EUROPEAN COMMISSION, DG ENVIRONMENT

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EFFECTIVENESS OF THE ESSENTIAL REQUIREMENTS FOR PACKAGING AND PACKAGING WASTE AND PROPOSALS FOR REINFORCEMENT

BACKGROUND PAPER, FINAL WORKSHOP WITH STAKEHOLDERS

FRAMEWORK CONTRACT ENV.F.1/FRA/2014/0063

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1 Introduction to the Study

The Essential Requirements were introduced in the Packaging and Packaging Waste Directive (PPWD – Directive 94/62/EC). The Requirements have not changed substantially in the intervening 25 years and previous studies have identified the Essential Requirements as potentially requiring further attention to improve packaging design, particularly in relation to the lack of recyclability of many packaging formats.[1]

The 2018 revisions to the PPWD mandate the European Commission with examining "*the feasibility of reinforcing the essential requirements with a view to, inter alia, improving design for reuse and promoting high quality recycling, as well as strengthening their enforcement.*"

This study looks to help to inform the European Commission's review of the Essential Requirements by:

- Analysing the adequacy of the effectiveness of the Essential Requirements in meeting the PPWD objectives and EU circular economy policies;
- Identifying obstacles to the effective implementation and enforcement of the Essential Requirements;
- Developing options for making the Essential Requirements more operational and effective and to support the objective in the Plastics Strategy to ensure that "by 2030, all plastic packaging placed on the EU market is reusable or easily recycled"; and
- Identifying the potential impacts linked to different options for reinforcing the Essential Requirements.

This study is intended to contribute to the Commission's broader policy-making; following the conclusion of this study, options for reinforcing the Essential Requirements may be subject to a full impact assessment.

1.1 Approach to Study

The study comprised two key phases:

- Firstly, a review of the existing Essential Requirements, and
- Secondly, an appraisal of measures to reinforce the Essential Requirements.

The review took the outline structure of an evaluation, based on the Better Regulation Guidelines criteria of:

- Effectiveness;
- Efficiency;
- Relevance;
- Coherence; and
- EU added value.

A comprehensive programme of stakeholder engagement was designed for the study. This included a survey that was conducted with all Member State authorities (typically environment ministries and environment agencies) to seek further details on their current enforcement arrangements, instances of non-compliance with the Essential Requirements, any perceived obstacles to effective implementation and priorities for reinforcement.

[1] ICF & Eunomia (2018) *Plastics: Reuse, Recycling and Marine Litter.* Final Report for DG Env. May 2018.

Following this initial research, a stakeholder workshop was conducted in March with packaging manufacturers, distributors, trade bodies and NGOs from across the Member States. During the workshop, views were sought on the existing implementation and enforcement of the Essential Requirements, and on stakeholders' priorities for any future revisions. The workshop report summarising the discussions was circulated to stakeholders and is included in Annex 1 in the attached document.

The review of the existing Essential Requirements confirmed the need to make them more operational and enforceable, and to bring the Essential Requirements into line with more recent EU policy. A longlist of potential measures to reinforce the Essential Requirements was consequently developed based upon a comprehensive assessment of the literature, the outcomes from the evaluation methodology, the development of 18 case studies of specific packaging formats and position papers received from stakeholders.

A multi-criteria assessment process was conducted to identify the most suitable measures for reinforcing the Essential Requirements. This short-list of measures was reviewed in-depth during two further workshops with stakeholders and Member States in July. The stakeholder workshop report is included in Annex 2 in the attached document. The feedback obtained during these workshops was used to select the most feasible measures to be appraised during the final stage of the study.

The aim of this October workshop is to present the assessment and rationale for the proposed design of the measures for reinforcing the Essential Requirements. Stakeholders will have an opportunity to provide their feedback on this paper and the workshop report in writing, following the workshop.

2 Proposed Measures for Reinforcement

The Review of the effectiveness of the Essential Requirements identified a number of areas for improvement. Most significantly:

- The requirement that "the packaging volume and weight be limited to the minimum adequate amount to maintain the necessary level of safety, hygiene and acceptance for the packed product and for the consumer" is vague and too subjective to effectively implement or enforce. The fact that some retailers and manufacturers have pledged to remove "excessive" packaging indicates that not all packaging currently constitutes the minimum necessary.
- The Requirements do not sufficiently promote design for reuse and recycling, exemplified by an increase of packaging placed on the market that is only suitable for energy recovery lower down in the waste hierarchy.

Revisions are, therefore, needed to ensure that the Essential Requirements support the top three tiers of the waste hierarchy: prevention; reuse; and recycling.

2.1 Requirements specific to the manufacturing and composition of packaging

2.1.1 All Packaging to be Reusable (and recyclable) or recyclable

Assessment of Options

It is recommended that the second point para in section 1 of Annex II of the Essential Requirements is replaced with:

- Packaging shall be designed, produced and commercialised in such a way as to permit its reuse or recycling, in line with the waste hierarchy, and to minimise its impact on the environment when packaging waste or residues from packaging waste management operations are disposed of.
- All reusable packaging shall be recyclable except in certain applications where the format provides significant added value for an exemption to be applied following a robust assessment.

This removes the reference to energy recovery as a preferred destination for packaging waste among the guiding principles/requirements for packaging design, in line with the overall move up the waste hierarchy. Energy recovery is further down the waste hierarchy than reuse/recycling, which is in line with the fact that the specific recovery targets have been removed from the Packaging & Packaging Waste Directive (PPWD) since the Essential Requirements were first formulated. Promoting design for recycling will support the recycling targets in the PPWD.

The critical element of this measure, in terms of its ability to be operationalised and enforced, is the definition of recyclable and reusable. The definition of recyclable is dealt with first.

A range of approaches were developed through the study and tested with stakeholders at a workshop in July 2019 (see workshop report in Annex 2). It was clear that there is a need for a more robust approach to defining what is recyclable than currently exists, although some stakeholders indicated the existing approach was working adequately. The objective of the assessment, however, was to seek to define a methodology that had a clearly defined approach, facilitated enforcement and was feasible from an operational and cost perspective. The two main methods considered were quantitative metrics and design for recycling (DfR) criteria.

Regarding all approaches, it is clear that if the methods were applied at the Member State level they may differ because of differences in recycling infrastructure at the Member State's level. This would result in

different decisions being made on what was recyclable and what was not. This fragmentation of the single market is not an outcome that is desired. Therefore, the geographical scope of the approaches to defining recyclable have been considered at an EU level only.

Firstly, a recycling rate threshold-based approach was considered. The Ellen MacArthur Foundation is currently also investigating this approach as a quantitative means to defining 'recycling at scale', to support the robustness of their definition used in their global commitments.[2]

The most important aspects to consider are the production of data needed to calculate the recycling rate and what granulation of categories of packaging are to be used. In terms of the data, the tonnage of packaging placed on the market is already being submitted to EPR schemes, although at a more aggregated level of categorisation. These categories are increasing in number due to the introduction of modulated fees (with the driver to more accurately apply the costs of recycling based upon the format specific costs rather than the average). Nevertheless, producers should either already have or relatively easily be able to access the weight of packaging for specific products sold in the majority of cases.

The more challenging aspect is the production of data related to the amounts recycled of a given category. There is a clear trade off here between the granulation and effort involved in gathering the data. If the category is too wide there could be a whole range of different formats within it, some of which could be recyclable some of which not. In this case, the threshold could just be met but the remainder could be unrecyclable other formats. This would not achieve the aims of the measure. If the category is too narrow the effort involved in identifying a small amount of waste in the overall recycling stream could be highly significant. If each permutation of material, adhesives, labels, inks etc were considered, there may be hundreds of thousands or a million categories to calculate the recycling rate for. The number could be reduced if the categories did not distinguish between formats with small quantities of disrupting material, by including a requirement that at least 95% of the packaging had to be recyclable, for example. Even so, there may still be thousands or tens of thousands of formats and respective categories.

The method to produce the data on the amounts recycled would have to be aligned with the new calculation rules on recycling.[3] In practical terms, some sampling of the recycling stream would have to be carried out. Under the new rules some sampling is likely to have to be carried out at the input and output of recycling plants in order to identify the amount of packaging and non-packaging materials that are recycled. These sampling surveys could potentially be expanded to include a greater level of granularity to produce data at the format level.

The amount of waste in the recycling stream that would need to be sampled to produce an estimate at a format level to a reasonable level of statistical accuracy, relates to the proportion of the waste stream that the specific format makes up. If the proportion is small, the number of samples needs to be higher. The number of samples could be reduced using stratification methods, using strata such as: material, region, collection system, recycling technology, consumption indicators (GDP) etc. To test the potential scale of the sample size a scenario was considered where 35 million tonnes of packaging waste were being recycled across the EU. Using some statistical methods it was estimated that if there were 1,000 categories then the sample size would need to be 20,000 to 30,000 tonnes. This estimate can be scaled, so for 100 different

[2] https://www.ellenmacarthurfoundation.org/assets/downloads/Global-Commitment-Document-to-download-on-website-2.pdf
[3] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02005D0270-20190426&from=EN

categories, the sample size would be 2,000 to 3,000 tonnes, and 10,000 categories, 200,000 to 300,000 tonnes of samples.

The size of the samples needed appears to be prohibitive if a detailed level of categorisation were needed. Separating the samples out into a significant number of fractions would also add considerable cost. For some specific formats which comprised a larger proportion of the market it may be feasible to carry out the sampling in a more cost-efficient manner, as the sample would be smaller and the segregation into one or a limited number of fractions would be much quicker.

The sampling would certainly be more cost effective if the categories were broader, but as stated above, there would be a reasonably high likelihood that this would result in a large proportion of the category remaining unrecyclable. The threshold could be increased significantly but the more obvious instrument to achieve the same effect would simply be to increase the recycling target and drive the increase in recyclable packaging in that way.

Other quantitative metrics do exist, such as the HTP Cyclos method. However, these approaches are more subjective than a recycling rate threshold which is more objective and enforceable. There has been some anecdotal evidence that some formats of packaging that have been assigned a high score are known to be not well recycled by the industry. Such outcomes could erode trust in the system from consumers and producers a like.

An alternative method to defining recyclable packaging could be to use DfR criteria to set a list of recyclable or non-recyclable formats through some form of technical committee. It would be important to ensure that there were clear allowances for innovation in such an approach. SMEs are less likely to be innovating in packaging design and more likely to be purchasing packaging from packaging producers. Larger packaging producers and brands with R&D budgets are likely to be innovating in design.

To provide a common set of conditions for all packaging users across the EU a 'positive list' of packaging types compliant with the Essential Requirements and therefore allowed to be placed on the market should be developed. This list would provide simple guidance to SMEs as to what packaging they can use that they are sure it recyclable. The positive list would be defined by a technical committee and could be based upon a quantitative metric such as recycling rate to reduce the subjectivity of the method. This list would cover the main types of packaging that are recycled at the point the list was defined. The rules defining what would be included in the positive list would be developed after the changes to the Essential Requirements had come into force or, alternatively before their coming into force. The actual implementation of the positive list would not occur until 2030, after the list itself was defined in 2027 and updated every three years to allow for new innovative packaging to be added. This would give time for packaging producers to adapt and ensure their packaging was suitable for including in the positive list by the time the assessment came round in 2027. Each time the positive list was renewed companies would have three years to comply with the changes i.e. if an item is removed from the green list.

There are some aspect of packaging design, however, that many stakeholders have identified as being disruptive to recycling. Therefore, in order to shift the market away from these disruptive elements in the shorter term and support the achievement of the PPWD targets, a negative list of packaging types / elements should also be developed. The Essential Requirements being linked to 'placing on the market', would mean this would apply to any packaging producer whether SME or not. The negative list would be developed through a technical committee and updated on a periodic basis. The list could be developed in an annex to the Directive, to be updated through a Comitology procedure, or developed in an implementing act. The

elements of packaging that might be included in the negative list relate to those that disrupt recycling processes, and might include:[4]

- Incompatible and inseparable combinations of polymer types, barrier layers, dyes and adhesives
- Sleeves of different polymer types to main body
- Sleeves that are difficult to remove
- Black plastics that cannot be identified in sorting plants
- High levels of pigmentation
- Non-washable inks
- Gassing inks
- Dark coloured inks
- Full body printed labels

This is, of course, not a final list of design elements, the actual list would be defined through a process overseen by a technical committee. The process would be established soon after implementation of the new Essential Requirements and tasked to define an initial negative list within 2021 and 2022. The negative list would then be ready before the introduction of modulated EPR fees in 2023.

A clear link between the Essential Requirements and the setting of modulated fees should be made. Within three years of the introduction of modulated fees (2026) the Essential Requirements should require that all negative listed packaging placed on the market is subject to a minimum fee payable to EPR schemes of at least e.g. €1,500 per tonne of packaging placed on the market. This will provide a clear economic incentive for building the business case to shift to alternative solutions. The negative list would be re-defined in 2027 and every three years thereafter. After each renewal a period of three years would be given whereby at the end of the three years the EPR fee for that packaging format would be raised to a similar level (or higher) and any packaging on the list excluded from the market. By 2030 all negative listed packaging would be restricted from the market.

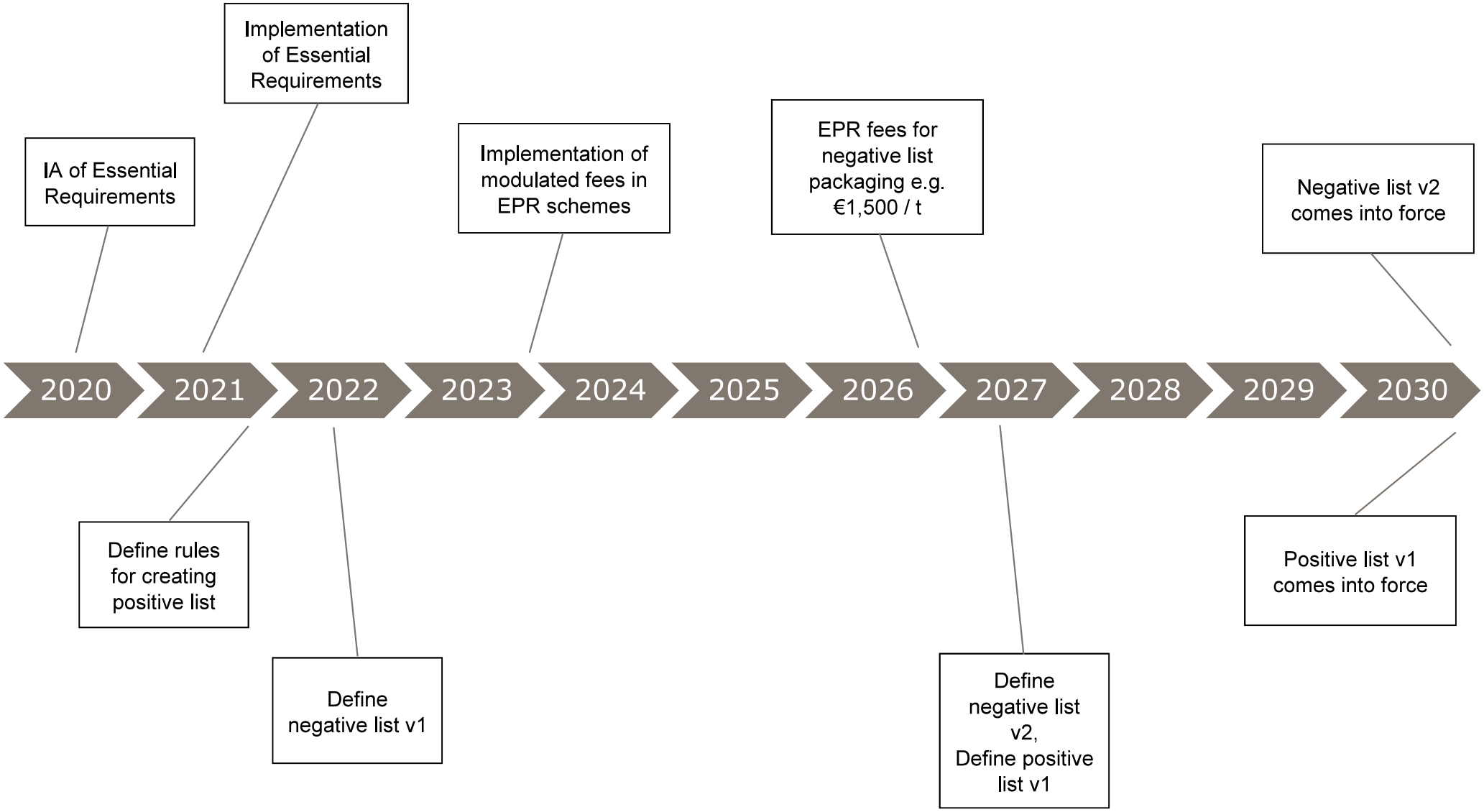
Exemptions from both lists could be applied at any point when the lists were being defined. This would seek to ensure that packaging with critical functionality, for example in the healthcare sector, could remain in use.

Moreover, to ensure that innovation was supported a mechanism would be included where new packaging that could be proved to be being recycled above a threshold level (for example 20%) within three years of entering the market would automatically be included in the positive list, and circumvent the technical committee. A methodology for proving the recycling rate should be aligned with the new calculation rules and should be developed by the Commission or perhaps through a new CEN Standard. The onus and cost of proving the recycling levels would be on those placing the packaging on the market.

The timeline below summarises the development of the proposed approach.

[4] List defined through research during the course of the study, interviews with stakeholders, literature etc.

Figure 2-1: Timeline for Development of Recyclable Definition



Finally, there is a need to define reusable packaging. There is already a definition in Standard EN 13429 for reusable packaging. However, it stops short at seeking to define reusable packaging by the number of trips or uses, instead just referring to “a minimum number of trips”. Whether such an approach is needed is now discussed.

Where industrial reuse systems are in place there is a strong economic incentive to maximise the use of resources within the system for a given cost. Therefore, there should be no disincentive to maximise the number of trips / uses or claim otherwise. In this case, a further definition of reusable packaging is not needed.

For packaging sold for consumers to reuse themselves, there may be a greater need to define a minimum number of uses as there could be an incentive to claim such products as reusable to sell at a higher cost. However, the actual technical specifications of the packaging might be such that the item is only used a few times before it cannot be used again or a lot less than a competitor’s product. A shopping bag over 50 microns claimed as a ‘bag for life’, a trigger spray with concentrated pod refill or a piece of single use cutlery, for example. Technical testing requirements could be mandated, related to e.g. tensile strength, puncture resistance, dynamic loading, impact resistance etc, and limits set on a case by case basis. However, this may be costly and provide a disincentive for the uptake of reuse. Moreover, there are also commercial drivers to keep the issue in check. If customers complain that the bags for life keep breaking after a few uses the retailer may ask the supplier to make the product more durable, for example. Given that the share of reusable consumer packaging is very low and current drivers incentivising the uptake of reusable packaging are limited, there is not a strong rationale to define reusable consumer packaging according to its expected number of uses.

Conclusions – Measures for All Packaging to be Reusable (and recyclable) or Recyclable

The conclusion for the reinforcement of the Essential Requirements is to define recyclable using a combination of DfR and recycling rate thresholds. This approach seeks to maximise the robustness of the approach, whilst minimising the overall cost of compliance and including opportunities for innovation in the packaging sector. The new approach to defining recyclable packaging should be specified in the Essential Requirements itself. The use of Standard EN 13430 ‘Requirements for packaging recoverable by material recycling’ is therefore no longer required and reference to it should be removed.

The reference to Standard EN 13429 ‘Reuse’ should be maintained to provide the definition of reusable packaging. Specified minimum thresholds for the number of trips should not be included in the Essential Requirements. If future European policies seek to significantly increase the levels of packaging reuse this approach should be reviewed to assess whether a more defined methodology is required.

2.1.2 Measures for the Efficient Use of Packaging

Assessment of Options

Subject to the requirement to be reusable or recyclable, the packaging would then need to be designed to be the minimum volume and weight necessary. This is intended to recognise that the minimum weight is likely to be greater if the packaging is designed to be reused and to indicate that it is not sufficient to minimise the weight of packaging without considering first how it can be treated at the end of life.

In terms of additional measures to avoid over-packaging, an option is to introduce a **maximum ratio of packaging to product** by either weight or volume, which would provide a quantifiable metric to enforce. This would remove the degree of subjectivity that undermines the existing Essential Requirements and leads to differing interpretations between competing producers and between producers and regulators. There is, however, a concern that a ratio alone does not necessarily take into account the functionality of the product or reflect its overall environmental impact. Given the diverse nature of packaging and packaged products, it has been questioned how practical it is to set a suitable ratio that applies to all packaging and adequately reflects the different vulnerabilities of products to breakage, light, air or moisture, or the safety and hygiene risks. Nor is it considered feasible to set a specific ratio for every type of packaging placed on the market. Moreover, although some views on overpackaging were given during the stakeholder engagement process, there were, in general, no concrete examples. Food packaging was highlighted as an issue by some but considered essential to reducing food waste in the supply chain by others. However, there were many references to e-commerce packaging being inefficiently utilised.

One survey of e-commerce executives found that 60% believe that more than a quarter of their packaging is empty space and research across product categories indicates that the empty space in e-commerce packaging ranges from 18% to 64%.[5] One suggested approach was to **define limits on the amount of sealed air in e-commerce packaging**. Whilst this appears to be an important objective, it is not possible for the Essential Requirements to address the main cause of the issue, which is at the stage of the packer. It might be possible to mandate the use of multi-size foldable boxes for use in e-commerce delivery applications, but it would be difficult to know exactly which companies were utilising e-commerce methods and those that were not. E-commerce sales are projected to continue growing so some solution should be sought. While the Essential Requirements specifically relate to packaging placed on the market, **secondary legislation under the PPWD could be considered to address the wider range of issues related to e-commerce** than just packaging design e.g. packer behaviour, box optimisation tools, standards for testing, reusable alternatives, or pricing mechanisms of delivery services. This would require more detailed consultation with the industry and an impact assessment. However, **labelling of e-commerce packaging to facilitate enforcement** could be considered and is discussed below.

[5] Forbes Insights & DS Smith (2018) *The Empty Space Economy*.

Alternatively, or additionally, EN 13428 (relating to prevention by source reduction) could be amended to refine the critical areas which limit the extent to which the volume/ weight of packaging can be further reduced. The current inclusion of consumer acceptance, marketing, logistics operations and the manufacturing and filling processes as "critical areas" that prevent further reductions in the amount of packaging indicates that these considerations take priority over the packaging's environmental impact. The provisions arguably do not reflect the apparent increase in consumer awareness of packaging waste, the other marketing and promotional tools at companies' disposal and the potential to adjust processes and operations along the supply chain. Critically, this list of critical areas in EN 13428 includes the catch-all "other issues", which could limit the potential impact of the requirement for source reduction. On the other hand, it is clear that product protection, hygiene and safety are fundamental considerations in packaging design.

Conclusions – Measures for the Efficient Use of Packaging

While it is not considered appropriate at this stage to set a ratio for all packaging, requiring producers to report this will enable the Commission to **monitor packaging to product ratios** and trends over time and to compare different packaging designs that serve the same purpose. It is suggested that the Commission **review this in a few years' time to determine whether a legal limit is required**, which could then be set using the reported data. These measures could be combined with modulated EPR fees to provide a financial incentive to reduce packaging.

After a review of the possible options and discussions with stakeholders, the following measures are proposed:

- Producers placing packaging on the market must report to a central registry (see enforcement section below) on the weight/ volume ratio of packaging to product
- The Commission shall review the product to packaging ratios after a period of three years of coming into force of the registry with a view to determining whether legal requirements on maximum ratios shall be set for specific types of packaging
- Secondary legislation to be introduced for e-commerce packaging, with limits on the proportion of sealed air, varying if the packaging is a) recyclable only or b) reusable.
- Amending EN 13428 to restrict the critical areas to:
    - Product protection;
    - Hygiene;
    - Safety; and
    - Information.

2.1.3 Recycled Content

The Essential Requirements do not currently cover recycled content and the need to reduce reliance on virgin materials. This contrasts with more recent EU policies, such as the Single Use Plastics Directive, and is missing an opportunity to support the attainment of recycling targets by increasing demand for recycled material. It is important to highlight that recycled content targets should be set at the EU level, to avoid distorting the single market if set at the Member State level.

Assessment of Options

It should firstly be noted that the use of recycled material can change the appearance of packaging due to difference in structure and colour. While this is a concern for some producers, other have indicated that they are willing to accept a change in appearance due to the environmental benefits. Some stakeholders have also expressed a belief that consumer perceptions and priorities are changing, so the visual appearance may be less of a concern than it once was.

It has also been suggested that the need for a certain level of mechanical strength or degree of flexibility from the packaging could reduce the opportunities to include recycled content. This could be mitigated by using more material, but this would not necessarily support resource efficiency. Stakeholders have also suggested, however, that the mechanical properties of packaging can be more robust than strictly necessary due to uncertainty about the specific mechanical needs of the packaging. This indicates that recycled content is not necessarily an obstacle if more is known about the exact requirements for the packaging. It is understood that recycled material can be difficult to print on, but techniques could be improved to address this.

There are also legal restrictions that can affect the use of recycled content, particularly in packaging for food, cosmetics and toys. Many stakeholders cited the food safety regulations that limit the possibilities to include secondary material and the limited supply of food-grade material, although it has also been suggested that more clarity in the EFSA rules on functional barriers would help. It may also be that industry standards need to be reviewed to allow more scope for recycled content.

A general concern amongst producers interviewed for this study was that strict recycled content requirements may not consider market conditions and whether there is sufficient supply of the right quality material (although demonstrating there is a market for the material could lead to efforts to increase supply). Increased demand could, drive-up prices for recyclate, in which case recycled content targets may be more affordable for larger companies than SMEs and there is a concern than mandating the use of recycled content in specific low-end applications could divert higher-grade material from other applications.

There are also challenges in calculating recycled content, with representatives of the aluminium industry indicating that it is not currently possible to report on the recycled content of specific products. It should also be noted that the market could be more complex where the materials are also used for products other than packaging, so one suggestion is that recycled content targets should apply on a material or polymer basis, and not on a packaging-specific basis.

Nevertheless, during stakeholder interviews, a number of suggestions were made for packaging types that may be suitable for considering recycled content targets:

- Transport packaging
- E-commerce packaging
- HDPE bottles

- PET trays / containers
- Bottles for household cleaning products
- Paper packaging for dry foods (an in-layer is sometimes used where there are concerns about residual inks)
- Plastic trays
- Films not intended for food contact
- Paint tins
- Any products that are produced through sheet extrusion / thermal forming, as these can accommodate the encapsulation of a recycled layer

The majority of the products mentioned related to plastics. This is unsurprising as other materials have much stronger secondary markets, in general, so any new recycled content targets would likely be focused on plastics. The amount of recycled content that can be added to a type of packaging is quite variable and so has not been assessed here. This would be carried out in the development of the legislation itself. Some stakeholders suggested that the SUP Directive or other product or material specific legislation would be more suitable for setting recycled content targets than the Essential Requirements. Others mentioned the potential for including renewable content also. However, the Essential Requirements could in principle require packaging formats placed on the market to have certain levels of recycled content as it related to the manufacturing and composition of packaging so it could be considered further.

Rather than targets, the Essential Requirements could include a **standardised process for designers to assess the potential to include recycled content**, allowing them more flexibility to consider the requirements and options on a case-by-case basis. This process could be incorporated in a CEN Standard. The content of the standard should include at least the following key areas with examples of opportunities and barriers to consider:

› Visual appearance
› Mechanical properties
› Legal considerations e.g. food contact

Doubts have, however, been expressed as to whether a standalone process could incorporate all the aspects to be considered, although others cited existing process management tools.

An alternative approach would be for modulated EPR fees to reflect the recycled content, giving producers a financial incentive to consider in addition to market prices.

2.1.4 Conclusions – Measures for Recycled Content

The Essential Requirements – which are currently universal to all packaging – may not be the appropriate place for format-specific targets. However, it has been argued that the Essential Requirements could include some cross-cutting requirements as well as some specific requirements reflecting the differing challenges seen by different materials. It is, therefore, recommended that the Commission's impact assessment examines the options for **recycled content targets for specific formats** and, if there is sufficient evidence to

justify these, that they are introduced into either the Essential Requirements or product specific secondary legislation. The impact assessment should enable a detailed analysis of market conditions and supply and demand. Any new targets that relate to packaging materials used for food packaging will also have to consider whether EFSA rules need to be and can be updated.

Irrespective of the introduction of recycled content targets, it is recommended that the Commission sets a legal requirement in the Essential Requirements to **request the development of a new CEN Standard that would detail a process for packaging designers to follow to maximise the potential recycled content**. The text of the Essential Requirements would consequently need to be amended to refer to the need to consider recycled content and demonstrate to regulators that this process has been followed.

2.1.5 Hazardousness

The Essential Requirements include limits for four heavy metals. Since these came into force in 1994, however, knowledge of substances of concern has expanded significantly. Additionally, the regulatory framework has evolved, with the development of the REACH Regulation (EC Regulation 1907/2006) and the European Chemicals Agency, as well as EC Regulations 1935/2004 and 2023/2006 relating to Food Contact Materials and the European Food Safety Authority.

The REACH regulations are updated more regularly than the Essential Requirements and producers have procedures in place for complying with REACH and, where applicable, the FCM regulations. Compliance is likely to be supported by including all the restrictions relating to hazardousness in once piece of legislation so that manufacturers have a clear point of reference and there is a single, nominated body responsible for the regulations. In order to avoid duplicating monitoring, reporting and enforcement measures – as well as a new list of substances that could relatively quickly become out-of-date – it is **not recommended that the list of hazardous substances be expanded in the Essential Requirements**. Instead, the REACH regulations appear to be the most suitable framework for all products, including packaging. This approach had significant support from the majority of stakeholders that were interviewed.

2.2 Requirements Specific to the Reusable Nature of Packaging

Unlike the waste hierarchy, the Essential Requirements are neutral on the choice between reuse and recycling. There is also little guidance on how to design a reuse system to optimise the environmental impact (which will depend on the number of trips and the logistics operation in place). The 2018 revisions to the PPWD accordingly mandated the Commission to reinforce the Essential Requirements with a view to “improving design for reuse”.

2.2.1 Assessment of Options

A number of stakeholders proposed that a life cycle assessment (LCA) is needed to determine whether single-use or reusable packaging is preferable and one option was for producers to undertake an ex-ante assessment if they are considering single-use packaging. There is, however, no undisputed methodology for such assessments and concerns were raised about the administrative burden it would place on producers.

It may be that there are too many variables that depend on specific circumstances to be reflected within the Essential Requirements. Reuse systems may, for instance, be more environmentally beneficial on a local and regional level than at a national scale, where packaging would need to be transported further (although electric vehicles would reduce the environmental impact of the logistics system). Undertaking such assessments at the European level would not result in accurate results due to these variations. If the assessments were conducted at the Member State level the outcomes would very likely be different on a country by country basis. This would result in different decisions being made and consequently a fragmentation of the single market. This is the strongest argument for not taking this approach forward.

In terms of the types of packaging that are more appropriate for reuse, glass packaging was mentioned during the interviews, however a blanket provision for all glass packaging would not consider the nuances of individual systems. Single-use applications such as take-away cups were also proposed, however there was little agreement on this and there are alternative options to reduce the use of single-use cups – such as charges – that are outside the scope of the Essential Requirements. Providing such incentives or disincentives, or targets for reuse, are much more likely to be an efficient approach to transforming the market than LCA assessments for each single-use item placed on the market.

While there are increasing reuse opportunities for household items (such as dried food and cleaning products), mandating such approaches in the Essential Requirements would necessitate an overhaul in retail systems and there is disagreement over whether product-specific approaches are appropriate for the Essential Requirements. It was also suggested that, in some Member States, there are concerns about consumers bringing their own packaging to fresh food-preparation areas (such as deli-counters in supermarkets). While such potential problems do not appear to be insurmountable, they do indicate that producers and retailers could see liability and hygiene concerns as a potential obstacle.

A number of interviewees commented that reusable packaging is already relatively common in some business to business applications, where there is an established distribution network and, effectively, a closed loop. Reuse of tertiary packaging could also be less resource-intensive than reuse of primary packaging, as less cleaning may be required. Similarly, e-commerce packaging was suggested as a suitable option for reuse if there are opportunities for consumers to return the packaging. There are already such

initiatives, like Repack, which enables consumers to post back their packaging free of charge for it to be reused.[6]

2.2.2 Conclusions – Options for Reusable Packaging

It is recommended that transport (tertiary) packaging formats are examined in more detail in an impact assessment and legal requirements mandating the placing on the market of reusable formats considered for inclusion in the Essential Requirements.

2.3 Requirements Specific to the Compostable or Biodegradable Nature of Packaging

It is recommended that reference to the **concept of biodegradable packaging defined in CEN Standard 13432 is removed or further specified so that there is a clearer definition, or there is a greater emphasis on the defining compostable packaging**. While the reinforced Essential Requirements should retain the option for compostable packaging, it is recommended that they are amended to reflect criteria for which design for compostability can be considered to be of added value.[7]

In revising the Essential Requirements, the **Commission should also mandate CEN to update EN 13432**. As the Standard currently certifies that a plastic is compostable in specific, optimal conditions that do not necessarily match reality, more detailed consultation with industry is needed to determine how the Standard can be made more relevant for composting facilities.

2.4 Requirements Specific to the Labelling of Packaging

2.4.1 Labelling Packaging as Reusable, Recyclable or Compostable

The majority of stakeholders supported new measures to **harmonise the approach to labelling packaging as reusable, recyclable or compostable**. This is to ensure consumers across the EU are met with a common set of symbols on all packaging to maximise understanding and the effectiveness of them. This will make it easier for consumers to sort their packaging appropriately and increase recycling rates (including by reducing contamination). Moreover, the standardisation process would **only allow the symbol to be used if the packaging met certain criteria**. The criteria used to define recyclable or reusable packaging outlined above would be used as the basis for allowing the symbols to be used. For example, the registry within a database could be contingent

[6] https://www.originalrepack.com/

[7] "Relevance of biodegradable and compostable consumer plastic products and packaging in a circular economy"; Contract No. 07.0201/2019/798924/ENV.B.3

upon the criteria being met and therefore the allowance of the label's use. This could aid enforcement of those measures; although there always be a risk that the symbol could be copied and used fraudulently without the piece of packaging being registered.

More importantly, perhaps, there have been some concerns raised regarding the unregulated approach to **labelling packaging as biodegradable or compostable**.[8] Labelling of these products on the market can generally be very confusing to consumers. One common example of bad practice is when a product is described as '100%' compostable – with no explanation what this means or guidance on which waste stream is appropriate. It is also often used when a product has not been certified to be home compostable. This can be very misleading, and the layperson could even think that this means the item can be littered and degrade in a short timeframe. As mentioned above, Standard EN 13432 will be revised to include new standardised definitions of these terms. The **use of such a label would therefore be contingent on meeting these standards**.

The proposed approach for reinforcing the Essential Requirements, therefore, is to **include a legal requirement for a) the use of labels relating to reusable, recyclable or compostable to only be used if the packaging meets the relevant definitions and b) a minimum standard of the label itself**. For example, by setting some specific parameters related to the format of the label, the size, wording, symbol etc. It is expected that the approach to defining the minimum standard would be included in a Commission study, as is the approach to defining the minimum standard for labelling of non-flushables (e.g. wet wipes) under the SUP Directive.

2.4.2 E-commerce Packaging Labelling

In order to support the objective to reduce the amount of unnecessary air space in e-commerce packaging, **any packaging used specifically for e-commerce should be required to include a clear label on the front or side that alerts the consumer to record the delivery in a national enforcement database if they think it is over packaged**. Dedicated e-commerce packaging could have the label printed on, whereas SMEs using other non-specific boxes could use stick on labels. The senders and the delivery companies could both be fined it they are caught delivering without such a label, so the delivery companies would act as monitors and not pick up parcels from suppliers without labels in order to avoid the risk of getting fined themselves. The enforcement database could be run and funded by the national EPR scheme.

2.4.3 Digital Watermarking

Part of the approach to considering changes to labelling requirements included a review of the status of digital watermarking technologies and the potential feasibility for requiring their use through the Essential Requirements. The assessment was based upon

[8] Eunomia (2019) *Relevance of Biodegradable and Compostable Consumer Plastic Products and Packaging in a Circular Economy*, Interim Report to DG Environment of the European Commission

interviews with three participants of the HolyGrail project. This was a pioneering project, supported by the Ellen MacArthur Foundation, investigating on how plastic packaging integrated with chemical tracers or watermarks can help improve recycling rates by increasing the segregation of packaging types. The technology can thus help address the difficulties in sorting multilayer- and black packaging and in differentiating between food/ non-food packaging, for example. This is important to ensure a higher level of recycled content can be included in food contact materials. There are other advantages as it would remove the need for bar codes on the labels and could speed up scanning times at check-outs.

Tracer based technologies were not generally supported due to the potential issues with adding further chemicals into the packaging. There does appear to be strong support from the packaging, retail and recycling industries for digital watermarking. The technology is currently being used by Walmart in the United States, but it was found not to be at a commercially ready scale as yet. A new HolyGrail 2.0 project is now underway with a much broader range of stakeholders in the consortium, including brands and retailers.

The costs are likely not too be prohibitive, with just a licensing fee to the technology company providing the watermark and the cost of installing add-on modules linked to existing infrared sorting units.

It was considered too early for inclusion in the Essential Requirements by stakeholders, as further research and trials need to be carried out. There is an expectation the system might be implementable by industry in 2021. However, it was stated that further technology advancement might be needed before mandatory adoption through the Essential Requirements. There was some support for seeking to support voluntary adoption, through Horizon 2020 funding or other means.

The proposed approach for the revision of the Essential Requirements, therefore, is to **include a statement encouraging the uptake of the technology in a voluntary manner** in the short term. A statement should be included in the Essential Requirements to the effect that a **review will be carried out by the Commission in 2025 to assess the feasibility for adoption in them as a legal requirement** following a full impact assessment.

2.5 Enforcement

To date, the Essential Requirements have predominantly relied on the presumption of compliance – attached to the CEN Standards – and there has been little pro-active enforcement in most Member States. As the intention is to reinforce the Essential Requirements, to define the requirements more precisely and enhance their impact, it stands to reason that enforcement measures should also be stepped-up.

2.5.1 Assessment of Options

As several of the enforcement requirements relate to EU wide approaches there may be the case for an **EU wide packaging registration system to aid compliance**. This could work in two ways. A bottom up approach where Member States have individual registries which feed data up to an umbrella system that aggregates data only. Or a top down approach where the EU registry is the primary portal for data management, which could then be fed down to national level registries. There are several advantages of an EU-wide registry. Firstly, producers would only have to submit data returns across the EU once. This would compensate for the additional time that would be required to submit more data per packaging item than is currently required. Secondly, smaller Member States have limited capacity for developing their own databases so there may be gaps if the bottom up approach were taken. Under the top down approach there would be no reason why national governments could not maintain their own databases, and potentially save effort by receiving relevant data from the EU registry. In either case, it would be important for the registry to be harmonised with the needs of reporting on packaging placed on the market to EPR schemes to ensure no duplication of efforts.

To consider the viability of a packaging registry, potential existing models from Member States have been reviewed, and are summarised in the boxes below.

Germany has introduced LUCID, a registry to implement packaging law.[9] All companies placing packaging on the German market are required to register with this central system, provide information on packaging materials and quantities and produce data reports. Registration is free of charge and the register is publicly available; it is used to calculate producers' financial contribution towards of costs of disposing of their packaging. Registered producers receive a registration number from LUCID, which producers require in order to participate in the mandatory Green Dot system. If the weight of packaging placed by a company on the German market exceeds a certain threshold (such as 30 tonnes for metals and plastics), they must have the amount independently inspected and verified.
The UK has a National Packaging Waste Database (NPWD), to which producers that do not participate in a producer responsibility scheme must submit information on their company (including turnover) and quantities of packaging placed on the market.[10] Packaging suppliers are required to provide their customers with data about: return, collection and recovery systems used; reuse, recovery and recycling; and the meaning of recovery and recycling symbols on the packaging.
Estonia operates a similar system to the UK and data is submitted to a national packaging register, which is independently audited.[11] The register records information

[9] https://www.verpackungsregister.org/

[10] https://npwd.environment-agency.gov.uk/Public/PackagingHome.aspx

[11] The information about the approach used in Estonia summarised in this section is based on the following sources:

on quantities placed on the market, waste generation, reuse and recovery and on any heavy metals content. The Ministry of the Environment, the Environmental Inspectorate and the Tax and Customs Board have the right to examine the source documents of the reported data.

There are also examples of EU-level registries, including REACH registration with the European Chemical Agency (ECHA) and the European Product Database for Energy Labelling (EPREL). Although not specific to packaging they have been considered to assess whether any principles or lessons learned could be applied to a new EU-wide packaging registry. Concerns have, however, been expressed that a packaging registry would involve a significantly higher volume of entries than EPREL, given the number of different types of packaging placed on the market compared to electrical appliances. In practice, this might mean that including all individual packaging into a common database is not possible and that collecting data by materials, chemistry, formats or producers may be more appropriate. The actual number of categories would relate to the number required to define the positive and negative lists and any specific types of packaging that had specific requirements, such as mandatory reusable packaging formats.

In terms of the data to be provided, information about the volume and composition of the different types of packaging used or handled is expected to be readily available to companies due to their EPR obligations. Companies involved in food packaging additionally have checks in place to ensure that their packaging complies with food contact rules, indicating that internal monitoring and data recording of material composition is eminently feasible. Data related to recycling content is not as readily available as suppliers aren't always able to provide these data. If such data were mandated this would stimulate the development of data management systems to provide the necessary information.

There are, however, potential challenges in passing information along the supply chain and disclosing information that is commercially sensitive. Stakeholders have indicated that larger companies are able to specify the information and documentation that their suppliers must provide, while SMEs could have less influence over their suppliers to secure this information. If the register is publicly available, there are also considerations relating to intellectual property rights, however it seems feasible to publish information on material quantities and substances used without disclosing commercially sensitive information. Further consultation with stakeholders and consumer representatives would indicate the appropriate and necessary degree of disclosure.

There are a range of European-level bodies that could potentially be in charge of a packaging registry. These include: DG Environment; DG GROW; the JRC, Eurostat and the European Environment Agency. Many of these are already well-practised in handling confidential data if it is ultimately decided that not all the information is to be made

OECD Environmental Performance Reviews, Estonia 2017: https://www.oecd-ilibrary.org/sites/9789264268241-11-en/index.html?itemId=/content/component/9789264268241-11-en&mimeType=text/html
Estonian Packaging Act (English version): https://www.riigiteataja.ee/en/eli/ee/Riigikogu/act/524102014004/consolide

publicly available. Alternatively, there may be a preference for a new, independent body, to be set-up and financed by producers.

In terms of the **verification of the data submitted** to the register there are a number of approaches that could be considered. These different mechanisms would imply trade offs between robustness and cost.

- Self-certification
- Auditing by third parties (checking data etc)
- Auditing by EU registry / Member State authorities (monitoring outliers etc)
- Prior approval by an EU level technical body to be registered

Prior approval of each piece of packaging placed on the market would be an intensive process. Given that a lot of packaging types will relate to the positive and negative lists that would already be defined by an EU level technical body, it does not appear necessary to take this approach.

Finally, the setting of minimum penalties for non-compliance jointly and severally liable (i.e. each partner) across the value chain would incentivise all actors to ensure the packaging was within the legal requirements. If not, the penalty would have to be shared across the different actors.

2.5.2 Conclusions – Measures for Enforcement

It is proposed that companies placing packaging on the market (fillers) are required to report to an EU Packaging Register with the following information:

- Packaging weights
- Material composition
- Types of glues, fillers, inks used
- The recycled content and evidence that the relevant Standard has been followed
- Ratio of packaging to product volume/ weight
- Information on the reuse system in place (if designed for reuse) and the minimum number of trips for which the packaging is designed
- Evidence that the packaging complies with the positive and negative list for recyclability

This will help to enforce the new requirements relating to the efficient use of packaging, recyclability/ reuse and recycled content. Member States will be responsible for checking that packaging placed on the market in their country is registered on the database and the information declared is accurate. Member States could then impose fines for non-compliance.

The Commission's impact assessment can examine the feasibility of an EU-wide registry in more detail, including the likely costs to producers funding a register, the reporting burden – particularly for SMEs, and the mechanisms the registry interacts with existing reporting requirements at Member State level, for instance for EPR compliance.

In terms of compliance, **self-certification back up by minimum levels of third party auditing of companies specified in the Essential Requirements and auditing from the registry and/or Member State authorities should be adequate to ensure a high level of compliance with the rules**.

With the Essential Requirements themselves changing and a new enforcement procedure, it is appropriate to review the role of the CEN Standards. The recommendations are summarised in Table 1; it should be noted that the comments specifically relate to compliance with the Essential Requirements and do not consider whether the standards are used for other purposes. If the existing standards need to be maintained, new standards could be created based upon the old ones and references made to the new codes in the revised Essential Requirements.

Table 1: Future Role of the CEN Standards with Respect to the Essential Requirements

Standard	Future Role
EN 13427 – the Umbrella Standard	The intention is that Annex II of the PPWD provides producers with the necessary level of detail to effectively comply with the Essential Requirements. The reporting requirements will be included in legislation and the evidence needed to demonstrate compliance will be provided in a compliance form from the EU Packaging Registry. The Standard will therefore not be needed to implement and enforce the Essential Requirements.
EN 13428 – Prevention by Source Reduction	This is still required to provide guidance on reducing packaging to the minimum adequate amount and procedures for calculating rations (which are to be reported to the EU Packaging Registry). The Standard will need to be amended to refine and define the critical areas.
EN 13429 – Reuse	This is still required to define reuse within the Essential Requirements. Producers can be required to submit information to the packaging registry to demonstrate that a reuse system in place and steps have been taken to minimise the environmental impact of the reconditioning process.
EN 13430 - Recycling	As the Essential Requirements themselves are to include a clear definition of recyclable packaging and set out how this is to be assessed, there will no longer be a need for this Standard in relation to the Essential Requirements.
EN 13431 – Energy Recovery	It is proposed that energy recovery is removed as an option from the Essential Requirements, so this Standard will no longer be needed.
EN 13432 – Biodegradation & Composting	The Standard to determine what is compostable is still needed, however the Standard is based on optimal conditions that do not always reflect reality. Further stakeholder engagement and a detailed impact

	assessment are needed to determine how the Standard can better reflect the infrastructure available for compostable packaging.
New Standard – Recycled Content	A new Standard on a procedure to maximise the potential recycled content of packaging should be developed for packaging that does not have specific recycled content targets.