Council of the
European Union

Brussels, 2 December 2022
(OR. en)

15581/22
ADD 2

Interinstitutional File:
2022/0396(COD)

ENV 1243
MI 898
ENT 169
IND 527
CONSOM 320
COMPET 984
CODEC 1903

COVER NOTE

From:	Secretary-General of the European Commission, signed by Ms Martine DEPREZ, Director
date of receipt:	1 December 2022
To:	Ms Thérèse BLANCHET, Secretary-General of the Council of the European Union
No. Cion doc.:	SWD(2022) 384 final
Subject:	COMMISSION STAFF WORKING DOCUMENT IMPACT ASSESSMENT REPORT Accompanying the document Proposal for a Regulation of the European Parliament and the Council on packaging and packaging waste, amending Regulation (EU) 2019/1020, and repealing Directive 94/62/EC

Delegations will find attached document SWD(2022) 384 final.

Encl.: SWD(2022) 384 final

EUROPEAN
COMMISSION

Brussels, 30.11.2022
SWD(2022) 384 final

PART 1/2

COMMISSION STAFF WORKING DOCUMENT

IMPACT ASSESSMENT REPORT

Accompanying the document

Proposal for a Regulation

of the European Parliament and the Council on packaging and packaging waste, amending Regulation (EU) 2019/1020, and repealing Directive 94/62/EC

{COM(2022) 677 final} - {SEC(2022) 425 final} - {SWD(2022) 385 final}

1. INTRODUCTION: POLITICAL AND LEGAL CONTEXT 3
1.1. Policy context 3
1.2. Legal context 4
1.3. Public, environmental and economic context 5
2. PROBLEM DEFINITION 5
2.1 Problems and intervention logic 5
2.1.1. High levels of avoidable packaging 9
2.1.2 Barriers to packaging circularity 11
2.1.3 Quality of recycling 14
2.2 Links between problems 14
2.3 What are the problem drivers? 14
2.4 How is the problem likely to develop? 15
2.5 Summary of consequences 16
2.5 Who is affected and how? 17
3. WHY SHOULD THE EU ACT? 18
3.1. Legal basis 18
3.2. Subsidiarity: Necessity of EU action and EU added value 18
3.3. Interface with and gaps within the existing legal framework for waste 18
4. OBJECTIVES: WHAT IS TO BE ACHIEVED? 19
5. WHAT ARE THE AVAILABLE POLICY OPTIONS? 20
5.1. Legal instrument: Change from a Directive to a Regulation 20
5.2. What is the baseline from which options are assessed? 20
5.3. Description of the policy options 21
6. WHAT ARE THE IMPACTS OF THE POLICY OPTIONS? 23
6.1.1. PREVENTION AND REUSE 23
6.1.2. MEASURES ON PREVENTION AND REUSE IN POLICY OPTION 1 23
6.1.3. MEASURES ON PREVENTION AND REUSE IN POLICY OPTION 2 24
6.1.4. MEASURES ON PREVENTION AND REUSE IN POLICY OPTION 3 28
6.2. RECYCLABILITY AND COMPOSTABILITY 29
6.2.1. MEASURES ON RECYCLABILITY AND COMPOSTABILITY IN POLICY OPTION 1 29
6.2.2. MEASURES ON RECYCLABILITY AND COMPOSTABILITY IN POLICY OPTION 2 31
6.2.3. MEASURES ON RECYCLABILITY AND COMPOSTABILITY IN POLICY OPTION 3 32
6.3. RECYCLED CONTENT OF PLASTIC PACKAGING 33
6.3.1. MEASURES ON RECYCLED CONTENT OF PLASTIC PACKAGING IN POLICY OPTION 1. 33
6.3.2. MEASURES ON RECYCLED CONTENT OF PLASTIC PACKAGING IN POLICY OPTION 2. 33
6.3.3. MEASURES ON RECYCLED CONTENT IN POLICY OPTION 3 34
6.4. ENABLING MEASURES 34
6.4.1. ENABLING MEASURES IN POLICY OPTION 1 34
6.4.2. ENABLING MEASURES IN POLICY OPTION 2 36
6.4.3. ENABLING MEASURES IN POLICY OPTION 3 40

6.5. TRANSFERS OF FINANCIAL COST 42
6.6. COST BENEFIT ANALYSIS OF OPTIONS 44
6.7. COMPARISON OF POLICY OPTIONS 46
7. PREFERRED OPTION 47
7.1. THE PREFERRED POLICY PACKAGE 47
7.2. IMPACTS OF THE PREFERRED POLICY PACKAGE 49
7.3. FEASIBILITY 50
7.4. INTERNATIONAL ASPECTS 52
7.5. REGULATORY BURDEN AND SIMPLIFICATION 52
7.6. APPLICATION OF THE 'ONE IN, ONE OUT' APPROACH 53
8. HOW WILL IMPACTS BE MONITORED AND EVALUATED? 53

1. INTRODUCTION: POLITICAL AND LEGAL CONTEXT

All goods need packaging to be protected and to be easy transported from where they are produced to where they are used or consumed. There are, though, barriers that hamper the Internal Market from fully functioning for packaging, with diverging regulatory approaches mushrooming across Member States. In addition, there are environmental concerns: packaging is a key user of virgin materials (40% of plastics and 50% of paper use in the EU is for packaging) and packaging represents 36% of municipal solid waste.[1] At the same time, low levels of reuse and poor recycling stand in the way of achieving a low-carbon circular economy. Instead, important shares of the recovered waste are incinerated or landfilled.

This initiative updates the EU's legislative framework for packaging and packaging waste. It is an integral part of the Green Deal[2], the EU's growth strategy to transform the EU into a modern, resource-efficient, clean and competitive economy where there are no net emissions of greenhouse gases by 2050, where economic growth is decoupled from resource use, and where no person and no place is left behind. The initiative also needs to ensure that Member States and businesses are properly supported in delivering existing objectives, with a regulatory framework that supports investment, reduces waste and supports high quality recycling.

1.1. Policy context

As stated in the Green Deal, the transition to a low-carbon circular economy is an opportunity to expand sustainable economic activity, thus generating employment. With regards to packaging and packaging waste, the Green Deal's commitments are taken up in the new Circular Economy Action Plan (CEAP)[3], which commits to reinforcing the mandatory essential requirements for packaging and to consider measures to reduce (over)packaging and packaging waste, drive design for re-use and recyclability of packaging, reduce the complexity of packaging materials and introduce requirements for recycled content in plastic packaging. Further, the CEAP strives in line with the European Strategy for Plastics[4] that "all packaging, including plastics, on the EU market is reusable or recyclable in an economically viable, cost-effective manner way by 2030". The Industrial Strategy for Europe[5] confirmed the importance of the Internal Market for the EU's competitiveness and prosperity. European citizens and operators though experience barriers that prevent them from fully exploiting the potential of the single market including restrictive and complex national rules, limited administrative capacities, imperfect transposition of EU rules and their inadequate enforcement.

The Council conclusions of December 2020[6] welcomed the intention of the Commission to ensure that all packaging is reusable or recyclable in an economically feasible manner by 2030 and reducing packaging, over-packaging and thereby packaging waste. The Council underlined that the revision "should update and establish more concrete, effective and easy to implement provisions to foster sustainable packaging in the internal market and minimise the complexity of packaging in order to foster economically feasible solutions and to improve the reusability and recyclability as well as minimise substances of concern in packaging material, especially with a view to food packaging materials".

The Parliament's resolution of 10 February 2021 on the New Circular Economy Action Plan[7], reiterated the objective to make all packaging reusable or recyclable in an economically viable way by 2030 and called on the Commission to present a legislative proposal including waste reduction measures and targets and ambitious essential requirements in the Packaging and Packaging Waste Directive (PPWD) to reduce excessive packaging, also in e-commerce, improve recyclability and minimise the complexity of packaging,

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[1] Coelho et al (2020), *Sustainability of reusable packaging – current situation & trends*– Resources, Conservation & Recycl, Vol 6

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2019%3A640%3AFIN

[3] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2020:98:FIN&WT.mc_id=Twitter

[4] EUR-Lex - 52018DC0028 - EN - EUR-Lex (europa.eu)

[5] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0102

[6] https://data.consilium.europa.eu/doc/document/ST-13852-2020-INIT/en/pdf

[7] https://www.europarl.europa.eu/doceo/document/TA-9-2021-0040_EN.html

increase recycled content, phase out hazardous and harmful substances, and promote reuse. It underlined that food safety or hygiene standards must not be compromised.

Europe faces strategic dependencies for many materials, and so remains vulnerable to supply shocks, including for fossil fuels. The invasion of Ukraine by Russia highlights the vulnerabilities of global supply chains. Using materials more efficiently, by boosting the use of recycled materials instead of primary raw materials, and by supporting the circular economy will help decouple economic development from natural resource use, contribute to achieving climate neutrality by 2050 and to halting biodiversity loss. This will also reduce our dependencies, strengthen our competitiveness and foster our open strategic autonomy, thus making the EU economy more resilient to disruptions in integrated global value chains.

Further, the EU has committed to implementation of the UN 2030 Agenda for Sustainable Development, including its 17 Sustainable Development Goals (SDGs). Despite this, while notable progress has been achieved towards the SDG on ensuring sustainable consumption and production patterns (SDG 12), this is also the SDG where in the global ranking the EU-27 Member States have the second lowest average score[8]. This initiative will improve the EU's performance regarding SDG 12.5, which is to substantially reduce waste generation through prevention, reduction, recycling and reuse by 2030.

Finally, EU citizens and civil society proposed in the Conference on the Future of Europe[9] strong action on waste prevention, packaging waste management and packaging circularity through more recycled content.

1.2. Legal context

The Packaging and Packaging Waste Directive (PPWD)[10] was adopted in 1994. It aims to harmonise national measures, to provide a high level of environmental protection and to ensure a good functioning of the internal market. Packaging is defined as "all products made of any material of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user of the consumer". Packaging consists of sales packaging (primary packaging), grouped packaging (secondary packaging) and transport packaging (tertiary packaging). As main instruments, the PPWD imposes on the Member States to enforce the Essential Requirements, which relate to the composition of packaging and its reusable and recoverable nature, and to meet recovery and recycling targets. Whereas recycling and incineration with energy recovery could be credited till 2008 to the targets, since 2008 only the recycled waste can be accounted for the targets.

In 2014, a Fitness Check[11] identified weaknesses in the Essential Requirements and recommended to make them "more concrete and easily enforceable" and "to strengthen essential requirements as a key tool to achieve better environmental performance of packaging". However, the amendment of the PPWD in 2018 did not yet address these weaknesses. It mainly increased the 2008 recycling targets for 2025 and 2030; in particular, the low recycling rates for plastic packaging (22,5%) were more than doubled to 50% for 2025 and set at 55% in 2030. Moreover, it introduced new methods for calculation of the recycling percentages and rules for their reporting. This initiative delivers on three revision clauses included in the 2018 amendment of the PPWD: firstly, to examine 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; secondly, to examine the feasibility of setting quantitative targets on reuse of packaging and any further measures to promote reuse of packaging; thirdly, to evaluate the effectiveness of the measures aiming to reduce the consumption of lightweight plastic carrier bags (LPCBs) and to examine other possible ways to achieve this objective; and to present a legislative proposal on these issues, if appropriate.

[8] https://ec.europa.eu/info/sites/default/files/rp_sustainable_europe_30-01_en_web.pdf
[9] 2po250fn174z62m8g8c9ya9e62m7 (prod-cofe-platform.s3.eu-central-1.amazonaws.com)
[10] European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste, (OJ L 365, 31.12.1994, p. 10)
[11] European Commission (2014), *Ex-post evaluation of Five Waste Stream Directives*, – SWD (2014)209

A number of related initiatives are very important for packaging: The Waste Framework Directive (WFD[12]) establishes horizontally applicable concepts related to waste generation and waste management, including waste treatment, recycling and recovery. It creates the waste hierarchy, giving priority to waste prevention over reuse and/or recycling, subsequently recycling over other recovery options and final disposal via landfilling. Further, it obliges Member States to have in place functioning Extended Producer's Responsibility (EPR) schemes, which ensure that producers of products bear responsibility for the management of the waste stage of their products. In the CEAP, the Commission committed to assess feasibility of harmonising the separate waste collection systems in the Member States.

The Single-Use Plastic Directive (SUPD[13]) focusses -amongst other plastic products- also on certain plastic packaging (e.g. carrier bags, beverages cups, food and beverage containers including bottles) with the main purpose to prevent littering and its environmental impact. It contains product bans, the obligation for Member States to ensure the separate collection for recycling and to reduce the volume of certain groups of single use plastics. Finally, it established minimum recycled content targets for single use plastic beverage bottles.

Another legal act with respect to plastic packaging is the 2020 Own Resource Decision (ORD[14]), which established an own resource based on plastic packaging waste not recycled in a specific Member States, irrespective whether this Member States meets the target or not. The ORD creates an incentive for Member States to put in place measures in the pursuit of high recycling rates for plastic packaging. It gives flexibility to the Member States in deciding on their efforts to have high plastic recycling rates in line with the WFD. Annex 5.3 sets out the links of the PPWD to European Green Deal initiatives and other product legislation.

1.3. Public, environmental and economic context

Packaging grows faster than the GNI and has negative impacts on the environment -from overexploitation of resources to pollution of land and sea- and is a significant source of climate change. According to a Eurobarometer survey, 94% of citizens in EU Member States say that protecting the environment is important to them with climate change, air pollution, and waste being the three most important environmental issues.[15] Around nine in ten citizens are concerned about plastics' impact on the environment. 67% of the citizens state that industry and retailers should reduce plastic packaging and want products to be designed for recycling.

As a result of the growing public awareness about the environmental concerns related to packaging, many companies have committed to act on packaging waste.[16] These voluntary commitments, however, tend to focus more on quick wins or window dressing and less on the needed systemic change. This situation impacts the internal market and leads - through diverging EU provisions now and in the future - to legal uncertainty for business with subsequently lower investment and innovation in packaging and business models beneficial to the environment. At the same time, packaging is a significant economic activity: Packaging manufacturing generated in the EU by itself a turnover of EUR 355 billion[17] in 2018 and the operators in waste its management, including reuse and Deposit Return Systems (DRS), EUR 15 billion[18]. Packaging for e-commerce, estimated global turnover of EUR 57 billion in 2022, increased from 2017 till

[12] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02008L0098-20180705

[13] 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 (OJ L 155, 12.6.2019, p. 1–19)

[14] Council Decision (EU, Euratom) 2020/2053 of 14 December 2020 on the system of own resources of the European Union and repealing Decision 2014/335/EU, Euratom (OJ L 424, 15.12.2020, p. 1–10)

[15] Special Eurobarometer 501, Dec 2019, "Attitudes of European citizens towards the environment"

[16] https://www.mckinsey.com/industries/paper-forest-products-and-packaging/our-insights/the-drive-toward-sustainability-in-packaging-beyond-the-quick-wins

[17] thereof 55 billion € plastics, with ~1.5 billion € EU27 exports and ~1.2 billion € imports, main partners USA, UK, China (Statista)

[18] Eunomia report for PPWD2 contract

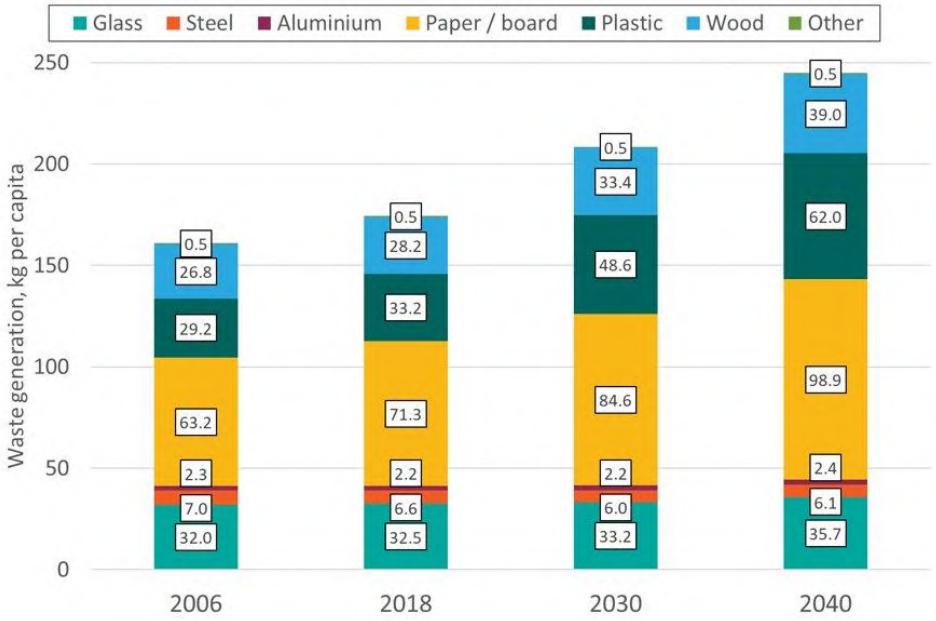
2021 annually by 20%[19]. In general, business is calling for a clear EU framework that supports a shift of their activities towards more sustainability and ensures growing supplies of recycled materials.

2. PROBLEM DEFINITION

2.1 Problems and intervention logic

The problems can be directly derived from the waste hierarchy established in the WFD: *underexploited prevention-reuse-recycling and too much incineration and landfill.* The total packaging waste generation in the EU increased from 66 million tonnes in 2009 to 78.5 million tonnes in 2019 (19% growth, more than GNI). The PPWD from 1994 could not reverse this trend. The COVID-19 pandemic might have further enhanced the trend due to more internet sales, more sales in supermarkets for food consumed at home instead of restaurants and more take-away/prepared home delivery of food. The annual packaging waste generated was estimated in 2018 at 173 kg per inhabitant in the EU, an increase of 27 kg compared to 2009. This quantity varied from 74 kg in Croatia to 228 kg in Ireland. Figure 1 shows the rising trend in packaging waste generation, in particular for paper and plastics. Plastic packaging is the most carbon intensive material, with a total of 1.8 tonnes of CO_2e emitted for the lifecycle of one tonne of plastic packaging. It is followed by paper/board and glass, which have emissions of 809 and 565 kg CO_2e per tonne, respectively. Wood packaging has 19 kg CO_2e net emissions per tonne, while for steel and aluminium they are negative.

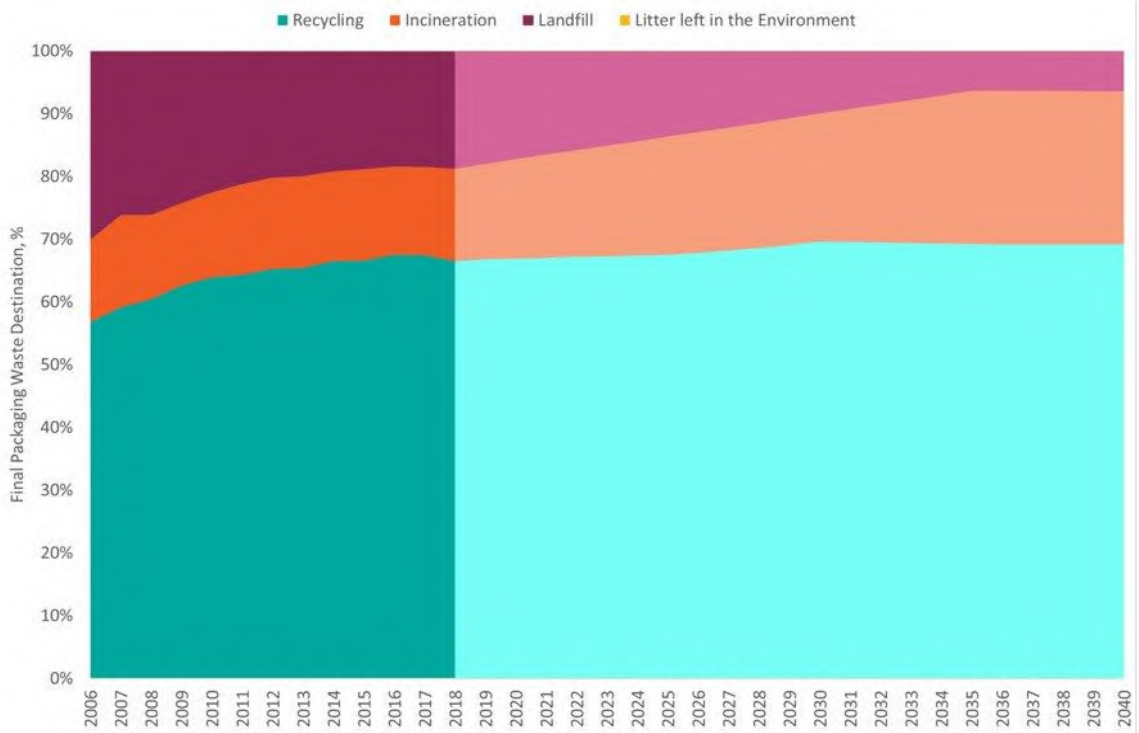
Figure 1 Trend in Packaging Waste Generation per capita for the packaging materials (EU-27 countries)[20]



The second group of problems relates to barriers to packaging circularity e.g., an increased use of packaging design features that inhibit recycling, increased cross-contamination of compostable recycling streams[21], substances in packaging that may be hazardous and confusing labelling of packaging for consumer to sort it. Thus, the priority of reuse and recycling over recovery and landfill is still not yet fully enforced. Figure 2 shows that recycling rates stagnate, while 15% went 2018 into incineration and 19% was still landfilled.

Figure 2 Packaging waste treatment (littering always below 0,5%)[20]

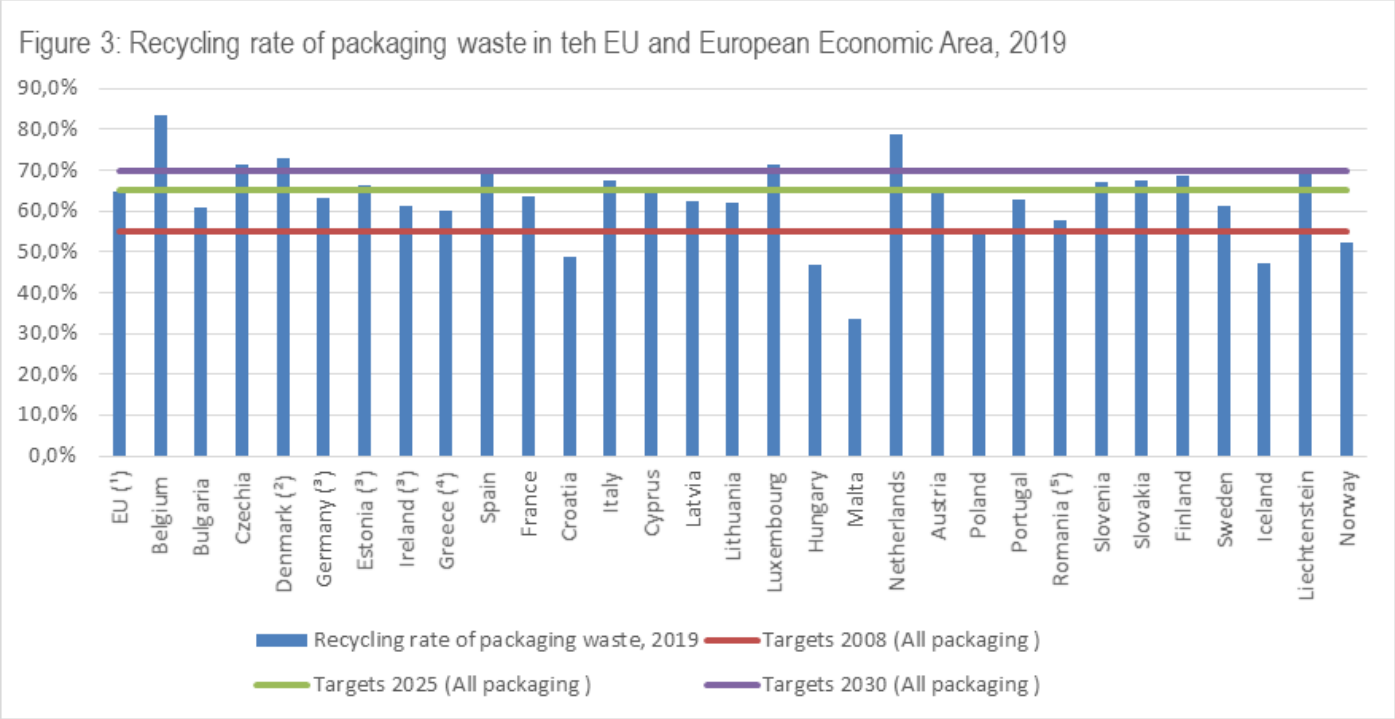
[19] Smithers, "*The Future of E-commerce Packaging to 2027*", 2021
[20] Source: Eunomia report December 2021 based on EUROSTAT data
[21] Ottimizzazione del riciclo dei rifiuti organici, CIC – COREPLA (2019-2020)



Against the background of the Russian invasion in Ukraine and the subsequent impacts on the energy markets, a comparison of recycling vs incineration with energy recovery might be useful: According to a recent LCA conducted by the JRC[22], 1 tonne of PET waste going into mechanical recycling saves 2.15 tonnes CO2e and 1.85 tonnes CO_2e when going into chemical recycling, whereas its incineration with energy recovery results in additional 1,2 tonnes CO_2e. In terms of fossil resource use, 1 tonne PET waste going into mechanical recycling and chemical recycling recovers 65.9 GJ and 59.7 GJ respectively, and 12.3 GJ in case it is incinerated with energy recovery. The results were similar for the management of packaging waste from Expanded Polysterene. Thus, recycling of plastic waste is approximately 5 times better than incineration with energy recovery in terms of fossil fuel use; in terms of climate change, recycling leads to savings, while incineration to additional emissions.

Figure 3 provides an overview of Member States' recycling performance vis-à-vis the current and future targets for all packaging. These recycling rates are still based on the old calculation methodology. It is estimated that the application of the new methodology will result in a reduction of the reported recycling rates of 5-20%.

[22] Amadei A., Ardente F., Garcia-Gutierrez P., Klenert D., Nessi S., Tonini D., Tosches D., Saveyn H. (2022), Environmental and economic assessment of plastic waste recycling, Mechanical, physical and chemical recycling technologies, publication pending



(1) Eurostat estimate (2) Provisional data (3) Break in series (4) Estimated data (5) 2018 data instead of 2019 Source: EUROSTAT

The EEA assessments[23], based on 2019 data and considering success and risk factors and including estimates how the new calculation methodology reduced the Member States recycling performance, show that the recycling rates stagnate. 10 Member States are at risk of not reaching the overall packaging recycling target for 2025 (EL, HR, CY, LT, HU, MT, PL, RO, SK), 11 Member States are at risk of not meeting two or more material specific targets (BG, EL, ES, HR, CY, HU, MT, PL, PT, RO, SK) and 20 Member States are at risk of not reaching at least one of the material specific recycling targets (BG, CZ, IE, EL, ES, FR, HR, IT, CY, LV, LT, LU, HU, MT, AT, PL, PT, RO, SK, FI). The reasons for the variety of the national recycling rates (and waste generation levels) are differences of the waste management and infrastructure established in the Member States, which are mainly a consequence of the national implementation of the waste directives. These differences are compiled in the regular, country specific Commission's Early Warning Reports, which contain a detailed country profile, a thorough analysis of the success and risk factors likely to influence future performance and conclusions. Typical examples for such factors are rules for reuse or deposit return systems. The assessment of the Commission's Early Warning Reports, has revealed so far that for packaging waste, the most challenging packaging waste stream, in terms of recycling is plastic. The assessment found that 19 MS might be potentially at risk of missing the 50% recycling target in 2025. The main reasons for not meeting the recycling targets are the low separate collection rates for packaging waste. Also, economic operators and the Member States have problems to correctly interpret the data to be reported.

The third group of problems relates to downcycling and the low levels of uptake of recycled content in plastic packaging, which limits the EU's ability to reduce the use of virgin materials in new packaging and products. Market failures and shortcomings in the current regulatory framework are a drag on the profitability of recycling activities and put a strain on investment in technologies and the supply logistic needed to ensure that packaging is collected, sorted and recycled to a sufficiently high quality. These shortcomings include: a quality risk associated with the use of recycled content; the fact that market prices of virgin materials do not include environmental impacts associated with their production and use; and a non-optimal functioning of markets for secondary raw materials related to the lack of appropriate quality standards and information failure. High and growing levels of packaging waste and too little packaging waste going into high quality recycling.

[23] Basis of the Commission's Early Warning Report 2022 identifying Member States at risk of not meeting the recycling targets

Figure 4, which gives the full intervention logic, building on the problems tree and showing their relationship to the objectives and the policy options, which are then described in the following sections:

Context	**Green Deal – Transition to a lower carbon, circular economy, Plastic Strategy, Circular Economy Action Plan, Zero Pollution Action Plan**	
Drivers	**Market failures** - Externalities and fragmented market - Information failures (unclear labelling) - Suboptimal market structure along the waste value chain	**Regulatory failures** - Delayed / incorrect transposition of current Directive - Essential Requirements poorly designed, unenforceable, and unevenly applied - Difficulties of the Member States to ensure compliance with national recycling targets - SUPD and ORD only cover plastic packaging, and this partly
Problems (highly interrelated)	**High level of and growing packaging waste:** - High levels of avoidable packaging - Increasing single use packaging	**Barriers to packaging circularity:** - Packaging design features that inhibit recycling - Cross contamination of compostable recycling stream - Reuse systems not cost efficient - Inconsistent and confusing labelling
Consequences	**Environmental impacts** - Climate impacts - Littering - Landfill / incineration / export at end life - Presence of hazardous substances	**Economic impacts** - Inefficient use of resources - High costs of packaging - Inefficient and costly waste management
Objectives	**General objective to reduce negative environmental impacts of packaging and packaging waste and improve the functioning of the internal market** Specific objectives to meet this general objective is: 1. Reduce the generation of packaging waste 2. Promote a circular economy for packaging in a cost-efficient way 3. Promote the uptake of recycled content in packaging	
Polity options	*Option 1 – Better standardisation and clearer Essential Requirements* *Option 2 – Mandatory targets for waste reduction, reuse and minimum recycled content in plastic packaging, requirements to ensure full recyclability by 2030 and harmonised product rules* *Option 3 – Higher mandatory targets and additional product requirements*	

2.1.1. High levels of avoidable packaging

Ratio packaging material weight/packaged product weight

Light-weighting efforts within material categories have led to a relative increase in packaging material efficiency on a per unit basis (i.e. the amount of packaging by weight used for a certain application). This has reduced the unit weight by an average 26% from 1990-2015. However, there are significant variations in the weight of packaging within a packaging material groups for a certain product type, as evidenced by Figure 5. Accordingly, there are still many examples of packaging that are heavier and larger than functionality requires, mainly for marketing reasons. In e-commerce, over-packaging is even more evident (extra outer packaging and empty space (see Figure 6). Moreover, light-weighting of packaging has been accompanied by a shift to materials with a worse environmental footprint, particularly from metal and glass to plastic and paper/board.

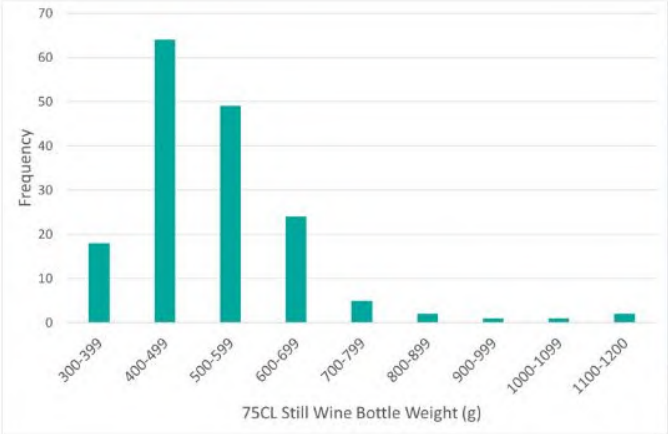


*Figure 5: Variation in Packaging Weights of Still Wine Bottles**

Figure 6: Example of oversized packaging in e-commerce

*Source: Eunomia report December 2021

Increase in the proportion of packaging that is single-use

Country specific trends of packaging reuse indicate a reduction in reusable primary and tertiary packaging (no separate data are available for secondary packaging) over the past two decades. The reuse of consumer (primary) packaging is increasingly uncommon and is limited primarily to certain beverage packaging at a national scale. Even within beverage packaging, a steep decline in reusables has been recorded, with some exceptions in the hospitality sector. Table 1 shows the Member States with the greatest market share decreases for refillable bottles for beer and carbonated soft drinks over the last two decades. The highest being Denmark with an 80% reduction in market share of refillables for that categories of beverages.

Table 1 Change in Refillables' Market Share for beer and soft drinks, 1999-2019 (Source GlobalData Reloop 2019)

Country	Market Share refillables 1999	Market Share refillables 2019	% difference
Denmark	93%	13%	**-80%**
Finland	80%	4%	**-76%**
Romania	70%	13%	**-57%**
Bulgaria	74%	22%	**-52%**
Hungary	63%	11%	**-52%**
Slovak R.	69%	20%	**-49%**
Sweden	44%	4%	**-40%**
Germany	73%	54%	**-19%**
France	9%	3%	**-6%**

The tertiary sector remains the strongest in terms of reuse practices. However, there are still several transport packaging items with promising potential to improve.

As products, materials and consumption patterns have evolved, there has been a significant rise in the use of one-way packaging, especially single-use plastic. The evolving retail landscape, with larger distribution networks, produced and packed on high-speed packaging lines, have exerted a downward pressure on reuse. This trend is likely to continue despite the introduction of the SUPD. There have been recent signals, albeit on a small scale, that this decline in reusable primary packaging may be slowing in some areas and for some consumer packaging types. There is significant opportunity in this sector to build upon a rise in consumer awareness, and the growing popularity of packaging free/zero waste shops. Some Member States are taking action to encourage reuse, through for example: binding and non-binding reuse targets, Green Public Procurement (GPP) and/or use of funds from the Extended Producer Responsibility (EPR) schemes to promote reuse. While welcome, such initiatives at Member State level may challenge the integrity of the internal market and might not be proportionate.

2.1.2 Barriers to packaging circularity

Data from both Eurostat and market data reports[24] shows increased use of packaging design characteristics that may inhibit recycling. Packaging is non-recyclable because it poses challenges for most sorting systems and recycling operations. From 2012 till 2020, the share of unrecyclable packaging has grown significantly.

Many 'non-recyclable' packaging types are technically recyclable, but the processes associated with their collection and sorting can be costly and inefficient, associated with relatively low quality/quantity of useful output and a lack of sufficient demand in end markets. In terms of packaging design, the shift away from glass and metal packaging towards lighter, alternative materials, such as multi-layer flexible packaging, tubs, and trays, which are not always recyclable, puts pressure on re-processors. They would need to improve their infrastructure, but in the absence of incentives, they rather reject these types of packaging, which then end up incinerated, landfilled or exported abroad. Furthermore, the switch to lightweight packaging, which facilitates on-the-go consumption also results in increased litter in the environment.

Latest data shows that 17% of packaging is currently non-recyclable[25], 7% could become recyclable in the future using the existing technology, but the remaining 10% only if there are further technological advancements. Under this estimation, it is assumed that all steel, glass and wooden packaging are fully recyclable, which may not be the case in practice. Plastic packaging represents a particular challenge. According to the RecyClass methodology developed by the Plastic Recyclers Europe, 57% of plastic packaging could be repartitioned in classes A, B and C[26] with the remaining 44% having significant or major design issues that highly affect its recyclability or make it unrecyclable. The average rate of plastic packaging recycled in 2019 as declared by the EU Member States was 40.6% (down from 41.4% in 2018); however, in most countries this refers to volumes collected for recycling, while the effectively recycled plastic packaging is estimated at only 14% [27]. There are several related challenges in respect of the packaging recyclability and many related negative consequences. Environmentally, this has negative consequences since the landfilling/incineration of recyclable materials results in increased GHG emissions. Continued reliance on virgin materials rather than recycled ones increases resource use footprint and puts pressure on biodiversity.

Cross-contamination of conventional and compostable recycling streams

The demand for bio-based and compostable plastics has grown substantially and this trend persists because certain Member States organised the collection of the organic waste of households with the compostable bags. This system of collection is working well following the information coming from the composter association. The use of compostable plastic materials alongside conventional plastics in consumer packaging may led to confusion about its correct end-of-life management if not well explained to consumers. Inconsistent labelling practices across the EU may confuse consumers about how to dispose of compostable packaging at the end of life, making their correct sorting challenging, and increasing cross-contamination between packaging streams. Differences in systems for packaging waste collection and treatment of such materials at the end of life can result in situations where a compostable packaging may be correctly separated and subsequently composted in an industrial facility in one Member State but identified as contamination and disposed as residual waste from composting in another.

At present, food packaging, disposable tableware and bags are the largest end use segment for bio-based and compostable plastics, and the major growth driver for compostable polymer consumption. Some countries encourage the use of compostable single-use carrier bags in shops also for fruit and vegetables and bio-waste collections. In this way, compostable plastics may also play a potential role in reducing contamination levels in bio-waste collection and treatment systems.

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[24] Transparency Market Research (2018) *Packaging Market - Europe Industry Analysis, Size, Share, Growth, Trends and Forecast, 2018 – 2026*, December 2018.

[25] Annex I – RecyClass Applications: Statistics (Plastic Recyclers Europe)

[26] RecyClass methodology: Class A: The package does not pose any recyclability issues and it can potentially feed a closed-loop scheme to be used in the same application. Class B: The package has some minor recyclability issues but could even potentially feed a closed loop scheme. Class C: The package has some recyclability issues that affect the quality of its final recyclate.

[27] https://plasticseurope.org/wp-content/uploads/2022/04/SYSTEMIQ-ReShapingPlastics-April2022.pdf

Hazardous substances in packaging

Numerous additives are used to provide different functionalities to packaging materials, in particular to plastics and rubber. We know that some of these substances have specific hazardous properties while for many others we know they are not hazardous. For others, information on their potential hazards is lacking as highlighted in a number of publications[28,29,30] and technical reports[31] where hazardous substances in plastics, including in plastic packaging, have been identified. We often also do not know to what extent they are used to manufacture packaging and to what extent they remain therein. When these substances are present in packaging, they can impact human health and the environment because of their release into food or other materials, via contact with the skin or through the environment as a result of leaching or the release of dust during the service life and waste management of the packaging material. The adverse environmental impacts associated to the presence of certain metals in packaging, such as beverage crates and pallets, has been assessed in the past[32]. Upon mechanical recycling, these substances will be reintroduced into the chain within the recovered material[33]. This leads to the exposure of users of new articles made with recycled materials to substances of concern. Therefore, the presence of substances of concern in recycled materials, also in relation to recycled materials from packaging[34,35], represents a potential risk to users and reduces the confidence of supply chain operators (e.g. plastic converters) and of consumers in recycled materials.

The problems associated with the presence of substances of concern in packaging can be summarised as:

- Hazardous substances in packaging can be released in different ways, resulting in exposure to humans and the environment. This exposure can contribute to human morbidity or mortality, ecosystem degradation and biodiversity loss.
- The presence of hazardous substances in packaging can result in contaminated recycled materials. This reduces confidence in recycled materials and may result in the destruction or final disposal of waste that could otherwise be potentially recycled. In turn, this often leads to an increase in CO_2 emissions due to the need to substitute with primary material and runs counter to achieving the EUs climate neutrality objectives.

The current proposal aims to address these problems by better defining the hazardous substances in scope, by covering the full life cycle of substances in packaging, covering both effects on human health and the environment, and paying particular attention to the circularity of materials recovered from packaging, ensuring that substances of concern are not kept in the loop.

Waste management and reuse systems not cost efficient

Waste sorters and recyclers frequently complain that the choices by packaging producers as the composition of packaging, the design in view of its treatment at the end of life and its collection do not take account the waste management. This results in further complexity of decontamination or purification and has negative consequences for the cost of treatment of the waste streams. Moreover, due to the scattered sorting and recycling markets, there is limited potential for economies of scale. In the absence of a clear legal framework incentivising circularity of packaging, there is also an investment risk for the recycling industry. The industry is cautious to invest in new technologies and unable to achieve economies of scale for innovative activities.

When reuse systems are established, such as DRS for refillable bottles, those who place refillable containers on the market incur the full costs of refill and collection schemes, compared to economic operators placing one-way packaging on the market, who typically only pay for a share of the end-of-life management cost. This imbalance creates an economic incentive to use single-use packaging. On the other hand, closed pool

[28] Groh et al (2019). https://doi.org/10.1016/j.scitotenv.2018.10.015
[29] Wiesinger et al (2021) https://pubs.acs.org/doi/10.1021/acs.est.1c00976#
[30] Geueke et al (2018). https://doi.org/10.1016/j.jclepro.2018.05.005
[31] Hansen et al. COWI/DTI (2013). https://www.byggemiljo.no/wp-content/uploads/2014/10/72_ta3017.pdf
[32] https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32009D0292
[33] https://doi.org/10.1016/j.chemosphere.2018.02.084
[34] Eriksen et al (2018). https://doi.org/10.1016/j.wasman.2018.08.007
[35] Danish Environmental Protection Agency (2021). https://www2.mst.dk/Udgiv/publications/2021/07/978-87-7038-330-1.pdf

systems, where the reusable packaging has to go back to the initial packer, might be less environmentally beneficial than single use packaging, if the transport distance is very big, or be a risk for food hygiene.

Moreover, it is often unclear whether a given item, after a certain use, should be classified as waste or not. If an item becomes waste and is then reused, it must undergo a 'preparing for reuse' process. Many national administrations consider that reusable packaging undergoing preparing for reuse becomes waste. This results in additional administrative burden for users of reusable transport packaging, which must apply and re-apply for multiple waste licences.

Confusing labelling about the recyclability and separation of packaging waste

Efficient waste collection relies in the first place on correct waste sorting at source by households. The importance of citizens' cooperation is widely acknowledged[36,37]. Currently observed capture rates (i.e. how much of all separately collectable waste is deposited in the appropriate separate collection receptacle) and misthrow rates vary considerably between different collection systems[38], suggesting that significant efficiency gains are possible if best practices are adopted more widely throughout the EU. To correctly sort their waste, consumers need to feel both, motivated and competent, as well as supported by an environment that provides them with adequate information and opportunities to do so[39]. While separate waste collection schemes have been in place now in most EU Member States for several decades, evidence shows that a considerable level of confusion persists among citizens with regard to correct sorting behaviour[40]. This is particularly true for plastic packaging, given the wide range of polymers and components in such packaging.

Consumers are confronted with a large amount of packaging related labels and other information on packaging, some of which is actually targeted at waste operators (e.g., alphanumerical codes indicating packaging materials). Some codes convey information regarding the end-of-life treatment, which may not be relevant in their local context (e.g. recyclability, compostability), some of which bear information on the payment of EPR fees (recycling arrows or "Grüne Punkt", widely confused with indications of recyclability or recycled content) and other environmental claims (e.g. recycled plastic content, reusable). A divergent landscape of mandatory national and voluntary industry labels has emerged on the packaging composition in the EU market, its recyclability, content of recycled material, sorting instructions for consumers and other information linked to the sustainable management of packaging waste, e.g. on participation of packaging to a deposit return system or reusable packaging. All this information can be confusing and contradictory due to the number of labels, some of which look similar but do not mean the same thing, and symbols providing potentially misleading and/or unsubstantiated information. Of course, consumer information through labelling is not the only driver of consumer behaviour, but they are an important precondition for the capability and willingness to correctly separate waste.

Unclear and non-harmonised labelling practices across the EU result in barriers to the single market with increased costs for packaging producers and reduced capture of recyclable materials, their contamination and increased costs of reprocessing[41,42]. The problem results in waste operators ultimately bearing the costs of additional sorting, washing and disposal, as well as lower prices and fewer markets for the resulting low quality of recyclates. Evidence shows that a considerable level of confusion persists among citizens with regard to correct sorting behaviour[43] that have emerged in the absence of harmonized EU rules. For instance, the combination of inappropriate and heterogeneous colours and/or shape of waste containers and bins

[36] Briguglio, M. (2016). Household cooperation in waste management: Initial conditions and intervention. Journal of Economic Surveys, 30(3), 497–525. https://doi.org/10.1111/joes.12156

[37] https://doi.org/10.1016/j.jenvp.2019.05.004

[38] COLLECTORS (2020): *Work package 3 - Quantification of costs and benefits. ASSESSMENT OF SOCIO ECONOMIC AND FINANCIAL PERFORMANCE OF 12 SELECTED CASE STUDIES, and:* https://doi.org/10.2779/49194

[39] https://doi.org/10.1016/j.wasman.2021.05.034

[40] http:/www.recoup.org/p/275/publications

[41] https://www.viridor.co.uk/siteassets/document-repository/recycling-index/viridor-uk-recycling-index-2018.pdf

[42] https://ec.europa.eu/info/sites/info/files/ec_circular_economy_final_report_0.pdf

[43] WRAP (2016) reported that 73% of citizen are uncertain about appropriate disposal practices for at least one or two materials; 46% of all householders tended to dispose wrong items in the bin because they were confused if they can be recycled or not

discourages citizens´ engagement and results in lower recycling rates[44]. Even when labels on products and waste receptacles are used to assist sorting, they can create confusion when not properly coordinated between producers and waste collectors, when producers are required or allowed to display several uncoordinated labels or when different producer groups establish their own labels[45]. The confusion is enhanced because the citizens increasingly travel or move within the EU: On one side, the consumers are unable to properly separate the waste during their stay in another Member State because of their habits at home, and on the other side they are confused when they are back in their home country, why e.g. paper cups with a plastic inlay have to go into a different collection stream than elsewhere.

2.1.3 Quality of recycling

The current recycling of waste is dominated by downcycling, where the recycled material is of lower quality and functionality than the original material and the original functionality must be replaced by virgin material (e.g. when plastic packaging is recycled into garden furniture or glass into filling material in road building). Instead, high quality recycling allows the recyclate to be used in the same way ("closed loop recycling").

The rates of uptake of recycled material in packaging varies significantly across the different materials. E.g. broader categories of paper and cardboard, aluminium, steel, and glass show higher levels of recycled content than plastic packaging. Within these categories, however, current rates of uptake vary depending on the packaging application, which is related also to certain regulatory requirements, for example for food contact materials. In this way, in the paper and cardboard category, the average level of recycled content in new packaging in corrugated cardboard is 89%, whilst for beverage cartons it is negligible. Many materials are not being recycled to a quality that allows them to be recycled back into packaging. For producers, there is a quality risk associated with the use of recycled content, in particular for paper and plastics, which is compounded by a lack of information on the quality and availability of recyclates. In addition, the relative environmental impacts of the production of virgin materials compared to the secondary materials are not reflected in their market prices, which means that external costs are not incorporated into the price paid by producers.

2.2 Links between problems

There is a high degree of linkage between the three problems (high and growing levels of packaging waste, barriers to circular packaging and downcycling), which means that the policy options respond to them together. For example, barriers to packaging circularity that inhibit recycling contribute to the growing levels of packaging waste and downcycling. Similarly, the low levels of recycled content in packaging contribute to the increased use of natural resources, which is also one of the consequences of the growth of packaging generation.

There are also potential trade-offs, for example, between designing for lightweight packaging and its recyclability, between using high levels of recycled content and light-weighting or between lowering impacts related the manufacturing and logistics and those of the end-of-life processes. It should be also always kept in mind that packaging must be fit for purpose to fulfil its core functions and that there may be trade-offs between the objectives related to packaging and those of products, which it is intended to contain, protect, handle, deliver and present.

2.3 What are the problem drivers?

At the root of the issues described above are two key problem drivers**,** market failures and regulatory failures. The first problem driver is market failure i.e., where markets fail to deliver an efficient outcome from a societal perspective. In respect of packaging, market failure takes several forms:

- Externalities – where market prices do not internalise the costs to society associated with an activity,

[44] https://doi.org/10.1016/j.resconrec.2003.11.001

[45] RECOUP (2019): Research study into consumer plastic recycling behaviour; UNEP (2020): Can I Recycle This? - A global mapping and assessment of standards, labels and claims on plastic packaging

- Fragmented markets with inefficient supply chains – whereby a misalignment of incentives exists, meaning that socially desirable actions are not undertaken because market actors have different, not aligned objectives,
- Imperfect information – information is needed for markets to operate efficiently, and where market information is imperfect, or not equally available to all market participants, sub-optimal decisions can lead to sub-optimal societal outcomes.
- Suboptimal market structure along the waste value chain, in part because of different requirements in different regions and countries.

Case study of a pan-European snack producer: Over the last two years, France, Italy, Bulgaria, Luxembourg and Portugal have introduced or have stated an intention to introduce mandatory national packaging waste labels. This is challenging for snack producers as snack packaging tends to have a small surface area for displaying the mandatory consumer information. So, if the additional mandatory information cannot fit, then different products needs to be made for the concerned Member States, who might have otherwise been able to supplied with the same products previously.
Modelling of how the proliferation of national mandatory packaging waste logos impacts turnover resulted in a double digit loss for one of the company brands because it would be required to make different labels (and effectively produce different packaged products) for each EU country that adopts a national mandatory label. Almost ¾ of the losses would come from the minimum order quantity impact on supply chain efficiencies (smaller EU countries would no longer be able to achieve the minimum run lengths required to make production cost efficient). Another big costs factor (appr 1/5) would come from other supply chain inefficiencies, such as not being able to move packaged snacks from cancelled orders in one EU country to another EU country without incurring relabelling costs. It would also increase food loss in the order of 1.2% of the turnover as a result of more changeovers in manufacturing. Printing new labels for this scenario contributed a minor amount (0.3% of turnover) to the cost impact.

The second problem driver is regulatory failure. The PPWD is failing to achieve its objectives due to a mixture of poor implementation and enforcement, not being up to date with the policy context, and by leaving too much flexibility and discretion to the national authorities. In particular, the Essential Requirements

- Fail to reflect the waste hierarchy, as there is not sufficient recognition that reuse takes precedence over recovery, or that recycling is preferable to energy recovery; and
- Are unenforceable as their formulation is too imprecise for Member States to enforce them – a situation compounded by the lack of requirements on producers to report on conformity.

Therefore, there is not adequate enforcement activity in the Member States and surveys suggest that the Essential Requirements have had little influence on packaging design. This was noted by the Scoping Study[46] as well as in the 2014 Fitness Check.[47] When Member States do try to enforce the essential requirements, they are obliged to create national rules, which in turn are not compatible with the free movement of goods and the protection of the EU internal market. In addition, there have been delays in transposition of the Directive. After the expiry of the 2-year transposition period, the 2018 amendment of the PPWD (Directive 2018/852) was not transposed in time by 23 Member States. Almost four years after the adoption of the Directive, 3 Member States have still not transposed the directive (in April 2022). This necessarily implies that such countries are also not implementing measures necessary to meet the new requirements, such has higher recycling rates in 2025. Indeed, the upcoming Commission's Early Warning Report shows preliminarily that 20 Member States are at risk of not reaching at least one of the material specific recycling targets.

Also in the SUPD, regulatory failure is evident[48]: only 13 Member States have banned plastic straws and expanded polystyrene food and drink packaging within the deadline set under the SUPD. The deadline for

[46] https://op.europa.eu/en/publication-detail/-/publication/05a3dace-8378-11ea-bf12-01aa75ed71a1
[47] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0209&from=EN
[48] https://press.plasticsconverters.eu/eu-harmonisation-going-backwards-is-the-state-of-play-for-the-eu-single-use-plastics-directives-first-anniversary

the transposition in national laws of bans and labelling rules on certain plastic products was July 2021, but the result has so far been a "patchwork" of packaging laws for the consumers and companies.

2.4 How is the problem likely to develop?

In terms of the overall trend, packaging waste generation in the EU is expected to increase further in line with economic growth and greater consumption of goods (see also Section 5.2). Underlying this, issues such as over-packaging and unnecessary single use packaging will continue. Over the past decade, the amount of difficult to recycle packaging has increased at a greater rate than the total packaging waste generated, and there is no sign of this trend abating. There are warning signs that Member States are struggling to meet the recycling targets for 2025/2030. Legislation and initiatives to combat the current trends have been introduced at both EU and Member State level, but the problems identified in Section 2.1 would remain insufficiently addressed. There is a risk that a failure to tackle these issues through harmonised legislative approaches would lead to national approaches that weaken the internal market as already evidenced by a growing number of national measures on packaging labelling for recycling and consumer sorting, different national approaches to defining recyclable packaging or mandating the use of compostable plastic packaging for certain packaging applications, in particular lightweight plastic carrier bags.

Furthermore, it is unlikely that the recently adopted SUPD will stimulate the increase in recycled content uptake across packaging beyond PET bottles, whilst voluntary industry initiatives (e.g CPA) are either limited in time or different in scope and unlikely to provide for a sufficient pull effect for all problematic packaging types. Indeed, CPA is focused on achieving an uptake of 10 million tonnes of recycled plastic in products by 2025. There is, though, an increasing consumer awareness and interest in packaging and so an opportunity to build upon this trend. However, without widespread supporting policy, these small shifts, such as emergence of zero-waste shops, are unlikely to have anything but minimal effect. Finally, new technologies are expected to improve packaging, like chemical recycling, block-chain technology, digital watermarking. However, their commercial viability still requires appropriate legislative environment.

2.5 Summary of consequences

The problems described in Section 2.1 lead to three main groups of inter-connected consequences, they 1) threaten the integrity of the EU Internal Market, 2) hinder the transition towards a circular economy, and 3) generate negative environmental impacts. The problems negatively impact on the functioning of the internal market. This presents challenges to the free circulation of packaged goods – what can be placed on the market in one Member States may not be in another, and results in additional costs for producers to have to adapt to divergent legislations. The lack of harmonisation leads to missed opportunites for economies of scale and can, for example, result in under-investment in reprocessing capacity and innovation, act as a drag on productivity growth and lead to higher costs for producers and consumers. Beyond costs for industries due to the proliferation of national labels, even more significant efficiency losses in the supply chain as a consequence of the fragmented EU market are due to (1) not reaching minimum order quantities, (2) reduced demand because of a smaller product variety and (3) additional stock holding.

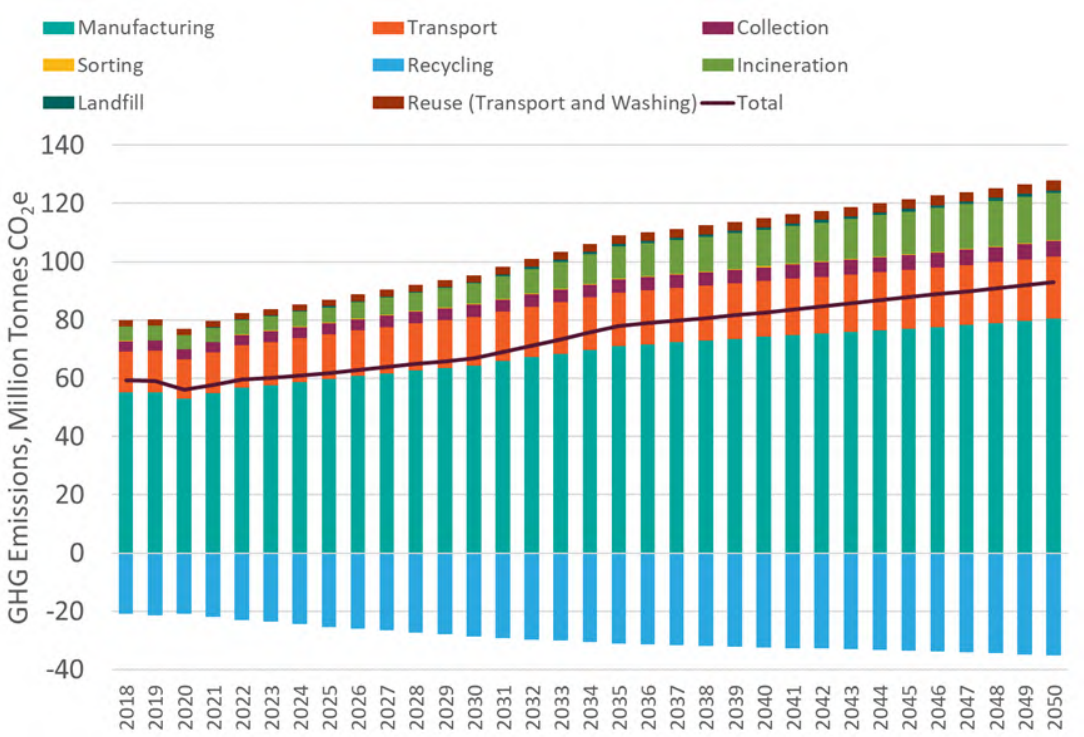
Case study labelling of cosmetics: Cosmetic companies are confronted with a specific challenge due to the small size of their products, which makes complying with additional on-pack information requirements -without compromising the legibility- particularly difficult. Accommodating multiple instructions can be addressed by decreasing the size of the label's font. However, this option is in most instances unworkable, since labels are already dense and include a comprehensive set of information, notably due to other European regulatory requirements such as those imposed by the Cosmetic Products Regulation to ensure the safe use of the products. Increasing the size of the packaging does not seem either an appropriate course of action at a time when companies are compelled to reduce packaging waste.
Therefore, to comply with the different sorting instructions recently imposed by various Member States, companies chose to add a specific sticker by country. The cost for over-stickering to comply with the various national labelling requirements following the transposition of the PPWD in France, Italy, Spain, Portugal and Austria were estimated to reach 3% of the revenues in these markets; these significant costs are because over-stickering in most cases cannot be automated and needs to be applied manually.

With regards to the circular economy, the increasing demand for packaging, combined with low levels of reuse, low recyclability and low levels of recycled content will continue to lead to an increased use of non-renewable resources. The lack of clarity as to the definition of recyclable packaging and other related

barriers that prevent an optimal functioning of reuse and recycling markets make it harder for Member States to meet the PPWD's recycling targets, use more recycled material and create jobs in these sectors.

Thirdly, the manufacture of packaging, accounting for both resource extraction and subsequent production processes, has significant negative environmental externalities. Next to the carbon emissions, litter from packaging, often from on-the-go consumption, is expensive to clean up, and has severe consequences. Littered plastics are a particular concern in marine environments, where they can degrade and break down to form micro-plastics, which re-enter the food chain via marine animals consumed by humans, where they potentially cause health risks. Until 2018, GHG emissions from packaging rose to 59 million tonnes CO_2e per annum, which is more than the total GHG emissions generated in Hungary. Unless GHG emissions are reduced, packaging will be inconsistent with the EU's objective of being carbon neutral by 2050. Instead, packaging induced GHG emissions are projected to increase to 66 million tonnes CO_2e in 2030 and 93 million tonnes CO_2e per annum in 2040 (Figure 9).

Figure 9 GHG emissions million tonnes CO_2e (Source: Eunomia baseline report)



On top of the air emissions (CO_2, CH_4, NO_x, SO_x, Particular Matters), packaging waste is a notable soil and land pollutant[49] and makes up about half of marine littering. Littered plastics are a particular concern in marine environments, where they can degrade and break down to form micro-plastics, which re-enter the food chain via marine animals consumed by and carried over to humans, potentially leading to health risks. Finally, the problems in terms of hazardous substances reduce recycling rates and increases incineration and landfilling.

2.5 Who is affected and how?

Society as a whole (general public): Packaging and packaging waste represent a huge burden to society when issues associated with their manufacture, use, and disposal are not sufficiently addressed. Potential adverse impacts include, but are not limited to, environmental pollution, depletion of finite resources, unnecessary emissions, economic loss, and damage to public health.

Consumers: EU consumers lack access to clear, harmonised, and reliable information about packaging. This lack of information prevents them from making well-informed decisions regarding the most appropriate

[49] Ncube LK, Ude AU, Ogunmuyiwa EN, Zulkifli R, Beas IN. *Environmental Impact of Food Packaging Materials: A Review of Contemporary Development from Conventional Plastics to Polylactic Acid Based Materials*. Materials. 2020; 13(21).

packaging options for their purchases. It also reduces the likelihood of consumers effectively and consistently engaging in the correct end-of-life strategy for the packaging waste they generate. The consumers who want to do the right thing are often offered only single-use packaging and/or (perceived) unnecessary packaging.

Brands: Brands, including retailers´ own brands and "no names", need packaging to fulfil several functions, including the protection of the product and maintaining the brand's image. At the same time, they are under pressure from consumers, who are increasingly environmentally conscious. As a result, many brands are innovating and redesigning their packaging to maintain competitiveness. However, they are doing this against a backdrop of a regulatory landscape that is not fully harmonised across EU Member States, with uncertainties, for example, in the way EPR schemes might choose to revise their fee structures and reporting requirements and define recyclable or reusable packaging.

Packaging manufacturers: Packaging manufacturers need to meet the demands of the brands they supply and comply with regulatory requirements. To remain competitive, they need a long-term investment certainty to be able to innovate, deliver cost-efficient solutions and to adapt their manufacturing capacities.

Waste management companies, including local public authorities organising waste collection and treatment, and recycling industries: Operators in the waste stream see their profitability limited due to scattered markets and regulatory failures. Harmonisation of the economic framework and increased legal clarity would foster co-ordination of investments and a more cost-efficient waste management.

3. WHY SHOULD THE EU ACT?

3.1. Legal basis

The current legal basis of the PPWD is Article 114 of the Treaty on the Functioning of the European Union '*…internal market shall comprise an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured…'*), and this should not change. Based on this provision, the Union can adopt measures for the approximation of laws, regulations or administrative action in Member States, which aim for a smooth functioning of the internal market. Most goods require packaging at several stages of their product life. Non-harmonised rules related to packaging create barriers to the free flow of goods and services in the internal market. One of the objectives of this initiative is therefore to further detail the essential requirements for packaging, which are conditions for placing packaging on the market and should be fully harmonised.

Recent internal market notifications from the Member States show that the implementation of some not-fully-harmonised provisions of the Directive, such as labelling requirements, or vague requirements, such as essential requirements on packaging minimisation or recyclability, are causing additional cost to the economic operators. These are strongly calling for further harmonisation not only to be able to work more cost efficient, but also to overcome regulatory uncertainty about the environmental requirements for packaging, so that appropriate infrastructure investments can be made.

3.2. Subsidiarity: Necessity of EU action and EU added value

The problems cannot be sufficiently addressed by the Member States alone. The EU packaging market is in many respects one large market, rather than 27 individual markets. The packaging market is characterised by high-levels of cross-border trade between Member States, with many producers placing packaging on the market in multiple Member States. National initiatives could perhaps bring certain benefits but would inevitably contribute to further fragmentation of the internal market. Similarly, the packaging-related environmental concerns are widespread, with key underlying causes being common across all Member States.

There is clear added value in setting common requirements at EU level, as this will ensure a harmonised and well-functioning internal market across all Member States and, therefore, a level playing field for packaging producers. With requirements and targets set at EU level, the move towards packaging being reusable or recyclable in an economically viable manner will take place in a coherent way in all Member States, creating

a larger and more efficient market. Harnessing its strength to support the move towards a circular economy for packaging will support the achievement of targets in a more cost-effective way.

Economies of scale will be achieved through consistent approaches to, for example, influencing packaging design in such a way that packaging can be more cost-efficiently collected, sorted and recycled everywhere in the EU. This approach will be reinforced by harmonised criteria for modulation of EPR fees, which will provide an additional economic impetus for compliance and increased clarity as to the roadmap for investments in circular packaging design and innovative sorting and recycling technologies. Member State action alone could not achieve such harmonisation and thus economies of scale. The proposed measures will not go beyond what is necessary to provide regulatory certainty while ensuring a high level of protection of health and of the environment. EU action is therefore justified and necessary.

3.3. Interface with and gaps within the existing legal framework for waste

One of the problems in the waste management of the EU is that huge amounts of waste are shipped abroad. The EU´s exports of waste have increased by 75% since 2004 to reach 33 million tonnes in 2020, which is a considerable loss in its transition to a circular economy. This problem is addressed with the Commission proposal for a new regulation on waste shipments[50], fostering the preparation for reuse and recycling in the EU, in order to unlock the potential for more resource circularity in the EU internal market. In concrete, it modernises and simplifies the procedures for intra-EU shipments of waste, shifting from paper-based to electronic data interchange, and restricts waste shipment for landfills and incineration in line with the waste hierarchy and proximity principle. Thus, this initiative strives to keep more waste within the EU and further enhances the infrastructure of a single market for high quality secondary raw materials. The PPWD review now needs to build up on this, with a product-based legislation to ensure the transformation into a real packaging value chain.

The data available hints that neither measures undertaken by the Member States based on the PPWD, nor based on the ORD or SUPD are sufficient to ensure that they meet all the specific targets for the recycling rates set out in the PPWD. Moreover, there is significant potential to improve the packaging waste recycling even in Member States which will meet at least some of the established recycling targets.

The scope of the SUPD only covers about 70% of all plastic packaging and the measures mainly address the prevention of littering. The targets for recycled content in new plastic packaging set in the SUPD are only for plastic beverage bottles (less than 20% of plastic packaging). However, the reduction of plastic waste and the benefits of more recycled content should materialise for all plastic packaging. Moreover, the SUPD does not address the design of plastic packaging in order to improve their recyclability for higher recycling rates and - quality. Therefore, the problems about plastic packaging raised above cannot be tackled with the SUPD due to its limited scope in terms of products and intervention areas.

Coherence is ensured between the current PPWD and the ORD, the latter providing -beyond the obligations laid down in the PPWD- an additional incentive to decrease waste and increase recycling. The ORD not affecting materials other than plastics should be seen as an economic incentive for MS to take action. The principle in waste legislation that the use of economic instruments is indeed left to subsidiarity and only an indicative list is included in the acts, will be maintained. The national flexibility foreseen in the POR means that Member States would not have to introduce a plastic tax or other instruments to induce less non-recycled plastic waste and they are even free to decide to take no action to reduce the contribution. Until today, no Member States has chosen to share the burden of the contribution with industry, i.e. to opt for such an instrument. The envisaged measures in a new PPW Regulation with respect to waste reduction and better recycling will contribute to put in place concrete measures that are directly enforceable. They are designed in a way that they do not interfere with potential national instruments incentivised by the ORD but rather are mutually reinforcing and complementary. The Commission will continue to inquire from Member States best practices related to the impact of the ORD, be it regulatory, fiscal or other measures to reduce the quantity of plastic packaging waste that is not recycled and make them available to all Member States. This

[50] Proposal for a new regulation on waste shipments (europa.eu)

will allow them to optimise their national actions to simultaneously meet targets established in the new PPW regulation.

4. OBJECTIVES: WHAT IS TO BE ACHIEVED?

The general objective of the legislative proposal is to reduce the negative environmental impacts of packaging and packaging waste, while improving the functioning of the internal market. This general objective responds to the problems and their underlying drivers. In particular, it reflects the fact that the EU's legislation is allowing avoidable environmental impacts and leading to the loss of valuable resources. It also addresses the need for harmonised requirements that strengthen the level-playing field whilst supporting the green transition. The specific objectives to meet this general objective are to:

1. Reduce the generation of packaging waste
2. Promote a circular economy for packaging in a cost-efficient way
3. Promote the uptake of recycled content in packaging

The specific objectives relate to the problems directly, and through them to their underlying drivers. Each option from Table 3 (section 5.2) responds to a specific objective, and thus to a problem or underlying driver.

5. WHAT ARE THE AVAILABLE POLICY OPTIONS?

3.4. Legal instrument: Change from a Directive to a Regulation

The first policy decision to take is the choice of the legal instrument. The present legislation already provides for an extensive control over the management of packaging and packaging waste but has nevertheless resulted in a non-attainment of the general environmental objectives. The regulatory failures of the current Directive (section 2.3), such as (1) delayed or incorrect transposition into national law, (2) poorly designed, hardly to enforce and unevenly applied Essential Requirements and (3) difficulties of the Member States to ensure compliance with national recycling targets revealed that harmonisation is necessary in the form of a regulation, rather than simply revising the current directive (for more details see Annex 5.2). To further promote the move to a low-carbon and circular economy, a new comprehensive set of regulatory solutions is needed. Given the scope and scale of the envisaged measures to be introduced, their harmonised and correct implementation could pose a significant legislative challenge for the Member States. To avoid such a risk, the obligations for placing packaging on the market, such as product-based targets for recycled content or reuse, should be placed on the economic operators. Differing national transposition measures and sometimes unilateral Member States' actions on packaging policies have led to uneven national regulatory frameworks. This trend is set to continue given the recognised challenges to the packaging sustainability. A patchwork of national transpositions reduces the effectiveness of the policy and puts in jeopardy the effective establishment of a circular economy. This, while potentially welcome from environmental point of view, brings challenges for the integrity of the internal market. The existing barriers can only be removed by more detailed, harmonised rules, which should apply directly to economic operators. These arguments are strongly mirrored in the position papers of all stakeholders and NGOs.

A Regulation will ensure obligations are implemented at the same time and in the same way in all 27 Member States. The same requirements for all market players will provide the necessary legal certainty and reduce distortion of competition, and send clear signals to non-EU market actors, when placing products on the EU market. Furthermore, the Commission will have a mandate to develop implementing measures to flesh out the Regulation further, where necessary, allowing for common rules to be set swiftly. This approach is necessary in view of the calls from industry for further harmonisation and considering political commitments in the European Green Deal and the CEAP to ensure that by 2030 all packaging is reusable or recyclable.

3.5. What is the baseline from which options are assessed?

Under the baseline (or Business As Usual), all relevant EU level and national policies and measures remain in force. In particular, the baseline assumes the full implementation of the SUPD in all Member States by

2030. Two Member States are envisaging the introduction of plastic taxes as economic instrument to implement the Own Resource Decision.

Under the baseline (see Annex 8-1), total packaging waste generated is forecast to increase from 78 million tonnes in 2018 to 92.4 million tonnes in 2030 (+18.7%), and 107 million tonnes in 2040. The volumes of all packaging materials, except glass and metal, are forecast to increase, with plastic packaging increasing over proportionally, from 19% of all packaging placed on the market in 2018 to 23% by 2030. The increase of packaging waste per person in the EU from 161 kg in 2006 to 178 kg in 2019 is projected to accelerate to reach 209 kg in 2030 and 245 kg by 2040. The projected increase in packaging waste, both in absolute terms and per capita, suggests that the ambitions of the Commission for climate-neutral, resource-efficient economic growth set out in the European Green Deal are not compatible with the baseline scenario.

Within the increased waste generation volumes, the overall recycling rate in the EU is projected to increase from 66.5% in 2018 to 69% in 2030 (PPWD: 70%). The proportion of waste sent to landfill is projected to decrease from 18.7% in 2018 to 9.9% in 2030. The remaining waste fraction is sent to incineration, which is projected to increase from 14.7% of total packaging waste in 2018 to 20.4% in 2030. The greatest projected increase in recycling rates between 2018 and 2030 is for plastics. Overall, GHG emissions are projected to increase from 59 million tonnes CO_2e per annum in 2018 to 66 million tonnes CO_2e in 2030 and 93 million tonnes CO_2e per annum in 2040. The monetised environmental cost are projected to increase from EUR 5.9 billion in 2018 to EUR 9.4 billion in 2030 and EUR 17.1 billion in 2040.

3.6. Description of the policy options

All possible measures were compiled for analysis based on three studies from an external consultant, stakeholder workshops, an Online Public Consultation, dedicated interviews and stated objectives and measures in the European Green Deal and CEAP (Annex 2). These measures were screened for criteria, such as whether they could be enforced, monitored etc. (Annex 8.4). After the screening, shortlisted measures were retained for further analysis (see Annex 8.3). The diverse, complex and often interrelated measures were then grouped into 3 policy options. There is a stepping up from option 1 to option 2 to option 3 in terms of their environmental effectiveness but also intrusiveness and burden of implementation. The options are:

- Option 1 contains the measures related to the better standardisation and clearer Essential Requirements. These measures tend to be pre-requisites for measures in other groups.
- Option 2 sets mandatory targets for waste reduction, reuse and minimum recycled content in plastic packaging, requirements to ensure full recyclability by 2030 and harmonised product rules
- Option 3 contains higher mandatory targets and additional product requirements.

The main policy choices for the decision makers in the three intervention areas are the waste reduction targets at Member State level, reuse targets for selected sectors, measures to increase recyclability and targets for recycled content in plastic packaging. Out of the enabling measures, the mandatory establishment of deposit return systems and the labelling rules to facilitate consumers´ sorting are the outstanding policy choices.

Regarding waste reduction, it is evident that Member States and operators will face some challenges to ensure packaging reduction. Member States will have to enforce the EU measures and, with respect to the specific national situation, come up with national measures, which are still in line with the internal market. The regulation gives the Member States flexibility to meet the reduction target, e.g. they can require the Producer Responsibility Organisations (PROs) on their territory to ensure reduction of specific packaging waste by economic instruments.

The measures contained in each option are presented in the Table 2. In order to demonstrate the interlinkages between them, alternatives measures have the same number, e.g. M2b and M2c. Measures concerning the **main policy choices** are in **bold**.

Table 2: Description of the policy options (all measures are described in Annex 8.3)

Problems	Intervention area	Option 1: Better standardisation & clearer Essential Requirements	Option 2: Mandatory targets and stricter requirements	Option 3: Far-reaching targets and requirements
High and growing packaging waste	Pre-vention and reuse	**M5: Minimization of empty space in packaging in selected sectors, including e-commerce** M1: Update of Essential Requirements to minimize over-packaging M10a: Revision of CEN standard for defining reusable packaging M19: providing clarity on the definition of reuse activity versus a "preparing for reuse" activity	**M8b: Mandatory reuse targets for selected packaging groups for 2030/2040 in selected sectors** +M19+M10a+M10b: Definitions and mandatory requirements for reusable packaging formats set in EU legislation and standards for some formats+M10c: Definition and mandatory standards for reuse systems **M7: Phase out avoidable / unnecessary packaging** **M2b: Mandatory target of 19% reduction of packaging waste per capita in 2030 compared to the baseline** +M1+M5	M8c: **Mandatory high level targets to increase the reuse of packaging by 2030/2040 in selected sectors** +M10a+ M10b+M10c+M19 **M2c: Mandatory target of 23% reduction of packaging waste per capita in 2030 compared to the baseline** +M1+M5+M7+M3: Banning by 2030 of heaviest packaging for selected items based on existing lighter alternatives
Barriers to packaging circularity	Recycla-bility and com-postability	**M21a: All packaging shall be reusable or recyclable by 2030- clarification of Essential Requirements and recyclability definition +M21b: All reusable packaging must be recyclable as of 2030** **M22a: Qualitative definition of recyclable packaging** M28: Clarification of biodegradability and compostability and updates of respective Essential Requirements & standard EN 13432 **M29a:** Allowing compostable and conventional plastics for selected packaging types	**M22b: Definition of recyclable packaging based on design for recycling (DfR) criteria complemented by the recyclability assessment procedure and a negative list of non-recyclable packaging characteristics** +M21a+M21b+M22a+M23: Harmonisation of EPR Fee Modulation Criteria **M29d:** Mandatory compostability for certain out of the selected plastics packaging types and for the remaining ones compostable or conventional plastics possible +M28	**M22c: Quantitative definition of recyclable packaging** +M21a+**M21b+M22a+M23** **M29b:** Mandatory compostability for all selected plastics packaging types +M28
Low level of recycled content	Recycled content	M37: Definition of Recycled Content and measurement method	**M35em: Broad targets for recycled content in plastic packaging based on contact-sensitivity for 2030 and 2040** +M37	**M35eh: Higher ambition, broad targets for recycled content in plastic packaging based on contact-sensitivity for 2030 and 2040** +M37
Enabling measures		Mx: Update of current material-based labelling: Removal of alphanumeric codes for waste sorters M31: Update of definitions concerning hazardous substance M32a: Expanding the information on hazardous substances	**Ma&b: Mandatory DRS and minimum requirements for all DRS** **M27c-y: Harmonised labelling of products and waste receptacles to facilitate consumers´ sorting** (advanced Nordic pictograms system)+Mx+Mk: Restrictions on use of confusing labels M12-u: Harmonised, mandatory labelling for reusable packaging M38-j: Labelling criteria for Recycled Content M32b: Notification of substances of concern in packaging +M33a: Restrictions of substances under REACH +M31 M40b: Mandatory minimum GPP criteria for packaging of priority products and services M42b: Harmonization of EPR reporting system MPCB: Extended reporting obligation on PCB	**Mc: Prioritized use of recycled packaging from DRS** +Ma&b M26cc: Waste collection schemes alternative to DRS+Mx+M12-u+M38-j+M27c-y+Mk M32c: Notification of all substances in packaging +M33b: Restrictions of substances under the reviewed PPWD +M31 M40c: Mandatory minimum GPP criteria for packaging of all products and services M34b: Mandatory reporting requirement for recycled content for all packaging +M42b + MPCB

6. WHAT ARE THE IMPACTS OF THE POLICY OPTIONS?

This section presents a summarized analysis of the impact of the measures grouped in options 1, 2 and 3 for the three intervention areas, which are linked to the problems. Subsequently, the impacts of the respective enabling measures are presented per option. The **key measures are presented at the beginning in bold** and the complementary ones afterwards. Further description of the measures is provided in Annex 8-3.

A detailed analysis was carried out in the respective parts of Annex 9 based on the following assessment criteria: effectiveness; ease of implementation; administrative burden; economic impacts; environmental impacts; social impacts; stakeholder views. A mass flow model over the waste value chain was constructed to allow for quantification of impacts, whenever possible. Annex 4 provides further methodological details.

6.1.1. PREVENTION AND REUSE

The detailed analysis of the measures in the intervention area prevention can be found in Annex 9.1 and for the reuse in Annex 9.2.

6.1.2. MEASURES ON PREVENTION AND REUSE IN POLICY OPTION 1

Measure 5: Minimization of empty space in packaging in selected sectors, including e-commerce

This measure, relevant for e-commerce, electronics, toys, computer hardware and cosmetics sectors, in particular, would set a maximum void (empty) space limit to packaging, with the percentage set to eliminate the worst offenders. This measure would result in an estimated 1.7% reduction in packaging waste generation (mostly cardboard and plastics) compared to the baseline.

In terms of economic impacts, the CBA model indicates material savings of EUR 983 million in 2030 and EUR 1,368 million in 2050, and EPR cost savings of EUR 235 million in 2030 and EUR 355 million in 2050. The environmental impacts are predominantly linked to a reduction in GHG emissions and water use. The change in 2030 relative to the baseline is estimated to be a reduction of 1.1 million tonnes CO_2e and 31k m^3 of water. The monetary value of the reduction in GHG emission and air pollution is estimated to be EUR 217 million. The social impacts in terms of employment are expected to be minimal, with potential job losses of approximately 3,300 FTEs in 2030 and 4,700 in 2050 in the waste management sector. Stakeholder views showed that 68% considered that there is currently too much packaging around products in the EU.

<u>Measure 1: Update of Essential Requirements to minimize over-packaging</u>

More precise elements for the definition of "over-packaging" would allow Member States to be firmer in enforcing the requirements on packaging minimisation. Packaging performance criteria, as justifiable limits for further packaging minimisation, will be specified through updating standard EN 2004:13428[51]. The need to comply with these criteria could be used to justify packaging weight and volume.

The measure is not expected to create significant administrative burden or economic cost for stakeholders, but - combined with clearer standard, which creates presumption of compliance with the essential requirements - it will improve the effectivness of the essential requirement on packaigng minimisation. A qualitative assessment of the economic impacts indicates impacts on packaging used for marketing purposes. The clearer legal framework for operators to reduce excessive or unnecessary packaging, positive environmental impacts are expected. Stakeholders noted that over-packaging should be clearly defined.

<u>Measure 10a: Revision of CEN standard for defining reusable packaging</u>

[51] EN 13428 Packaging – Requirements specific to manufacturing and composition – Prevention by source reduction

The Commission would request CEN to update the current standard EN 13429:2004 with regards to definition of reusable packaging, reusable packaging format and design, reuse systems requirements, return infrastructure and incentivising consumers, supply chain and logistics as well as public engagement. The updated standard will provide a reference point for industry to improve the performance of reuse systems and facilitate their adoption.

The effectiveness of this measure is increased when it is complemented by M10b and M10c. The administrative burden is mainly related to the development of an updated standard based on Commission's formal request. As with the current standard, the stakeholders would be able to show compliance with the essential requirement on reuse by complying with the harmonised standard, which however, will cover more issues. As a supporting measure, it is not possible to attribute any share of the outcomes assessed under economic, social and environmental impacts but it will support delivery of reuse. There is broad support for CEN standardization from across the spectrum of stakeholders, as long as it takes into account current standards. Two criteria stood out as being of importance for the guidance: the recyclability of reusable packaging and the minimum number of rotations required.

Measure 19: providing clarity on the definition of reuse activity versus a "preparing for reuse" activity

The harmonisation of when reusable packaging is classified as waste will provide EU-wide consistency on the definition of reuse activity versus a "preparing for reuse" activity. The definition would clarify that reusable packaging should be classed as waste only once it has reached the end of its useful life and is discarded. Reusable packaging, in particular tertiary packaging with respect to which this problem is most known, should not be classified as waste when it is cleaned and reconditioned by a third party and is not returned to the same user. This would facilitate uptake and performance of reuse systems.

By overcoming different interpretations at Member State level, the measure would be efficient and easily implemented. The administrative burden on actors in the reuse supply chain would fall due to the reduced need for waste licenses. The measure is expected to reduce costs for producers/fillers and improve the uptake of reuse which will lead to an increase in employment in the reuse sector. It will lead to environmental benefits due to prolonging the life of products, resulting in better use of resources and the avoidance of landfilling. A broad range of stakeholders supports this measure.

6.1.3. MEASURES ON PREVENTION AND REUSE IN POLICY OPTION 2

Measure 8b: Mandatory reuse and refilling targets for selected packaging groups for 2030/2040 in selected sectors

This measure introduces targets for reuse systems and refill operations as a percentage of sales with reusable/refillable packaging and aim to reflect both: the proportion of reusable items sold and their durability, i.e. the number of uses/rotations of a multiple use (MU) packaging. The targets will be imposed on the economic operator placing the respective products on the market. The set of mandatory and strict targets, e.g. 100%, would have as a consequence that businesses which only produce single-use packaging for the market in question, they could not adapt to producing reusable packaging. It would be thus at risk of closure. Targets at that level have not been specified in the enclosed reuse and refill measures, but for the packaging types such as large household appliances for which high level targets (90%) have been introduced, these do not refer to the producers that they can sell their products only in single use packaging. A scoping process assessed the full packaging range against 6 criteria[52] for its respective re-use potential.

[52] E.g., "Does the multiple-use option meet the functional requirements of containment/tidiness, health/hygiene, and safety?", "Does the multiple-use option decrease the generation of waste?", "How many reusable models are available or in place for a given product/packaging (e.g., business-to-business, refill at home, etc.)?", "Is the reuse system easy to implement and apply?"

Subsequently, this selection was discussed with the concerned stakeholders and the specific targets were chosen in cooperation. The detailed calculation rules and reporting schemes will be established in an implementing act. Table 3 lists the selected sectors, packaging types and products with the most proportionate economic and environmental impacts. The measure will be complemented by M10a, b, c (standardisation in reuse sector) and M19 (clarification of reuse activity).

Table 3. Reuse/refill targets for certain packaging in Measure 8b and 8c for 2030 [2040]

Sector	Packaging type - Business model	**Packaging groups and products**	Target for 2030 [2040] **Measure 8b**	Target for 2030 [2040] **Measure 8c**
Food and beverage-HoReCa	Primary - B2C	Beverage (cold and hot) filled into a container at the point of sale for take-away, to be sold in packaging within a system for re-use or refill.	20% [80%]	30% [95%]
	Primary-B2C	Food for take-away, to be sold in packaging within a system for re-use or refill	10% [40%]	20% [75%]
Food and beverage-Retail	Primary-B2C	Alcoholic beverages other than wine and spirits, and products based on wine, spirits or other fermented beverages mixed with non-alcoholic beverages, to be sold in packaging within a system for re-use or refill.	10% [25%]	20% [75%]
	Primary B2C	Wine, sparkling wine, spirits and other spirituous beverages, to be sold in packaging within a system for re-use or refill.	5% [15%]	10% [30%]
	Primary-B2C	Non-alcoholic beverages, such as water, soft drinks, juices, to be sold in packaging within a system for re-use or refill.	10% [25%]	20% [75%]
	Tertiary-B2B	Large household appliances e.g., washing machines or fridges, to be sold in reusable packaging	90% [90%]	90% [90%]
Commercial and Industrial	Tertiary-B2B	Goods sold using pallets, crates, foldable boxes, pails and drums for the conveyance or packaging of the goods, to be sold in reusable packaging	30% [90%]	50% [90%]
	Tertiary-B2B	Non-food goods sold via e-commerce using packaging for transport and delivery, to be sold in reusable packaging	10% [50%]	20% [80%]
	Tertiary-B2B	Pallet wrappings and straps for stabilization and protection of goods during transport, to be sold in reusable packaging	10% [30%]	20% [75%]
	Tertiary-B2B	Grouped packaging boxes used for wholesale (excluding cardboard) e.g., pack of larger quantities of packaging units used, outside of sales packaging to group a certain number of goods to create a stock-keeping packaging unit is classified as reusable packaging within a system for re-use.	8% [25%]	15% [50%]
	Secondary-B2C	Grouped packaging boxes, e.g., pack of 6 bottles of water or pack of 4 bottles/cans of beers used outside of sales packaging to group a certain number of goods to create a stock-keeping packaging unit is classified as reusable packaging within a system for re-use.	8% [25%]	15% [50%]

The concrete targets for 2030 have been set to ensure a "critical mass" for the concerned operators i.e., that there are at least some economies of scale for the additional logistical and organisational costs. On the other side, very high targets e.g., 100%, risk that businesses that only market their (premium) products in single-use packaging cannot shift to MU packaging and are kicked out of the market. The whole set of the reuse

measures is designed to set feasible targets and to avoid that the transport of the emptied reusable packaging does not devour the environmental benefits, neither undermine the safety of the packaged products: For example, the harmonisation of packaging formats, exemptions (see below), the fact that for products with a significant market share of premium brands relative low percentages are proposed or the fact that there is no requirement that the reusable packaging must be returned to the initial packager (filler), should ensure feasibility and overall environmental benefits.

A coffee shop (target = 30%), for example, which sells 10000 cups of coffee for take away per year is obliged to sell and report a minimum of 3000 coffee served in MU coffee cups. In case of an assumed average number of rotations of a MU coffee cup of 15, the coffee shop would, at a MU rate of the 30%, reduce packaging by 24.8%. The modelling expects the targets to decrease packaging waste compared to the baseline by 4.9% in 2030 [13.3% in 2040]. Further, the measure will stop the downward trend in reuse and increases the share of products sold in MU packaging from 2.4% in the baseline 2030 to 5.9% [10.3% in 2040].

For the implementation, administrative burden would derive from monitoring and reporting of compliance with the targets, both for public authorities and businesses. The economic impacts are estimated for 2030 to be EUR 461 million savings in waste management costs (lower EPR fees and avoided costs of one-way DRS), EUR 15.82 billion reduction in SU production and consumption, EUR 1.62 billion savings in material costs, and capital & operating costs of EUR 1.48 billion for reuse schemes (including DRS for refillables). The increase in reusable packaging is estimated to lead to decreases in GHG emissions of 1.25 million t CO_2e in 2030 [5.54 million t CO_2e in 2040], in environmental externalities of EUR 427 million in 2030 [EUR 1.72 billion in 2040], and in water consumption of 69k m^3 in 2030 [212k m^3 in 2040]. The measure would result in a net creation of 468k FTE in 2030 (loss in SU production and new jobs in MU sector).

NGOs stressed that reuse should always be the first option, while some industry stakeholders favouring in recent years single use (especially food and beverage industry or paper packaging industry) expressed that reusable product could lead to trade-offs in terms of food safety, food security, food waste risks or environmental performance. They were not very supportive of a general reuse target but are more open to differentiated targets by sector and type of packaging, and clearly opposed to 100% targets. A majority of stakeholders argued for mandatory instead of voluntary targets to ensure security of investment, to avoid undermining the single market through heterogeneous implementation and to enable economies of scale. Opposing views on target levels were expressed from 'not ambitious enough' to 'unrealistic and unachievable'.

To mitigate the concerns raised by stakeholders and Member States, exemptions from the obligation to meet re-use and refill targets can be established for economic operator. Concretely, economic operators could be exempted from the obligation to meet the targets, if they only place packaging below a certain threshold on the market or comply with the definition of micro-company in accordance with rules set out in the Commission Recommendation 2003/361 or have a sales area below 100 m^2.

As regards the distribution of impacts: With mandatory targets, there would be less divergence of activities between Member States and also between competing enterprises than under voluntary regimes. In terms of how effects on packaging manufacturers and producers of products would be distributed across the EU, those countries where a high volume of single-use packaging is manufactured, or products are sold in single-use packaging, will be more affected than those for which this is not the case. Businesses manufacturing reusable packaging and who would gain market shares may also not be evenly distributed across Europe.

<u>Measure 10b: Definitions and mandatory requirements for reusable packaging formats set in EU legislation and standard for some formats</u>

This measure would improve the legal definition of reusable packaging, including setting a minimum number of rotations. In addition, the Commission would launch a standardisation of some reusable packaging formats (e.g reusable food trays). The economic and social impacts would be higher than under

M10a, but so would be the environmental performance. The measure would contribute to increase reuse. Expected economic impacts include increased cost for infrastructure development and replacement of the current formats, and reduction of manufacturing costs and easier deployment of reusable packaging systems.

Stakeholders agreed that the standardisation of the formats is the most contentious proposition; standards should be considered on a case-by-case basis depending on the sector and the type of reuse. In contrary, NGOs are very keen on standardisation of reusable packaging formats at EU level, as this would be the most effective way of creating a scalable model for major product groups.

Measure 10c: Definition and mandatory standards for reuse systems, in terms of incentives, infrastructure, logistics, required reporting etc., set in legislation and standard

This measure further clarifies the legal framework for reusable packaging focusing on establishing requirements for reuse systems, both in the legislation and via a request to CEN to standardise specific reuse systems. More concretely, the full range of reuse systems, e.g. consumer led (refill), industry led (return), B2C, B2B, would precisely addressed in the new regulation. The improved legal definitions and standards will contribute to an enhanced development of reusable packaging systems with a broader coverage and improved performance. Economic, social and environmental impacts are similar to M10a but slightly higher. Stakeholders generally support the standardisation of the legal framework of reuse systems.

Measure 7: Phase out avoidable / unnecessary packaging

This measure would entail the gradual elimination from the EU market of several items of 'unnecessary' packaging. In scope are some single use transit packaging used between companies, some single-use retail packaging, notably certain plastic packaging for fruit and vegetables, and some packaging formats in the HORECA sector (single use packaging for condiments, preserves, sauces and similar, single use miniature hygiene and toiletry packaging, EPS packaging layers in retail pizza and other retail food packaging) and packaging using double walls, false bottoms and other means to create impression of a greater volume than it is. Experience with the SUPD shows that a proper implementation would require a clear description of the product scope, by issuing guidelines, which will imply some administrative burden. The measure contributes to a harmonised approach to the implementation of M2b but would require an appropriate phase out period.

The modelled impacts show an overall reduction of 4.4% in packaging waste in 2030, compared to the baseline. The administrative burden would be on Member States market surveillance authorities, with different enforcement issues on transit packaging. In addition, the list of banned items would need to be reviewed and updated, if necessary, after the implementation. The economic impacts due to avoided packaging include EUR 1.24 billion savings in EPR fees, EUR 15.4 billion loss of producer turnover, material cost savings of EUR 1.7 billion and EUR 979 million costs in reuse schemes. The environmental benefits are linked to a reduction in GHG emissions and water use. The change in 2030 relative to the baseline estimates a reduction of 2.18 million tonnes CO_2e and 91k m^3 of water. The monetary value of the reduction in GHG emission and air pollution is estimated to be EUR 516 million. In terms of social impacts, 490k FTE would be created. Stakeholder views on this measure were polarized, with NGOs generally in strong support, industry strongly against insisting on the need for LCA data to ensure that the changes had a positive impact on GHG emissions and did not result in increased product waste.

Measure 2b: Mandatory target of 19% reduction of packaging waste per capita in 2030 compared to the baseline+M1+M5

Member States are given a target to reduce the absolute packaging waste figure in terms of kg packaging waste per inhabitant. The reduction target of 19% compared to the 2030 baseline is equivalent to a 5% reduction from the 2018 figure, with wood, paper/board and plastic packaging having the greatest impacts. The measure is ambitious considering the steady increases till the application date (the baseline projection does not take into account the Covid pandemic, which seems to have increased waste generation) and the need for a turn-around of the trend to come to a reduction.

The measure will be supported by the EU harmonised M5 (void space), M7 (phase out of unnecessary packaging) and M8b (reuse targets), which contribute to almost 60% of the waste reduction. Concerning the complementary M10a, M10b, M10c and M19 (all supporting more reuse) and M1 (over-packaging), the Member States have leeway to identify the optimal mix of policies to meet the target reflecting their national circumstances. First of all, they might monitor to what extent economic operators undertake voluntary actions to generate less packaging waste beyond the legal requirements, e.g. further fostering reuse and refill, because it is appreciated by the consumers. In addition, the Member States can opt for actions under the scope of the ORD or other measures compliant with the internal market rules, such as mandating corporate waste management plans[53], in order to fill the gap between the impacts of the harmonised measures and target.

The administrative burden associated with it will depend on how Member States deliver on the target. The economic impacts are estimated for 2030 to be EUR 4.2 billion savings in waste management costs, EUR 429 million avoided costs of DRS, EUR 52.2 billion loss of producer revenues, EUR 11 billion savings in material costs and EUR 4 billion costs in reuse schemes. In terms of social impacts, the jobs created in the reuse sector are overcompensated by the reduction of jobs in packaging production, resulting net in a loss of around 22 k jobs in 2030. The environmental benefits are linked to a reduction in GHG emissions in 2030 relative to the baseline estimated at 11.8 million tonnes CO_2e. The monetary value of GHG emission and air pollution reduction is estimated at EUR 3.7 billion.

Packaging producers concerned by turnover losses suggested that instead of the strict reduction of packaging, voluntary measures should rather avoid waste ending up in landfill or incineration and foster recycling. There was a wide range of views on the setting of these targets, which were considered either too high or too low. On the materials included, the plastics industry asked for the target to be the same for all materials while representatives of other packaging materials (e.g. glass or paper) preferred to increase the target for materials considered more difficult to collect and recycle at the present time such as plastics. A general concern was expressed if Member States diverge in the setting of targets and/or the measures to be taken to achieve them and that an over-arching target should not only encourage the switch to lighter single-use materials.

6.1.4. MEASURES ON PREVENTION AND REUSE IN POLICY OPTION 3

Measure 8c: Mandatory high level targets to increase the reuse and refill of packaging by 2030/2040 in selected sectors +M10a+M10b+M10c+M19

This measure is identical with M8b, but with higher targets for the selected packaging types (see table 3). It is expected that the targets reduce packaging waste by 7.8% in 2030 [26.4% in 2040]. Further, the measure increases the share of reusable packaging from 2.4% in the 2030 baseline to 8.6% [19.2% in 2040].

For the implementation, administrative burden would derive from monitoring and reporting the progress with respect to the targets, both for public authorities and businesses. The economic impacts are estimated for 2030 to be EUR 852 million savings in waste management costs (lower EPR fees and avoided costs of one-way DRS), EUR 24.2 billion loss of producer revenues, EUR 2.5 billion savings in material costs and capital and operating costs of EUR 2.2 billion for reuse schemes (including DRS for refillables). The increase in reusable packaging is estimated for 2030 to lead to decreases in GHG emissions of 2.67 million t CO_2e [15.76 million t CO_2e in 2040], in environmental externalities of EUR 704 million [EUR 3.12 billion in 2040], and in water consumption of 118k m^3 [451k m^3 in 2040]. The measure would result in a net

[53] Packaging producers have to develop plans to reduce packaging waste and issue annual reports on its implementation, which all should be publicly available. The plans must not be reported to the authorities but to the EPR organisations.

creation of 629k FTE in 2030. Stakeholders´ positions were similar than concerning M8b, but in a reinforced way.

Measure 3: Banning by 2030 of heaviest packaging for selected items based on existing lighter alternatives

This measure would consist of two steps: (i) identifying, for a given kind of packaging, the lightest option available on the market, (ii) if such weight is X, banning, by 2030, any such packaging exceeding X by 20%. This measure would be targeted initially only at bottles (possibly adding jars) made of plastic and glass, as they are easy to define, relatively simple in nature, and have good weight reduction potential. The modelled impacts of this measure would lead to a reduction of 2.7% in overall waste generation in 2030. The implementation of this measure is predicted to be complicated. The measure would ensure a more harmonised approach to the implementation of M2b.

The following economic impacts have been identified: (i) Light-weighting of a current design (or selecting a lighter standard bottle) saves material costs (estimated EUR 294 million in 2030), (ii) initial investment costs are generally paid back quickly through material cost savings, (iii) if applied across the EU, there will be no disadvantage to any single EU producer as all will be treated equally, so long as imported bottles are also treated the same way and enforcement is effective, (iv) the margin (e.g. +20%) of weight allowed with respect to the lightest option gives margin to SMEs to comply, (v) waste management and EPR cost savings are estimated at EUR 81 million by 2030. The environmental benefits of this measure are predicted to be significant and predominately linked to a reduction in GHG emissions and water use. The change in 2030 relative to the baseline estimates a reduction of 766k tonnes CO_2e and 39k m^3 of water. The monetary value of the reduction in GHG emission and air pollution is estimated to be 104 million EUR. In terms of social impacts, a small negative impact on jobs is expected (-3,700 in 2030), only affecting raw material suppliers in the EU. Stakeholders are generally very concerned about the availability of the data required for this measure at the EU-level and the need to keep that data up to date. Many stakeholders preferred to set a best-in-class threshold only as a voluntary approach.

Measure 2c: Mandatory target of 23% reduction of packaging waste per capita in 2030 compared to the baseline +M1+M5+M7

The measure is similar to M2b, but with a higher target. In terms of effectiveness, it would reduce packaging waste by 23% in 2030 compared to the baseline, which is equivalent to a reduction of 10% compared to the waste generated in 2018. As regards implementation and administrative burden, see M2b, but the implementation by the Member States would become even harder considering the increases till the application date of the new law and the sharper reduction within the few years between the application date and 2030.

Due to the additional M3 (bans of heaviest packaging items) and the higher reuse targets in M8c, the EU harmonised measures contribute to more than 70% to the waste reduction, leaving still about 30% to the Member States to develop internal market compliant national measures to meet the target.

The economic impacts modelled entail EUR 4.9 billion savings in waste management costs, EUR 160 million avoided costs of DRS, EUR 59.9 billion loss of producer revenues, EUR 12.9 billion savings in material costs and EUR 4.8 billion costs in reuse schemes. The environmental impact includes an estimated decrease in 2030 relative to the baseline of 14.6 million tonnes of CO_2e and monetised reduction of GHG emission and air pollution of EUR 4.9 billion. A net loss of around 18k jobs is modelled. Stakeholder opinions were similar but fortified to M2b and concerned packaging industry was strongly opposed to the ban of heaviest packaging.

6.2. RECYCLABILITY AND COMPOSTABILITY

The detailed analysis of the measures on recyclability is in Annex 9.3 and on compostability in Annex 9.4.

6.2.1. MEASURES ON RECYCLABILITY AND COMPOSTABILITY IN POLICY OPTION 1

Measure 21a: All packaging shall be reusable or recyclable by 2030- clarification of Essential Requirements and recyclability definition

M21a will be the basis for clearer, better enforceable Essential Requirements on packaging, clearly prioritising recycling over recovery. It will make clear that packaging cannot be designed for energy recovery as it will remove the essential requirement on energy recovery and update the essential requirement on material recycling by requiring that not only a percentage of packaging item must be recyclable.

The CBA model estimates EUR 237 million of additional costs relative to the baseline 2030, mainly born by those producers of packaging types that do not meet the new requirements. The reduction in the quantity of packaging waste material sent to incineration could generate savings of 812k tonnes of CO_2e, of 29k m^3 of water use and EUR 179 million less of externalities. 3,800 jobs would be created.

The update of the essential requirement to bring coherence across Member States is widely supported by stakeholders, apart from a debate on the scope of what is included in recycling (i.e. composting). The removal of 'energy recovery' from the essential requirement was broadly supported, although the wood sector indicated that the best end-of-life for wood might be energy recovery.

Measure 21b: All reusable packaging must be recyclable as of 2030

This measure requires that all reusable packaging must also be recyclable by 2030. The effectiveness and feasibility will be strictly linked to the level of stringency of the minimum reusability criteria (Measure 10) and recyclability assessment procedure and criteria as defined in M22b. The measure complements M21a and will require an extra effort by the operators in the reuse sectors.

The CBA model estimated that the measure will increase the recycling rates by maximum 1.7%. The CBA model estimates a net increase in production costs for packaging producers of EUR 107 million. Furthermore, the shift from incineration and landfill to recycling of some packaging materials will increase waste management costs by EUR 39 million. Savings of 550k t of CO_2e, 18k m^3 of water and EUR 163 million of externalities can be expected. 2k additional jobs are created in packaging production and waste management.

Some stakeholders argued that non-recyclable reusable packaging should be allowed until 2035, subject to proven reuse and significantly better environmental parameters than single-use packaging. On the other hand, mainly NGOs argued that exemptions should not be allowed, as they risk being abused by the market.

Measure 22a: Qualitative definition of recyclable packaging

The Commission would define recyclable packaging as this much needed definition is currently non-existent. The impact of a qualitative definition alone on the recycling rates is not estimated to be significant. However, for some packaging types[54] recycling rates are expected to increase by 3-5%.

If the measure is applied alone, it could be hampered by different interpretations between Member States, which could also increase the administrative burden for producers. The maximum additional cost of packaging producers is EUR 260 million and EUR 91 million for the recycling industry in 2030. Savings of 1.2 million tonnes of CO_2e, 44k m^3 of water use, EUR 270 million of externalities and a maximum increase in jobs of 5,700 are estimated relative to the baseline in 2030.

The qualitative definition is widely supported and preferred over the quantitative definition in M22c. On the question whether key terms should be defined in the basic or in an implementing act, a majority of stakeholders called for definitions and key criteria to be clearly set out in the body of the act, while expressing concern about leaving the details to implementing acts and other secondary legislation. Further,

[54] e.g. rigid food, stand-up pouches, beverage cartons. See Annex 4 for more detail in Annex 4 (analytical methods)

representatives of the recycling sector argued for technological neutrality concerning chemical recycling to allow this type of recycling to coexist next to mechanical recycling. Finally, on the relevance of existing definitions of recyclability e.g. in EN13430, a majority of stakeholders argued that these definitions were obsolete.

Measure 28: Updates of Essential Requirements and EN 13432, clarifying biodegradability and compostability concepts

The updating of the Essential Requirements and EN 13432 will ensure better management of compostable packaging. To that end, the measure would improve the definition of compostable packaging and update the standard to ensure that real life conditions of composting are considered. This will lead to reduced cross-contamination of both waste streams.

M28 is feasible. There are too many uncertainties regarding the development of bio-waste treatment industry and the compostable polymers market to be able to estimate the impacts of avoided contamination. Slightly higher organic recycling rates and improvements in quality of the compost can be expected.

Measure 29a: Allowing both compostable and/or conventional plastics for selected packaging types

There are areas where the use of compostable plastic is beneficial, due to increased collection of organic waste and its diversion from residual waste or reduction in plastic contamination of compost. Therefore, a scoping exercise was undertaken to select plastic packaging, for which compostable materials are favourable: Lightweight plastic carrier bags, tea bags and coffee pads, fruit & vegetable labels (stickers), fast food trays that are unsuitable for re-use, films for perishable, trays for fruit & vegetables. In this measure, both compostable and/or conventional plastics are allowed to produce these packaging types.

Economic and environmental impacts would be moderate as it is assumed that some transition to compostable items is already occurring in the baseline scenario, also the social impact would be negligible.

6.2.2. MEASURES ON RECYCLABILITY AND COMPOSTABILITY IN POLICY OPTION 2

Measure 22b: Definition of recyclable packaging based on design for recycling (DfR) criteria complemented by the recyclability assessment procedure and a negative list of non-recyclable packaging characteristics +M21a, M21b, M22a

This measure is complementary to the qualitative definition of recyclable packaging (M22a) and is based on the mandatory use of design for recycling (DfR) criteria and two-step recyclability assessments to determine whether packaging is recyclable. The qualitative definition (M22a) would be used as a set of guiding principles to support the development of mandatory DfR assessment methodology. While the measure is expected to be demanding to implement, it should be highly effective in raising recycling rates and improving the quality of recycled material. Linking the measure to the modulation of EPR fees would reinforce its effectiveness. The DfR approach will be flanked by a negative list of packaging characteristics, which impede or hinder recycling, which will have the effect of reversing the burden of proof and requiring packaging producers of such packaging to prove recyclability via third party certification system.

The maximum potential increase in the recycling rate is estimated to be between 11-20% for packaging types that are more challenging to recycle while for overall packaging recycling rates it will correspond to an increase of ~2% relative to the baseline in 2030.

Administrative burden of this measures is expected to be significant. The Commission will need to manage the processes of establishing DfR criteria for 29 packaging categories in delegated acts and set a system for recyclability assessment including criteria for accreditation of certifying bodies. The costs for the preparatory work to establish the DfR criteria are established to be between EUR 1.8 and 2.6 million per year over 10 years. Packaging producers will have administrative burden associated with undertaking the two-stage assessment. This has been estimated at annual costs of EUR 385 million for first stage (self-assessment) and annual costs of EUR 750 million for the second stage (third-party assessment) if this takes

place every 10 years. The economic impact will lead to EUR 868 million of additional production costs and EUR 172 million of additional costs in waste management, relative to the baseline in 2030. These costs are likely to be relatively low compared to an unregulated scenario. In terms of environmental benefit, savings equal to 4.2 million tonnes of CO_2e, 150k m^3 of water use, EUR 930 million reduced externalities of GHG and air quality. The measure will generate ~ 19k additional FTEs.

Overall, there is a broad consensus on the need for harmonised DfR criteria to have a uniform packaging classification on the internal market. Requests from industry stakeholders to ensure the recyclability assessment not to be too onerous have been addressed by creating the two-step procedure, where a self-assessment (first step) exempts the majority of the packaging types from a mandatory third party certification.

Measure 23: Harmonisation of EPR Fee Modulation Criteria

The measure envisages harmonisation of EPR fee modulation criteria. The setting of the actual fees and their magnitude would still be left to PROs and/or Member States. The measure would make the attainment of the recycling targets in the baseline more efficient and cost effective, as it will act as price driven incentive for improved packaging design; in this sense, the measure complements and strengthens the effect of M22b. At the same time, the use of standardised packaging formats for reuse could lead to lower EPR fees for reusable packaging. Implementation of this measure is simple as PROs already collect much of the data required to operationalise the measure and would play a key role in monitoring. As fee modulation is already required by PPWD, the additional administrative burden is expected to be small.

The economic impacts of this measure could not be quantified but largely affect packaging producers: harmonised fee modulation criteria will lead to a better application of the "polluter pays principle", especially for the producers of the least recyclable forms of packaging. The environmental benefits would be evident due to reduced negative impacts of packaging waste management. The model estimates a small job creation in recycling industry of 5,700 FTEs by 2030. Stakeholders welcomed a coordinated approach to EPR fee modulation.

Measure 29d: Mandatory compostability for certain out of the selected plastics packaging types and for the remaining ones compostable or conventional plastics possible +M28

Under this measure, lightweight plastic carrier bags, tea bags (and the similar coffee pods or bags) and labels sticking on fruit & vegetable must be produced from compostable plastic polymers. The other products selected in M29 would be allowed to be made from compostable polymers (hybrid status as in M29a). For the first group of products, consumer confusion and contamination issues arising in the bio-waste treatment plants and plastic recycling plants is reduced. For the other products listed in M29a, the consumer confusion remains high, as both compostable and conventional plastic polymers are allowed.

Additional investments to shift to more compostable plastics will be limited, as also in the baseline these polymers are soaring. The economic impacts are reduced costs in waste management (less incineration and landfill) and food waste contamination removal in the order of EUR 200 million in 2030, but the additional costs for more compostable plastics (~EUR 380 million) lead to cost a cost increase of app. EUR 180 million. The model estimated savings of 1.1 million tonnes of CO_2e and EUR 262 millions of externalities. Also, the environmental performance would significantly improve, if the hybrid status is completely phased out, because the plastic recycling will have better parameters in the future. The social impact is negligible.

6.2.3. MEASURES ON RECYCLABILITY AND COMPOSTABILITY IN POLICY OPTION 3

Measure 22c: Quantitative definition of recyclable packaging +M21a, M21b, M22a, M23

A quantitative definition of recyclable packaging based on actual recycling rates within a packaging category or for a specific packaging item would be established. This measure is an alternative to M22b.

Packaging item would be considered recyclable, if it is recycled (as a packaging format or a category of packaging) beyond a certain threshold. The feasibility would depend on the roll-out of new digital technologies that would enable the calculation of recycling rates for specific packaging items/categories. As such technologies are unlikely to be EU-wide in place by 2030, this measure would only be effective by 2040; the recycling rates for the concerned packaging would increase by 15-31% compared to the baseline, which corresponds to an overall increase of recycling rates by 2-3% in 2040. Significant additional administrative burdens are required to implement the new data systems and reporting process. These additional costs for packaging production are estimated to be EUR 1.6 billion and EUR 49 million for sorting and recycling, compared to the 2040 baseline. Savings by 2040 of 8.3 million tonnes of CO_2e, 287k m^3 of water use and EUR 2.5 billion of externalities are estimated. Shifting from incineration and landfill towards recycling would generate 36k FTEs.

Most stakeholders support the quantitative definition of recyclable packaging but are aware about the challenges of its implementation. In contrast to the qualitative definition in M22a, and although it may have generated interest, there was a broad consensus that M22c is not feasible before 2040 and neither desirable, as it would be difficult to implement considering that a high level of granularity (i.e. level of detail that should be considered by categories/types of packaging materials) would be required. Further, the current EU recycling targets are material specific and not product specific. One NGO suggested to launch a data collection system via the PROs now and based on this establish targets at a later stage.

Measure 29b: Mandatory compostability for all selected plastics packaging types packaging +M28

This measure would require that all products identified in M29 are made from compostable plastics. Consumer confusion - thus also the issue of cross contamination - is eliminated. However, the measure would imply further complexity for the packaging industry compared to M29d in terms of investments in research and development. Strong opposition from the waste management sector and Member States can be expected, as the compostability at local level of several out of the newly mandatory compostables is severely challenged. As regards economic impacts, the costs of switching to compostable polymers primarily result in higher material costs which exceed savings in waste management by EUR 170 million. The model estimated savings of 2.1 million tonnes of CO_2e and EUR 518 million of externalities. Some additional 28k FTE are created.

6.3. RECYCLED CONTENT OF PLASTIC PACKAGING

The detailed analysis of the measures in this intervention area can be found in Annex 9.5.

6.3.1. MEASURES ON RECYCLED CONTENT OF PLASTIC PACKAGING IN POLICY OPTION 1

Measure 37: Definition of Recycled Content and measurement method

This measure introduces provisions to establish a harmonised methodology for the calculation, reporting and verification of recycled content levels in packaging, as well as clarifying the definition of the terms recycled content. The elaboration of the respective Implementing Act could revert on the respective act for the SUPD.

The economic, social and environmental impacts of this measure in isolation are negligible, but it should be seen as a crucial basis for M34 and M35, as strongly supported by stakeholders. The inclusion of chemical recycling was subject of intense debate, especially the concrete allocation in a mass balance approach.

6.3.2. MEASURES ON RECYCLED CONTENT OF PLASTIC PACKAGING IN POLICY OPTION 2

Measure 35em: Broad targets for plastic packaging based on contact-sensitivity for 2030 and 2040 +M37

This measure would set mandatory targets for post-consumer recycled content in plastic packaging from the years 2030 and 2040, with two variants in terms of ambition.

- The targets would be applied as a requirement on each item of obligated packaging, as opposed to an average to be met across a group of packaging items, based on the methodology for their quantification set out in M37 and certified for the respective packing item;
- The basis for the targets would be packaging placed on the EU market, such that they would be implemented by operators monitored and enforced by the Member States.

These targets are aimed at three groups: contact and non-contact sensitive and beverage bottles (see Table 4).

Table 4 Measure 35e Post-consumer Recycled Content Targets

Product Group	2030		2040
	M35em	**M35eh**	
Contact Sensitive	25%	30%	50%
Non-Contact Sensitive	35%	45%	65%
Beverage Bottles	30% (set in SUPD)	50%	65%
Total	*~30%*	*~40%*	*~60%*

Apart from a precondition to have M37, a key aspect in terms of implementation will be to determine a mass balance approach as a key enabler of chemical recycling, in order to make the needed recyclates available. Due to the specific challenges for 'contact sensitive' plastic packaging, the economic impacts are likely to be significantly higher than for the non-contact sensitive, i.e. those recyclate markets will be tighter. As well as some administrative burden for the Commission and Member States, the estimated certification costs for the industry are divided into One-off costs around EUR 30 million and EUR 120 million recurring costs.

At the beginning of 2022 recycled PET became more expensive than fossil based PET (1000-1500€/tonne). If a 100 €/t price differential between rPET and virgin resin were to be maintained across the plastics packaging sector this would be an increase in costs to the industry of EUR 270 million annually for the medium ambition 2030 target. A price differential between recycled PET and virgin resin of 100 €/tonne means an increase of the material costs for a 13g PET beverage bottle produced from 50% recycled PET of 0.00065€. The price differential will increase with higher targets, as the recyclate markets will be tighter. Further, high recyclate prices exert a pull to have higher plastics recycling rates.

Carrying out recycling and incorporating recycled content within the EU reduces the effect of the uncertainty of oil supply associated with geopolitical issues. The medium ambition 2030 target would therefore reduce fossil fuel requirements of the EU by 3.1 million tonnes per year. The increase in plastics recycling related jobs in the EU is estimated to be 26k FTE (2030). The model estimated savings of 6.5 billion tonnes of CO_2e and EUR 710 million of externalities compared to the 2030 baseline.

There is big support from all sides to foster closed loop recycling via recycled content targets for plastic packaging. However, there are concerns from certain industries, e.g. food and pharma, about high costs for or unavailability of recyclates (see section 2.4.3 of Annex 9.5). Thus, several stakeholders expressed the need for the deployment of new recycling technologies, such as chemical recycling, exemptions from the targets for certain plastic packaging, measures to restrict the losses of recyclates to other sectors and for the targets to be re-evaluated in ~5 years to avoid unnecessary market prohibitions if the material is not available. Another exemption should focus on SMEs: a de-minimis threshold of 100 tonnes plastic production p.a. from the requirement to incorporate recycled content affects ~ 2000 plastic packaging convertors (10%); it would result in reducing the recycled content in 2030 by ~ 200k t i.e., ~ 4% reduction in

the total mass of recycled content and ~1 percentage point reduction in the overall average plastic packaging recycled content. Further, industry requested to ensure well-functioning markets for secondary raw materials and the creation of efficient infrastructure in the waste value chain. The chemical recycling industry has stressed the importance of this type of recycling to increase recycled content especially in food packaging. Stakeholders representing plastics argued that recycled content targets should also be set in other material categories to avoid discrimination of plastics, while the representative of glass, metal and paper/cardboard stressed that for these materials there are already high shares of closed loop recycling without recycled content targets.

6.3.3. MEASURES ON RECYCLED CONTENT IN POLICY OPTION 3

Measure 35eh: Higher ambition, broad targets for recycled content in plastic packaging based on contact-sensitivity for 2030 and 2040 +M37

This measure requires higher recycling rates of the plastic waste than 35em and thus the mass flow is tighter, impacting the feasibility. Admin burden for the Commission and Member States, and certification costs for the industry are estimated equal than in M35em. As the market are tighter, the prices for recyclates tend to be higher than in 35em, thus the additional production costs would increase more than EUR 500 million. The reduction in fossil fuel requirements of the EU would be 4.5 million tonnes per year. The model estimated savings of 12 million tonnes of CO_2e, 930k m^3 of water use and EUR 1.35 billion of externalities.

Stakeholder opinions were similar to M35em, but intensified, as certain recyclate markets become very tight and the call for exemptions thus stronger.

6.4. ENABLING MEASURES

The detailed analysis of the measures about hazardous substances can be found in Annex 9.6, on DRS and waste collection in Annex 9.7, on labelling in Annex 9.8, on GPP in Annex 9.9 and Data Reporting, including on PCBs, and Enforcement in Annex 9.10.

6.4.1. ENABLING MEASURES IN POLICY OPTION 1

Mx: Update of current material-based labelling: Removal of alphanumeric codes for waste sorters

This measure would remove the obligation for the alphanumeric labelling of the packaging materials, as there is no evidence alphanumeric coding has ever been used in any meaningful way by consumers, neither is it used by the waste sorters. New packaging labelling requirements to facilitate smarter sorting in the waste management sectorn would be mandated. Apart from the already widely applied optical sorting (NIR), digital watermarking[55] and serialisation[56] have demonstrated to be technically viable labelling technologies, but they are not yet rolled out. Also integration of information into a Digital Product Passport[57] could be an option.

Removing the alphanumeric codes will not adversely affect consumer behaviour, but to minimise disruption, it should be aligned with the introduction of M27c-y on consumer-facing sorting labelling. Economic, environmental and social impacts are marginal.

There was broad support for harmonising labelling requirements and consensus that the alphanumeric coding does not support consumer sorting. Stakeholders of industry and brands stressed that space on labels

[55] See https://www.digitalwatermarks.eu/
[56] World Economic Forum, 2019, *Here's how digitization can boost recycling rates*
[57] Proposal for Ecodesign for Sustainable Products Regulation (europa.eu) as published on 30 March 2022

is limited and therefore the necessity of each labelling particular should be substantiated. There was strong support for digitisation of information, a language-neutral system (logos, pictograms or codes) and a consumer testing phase. NGOs stressed the need to accompany any new labelling requirement with dedicated communication to ensure that it is accepted and drives the intended behaviour. The industry representing biodegradability would like specific information on biodegradable packaging, but this was opposed by all other stakeholders.

Measure 31: Update of 'hazardousness' definition

This measure is included in Option 1 and it aims at: a) reviewing the objectives of the packaging legislation by including the protection of human health, b) including the whole life-cycle of packaging, when establishing the requirements on the content of hazardous substances in packaging and c) updating the Essential Requirements by replacing "noxious and other hazardous substances and materials" with "substances of concern" as described in the Chemicals Strategy for Sustainability and defined in the Commission proposal for the Ecodesign for Sustainable Products Regulation.

This measure is considered effective as it will significantly reduce confusion about the substances in scope of this obligation. Manufacturers may need to engage in new communication with their suppliers, to update information based on the more precise definition of substances covered ("substances of concern"), which will require some additional administrative burden. In terms of economic impact, adaptation costs may be needed for changing the formulation of packaging materials or switching packaging formats. However, the extent of the economic impact cannot be determined given the variety of packaging in the scope and the current lack of a specific mapping of relevant substances of concern in packaging and the frequency and extent of their use. This measure will achieve a positive social impact due to the improved protection of human health. Furthermore, the protection of the environment will be improved thanks to the reduction or elimination of substances of concern in packaging, thereby also limiting potential emissions during the waste phase. In general, stakeholders indicated that hazardous substances in packaging should be addressed via REACH, the EU Chemicals Strategy for Sustainability and the Food Contact Material regulations.

Measure 32a: Expanding the information on hazardous substances

This measure aims at collecting, identifying and prioritising relevant substances of concern in packaging for which potential limitations or restrictions could be envisaged. This measure may not be effective to gain a comprehensive overview of all the hazardous substances potentially contained in packaging, but will draw on available information and registers covering substances of concern to enable an initial prioritisation for swift further restriction action, as appropriate.

No major difficulties are expected in its implementation given it relies upon existing information on packaging. The administrative burden for suppliers of packaging would remain unchanged. Only a small increase in administrative burden would be expected to occur for the European Commission, the European Chemicals Agency and the national administrations, which would translate in the effort to run dedicated data-mining in existing databases and to tender and run support studies for the identification and prioritisation of substances in packaging. The economic impact associated with the execution of this measure is modest and would rely on the public administrations, responsible for running and paying for the data-mining and support studies described above. No significant social and environmental impacts are envisaged from this measure given it only entails desk work information gathering and analysis. The majority of stakeholders were in favour of this measure.

6.4.2. ENABLING MEASURES IN POLICY OPTION 2

Measure A&B: Mandatory DRS and minimum requirements for all DRS

DRS systems ensure high recovery and purity rates, which are preconditions for high quality recycling. Therefore, this measure requires Member States to set up DRS for plastic bottles and metal cans

mandatorily, supplemented by DRS for other beverage containers on a voluntary basis and establishment of minimum requirements for all DRS; the latter measures are supportive, subsidiary elements for the Member States. The measure will facilitate the scale-up of DRS, while improving consumer and economic operators' uptake. It would contribute to M35em and m35eh by allowing for collection of more and purer waste materials.

The implementation timeline (3 Phases: 4-9 months preparation, 14-24 months implementation, 12 month "go-live" and support) would start in 2027 to reach 90% collections by 2030. The main administrative costs are expected for producers related to the design and implementation of the DRSs. The measure would amount to annualised cost of EUR 980 million, comprising of cost of EUR 1.04 billion in producer fees for beverage containers and savings of EUR 55 million EPR fees. 15k new FTEs relative to the baseline are estimated for 2030. The distributional effects, cost transfers and the Member States, which would have to introduce a DRS (some Member States have already introduced DRS to meet the SUPD targets) are detailed in Annex 9.7.

There was broad support (especially from NGO and soft drink industry) for the extension of DRS and EU wide minimum requirements. While most stakeholders supported the expansion of DRS for certain packaging, about half also supported a possibility of national exemption from a mandatory DRS for specific beverage container, if the country is already capturing a high rate of targeted containers through alternative means. The environmental NGOs pointed out that if refillable packaging were to be included in a mandatory DRS, it makes sense for refillables to have a lower deposit than one-way packaging, to encourage reuse. Member States favoured the further harmonisation and the development of harmonised minimum DRS requirements.

Measure 27c-y: Harmonised labelling of products and waste receptacles to facilitate consumers´ sorting (advanced Nordic pictograms system) +Mx

The new uniform labelling systems avoid consumer confusion as to where to dispose of their waste packaging and will allow for harmonisation of collection systems across the Member States. They are implemented in conjunction with consumer awareness campaigns. The inspiration is taken from the pictogram system, which is already being very successfully implemented in Denmark, Sweden, Finland, Norway and Baltic countries. Material composition (rather than "recyclability") will be labelled. The measure will prevent Member States from mandating their own consumer-facing packaging sorting instructions or labelling systems, thus preserve the integrity of the single market, and be combined with measure x (Removal of alphanumeric codes, "One in One out"). The approved symbols will be an on-pack requirement, thus visible as a direct prompt to the consumer at point of disposal. It will also require labelling waste collection containers with the same symbols as packaging, in order to allow consumers a straightforward identification of the correct waste container for the corresponding packaging and an overall improvement to separate waste collection.

Overall, 15 Member States will have to enforce the EU harmonised labels with pictograms on waste receptacles and packaging products for the first time, the remaining simply having to adapt their systems during the phase in period. These Member States will reap the largest share of the waste management efficiency gains (EU total: material capture rates +2%; purity of collected waste +12%). There will be one-off costs to the Commission of EUR 0.8 million to develop (design, testing, rollout of the EU labels) and establish in an implementing act the new labelling system, and EUR 15 million each year for waste collectors to conduct annual inspections to ensure that the new EU labels are in use.

The estimated total (cumulative) cost to businesses, citizens and public administrations of implementing the new EU harmonised labelling system for the labelling of the receptacles is estimated at around EUR 330 million over the implementation period (3 or 4 years). In contrast, the model estimated cost savings in the EU waste management sector of EUR 140 million due to reduced fees for waste incineration and the efficiency gains in the waste treatment value chain. Thus, there are aggregated additional costs for the

labelling of waste receptacles -including in the waste management sector- of EUR 210 million over the phase in period.

The cost for redesign of impacted packaging labels of products for the economic operators would be EUR 18.1 billion, spread over the implementation period of three years (EUR 6 billion per year for three years). These costs could be significantly reduced by allowing four years for transition (cost falls to EUR 10.3 billion in total, equivalent to EUR 2.6 billion per year for four years). All the estimated costs are administrative costs and refer to the implementation of the labelling per single keeping unit (SKU) and on waste receptacles, external development and testing costs, designing of communication information and annual inspection costs to ensure that the new EU labels are in use. The measure will contribute to environmental benefits through clearer information on the material composition of packaging, particularly when aligned with other measures to improve labelling consistency and clarity. It will lead to improved sorting, thus less contamination of recycling streams and more material being recycled, and this with higher quality. Waste management and consumer stakeholders strongly called for better, harmonised and more comprehensive sorting instructions to consumers, and this under consideration of local collection and sorting infrastructure differing across the EU.

Measure k: Restrictions on use of confusing labels

This measure will restrict the ways in which information on subjects covered by the labelling measures under the revised packaging legislation is communicated and prevent Member States and EPRs from mandating their unique national labelling requirements on these subjects. The measure will preserve the integrity of the single market and further reduce consumer confusion as to correct disposal of waste packaging and some of packaging characteristics. If it is introduced alongside other labelling measures, it will reinforce their impacts and the additional costs of this measure alone would be minimal, with all packaging being redesigned over the course of the transition period for M27c-y in any case. Enforcement costs for Member States would be minimally affected, in line with M27c-y. Over time, removal of the diverging national labelling systems might lead to savings of EUR18 billion, thus outweighing the cost estimate for M27c-y. This is confirmed by all stakeholders.

Measure 38-j: Labelling criteria for Recycled Content

This measure will prevent Member States from setting up their unique national labelling requirements on how recycled content in packaging, and so preserve the integrity of the single market. Such standardised information may additionally impact consumer purchasing preferences and encourage competition between economic operators, if it is considered that demonstrating “recycled content” provides them with a marketing or reputational advantage. The respective implementing act ensures that the claims are not misused.

If this measure is introduced alongside other labelling measures, its additional costs alone would be minimal, with all packaging being redesigned over the course of the transition period for M27c-y in any case. Most packaging industry stakeholders were more concerned about divergent labelling and NGOs criticised misleading claims on recycled content in a non-EU harmonised system (“green washing”).

Measure 12-u: Harmonised labelling for reusable packaging

This measure will introduce a mandatory symbol for reusable packaging. The measure will overcome the current fragmentation in reuse labelling schemes at national level and therefore preserving the integrity of the single market by preventing divergence in mandatory labelling requirements. Harmonising the reuse labelling may additionally encourage consumer preferences for reuse and support more packaging reuse. This measure and its impacts are closely linked with M27c-y on labelling criteria to facilitate consumers´ sorting and M38-j labelling on criteria for recycled content and could be part of the future implementing act on labelling.

Significant administrative burden for the Commission occurs for the development of reusability standards and designing the EU symbol. To the extent that the symbol facilitates more reuse– and thus the efficiency and effectiveness of reuse systems overall – it is expected that the measure would have environmental benefits. Stakeholders were more concerned about preventing the further multiplication of divergent national requirements on reuse labelling than for establishing an EU label. Views also diverged on the value for the consumer of additional performance information (such as the number of reuses an item can serve).

Measure 32b: Notification of substances of concern in packaging +M31

Under this measure, which is an alternative to M32a, in addition to the use of existing information described under 32a, a new legal obligation would be introduced by which all substances of concern used in packaging would have to be notified by the supplier placing the packaging and packaging materials on the EU market. The notification could be done through:

1. a centralised European Database, relying on an expanded IT infrastructure of the current SCIP database.
2. EPR schemes: Dedicated IT infrastructure needed to support notification, data storage and management.
3. Integration into the information contained in a Digital Product Passport.

This measure has a broader scope than M32a in terms of the amount of substances covered. However, only a subset of substances classified as hazardous substances in Annex VI of the CLP regulation meet the criteria to be considered "substances of concern". This is however a large set of substances, prioritised under the Chemicals Strategy for Sustainability. The ease of implementation depends on the notification scheme chosen. The first one will require substantial efforts in the development of the IT infrastructure, the second will be be even greater if EPR systems have to be created ex-novo. The third one relies on a system that is going to be developed under ESPR, however, given the developments pending in this area, it is not possible at this stage to assess the impacts of relying on such a system. Additional administrative burden will be imposed on suppliers of packaging due to the increased scope of substances to be reported. Significant burdens can also be envisaged for public administrations, particularly the European Commission and ECHA for the coordination and IT development. The economic impact will depend on the choice of the system but is expected to be several million Euros over a few years for the development and adaptation of the IT system and a permanent increase in the fixed maintenance and operational costs of the database. No significant social and environmental impacts are expected.

A study on determining the restrictions on substances of concern in packaging will be carried out by the European Chemicals Agency (ECHA), which has the needed experience to carry out these assessments. This will cost around 817 ooo EUR (consisting of 400 000 outsourcing the study to ECHA and some 175 000 staf costs for 3 years).

Measure 33a: Restrictions of substances under REACH

This measure would ensure that there is a reliable and well tested process for assessing the risks posed by substances of concern in packaging and to, as appropriate, effectively limit their use and presence. This would increase the uptake and confidence in secondary raw materials obtained from packaging. The measure would be complemented by M31 (updated definition of hazardous substances in packaging and M32a (more information on the presence of substances of concern in packaging).

Considering economic impacts, restrictions on substances of concern in packaging may require additional efforts for packaging manufacturers in the form of additional communication with suppliers regarding substances in packaging materials or even adaptation costs by changing the formulation or changing the packaging formats. The magnitude of these costs is unknown due to the lack of data. A beneficial social impact is expected through the improvement of human health through a more limited use of substances of concern in packaging, but it is difficult to quantify as it will be largely dependent on the precise substances restricted and their precise patterns of use. Positive environmental impacts are also expected though difficult to quantify at present due to the lack of available data. Several stakeholders believe that the PPWD is not the

appropriate instrument for restriction and therefore support this measure where such restrictions would be left to REACH (and as applicable, to the FCM Regulation).

Measure 40b: Mandatory minimum GPP criteria for packaging of priority products and services

This measure will set out mandatory minimum Green Public Procurement compliance criteria for packaging of products and services with high efficiency. An initial selection based on the Common Procurement Vocabulary identified 13 product groups, considering factors such as the amount of packaging and the potential impacts. The criteria would be applied by authorities for contracts above a certain financial threshold. Applicants for public sector contracts are required to provide information related to the packaging criteria.

The measure is expected to be effective in increasing the demand for lower environmental impact packaging in products and services. The uptake of the mandatory and efficient GPP criteria will be wider and consistent across Member States. The measure would support the attainment of objectives under other policy areas, such as recycled content, recyclability, packaging minimisation and reuse. In terms of ease of implementation and administrative burden, an expert group would identify, based on best practices, high potential impact products and services, as well as related packaging-specific criteria. Subsequently, the criteria will be set out in an implementing act. Member states will need to set up monitoring, reporting and enforcing systems. Public bodies will be required to ensure that the tendering processes include the relevant GPP criteria, and that staff is trained on mainstreaming, assessment and verification of those criteria.

The overall economic, environmental and social impacts could not be quantified since they depend on the choice of the criteria and de-minimis threshold. Evidently, the requirement for the applicants to prove compliance with the packaging criteria implies some administrative burden. Furthermore, it is predicted that this measure will have a positive environmental impact due to the prevention and reduction of packaging waste. The social impact is expected to be minimal. Stakeholders were mostly positive about this measure and were in favour of mandatory minimum packaging criteria for GPP. However, several stakeholders pointed out that there was a need for additional considerations, namely (i) minimum requirements should not restrict the ability of contracting authorities to set more ambitious sustainability requirements, (ii) mandatory requirements should be aligned with established packaging criteria, and (iii) there should be pre-defined procedures to enable exemptions in exceptional circumstances.

Measure 42b: Harmonization of EPR reporting system for packaging producer above a threshold

The economic impacts of the measure are attributed to the increased data processing needs associated with harmonised and more detailed EPR data. The majority of packaging producers would be required to provide more detailed product data to the relevant EPR systems. It is recommended to introduce a *de minimis* threshold for producers below a certain size to limit the additional reporting requirements faced by small producers. The economic impact on EPR systems could be equivalent to 0-1 FTE during the set-up and 0-0.5 FTE once the system is operational (per PRO). It is unlikely that national governments would experience a significant economic impact.This measure is not expected to have a significant environmental impact.

Some stakeholders observed that EPR systems are becoming increasingly divergent from each other. They also drew attention to the fact that the granularity of the data required is linked to the administrative burden and therefore harmonisation will be crucial to limit additional efforts and haveshowed almost unanimous support for this measure on the condition that it does notdisproportionately increase the administrative burden. Several participants specifically pointed out that harmonisation not only of what is reported, but also of the timing of reporting, would facilitate the planning and scheduling of administrative tasks.

Measure PCB: Reporting obligation on PCBs

In 2018, the PPWD introduced provisions aiming to reduce consumption of LPCBs (bags with a wall thickness of 0<50 micron) in order to combat littering and promote waste prevention. In concrete, the PPWD

requires Member States to report annual consumption data on all LPCBs, while it is voluntary for VLPCBs (bags with a wall thickness of 0<15 micron), LPCBs of 15<50 micron and PCBs ≥50 micron is.

An evaluation of the measures in the PPWD as regards PCBs unveiled a lack of data on consumption of VLPCBs and PCBs ≥50 micron in order to assess, if the consumption of these bags has increased as a substitution effect to reductions of LPCBs of 15<50 micron. Further, there is evidence that PCBs ≥100 microns are intended to have a long lifetime, are reused many times and have only a small littering potential. The measure therefore extends the current reporting requirements on Member States to include

- reporting of PCBs 50<100 micron mandatorily and PCBs ≥100 microns voluntarily.
- mandatory disaggregation of the LPCBs data in <15 micron (VLPCBs) and 15<50 micron.

The study above underpins that closing these data gaps would efficiently ensure that the objectives in the PPWD are not undermined. Implementation should not lead to problems as reporting regimes exist already for LPCBs and many Member States already collects the data which will become mandatory on a voluntary basis. There is a small one-off and annual additional administrative burden on public authorities in the 14 Member States, where PCBs ≥50 microns are not yet reported. Further, 5 Member States would have similar additional administrative burden for the mandatory disaggregation of the LPCBs data in <15 micron (VLPCBs) and 15<50 micron (Member States concerned are listed in Annex 9.10).

6.4.3. ENABLING MEASURES IN POLICY OPTION 3

This option includes M27c-y, Mx, M12-u, M38-j, Mk, M31, M42b, MPCB, plus:

Measure C: Prioritized use of recycled packaging from DRS

This measure will, via an addition to the minimum requirements of DRS, give priority access to recyclates from packaging collected through mandatory DRS to each beverage container producer that is registered in the respective DRS and places such deposit containers on the market. The measure is solely focussing on PET recycling, even though it could also cover beverage cans or glass bottles, in case they were under a DRS. It is effectively facilitating and assuring PET bottle producers meeting EU recycled content targets (bottle-to-bottle recycling). However, in case of aluminium cans there is already a very high closed loop recycling without regulating recyclate market. Further, glass bottle producers already experience that recycled glass commands a premium price, meaning bottle-to-bottle demand is supported without priority access. The measure may cause tensions related to the change in market conditions for many operators. It would have a price curbing effect for rPET, at least on the significant, prioritised market share; thus, the incentive for the waste value chain to closed-loop recycle PET is reduced. The measure will reallocate costs and benefits across economic actors: Drinks producers filling PET bottles will benefit from an ability to obtain grade rPET food more easily, and may pay a lower price due to the priority access. Other food or non-food packaging producers as well as other users of recycled plastic (e.g. textiles) will find access to food grade rPET harder. The EPR fees would decrease less, as the PET recyclers would have to sell the rPET at lower prices to the priviledged PET bottle producers. There are no significant social impacts expected.

Stakeholders' views were divided, with stakeholders placing PET bottles on the market strongly in favour, because they would have a privileged, assured and less costly supply of recycled PET. Stakeholders who would not have a right to first refusal believe the regulatory intervention into the newly created market for the various recyclates will jeopardise single market rules, restrict these markets and lead therefore to suboptimal allocations and damage their ability to innovate.

Measure 26cc: Waste collection schemes alternative to DRS

This measure focusses on the separate collection via EPR schemes for certain packaging, which have proven to be efficient and effective in terms of the amount of separately collected waste and its high purity. Ma&b ensures that a 90% collection target is reached in a cost-efficient way by means of mandatory DRS for

aluminium beverage cans and plastic bottles. M26cc however, refers to the possibility of setting up efficient and effective EPR based actions for beverage containers.

There is evidence that in some Member States and for certain beverage containers, well designed and operated EPR schemes are efficient to achieve high collection rates without DRS in place. Considering that all Member States will by 2025 have EPR schemes in place, it is expected that the costs to close the gap to a 90% collection target via specific measures within the EPR schemes would not exceed the costs of mandatory DRS for beverage containers. However, separate waste collection via EPR schemes may not be so efficient to reach high collection rates than DRS. The environmental savings of this measure is similar to Ma/b and could be slightly higher because also other containers of the same packaging type could be included into the separate collection scheme. Stakeholders from Member States without DRS for aluminium beverage cans and plastic bottles, but with well-established EPR systems, argued that these Member States should exempted from the mandatory DRS if they can guarantee the 90% collection rate via EPR schemes.

Measure 32c: Notification of all substances in packaging

M32c has a wider scope than the alternative 32b: the substances to be notified would cover all the substances known to be present in any given packaging or packaging material placed on the market. Therefore, this measure would be effective in developing an exhaustive inventory of all substances in packaging. However, it is likely to raise important concerns in industry in terms of the communication and use of confidential business information.

This measure would have higher costs in terms of implementation as compared to M32b. Economic impacts will be higher than M32b while no significant social and environmental impacts are expected for this measure as its nature is only information analysis. The potential need for testing could however have a small economic impact on operators. This measure is likely to impose an additional administrative burden on producers/importers, as it will include substances that were not previously reported. Producers/importers have to collect information from their supply chain or obtain/verify it directly through targeted chemical analysis.

Measure 33b: Restrictions of substances under the reviewed PPWD

This measure differs from the alternative M33a in that the procedure to make these restrictions into law would be carried out under the revised PPWD itself, via delegated acts and by introducing the list of restricted substances in an annex, to be created for this purpose in the Regulation.

Effectiveness of option 3 on the restrictions of substances under the reviewed PPWD would be similar of M33a. The task of restricting substances of concern relevant to packaging would be done with the advice of a dedicated expert group established under the PPWD and enacted via delegated acts under the PPWD (instead of under REACH). Similar to M33a, implementation of this measure would be simple as the approach relies on procedures already established under the REACH Regulation. An additional difficulty might arise in ensuring the availability of adequate chemicals risk management expertise in the responsible Commission service. Further administrative burden is expected for stakeholders that would be affected by the scope of a specific restriction on a substance used in packaging. Economic impacts are expected to be the same as in M33a. In terms of social and environmental impacts, it would be similar to M33a, providing more effective tool to ensure protection of the human health and environment from the substances of concern in packaging. Stakeholders' views express concerns that PPWD may not be the appropriate instrument for restricting chemicals and that this should be left to REACH and the Food Contact Material (FCM) regulation.

Measure 40c: Mandatory minimum GPP criteria for packaging of all products and services

This measure deploys a horizontal approach to mandating the application of a general set of packaging criteria across all public sector contracts where packaging arises. It would require Member States and related

contracting authorities to apply mandatory minimum packaging criteria to relevant contracts above and below OJEU financial threshold.

Similar to the alternative M40b, it is expected to be effective as it is mandatory and will entail the widening of existing GPP criteria. In terms of administrative burden, the implementation of the current measure's administrative activities would impact: (i) The European Commission to develop GPP criteria (this might be less burdensome than creation of specific criteria under M40b); (ii) Member States to ensure that new criteria are implemented, monitored, and reported on, (iii) Public bodies to update their tendering process, and (iv) Suppliers to update their packaging source options. Overall, similar to M40b, specific economic, environmental and social impacts could not be quantified since they depend on the choice of the GPP criteria selected. The social impact is expected to be minimal, resulting in the creation of jobs in the reuse business and the reduction of littler in local environments. Stakeholders were mostly positive about this measure, some highlighted that the new criteria should be aligned with other packaging sustainability criteria.

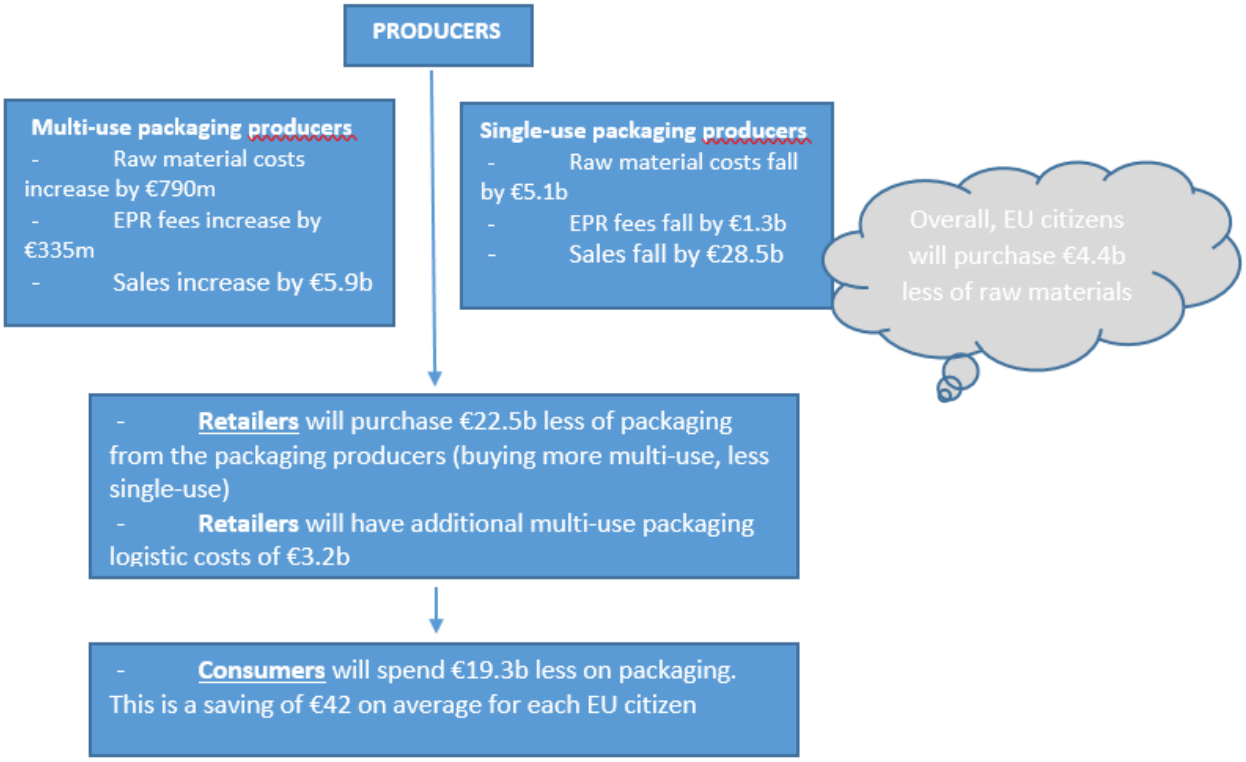
Measure 34b: Mandatory reporting requirement for recycled content for all packaging

This measure would indirectly encourage the increased use of recycled content in packaging. Improving the quality of and access to data on the current performance of the packaging sector in the area of recycled content will help identify best practice and improve the effectiveness of policy making in this regard. However, the administrative burden for this reporting obligation is significant, without having positive effects on job creation. Stakeholders expressed concern about the additional administrative burden and some suggested to postpone targets for recycled content while such a system is established and delivering data for the decisions on recycled content targets.

6.5. TRANSFERS OF FINANCIAL COST

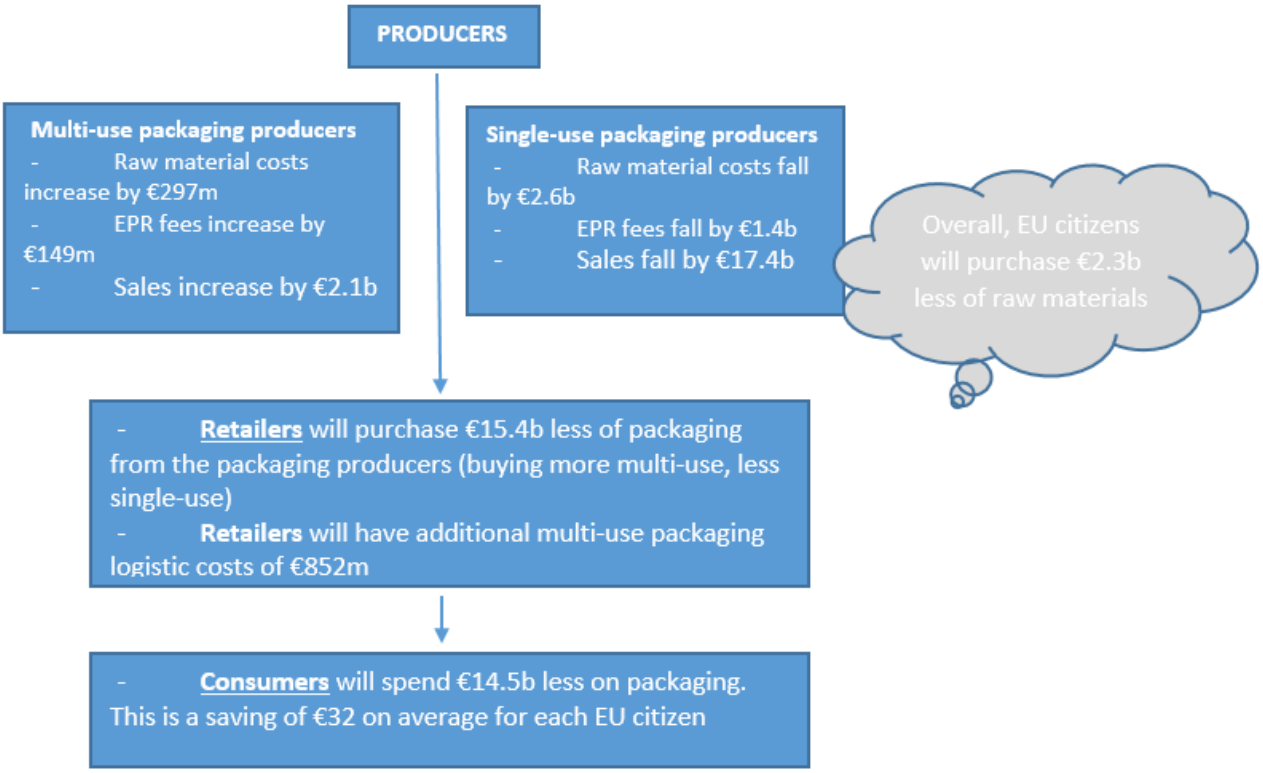
The following figures showcase for the measures with the most significant economic impacts an overview of how the costs identified are transferred from the packaging producers to the consumers, including the waste management (EPR fees). Whilst it is not certain whether all costs borne by industry will be transferred, it is assumed for the purposes of the analysis that any increase in costs by producers will filter down the value chain. All costs are for the specific measure and will change when combined with other measure as part of an option, although the key actors and where revenues transfer from one industry to another will not change.

Figure 10: Transfers of financial costs for Measure 8b – Mandatory reuse targets



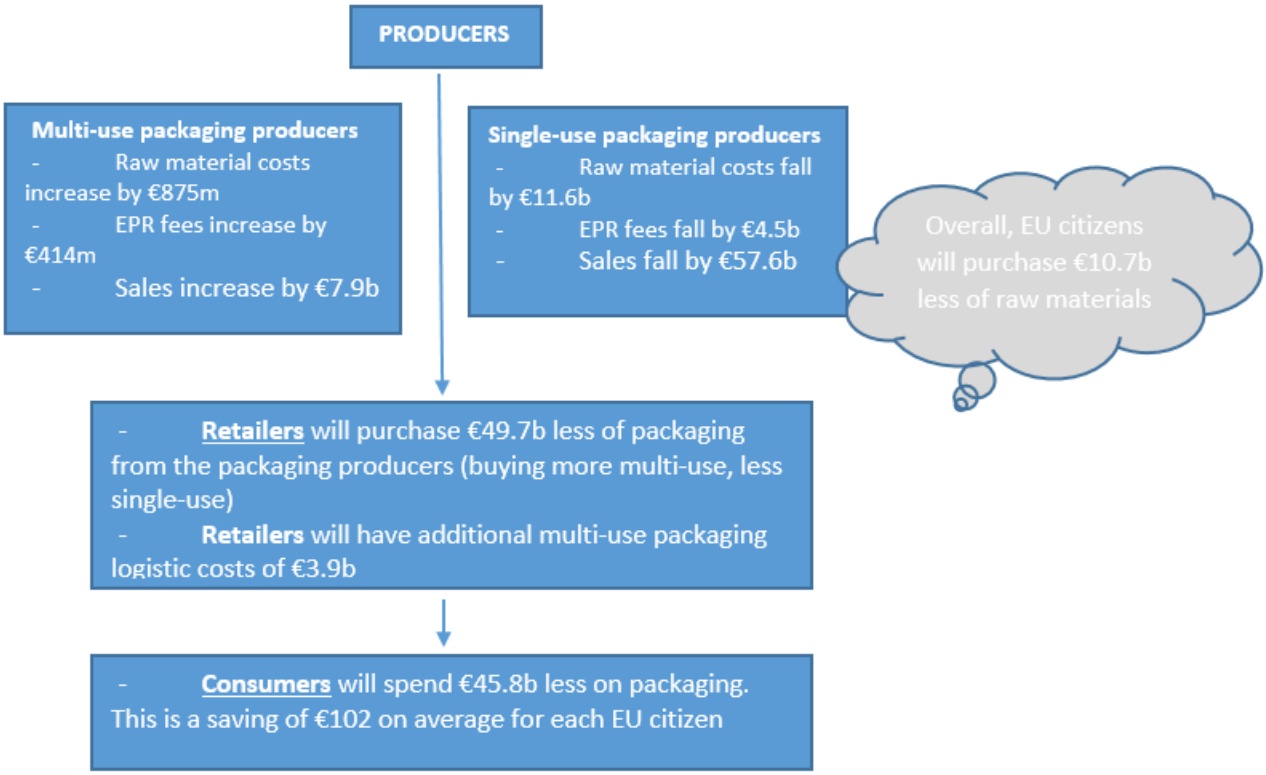
The mandatory reuse targets see a significant transfer of revenue from single use packaging producers to multi-use packaging producers. This is net reduction in packaging requirements is passed through as a cost reduction to retailers. The costs associated with production and the logistics of reusable packaging are met by the retailers, but as this is lower than the cost savings, there is a net financial benefit to consumers. This diagram also applies to 8c, but with higher costs due to the higher targets.

Figure 11: Transfers of financial costs for Measure 7 – Phase out Avoidable / Unnecessary Packaging



Avoiding unnecessary packaging also would result in moves to reusable alternatives, but the main impact is the reduction in revenue by single use packaging producers, resulting overall in net savings for the consumers.

Figure 12: Transfers of financial costs for Measure 2b – Waste prevention targets



Naturally, the overarching M2b shows similar transfers than the single waste prevention measures but with larger absolute cost impacts. Consumers would be significantly benefited.

6.6. COST BENEFIT ANALYSIS OF OPTIONS

This section sets out the cost-benefit analysis by intervention area, and where possible measure, for Options 1, 2 and 3. These are based on the mass flow model described in Annex 4. The analysis covers the financial impacts calculated in the model. Some measures could not be included in the model. In particular, measures in Option 1 are to a large extent outside the model as, for example, the costs and benefits of reducing over packaging in line with a revised Essential Requirements is difficult to quantify.

Costs are measured relative to the baseline, so a negative impact represents a saving; for example, a negative value in "waste management costs" means that waste management costs are reduced. The assumption is that all cost savings (reductions of operators´ turn-over) will be fully passed through to consumers/EU citizens. (This assumption is reasonable, as the markets tend to be competitive.) Raw material and waste management costs are therefore included in packaging consumption and to avoid double counting are not added on top.

The results of modelling measures by themselves (sections 6.1-6.4) are not the same as the results of modelling the measures as part of the policy options in this section due to overlaps, which are sorted out in the comprehensive analysis. More generally, the model does not capture the benefits of moving towards a more circular economy within packaging, including benefits such as empowering consumers, reducing negative impacts on the environment and human health, improving the security of the supply of raw materials (including a reduction in using fossil resources), increasing competitiveness, stimulating innovation and boosting economic growth. New business models focused on for example reuse or recycling offer innovation opportunities and the creation of new employment, including those that involve e.g. the creation of new business models for reuse systems, better recycling and sorting management as well as reverse logistics, R&D and innovation, sustainable product design, and digitalisation.

The modelling captures all of the different financial impacts. The only measure outside the model with quantified financial impacts relates to labelling, but whilst this has significant costs it also has significant savings. As such, it does not change the net impact as the measure effectively has net zero costs.

The modelling results for option 1 (Table 5) shows a reduction in economic costs of EUR 1.6 billion and monetised environmental benefits of EUR 967 million, giving a total net benefit of EUR 2.6 billion in 2030.

Table 5: Monetised impacts of Option 1 relative to baseline (2030, million €)

Costs and benefits analysis	Prevention and Reuse	Recyclable and Compostable			**Total**
	M5	M21	M22a	M29a	
Packaging producers & waste management operators	-1,186	-173	-260	*1*	-1,618
- Raw materials	*-961*	*40*	*60*	*1*	-860
- Waste Management Costs	*- 225*	*63*	*91*	*0*	-71
Net economic impact	-1,186	-173	-260	1	**-1,618**
Environmental impacts	-403	-223	-337	-4	**-967**
Total monetised impact	-1,589	-396	-597	-3	**-2,585**

Option 2 (table 7) results in overall economic savings of EUR 47.2 billion from 2030 baseline revenues of EUR 378 billion, which are predominantly due to the reduction of packaging by 19%. Having to buy less packaging, creates financial savings to consumers (line d). This has been calculated through an examination of turnover from the packaging producers: if consumers buy 100 Euros less of packaging, producers receive 100 Euros less of income (ie turnover falls) and their expenditure on raw materials, labour etc falls along with their profits. However, that 100 Euros is a benefit from the point of view of society.

There will though be increases of costs for operators for reuse and DRS. On top of this, the monetised environmental benefits is EUR 6.4 billion. Whereas the additional costs in the areas of recycled content are more than compensated by the reduction of environmental externalities, this is not the case for M29d and Ma&b. The latter is due to the costs for the introduction of mandatory DRS schemes. On M29d, the environmental benefits of more plastic waste composting are not so evident to compensate for the higher costs of the additional compostable plastics.

Table 6: Monetised impacts of Option 2 relative to baseline (2030, million €)

Costs and benefits analysis	Prevention and Reuse	Recyclable and Compostable		Recycled Content	Enabling Measures	**Total**
	M2b (M5, M7, M8b)	M21, M22a, M22b	M29d	M35em	Ma&b	
Reuse schemes (a)	4,090	0	0	0	0	4,090
Biowaste contamination (b)	0	0	-122	0	0	-122
DRS Schemes (c)	-429	13	0	0	939	523
Savings for consumers from reduced packaging consumption (d)	-52,218	-426	734	232	-51	- 51,729
- Raw material costs	*-11,078*	*290*	*380*	*231*	*-51*	*-10,228*
- Waste management costs	*-4,221*	*93*	*-79*	*0*	*0*	*-4,207*
Net economic impact (a+b+c+d)	-48,557	-413	612	232	888	**-47,238**
Environmental impacts	-3,662	-1,533	-175	-710	-309	**-6,389**
Total monetised impact	-52,219	-1,946	437	-478	579	**-53,627**

For option 3 (Table 7), the savings for the EU economy are EUR 53.9 billion per annum in 2030, plus environmental benefits of EUR 8.3 billion. The specific impacts are in line with those of option 2, but reach a higher level. Again, the reduction in packaging of 23% is the main driver for the impacts and the

environmental benefits of the measures on compostability and DRS are not compensated by the economic costs.

The cost-benefit ratio, (simplistically) shows modelled costs of EUR 4.5 billion and benefits of EUR 58.1 billion, so a ratio of 1 to 13.

Table 7: Monetised impacts of Option 3 relative to baseline (2030, million €)

Costs and benefits analysis	*Prevention and Reuse*	*Recyclable and Compostable*		*Recycled Content*	*Enabling Measures*	***Total***
	M2c (M3, M5, M7, M8c)	*M21, M22a, M22b*	*M29b*	*M35eh*	*Ma&b*	
Reuse schemes (a)	4,765	0	0	0	0	4,765
Biowaste contamination (b)	0	0	-188	0	0	-188
DRS Schemes (c)	-160	11	0	0	932	783
Savings for consumers from reduced packaging consumption (d)	-59,911	-982	948	700	-49	-59,293
- Raw material costs	*-12,875*	*-613*	*542*	*700*	*0*	*-12,245*
- Waste management costs	*-4,852*	*143*	*-171*	*0*	*-49*	*-4,929*
Net economic impact (a+b+c+d)	-55,306	-971	760	700	883	**-53,933**
Environmental impacts	-4,902	-1,334	-546	-1,225	-299	**-8,306**
Total monetised impact	-60,208	-2,305	214	-525	584	**-62,239**

The overall savings for consumers, mainly due to the reduced expenditures on packaging, may be to a small extent be offset by 'hassle' or 'in-convenience' costs that are not covered in the model, such as the cost of better packaging sorting or for the reuse systems. For individual consumers, the impacts will vary depending on their consumption habits and their preferences.

The cost-benefit ratio, (simplistically) shows modelled costs of EUR 5.5 billion and benefits of EUR 67.7 billion, so a ratio of 1 to 12.

6.7. COMPARISON OF POLICY OPTIONS

Table 9 ranks the options for several impact categories:

- Option 1 is easy to implement, would deliver some economic benefits for consumers, and some positive contribution towards the environmental objectives.
- Option 2 involves a considerable increase in effectiveness, contributing to a greater degree to the different specific objectives. The measure is economically beneficial, with significant savings for consumers and delivers significant environmental benefits. The measures could involve some administrative costs, depending in part on the choices of Member States.
- Option 3 involves a further step up in the effectiveness for delivery of the different specific objectives. The measure is also the most economically beneficial and delivers the highest environmental benefits. However, the ease of implementation is lower, reflecting the difficulty of delivering some of the measures in practice. Also, the measures would involve further administrative costs for operators and authorities. Hence, the effectiveness gain comes at a disproportionate price.

Overall, Option 1 of better standardisation and clearer Essential Requirements is a low risk option, delivering some environmental benefits at very low cost (so is very efficient). Option 2 is a significant step forward, with some significant choice for legislators, such as the reuse, waste reduction and recycled content targets, steps forward in compostability and the measures to ensure full recyclability by 2030. Option 3 could be the most effective, but actual effectiveness / efficiency would be reduced by the challenges inherent

in implementing more ambitious targets and more intrusive provisions for the operators. In terms of coherence, each of the options complements, for example, the Single Use Plastics Directive and efforts to reduce plastics use.

The social impacts in Option 2 and 3 are broadly similar, with some limited net direct positive job creation. This could be offset through changes in other sectors, but the impacts are not considered significant (and to some extent are captured in the efficiency and economic impact categories).

Table 8 shows the effectiveness (overall and for the different specific objectives), efficiency (are benefits delivered at low cost?), coherence and the economic, social and environmental impacts. Pluses reflect positive impacts.

Table 8: Comparison of the options:

Impact categories	**Option 1**	**Option 2**	**Option 3**
Effectiveness in delivering specific objectives	+	++	+++
- *Reduce the generation of packaging waste*	*0*	*++*	*+++*
- *Promote a circular economy for packaging in a cost-efficient way*	*++*	*+*	*+*
- *Promote the uptake of recycled content in packaging*	*+*	*++*	*+++*
Efficiency	+++	++	+
Coherence	+++	++	++
Overall economic impacts	**++++**	**+++**	**++**
Administrative costs for MSs, businesses and citizens	0	--	---
Savings for consumers	+	+++	++++
Ease of implementation	+	--	----
Overall environmental impacts	**+**	**++++**	**++++++**
Overall Social Impacts	0	+	+

7. PREFERRED OPTION

7.1. THE PREFERRED POLICY PACKAGE

With respect to the problems in the respective sections of chapter 2 and arguments detailed in section 5.1, there will be a switch from a Directive to a Regulation. As packaging and its waste management varies depending on the product category, the new Regulation will work in coherence and synergy with existing related regulations and other initiatives announced in the CEAP or implementing the European Green Deal, such as the WFD, SUPD, FCM and other food legislation, REACH Regulation, EU Taxonomy Regulation and the upcoming Regulations on Eco-design for Sustainable Products.

Based on the assessment of the measures combined in the options packages, the overall preferred option is Option 2. It contains the measures in Option 1 that are supportive or even pre-requisites for the Option 2 measures, i.e. to facilitate delivery on the mandatory targets and stricter requirements in a balanced approach, thus fostering effectiveness (achievement of the objectives) and efficiency (cost-effectiveness). The measures in Option 1 (no targets established nor strict harmonised provisions) alone are not sufficient to stop the growth in packaging generation (increase just reduced by 2%). Thus, packaging waste would increase by 16.8% in 2030 compared to 2018. Moreover, the recycling rates would not increase, neither would high quality recycling and resource efficiency be enhanced. Finally, it would fail to deliver

sufficiently on the environmental objectives of the Green Deal; the GHG emissions would still increase compared to 2018, as they are only reduced by 3.3 million t compared to the baseline 2030.

On the other side, the full set of measures in Option 3, alternative or additional to those in Option 2, are much more difficult to implement, risk economic viability and feasibility, and cause significantly higher administrative burden and costs. In reverse, the overall additional benefits on environment and jobs of Option 3 vs Option 2 are less significant.

However, a diligent case by case evaluation was undertaken in order to detect elements of measures outside Option 2, whose integration into the preferred policy option would further improve the environmental performance and feasibility, while still being proportionate. Along this line, some refinement of Option 2 was done to better respect the subsidiarity principle and to take into account pertinent stakeholder positions. With respect to the remaining confusion of citizens in the measure about compostability of Option 2 (M29d), whether certain biodegradable plastic packaging should be disposed of in the bio-waste stream or the receptacle for material recycling, it should be clarified that these packaging items are to be valorised via material recycling. This, combined with the short list of mandatorily compostable packaging items, would eliminate the hybrid status of these packaging items and thus increase carbon circularity, as recycling of these packaging makes it possible to have a biogenic carbon sink instead of a short-term CO_2 release via composting[58]. Moreover, flexibility could be given to Member States, where -subject to the respective infrastructure established on their territory- lightweight plastic carrier bags >15 micron cannot enter the bio-waste stream, so that these plastic carrier bags go into material recycling and not into composting. Furthermore, a waiver from the mandatory DRS for plastic bottles and beverage cans could be established in the preferred option in case the Member State can ensure that the 90% collection rate is achieved by other means (combination of Ma&b with M26cc). With respect to these refinements, the preferred policy package is rather ´Option 2+´ than the pure Option 2.

Table 9 brings together all measures that were included into the preferred policy option package based on the assessment of their specific and complementary impacts in the various areas.

Table 9: Measures selected for the **preferred policy option 2+**

Intervention area	Option 2+: Mandatory targets and stricter requirements
Prevention and reuse	**M2b: Mandatory target of 5% reduction of packaging waste per capita in 2030 compared to 2018, supplemented with a reduction targets for 2035 and 2040** M1: Update of Essential Requirements to minimize over-packaging M5: Minimization of empty space in packaging in selected sectors, incl e-commerce M7: Phase out avoidable / unnecessary packaging M8b: Mandatory targets to increase the reuse of packaging by 2030/2040 in selected sectors M10a: Revision of CEN standard for defining reusable packaging M10b: Definitions and mandatory requirements for reusable packaging formats set in EU legislation and standards for some formats M10c: Definition and mandatory standards for reuse systems M19: Clarification of reuse activity versus a “preparing for reuse” activity

[58] The modelling could only calculate with a static recycling rate of 13% for conventional plastic and for compostable plastics that 50% are recycled via composting and anaerobic digestion. Thus, the environmental performance of conventional plastics is underestimated considering that by 2030 a recycling rate of 55% can be expected.

Recyclability and compostability	**M21a: All packaging shall be reusable or recyclable by 2030- clarification of Essential Requirements and recyclability definition** M21b: All reusable packaging must be recyclable as of 2030 M22a: Qualitative definition of recyclable packaging **M22b: Definition of recyclable packaging based on design for recycling (DfR) criteria complemented by the recyclability assessment procedure and a negative list of non-recyclable packaging characteristics** M23: Harmonisation of EPR Fee Modulation Criteria based on recyclability assessment M28: Clarification of biodegradability and compostability and updates of respective Essential Requirements & standard EN 13432 **M29d+: Mandatory compostability for certain out of the selected plastics packaging types and requirement of material recyclability for the remaining biodegradable plastic packaging**
Recycled content	**M35em: High ambition targets for recycled content in plastic packaging based on contact-sensitivity for 2030 and 2040** M37: Definition of Recycled Content and measurement method
Enabling measures	**Ma&b+: Mandatory DRS for plastic bottles and beverage cans (waiver if Member States can prove 90% collections targets achieved by other means)** and minimum requirements for all DRS **M27c-y: Harmonised labelling of products and waste receptacles to facilitate consumers´ sorting** M12-u: Harmonised, mandatory labelling for reusable packaging M38-j: Labelling criteria for Recycled Content Mx: Update of current material-based labelling: Removal of alphanumeric codes for waste sorters Mk: Restrictions on use of confusing labels M31: Update of definitions concerning hazardous substance M32a: Expanding the information on hazardous substances M32b: Notification of substances of concern in packaging **M33a: Restrictions of hazardous substances under REACH** M40b: Minimum GPP criteria for packaging of priority products and services M42b: Harmonization of EPR reporting system MPCB: Extended reporting obligation on PCB

An important issue is the complementarity and coherence of the different measures. Setting mandatory reduction targets of packaging waste at Member State level is the overarching measure in the intervention area of prevention and reuse. M2b sets an exogenous reduction target of packaging waste per capita for 2030 compared 2018 of 5% (19.1% less packaging waste than in the baseline). In order to ensure that the reduction efforts continue beyond 2030, a reduction target of 10% could be set for 2035 (reduction of 29% compared to baseline) and for 2040 a reduction target of 15% could be set (reduction of 37% compared to baseline). The measures on packaging recyclability will improve the market conditions along the waste value chain, support Member States in meeting the existing recycling targets in the PPWD and allow those who do so already to progress further. Further, the enhanced recyclability is a pre-condition for more packaging circularity.

7.2. IMPACTS OF THE PREFERRED POLICY PACKAGE

The modelling and the discussion in chapter 6 demonstrates that the combination of measures included in the preferred option package is overall the best performing and most proportionate combination:

Packaging waste generation would be reduced in 2030 by 18 million t (32 million t in 2040) compared to baseline waste generation of 92.4 million t for 2030 (107 million t in 2040). This means that 3.1 million t

less packaging waste is generated than in 2018 (Option 1: +13Mt, Option 3: -7Mt). The biggest reductions are modelled for the producers of transport packaging (Corrugated and other board boxes: -7.6 million t down from 29.7 million t in baseline 2030, wood pallets: -4 million t down from 13.9 million t in baseline 2030, plastic wrapping: -1.5 million t down from 4.4 million t in baseline 2030) and glass beverage containers (-1.7 million t down from 12 million t in baseline 2030). On the other side, producers of plastic crates and boxes for multi-use would increase sales by 0.8 million t compared to baseline 2030.

Option 2+ results in overall economic savings of EUR 47.2 billion compared to the baseline 2030: additional costs for reuse and DRS of EUR 4.6 billion, reduced costs in waste management of EUR 4.2 billion and reduced sales and consumption of packaging of EUR 51.7 billion. In reverse, this option results in additional annual administrative costs of EUR 1.3 billion, mainly for certification of the packaging recyclability and of the recycled content in plastic packaging. The complex impacts on employment are estimated to result in a slight net increase of about 29.000 "green" jobs. If the economic savings were completely transferred to the consumers, the yearly savings per citizen are in the order of 100€.

The modelled reduction in GHG emission is 23 million t compared to the baseline 2030 (42% of the total CO_2e emissions of Hungary) and would bring them down to 43 million t. Option 1 would still lead to an increase to 62 million t in 2030 and Option 3 would decrease them by an additional 6 million t. Water use would be reduced by 1.1 million m^3. The monetised environmental externalities are reduced by EUR 6.4 billion relative to the baseline 2030.

Due to the recent geopolitical developments, special focus was given to the EU`s import dependency on raw materials and fossil fuel: The measures on recycled content reduce fossil fuel requirements of the EU by 3.1 million t per year (almost 1/4 of the fossil fuel needed currently for plastic packaging production). The overall decrease in fossil fuel needs of Option 2+ is difficult to quantify but the fact that the GHG savings of the recycled content measure represent 22% of the total GHG savings indicates an order of magnitude of 12-15 million t fossil fuel savings. Further, the measures to improve recyclability increase the overall packaging recycling rate from 66.5% in 2018 to 73% in 2030 (landfill is decreased from 18.7% to 9.6%). This push for circularity results in significantly reduced needs of virgin raw materials such as wood, glass and aluminium.

Overall, the reduction in packaging volumes and transition to a resource efficient waste value chain translates into reduced costs of packaging and efficiency gains for society as a whole. Moving towards a more circular economy within packaging would deliver benefits such as empowering consumers, reducing negative impacts on the environment and human health, improving the security of the supply of raw materials (including a reduction in using fossil resources), increasing competitiveness, stimulating innovation and boosting economic growth. The proposed measures will stimulate the creation of jobs linked to the circular economy, including those that involve e.g. the creation of new business models for reuse systems, better recycling and sorting management as well as reverse logistics, R&D and innovation, sustainable product design, digitalisation, but also education, government and professional services, that all support the transition towards circular economy by reducing packaging and waste generation. Furthermore, the preferred option will reduce hazardous chemicals in packaging and phase out unsustainable packaging such as single use hotel 'miniatures' for liquid hair shampoo or single use multi-item collation packaging for fresh vegetables. Finally, it will change consumer behaviour, allowing citizens to make sustainable choices by providing them with relevant information and affordable options. It will also nudge consumers towards more environmentally friendly purchases by correcting market failures.

7.3. FEASIBILITY

Overall, the preferred measures included under Option 2+ are technically feasible and efficient in delivering economic, environmental and social improvements. Notably, the preferred measures will help Member States reinforce design for reuse and promote high quality recycling to reduce the generation of packaging waste. The transition to a low-carbon and circular economy can be implemented meeting the targets in the

field packaging and packaging waste. Furthermore, the Regulation will allow the setup of a coherent approach among Member States.

Many of the measures are based on Member State experience, for example:

- Waste reduction targets: France recently set reduction, reuse and recycling targets for 2021-2025 (e.g. the reduction target is 20% by 31 December 2025). Spain is setting quantified targets, with a reduction in the weight of waste produced of 15% by 2025 compared to 2010, in addition to the current target of a 10% reduction from 2020 onwards.
- Uptake in reuse solutions: In France, larger retail stores must provide customers with clean containers suitable for reuse and accept that consumers bring their own container. In Germany, owners of restaurants and retailers will have to offer reusable alternatives instead of single-use plastic packaging from 2023 when selling food and beverages for immediate consumption.
- Value chain collaborations: Denmark have introduced several sector collaborations on waste reduction with e.g. the HORECA sector. They face a target of 50 % reduction of certain plastic take-away packaging in 2026. The goal must initially be sought to be achieved through a binding sector collaboration in the restaurant sector. Further regulation will be implemented, if the goal is not achieved voluntary, ensuring that small and medium-sized companies are not disadvantaged.
- DRS: Several Member Stats have a DRS for beverage packing in plastic (predominantly PET) and metal (some for glass) in place - including The Netherlands, Sweden, Estonia, Finland, Lithuania, Germany and Denmark. Hungary, Romania, and Portugal are expected to achieve effective DRS soon.
- Labelling: The Nordic pictogram system are mandatory to use on all waste bins in Denmark and consists of a number of symbols and colours that are used in connection with waste sorting. The symbols for waste sorting can also be used on packaging. A symbol on a packaging design ensures a visual link between the empty packaging and the waste container, making it simpler for consumers to sort packaging waste. 150+ private users have already voluntary adopted the pictograms on their products and packaging.
- GPP criteria: In Denmark, all public procurement must be eco-labelled by 2030.The specific phasing in will take place in close collaboration with the companies in the individual areas, so that we, for example, ensure that small and medium-sized companies are not disadvantaged.

In terms of technical and economic feasibility, the measures will improve the availability of recycled source material and improve the quality of recyclates. In doing so, the proposed option will reduce the costs of recycled materials and thereby reduce the use of virgin materials. It will do so through a mixture of enabling more efficient markets by addressing information failures and directing through additional targets, as well as addressing regulatory failures. Where possible prices will be redirected to make markets more efficient. Doing so it will support Member States in meeting both the existing targets (which for some are a challenge) and the new targets that will be set. Overall, it is expected that all packaging will be reusable or recyclable in an economically feasible manner by 2030 and there will be a significant reduction in packaging, over-packaging and thereby packaging waste.

The new Regulation should foresee sufficient time for economic operators to comply with their obligations under this Regulation. Also, for Member States, adequate phase in time should be established to allow them setting up the administrative infrastructure necessary for its application. The application of the Regulation should therefore also be deferred to a date where those preparations can reasonably be finalised.

The impact for SMEs is considered proportionate as reasonable efforts are required to reach the objectives of each measure under Option 2. In case a measure had significant negative impacts on SMEs, an exemption was included e.g. in M8c, M35em, M42b. In order to facilitate compliance by SMEs with their obligations and requirements under the new Regulation, guidance should be elaborated by the Commission in consultation with the stakeholders. If a specific measure implied disproportionate burden for SMEs that

could not be addressed by an exemption, it was either put in Option 3 (e.g. M34b) or completely discarded. The proposed option would strike a proper balance between predictability and legal certainty and allowing for technological progress. This is important for packaging as it is a developing and innovative market, where there is a need to facilitate adaptability and regulatory responsiveness in line with technological and market developments.

7.4. INTERNATIONAL ASPECTS

The measures would apply equally to domestic and imported products. European producers would not be disadvantaged in their ability to function inside or outside Europe; nor would non-European producers be disadvantaged in the sense that they would face the same requirements. For example, the current Essential Requirements would be updated on over-packaging, and imported products would need to comply.

The measures should not be more trade restrictive than necessary to fulfil their environmental objectives. The proposed initiative would mostly not affect production costs in a significant manner. The only area, where exporters to the EU might be significantly affected, are the requirements for minimum inclusion rates of recycled plastic in new packaging. The assessment of this measure underpins (see Annex 9.5), that its environmental benefits clearly justify this requirement for plastic packaging placed on the EU market.

As the proposed initiative will aim at further harmonisation, it will also facilitate imports from outside the EU, which will not have to comply with diverging requirements amongst the MS: this should also be beneficial for Market Surveillance Authorities. Third countries (most recently Canada, the US and South Korea), as part of the regular discussions on Technical Barriers to Trade, have underlined their desire to have more harmonisation in Europe – in particular for labelling and rules for single use packaging- and that the current different regimes in the MS lead to unnecessary costs for their businesses operating in Europe.

In line with current EU international cooperation, the EU will provide support to developing and least developed countries for the green transition. In particular, efforts will be made to mitigate possible adverse effects if need be (for example, via capacity building to ensure a better understanding of the Essential Requirements or the definition of recyclability). In the medium/long term EU packaging requirements are likely to influence packaging requirements internationally.

The reduction in packaging waste would also lead to reduced amounts of shipped waste, including exported from the EU. This is consistent with the EU's objective to stop exporting its waste problems by ensuring exported waste is treated in a sustainable manner, while respecting the EU's international legal obligations. Overall, the proposal is in line with the Basel Convention and will also be consistent with the ongoing work on a global Plastics Treaty.

7.5. REGULATORY BURDEN AND SIMPLIFICATION

The Regulation will reduce the burden for Member States to develop and establish their national systems within the framework of the current Directive. The harmonised framework for packaging and its waste streams will simplify several procedures, for example the reporting of the transposition of the provisions in the Directive and the respective follow up work in the Commission.

With respect to the regulatory burden for the operators, the preferred option will ensure savings in waste management costs especially due to the mandatory target of packaging waste reduction introduced by M2b and the better waste sorting due to M27c-y. Nevertheless, in the first years of implementation, compliance costs will increase for packaging producers who would need to re-design packaging as per M22b, M8b and M29d. Furthermore, the Regulation will provide legal certainty in various contentious issues, thus facilitating operators´ decision making.

The preferred option, enshrined in the Regulation, will include important reductions in regulatory burden due to the harmonisation: In the context of recyclability, this option will streamline procedures by providing a clear definition of recyclable packaging based on Design for Recycling criteria. The harmonised state of the art labelling for consumer sorting, recycled content and reusable packaging will significantly reduce the compliance cost of the packaging producers, apart from the efficiency gains. In addition to that, the preferred option will allow the harmonised collection of data on hazardous waste on packaging and integrate minimum criteria for packaging of priority products under mandatory GPP, thus facilitating a coherent approach among Member States. Furthermore, Option 2 will harmonise the EPR reporting system for packaging producers. Governance frameworks for monitoring, reporting and enforcing systems will need to be established at Member States for efficient implementation and enforcement.

7.6. APPLICATION OF THE 'ONE IN, ONE OUT' APPROACH

The One In One Out analysis (see Annex 3 for details) considers administrative burdens for businesses and citizens (excluding public authorities). Many measures will have negligible costs, associated with, for example, updating Essential Requirements. The most significant costs will relate to the new, harmonised labelling (requirement to label packaging with alphanumeric codes will be replaced by pictograms): the additional administrative burden is estimated at around EUR 2.6 billion during the 4 years phase in period. However, this will be offset (at least) by savings: the savings in administrative costs simply from avoiding multiple labels, are in the order of 0.3%[59] to 3% of the concerned industry´s turnover. If we apply a 0.5% saving only to the EU food and drink industry (turnover of €1.1 trillion), their administrative costs would be reduced by EUR 5.5 billion. Stakeholders are supportive of the changes, given the likely net benefits.

The certification of recyclability, which is the key to raise recycling rates and quality recycling, results in administrative costs for the packaging producers of EUR 1.14 billion.

8. HOW WILL IMPACTS BE MONITORED AND EVALUATED?

Effective monitoring relies on harmonised reporting of packaging placed on the market and the reporting on the collection and recycling rates of the different packaging materials. Existing reporting obligations would provide much of the reporting framework needed to monitor targets; however, some additional reporting obligations on Member States will be introduced for waste prevention targets. For reusable packaging targets, monitoring the increase in its use could be done via existing reporting requirements under Art. 12(3) PPWD or through a new system – based on digital product passport - to track reuse per item combined with auditing and results of pilot studies on performance evaluation, if the future definition on reuse was to capture broad reuse systems (e.g., refill on the go, return at home, etc.).

Market surveillance authorities will support monitoring activities at the level of obligated economic operators. Monitoring the target of increasing the level of recycled content in packaging would be undertaken through M34b (reporting obligation on the recycled content), which obliges economic operators to provide data on the levels of recycled content in their packaging by 2025. Authorised certification bodies will certify the recycled content of packaging formats to economic operators. Monitoring the increase in packaging recyclability requires a harmonised approach to defining recyclability, on-line self-assessment tool and a certification system with accredited certifiers. M22b sets out details of the proposed assessment system. In case M22c was preferred, this would require setting up of new tracing technologies at industrial scale; this is considered unfeasible before 2030. The monitoring of the amount of packaging waste

[59] Over 90% of the turnover loss quantified in section 2.3 is due to supply chain inefficiencies, only 2% for printing different labels

generated, is already covered through data transmitted to Eurostat. In order to monitor measures to reduce cross-contamination of compostable packaging in the recycling stream, it is first necessary to understand the current levels of cross-contamination and then to monitor progress. Member States should regularly undertake waste stream surveys to obtain the data required.

For hazardous substances, M32a has no effect on the monitoring as it relies on existing information on packaging. M32b and M32c introduce a new obligation for the notification of all substances of concern used in packaging by the supplier who places the packaging and packaging materials on the EU market. Its monitoring involves a notification system that would imply the development of a dedicated IT infrastructure. Finally, monitoring of labelling will be done by the Member States' market surveillance authorities.

M42 (EPR reporting harmonisation) will provide much of the reporting framework needed to monitor many of the identified objectives. The aim of the monitoring arrangements detailed above is to collect factual data on the implementation of the legislative proposal. This would help a future evaluation assess whether the new provisions achieve the intended objectives efficiently.