparable to that achieved using separate collection;
2. In the case of food contact packaging, the items which are most readily recycled back into food contact packages – PET beverage bottles - are already subject to requirements for separate collection as per the SUPD and the associated Implementing Regulation. Whether these go far enough to ensure equivalence of quality across options is unclear;
3. Whether the recycling of other (than beverage container) food contact packages is constrained by resort to SLMW may depend upon evolving opinions from EFSA. Presently, the ability to use recycled content in food grade packages (other than SUPBBs) would appear to be similarly constrained irrespective of whether waste is separately collected or not (unless 'food packaging plastics' are collected as a separate stream from other plastics), but to the extent that this could change in future, then separate collection might be less likely to be supplanted by SLMW;
4. To the extent that 'chemical recycling' may provide an avenue for use of recycled content in food-grade packaging, then the source of material entering the process might be less, not more, relevant, though subject to the tolerances on inputs that such facilities are able to operate within;
5. For recyclate used outside food contact applications, then there is some potential for SLMW to compete with separate collection. Whether or not it makes sense to consider these as competing of complementary depends on a range of other factors:
    - What is the level of recycling achievement under the PPWD using the calculation methods as per the 2019 Implementing Regulation? As has been considered elsewhere, there may be a requirement for 'a second go' at recycling of plastics with existing recycling targets less likely to be met without its (not necessarily universal) use.
    - Irrespective of the level of achievement of plastics recycling, with the EU ETS potentially including incineration within its scope in the coming years, municipalities and operators may seek to reduce emissions associated with burning plastics. Although this is likely to have ramifications for all facilities in scope of the ETS, this is especially relevant in those countries where the vast majority of residual municipal waste is incinerated (Belgium, Denmark, Germany, Luxembourg, Netherlands, Slovenia, Finland and Sweden (as well as Norway and Switzerland)). Again, the effect would potentially be complementary rather than competitive, depending on (amongst other things) systems already in place.
    - Finally, and unrelated to derogations per se, but of relevance to the matter of achieving recycling targets, a high efficiency of separation of plastics from LMW might exceed the quantity of plastics captured through separate collection, especially (but not only) if this excludes non-packaging materials.

Zero Waste Europe (ZWE) is the European network of communities, local leaders, experts, and change agents working towards a better use of resources and the elimination of waste in our society. We advocate for sustainable systems, for the redesign of our relationship with resources , and for a global shift towards environmental justice, accelerating a just transition towards zero waste for the benefit of people and the planet.
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