

<b>Title:</b> Introducing Extended Producer Responsibility for Packaging (pEPR) <b>IA No:</b> <b>RPC Reference No:</b> RPC-DEFRA-4343(4) <b>Lead department or agency:</b> Defra <b>Other departments or agencies:</b>	<b>Impact Assessment (IA)</b>
	<b>Date:</b> 17/10/2024
	<b>Stage:</b> Final Stage
	<b>Source of intervention:</b> Domestic
	<b>Type of measure:</b> Secondary Legislation
<b>Contact for enquiries:</b> packaging@defra.gov.uk	
<b>Summary: Intervention and Options</b>	<b>RPC Opinion:</b> Fit for purpose

Cost of Preferred (or more likely) Option (in 2019 prices, 2020 Present Value)			
Total Net Present Social Value	Business Net Present Value	Net cost to business per year	Business Impact Target Status Qualifying provision
-£151.7m	-£9.131.9m	£1,080.9m	

**What is the problem under consideration? Why is government intervention necessary?**

A producer responsibility system for packaging has been in place since 1997. It has helped businesses across the UK meet their packaging waste recycling obligations and the UK achieve its packaging waste recycling targets.

However, it is designed to enable producers to meet (not exceed) recycling targets and it does not incentivise producers to design packaging to be more recyclable or be reusable/refillable. Currently taxpayers pay most of the costs of collecting and managing household packaging waste, and packaging producers do not bear the full financial responsibility for the end-of-life management of the packaging they supply and import, nor the environmental externalities consistent with the polluter pays principle.

Reform is also required as the existing framework was introduced prior to devolution in Scotland and Wales, making this a devolved matter without a legislative framework that reflects the accountability of the devolved administrations.

**What are the policy objectives of the action or intervention and the intended effects?**

The objective is to reform the current legislation and introduce ‘extended producer responsibility’ (EPR) for household packaging. This will help deliver commitments previously made in various policy documents, including the 2022 consultation response, to maximise value from resources and minimise waste through the circular use of materials, and to better incentivise producers to manage resources more efficiently.

These reforms will place costs on packaging producers for the environmental impact of their packaging, and for the costs of managing packaging at end of life. The new regulations are designed to incentivise recyclability and reusability of packaging by rewarding/penalising producers according to specified criteria. The fees paid by producers should fund:

- Better and more consistent recycling collections of packaging waste by LAs.
- Encourage more domestic recycling and reprocessing
- Deliver overall system savings.

Payments to LAs will take account of equity and regional considerations by looking at rurality, level of deprivation and performance expectations. Measures related to the presentation of evidence relating to the export of packaging waste for recycling will be tightened.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**

We present one option reflecting the final policy decisions following public consultations in 2019, 2021 and 2023:

**Baseline – Do Nothing** – Do not reform the packaging regulations but implement the changes to municipal recycling collections in England as set out in the Simpler Recycling Collections IA and introduce the Deposit Return Schemes (DRS) for drinks containers in England, Wales, Scotland and Northern Ireland.

**Option 1** – Reform the packaging producer responsibility system such that producers pay pEPR fees for the collection and end-of-life treatment of packaging waste from households (Kerbside and Household Waste Recycling Centres). This is assumed to incentivise the correct behaviours by producers and consumers to deliver the policy objectives. This is our preferred option.

A non-regulatory option has not been appraised. A regulatory approach has been in place since 1997 and Government intends to reform this and extend the polluter pays principle such that packaging producers are responsible for the net cost of managing household packaging waste. This requires a regulatory approach.

**Will the policy be reviewed? It will be reviewed. If applicable, set review date: 31<sup>st</sup> December 2028**

Is this measure likely to impact on international trade and investment?	Yes			
Are any of these organisations in scope?	<b>Micro</b> Yes	<b>Small</b> Yes	<b>Medium</b> Yes	<b>Large</b> Yes
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)	<b>0.8MT</b>			

*I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.*

Signed by the responsible Minister:           Mary Creagh           Date:           17<sup>th</sup> October 2024

# Summary: Analysis & Evidence

## Policy Option 1: pEPR payments of household packaging waste management costs with modulated fees

Price Base Year 2020	PV Base Year 2025	Time Period 10 Years	Net Benefit (Present Value (PV)) (£m)		
			Low: -2,435.4	High: 1,504.6	Best Estimate: -189.8

COSTS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	90.7	3	1242.3	10757.0
High	139.0		1508.4	13087.0
Best Estimate	109.4		1360.2	11791.8

**Description and scale of key monetised costs by 'main affected groups' (all costs discounted) and for the 10-year appraisal period**  
Producers cover the cost of household packaging waste management (£11,096m), administrative and Regulatory costs (£534m, including transition familiarisation costs); Materials Facilities will face additional sampling and compositional costs (£26m, transition and ongoing); reprocessors and exporters will face additional reporting costs (£5m); public sector will face loss of landfill tax revenue (£26m) and incur IT investment costs (£104m).

### Other key non-monetised costs by 'main affected groups'

Potential cost pass-through from producers to consumers is not considered in the cost benefit analysis, rather within the wider impact section (these costs are ascribed to businesses in the cost benefit analysis).

BENEFITS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0.0	3	1242.9	10651.6
High	0.0		1431.8	12261.7
Best Estimate	0.0		1354.3	11602.0

### Description and scale of key monetised benefits by 'main affected groups' (all benefits discounted)

LAs benefit (£11,096m) from a transfer of costs for the collection, sorting, treatment and disposal of household packaging waste to producers; additional material sales profits by reprocessing and recycling industry (£48m); avoided residual disposal costs from diverting household packaging waste from incineration and landfill treatment into recycling, including landfill tax savings (£193m); avoided greenhouse gas emissions from diverting waste from landfill and incineration to recycling (£189m). Government will be able to recover the build of the Scheme Administrator IT system through fees (£76m).

### Other key non-monetised benefits by 'main affected groups'

The domestic reprocessing market may benefit due to more material being recycled in the UK. There may be natural capital benefits from reduced reliance on virgin materials and a reduction in the amount of waste sent to landfill and incineration. There are benefits to consumers from communications on how to recycle and dispose of household packaging waste. This results in environmental benefits from reduced greenhouse gas emissions. There are also several system-wide benefits including increased transparency in the system.

<b>Key assumptions/sensitivities/risks</b>	<b>Discount rate</b>	3.5%
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Data on packaging supplied or imported might be higher than currently estimated, affecting recycling rates and sectoral costs. We conducted sensitivity analysis on non-household municipal packaging waste arisings. Material prices (including reprocessed and recovered prices) and landfill gate fees are assumed to be constant. The analysis is sensitive to the growth of packaging supplied or imported, the baseline assumption that both Simpler Recycling and the Deposit Return Scheme (DRS) policies are in place, the packaging placed on the market split between HH (household), NHM (non-household municipal or household-like) and C&I (commercial and industrial) packaging; and the carbon price assumptions provided by the Department for Energy Security and Net Zero.

### BUSINESS ASSESSMENT (Option 1)

<b>Direct impact on business (Equivalent Annual) £m:</b>	<b>Score for Business Impact Target (qualifying provisions only) £m:</b>

<b>Costs: 1351.8</b>	<b>Benefits: 0.0</b>	<b>Net: 1351.8</b>	<b>5404.3</b>
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## INTRODUCTION AND EVIDENCE SUMMARY

### *Introduction*

This is the final impact assessment for reforming the packaging producer responsibility regulations<sup>1</sup> and follows the previous consultation impact assessments in 2019<sup>2</sup> and 2021<sup>3</sup>. The analysis from the previous impact assessments has been updated to reflect final policy decisions as reflected in the draft regulations that will introduce these measures. Packaging Extend Producer Responsibility will cover the United Kingdom.

### *Current system and reforms*

Under the 2007 regulations, obligated producers of packaging<sup>4</sup> are required to register with the regulator, report data on the amount of packaging they supply and import, and meet recycling targets. To meet these recycling targets, producers must purchase recycling evidence known as PRNs (Packaging Recycling Notes) or PERNs (Packaging Export Recycling Notes), equivalent to their recycling obligation. This evidence can be supplied by accredited reprocessors and exporters of packaging for recycling based on the amount of packaging they recycle. This is a market-based system, such that the price of evidence fluctuates based on market forces<sup>5</sup>. This system is designed to incentivise industry to increase packaging recycling rates to meet UK recycling targets and it leads to producers paying partial costs of managing and recycling packaging waste.

The reforms outlined in this impact assessment will see obligated packaging producers pay the costs of collecting and managing packaging waste collected from households through efficient and effective systems under an Extended Producer Responsibility (EPR) scheme. This includes the proportion of household kerbside residual waste and recycling collections costs attributed to household packaging waste, as well as the cost of managing household packaging waste through Household Waste and Recycling Centres (HWRCs) and bring sites. From 2026, costs paid by producers will be on the basis of modulated fees, such that producers supplying or importing packaging that is more expensive to recycle, or has a higher environmental impact, will face higher fees. Overall, this is expected to incentivise producers to reduce unnecessary packaging, switch to more recyclable or reusable packaging and increase the recyclability of the packaging they supply.

Under the reformed system producers will still need to provide evidence of meeting their recycling obligations for all packaging. To facilitate this, as an interim measure, producers will continue to purchase recycling evidence (PRN/PERNs) on all packaging equivalent to their obligations. Government undertook a further consultation in 2021 to gain stakeholder views on the best way to increase the efficiency of the market-based PRN/PERN system, such

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<sup>1</sup> See Annex A for more details.

<sup>2</sup> [https://consult.defra.gov.uk/extended-producer-responsibility/consultation-on-reforming-the-uk-packaging-produce/supporting\\_documents/packagingepconsultimpactassessment.pdf](https://consult.defra.gov.uk/extended-producer-responsibility/consultation-on-reforming-the-uk-packaging-produce/supporting_documents/packagingepconsultimpactassessment.pdf)

<sup>3</sup> [https://consult.defra.gov.uk/extended-producer-responsibility/extended-producer-responsibility-for-packaging/supporting\\_documents/Extended%20Producer%20Responsibility%20Impact%20Assessment.pdf](https://consult.defra.gov.uk/extended-producer-responsibility/extended-producer-responsibility-for-packaging/supporting_documents/Extended%20Producer%20Responsibility%20Impact%20Assessment.pdf)

<sup>4</sup> A shared point of compliance exists, whereby producers at different stage of the supply chain have a shared obligation. The main producer categories obligated are raw material manufacturers, packaging conversion, packers/fillers and sellers. Importers of packaging and service providers are also obligated.

<sup>5</sup> See Annex F for details of historic prices.

as requiring more regular reporting of data and a more active role for Compliance Schemes. Some of the changes consulted on (e.g. increased reporting, reporting on PRN prices) have been included in the final legislation, and therefore included in the cost-benefit analysis of the preferred scenario. The summary of responses can be found here<sup>6</sup>.

To enable these reforms, additional data requirements will be placed on the packaging supply chain, and on materials facilities, reprocessors and exporters of packaging for recycling.

### ***Summary of impacts on the supply chain***

This section summarises the responsibilities and impacts on businesses from across the packaging supply chain as a result of the reforms.

#### **Obligated Packaging Producers**

Obligated packaging producers will still be required to purchase evidence to meet their recycling obligations on all packaging. Producers supplying packaging likely to be disposed of in households will also be obligated to pay fees to cover the costs of managing household packaging waste through efficient and effective services. These costs include:

- The costs of collection and management of household packaging waste for recycling and other recovery operations, minus the revenue received from the sale of the household packaging waste. This is in addition to the cost of collecting and disposing of packaging in the residual waste stream.
- The costs of collection and management of packaging at Household Waste and Recycling Centres (HWRC) and bring sites.
- Producers of household packaging will cover the cost of the pEPR Scheme Administration, and may also choose to pay a Compliance Scheme.

There will be savings to producers, relative to the baseline, on their payments towards household packaging waste collection and management costs as more packaging waste is recycled rather than sent to residual.

#### **Public Sector**

There will be gains to the public sector as LAs will receive payments to cover household packaging waste collections, management and end-of-life treatment. This is a transfer from packaging producers to the public sector.

The public sector will face additional costs relating to set up costs of the Scheme Administrator, including IT system set up costs for a new packaging data reporting digital service. There will also be reductions in landfill tax as more packaging is diverted from residual routes to recycling. This is a transfer from HMT to LAs (and ultimately packaging producers).

Overall, the public sector will see a net gain from the reforms.

#### **Materials Facilities**

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<sup>6</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1114183/PRN\\_Reform\\_Consultation\\_-\\_Summary\\_of\\_responses\\_and\\_government\\_response.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1114183/PRN_Reform_Consultation_-_Summary_of_responses_and_government_response.pdf)

Materials facilities (referenced as MFs in this IA), such as Material Recovery Facilities (MRF) and Transfer Stations (TS) are often the first destination of packaging collected as recycling from households and businesses. Here recyclate is bulked and/or sorted to be sent to another material facility or recycler. Through The Environmental Permitting (England and Wales) (Amendment) Regulations 2023<sup>7</sup>, additional requirements to support pEPR have been placed on materials facilities in England and Wales to provide sampling and compositional data of the recyclate they receive and process. Equivalent requirements have been introduced in Scotland and are expected to be introduced in Northern Ireland. This will lead to increased costs for materials facilities. To cover these costs, in scope facilities may increase the fees they charge for their services. These costs would therefore accrue to local authorities and businesses disposing of dry recyclate, with relevant local authority household packaging waste sampling costs being covered through pEPR payments.

### **Reprocessors and exporters of packaging for recycling**

Reprocessors of packaging waste, as well as exporters of packaging waste for recycling, will incur additional costs due to increased data reporting requirements.

Reprocessors will, however, gain through increased profit from selling reprocessed packaging as an input for new products and packaging on the secondary market. This is due to the increased supply of recycled packaging due to pEPR.

### **Society**

Increased recycling of packaging materials produces secondary materials for use in manufacturing (e.g. new packaging). This reduces the GHGs emissions associated with raw material extraction, packaging manufacturing and waste management. The scheme will also incentivise a transition away from more difficult to recycle packaging materials, to more easily recyclable packaging materials. Recycling packaging materials is generally less carbon-intensive than other packaging waste treatment options. Society will therefore gain through reduced carbon emissions.

### ***Evidence summary – Impact Assessment modelling and the Local Authority Packaging Cost and Performance (LAPCAP) Model***

This impact assessment sets out pEPR household packaging waste management cost and benefit analysis. It is based on the WRAP household modelling used in previous iterations of the IA, which is also aligned with what has been used within the Simpler Recycling IA's. This alignment is crucial to ensure that Simpler Recycling's impacts are reflected in the pEPR baseline, and the three Collection and Packaging Reform IAs can be considered together. Alongside this analysis developed to underpin the IA, in order to implement the scheme, Government has developed a cost model that will be used by the pEPR Scheme Administrator (Local Authority Packaging Cost and Performance model - LAPCAP). LAPCAP estimates local authority costs for collection and disposal of each of the eight packaging materials in scope of the regulations, by disposal facility type and collection stream. Data sources include sampled local authority costs from 49 local authorities, processed Waste Data Flow data, WRAP gate fees survey and recycled material resale values from updated WRAP's materials pricing report. These costs include HWRC management costs. Each material is then aggregated across all local authorities to generate a total cost estimate for each packaging material in scope.

The purpose of the LAPCAP model is to enable the pEPR Scheme Administrator to calculate:

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<sup>7</sup> <https://www.legislation.gov.uk/uksi/2023/1156/contents/made>

- Amounts to be paid to individual LAs across all of the four nations of the United Kingdom for the necessary costs incurred for the collection, handling, treatment and disposal of household packaging Waste (netted off from income from the sale of recyclate) as part of an Efficient and Effective service.
- The “base fees”, in £/tonne for 8 categories of packaging materials, to be paid by large producers to fund the sum of costs incurred by LAs across the 4 nations, as described above. From Year 2 of the scheme, modulation of producer fees will also apply. These payments will be set each year by the Scheme Administrator.

### Evidence summary

**Table 1: A summary of costs and benefits of the reform are set out below.**

<i>Present Value (2025-34) £m</i>	<b>Impact on Business</b>	<b>Direct/Indirect</b>	<b>Option 1</b>
<b>Transition Costs</b>			
Producer - pEPR Familiarisation	Yes	Direct	£2.5
Materials Facility - Capital and Familiarisation	Yes	Indirect (sits in separate regulations)	£2.1
Reprocessor/Exporter - Familiarisation	Yes	Direct	£0.8
Public Sector - IT Investment	No	Direct	£104.0
<b>Costs</b>			
Producer - Household Packaging Waste management (Kerbside collections) - Transfer	Yes	Direct	£10,727.3
Producer - Household Packaging Waste management (HWRC) - Transfer	Yes	Direct	£368.7
Producer - Scheme Administrator (incl. IT)	Yes	Direct	£143.1
Producer - Compliance Scheme	Yes	Direct	£116.9
Producer - Regulator	Yes	Direct	£157.0
Producer - SA Comms Campaigns	Yes	Direct	£114.9
Materials Facility - Operational Costs	Yes	Indirect (sits in separate regulations)	£24.6
Materials Facility - Regulator	Yes	Indirect (sits in separate regulations)	-£1.0
Reprocessor/Exporter - Regulator	Yes	Direct	£0.2
Reprocessor/Exporter - Additional Data	Yes	Direct	£4.4
Public Sector - Landfill Tax Loss - Transfer	No	Indirect	£26.3
<b>Benefits</b>			
Society - GHG Emission Savings	No	Indirect	£189.1
Producer - Net Collection Cost Savings	Yes	Indirect	£192.7



Reprocessor - Secondary Material Market	Yes	Indirect	£47.7
Public Sector - Household Packaging Waste management (Kerbside, HWRC) - Transfer	No		£11,096.0
Public Sector – IT Investment Cost Recovery	No	Direct	£76.4
<b>Total Costs</b>			£11,791.8
<b>Total Benefits</b>			£11,602.0
<b>NPV</b>			-£189.8

The table below outlines the recycling rates for packaging in scope of pEPR under the baseline and the preferred option in 2034. As will be demonstrated in the evidence section, packaging recycling rates are expected to increase by 2 percentage points above the baseline in the preferred policy option scenario. This is equivalent to a 225kt increase in recycling in 2034.

**Table 2: Packaging recycling rates in the baseline and policy option.**

	<b>Baseline</b>	<b>Option 1</b>
<b>Plastic</b>	59%	62%
<b>Wood</b>	42%	42%
<b>Aluminium</b>	40%	40%
<b>Steel</b>	81%	83%
<b>Paper/Card</b>	90%	90%
<b>Glass</b>	74%	79%
<b>Fibre-based composite</b>	29%	37%
<b>Total</b>	73%	75%

A summary of the direct business costs and benefits included in the EANDCB are outlined in Table 3 below.

**Table 3: Equivalent Annual Net Direct Cost for Businesses (EANDCB) for option 1.**

<i>Present Value – 2020 base year (2025-34) £m</i>	<b>Option 1</b>
<b>Transition Costs</b>	
Producer - pEPR Familiarisation	£2.5
Reprocessor/Exporter - Familiarisation	£0.8
<b>Costs</b>	
Producer - Household Packaging Waste management (Kerbside collections) - Transfer	£10,727.3
Producer - Household Packaging Waste management (HWRC) - Transfer	£368.7
Producer - Scheme Administrator (incl. IT)	£143.1
Producer - Compliance Scheme	£116.9
Producer - Regulator	£157.0
Producer - SA Comms Campaigns	£114.9
Reprocessor/Exporter - Regulator	£0.2
Reprocessor/Exporter - Additional Data	£4.4
<b>Total Costs</b>	£11,635.9
<b>Total Benefits</b>	£0.0
<b>Net Costs</b>	£11,635.9
<b>EANDCB (Annualised)</b>	£1,351.8

***Comparisons of preferred scenario from 2022 publication to now***

Summary of notable changes from the last impact assessment

- **Implementation date:** As per the 2023 Collection and Packaging Reforms reset, we present this Impact Assessment with the new implementation date of 2025.
- **Reduction of pEPR scope:** Since the last published IA, some components of the Statutory Instrument (SI) supporting pEPR needed to be removed and delivered separately in order to focus on delivery for the planned implementation year without imposing any further delay. As a result, three of the functions from the last preferred option which were considered have been stripped from the cost benefits analysis; Mandatory recyclability labelling, mandatory takeback of fibre-based composite cups, and binned packaging waste clean-up costs.
- **Updated input data:** Updating the packaging input data using the Packflow 2023<sup>8</sup> report data (year reporting, 2022) from previously 2019 reporting years. This has had a reasonably big impact on the modelling due to the changes in trends since the 2019 data<sup>9</sup>. The report shows that, for most materials,

<sup>8</sup> <https://www.wrap.ngo/resources/report/packflow-refresh-2023-reports>

<sup>9</sup> <https://www.valpak.co.uk/knowledge-hub-post/packflow-covid-19-report/>

amount of total packaging placed on the market (POM) has decreased, and relative increases in material recycling rates have impacted the amount of additional recycling from pEPR.

- Reduction in number of MF facilities: In line with the de minimis assessment produced last year for the supporting Material Facilities SI, we have updated the central analysis to include the revised down facility estimates in scope, using submitted Devolved Administration data. Note, MF costs in this Impact Assessment have been removed from the EANDCB, as they are introduced under separate regulations. They are shown in the central case for full transparency. Further details on this can be found in Section 5.

**Table 4: This table shows the difference in preferred scenario cost and benefits, £m, in the current and previous**

	Option 1 – new preferred option, 2024 IA	Previous preferred option, 2022 IA
<b>Transition costs</b>		
Producer - Labelling Transition	Not in scope	£89.4
Producer - pEPR Familiarisation	£2.5	£2.5
Producer - Fibre Mandatory Takeback Transition	Not in scope	£19.9
Materials Facility - Capital and Familiarisation	£2.1	£7.5
Reprocessor/Exporter - Familiarisation	£0.8	£0.6
Public Sector - IT Investment	£104.0	£12.4
<b>On-going costs</b>		
Producer - Household Packaging Waste management (Kerbside collections) - Transfer	£10,727.3	£9,771.2
Producer - Household Packaging Waste management (HWRC) - Transfer	£368.7	£370.4
Producer - Household Packaging Waste Management (Binned Packaging Waste) - Transfer	Not in scope	£843.6
Producer - Scheme Administrator (incl. IT)	£143.1	£156
Producer - Compliance Scheme	£116.9	£121.9
Producer - Regulator	£157.0	£77.0
Producer - SA Comms Campaigns	£114.9	£150.7
Producer - Labelling Ongoing	Not in scope	£58.7
Producer - Fibre Mandatory Takeback (Enforcement)	Not in scope	£6.2
Producer - Fibre Mandatory Takeback (Training)	Not in scope	£17.4
Producer - Fibre Mandatory Takeback (Net collection costs)	Not in scope	£17.7
Materials Facility - Operational Costs	£24.6	£191.2
Materials Facility - Regulator	-£1.0	£12.5
Reprocessor/Exporter - Regulator	£0.2	£0.2
Reprocessor/Exporter - Additional Data	£4.4	£5.5
Public Sector - Landfill Tax Loss - Transfer	£26.3	£81.9
<b>Benefits</b>		
Society - GHG Emission Savings	£189.1	£526.3
Producer - Net Collection Cost Savings	£192.7	£322.2
Producer – Fibre residual savings	Not in scope	££16.4
Producer – Fibre litter savings	Not in scope	£2.0
Businesses - Net Household- Like Business Waste Savings	£0.0	£32.4
Reprocessor - Secondary Material Market	£47.7	£131.4
Public Sector - Household Packaging Waste management (Kerbside, HWRC) - Transfer	£11,096.0	£10,985.2
Public Sector – IT Investment Cost Recovery	£76.4	Not in scope
<b>Total Costs</b>	<b>£11,791.8</b>	<b>£12,014.5</b>
<b>Total Benefits</b>	<b>£11,602.0</b>	<b>£12,061.0</b>
<b>NPV</b>	<b>-£189.8</b>	<b>£1.5</b>

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## GLOSSARY

Packaging Recycling Note (PRN) /Packaging Export Recycling Note (PERN): Evidence issued by reprocessors and exporters of packaging, representing the packaging they have recycled.

Household Packaging (HH): Primary or shipment packaging other than; packaging that is supplied directly to a business or public institution that is the end user, or packaging that is not reasonably likely to be disposed of in a household that is for a business product.

Business product: A product which is designed only for use by a business or a public institution.

Household Packaging Waste (HPW): Packaging disposed of as waste by households.

Non-Household Municipal (NHM): Businesses and public sector organisations that produce household-like waste. Household-like is used synonymously with NHM in this impact assessment.

Other C&I: Commercial and Industrial waste not considered to be household-like. For example, transit/distribution packaging.

Material Facility (MF): A facility is classed as an MF if it holds a permit under environmental Permitting (England and Wales) Regulations 2016, receives and handles waste classed as waste material, consolidates waste materials at bulking or transfer stations, or sorts incoming waste material into specific material streams.

Material Recovery Facility (MRF): A materials facility which takes in mixed recycle and sorts it into separate material/packaging types to be sent to a recycler.

Transfer Station (TS): A site at which waste is consolidated, aggregated, bulked, or sorted before transported for further processing or sorting, recycling or disposal.

Reprocessor: A facility that turns waste materials (such as packaging collected for recycling) into usable inputs for new products.

Exporters of packaging for recycling: Businesses that export UK sourced packaging collected for recycling, to be recycled abroad.

Primary packaging: This is generally the packaging in direct contact with the product. This packaging is mostly likely to be handled by consumers.

Secondary packaging: This is additional packaging used with a product. This could be for purposes such as marketing/branding, extra protection or combining products sold in multipacks. Some secondary packaging is handled by consumers, but some may be retained and disposed of at the point of sale.

Tertiary packaging: This is packaging used in the transportation of products, i.e. transit packaging. This packaging is generally removed before the product is sold to consumers.

Fibre-based composite packaging: Packaging material which is made of paperboard or paper fibres, with a layer of plastic, and which may also have layers of other materials, to form a single unit that cannot be separated by hand.

Household packaging waste management costs: Household waste management service costs related to the management of packaging waste, these are referred to in the regulations as “disposal costs” and imported/obligated.

## SECTION 1: PROBLEM UNDER CONSIDERATION

Domestic regulations governing producer responsibility for packaging and packaging waste are (i) the Packaging (Essential Requirements) Regulations 2015<sup>10</sup>; and (ii) the Producer Responsibility Obligations (Packaging Waste) Regulations 2007 (as amended)<sup>11</sup>. This IA assesses options relating to reforming the latter set of Regulations, which are hereafter referred to as ‘the Packaging Waste Regulations’. A system of producer responsibility for packaging waste has been in place since 1997 and operates UK-wide under GB and parallel Northern Ireland regulations. The regulators are the Environment Agency (EA) in England, Natural Resources Wales (NRW), Northern Ireland Environment Agency (NIEA) and Scottish Environment Protection Agency (SEPA). Under Annex 2 of the Windsor Framework, Northern Ireland must meet the requirements of the EC Directive on Packaging and Packaging Waste (94/62/EC) including introducing an EPR scheme for packaging by 31 December 2024. A detailed description of the Packaging Waste Regulations can be found in Annex A.

To date, the Packaging Waste Regulations have been successful in that producers have met the packaging waste recycling targets set by Government at a low cost to business<sup>12</sup>. However, the current system has shortcomings and is unable to meet the policy commitments set out in the Packaging Waste Regulations as set out by the UK Government and devolved administrations.

The proposals to reform the current system, including the introduction of Extended Producer Responsibility for packaging (pEPR), in which producers are required to cover the net collection and end-of-life treatment costs for household packaging, will address these shortcomings and wider policy objectives of Government:

- Under the current system, obligated packaging producers are required to meet recycling targets set by Government. To do so they must buy evidence known as Packaging Waste Recycling Notes (PRN) or Packaging Waste Export Recycling Notes (PERNs) from reprocessors and exporters. Reprocessors and exporters can issue this evidence based on the packaging they recycle and sell them at the market price. When these notes are in short supply, the market price should increase, providing an incentive for reprocessors and exporters to ensure more packaging is recycled. As such, the system is designed to incentivise an increase in the recycling of packaging waste above levels delivered through wider policy measures (e.g. landfill tax or requirements to recycle), and the values attached to the purchase of evidence (PRNs) essentially represents the additional cost of recycling different packaging materials. The existing system therefore is not designed to recover the full cost of collecting and managing packaging waste from producers.
- The income raised through the sale of PRNs has supported some growth in reprocessing capacity but only covers a small proportion of packaging waste management costs<sup>13</sup>. An area of particular criticism has been that the PRN does little to support LAs to increase recycling, a criticism that has grown as LAs budgets have become more constrained and recycling rates have plateaued. Furthermore, as the current system is market driven the price of PRNs and hence the total revenue raised through the sale of PRNs can fluctuate considerably from year to year. Under pEPR, LAs will receive a predictable income covering the costs of the household packaging waste they manage.

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<sup>10</sup> <https://www.legislation.gov.uk/uksi/2015/1640/body/made>

<sup>11</sup> <https://www.gov.uk/guidance/packaging-producer-responsibilities>

<sup>12</sup> <https://npwd.environment-agency.gov.uk/Public/PublicSummaryData.aspx>

<sup>13</sup> The National Packaging Waste Database reports at a high level the allocation of PRN revenue. In 2020 around 30% of the total PRN revenue funded collections, however this represented somewhere between 3-7% of the total cost of managing household packaging: <https://npwd.environment-agency.gov.uk/Public/PublicSummaryData.aspx>

- There are also concerns around the transparency of the PRN system, particularly around the sale of evidence to producers and compliance schemes, as well as the visibility producers have of how their PRN fees have been used. Under the pEPR system producers will contribute more funds into the system, so all actors require visibility of how this money is raised, distributed and the outcomes it achieves. More robust data and greater transparency of reporting are planned under the reforms and will help achieve higher recycling targets. Government undertook a further consultation in 2021 to gain stakeholder views on the best way to increase the efficiency of the market-based PRN/PERN system, such as requiring more regular reporting of data and a more active role for Compliance Schemes. Some of the changes consulted on (e.g. increased reporting, reporting on PRN prices) have been included in the final legislation. The summary of responses can be found here<sup>14</sup>.
- There is concern that under the current system an uneven playing field exists, favouring the issuing of evidence on packaging exported for recycling abroad over that recycled in the UK may be leading to an over-reliance on export markets and insufficient growth in UK reprocessing capacity. Risks identified include the potential for PERNs to be issued on recyclable material that is not packaging, packaging that is of poor quality that cannot be recycled, or on contaminants such as food residuals. There is also the challenge that recycling can be done at a lower cost overseas. Under the reforms, exporters of packaging for recycling abroad will need to provide more detailed evidence on the packaging exported as well as proof that it has reached its intended destination and been recycled.
- The current system is designed to support an increase in the recycling of packaging waste, and not the design and use of more sustainable and recyclable packaging. Under pEPR, producer fees will be modulated by factors such as recyclability of the packaging to incentivise producers to use more sustainable packaging.
- Producers are only required to report data on packaging they placed on the market by material category<sup>15</sup>, which means that data for specific types of packaging is not reported. The new system can require more granular reporting by material and in some instances packaging format (films, rigids, etc). The current system has limited the opportunity to target specific packaging materials. For example, fibre-based composite cups are reported as card packaging meaning that producers can meet their obligation by purchasing card PRNs, rather than by taking specific action to increase the recycling of fibre-based composite cups.

Overall, the current producer responsibility system for packaging is not comprehensive enough, lacks transparency, and does not provide enough incentive for producers to make packaging more recyclable. The reforms seek to address this in a balanced and proportionate way, addressing the key shortcomings of the current system.

### ***Recycling of fibre-based composite packaging***

Fibre-based composite packaging, including fibre-based composite cups when sold filled (used for both hot and cold drinks), are defined as packaging and producers placing this packaging on the market are obligated to comply with the Packaging Waste Regulations. However, the current scheme does not incentivise the recycling of these types of packaging as producers can meet their obligations by purchasing paper/card PRNs. This means that there is little incentive for fibre-based composite packaging producers to make their products more easily recyclable. As

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<sup>14</sup> [EPR Consultation Government response template \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

<sup>15</sup> Plastic, Paper/Card, Aluminium, Steel, Glass, Wood



part of the proposed reforms, Government is establishing fibre-based composites as a separate packaging stream with its own recycling target.

## SECTION 2: RATIONALE FOR INTERVENTION

### ***Polluter pays principle and negative externalities***

At present, taxpayers pay most of the costs of collecting and managing packaging waste generated in the home through services provided by local authorities but have limited control over the packaging that accompanies the products they purchase. Whilst we cannot precisely attribute the proportion of costs that are borne by producers at present<sup>16</sup>, packaging producers do not bear full financial responsibility for the end-of-life management of the packaging they supply and import and are not accountable for the externalities of their packaging as consistent with the ‘polluter pays’ principle<sup>17</sup>. As a result, there is limited incentive for producers to consider the impact of disposing of the packaging they choose to use for their products at end of life.

Under pEPR, producers will become financially responsible for the costs of the collection and treatment of household packaging waste<sup>18</sup>. This will therefore internalise some of the costs of dealing with packaging waste.

With the addition of modulated fees, producers will have further incentives to reduce the environmental impacts of their packaging. For example, producers will have a financial incentive to use less packaging, particularly unrecyclable or hard-to-recycle packaging, in order to improve how their packaging is managed at end of life and to minimise their costs. Where packaging is necessary there will be a financial incentive to make it easily recyclable. This will reduce the negative externalities associated with the production, use and disposal of packaging including natural resource depletion, wider ecosystem impacts associated with the production of raw materials and damage to eco-systems including leakage to the environment, greenhouse gas (GHG) emissions (from both production and disposing of packaging to landfill and incineration), and impacts on land use from landfill sites.

### ***Poor quality of material for recycling***

Contamination of materials (for example where unrecyclable materials are mixed in with recyclable materials) collected for recycling during the collection process reduces the value of the materials and results in a loss of material for recycling. pEPR complements other policies, such as a Deposit Return Scheme for drinks packaging, as well as simpler recycling collections in England, which will lead to higher quality recyclate. pEPR specifically, will incentivise producers to consider the design of their packaging and to reduce hard to recycle, or disruptive packaging materials.

### ***Insufficient consumer information and confusion over what packaging items are recyclable***

The current system has not encouraged producers or compliance schemes to educate and inform consumers, although a few have chosen to do so. This is because the costs of doing so would likely be borne by a few organisations, but the benefits could be felt by all. In essence, a “free rider” problem. However, to reach high levels of collection and recycling, consumer education and information must be prioritised and scaled up. The proposed

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<sup>16</sup> For example, our current analysis suggests that producer payments under the current regulations would equate to around 7-11% of the full next costs of municipal (household and household-like) packaging waste collection and end-of-life treatment.

<sup>17</sup> While producers do pay a proportion of net cost of packaging collection through the PRN system, this is likely to be small. Producers do also likely already pay for a proportion of C&I and Non-Household Municipal (NHM) costs through backhaul and direct contracts with waste collectors, and as such Household packaging is a priority for inclusion in EPR. Government does not intend to extend pEPR fees to these sectors at the current time but will keep these under review once we have improved data on tonnages and costs.

<sup>18</sup> Net of any income from the sale of these materials to the reprocessing and recycling sectors.

changes will require obligated producers to fund national and local consumer communication and information campaigns that will support increased recycling, reuse, and the prevention of litter.

#### ***Lack of collection and sorting infrastructure and poorly developed markets***

Some types of packaging are technically recyclable but are not recycled (or not widely recycled) due to limited provision of collection points, collection services, or a lack of sorting capacity to separate this packaging from other packaging types. This may either be because it is not cost effective to put those systems in place currently or because the full societal cost of the packaging is not reflected currently in decisions regarding its use.

Examples include food and drinks cartons which despite collection provision increasing in many parts of the UK are not always collected in a way that enables them to be separated for recycling or are not separated effectively from other types of card packaging to enable them to be recycled. Whilst some types of film and flexible plastic packaging are technically recyclable, the collection and sorting infrastructure is poorly developed and there is a lack of end markets for the recovered materials. Other types of flexible plastic packaging are not suited to mechanical recycling such as packaging that is made of more than one polymer.

pEPR will incentivise obligated producers to choose to use packaging materials for which there is effective recycling infrastructure in place or provide a means by which new infrastructure is funded to increase the recycling rates of certain packaging if it is more cost effective to do so.

#### ***System-wide inefficiencies***

There is a lack of shared objectives across the supply chain for long term transition towards more packaging waste being recycled; a failure to include and coordinate different actors in the supply chain; a lack of support to drive market demand for recycled materials; and insufficient mechanisms to deal with uncertainty and learning through innovation. We expect that pEPR will lead to packaging producers making their packaging more recyclable and easier for consumers to maximise their recycling. This will reduce collection and treatment costs to Local Authorities, thereby reducing pEPR fees they are obligated to cover. There is a need to improve the collection, sorting and reprocessing infrastructure across the whole system. This is unlikely to happen without government intervention because the costs associated with innovation and improving the flow of knowledge and technology between actors would need to be faced by individual businesses whilst the whole sector would enjoy the resulting benefit. Whilst we should assume that there will be *some* innovation amongst producers at present, as ultimately different actors in the supply chain still need to operate in a competitive marketplace, the current system does not drive the *optimum* level of innovation due to the potential for free riding.

## SECTION 3: DESCRIPTION OF OPTIONS CONSIDERED

We present two options including the baseline. Option 1 details the costs and benefits of introducing pEPR payments for household packaging waste and modulated fees.

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### *BASELINE*

In the baseline it is assumed that there will be no reform to current packaging regulations. It is therefore assumed that producers would continue to be required to obtain evidence, in the form of PRN/PERNs, to demonstrate that they have met their recycling obligations. Although we do not attempt to forecast future PRN/PERN prices, we do make assumptions about the cost to producers of meeting these obligations. These are discussed in Annex F.

The baseline makes an ex-ante assumption about the approach to Simpler Recycling collections in England, which we have assumed will be implemented in households in 2026. The baseline also accounts for the introduction of a Deposit Return Scheme for drinks containers. It is assumed that a PET, aluminium and steel drinks container Deposit Return Scheme will be introduced in England, Northern Ireland, and Scotland in October 2027. It is assumed that a PET, aluminium, steel, and glass drinks container Deposit Return Scheme will be introduced in Wales in October 2027.

We expect some packaging to switch from harder to recycle (or non-recyclable) packaging material types to more recyclable packaging material types in anticipation of the policy pre-2025, due to the Government's announcement of its intention to reform packaging producer responsibility policy combined with voluntary initiatives by industry such as the UK Plastics Pact. These switches have been accounted for in the baseline modelling. Please see Annex B for more detail.

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### *PEPR OPTION 1 (MINIMAL PRODUCT): PEPR FEES FOR PACKAGING WASTE COLLECTED FROM HOUSEHOLDS, MODULATED FEES, AND RETENTION OF RECYCLING OBLIGATIONS AND THE PRN SYSTEM*

Option 1 is to reform the packaging producer responsibility system. The principal change in this option will see the requirement placed on producers to take financial responsibility for the net costs of managing packaging they supply and import which arises as waste in households and Household Waste Recycling Centres (HWRCs), and the introduction of modulated fees. Modulated fees are the mechanism by which those costs are recovered from producers and the costs vary to reflect the environmental sustainability of the packaging and associated criteria, such as the recyclability of the packaging. The IA quantifies these changes for all packaging materials in scope by using a model developed by Eunomia on behalf of Defra<sup>19</sup>.

The 2019 and 2021 pEPR consultations also set out options for introducing payments to cover household-like packaging collected for recycling from businesses. Stakeholders raised concerns about the options in the consultation relating to the complexity and value for money of introducing a new payment mechanism, given that obligated sectors already bear much of this cost, and the potential for fraud in the system. Government has decided to prioritise introducing payments to cover household packaging waste collected from households by local authorities, as soon as possible. As an interim measure, producers will still be required to obtain recycling evidence (PRN/PERNs) to demonstrate they have met their recycling obligations on all packaging.

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<sup>19</sup><http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20310&FromSearch=Y&Publisher=1&SearchText=Extended%20Producer%20Responsibility&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

These measures will be complemented by producer funded local and nation-based communications and education initiatives to advise consumers on how to recycle their packaging and the consequences of making the wrong disposal choices. These costs will be included in the fees paid by producers.

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## *NON-REGULATORY OPTION*

### ***Producer Responsibility***

A non-regulatory option was not appraised. There are no realistic non-regulatory alternatives that would achieve the aims of recovering Local Authority disposal costs for managing household packaging. Standard economic theory implies that it would not be rational for one producer to voluntarily cover the full costs of their product/packaging going through the waste system unless their competitors were also voluntarily paying. Thus, this market failure of coordination can only be corrected through a regulatory approach. This policy requires producers to operate on a level playing field, therefore regulations are required to ensure that all obligated stakeholders comply.

A regulatory approach to packaging producer responsibility has been in place since 1997 and has placed obligations on producers in respect of the packaging they supply and import. The UK government made a commitment in the Resources & Waste Strategy 2018 to invoke the 'polluter pays' principle and to introduce extended producer responsibility for packaging meaning that producers would be required to pay the costs of household waste management for packaging they supply and import. The Devolved Administrations have made similar commitments. The 2019 and 2021 consultations on reforming the current regulations set out the case for change and sought views on the key areas for reform for which there was broad support.

The system provided by the current regulations is not designed to enable full cost recovery from producers and will not deliver the government's ambitions for higher packaging recycling rates and the use of more recyclable and sustainable packaging. Regulations are required to define obligated producers, to set out the requirements and obligations on these producers including the packaging waste management and other costs payable by producers, and to ensure equal treatment of obligated producers. Regulations are also necessary to ensure provision is made for the fees paid by producers to be distributed to those incurring the costs of managing packaging waste, for example to LAs who are responsible for managing household packaging waste. Although there are many outcomes for the policy, the main policy objective is to make packaging producers responsible for the end-of-life costs of packaging and in doing so improve the end-of-life management of packaging waste. This would not be possible in a non-regulatory system.

## SECTION 4: POLICY OBJECTIVE

The UK Government and the Devolved Administrations are working jointly on proposals to reform the current UK packaging producer responsibility regime and introduce pEPR given the integrated supply chains associated with the production and use of packaging materials within the UK market; with Defra taking the lead in the resourcing and programming of the work supported by officials from Welsh Government, Scottish Government, and the Department of Agriculture, Environment and Rural Affairs, Northern Ireland.

There are several objectives of the proposed policy reforms which are reflected in commitments made by the UK Government and the Devolved Administrations. These are set out in Annex B.

An initial consultation on proposals to reform the producer responsibility system was undertaken in 2019, and a second consultation on proposals for packaging extended producer responsibility in 2021. The summary of responses to the 2019 Consultation can be found here<sup>20</sup> and the Government Response to the 2021 Consultation can be found here<sup>21</sup>. A third consultation to receive stakeholder feedback on the operability of the draft regulations was undertaken in 2023 and responses to this consultation were taken into account in revising and finalising the legislation. Alongside and following these exercises, stakeholder engagement has continued and has informed the further development of our policy proposals. Engagement has included an industry sounding board established with the support of INCPEN (Industry Council for Packaging and the Environment), the government's Advisory Committee on Packaging (ACP), and Defra's Packaging and Collections Working Group and Resources & Waste Stakeholder Advisory Group. Specific engagement has also taken place with local authority groups and stakeholders in England, Northern Ireland, Scotland, and Wales. These have given stakeholders the opportunity to discuss the proposed reforms and put their opinions forward.

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<sup>20</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/819467/epr-consult-sum-resp.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/819467/epr-consult-sum-resp.pdf)

<sup>21</sup> Packaging and packaging waste: introducing Extended Producer Responsibility - GOV.UK ([www.gov.uk](http://www.gov.uk))

The key policy objectives are summarised below:

<p>Increase the amount of packaging recycled</p>	<p>The proposals will inform the setting of packaging waste recycling targets and help obligated producers achieve these targets. A principle of pEPR is that money raised from producers should be retained in the system to fund the management of household packaging waste. This should be used to support improvements to the collection and sorting infrastructure in addition to wider costs such as disposal and treatment. This will contribute towards more packaging waste being collected, it being collected in a more consistent way and improvements in the sorting and reprocessing processes, resulting in higher recycling rates.</p>
<p>Increase the recyclability of packaging</p>	<p>We estimate that 62% of packaging was recycled in 2020, which is equivalent to around 7.5Mt<sup>22</sup>. The introduction of modulated fees will encourage producers to make changes to the design and use of packaging, in order to make packaging more recyclable. For example, fee rates will be lower for materials which are easily recyclable and higher for materials which cannot be recycled.</p>
<p>Reduce unnecessary packaging</p>	<p>The requirement to pay the costs of end-of-life management of household packaging waste, and the introduction of modulated fees, will provide an incentive to producers to review the packaging they use. This will include opportunities to reduce the packaging they use, thereby reducing their overall costs of compliance.</p>
<p>Improve the environment</p>	<p>Increased recycling of packaging waste will mean that less packaging waste is landfilled or incinerated, and the materials collected for recycling will reduce the use of virgin materials in the manufacture of new products and packaging. These outcomes will improve the environment for the public and for wildlife, while also generating carbon savings.</p>
<p>Increase domestic recycling and reprocessing capacity</p>	<p>A key aim of the 2007 Packaging Waste Regulations is to increase the recycling of packaging waste and in doing so to stimulate growth in the UK recycling industry. This has not been achieved to the level that government and stakeholders would like to see. Whilst there has been an increase in the recycling of packaging waste, for certain materials much of this increase in recycling has occurred overseas. The reforms will increase the supply and quality of the material for recycling, by reducing the use of packaging that is hard to recycle or not recyclable as well as reducing contamination. They will also introduce requirements for exporters of packaging waste to demonstrate packaging waste that is exported is recycled and report on this, so that UK reprocessors and exporters are operating on a level playing field. In turn, this will allow investors to be more confident in investing in the UK's recycling industry.</p>
<p>Enhanced data reporting</p>	<p>The effective implementation and operation of pEPR will rely heavily on data and evidence provided by participants across the packaging value chain. Appropriate reporting of packaging placed on the market and evidence on the mass flows of packaging through the waste management system needs to be provided to support and inform the setting of targets, fees to be paid by producers, and payments made for the costs incurred in delivering LA packaging waste management services.</p> <p>Producers will be required to report data at a more granular level, than under the current system, to inform the cost they will pay and the setting of fee rates on individual packaging types. Under</p>

<sup>22</sup> This analysis is discussed in the baseline section of the impact assessment.

changes to the obligated producers, more packaging is expected to be brought into obligation and in turn will need to be reported. This will provide better quality data on the amounts, and types, of packaging placed on the market which will help policymakers in future.

Under changes to existing regulations in England, Wales and Scotland<sup>23</sup> and new equivalent regulations or requirements in Northern Ireland, materials facilities (transfer stations, bulking stations, and sorting facilities) that receive household or household-like recyclate waste material will need to report on the tonnages and composition of packaging waste received, handled/sorted, lost and/or sent to other facilities. These facilities will also be required to sample against a greater number of material categories and at a higher input frequency to ensure that the data reported is of a high enough quality to support pEPR outcomes, including accurate payments and minimising the risk of fraud. The number of facilities to which these requirements apply are expected to increase.

Reporting requirements, beyond those already required by the Packaging Waste Regulations, will also be required of reprocessors and exporters in order to distinguish between different types of recyclate and different quality of recyclate entering and leaving their facilities. Many reprocessors already capture and use this information as part of their core business processes but this will be standardised.

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## SECTION 5: COSTS AND BENEFITS OF EACH OPTION

### BASELINE

#### BRIEF DESCRIPTION

As described in Section 4, the baseline assumes that Simpler Recycling in England, as well as a DRS for drinks containers in England, Wales, Northern Ireland, and Scotland are in place and the associated costs, benefits, and recycling rates of these are reflected in the baseline. Packaging items in scope of the proposed DRS will be excluded from packaging pEPR, therefore, this tonnage is not included in the data and analysis in this IA. It is assumed that DRS in Wales will include PET drinks bottles, metal drinks cans, and glass drinks bottles. It is assumed that England, Northern Ireland, and Scotland will include PET drinks bottles and metal drinks cans only. The cost attached to any DRS materials collected via household or other business collection services will be a matter for the DRS Deposit Management Organisation. pEPR obligated producers will not be expected to pay for the costs of collecting DRS materials not returned to designated DRS collection points. This Impact Assessment's scope covers the United Kingdom.

In this section we present the amount of packaging that is supplied or imported, current recycling rates and the amount of packaging currently found in residual waste in a 'do-nothing' option (but assuming DRS and Simpler Recycling are in place). Further details on assumptions used for the baseline are detailed in Annex D.

#### BACKGROUND

##### *Placed on the market packaging and pre-2025 switches*

In the 2022 IA<sup>24</sup>, UK placed on the market ('POM') packaging data was taken from the material specific PackFlow 2019<sup>25</sup> reports commissioned by Defra, and carried out by Valpak Consulting, Verde Research & Consulting, Recoup and WRAP. Since the previous IA, updated versions of these reports have been published which account for the impact of Covid-19 and resultant lockdowns on POM, as well as forecasting likely changes to POM with the ending of Covid-19 restrictions in future years. Assumptions from these reports have been added to our modelling.

As with the 2022 IA, this FIA uses UK placed on the market ('POM') packaging data taken from updated material specific PackFlow 2023<sup>26</sup> reports commissioned by Defra and carried out by Valpak Consulting.

The key benefit of using the data provided by the PackFlow reports is that they account for packaging supplied by currently unobligated businesses which is not captured by the National Packaging Waste Database (NPWD)<sup>27</sup>. The implication of this is that the PackFlow reports are more likely to account for all packaging waste, regardless of whether the producers are currently obligated or not.

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<sup>24</sup> <https://assets.publishing.service.gov.uk/media/623efc968fa8f5276d1f9ec0/epr-final-impact-assessment.pdf>

<sup>25</sup> PackFlow report -plastic packaging, PackFlow report-metal packaging ; PackFlow-paper/card; Wrap -glass packaging ; Wrap-wood packaging

<sup>26</sup> <https://www.wrap.ngo/resources/report/packflow-refresh-2023-reports>

<sup>27</sup> <https://npwd.environment-agency.gov.uk/>

A further benefit of these reports is their granularity. The reports provide a detailed breakdown of POM for each material type by packaging format and polymer (for plastic). This is an important input for estimating the impact of modulated fees on individual packaging types as for some materials, such as plastic, the polymer can impact recyclability. Assumptions made by Eunomia in their analysis of the impact of modulated fees<sup>28</sup> were used to provide further granularity.

According to Eunomia's initial report on fee modulation, the use of some plastic polymers is expected to reduce significantly before 2025 and this change has been captured in the IA baseline. It is assumed that the use of Polyvinyl chloride (PVC), Polystyrene (PS) and non-recyclable black plastic used in Pots, Tubs and Trays (PTTs) will reduce between 2021 and 2025 in favour of more widely recycled packaging. It is expected that some of this material switching will be attributable to producers starting to respond to anticipated pEPR measures and some will be attributable to other incentives, including the WRAP-led UK Plastics Pact<sup>29</sup> and other independent business initiatives. Without robust data on the extent to which these switches will take place, assumptions were informed by WRAP expert judgement and trends emerging from the UKPP. Annex C provides a sensitivity analysis of the pre-2025 switches.

Table 5 below shows the packaging placed on market in the 'do-nothing' option. The data is categorised into Household ('HH')<sup>30</sup>, Non-Household Municipal<sup>31</sup> ('NHM'), and other Commercial and Industrial ('C&I'). NHM is the portion of C&I waste that is household-like, and other C&I is non-household-like packaging such as transit and distribution packaging. pEPR fees will only apply to packaging collected from households. A key uncertainty in the POM data is calculating the NHM portion of C&I packaging. A discussion on how this has been estimated and the implications of this uncertainty are discussed in Annex D.

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<sup>28</sup><http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20670&FromSearch=Y&Publisher=1&SearchText=Extended%20Producer%20Responsibility&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

<sup>29</sup> The UK Plastics Pact is a collaborative initiative that aims to help create a circular economy for plastics. Its membership includes businesses from across the plastics value chain as well as UK governments and NGOs; <https://wrap.org.uk/taking-action/plastic-packaging/the-uk-plastics-pact>

<sup>30</sup> Packaging collected as waste from households.

<sup>31</sup> Also known as Household-like. This is packaging that is similar in nature to household packaging but collected as waste from businesses.

**Table 5: Baseline packaging POM data (excl. packaging in scope of DRS) in a ‘do-nothing’ scenario – best estimate**

Packaging material	2025			2029			2034		
	POM (Kt)			POM (Kt)			POM (Kt)		
	HH	NHM	Other C&I	HH	NHM	Other C&I	HH	NHM	Other C&I
<b>Plastic</b>	1,163	300	472	1,211	312	491	1,264	325	513
<b>Wood</b>	13	238	1,313	13	237	1,309	13	236	1,301
<b>Aluminium</b>	11	37	61	11	40	66	12	43	72
<b>Steel</b>	219	107	117	219	107	117	219	107	117
<b>Paper/Card</b>	1,773	2,547	1,093	1,794	2,577	1,105	1,833	2,633	1,129
<b>Glass</b>	2,000	544	-	1,976	537	-	1,951	530	00
<b>Fibre Based Composite</b>	55	86	-	56	95	-	57	106	00
<b>Total POM</b>	5,245	3,859	3,056	5,293	3,905	3,089	5,363	3,981	3,132

## Projected recycling

Recycled tonnages for each packaging material are also taken from the PackFlow reports with additional assumptions from Eunomia’s analysis, including the use of waste composition analyses<sup>32</sup>, also used to provide further granularity. The PackFlow recycling estimates are less granular than their POM estimates and so there is more reliance on these additional assumptions. Good quality household waste composition analyses are available to disaggregate household data, however, the equivalent data for NHM is less detailed and these estimates are therefore less certain. For additional information on the methodology used to come up with the projected recycling tonnages and rates in the tables below please check Annex D. Table 6 presents the baseline recycling projections in tonnes (excluding packaging in scope of DRS).

**Table 6: Baseline recycling projections in tonnes (excl. packaging in scope of DRS, including IBA<sup>33</sup>) in a ‘do-nothing’ scenario – best estimate**

Packaging material	2025			2029			2034		
	Recycling, Kt			Recycling, Kt			Recycling, Kt		
	HH	NHM	Other C&I	HH	NHM	Other C&I	HH	NHM	Other C&I
<b>Plastic</b>	467	51	449	653	60	467	689	62	487
<b>Wood</b>	7	132	518	7	131	517	7	131	513
<b>Aluminium</b>	6	10	27	7	10	29	8	11	32
<b>Steel</b>	200	47	113	199	48	113	199	48	113
<b>Paper/Card</b>	1,390	2,215	1,038	1,406	2,448	1,050	1,437	2,502	1,073
<b>Glass</b>	1,353	502	-	1,337	510	-	1,320	504	-
<b>Fibre Based Composite</b>	22	6	-	38	7	-	39	7	-
<b>Total</b>	3,446	2,961	2,145	3,649	3,214	2,176	3,700	3,264	2,219

<sup>32</sup> <https://wrap.org.uk/resources/report/quantifying-composition-municipal-waste>

<sup>33</sup> Incinerator Bottom Ash – Metal captured for recycling from incinerator waste outputs

Table 7 shows the recycling rates under a baseline option which excludes packaging captured by DRS. The removal of DRS materials reduces the total packaging recycling rate, as well as the recycling rate for the relevant material types, as DRS materials tend to be highly recycled compared to other packaging types. The introduction of Simpler Recycling in England is expected to increase the baseline packaging recycling rate over the appraisal period. The impacts of this policy differ across material types according to the proportion of packaging in scope. For example, the baseline recycling rates for a number of packaging types are expected to increase significantly.

**Table 7: Baseline packaging recycling rates (excl. packaging captured by DRS, including IBA) in a ‘do-nothing’ scenario – best estimate**

	2025				2029				2034			
	HH	NHM	Other C&I	Total by packaging type	HH	NHM	Other C&I	Total by packaging type	HH	NHM	Other C&I	Total by packaging type
<b>Plastic</b>	40%	17%	95%	49%	54%	19%	95%	58%	55%	19%	95%	59%
<b>Wood</b>	55%	55%	39%	42%	55%	55%	39%	42%	55%	55%	39%	42%
<b>Aluminium</b>	60%	26%	45%	40%	62%	26%	45%	40%	62%	26%	45%	40%
<b>Steel</b>	91%	43%	97%	81%	91%	45%	97%	81%	91%	45%	97%	81%
<b>Paper/Card</b>	78%	87%	95%	77%	78%	95%	95%	90%	78%	95%	95%	90%
<b>Glass</b>	68%	92%	-	69%	68%	95%	-	74%	68%	95%	-	74%
<b>Fibre Based Composite</b>	40%	7%	-	19%	68%	7%	-	28%	69%	6%	-	29%
<b>Total recycling rate</b>	66%	77%	70%	66%	69%	82%	70%	74%	69%	82%	71%	73%

### **Packaging in residual waste by sector**

It is assumed that all non-recycled packaging waste is collected as residual waste and sent to landfill or Energy from Waste (EfW). This is calculated by subtracting the recycling tonnage from the POM tonnage for each material. Comment on the source and reliability of this can be found in Annex D. The residual figures shown in Table 4 include metal packaging recovered for recycling from Incinerator Bottom Ash (IBA). We assume that the % of steel recovered from EfW is different from the % of aluminium recovered from EfW. The amount of packaging collected as residual waste in the baseline is expected to fall over the appraisal period due to the increase in recycled packaging arising from Simpler Recycling in England.

- 1). Metal POM – Direct Metals Recycling = Metal Residual Waste
- 2). Metal Residual Waste × Proportion of Residual Waste sent to EfW = EfW Residual Metals
- 3). EfW Residual Metals × % of metal recovered from EfW = IBA Metal
- 4). Direct Metal Recycling + IBA Metal = Overall Metal Recycling

**Table 8: Baseline packaging in residual waste in tonnes - best estimate**

Packaging in residual	2025			2029			2034		
	Kt			Kt			Kt		
	HH	NHM	Other C&I	HH	NHM	Other C&I	HH	NHM	Other C&I
Plastic	697	249	24	557	252	25	575	263	26
Wood	6	106	795	6	106	793	6	105	788
Aluminium	9	37	46	9	40	49	10	43	54
Steel	75	94	6	74	91	6	74	91	6
Paper/Card	416	332	55	405	129	55	414	132	56
Glass	646	42	0	639	27	0	630	27	0
Fibre Based Composite	33	81	0	18	88	0	18	99	0
<b>Total packaging in residual waste</b>	<b>1,858</b>	<b>940</b>	<b>925</b>	<b>1,703</b>	<b>732</b>	<b>927</b>	<b>1,722</b>	<b>760</b>	<b>929</b>

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### ***Preferred governance model***

The consultation IA included two approaches to the administration and governance of pEPR, namely an approach with compliance schemes and a Scheme Administrator, and a single Scheme Administrator (SA) approach. After exploring both options through the consultation, and decisions regarding the scope and approach to pEPR (in particular the decision to retain the PRN arrangements), the former approach will be taken forward. For clarity, the decision to retain the PRN system focusses on evidence that recycling target obligations are still needed for non-household municipal sectors while pEPR fees are focussed on household packaging only.

Producers will retain the choice to join a compliance scheme, or manage their compliance directly, to meet their overall packaging recycling obligations, as under the current system. Compliance schemes would submit their members packaging data to the regulator (and likely support them in reporting data to the SA), take on the legal responsibility for meeting recycling obligations on behalf of their members and provide evidence to demonstrate that their members had met their recycling obligations (through purchasing PRN/PERNs). The cost of this evidence would be paid for by their members. The use of compliance schemes by producers is reflected in our baseline and policy option.

A SA which will be hosted in the public sector by Defra, will be appointed to manage producers' obligations where they are required to pay fees towards the costs of managing household packaging waste. The SA will make the necessary arrangements for paying local authorities for the provision of efficient and effective household packaging waste management services and the costs to be paid by producers for these services. Producers supplying and importing household packaging, that is expected to end up in household waste, will register with the SA (unless they have put in place their own arrangements to collect and recycle household packaging waste).

The Environment Agency and equivalent nation agencies will be responsible for monitoring and enforcing compliance activities on the part of obligated producers.

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### ***De minimis and point of compliance***

Under the 2007 Packaging Waste Regulations<sup>34</sup>, a producer is an 'obligated' packaging producer if it, or a group of companies it is part of, handled at least 50 tonnes of packaging materials in the previous calendar year and has a turnover of more than £2 million a year (based on the previous financial year's accounts)<sup>35</sup>. This threshold is called the 'de minimis'. Under the same regulations, compliance is shared across the supply chain. This means that all businesses above the de minimis threshold who handle packaging, from raw material manufacturers to those selling packaged products to the final user, as well as importers and service providers, are obligated for a share of the overall recycling obligation. The proposed de minimis for fully obligated producers under pEPR will again be set at a turnover of more than £2 million a year and a tonnage of a least 50 tonnes. As such, the de minimis for fully obligated producers under these measures is remaining unchanged. In 2023, 6,968 producers were registered with the regulators.

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<sup>34</sup> <https://www.legislation.gov.uk/uksi/2007/871/contents/made>

<sup>35</sup> <https://www.gov.uk/guidance/packaging-producer-responsibilities>

Under pEPR, rather than sharing compliance across the packaging supply chain, there will be a single point of compliance for any individual piece of packaging and for complying with recycling obligations. There is a slight change to the type of producer who is obligated. The obligations will fall mainly on brand owners; a new category of producer expected to cover several of the categories under the current scheme. Several other producer categories will also be obligated to an extent under certain scenarios. Although it is likely that some producers obligated under the current regulations will cease to be obligated with the change to the point of compliance, given that brand owners will include several of the current producer categories, and that requirements will be made on other categories (such as importers), many will retain an obligation. For the purpose of this analysis, and as a cautious assumption, we therefore assume that that this change will not reduce the overall number of obligated producers.

Under pEPR a new class of producers will become obligated. This relates to online marketplaces who will become obligated for filled packaging sold on the UK market through their platform/website by businesses based outside the UK.

We estimate that this will lead to around 46 additional producers being obligated under pEPR. This number has been arrived at by counting the number of online marketplaces that sell to the UK market.<sup>36</sup> In order to exclude producers who are below the current de minimis threshold in this estimate, we have looked at the number of monthly site visits and have included only the number of producers with greater than 300,000 visits, assuming that these producers will surpass the de minimis threshold.

This closes a regulatory loophole whereby overseas packaged products sold through online marketplaces are not captured under the current producer responsibility scheme. It is recognised however that this may not bring all businesses into scope and will need to be reviewed once pEPR is operational.

While the de minimis for full obligation, including household packaging waste management costs, is remaining unchanged at £2 million a year and 50 tonnes, there will be a new 'lower' de minimis established for data reporting requirements. Producers with a turnover of more than £1 million a year and who supplied at least 25 tonnes of packaging in the previous year will be required to report data on the amounts and types of packaging they supply and import, while they will not be obligated for disposal costs. Defra commissioned external research to estimate the number of additional firms that would become obligated under various de minimis and point of compliance scenarios<sup>37</sup>. Using data from the National Packaging Waste Database (NPWD)<sup>38</sup> on the number of producers by turnover, this research used regression analysis to estimate the number of producers below the current de minimis at different turnover levels. This research is discussed further in the Small and Micro Business Assessment. The central estimate from this analysis was that 1,823 additional businesses would become obligated under this de minimis scenario. However, the uncertainty level within the analysis was high, suggesting a range of 0 to 14,808 based on a 90% confidence level.

Recognising the uncertainty in this estimate, two other sources are used to calculate a central estimate. Firstly, we used an internal estimate calculated for the 2019 pEPR consultation IA. This estimated around 3,700 additional producers could come into scope. In addition, Valpak have advised that internal modelling of their membership

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<sup>36</sup> <https://www.webretailer.com/b/online-marketplaces/>

<sup>37</sup> <http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20670&FromSearch=Y&Publisher=1&SearchText=Extended%20Producer%20Responsibility&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

<sup>38</sup> <https://npwd.environment-agency.gov.uk/>



database suggests that there could be around 3,500-4,000 additional producers nationally if the de minimis was lowered to £1m turnover and 25 tonnes of packaging supplied. This modelling analysed the number of producers by turnover and packaging tonnage based on those currently obligated and extrapolated the trend to provide a broad estimate of the number of smaller producers likely to become obligated when scaled up to a national level. Using an average of these three sources leads to a central estimate of close to 3,100 producers obligated for data reporting only.

In our central scenario, we have assumed that the number of producers will grow by 0.02% per year, which is the average growth rate between 2013-2023<sup>39</sup>. For sensitivities, we have assumed in our low scenario that the number of producers reduces by 1.5% per year, and in our high scenario the number of producers grows by 1.3% a per year.

**Table 9: Number of obligated packaging producers**

	<b>Low</b>	<b>Central</b>	<b>High</b>
Currently obligated producers	6,968	6,968	6,968
Newly obligated producers (online marketplaces)	46	46	46
Data reporting only	0	3,105	14,808
<b>Total producers</b>	<b>7,014</b>	<b>10,119</b>	<b>21,822</b>

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### **Projected POM and recycling**

**Pre-EPR Packaging Switches:** It is anticipated that producers will switch some packaging to more recyclable materials before, and in anticipation of, the introduction of modulated fees. Based on recommendations by WRAP we have assumed that black plastic PTTs will be phased out completely by 2025 under the pEPR option. It is assumed that this packaging will be replaced by non-black versions of the same polymers. In addition to this, it is assumed that 50% of the 2017 tonnage of household PVC and PS PPTs will be replaced by more recyclable polymer alternatives (PET, PP and HPDE) by 2025<sup>40</sup>. These switches are assumed to occur according to a linear trend over this period. The overall tonnage of plastic packaging is not expected to be impacted by these assumptions, rather the composition of plastic polymer types.

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<sup>39</sup> <https://npwd.environment-agency.gov.uk/>

<sup>40</sup> Based on discussion with WRAP

As pEPR is not the only factor influencing the choices of packaging producers when it comes to the recyclability of plastic packaging, we assume that not all pre-pEPR switches will be attributable to pEPR. In the central scenario we assume that 50% of these switches<sup>41</sup>, and associated benefits, will be directly because of pEPR. The remaining benefits are assumed in the baseline scenario. These switches have a relatively small impact on the overall NPV for this option, as these switches are expected to be small in comparison to those directly resulting from the introduction of pEPR in October 2025. A more comprehensive description of the assumptions, and impacts of these assumptions (including sensitivity analysis) can be found in Annex C.

### **Modulated Fees:**

Due to changes in producers' behaviour as a result of the policy, an increase in packaging recycling rates is expected from the introduction of modulated fees. Modulated fees will only apply to household packaging<sup>42</sup>. In reality there may be some spill over into NHM/household-like packaging recycling rates.

Defra commissioned Eunomia to analyse and make recommendations on the logistics of both a modulated fees and deposit based pEPR scheme<sup>43</sup>. Based on the findings of this study and following consultation with stakeholders, modulated fees were considered the more pragmatic and effective approach, so a deposit based pEPR scheme for packaging is no longer being considered.

A further objective of Eunomia's work was to suggest indicative fee levels and appraise the likely impacts of a modulated fees approach on producers. This included considering the impact of modulated fees on producers' behaviour in terms of packaging they supply and import. As part of this work Eunomia developed a model to provide indicative fee rates for several packaging types and assessed the potential impact of these fees on producer behaviour and on packaging recycling rates. Defra have further adapted this model to quantify indicative impacts of modulated fees for this analysis.

The Eunomia model includes options for how fees can be adjusted or modulated. However, all the options are based on modulating by recyclability, with the recycling rate of the packaging material used to measure recyclability<sup>44</sup>. Alternative approaches to measuring recyclability are discussed in Eunomia's report, however using the recycling rate was considered the most suitable method for this analysis based on the data available.

It should be noted that the options explored by Eunomia and included in this analysis are for illustrative purposes and do not imply a preferred mechanism on the part of Government for modulating fees. Indeed, implementing Eunomia's preferred approach may not be technically or economically feasible, *at least at present* due to a lack of recycling rate data for individual packaging materials and formats. Recyclability is one of several possible factors which could be used, alone or in combination with other factors to modulate fees. The preferred mechanism for modulating fees will ultimately be a decision for the Scheme Administrator in accordance with the Producer

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<sup>41</sup> This is an arbitrary assumption due to limited evidence. The impact of this assumption on the costs and benefits of this analysis are outlined in Annex C.

<sup>42</sup> Primary packaging: This is generally the packaging in direct contact with the product. This packaging is mostly likely to be handled by consumers.

<sup>43</sup>

<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20310&FromSearch=Y&Publisher=1&SearchText=Extended%20Producer%20Responsibility&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

<sup>44</sup> This is a simplifying assumption based on the available data. Although in many instances, recycling rate will correlate with recyclability, there will be some instances where this does not apply.

Responsibility Obligations (Packaging and Packaging Waste) Regulations 2024. Further details on the modelling approach, as well as sensitivity analysis are in Annex I.

It should be noted that our analysis was originally conducted based on modulated fees being implemented in 2024. However, to enable sufficient time for producers to report the correct data to enable fee modulation, they will now be introduced in 2026/27. The regulations will make provisions for a simple weight-based approach to be used to estimate producers' obligations in 2025/26. For this first year only, fees will be placed on a core material basis and set fees per material rather than on a more granular packaging type and recyclability basis.

Since the second consultation on pEPR, there has been engagement with the packaging value chain on approaches to modulated fees. Defra has also commissioned research aimed at learning from existing overseas pEPR schemes and to take account stakeholder views<sup>4546</sup>. Defra also engaged with industry stakeholders at several public events on proposals for materials that warrant higher fees on account of their low recyclability.

Having insights to future costs is essential in justifying packaging design decisions. The expert view of INCPEN (Industry Council for Packaging and the Environment) is that it could take two or more years for packaging producers to implement from the point the modulated fee approach is known. When major investment is required, it is natural that producers would wish to be fully informed on – and carefully consider – all aspects prior to deciding to make significant and disruptive change. This includes being informed by future modulated fee rates to justify changes in optimal packaging choices to minimise future pEPR costs.

Once these modulated fees are known, INCPEN advises that packaging producers are extremely likely to respond immediately by taking forward all necessary actions to minimise costs.

One key factor INCPEN were keen to stress is that producers will know their competitors will be minimising costs once the modulated fees are known, and companies are determined to remain competitively priced to their customers. As a clear example of this, INCPEN confirms that producers moved very speedily on packaging design decisions (specifically recycled content) when HM Treasury announced the Plastic Packaging Tax would cost £200 per tonne. Indeed, producers' actions began immediately and sometime before the cost was confirmed in legislation.

On this basis we do not expect producers to delay their packaging decision making on the back of a delay to modulated fees coming into force. Hence, our modelled impacts of modulated fees on recycling rates remain an accurate representation of producer's decision making. As stated in the previous section we have accounted in our baseline the fact that some positive changes to packaging would have been made without the introduction of pEPR, through voluntary measures such as the UK Plastics Pact<sup>47</sup>, and because of consumer pressure. Our option 1 analysis therefore captures the additional changes due to pEPR only.

Moving to a weight-based fee system is not expected to change the overall cost to business in 2025 as producers will still need to meet the costs of household packaging waste collection and treatment. However, individual producers may face different costs as the allocation of these costs is likely to be different. Our modelling already accounts for the fact that benefits from modulated fees may be staggered rather than occurring fully in 2025.

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<sup>45</sup> Exploring UK stakeholder views on modulated EPR fees for packaging - EV1009 (defra.gov.uk)

<sup>46</sup> The Principles of Eco-modulated Packaging fees in Europe - EV1010 (defra.gov.uk)

<sup>47</sup> [https://wrap.org.uk/?gclid=EAlaIqobChMI8IWrnqGq9gIVZ4BQBh12JwoZEAAAYiAAEgJM5fD\\_BWE](https://wrap.org.uk/?gclid=EAlaIqobChMI8IWrnqGq9gIVZ4BQBh12JwoZEAAAYiAAEgJM5fD_BWE)

Lastly, it should be noted that we still see the introduction of modulated fees as necessary for maximising the impact of pEPR.

### Modulated Fees Impact

The impact of modulated fees is shown in Table 10. All material types are expected to see some increase in recycling due to increases in collection and a shift over time towards easier to recycle materials. Based on the modelling described in the previous sections, modulated fees are estimated to increase the municipal (Household and NHM) recycling rate of packaging by around three percentage points (from 73% to 76%<sup>48</sup>) above the baseline level by 2034. As non-municipal and tertiary packaging is not within scope of modulated fees, it is assumed that there will be no impact on the recycling rate of this packaging. Taking this into account, the impact on the overall packaging recycling rate is a two-percentage point increase on the baseline by 2034 (73% to 75%), equal to a recycling increase of 225kt. These impacts are in addition to the positive impact of Simpler Recycling on the packaging recycling rate which are captured in the baseline.

**Table 10: Impact of modulated fees on recycling rates for packaging in scope of pEPR (excludes packaging in scope of DRS, including IBA)**

Recycling Rate 2034	Baseline				Option 1			
	HH	NHM	Total Municipal (HH + NHM)	Total (incl. other C&I)	HH	NHM	Total Municipal (HH + NHM)	Total (incl. other C&I)
Plastic	55%	19%	47%	59%	60%	19%	51%	62%
Wood	55%	55%	55%	42%	55%	55%	55%	42%
Aluminium	62%	26%	34%	40%	62%	26%	34%	40%
Steel	91%	45%	76%	81%	95%	45%	78%	83%
Paper/Card	78%	95%	88%	90%	79%	95%	89%	90%
Glass	68%	95%	74%	74%	74%	95%	79%	79%
Fibre Based Composite	69%	6%	28%	29%	95%	6%	37%	37%
<b>Total recycling</b>	69%	82%	73%	73%	73%	82%	76%	75%

It is estimated that there will be 9,183kt of packaging recycling in 2034 under the pEPR option in contrast to the baseline estimate of 9,407kt. This equates to 225kt of additional recycling per year by 2034.

<sup>48</sup> May be lower than the percentage point rise due to rounding.

**Table 11: Recycling packaging (in tonnes) in 2034 under the baseline and option one**

Recycling Tonnage Kt (2034)	Baseline			Option 1		
	HH	NHM	Total (incl. other C&I)	HH	NHM	Total (incl. other C&I)
Plastic	689	62	1,239	742	62	1,292
Wood	7	131	651	7	131	651
Aluminium	8	11	51	8	11	51
Steel	199	48	360	208	48	368
Paper/Card	1,437	2,502	5,012	1,457	2,502	5,032
Glass	1,320	504	1,824	1,448	504	1,952
Fibre Based Composite	39	7	46	54	7	61
<b>Total recycling</b>	<b>3,700</b>	<b>3,264</b>	<b>9,183</b>	<b>3,924</b>	<b>3,264</b>	<b>9,407</b>

### Comparison of these estimates to international schemes

EPR is a well-established policy mechanism across Europe; all major EU economies have well established and successful packaging EPR (pEPR) schemes with the majority of the European schemes discussed being introduced in some form between 20 and 30 years ago. Many schemes were introduced initially in response to the EU's 1994 Packaging & Packaging Waste Directive. The UK, at the time these schemes were being introduced, opted instead for the PRN system.

Common to all schemes, the core aspect of pEPR is the requirement that packaging producers make payments for the costs associated with managing packaging waste as well as other supporting costs such as campaigns and public communication. Key differences between the schemes arise from differences in the way schemes are administered, the way schemes use producer payments to finance waste management costs (some work with LAs whereas some tender for services and enter into arrangements with collection providers) and the scopes of the schemes (some deal only with HH and HH-like packaging, whereas others cover all packaging). Another key difference is the extent to which fees are modulated. Although all European schemes include some basic form of modulation, in some countries the modulation goes further and looks at the design of packaging and its recyclability.

Considering the differences across the major European schemes, the ones that are most similar to pEPR are the Belgian scheme, the Spanish scheme and the French scheme. In line with pEPR, in all of these schemes the Producer Responsibility Organisation (PRO), the SA equivalent, administers payments to local authorities who provide the packaging waste management services. These schemes are also similar to the proposed UK scheme as they have a single delivery organisation, rather than competing organisations (as in Germany). Another key similarity, between these schemes and the proposed UK scheme, is the scope of the scheme. In these three countries, as is proposed in the UK, the schemes all target only HH and HH-like packaging waste<sup>49</sup>. As with pEPR, the fees in all of these countries are based on both the amount and type of packaging, and different rates are applied to different

<sup>49</sup> adelphi\_study\_Analysis\_of\_EPR\_Schemes\_July\_2021.pdf (erp-recycling.org)

materials. In France fees vary in accordance to factors such as recyclability and in Spain fees depend on the type and the quantity of packaging, with each component charged separately according to its material type.

In all of these countries a single organisation receives payments from obligated producers and performs the same function of financing the management of HH and HH-like packaging waste. The organisation performs this function in the same way, via payments to LAs. As these schemes are highly similar to the proposed UK scheme, the outcomes of these schemes are informative about the possible impacts of pEPR in the UK.

High household packaging recycling rates, that surpass the projections of UK pEPR, have been attained in Belgium and Spain. Belgium have achieved a rate of just over 83% in 2020<sup>50</sup> whereas the rate achieved by Ecombes (the Spanish PRO) was just over 80% in 2019<sup>51</sup>. This lends credence to the possibility of such high recycling rates being achieved in the UK. Furthermore, both countries have recorded significant increases in this recycling rate over time. In the Spanish case, the recycling rate for household packaging waste was only around 65%<sup>52</sup> in 2010..

Over a time period similar to our appraisal period, we have modelled a 2% increase in the overall packaging recycling rate, and a 3% increase in the municipal (HH + NMH) packaging recycling rate. In 2034, following pEPR, we expect the overall Municipal recycling rate to be 76%, and the overall recycling rate to be 75%.

France have recorded a lower recycling rate for household packaging, with the recycling rate being 65.6%<sup>53</sup> in 2019 which is below the rate we have ultimately predicted for the UK in 2034. In 1999 however, a few years after the PRO CITEO was set up, the overall packaging recycling rate in France was 42%<sup>54</sup>. The corresponding rate in France in 2010 was 52%<sup>55</sup>. From this we can infer large gains in the packaging sector in France.

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<sup>50</sup> [Belgium — European Environment Agency \(europa.eu\)](https://europea.europa.eu/en/press-communications/2021/02/20210202-belgium)

<sup>51</sup> [adelphi study Analysis of EPR Schemes July 2021.pdf \(erp-recycling.org\)](https://www.erp-recycling.org/wp-content/uploads/2021/07/adelphi_study_Analysis_of_EPR_Schemes_July_2021.pdf)

<sup>52</sup> [adelphi study Analysis of EPR Schemes July 2021.pdf \(erp-recycling.org\)](https://www.erp-recycling.org/wp-content/uploads/2021/07/adelphi_study_Analysis_of_EPR_Schemes_July_2021.pdf)

<sup>53</sup> [France — European Environment Agency \(europa.eu\)](https://europea.europa.eu/en/press-communications/2021/02/20210202-france)

<sup>54</sup> [EU packaging compliance: same directive, different directions? - blog | Ecosurety](https://www.ecosurety.com/blog/eu-packaging-compliance-same-directive-different-directions/)

<sup>55</sup> <https://www.statista.com/statistics/633604/packaging-waste-recycling-france>

## COSTS AND BENEFITS

### This section is structured as follows:

- Costs
  - Monetised
    - Costs to producers
      - Producer Compliance costs
        - Cost of purchasing PRNs
        - Net cost of Household Packaging Waste Collection and Management
        - HWRC packaging costs
        - Data reporting costs
        - Familiarisation costs
        - Monitoring and Enforcement costs
        - Scheme Administrator costs
        - IT Investment costs
        - Communications campaigns
    - Costs to Materials Facilities
      - Capital costs
      - Operational costs
      - Familiarisation costs
      - Enforcement costs
    - Costs to Reprocessors
      - Accreditation costs
      - Mandatory reporting costs
      - Familiarisation costs
      - Enforcement costs
    - Costs to the Public Sector
      - Loss of landfill tax
      - IT investment costs
      - Loss of PRN funding
  - Benefits
    - Monetised
      - Public sector benefits
        - Household Packaging Waste Collections and Management cost saving
        - HWRC savings
        - IT Investment Cost Recovery
      - Benefits to producers
        - Household collection efficiency savings
      - Benefits to reprocessors
        - Secondary market material revenue
      - Benefits to society
        - Greenhouse gas savings
    - Non-monetised benefits

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## COSTS

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### Producer compliance costs

Producers will continue to be required to purchase evidence of meeting recycling obligations on all packaging. Producers placing packaging on the market that will likely end up being collected from households, will be charged an additional fee in addition to PRN/PERNs purchases to cover collection and end-of-life management for household packaging costs<sup>56</sup>. This will cover the packaging waste element of kerbside collections (recycling and residual), Household Waste and Recycling Centres (HWRC) and bring sites. In addition to this, producers will be required to make payments to cover regulator costs as well as administrative costs relating to the Scheme Administrator.

As in the baseline, obligated packaging producers face the following costs:

- The cost of purchasing evidence (PRN/PERNs) to meet recycling obligations for all packaging.

The following costs reflect the policy option and are additional to the baseline. Some costs are only required if producers are obligated, i.e., above the threshold for data reporting only:

- If obligated, a fee to cover Local Authority disposal costs for managing household packaging (kerbside, HWRC and bring site).
- The cost of reporting packaging data to the Scheme Administrator and Regulator.
- Fees to cover Regulator costs.
- If obligated, costs to cover the running of the Scheme Administrator.
- Familiarisation costs.

### Cost of purchasing PRN/PERNs

Producers will continue to be required to purchase PRN/PERNs to demonstrate compliance with their recycling obligations. We assume that these costs will be largely the same under the baseline, as under option 1, and therefore there is no *additional* cost to producers<sup>57</sup>. As such these costs do not contribute to the Net Present Value estimations, however, they have been presented in the IA as they make up part of the final cost to producers under pEPR. To estimate these costs, we have used historic data on PRN prices and have multiplied these by the estimated tonnage of recycling by accredited reprocessors. We do not attempt to forecast future PRN prices, rather, we assume that the price of the PRN will remain at their highest price over the past 3 years. As the PRN price for most materials spiked and then fell over this period, this is seen as a cautiously high estimate. It is assumed that to meet their recycling obligations<sup>58</sup>, producers use compliance schemes that charge an additional purchase fee of £1 per PRN purchased. More details on these costs are in Annex F.

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<sup>56</sup> More details on how this is expected to work are in Annex F

<sup>57</sup> Although lowering the de minimis will bring more tonnage into obligation, under the reformed system there will be more recycled packaging which should lead to more availability of PRNs. For simplicity, we have assumed that these factors will balance out and that producers will pay the same amount overall on PRNs after the reforms. This amount will be spread over more producers. More detailed analysis of the impact of the reforms on PRN prices will accompany the consultation to amend the PRN system.

<sup>58</sup> In 2020 94% of obligated producers used a compliance scheme. <https://npwd.environment-agency.gov.uk/>



**Table 12: PRN Costs to producers, £m**

	Baseline and Option 1		
	2025	2029	2034
<b>PRN Costs</b>	£575.1	£643.8	£661.9
<b>PRN Procurement Costs</b>	£8.1	£8.6	£8.8
<b>Total</b>	£583.2	£652.4	£670.7

*Household packaging waste kerbside collection and end-of-life treatment (residual and recycling)*

As in the consultation IA, HH collection and end-of-life treatment costs are taken from WRAP modelling which is also used in the Simpler Recycling IA.

Recycling costs are for the packaging waste proportion of dry recycling collections and are net of primary material revenues. It is assumed that Simpler Recycling is in place and costs are modelled on this basis.

The option is presented as:

- Multi-stream – or twin-stream for LAs unable to change pre-2026
- Plastic film collections

Costs under pEPR have been calculated by applying an estimate of the proportion of packaging in household recycling streams to the overall dry recyclables costs. For example, in 2024, WRAP’s model<sup>59</sup> estimates that LAs net collection and treatment costs of optimised collection in England would be £1,025m for all dry recyclables. WRAP estimates that packaging materials could represent around 78.7% of total volume when partially compacted by collection trucks, or 65.3% by weight<sup>60</sup>. Thus, using the former estimate, packaging recycling costs are modelled to be around £686m in 2025 for England’s LAs.

The addition of packaging materials such as food and drink cartons, other types of metal packaging in addition to cans, and plastic film have increased the costs of collections. The increase in tonnage relating to the inclusion of these additional materials in recycling collections is captured in Table 13.

**Table 13: Tonnes contributed by the inclusion of additional materials (England)**

	Food & Drink Cartons	Other Metal Packaging	Plastic Film
Kt	27,028	9,284	83,693
% increase in tonnage	0.8%	0.3%	2.6%

Furthermore, WRAP estimates that operational costs will face upward inflationary pressure due to a combination of the new regulatory requirements and supply-side frictions. To comply with Simpler Recycling requirements, it is expected that waste collectors will need to invest in additional capital items – notably haulage vehicles.

Similarly, residual costs are determined by applying the estimated proportion of packaging in residual waste (17.8%)<sup>61</sup> to WRAP’s total modelled residual waste costs (£1.5bn in 2025). Applying this proportion gives an

<sup>59</sup> WRAP Routemap modelling, unpublished.

<sup>60</sup> Some aspects of the costs are calculated by weight and some by partially compacted volume.

<sup>61</sup> WRAP, 2019, Bristol, National Household Waste Composition 2017, prepared by Eunomia Research & Consulting Ltd

estimated cost of £267m in 2025. These costs are inclusive of the landfill tax and average gate fees for residual waste treatment.

**Table 14: Collection and end-of-life treatment costs by Nation, £m**

		2025	2029	2034
<b>Recycling</b>	England	£586	£855	£875
	Northern Ireland	£13	£22	£23
	Scotland	£34	£39	£40
	Wales	£64	£60	£61
	Total	£697	£976	£998
<b>Residual</b>	England	£267	£235	£224
	Northern Ireland	£16	£14	£14
	Scotland	£62	£63	£64
	Wales	£11	£09	£09
	Total	£356	£321	£310
<b>Total</b>	England	£853	£1,090	£1,099
	Northern Ireland	£29	£37	£36
	Scotland	£96	£102	£103
	Wales	£75	£68	£69
	Total	£1,053	£1,297	£1,308

Within the 2021 consultation IA, England estimates were scaled up to estimate total UK costs. Since then, analysts from the Devolved Administrations have worked with WRAP and Defra to estimate specific costs for each nation. These costs, therefore, take account of specific regional differences in collection costs (for example geography). Details of how this was incorporated into the analysis are set out in Annex H.

Net recycling costs are also expected to increase over the appraisal period. This is partly due to increased amounts of packaging diverted from residual waste to recycling<sup>62</sup>, as well as estimated increases in the amount of packaging placed on the market over time<sup>63</sup>. We do not expect POM tonnages to decrease as a result of the pEPR policy option, as the policy is modelled as increasing recycling rates, rather than increasing resource efficiency. In contrast, residual treatment costs are expected to reduce over the appraisal period due to lower tonnages being sent to landfill and EfW. The overall impact on collection costs is an increase in costs over time, which is largely explained by predicted increases in the number of households and the tonnages of packaging placed on the market over time. Overall, it is expected that costs will be lower under this option than under the baseline due to additional packaging

<sup>62</sup> From Simpler Recycling in England, as described in the baseline section, and from EPR, as modelled for this analysis and described in the background section of this chapter.

<sup>63</sup> <https://wrap.org.uk/resources/report/packflow-covid-19-reports>; For example, the PackFlow reports assume some drop in packaging tonnages as a result of covid-19 restrictions, returning to pre-covid growth trends by 2022.

being diverted from residual waste to recycling due to modulated fees. This saving to producers is discussed in the benefits section.

### Household Waste and Recycling Centre (HWRC) packaging costs

As per above, Household Waste and Recycling Centre (HWRC) costs are based on the WRAP modelling for the optimised collection option as outlined in the Simpler Recycling IA<sup>64</sup>. WRAP’s projected HWRC costs (£35m in 2024 in England) were uplifted by 1.22 based on the proportion of English packaging waste compared to UK packaging waste<sup>65</sup> to determine the total UK cost (£43m). This uplift was done as we did not have data from Devolved Administrations to model HWRC costs.

There are savings incurred by producers for the diversion of household packaging waste from residual to recycling collection. This can be explained by the fact that the unit cost of HWRC residual waste is greater than the corresponding recycling value, and therefore the reduction in the collection of residual tonnages more than offsets the increase in costs associated with higher recycling rates. Total costs are illustrated in Table 15. These represent a transfer of costs from LAs to obligated producers.

**Table 15: Total cost of HWRC collections – best estimate, £m**

	<b>2025</b>	<b>2029</b>	<b>2034</b>
<b>Residual</b>	£17.5	£17.7	£18.0
<b>Recycling</b>	£25.5	£25.1	£24.6
<b>Total</b>	£43.0	£42.8	£42.7

### Producer data reporting costs

Under the current system, producers generally hire the services of compliance schemes<sup>66</sup>, who take on their legal obligation to meet recycling targets. Compliance schemes will also provide data reporting services, whereby they take raw data from the producer and do all necessary calculations and formatting to report ‘placed on the market’ data to the regulator. Currently, producers are required to report packaging data by the six main packaging categories<sup>67</sup>.

Under the reformed system, producers are still required to report ‘placed on the market’ data, however, those obligated to make payments to cover household collections need to provide significantly more granular data. This will ensure the Scheme Administrator can accurately calculate their additional fee based on modulated fees. Therefore, the number of packaging categories they need to report on will increased significantly. Producers that are only required to purchase recycling evidence, and those required to make an additional payment for household packaging collections, can report data via the same portal, however, as stated, the latter must report at a higher granularity.

<sup>64</sup> [https://www.legislation.gov.uk/ukia/2024/97/pdfs/ukia\\_20240097\\_en.pdf](https://www.legislation.gov.uk/ukia/2024/97/pdfs/ukia_20240097_en.pdf)

<sup>65</sup> WRAP, 2019, Bristol, National Household Waste Composition 2017, prepared by Eunomia Research & Consulting Ltd; England proportion of UK packaging waste.

<sup>66</sup> For example, in 2020 94% of obligated producers used a compliance scheme (<https://npwd.environment-agency.gov.uk/Public/PublicSummaryData.aspx>).

<sup>67</sup> Plastic, Paper/Card, Aluminium, Steel, Glass, Wood

Compliance schemes will still be able to take on the legal obligation for meeting recycling targets (and purchasing recycling evidence), including data reporting, on behalf of producers but will not have a statutory role in meeting additional obligations under pEPR producer fees. Producers required to pay fees may still find it beneficial to hire the services of compliance schemes to collate their data for reporting, however, they will retain the legal responsibility for the accuracy of their data submission. For the analysis in this IA, we assume that producers will continue to pay compliance schemes to collate and report the necessary data for both elements of their obligation.

Generally, compliance schemes will charge a membership fee which allows members access to compliance services. Some schemes charge a fee comprising only of membership, with additional services acquired on top of this, whereas others will charge a higher fee, which includes a more comprehensive service. Based on discussions with industry experts as well as compliance schemes, we have assumed an average membership fee (including data reporting services) of £1,500 per producer. This is multiplied by the number of obligated producers in each year to estimate the total data reporting costs for producers under the baseline.

To gather evidence on the costs of providing these services under a reformed scheme we spoke to industry stakeholders, including compliance schemes. Further information was taken from stakeholder engagement as part of the second pEPR consultation. Although compliance schemes were able to provide us with information such as the number of hours/days they spend on the average producer, the additional time taken to help newly obligated producers and the rates they charge, much of this information is sensitive. We have therefore used a range of aggregated estimates for these costs and have not named the stakeholders that were involved. Together, these stakeholders are considered representative of the industry.

Stakeholders generally felt that requirements to report data towards household waste management payments would be sufficiently different to reporting data for estimating recycling targets (PRNs) and that this would be the equivalent of at least the same costs again. In other words, producers would need to pay at least a further £1,500 to account for the new requirements.

We have therefore assumed that producers will be charged £3,000 by compliance schemes, on average, for data reporting (representing an additional £1,500 for these producers under pEPR). To account for uncertainty, we have also included a high estimate of £5,000 per producer for data reporting costs (i.e., an additional £3,500 for these producers under pEPR).

Producers that have between £1-2 million turnover and produce 25-50 tonnes of packaging will only be required to report at basic material level rather than at the granularity of those obligated under modulated fees. This means their reporting cost will be more in line with those under the PRN system. Compliance schemes have advised us that although there can be exceptions, on average, smaller producers tend to have less complicated data reporting requirements (for example due to having fewer product lines) and therefore face lower costs. Based on these discussions we have used an estimate of £1,000 as the average cost to these producers under pEPR compared to no reporting obligation currently.

To calculate the total data reporting costs for producers under pEPR, these costs are multiplied by the number of producers, which includes newly obligated online marketplaces and producers newly obligated through lowering the de minimis. In 2025, we assume that there are:

- 6,971 large producers.
- 3,105 small producers.
- 46 online marketplace producers.

**Table 16: Total cost of data reporting for producers, £m**

	Baseline			Option 1		
	2025	2029	2034	2025	2029	2034
<b>Data Reporting Costs</b>	£10.5	£10.5	£10.5	£24.0	£24.0	£24.1

### Familiarisation costs

It is assumed that costs for newly obligated producers would be higher initially as they would need to become familiar with the requirements. Compliance Schemes we spoke to suggested that it could take an extra day (8 hours) of work to help a new producer to understand their obligations. Compliance Schemes could charge anywhere from £600-£1000 per day to provide this advice. The mid-point of this range (£800) is used for the central estimate. This additional cost is assumed to only occur in the first year of pEPR. The 3,105 newly obligated producers and 46 online marketplace sellers are assumed to need to familiarise with the requirements.

**Table 17: Familiarisation costs to producers, £m**

	<b>2025</b>
<b>Familiarisation costs</b>	£2.52

### Regulator costs

Currently, producers are required to pay a registration fee to the regulator to cover the costs to the regulator of compliance monitoring the existing scheme. The current regulator fee is dependent on the size of the producer and whether they register directly or via a compliance scheme. For direct registrants the fee is £776 or £562 for small producers. For producers using a compliance scheme the fee is £564 or £345 for small producers<sup>68</sup>. These fees are multiplied by the number of obligated producers to estimate the compliance monitoring costs. As 94% of producers use a compliance scheme, £564 has been used for the analysis. We assume that no small producers are required to register under the existing PRN system.

The producer fees under the current system have not been changed since amendments in 2007 and are now out of step with current costs, it is therefore not appropriate to use these fees as an estimate under the reformed system. A reformed system will need more detailed data sets and may require the development of protocols and assessment of methodologies by regulators which will impact the type and level of fees charged. We therefore expect there to be a material difference in the level of fees charged by regulators. Under the reformed system producers may have differing obligations and therefore a single regulator fee may not be appropriate, fees more reflective of the level of monitoring may be necessary.

As is set out in Schedule 1 Paragraph 2. (1) of the regulations, the charge for an application for registration of a producer is the total of £2,620 for a large producer, £1,216 for a small producer with an additional charge of £2,579 as appropriate, where the producer is an online marketplace operator. Subsidiaries which are registered as part of

<sup>68</sup> <https://www.gov.uk/guidance/packaging-producer-responsibilities>

a group registration incur lower charges for registration of £558 for the first 20 subsidiaries in a group, falling to £140 for the 21<sup>st</sup> onwards. These fees are expected to increase in line with inflation, as laid out in Schedule 1. Of the regulations; “The charges specified in this Schedule are to increase annually on 1st September in each year starting on 1st September 2026, in line with any increase in the Consumer Prices Index published by the Office for National Statistics as at 31st March of the same year”. In this analysis, we have decided to keep these charges constant.

**Table 18: Regulator costs, £m**

	Baseline			Option 1		
	2025	2029	2034	2025	2029	2034
<b>Regulator Fee</b>	£3.9	£3.9	£3.9	£18.3	£18.3	£18.3

### Scheme administrator costs

The costs provided in this section are based on advice by Valpak and WRAP. Analysis by Valpak on the costs involved in administering an pEPR scheme are based on their experience of supporting the delivery of producer responsibility for packaging through their compliance scheme. The WRAP analysis was developed with guidance from Defra and was informed by their experience of managing UK-wide voluntary schemes on behalf of producers. These have been updated since the Consultation IA to reflect final policy decisions. For example, the number of staff FTEs has been updated to reflect the additional producers in scope due to amendments to the de minimis threshold. There has been a reduction in costs owing to changes in the scope of producer fees which, initially, is not expected to include payments to cover packaging collected from businesses.

The costs below do not include the costs to producers of using compliance schemes which were discussed previously.

#### **Staff costs:**

The roles in the SA assumed to be required include account managers, technical specialists, analysts, financial professionals, admin, management, HR, audit, marketing, communications, and IT staff. For the purposes of this assessment each staff member is assumed to cost the Scheme Administrator £45,800<sup>69</sup>. We have applied a 2% annual wage growth rate to this salary each year to 2034.

**Table 19: staff costs of governance model, £m**

	2025	2029	2034
<b>Staff Costs</b>	£11.2	£12.2	£13.7

#### **Office costs:**

Office costs that are expected to be required include: the cost of a premises, ground rent, utility bills, security, cleaning, and maintenance. The office costs are set out in Table 20 and have been estimated based on internal analysis of commercially sensitive data provided by Valpak. These are expected to stay constant each year during the appraisal period.

<sup>69</sup> This salary was provided by Valpak and has been uplifted by 22% to account for non-wage labour costs.

**Table 20: Annual office costs for each scheme, £m**

	Per year
Cost of premises	£0.17
Ground Rent / Rates / Utilities	£0.42
Security / Cleaning / Maintenance	£0.48
Office Costs	£0.17
<b>Total</b>	<b>£1.24</b>

Source: Valpak modelling, adjusted by Defra based on number of employees

### **Admin costs**

The admin costs are set out in Table 18 and are also based on internal modelling using confidential data. These are expected to stay constant each year during the appraisal period.

**Table 21 – Annual admin costs for each scheme, £m**

	Per year
Audit & Tax	£0.35
Legal	£0.13
Insurance	£0.40
Other Professional Fees	£0.28
Other	£0.52
<b>Total</b>	<b>£1.67</b>

Source: Valpak modelling, adjusted by Defra based on number of employees

### **Initial Set Up Costs**

Based on estimates by WRAP<sup>70</sup>, and then adjusted by Defra based on the estimated number of staff members, an additional £1.2m set up costs are included in the analysis. This initial WRAP estimate totalled around £950k of set up costs; around £350k for interim HR/Recruitment and around £600k for office fit. These costs are assumed to occur in 2024.

### **Total Costs**

The total administrative costs for both options are presented in Table 19 below. This table includes the costs outlined in tables 19, 20, and 21.

**Table 22: Total SA Administrative Costs for SA, £m**

	2025	2029	2034
<b>Total SA Admin Costs</b>	£14.04	£15.04	£16.30

### **Running cost for IT system**

<sup>70</sup> "What is a likely cost for an EPR Scheme Administrator?" WRAP (unpublished)

New IT systems are required to facilitate the running of pEPR. These IT systems will be required for a number of functions including reporting of the packaging supplied and imported, charging producers, and making the necessary payments from the Scheme Administrator to LAs. Once the IT systems have been developed, the costs of running the IT system will be borne by the Scheme Administrator and Regulators (with the costs ultimately passed on to producers). Since the consultation IA, further work has been done by Defra’s Data, Digital and Technology Services (DDTS) team to estimate the ongoing costs.

**Table 23: IT system cost per year, £m**

£m	2025	2029	2034
<b>IT system costs</b>	£1.23	£1.63	£1.23

### Communication campaigns

The SA will be able to charge producers who supply and import household packaging for public information campaigns to maximise packaging collected for recycling from households. Ultimately it will be for the Scheme Administrator in conjunction with its producer members to determine how much they wish to spend on national communications campaigns in England, Northern Ireland, Scotland, and Wales. However, for the purpose of this IA cost estimates have been included based on WRAP’s analysis<sup>71</sup>.

WRAP estimate producing national guidance and one-to-one business support could cost around £49.6m, of which around 80% of the cost relates to dry recycling materials. Only costs relating to dry recycling materials are included in the IA. Under the central option we assume that these costs would cease after all businesses are complying with Simpler Recycling regulations. However, WRAP have suggested that they could continue at a lower cost after 2027 (which we have included in our high estimate). Our low option assumes a lighter touch version of the central estimate, which supports fewer businesses. Ultimately it will be up to the Scheme Administrator to decide how best to conduct communication campaigns and how much to spend.

**Table 24: Business communications campaigns, £m**

	2025	2027	2029	2034
<b>High</b>	£39.6	£39.6	£19.8	£19.9
<b>Central</b>	£39.6	£39.6	£0.0	£0.0
<b>Low</b>	£19.8	£19.8	£0.0	£0.0

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<sup>71</sup> Unpublished WRAP analysis



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## Costs to Materials Facilities

For pEPR to be implemented, appropriate data on the flow of packaging through the waste system needs to be collected. Data is needed for the calculation and setting of targets, fees, and payments, as well as monitoring compliance of the scheme. Once collected from households and businesses, dry recyclate (which is mainly packaging<sup>72</sup>) is generally taken to a material facility, often a transfer station or Material Recovery Facility (MRF) to be bulked<sup>73</sup> and/or sorted before being sent to a reprocessor and/or exporter. As this is often the first point at which packaging waste is bulked or consolidated with similar waste from other sources, a first point of consolidation (FPoC), this is a key point at which data collection is needed to determine supplier specific waste composition.

For pEPR purposes, sites considered to be a FPoC will be required to sample input material, and where the site is undertaking a sorting process into target material streams, output sampling will also be required. A site will be considered a FPoC if it receives packaging waste directly from multiple waste collectors, and undertakes the first weighing, consolidation/bulking and/or sorting of the packaging waste before sending onto another materials facility, reprocessor or to export. FPoCs will be mandated to undertake sampling and compositional analysis and report this data to the regulator.

Instead of having a separate pEPR sampling regime placed on FPoCs, to reduce the sampling and reporting burden on materials facilities, we have expanded the current Materials Facilities (MFs) sampling regulations in England and Wales<sup>74</sup> and the equivalent Code of Practice in Scotland<sup>75</sup>, which requires MRFs to sample both input and output material. There is no equivalent legislation in Northern Ireland, therefore, Northern Ireland will need to develop new legislation or requirements or amend/use existing legislation to accommodate similar sampling and reporting requirements. For pEPR purposes, when additional sites come into the scope of these regulations and codes of practice (for example where a MF is an FPoC and includes facilities that manage source separated waste streams), input sampling categories will change (to understand packaging composition), and input sampling rates will increase from 60kg per 125t to 60kg per 75t. This is crucial as this data will be key for determining evidence of packaging collected and managed and support the allocation of pEPR payments to local authorities and must therefore be sufficiently accurate. It is acknowledged that this will increase the number of businesses facing a cost, as well as increasing the level of cost to each business.

As with the current regulations, the de minimis has been retained such that sites that handle waste below a 1,000t per year will be excluded. This is discussed further in the Small and Micro Business Assessment (SaMBA) section.

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<sup>72</sup> For example, 65% of dry recyclate collected from households by weight is estimated to be packaging; <https://wrap.org.uk/resources/report/quantifying-composition-municipal-waste>

<sup>73</sup> Waste is combined and compressed to be transported onwards for further processing, disposal or recycling.

<sup>74</sup> Part 2 of Schedule 9 of the Environmental Permitting Regulations (England and Wales)

<sup>75</sup> Code of Practice on Sampling and Reporting at Materials Recovery Facilities Practice (<https://www.zerowastescotland.org.uk/sites/default/files/MRF%20Code%20of%20Practice%20Guideline.pdf>); The Waste (Recyclate Quality) (Scotland) Regulations 2015 (<https://www.legislation.gov.uk/ssi/2015/101/contents/made>)

It is assumed that 268<sup>76</sup> sites across the UK could be in scope. Further details on how this was estimated are in Annex G. **Note, costs to MF's are presented below for transparency and not to be considered direct costs from the pEPR Regulations therefore not included in the EANDCB.**

### One off capital costs

Waite Resource Management and WRAP conducted a costs survey on behalf of Defra<sup>77</sup>. This survey asked MFs, that are expected to be in scope, to provide details on costs to meet the current regulations and an estimate of additional costs to meet an amended input sampling methodology including additional material categories (based on the suggested list in the 2021 consultation) and a higher sampling frequency for packaging of 60kg every 25t (as proposed in the consultation). Costs were split into operational and capital costs. 33 businesses were contacted, with 12 providing a response. Although this is a small sample size, the responses did cover both LA and private operated facilities as well as different sized facilities, ranging from 1,500t to 160,000t per year. Survey responses were used as the basis to estimate costs for this IA.

Within the survey the average cost per tonne that sites suggested they would need to sample every 25 tonnes was around £0.50 per tonne. As this was to sample every 25t, this was adjusted to represent sampling every 75 tonnes (see below).

The survey also asked sites to provide information on capital spend to meet the current regulations (sampling every 125 tonnes) as well as the additional costs for an increased sampling frequency. On average, sites suggested they would need 50% more capital than they have currently if they were to increase the sampling frequency by 5 times. It was therefore assumed that sites would need 25% more capital spend (or 75% of the overall expenditure recorded in the survey) to sample at a frequency of every 75 tonnes. Hence a newly obligated site would need a total of £0.38 per tonne capital spend. £0.30 and £0.45 per tonne were used as sensitivities.

Overall, the average site would need to spend around £8.3k on capital<sup>78</sup>. Note that this £8.3k cost figure is an average and is not representative of all sites due to different site sizes. This leads to a total, one-off cost of around £2.3m.

Some MRFs are required to submit sampling and compositional data under the current MF regulations. These are baseline costs. Data from the WRAP MRF portal<sup>79</sup> was used to determine how many MRFs submitted data in 2019, and which size bracket they fall into. As only English and Welsh sites reported data via WRAP in 2019, the Scottish Environment Protection Agency provided the number of sites reporting in Scotland in 2020. Currently no equivalent regulations exist in Northern Ireland. Overall, it was assumed that 110 sites are currently required to comply.

Current regulations require sampling every 125t, and survey respondents suggested current costs made up around half of overall costs needed under sampling of 25t. Therefore, it was assumed that currently in scope sites would need to spend 25% per tonne less than newly in scope sites. This leads to baseline costs of around £0.3m.

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<sup>76</sup> Since the last publication, this estimate has been revised down from 935 based on an improved filtering process on the raw data, and consultation with devolved regulatory agencies. In-scope sites are assumed at 268, broken down to 153 in England, 44 in Wales, 41 in Northern Ireland and 30 in Scotland. Updated England site numbers are from Environment Agency analysis of their permit data.

<sup>77</sup> Estimated Costings and Facility Numbers for EPR Manual Sampling (WRAP/Waite Resource Management Ltd) 2021 Unpublished

<sup>78</sup> £6.6m in the low scenario and £10k in the high

<sup>79</sup> <https://wrap.org.uk/resources/tool/materials-facility-mf-reporting-portal>

**Table 25: Capital costs to MFs, £m**

	<b>2025</b>
Baseline	£0.3
Option 1	£2.3
Additional Costs	£2.0

### Ongoing operational cost

The same survey data was used to analyse the operational (largely staff) costs required under the updated sampling regulations. Trend analysis was used to determine the correlation between cost per tonne and size. The results showed some evidence of a trend such that smaller sites expected to need to spend more per tonne than larger sites. Although this is from a small sample size, this suggests the possibility that there are economies of scale to sampling. This could be, for example, due to smaller sites having a less clear division of labour (where a full-time sampling staff member is not needed), or larger sites having more efficient processes<sup>80</sup>. The implications of this economies of scale are discussed in the Small and Micro Business Assessment.

Using a weighted average, the average operational cost per tonne is estimated to be around £2 per tonne sampling at a rate of every 25t. Within the cost survey conducted by Waite Resource Management, sites suggested that on average additional operational costs would be 5 times higher if sampling at a rate of every 25 tonnes compared to every 125t as this would require 5 times more sampling. To estimate the cost per tonne of sampling every 75 tonnes this was therefore multiplied by 1/3. This gives a cost per tonne estimate of around £0.60 per tonne.

Evidence from the previous MF regulation impact assessment<sup>81</sup> and the subsequent review of the regulations was used as an additional source to estimate the operational costs. In this assessment it was assumed that sites would spend £0.27 per tonne on staff to sample at a rate of every 125t. An assessment of these costs carried out in 2019 which included surveying MRFs complying with regulations, found that these costs were in line with those experienced by MFs. We adjusted this to account for wage growth<sup>82</sup> which leads to an estimate of £0.36 per tonne. As this relates to sampling every 125t, we adjusted this to every 75 tonnes which gives £0.61 per tonne.

Lastly, based on a subsection of survey respondents, the Waite Resource Management Ltd survey estimates that the average operator can process 3.5-4.1 samples per day. This suggests that 1 FTE would be needed for every 25t of input into the site. The average annual salary for operatives provided by survey respondents was £21.7k which would mean costs of £26.5k per year after adjusting for non-labour staff costs<sup>83</sup>. This would suggest a flat operation cost rate of around £1.00 per tonne when sampling every 25t. Adjusting this to every 75 tonnes leads to a cost rate of around £0.33 per tonne. However, as this is based on a small sample size it is only used as sensitivity.

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<sup>80</sup> Overall costs to smaller sites are still expected to be lower than that for larger sites as they will take in a lower tonnage. Economies of scale would suggest that the cost per tonne is higher for smaller sites.

<sup>81</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/278833/mrf-consult-sum-resp.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/278833/mrf-consult-sum-resp.pdf)

<sup>82</sup> The analysis used a wage of £7.75 per hour (uplifted by 25%) in 2014. In our cost survey, the average salary quoted for a sampling operator was £21,700 per year, which equates to £10.43 per hour when divided by 40 hours. This is an increase in wages of 35%.

<sup>83</sup> At a rate of 22%.

Overall, the low, central, and high estimates use £0.35, £0.60, £0.68 per tonne, respectively. Under the central estimate, the average operational cost per site is around £11k per year, which leads to aggregate costs of around £3.7m.

Again, as some sites are already sampling under current regulations, we have estimated the baseline costs. These use £0.20, £0.36 and £0.41 as the low, central and high cost per tonne, respectively. Under the central estimate, the aggregate baseline operational costs are £0.9m per year.

**Table 26: Operational costs to MFs, £m**

	2025	2029	2034
<b>Baseline</b>	£0.9	£0.9	£0.9
<b>Option 1</b>	£3.7	£3.7	£3.7
<b>Additional cost from baseline</b>	£2.9	£2.9	£2.9

### Regulator costs

Under the current regulations, in scope MFs must pay a fee of £2,240<sup>84</sup> to the regulator to cover monitoring and enforcement costs. The fee under the new regulations will be set by regulators based on the amount needed to cover their costs. Regulators have indicated that there are some economies of scale when it comes to these costs and they may be able to charge a lower fee due to the increased number of sites in scope. As such we have presented three scenarios: the high scenario in which the fee per MF is as it is currently, the central in which the fee is reduced by 20% and the low in which the fee is reduced by 50%. Under the baseline, 110 sites are assumed to be reporting and paying the current fee<sup>85</sup>.

**Table 27: MF Regulator costs, per year, £m**

	Baseline	Option 1	Net Costs
<b>Low</b>	£0.6	£0.3	-£0.3
<b>Central</b>	£0.6	£0.5	-£0.1
<b>High</b>	£0.6	£0.6	£0.0

### Familiarisation costs

Most sites identified as potentially being in scope of the new regulations are not currently required to report sampling data to the regulator. It is possible that they will therefore need to spend time becoming familiar with the regulations. It is assumed that facilities will spend 10-20 hours familiarising themselves with the requirements<sup>86</sup>

<sup>84</sup> In England: <https://www.gov.uk/government/publications/materials-facilities-how-to-report-on-mixed-waste-sampling>

<sup>85</sup> The fee may differ across nations depending on decisions by regulators in each nation.

<sup>86</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/278833/mrf-consult-sum-resp.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/278833/mrf-consult-sum-resp.pdf); the previous MRF regulations IA assumed that small sites would need around 16 hours, and large sites 14 hours to train staff – a 2019 assessment of costs from the IA found that the costs assumed in the IA were in line with the true cost to sites.

and training staff. It is assumed that some of this will require legal services, and the average hourly wage of a worker in the legal/accounting sector is used, with an uplift of 22% used to account for non-labour staff costs.

**Table 28: Familiarisation costs to MFs, £m**

	<b>2024</b>
<b>Low</b>	£0.1
<b>Central</b>	£0.1
<b>High</b>	£0.1

### Summary of costs

**Table 29: Total Additional MF costs (net of baseline), £m**

	<b>2025</b>	<b>2029</b>	<b>2034</b>
<b>Capital costs</b>	£2.0	£0.0	£0.0
<b>Operational costs</b>	£2.9	£2.0	£2.0
<b>Familiarisation costs</b>	£0.1	£0.0	£0.0
<b>Regulator costs</b>	-£0.1	-£0.7	-£0.7
<b>Total costs</b>	£4.8	£1.3	£1.3

Table 29 summarises the additional (net of baseline) costs for the central scenario. Additional costs to MF businesses can largely be explained by the increased number of sites expected to be in scope, as well as the increased sampling required under the new regulations. When considering the total costs to the industry on a per site basis, assuming annualised capital costs<sup>87</sup>, the average annual increase in costs per MF site is around £7-13k. This works out as an additional £0.35 to £0.72 per tonnage input on average. In WRAP's 2019/20 gate fee report<sup>88</sup>, they estimate that the median MRF gate fee<sup>89</sup> reported by LAs in 2019/20 was £43-£53 per tonne. Assuming MFs pass the full cost of these additional sampling requirements onto customers, the average MRF gate fee would be expected to increase by 1.0%- 1.5%.

Also, as part of the amendments to the MF regulations and new sampling requirements, the ability of a MF to seek approval from the regulators to sample and undertake compositional analysis using visual detection technology, instead of manual sampling, is an option within the regulations and guidance. MFs that wish to use visual detection technology will have to demonstrate that use of the technology still meets the minimum manual sampling requirements within the regulations, and the data can be submitted to the regulators in a useable, consistent format. This technology is currently available and is being further tested and used by some MFs already. There is

<sup>87</sup> Over 10 years

<sup>88</sup> <https://wrap.org.uk/sites/default/files/2021-01/Gate-Fees-Report-2019-20.pdf>

<sup>89</sup> The fee charged by MRFs for waste they take as inputs

likely to be a larger upfront capital cost for installing the technology, depending on the size of the site. However, it is also said to be able to substantially reduce the amount of staff labour required to undertake samples, which would subsequently reduce the above operational costs (although some level of manual sampling would still be required to verify results).

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### Costs to Reprocessors and Exporters

Under the reforms to the packaging regulation, all reprocessors and exporters of packaging will be required to register with the appropriate regulator and report data on packaging received, reprocessed and/or exported. This may bring further businesses into scope, and lead to some additional costs to these businesses. This will, however, fill a gap in the data, whereby under the current system only packaging received and reprocessed/exported by accredited businesses is recorded. This data will provide information on the quantity and quality of packaging supplied, which will support the monitoring and achievement of pEPR targets and outcomes, and the calculation of pEPR payments to local authorities.

Currently accredited reprocessors or exporters are required to report certain information to the regulators, for example, the source of the material input, the weight and type of packaging being reprocessed and exported, and the product the recycled material will be used for. Under the reforms, this information will still be required to be reported, with some at a more granular level.

In addition, packaging producers will still need to purchase recycling evidence from reprocessors and exporters to demonstrate they have met recycling targets, as under the current system. Reprocessors and exporters will therefore also be required to apply for accreditation, to allow them to sell this evidence. The estimated additional costs are outlined below.

### Increased costs – Mandatory registration for unaccredited reprocessors/exporters

All reprocessors and exporters of packaging waste will be required to register with the regulator and report some data information.

Stakeholders representing reprocessors of different material types were asked to provide their opinion on the likely number of reprocessors and exporters who are currently unaccredited but handle some packaging waste and would therefore come into scope. A common theme developed across material types, with stakeholders suggesting that the number would be low. In the case of aluminium and plastic, it was assumed that the recent spike in the price of PRNs for those materials<sup>90</sup> would have incentivised all previously unaccredited businesses to become accredited. For example, in 2017 there were 154 accredited plastic recyclers, however by 2020 this had risen to 281 (an increase of 82%). Similarly, the number of accredited aluminium recyclers rose by 90%, from 43 to 84, over the same period. For paper and card, it was felt that the vast majority of domestic recyclers are large and would already be accredited. There was less clarity on paper/card exporters, but this was still expected to be relatively few. Lastly, no new glass exporters were anticipated to come into scope but a small number of glass reprocessors may not be accredited.

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<sup>90</sup> See Annex F

Some analysis was done to estimate the number of businesses that could come into scope under these regulations. Within the PackFlow reports<sup>91</sup>, Valpak estimate the tonnage of recycled packaging waste currently not captured via NPWD; packaging waste recycled by unaccredited businesses. Overall, these reports estimate that only 3% of packaging waste is not captured. For the purposes of this analysis, we assume that this is recycled by businesses handling small tonnages and who are therefore all small and micro businesses (SMBs). Generally, SMBs make up a large proportion of the number of businesses but a smaller proportion of revenue. ONS data<sup>92</sup> shows that within the Materials Recovery sector, SMBs make up 93% of total businesses, but 39% of revenue. Using revenue as a proxy for tonnage handled, we therefore assume that SMBs handle 39% of total packaging waste recycled. It is assumed that the majority of these businesses are already accredited<sup>93</sup>. Based on these assumptions, it is estimated that 2.4% of businesses handle 1% of the tonnage<sup>94</sup>. Therefore, we assume 7.2% of businesses handle 3% of tonnage. Assuming, therefore, that the 614 currently accredited businesses make up 92.8% of recyclers handling packaging waste, this leaves 48 businesses unaccredited. This was used as the central estimate.

Alternatively, assuming that all unaccredited businesses are micro businesses, and using the same approach, currently obligated businesses make up 83.2% of total businesses in scope<sup>95</sup>, leading to an estimate of 124 unaccredited businesses. This was used as the high estimate.

£3.8k per business for complying with current regulations (excluding regulator fees) is used to estimate total cost per business (this assumption is discussed in more detail below). This is a conservative estimate as these businesses are likely to be smaller businesses and may therefore face lower than average costs to comply. It is assumed that these businesses would pay the regulator fee for smaller businesses (£500).

**Table 30: Additional costs to currently unaccredited Reprocessor/Exporters, £m**

	Low (0)	Central (48)	High (124)
<b>Data costs</b>	£0.0	£0.1	£0.4
<b>Regulator fee</b>	£0.0	£0.0	£0.1
<b>Total</b>	£0.0	£0.2	£0.4

<sup>91</sup> <https://wrap.org.uk/resources/report/packflow-covid-19-reports>

<sup>92</sup> <https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/annualbusinesssurvey>

<sup>93</sup> 25% of accredited businesses are considered “small” by the regulator based on the tonnage handled, and therefore pay the lower registration fee

<sup>94</sup> 93% divided by 39%.

<sup>95</sup> Micro businesses make up 63% of businesses and 11% of turnover. Therefore 1% of turnover/packaging is received by 5.6% of businesses. 3% of packaging is handled by 16.8% of businesses, assuming all are micro.

### Additional requirements on accredited reprocessors & exporters

Accredited reprocessors and exporters are currently required to provide regulators with a breakdown of how they have spent revenue received from selling evidence (PRN/PERNs). In 2020, these businesses reported spending £3.6m on activities involved in complying with regulation. As there were 614 accredited businesses, this amounts to £5.9k per businesses. As discussed in more detail later in this section, these businesses are required to pay a fee to the regulator on becoming accredited. We have used the top and bottom accreditation fee as the two fee levels, dependant on the tonnage of packaging recycled<sup>96</sup> We have assumed that only micro businesses will pay the lower fee level (157 businesses), and all others (457 businesses) pay the top level. Taking this into account, we assume the average fee paid was £3.0k. Thus, the average amount spent by reprocessors and exporters on complying with regulation, aside from regulator fees, was £2.8k per businesses. This is likely to cover the costs of collecting the required data needed.

Engagement with stakeholders representing recyclers of different material types was also conducted to understand the additional costs to businesses from having to provide more granular data on the packaging recycled. A common theme in these discussions was that the majority (if not all) of those currently accredited do collect more granular data than was required by regulation already as this is required for business purposes<sup>97</sup>. It was therefore felt that any additional cost would be minimal<sup>98</sup>.

We have therefore used a range of scenarios to estimate the additional costs to these businesses, which all assume a small increase in costs. We assume that costs, aside from the regulator fee, will increase by 10%, 20% and 50% under the low, central and high estimate.

**Table 31: Additional costs to currently accredited reprocessors/exporters, £m**

	Low	Central	High
<b>Additional costs to accredited reprocessors/exporters</b>	£0.2	£0.4	£0.9

### Familiarisation costs to reprocessors and exporters

It is assumed that all reprocessors and exporters will need to take time to familiarise themselves with the regulations. We spoke to stakeholders who represent reprocessors and exporters and they provided estimates of how many staff would be involved and how long this would take. It was felt that businesses would need a few days to 2 weeks of staff time (FTE) for familiarisation activities. We therefore assume 1 week of FTE as our central option with the full range used as sensitivity in the low and high option. We assume that this will mostly be undertaken by

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<sup>96</sup> The fees gradually increase dependant on the amount of packaging recycled. Regulator fees are as follows; £500 up to 500 tonnes, £2,000 up to 5,000 tonnes, £3,000 up to 10,000 tonnes and £3,631 over 10,000 tonnes.

<sup>97</sup> For example, it is in the interest of the recycler to monitor input material to ensure the quality is in line with the price paid for it.

<sup>98</sup> As stated in the text, industry representatives we spoke to were confident that the majority of businesses in scope would already be collecting more detailed data than current regulations require and that any additional requirements would therefore lead to minimal cost increases.



legal staff, therefore, the median wage for legal/accounting services is used<sup>99</sup>, including a 22% uplift for non-staff labour costs.

**Table 32: Familiarisation costs to reprocessors/exporters, £m**

	Low (614)	Central (662)	High (738)
<b>Familiarisation Costs</b>	£0.35	£0.75	£1.68

## Public sector costs

### Landfill tax

The landfill tax in the analysis is fixed at £94.15 per tonne. This is in line with the landfill tax assumed in WRAP's household collection costs analysis<sup>100</sup> and the analysis for the Simpler Recycling in England Impact Assessment<sup>101</sup>. We assume that this tax rate will remain constant for the period 2025-2034. A fixed landfill tax rate is assumed for the purposes of economic modelling and to be consistent with WRAP recycling options and the Simpler Recycling Impact Assessment. This might underestimate the total costs incurred by LAs should the rate of landfill tax increase.

Residual waste disposal is split between landfill and energy from waste (EfW). Within their modelling for household collection costs, WRAP use data from 'WasteDataFlow'<sup>102</sup> to estimate the split of waste to landfill and EfW. The percentage split used is 81.5% to EfW and 18.5% to landfill. We assume this remains constant throughout the period 2025-2034. Evidence would suggest that a lower proportion of non-household waste is sent to EfW<sup>103</sup>, and we therefore assume that 61% of non-household residual goes to landfill<sup>104</sup>.

The total expenditure on landfill tax is a product of the residual waste tonnages, the landfill tax rate and the tonnage of residual waste disposed to landfill. Table 33 shows the landfill tax expenditure in the central estimate in the

<sup>99</sup> The average hourly wage for legal services is £23.83/hour.

(<https://www.ons.gov.uk/surveys/informationforbusinesses/businesssurveys/annualsurveyofhoursandearningsashe>)

<sup>100</sup> WRAP have kept this constant to show the first order impact to LAs of increased recycling. The landfill tax costs are embedded within the net HH recycling management costs within WRAP's analysis. Thus, we too followed the approach of fixing landfill tax at the 2019 rate rather than projecting forward.

<sup>101</sup> [https://www.legislation.gov.uk/ukia/2024/97/pdfs/ukia\\_20240097\\_en.pdf](https://www.legislation.gov.uk/ukia/2024/97/pdfs/ukia_20240097_en.pdf)

<sup>102</sup> <https://www.wastedataflow.org/>

<sup>103</sup> [https://www.tolvik.com/wp-content/uploads/2021/05/Tolvik-UK-EfW-Statistics-2020-Report\\_Published-May-2021.pdf](https://www.tolvik.com/wp-content/uploads/2021/05/Tolvik-UK-EfW-Statistics-2020-Report_Published-May-2021.pdf); 80% of residual waste to EfW in 2020 was Local Authority collected waste. Although this will include some business waste this is likely to be predominantly household waste.

<sup>104</sup> From Tolvik 2021 it is estimated that 4,940kt of residual from C&I sources is sent to incineration (IBA and RDF). Total municipal C&I is estimated at 12,680kt. This is calculated as 26,846kt (the implied total municipal residual tonnage in Tolvik 2021) minus 14,238kt (the total household residual tonnage in 2020, from UK stats on waste). [https://www.tolvik.com/wp-content/uploads/2021/05/Tolvik-UK-EfW-Statistics-2020-Report\\_Published-May-2021.pdf](https://www.tolvik.com/wp-content/uploads/2021/05/Tolvik-UK-EfW-Statistics-2020-Report_Published-May-2021.pdf)

baseline option. Government receives less landfill tax revenue in option 1 than the baseline option due to the reduction in residual waste as more packaging waste is recycled (due to modulated fees). The household element of this is a transfer from Government to producers under pEPR.

**Table 33: Landfill tax expenditure by each sector - best estimate**

		2025			2029		2034	
	% Residual to landfill	Landfill tax rate	Residual (Mt)	Landfill tax expenditure (m)	Residual (Mt)	Landfill tax expenditure (m)	Residual (Mt)	Landfill tax expenditure (m)
	(a)	(b)	(c)	(a)*(b)*(c)	(d)	(a)*(b)*(d)	(e)	(a)*(b)*(e)
<b>HH</b>	18.5%	£94.15	1.83	£31.9	1.52	£26.4	1.46	£25.4
<b>NHM</b>	61.0%	£94.15	0.94	£54.0	0.73	£42.1	0.76	£43.7
<b>C&amp;I</b>	61.0%	£94.15	0.92	£53.1	0.93	£53.3	0.93	£53.4
<b>Total</b>			3.70	£139.0	3.18	£121.7	3.15	£122.4

Table 34 shows that overall, by 2034 there will be an £4.6m per year reduction in landfill tax payments as a result of pEPR.

**Table 34: Reduction in landfill tax net of baseline, £m**

	2025	2029	2034
<b>HH</b>	-£0.5	-£3.2	-£4.6
<b>NHM</b>	£0.0	£0.0	£0.0
<b>C&amp;I</b> <sup>105</sup>	£0.0	£0.0	£0.0
<b>Total</b>	-£0.5	-£3.2	-£4.6

### Investment in IT costs

Funding is required to establish IT systems and nearly all the costs are expected to be incurred prior to the appraisal period. We have included these costs in the NPV calculations following advice from RPC.

This will amount to £100.5m in total and will fund the development phase, including the design, procurement, testing and roll out of new systems, and transition from the National Packaging Waste Database (NPWD)<sup>106</sup> to the new system. These costs have been estimated by Defra's Digital, Data and Technology Service (DDTS) based on their expert knowledge of IT projects.

Once the IT system has been developed, the costs of running the IT system will be borne by producers through the administrative fees they pay to the scheme administrator and the regulators as shown in in Table 20.

<sup>105</sup> It is assumed that EPR will have no impact on other C&I packaging recycling rates, so there is no reduction in residual.

<sup>106</sup> <https://npwd.environment-agency.gov.uk/>

**Table 35: IT Investment costs, £m**

£m	2021	2022	2023	2024	2025	Total
IT Investment costs	£2.4	£3.1	£20.8	£39.0	£35.1	£100.5

## BENEFITS

### Benefits to producers (indirect)

It is expected that there will be efficiency savings to HH collection costs due to increased recycling capture rates. Although recycling collection and treatment costs will increase, this will be more than offset by reduced residual collection and disposal costs leading to lower costs overall. As these costs will be borne by producers, higher levels of recycling and more efficient collections will mean lower compliance costs.

These estimates are based on WRAP's modelling of HH collection and treatment costs, with additional assumptions to estimate the impact of modulated fees on packaging tonnages. Estimated increased tonnages in household recycling, as discussed earlier in the chapter, are assumed to be diverted from residual to recycling. The tonnage (225kt) is multiplied by the cost of residual waste disposal costs per tonne (EfW and landfill gate fees, and landfill tax). This leads to a reduction in residual costs of £11.4m by 2034.

To estimate the impact on recycling costs, it is assumed that higher recycling leads to increased bulking costs. The proportion of material assumed to be collected through comingled streams is multiplied by the average Material Recovery Facility (MRF) gate fee, whereas the tonnage assumed to be separately collected is multiplied by the relevant material revenue. Overall, this leads to net savings of £21.1m by 2034.

Overall, this leads to a net saving of £32.4m per year by 2034 to obligated producers, as local authorities will transfer collection costs to them once pEPR is in place. As these benefits are dependent on producers increasing the recyclability of their products and the behaviours of households acting on communications campaigns and placing additional recycle in their recycling bin, they are considered indirect and are therefore not included in the Equivalent Annual Net Direct Cost to businesses (EANDCB) calculation.

**Table 36: Difference in HH collection and treatment costs on baseline, £m**

	2025	2029	2034
Recycling	£0.0	-£15.6	-£21.1
Residual	-£2.1	-£8.4	-£11.4
Total	-£2.1	-£24.0	-£32.4

### Benefits to reprocessors

#### Secondary market profit margin (indirect)

One of the main benefits to reprocessor businesses is the material revenue from the sale of any additional packaging material sent for recycling. Unpublished research by Valpak<sup>107</sup> suggests that reprocessors plan to significantly increase their capacity over the next 5 years, however some additional investment will still be needed to meet the expected increase in recyclate under the waste reforms. We have assumed that the prospective financial gains should offer sufficient incentive for reprocessors to invest accordingly.

Revenue can be gained for packaging collected for recycling at two stages in the waste supply chain. The first is for separately collected recyclate as collected, for example, by LAs. The second is when recyclers sell reprocessed materials to be used as inputs for new products. The benefits to LAs from selling recyclate are already accounted for in the assessment of the net cost of recycling collections. For this reason, we account for benefits to reprocessors only here.

These wider economic benefits occur down the supply chain, i.e., at the stage of reprocessing and recycling dry materials that are then sold on the secondary materials markets. These benefits are considered indirect, and therefore not included in the EANDCB. To calculate total materials sold to the secondary materials markets we have used the projected recycling tonnages estimated for this impact assessment. We have then multiplied the tonnage placed on market for each material each year by the projected recycling rates. From that we have removed the tonnage of material that is exported, as the overseas reprocessors/recyclers would benefit from selling these materials in the secondary materials market<sup>108</sup>. We have then multiplied the tonnage of reprocessed/recycled material by the reprocessed material prices. These are the prices paid in the secondary market when reprocessed materials are sold. As a conservative estimate we assume average reprocessed materials prices will be flat over the period to 2034. The table below presents the reprocessed materials prices. This process is displayed iteratively below.

$$1). \text{ POM Tonnage} \times \text{Recycling Rate} = \text{Recycling Tonnage}$$

$$2). \text{ Recycling Tonnage} \times (1 - \% \text{ of recycling exported}) = \text{Domestic Recycling}$$

$$3). \text{ Domestic Recycling} \times \text{Reprocessed Materials Market Price} = \text{Material Revenue}$$

**Table 37: Reprocessed materials prices (£/t)**

	2025	2029	2034
<b>Paper</b>	400	400	400
<b>Glass</b>	50	50	50
<b>Aluminium</b>	1,578	1,578	1,578
<b>Steel</b>	560	560	560
<b>Plastic</b>	884	884	884

<sup>107</sup> The Impacts of a ban of Export of Plastic Waste (Valpak) 2021 (unpublished)

<sup>108</sup> <https://wrap.org.uk/resources/report/packflow-covid-19-reports>

To account for the additional profit margin rather than the revenue, we have applied a proxy for profit margin to the turnover values based on data from the Annual Business Survey (ABS) which details GVA and turnover<sup>109</sup> for individual sectors, including the UK recycling sector. We have assumed a gross margin of 25% for UK based recyclers. This is based on historical GVA/turnover for the materials recovery and glass/paper sectors. This is applied to the additional turnover resulting from the policies to estimate net impact on margins.

To sum up, this is the formula that has been used for each material for each year:

$$\text{POM tonnage} \times \text{Material Recycling Rate} \times (1 - \% \text{ of recycling exported}) \times \text{Reprocessed Material Price} \times 0.25 = \text{Gross Profit Margin of Reprocessors}$$

Table 38 shows the net gross profit to the recycling and reprocessors sectors under the baseline.

**Table 38: Baseline material gross profit from recycled material – central option (£m)**

	2025	2029	2034
<b>Reprocessors and recyclers gross profit margin</b>	£301.8	£330.6	£339.8

We have then calculated these benefits with recycling rates and tonnages for option 1 and to assess the additional revenues originating from the introduction of pEPR using the formulae above. We have then subtracted the baseline revenues from option 1, presenting the additional benefits originating from pEPR. Table 39 shows the net gross profit to the recycling and reprocessors sectors under option 1 net of the baseline. By 2034 there is approximately £11m per year in additional gross profit to reprocessors.

**Table 39: Option 1 gross profit margin of recyclers/reprocessors (net of baseline) – best estimate option (£m)**

	2025	2029	2034
<b>Best estimate</b>	£0.9	£3.2	£4.0

<sup>109</sup><https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/datasets/uknonfinancialbusinesseconomyannualbusinesssurveysectionsas>

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## Benefits to society

### Greenhouse-Gas Savings

An environmental benefit of pEPR is the reduction in greenhouse gas (GHG) emissions as a result of increased recycling. As discussed earlier in the assessment, by 2034 there is estimated to be an additional 387Kt of packaging diverted to recycling from residual waste.

**Table 40: Additional packaging diverted to recycling from residual waste (Kt)<sup>110</sup>**

	2025	2029	2034
Plastic	4	31	53
Wood			
Aluminium			
Steel	1	7	8
Paper/Card	3	14	20
Glass	11	102	128
Fibre Based Composite	4	12	15
<b>Total</b>	<b>24</b>	<b>166</b>	<b>225</b>

Diverting waste from residual to recycling will create GHG emissions savings. These are estimated here. The calculations are based on BEIS greenhouse gas conversion factors from 2019<sup>111</sup> as well as WRAP modelling. These conversion factors allow organisations and individuals to calculate GHG emissions from a range of activities, including waste disposal and recycling<sup>112</sup>. The carbon factors used in this appraisal account for the different GHG emissions associated with the process of recycling compared to sending waste to EfW or landfill. These factors incorporate emissions at each stage of the process, including the transport of the packaging, energy used in recycling and emissions released from either burning waste in EfW or during the breakdown of waste in landfill. One of the main benefits of recycling, however, is the forgone virgin material produced. Producing virgin materials tends to have a significantly higher GHG impact than using recycled materials. This is also accounted for by the carbon factors.

Overall, there is estimated to be around 200kt of emissions savings per year by 2034.

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<sup>110</sup> Figures might not add up due to rounding.

<sup>111</sup> <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018>, using these factors to align with wider CPR final Impact Assessments.

<sup>112</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/726911/2018\\_methodology\\_paper\\_FINAL\\_v01-00.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/726911/2018_methodology_paper_FINAL_v01-00.pdf)

**Table 41: Carbon reductions**

	Carbon reductions (t)		
	2025	2029	2034
<b>Plastic</b>	7,034	52,205	89,844
<b>Wood</b>	0	0	0
<b>Aluminium</b>	0	0	0
<b>Steel</b>	1,606	9,345	10,765
<b>Paper/Card</b>	-60	-235	-340
<b>Glass</b>	1,064	10,162	12,763
<b>Composite Fibre</b>	445	1,347	1,657
<b>Total</b>	10,089	72,823	114,689

For each of the Options' GHG emissions savings, we applied the carbon prices as presented in Table 42 over the appraised period. These are the updated prices released by BEIS in 2021<sup>113</sup>.

**Table 42: Applied carbon prices, in £/t of CO2**

	Low	Central	High
<b>2025</b>	£130	£260	£390
<b>2026</b>	£132	£264	£396
<b>2027</b>	£134	£268	£402
<b>2028</b>	£136	£272	£408
<b>2029</b>	£138	£276	£414
<b>2030</b>	£140	£280	£420
<b>2031</b>	£142	£285	£427
<b>2032</b>	£144	£289	£433
<b>2033</b>	£147	£293	£440
<b>2034</b>	£149	£298	£447

By applying the carbon prices, it is estimated that £69.6m in societal benefits through greenhouse gas emissions reductions will be achieved per year as a result of pEPR in 2034. These savings are presented in Table 43.

<sup>113</sup> <https://www.gov.uk/government/publications/valuing-greenhouse-gas-emissions-in-policy-appraisal/valuation-of-greenhouse-gas-emissions-for-policy-appraisal-and-evaluation>



**Table 43: Total carbon savings**

	2025 (£m)	2029 (£m)	2034 (£m)
Plastic	£1.8	£14.4	£26.8
Wood	£0.0	£0.0	£0.0
Aluminium	£0.0	£0.0	£0.0
Steel	£0.4	£2.6	£3.2
Paper/Card	£0.0	-£0.1	-£0.1
Glass	£0.3	£2.8	£3.8
Composite Fibre	£0.1	£0.4	£0.5
<b>Total</b>	<b>£2.6</b>	<b>£20.1</b>	<b>£34.2</b>

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## **Public sector benefits**

### **IT Cost Recovery**

To cover the cost of the initial investment in developing the IT services required for pEPR to operate as outlined in Table 34, regulators and the Scheme Administrator will be required to pay an annual fee to Government to recover the initial cost of investment.

Regulators are expected to pay for this through producer registration costs, whilst the Scheme Administrator is expected to fund this through their administration costs paid by producers.

This represents a transfer from producers to Government, as in the previous 2021 consultation IA, it was only recorded as a cost to businesses.

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## **Non-monetised benefits:**

- **A more vibrant domestic reprocessing market:** The measures aim to drive better design of packaging to enable greater recycling and to achieve consistency in the packaging materials collected for recycling. These measures are designed to increase the quantity and quality of material available to UK reprocessors, thereby increasing their confidence that they can access materials of the required quantity and quality on a consistent basis. This will be beneficial in creating a stronger, more stable, and more vibrant domestic reprocessing market.
- **Less contamination of recycle:** As consumers respond to mandatory recyclability labels and become more effective recyclers (i.e., they correctly put recyclable items in the recycling bins and put non-recyclables into residual waste), contamination levels in mixed recycling collections are expected to reduce. This is likely to reduce the gate fees at materials recovery facility (MRFs). LAs currently effectively 'pay twice' for contamination. They pay a gate fee for recycling materials to be sorted at MRFs, typically in the range £40-50<sup>114</sup> / tonne. This process removes non-recyclable and contaminating materials which then need to be disposed of at a typical cost of £80-120 / tonne<sup>115</sup>.

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<sup>114</sup> <https://wrap.org.uk/resources/report/gate-fees-report-2020>

<sup>115</sup> <https://www.letsrecycle.com/prices/efw-landfill-rdf-2/efw-landfill-rdf-2019-gate-fees/>

In addition, these are some of the system-wide benefits to the producer responsibility system.

- **Incentives for long-term innovation and strategic planning:** the reforms will create a more stable and transparent system that will de-risk investment in innovation and encourage strategic planning.
- **Increased transparency:** several measures will help towards creating a clearer and fairer system. This will benefit all actors in the system by creating a level playing field and giving stakeholders confidence in the system.
- **Reduced packaging:** as producers will have to cover Local Authority disposal costs for managing household packaging they place on the market that becomes waste in households, this will be a strong driver to encourage producers to use less packaging. This will in turn reduce the use of virgin materials as well as the environmental impact of manufacturing this packaging.
- **Circular economy:** the changes to the packaging producer responsibility regime will help in creating a more circular economy where less is wasted, and packaging materials are kept in the economic cycle for longer.

## SUMMARY OF COSTS AND BENEFITS TO BUSINESSES AND SUMMARY OF EANDCB

The table below summarises the direct costs and benefits to businesses in each option and displays the EANDCB. This also includes an explanation of why these costs and benefits are considered direct as well as a summary of the data used and the robustness/uncertainty in these estimates.

**Table 44: EANDCB Estimate, Justification for direct and key data**

<b>Present Value (2025-34) £m</b>	<b>Justification for direct</b>	<b>Key data sources and uncertainty/robustness</b>	<b>Option 1 Present Value, £m</b>
<b>Transition Costs</b>			
Producer - pEPR Familiarisation	These costs are necessary for producers to understand their obligation under pEPR to ensure they are compliant.	These costs are an aggregate of costs provided by various stakeholders, including compliance schemes who exist to help producers to comply with packaging regulation. There is some uncertainty in the number of producers that will be captured under pEPR which is reflected in the range of estimates.	£2.5
Reprocessor/Exporter - Familiarisation	These costs are necessary for businesses in understanding the new regulations and ensuring compliance.	These costs are based on information provided by representatives of the recycling industry across different material types and including reprocessors and exporters.	£0.8
<b>Costs</b>			
Producer - Household Packaging waste management (Kerbside collections) - Transfer	Under pEPR producers will be required to cover the Local Authority disposal costs for managing household packaging. This is a necessary cost to obligated producers however the costs to individual producers will be based on the amount of packaging they place on the market.	These costs have been modelled by WRAP who have spent a number of years collecting data, engaging with stakeholders and developing their model (see Evidence Summary to see how this differs to model being used to calculate actual LA payments). There are some uncertainties, for example the model must account for the decisions of individual LAs in response to consistent recycling in England and the amount of packaging diverted from households due to DRS.	£10,727.3

<p>Producer - Household Packaging waste management (HWRC) - Transfer</p>	<p>Under pEPR producers will also cover the cost of packaging collected from households through Household Waste and Recycling Centres (HWRC). This is a necessary cost to obligated producers.</p>	<p>These costs have also been modelled by WRAP as part of the same exercise as above, based on data collected from LAs and other key stakeholders. These estimates rely on certain assumptions such as around how packaging tonnages and costs to LAs will change over time.</p>	<p>£368.7</p>
<p>Producer - Scheme Administrator (including IT)</p>	<p>Obligated producers will be required to cover SA costs including IT costs under pEPR. This is a necessary cost under pEPR.</p>	<p>IT costs were estimated by Defra's Data, Digital and Technology Services who have expert knowledge in IT systems however it was not possible to fully test this with stakeholders before the publication of the government response as the scope is dependent on final policy decisions. The other SA costs were estimated using research by WRAP as well as confidential data provided by Valpak who have experience of supporting businesses meet their packaging obligations. These have been adjusted based on the expected number of producers in scope of pEPR however this remains uncertain to an extent.</p>	<p>£143.1</p>
<p>Producer - Compliance Scheme</p>	<p>These are largely data reporting costs as well as support in complying with packaging regulations. Data reporting is a necessary aspect of the policy and as such these costs are necessary to producers. It should be noted that producers are not required to join compliance schemes, however, they would face costs of carrying this out internally if they did not.</p>	<p>These costs are aggregate costs based on information provided by several stakeholders, including compliance schemes. The aggregate costs rely on estimates of the number of businesses that will be obligated by the policy.</p>	<p>£116.9</p>
<p>Producer - Regulator</p>	<p>Obligated producers will be required to register with the regulator and pay a fee to the regulator. This is a necessary cost to producers.</p>	<p>These costs were provided by the Environment Agency, one of the four national regulators. These are initial costs based on modelling however, and a more robust costing exercise will need to be undertaken by regulators before the final fees are</p>	<p>£157.0</p>

		set. A range of costs are used in the IA for sensitivity.	
Producer - SA Comms Campaigns	The SA will have the ability to request payment from producers to pay for communication campaigns to households and businesses where they feel this will increase packaging recycling rates. This will likely be in discussion with producers. This will be a necessary cost to producers.	These costs are based on modelling by WRAP. The uncertainty in these estimates emanates from the uncertainty in how the SA will decide to approach these communications campaigns. For example, the costs in the IA assume that the SA will pay for one-to-one business support. There is also uncertainty as to whether this would be needed on an ongoing basis or could be reduced or ceased after a certain period.	£114.9
Reprocessor/Exporter - Regulator	These are necessary costs to any reproducers and exporters currently not registered with the regulator who will be required to register under pEPR.	These costs are based on the fees charged to reproducers/exporters currently as regulators were not able to provide more information on how these costs might change. These are therefore liable to change in the future.	£0.2
Reprocessor/Exporter - Additional Data	These are necessary costs to reproducers and exporters of complying with the requirement to report more granular data.	These costs are based on data provided by reproducers and exporters through the National Packaging Waste Database. Costs were supported by additional information from representatives from the sector.	£4.4
<b>Total Costs</b>			£11,635.9
<b>Total Benefits</b>			£0.0
<b>Net Costs</b>			£11,635.9
<b>EANDCB (Annualised)</b>			£1,351.8

All costs to businesses are expected to be direct and unavoidable costs as a result of regulation, however there are several benefits to businesses which are considered to be indirect and therefore not included in the table above and in the EANDCB calculation. MF costs in this Impact Assessment have been removed from the EANDCB, as they are introduced under separate regulations. They are shown in the central case for full transparency.

**Table 45: Indirect costs & benefits to business**

<b>Present Value (2025-34) £m</b>	<b>Justification for indirect</b>	<b>Key data sources and uncertainty/robustness</b>	<b>Option 1</b>
<b>Transitional Costs</b>			
Materials Facility - Capital and Familiarisation	These include one-off capital and familiarisation costs necessary to meet sampling and compositional requirements under the regulations, separate to the pEPR regulations.	These costs are largely based on research by WRAP and Waite Resource Management Ltd who surveyed likely in scope MFs and organised trails at four MFs. Due to this data coming from a small sample size, this was supported by data used in the previous MF regulation Impact Assessment and subsequent review. The same research project also estimated the number of new MFs that would come into scope. The numbers in each nation have since been revised in the laying of the amending MF regulations in England and Wales, and the development of equivalent codes of practice in Scotland and Northern Ireland. However, we acknowledge that there is uncertainty in this number.	£7.5
<b>Annual Costs</b>			
Material Facility - Operational Costs	These costs relate to staff and other operational costs related to meeting sampling and compositional requirements under the updated MRF regulations and as such they are necessary to businesses as they are separate to the pEPR regulations.	These costs are largely based on research by WRAP and Waite Resource Management Ltd who surveyed likely in scope MFs and organised trials at four MFs. Due to this data coming from a small sample size, this was supported by data used in the previous MF regulation Impact Assessment and subsequent review.	£24.6
Material Facility - Regulator		Regulators were not able to provide an estimate for costs under changes to the Regulation. These costs are based on the fees required under the current MF regulations, with some additional assumptions around how these might change.	-£1.0
Producer - Net Collection Cost Savings	Although this benefit will directly impact the amount producers pay under pEPR fees, it is dependent on behaviour of producers in changing to more recyclable packaging and consumers making changes based on communications campaigns.	These savings come from increased recycling from modulated fees. This relies on the estimates from the Eunomia	£192.7

		<p>modulated fees model<sup>116</sup>. The outputs of this model are seen as an illustrative example of the impacts of modulated fees based on a particular approach to the fees. The fees will ultimately be set by the scheme administrator, so the exact mechanism is currently unknown. Sensitivity analysis is included in the following section. A review of pEPR schemes in Europe suggests significant packaging recycling rate impacts can be achieved – higher than have been assumed in this analysis.</p>	
Reprocessor - Secondary Material Market	This benefit occurs later down the supply chain, also relying on producer and consumer behaviour changes.	<p>These benefits arise from increased recycling due to modulated fees (option 1). Assumptions have been made on the proportion of packaging to be recycled in the UK (based on Valpak’s PackFlow reports<sup>117</sup>), revenue per tonne received by the reprocessor based on Valpak research<sup>118</sup> and the proportion of revenue that is profit based on ONS data<sup>119</sup>.</p>	£47.7

<sup>116</sup><http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20310&FromSearch=Y&Publisher=1&SearchText=Extended%20Producer%20Responsibility&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

<sup>117</sup> <https://www.wrap.ngo/resources/report/packflow-refresh-2023-reports>

<sup>118</sup> Valpak, (2019) The impact of proposed packaging policy reforms on the UK’s secondary materials markets

<sup>119</sup> <https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/datasets/uknonfinancialbusinesseconomyannualbusinesssurveysectionsas>

## SENSITIVITY OF MODULATED FEES AND IMPACT ON COSTS AND BENEFITS

The impact of modulated fees on recycling rates will ultimately come down to decisions on approach taken by the Scheme Administrator, and the subsequent decisions of producers. The outputs modelling for this IA are included as an example of the potential impacts of modulated fees, however, they may not reflect the final approach to modulated fees. The modelling is also a simplistic representation of the decisions made by producers under this scenario. We have therefore conducted sensitivity analysis to understand the impact on the outcomes of the policy should the impacts of modulated fees differ from those estimated for this analysis.

Three key outcomes could be influenced by the impact of modulated fees on recycling rates:

- Overall packaging recycling rates
- Greenhouse gas emissions
- Household packaging collection and end-of-life management costs

Three scenarios were modelled for the modulated fees sensitivity analysis:

- Low - No additional recycling from modulated fees. Under this scenario there will still be some additional recycling from pre-pEPR switches from harder to recycle materials.
- Central scenario – As presented in the main IA text.
- High Scenario – Modulated fees impact on recycling rates is double that in the main modelling. For some individual packaging types (for example some Steel packaging) this would push the recycling rate above 100%. A limit of 100% recycling rate was placed on each packaging type.

### **Recycling rates**

Overall, it is estimated that under the high scenario, an additional 179kt of packaging is recycled every year by 2034 than under the central scenario. This increases the overall packaging recycling rate by around 1% point above the central scenario.

**Table 46: Impact of modulated fees sensitivities on recycled tonnage**

Kt	Low	Central	High
Plastic	6	53	100
Wood	0	0	0
Aluminium	0	0	0
Steel	0	8	10
Paper/Card	0	20	40
Glass	0	128	238
Fibre based composite	0	15	15
<b>Total</b>	6	225	404

Under the low scenario it is estimated that there will be 218kt less packaging recycled annually by 2034 than under the central scenario. This leads to a 2-percentage point decrease in packaging recycling rates compared to the central scenario.



**Table 47: Impact of Modulated fees sensitivities on recycling rates**

<b>Kt</b>	<b>Low</b>	<b>Central</b>	<b>High</b>
<b>Plastic</b>	60%	62%	64%
<b>Wood</b>	42%	42%	42%
<b>Aluminium</b>	40%	40%	40%
<b>Steel</b>	81%	83%	84%
<b>Paper/Card</b>	90%	90%	90%
<b>Glass</b>	74%	79%	83%
<b>Fibre based composite</b>	28%	37%	37%
<b>Total</b>	73%	75%	76%

### **Greenhouse gas emissions**

The increase in recycling diverted from residual in the high scenario and decrease in the low scenario leads to changes to the amount of GHG emissions savings. Under the low scenario there are 104kt fewer emissions savings per year by 2034 which equates to £31m fewer in additional savings to society. In the high scenario there are 92kt additional GHG emissions savings per year by 2034, which equates to £28m in additional savings to society.

**Table 48: Impact of modulated fees on GHG savings**

<b>2034</b>	<b>Low</b>	<b>Central</b>	<b>High</b>
GHG Emissions Savings (t)	10,812	114,689	207,021
GHG Savings (£m)	£3.2	£34.2	£61.7

## SECTION 6: RATIONALE AND EVIDENCE TO JUSTIFY THE LEVEL OF ANALYSIS USED IN THE IA (PROPORTIONALITY APPROACH)

We have significantly expanded the evidence base and analysis compared to the 2022 final stage impact assessment<sup>120</sup>. Of particular note, we have included the following additional pieces of analyses in this IA:

- Estimates of the impact of Covid-19 on the production and consumption of packaging.
- Assessment of the impact of pEPR on consumer prices.
- Estimates of obligated producers – including online marketplaces.
- Monitoring and enforcement costs.
- Familiarisation costs to all businesses impacted.
- The inclusion of additional materials from Simpler Recycling in pEPR fee calculations.

Furthermore, we have developed our evidence base as far as possible through extensive stakeholder testing and engagement, and literature reviews. Evidence from stakeholders include costs, time required to familiarise with the policy, capital costs, and further analysis since the 2021 consultation IA.

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<sup>120</sup> [Impact Assessment \(publishing.service.gov.uk\)](https://publishing.service.gov.uk)

## SECTION 7: KEY RISKS AND UNCERTAINTIES

	<b>Risk/Uncertainty</b>	<b>Mitigation</b>
<b>Local Authority disposal cost estimates for managing household packaging</b>	Household collection and treatment costs have been estimated by WRAP who have been developing specific models to estimate these costs for a number of years. They have collected relevant data and engaged key stakeholders to increase the robustness of the modelling. There are however some uncertainties in the estimates. For example, the costs rely on assumptions related to how local authorities will react to consistent recycling policy and which collection systems will be put in place. Similarly, assumptions have had to be made about the impact of DRS on tonnages collected and other knock-on impacts.	The WRAP household collection and treatment cost assumptions have been used as data inputs for this indicative level assessment. In reality, the pEPR producer fees to Local Authorities are calculated by the LAPCAP model with updated, self-submitted by individual LA's, cost and tonnage assumptions.
<b>Number of producers below the de minimis</b>	The 2021 pEPR consultation put forward options to lower the de minimis threshold such that a producer is obligated if they have a turnover of at least £1m and supply 25t of packaging. Although there was support for this option through the consultation, it is uncertain how many additional producers this would bring into obligation. Analysis by Eunomia estimated an additional 1,800 producers in scope, however there was a high level of uncertainty to this estimate, with their analysis showing the figure could be as high as 15,000 <sup>121</sup> . Previous analysis for the 2019 consultation estimated around 3,900 producers. Internally modelling by Valpak suggest the number could be 3,500-4,000 <sup>122</sup> .	Within the IA analysis, the central estimate uses the average of the Eunomia, Valpak, and 2019 consultation estimate. 14,900 is used as the high estimate to account for the uncertainty.
<b>PRN/PERN Prices</b>	As shown in Annex F, PRN prices have been volatile, with prices for some materials rising significantly in 2018 and 2019, before falling	In both the baseline and policy option in this IA, we have modelled two additional prices sensitivities using the last three years of PRN

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<https://sciencesearch.defra.gov.uk/ProjectDetails?ProjectID=20670&FromSearch=Y&Publisher=1&SearchText=Extended%20Producer%20Responsibility&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

<sup>122</sup> Unpublished Valpak analysis.

	<p>in 2020 and 2021, before once again recovering in 2022 and 2023. This impacts the overall cost of packaging regulations to producers and causes uncertainty from year to year. It also makes it difficult to predict how cost to producers will change in the future.</p>	<p>price data. This mitigates the risk of underestimating the overall cost to producers. Note that PRN costs to businesses do not change between the baseline and policy option.</p>
<p><b>Impact of Modulated Fees</b></p>	<p>The impact of modulated fees on the behaviour of producers is dependent on a number of unknowns, including the final packaging categories and fee rates which are set to be finalised by the Scheme Administrator. The estimates in the IA therefore represent an illustrative example of the impact that could occur based on modelling by Eunomia.</p>	<p>Some cautious assumptions have been used in this analysis, for example the potential packaging switches made by producers have been limited to those that are considered highly likely (based on conversations with WRAP). Sensitivity analysis has also been conducted to show how other costs and benefits in the IA would be impacted should modulated fees have a higher or lower impact on recycling rates.</p>

## SECTION 8: WIDER IMPACTS

### SMALL AND MICRO SIZE BUSINESS ASSESSMENT (SAMBA)

Under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007<sup>123</sup>, a producer is an ‘obligated’ packaging producer if it, or a group of companies it is part of, handled at least 50t of packaging materials in the previous calendar year and has a turnover of more than £2 million a year (based on the previous financial year’s accounts)<sup>124</sup>.

Defra has engaged with SMEs in our stakeholder engagement process and has carefully considered any options that may put an unnecessary burden on SMEs. The responses to the 2021 consultation have provided a clear steer on the options presented for the de minimis, with a majority<sup>125</sup> of respondents expressing a preference to reduce the de minimis to incorporate producers who supplied at least 25t of packaging materials in the previous calendar year and had a turnover of £1 million. In addition to the support for a reduction in the de minimis, some respondents stressed the importance for finding a balance between excessive burden being placed on small businesses versus the strong belief in the ‘polluter pays’ principle.

Under the pEPR scheme Brand Owners, packer/fillers, importers or first UK owners, distributors and service providers will be obligated to pay modulated fees to cover waste management costs (for the household packaging they supply). There will also be an obligation on Online Marketplaces to report the packaging being sold through their marketplaces by overseas businesses and pay household packaging waste management costs. Sellers (e.g., supermarkets) will be required to report where they place packaging on the market, but not to pay modulated (household packaging waste management) costs. There are two de minimis thresholds. An “upper” de minimis threshold and a “lower” de minimis threshold. Only those producers who are above the “upper” threshold will be required to pay disposal cost fees. Those that fall between the two thresholds will have reporting obligations only.

The “upper” de minimis threshold be set at £2 million annual turnover and 50t packaging meaning that any producers of this turnover and tonnage band and above are obligated to meet household packaging waste management costs along with reporting. The “lower” de minimis threshold is set at £1 million and 25t packaging meaning that producers of turnover size such that £1-2m and 25-50t packaging supplied are obligated for data reporting and regulator costs only. Producers of size below £1 million and 25t packaging supplied are not obligated.

It is also proposed that Distributors (manufacturers and importers who supply unfilled packaging to businesses who fall *below* the “upper” de minimis threshold) would take on the obligation on their behalf. For example, a manufacturer selling unfilled fibre-based composite cups to a small coffee shop<sup>126</sup>. Below, we consider separately the effect of implementing the proposed de minimis thresholds for the obligated producers and how we are going

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<sup>123</sup> <https://www.legislation.gov.uk/ukxi/2007/871/contents>

<sup>124</sup> <https://www.gov.uk/guidance/packaging-producer-responsibilities>

<sup>125</sup> 57% supported lowering the de minimis, 16% did not support this and 27% were unsure.

<sup>126</sup> Distributors may pass on the cost of meeting the obligations of producers below the de minimis. It is, however assumed that larger businesses would be able to meet the administrative burdens associated with meeting obligations at a lower cost than smaller businesses. Therefore, the de minimis will to some extent shelter the smallest businesses from these costs.

to mitigate any possible disproportionate impact on small and micro enterprises. We also analyse the impact of additional sampling requirements on small and micro MFs.

### *IMPACT ON SMALL AND MICRO PRODUCERS – PEPR*

The 2021 consultation proposed a number of options on the approach to smaller businesses under pEPR. There was strong stakeholder support for lowering the de minimis with a majority of respondents supporting the proposal to lower the de minimis threshold from £2m turnover and supplying 50t of packaging to £1m turnover and 25t of packaging. Those in support believed that lowering the de minimis would result in a more level playing field and was consistent with the polluter pays principle, while some raised concerns about the increased burden on the new, small producers<sup>127</sup>.

#### ***Number of Producers below the de minimis***

An initial estimate of the number of producers below the de minimis was estimated for the 2019 consultation IA<sup>128</sup>. This approach matched industry SIC codes reported by obligated producers in the NPWD<sup>129</sup> to ONS data<sup>130</sup> on the number of businesses by SIC code and turnover type to estimate how many businesses in relevant industries had a turnover of less than £2m. As not all businesses in these sectors will supply packaging, the proportion of producers above £2m in relevant sectors registered in the NPWD was estimated. This was again done by matching the number of NPWD registrants recorded in relevant sectors and matching this to the number of businesses above £2m in those sectors based on the ONS database. This proportion was then applied to ONS businesses below £2m turnover to estimate the number of these businesses that supply packaging and therefore would be obligated if the de minimis was reduced.

Two approaches to the latter part of the modelling were used which resulted in two estimates for the number of packaging producers between £1-2m turnover. The first estimated an aggregate average proportion of businesses across all sectors, by dividing the total number of NPWD producers by all businesses above £2m turnover in sectors with at least one registered NPWD producer. The second did the same calculation but on a specific sector level. As discussed by Eunomia in a later critique<sup>131</sup>, the latter can be shown to be a more robust approach and has provided an estimate of 3,743 packaging producers between £1-2m turnover<sup>132</sup>.

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<sup>127</sup> 57% supported lowering the existing de minimis threshold to £1m turnover and 25 tonnes of packaging placed on the market, 16% did not support this and 27% were unsure.

<sup>128</sup> [https://consult.defra.gov.uk/extended-producer-responsibility/consultation-on-reforming-the-uk-packaging-produce/supporting\\_documents/packagingepconsultimpactassessment.pdf](https://consult.defra.gov.uk/extended-producer-responsibility/consultation-on-reforming-the-uk-packaging-produce/supporting_documents/packagingepconsultimpactassessment.pdf)

<sup>129</sup> <https://npwd.environment-agency.gov.uk/>

<sup>130</sup> UK business: activity, size and location - Office for National Statistics (ons.gov.uk)

<sup>131</sup> <http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20670&FromSearch=Y&Publisher=1&SearchText=Extended%20Producer%20Responsibility&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

<sup>132</sup> The alternative, less robust, approach produced an estimate of 12,273.

Several limitations were identified with this general approach used in the IA and, subsequently, Eunomia were commissioned by Defra to critique this approach and provide a more robust estimate. Further limitations were identified by Eunomia, and they proposed an alternative approach using econometric analysis of the NPWD<sup>133</sup>.

This alternative analysis uses regression analysis on NPWD<sup>134</sup> data to predict the number of producers below the de minimis. The bars in figures 1 and 2 show the number of producers registered in the NPWD at different packaging supplied tonnages and turnover levels. As can be seen, the number of producers grows exponentially as turnover and packaging tonnage supplied falls. As this database only includes producers above the current de minimis<sup>135</sup>, Eunomia use statistical analysis<sup>136</sup> to estimate how this trend would continue for producers below 50t of packaging and £2m turnover respectively. This can be shown by the line on figures 1 and 2. Combining these two estimates Eunomia then estimate the number of businesses at different turnover and packaging supplied combinations below the current de minimis.

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<sup>133</sup><http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20670&FromSearch=Y&Publisher=1&SearchText=Extended%20Producer%20Responsibility&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

<sup>134</sup><https://npwd.environment-agency.gov.uk/>

<sup>135</sup> As can be seen from the graph there are a small number of producers below the de minimis threshold registered.

<sup>136</sup> Regression analysis

Figure 1: Number of producers by packaging supplied (NPWD, graph prepared by Eunomia)

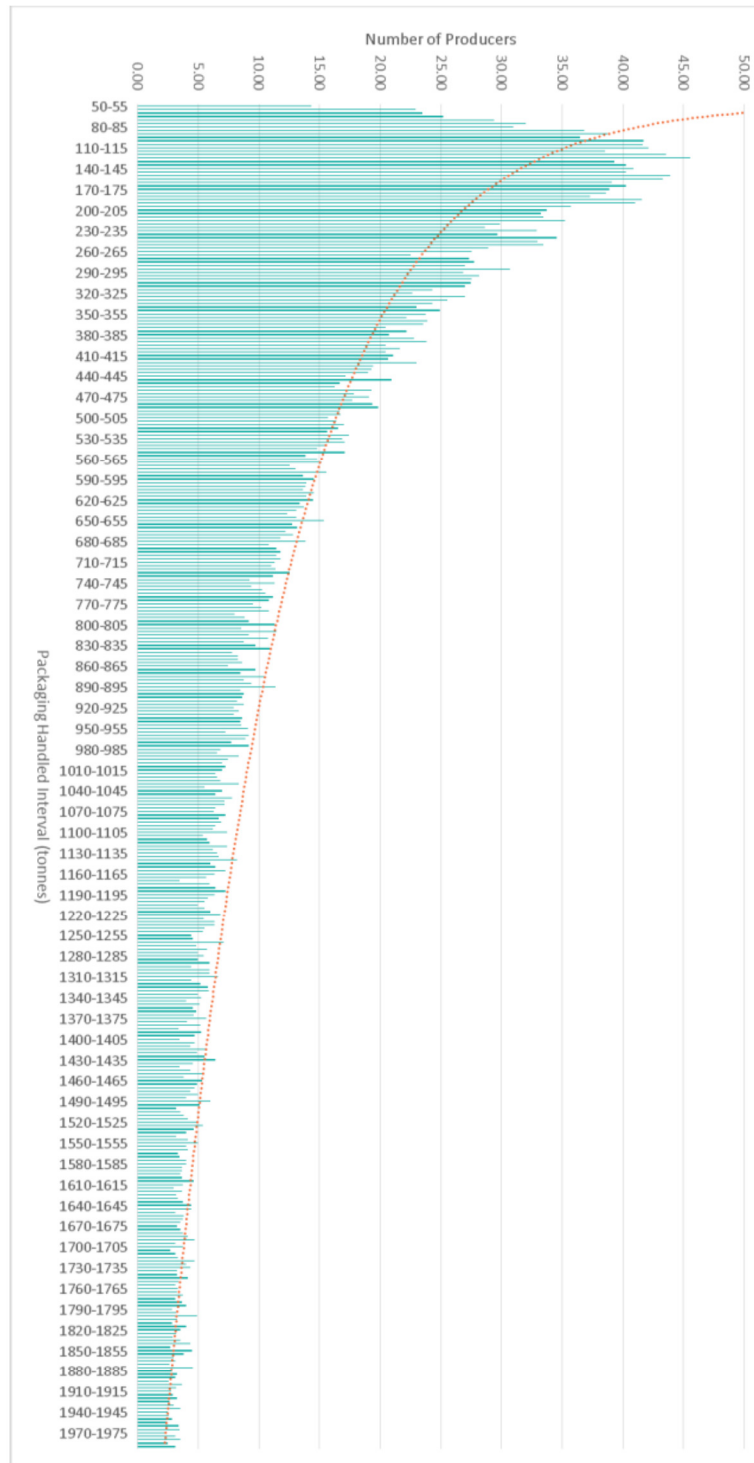
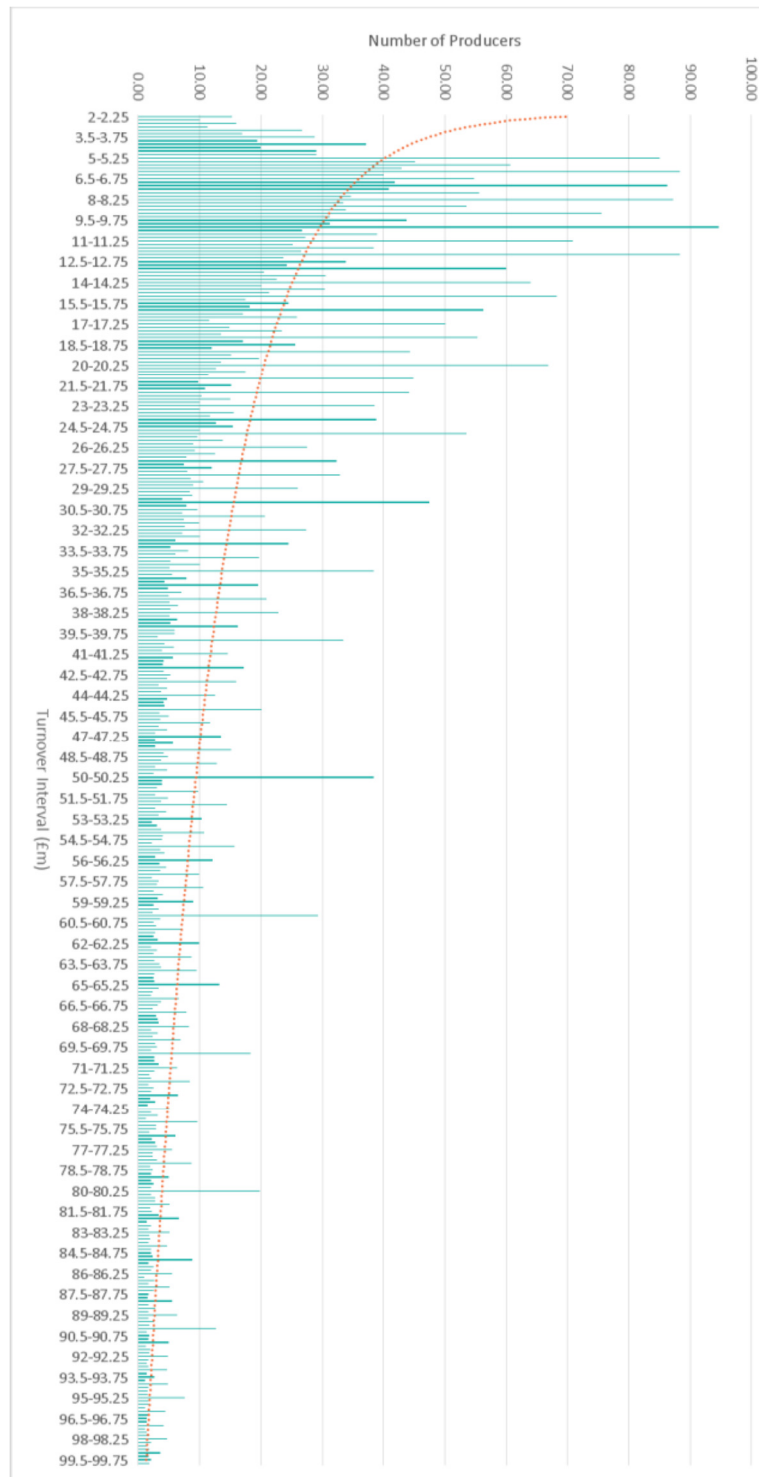




Figure 2: Number of producers by turnover (NPWD, graph prepared by Eunomia)



Overall, Eunomia estimate that around 1,800 additional producers will become obligated if the de minimis is lowered to 25t and £1m turnover. Inherent in all statistical analysis which aims to estimate an unknown population using a known population, there is a certain level of uncertainty. Such analysis relies on the assumption that the trend seen in the known population is the same as for those in the unknown population (rather than changing significantly); in this case, that the exponential growth in the number of businesses as packaging supplied, and turnover decreases both continue at the same rate below the de minimis. Confidence intervals are used by Eunomia to account for this uncertainty. Within Eunomia's analysis, using a 90% confidence interval leads to a high estimate of 14,900<sup>137</sup>. The lower estimate in the analysis was negative<sup>138</sup> however, it was truncated to 0 due to the impossibility of a negative number.

Due to the data available both the 2019 consultation, and Eunomia's estimates, are based on the number of producers under a shared point of compliance as is the case under the current producer responsibility regulations. Although the main point of compliance will move to brand owners, this will likely cover several of the current producer categories. Some compliance will also fall on businesses other than brand owners. As such we have assumed that the number of producers obligated will not reduce. It is however possible that some producers currently obligated will fall out of obligation<sup>139</sup>. Likewise estimates of the number of additional producers under the de minimis may include producers that will not end up being obligated.

Further work on estimating producer numbers included contacting members of the Advisory Committee on Packaging (ACP). Although many were unable to comment, several members responded to say that they felt that the Eunomia and previous Defra estimates are reasonable based on the data available or aligned with their own estimates. In addition, Valpak have advised that internal modelling of their membership database suggests that there could be around 3,500-4,000 additional producers nationally if the de minimis was lowered to £1m turnover and 25t of packaging supplied<sup>140</sup>. This modelling analysed the number of producers by turnover and packaging tonnage based on those currently obligated and extrapolated the trend to provide a broad estimate of the number of smaller producers likely to become obligated when scaled up to a national level.

Given the variation in estimates, and the acknowledgement that there exists uncertainty, we have used the average of these three estimates as the central estimate in the analysis. This accounts for the fact that although the Valpak estimate is more in line with the 2019 consultation estimate, the 2019 consultation is considered to be less robust than the Eunomia approach. The central estimate is therefore 3,100 producers between £1-2m turnover and 25-50t of packaging supplied with a data reporting obligation only.

### ***The De Minimis***

Defra acknowledges that despite best efforts, there is still uncertainty in estimates of the number of businesses below the current de minimis. This uncertainty is such that is difficult to make a reasonable assessment of the impact of lowering the de minimis on businesses below the current de minimis, considering the level of cost to be imposed on business through pEPR. The de minimis threshold, at which producers are obligated to make payments

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<sup>137</sup> Their central estimate is 1,823 however with a 90% confidence interval the overall range is estimated to be between 0 and 14,808.

<sup>138</sup> This was around -11,200.

<sup>139</sup> For example, raw material manufacturers are unlikely to be obligated.

<sup>140</sup> Unpublished Valpak analysis.

towards cost payments and purchase PRN/PERNs, will therefore be retained at £2m turnover and 50t of packaging supplied.

It is however seen as valuable to collect certain data from producers below this de minimis. As such it is proposed that producers with turnover between £1-2m and supplied between 25-50t of packaging will be required to register with the regulator and report data on the amount and types of packaging placed on the market. This would see the main pEPR de minimis remain at £2m turnover and 50t of packaging, with a 'lower' data reporting only de minimis for producers above £1m turnover and 25t of packaging. These costs are included in the main calculations. The key value in the data collected is twofold:

- 1) Data on the amounts and types of packaging placed on the market by producers below the de minimis does not currently exist. This means that Government does not have a full picture of the amounts and types of packaging in circulation in the UK.

A 2018 National Audit Office report<sup>141</sup> on the packaging responsibility regulations suggested that UK estimations of the packaging recycling rate were not robust and was critical of the lack of robust approach to estimating the amount of packaging consumed and recycled. Similarly, a 2019 inquiry into Plastic Packaging by the Environment, Food and Rural Affairs Committee, appointed by the House of Commons, concluded that "the Government does not know how much plastic packaging is placed on market in the UK, nor how much is actually recycled. We have called for the de minimis threshold that determines which businesses must report on packaging, to be significantly lowered."<sup>142</sup>

These comments were made after the publication of Defra's Resources and Waste Strategy and announcement of the intention to move to an Extended Producer Responsibility for packaging, which the Committee supported and highlights the need for this data.

Estimates suggest that packaging supplied by producers below the de minimis could be around 15% of the total packaging in the UK, however without further data collection the scale and composition of this packaging will remain uncertain. This is therefore a key evidence gap which collecting data from a greater number of producers would go some way to filling.

- 2) Requiring these producers to register with the regulator will provide certainty on the number of producers in this category. This will allow for a fuller assessment of the costs and benefits of bringing these producers into full obligation in the future. This is key as Government is keen to ensure the "polluter pays" principle and maximise incentives for producers to use more recyclable packaging, while minimising the impact on smaller businesses.

It should be noted that under the "distributor approach" businesses selling unfilled packaging to producers below the de minimis will be obligated to make pEPR payments for that packaging. This will bring more packaging into obligation and provide more data on the amount and types of packaging placed on the market. This approach will however not go the full way to alleviating the above concerns. This is likely to not bring all packaging placed onto the market into obligation, for example, where producers below the de minimis create or import their own packaging. It will also not provide Government with data on the number of producers below the de minimis, or which businesses are using certain packaging types. Lastly, although it is possible that distributors will pass on some or all of the costs of fee payments, these businesses will not necessarily have transparency on the makeup of costs

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<sup>141</sup> <https://www.nao.org.uk/wp-content/uploads/2018/07/The-packaging-recycling-obligations.pdf>

<sup>142</sup> <https://publications.parliament.uk/pa/cm201719/cmselect/cmenvfru/2080/208003.htm>

they pay for packaging enough that it influences them to make changes to their packaging, such that it may be beneficial in future to obligate these producers fully to increase the impact of pEPR.

The “distributor approach” alongside data reporting requirements for producers between £1-2m turnover and supplying 25-50t of packaging is seen as a suitable combination to bring further packaging into obligation, while collecting sufficient packaging data as well as data on the producers below the de minimis, while also minimising the impact on smaller businesses. These data reporting requirements pose a significantly lower burden on producers than facing a full obligation, and therefore the level of analysis on the number of producers is seen as proportionate.

### ***Data reporting costs***

To understand the extent to which these additional producers are likely to be SMBs we used ONS data<sup>143</sup> to estimate the average turnover per SMB for businesses within SIC codes from which producers are likely to be categorised<sup>144</sup>. This would provide an indication for whether SMBs are likely to have a turnover between £1m and £2m. The average micro business within the SIC codes is estimated to have a turnover of £0.97m, while for small businesses the average turnover is £5.69m. This suggests that the average micro business will remain below the “lower” de minimis threshold, however it is likely that some may be newly obligated under data reporting requirements (if they also supply more than 25t of packaging). The average small business would already meet the turnover threshold to be obligated under the current system, however some may become newly obligated.

Producers obligated for data reporting will face a significantly lower reporting burden than those above the de minimis, only being required to report annually and only having to report at material level rather than more granular packaging type data. This is much closer to the reporting obligations under the PRN system, which helps in estimating costs per business.

Discussions with stakeholders and compliance schemes suggests that data reporting costs under the current scheme range from £500-£3000, with an average of around £1500. The level of cost depends on the complexity of the task, usually related the size of the business. Based on discussion with stakeholders, we assume that producers over the de minimis face costs of £1500 on average for PRN reporting. However, compliance schemes have advised that although there are exceptions, on average smaller producers have fewer and less complicated packaging and therefore face lower reporting costs. Based on these discussions we use £1000 as the central estimate for those producers with a data reporting obligation only. These costs are in contrast to the average £3000 per year data reporting costs we estimate for producers above the de minimis.

It is assumed that, as with the majority of producers currently obligated, these producers can outsource their data reporting requirements to compliance schemes who have the resources and infrastructure in place. Under this scenario producers would only be required to provide the compliance scheme with basic sales data, therefore the infrastructure required would not be more than a computer with spreadsheet software. It is assumed that producers collect this data already for their own business purposes.

These producers will also be required to pay an annual fee to the regulator. For the purpose of this analysis, we assume that this will be £1216 as laid out in the regulations in Section 5 of this Impact Assessment. We therefore assume costs of £2216 per producer, not including £850 additional costs in year 1.

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<sup>143</sup> <https://www.ons.gov.uk/businessindustryandtrade/business/businessservices/methodologies/annualbusinesssurveyabs>

<sup>144</sup> It is assumed that the majority of producers will be within the Manufacturing and Wholesale & Trade categories.

Table 66 compares the burden of producers with a data reporting obligation only to those who are fully obligated. To estimate the average cost per producer for fully obligated producers an estimate of the average cost per tonne for pEPR payments and PRN payments is calculated and multiplied by the average compliance cost per tonne. To estimate the average cost per tonne of packaging we have divided the total compliance costs to producers (including SA costs) by the total tonnage of packaging supplied. We estimate that the cost of complying with the requirement to purchase PRNs for all packaging, will be £45 per tonne, whereas the cost of complying with pEPR payments will be £232 per tonne<sup>145</sup>.

It should be noted that this average cost per tonne of £232 for pEPR fees is not comparable to the per-material fee as set out in the illustrative base fees report<sup>146</sup>. This £232 figure is an average figure, calculated by summing costs that producers will be responsible for paying for (e.g., Scheme Administrator costs and Local Authority disposal costs for managing household packaging) and dividing through by the total amount of household packaging placed on the market.

There are close to 7,000 producers currently obligated under the PRN system who combined handle around 10Mt of packaging<sup>147</sup>. This suggests that the average fully obligated producer will handle around 1.4kt of packaging. Our modelling<sup>148</sup> estimates that 43% of packaging is household packaging. Multiplying this by 1.4kt suggests that on average around 616t of packaging handled by fully obligated producers is household and in scope of pEPR payments. Multiplying £232 by 616t gives an estimate of around £143k on average per fully obligated producer for pEPR payments<sup>149</sup>. Multiplying 1.4kt by £45 gives an estimate of around £65k on average per fully obligated producer for PRN obligations. The average cost to fully obligated producers is therefore around £208k.

To estimate the average turnover of fully obligated producers the average turnover of the Manufacturing and Wholesale & Retail sectors (excluding micro businesses), from which around 85% of currently obligated producers derive<sup>150</sup>, was taken from ONS data<sup>151</sup>.

The average fully obligated producer is therefore estimated to have a turnover of £26m and face costs of £208k, which equates to 0.8% of turnover. This is in contrast to producers with a data reporting obligation only who are estimated to have an average turnover of £1.5m and face additional costs of £2,216 per year (0.15% of turnover). It should be noted that these costs are average costs. The cost to individual producers will depend on the amount of packaging they place on the market which is shown to be related to their size such that smaller producers would be expected to face smaller nominal costs.

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<sup>145</sup> For example, in 2025 the costs to producers of complying with household pEPR payments will be £1.2bn (including SA costs). The tonnage of household packaging placed on the market in 2025 is 5.2Mt.

<sup>146</sup> <https://www.gov.uk/government/publications/extended-producer-responsibility-for-packaging-illustrative-base-fees/extended-producer-responsibility-for-packaging-illustrative-base-fees>

<sup>147</sup> National Packaging Waste Database ([environment-agency.gov.uk](http://environment-agency.gov.uk))

<sup>148</sup> Based on evidence from Valpak, Eunomia and internal assumptions. See the baseline section for a more detailed description.

<sup>149</sup> Including data reporting, SA and Regulator costs.

<sup>150</sup> <https://npwd.environment-agency.gov.uk/>

<sup>151</sup> Business population estimates - GOV.UK ([www.gov.uk](http://www.gov.uk))

**Table 48: Data reporting and full obligation costs**

	Average turnover	Average Annual cost per producer	% of Turnover
Data reporting only (£1-2m, 25-50t)	£1.5m	£2,216	0.15%
Full obligation (£2m/50t+)	£26m	£207,817 <sup>152</sup>	0.80%

**Distributor Approach**

As discussed, under the “distributor approach” businesses selling unfilled packaging to businesses below the de minimis will be obligated to make pEPR payments for that packaging. This will be mandatory and will allow for a much greater proportion of packaging to come into scope of pEPR. Distributors may pass some or all of these costs of these obligations onto these businesses. In this sense businesses below the de minimis may still indirectly contribute to pEPR fees. This would be in line with the “producer pays” principle, however it is assumed that larger businesses would be able to meet the administrative burdens associated with meeting obligations at a lower cost than smaller businesses.

This cost would essentially increase the cost per tonne or per item of packaging used by businesses, such that the increased cost they face will be in proportion to the amount of packaging they use. Eunomia estimate that were the de minimis to be removed completely, this would bring an additional 23,000 businesses into obligation<sup>153</sup>. They estimate that these producers supply 1.6Mt of packaging. On average each producer below the de minimis therefore supplies around 70t of packaging. As household packaging makes up 43% of packaging placed on the market it is assumed that each of these producers supply 30t of household packaging.

As previously stated above, the average pEPR fee is estimated to be £232 per tonne. As shown in table 49, a producer supplying 30t of household packaging would face costs of around £7,000 per year. Assuming the average business below the de minimis would have a turnover of around £1m this would amount to 0.7% of turnover. This is demonstrated in table 49 alongside estimates for producers with £0.5m and £1.5m turnover. Eunomia’s analysis suggests that producers with a lower turnover also supply less tonnage, however there is no specific analysis of the extent to which this will be the case for producers currently under the de minimis. For this analysis we assume that tonnage supplied will be proportional to turnover.

**Table 49: Distributor passed on cost by turnover**

Turnover	Household Packaging (t)	£ per Business	Cost % of Turnover
£0.5m	15	£3,474	0.7%
£1m	30	£6,948	0.7%
£1.5m	45	£10,423	0.7%

<sup>152</sup> This is the average estimate of cost per business. The majority of costs to producers are proportional to the tonnage of packaging they place on the market which is generally correlated with the size of the business. Smaller businesses will therefore face smaller costs than those stated in the table.

<sup>153</sup> [http://sciencesearch.defra.gov.uk/Document.aspx?Document=15061\\_ScenariosforadjustingtheExtendedProducerResponsibilityDeMinimisthreshold-EV0282.pdf](http://sciencesearch.defra.gov.uk/Document.aspx?Document=15061_ScenariosforadjustingtheExtendedProducerResponsibilityDeMinimisthreshold-EV0282.pdf)

This shows that even if distributors pass on the full cost of being obligated for the packaging of producers below the de minimis, this additional cost to producers is likely to be less than 1% of turnover.

### **IMPACT ON SMALL AND MICRO MATERIALS FACILITIES**

Materials Facilities (MFs) will be required to do enhanced sampling and compositional analysis on materials at input and output. Some MFs managing mixed waste material are required to do this already in England, Wales and Scotland<sup>154</sup> under the MF sampling regulations and the Scottish code of practice.<sup>155</sup> However, sites considered to be a First Point of Consolidation (FPoC) have come into scope, as well as those managing source separated waste streams. The sampling frequency for those already doing this sampling has also increased which increases costs. At present MF regulations include a de minimis which excludes sites with an input below a 1,000t. Results from the previous consultation suggest that the majority of respondents were in favour of removing or changing the de minimis, however some pointed out that the smaller sites would find it difficult to comply with these proposed regulations.

FPoC are the first point at which packaging waste from different sources (for example different local authorities) will be mixed, and sampling is required to understand the tonnage, quality, and composition of waste from each source. This is because these factors will impact payments to local authorities under pEPR. When setting a de minimis threshold, the quality and the importance of the data must be weighed with the burden on small and micro businesses.

**Table 50: Excluded sites and tonnage under de minimis options**

De Minimis Threshold	Excluded							
	Tonnage	Proportion of Total Tonnage	Sites (Total)	Proportion of total sites	LA sites	Proportion of LA sites	Operators	Proportion of total operators
200t	9,814	0.0%	195	15%	25	14%	165	21%
500t	40,438	0.2%	288	22%	34	19%	244	32%
<b>1,000t</b>	<b>106,798</b>	<b>0.5%</b>	<b>377</b>	<b>28%</b>	<b>47</b>	<b>27%</b>	<b>312</b>	<b>41%</b>
2,000t	262,911	1.2%	480	36%	66	38%	383	50%
10,000t	2,052,419	9.4%	838	63%	135	77%	593	77%

Using waste permit data<sup>156</sup>, it can be shown that maintaining the de minimis threshold at the current level would exclude 28% of sites. It would, however, only exclude 0.5% of the waste handled by potentially in scope sites. From the waste permit data it is not possible to determine the source of waste for each site. This is important as

<sup>154</sup> <https://www.legislation.gov.uk/ukxi/2016/1154/schedule/9/part/2/chapter/1/paragraph/1>

<sup>155</sup> <https://www.gov.scot/publications/code-practice-sampling-reporting-materials-recovery-facilities/>

<sup>156</sup> England <https://data.gov.uk/dataset/d409b2ba-796c-4436-82c7eb1831a9ef25/2019-waste-data-interrogator>; Scotland <https://www.sepa.org.uk/data-visualisation/waste-sites-and-capacity-tool/>; NI and Wales waste return data provided by WRAP

sites will only be in scope if they consolidate waste from multiple sources or undertake sorting of the waste. It is therefore possible that more sites than have been excluded in this analysis would be out of scope. It is therefore not possible to determine the accuracy of the estimated number of sites and tonnage excluded under different de minimis options.

**Table 51: Cost per tonne for different size sites, £**

Operational costs per tonne of input (to site p/a)	Low	High
7,000	£2.11	£2.90
10,000	£2.05	£2.47
20,000	£1.93	£2.03
50,000	£1.57	£1.46
100,000	£0.97	£1.03
150,000	£0.37	£0.78

Data from a survey<sup>157</sup> asking MFs about the additional costs they would expect to face if sampling frequencies were increased were analysed. When plotting the cost per tonne for operational costs against the size of the site from the MF cost survey, there is a visible negative trend, such that the cost per tonne decreases as the size of the site increases. This suggests the possibility of economies of scale which would lead to disproportionate costs on smaller sites. A simple line of best fit was calculated for the data, firstly using a linear relationship and then a logarithmic relationship. The latter was the better fitting model, with an R squared of 0.58, in contrast to 0.55 for the linear trend. The R squared suggests there is some correlation between these variables in the data.

Cost per tonne estimates across different site sizes from this analysis are presented in Table 51. The low represents the linear trend and the high is the logarithmic trend. Only site sizes that fall within the datapoints in the data are included. The results should be treated with caution as they are from a small sample size (12) and are representative of what businesses have reported saying they will need, rather than actual costs. Nonetheless, it suggests it is not possible to rule out that smaller sites will face disproportionately higher costs than larger sites.

Due to this uncertainty, and the potential disproportional costs on smaller sites, the current de minimis excluding sites below 1,000 tonnes of input has been retained in the amended regulations. This could be reviewed in 2028/29 as part of a wider initial review of pEPR.

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<sup>157</sup> Estimated Costings and Facility Numbers for EPR Manual Sampling, WRAP/ Waite Resource Management Ltd. Unpublished



**Table 52: Summary of SaMBA Impacts**

Challenge	Risks/Uncertainty	Mitigation
<p>Number of packaging producers below the threshold.</p>	<p>Uncertainty regarding the number of producers could lead to incorrect analysis on costs to producers.</p>	<p>To ensure the central estimate of producer numbers below the threshold is as accurate as possible, we have used the average of three estimates: The 2019 Consultation Estimate, Eunomia estimate based on further development of the 2019 estimate and regression analysis of NPWD data, and Valpak internal modelling.</p>
<p>Small and micro packaging producers: the de minimis</p>	<p>Under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007, producers are obligated if they handle at least 50 tonnes of packaging and have a turnover of £2 million a year. Changing the threshold could change the number of producers obligated to make pEPR payments and could significantly impact small and medium businesses.</p>	<p>We have decided to keep the existing de minimis threshold at the same level for pEPR payments.</p> <p>We have however decided to add a new data reporting requirement at a lower threshold of producers handling at least 25 tonnes of packaging and have a turnover of at least £1 million a year. This has been introduced as the value of the data from smaller producers will be valuable, and we do not expect these costs to be burdensome based off our analysis.</p>
<p>Small and micro packaging producers: data reporting costs</p>	<p>Costs for businesses which would have a data reporting obligation under pEPR would see their costs increase.</p>	<p>Our analysis suggests that the average business required to report data have an average turnover of £1.5m and would face additional costs of £2,250 per year. This would equal approximately 0.2% of turnover for these businesses. There is also room for the regulator to charge a lower fee for data reporting to reflect the lower granularity required for these businesses.</p>

Small and micro packaging producers: distributor approach	Under the “distributor approach” businesses selling unfilled packaging to businesses below the de minimis will be obligated to make pEPR payments for that packaging. This will increase pEPR payments for obligated businesses.	The distributor approach will allow for a much greater proportion of packaging to come into scope of pEPR. If distributors pass on the full cost of being obligated for the packaging of producers below the de minimis, this additional cost to producers is likely to be less than 1% of turnover.
Small and micro material facilities	MFs and FPoCs will be face high costs in order to comply with the sampling requirements in order to support pEPR.	In order to avoid disproportional costs on smaller sites, the existing de minimis excluding sites below 1,000 tonnes of input remains in the amended regulations. We do not expect significant impacts on the success of the policy given the proportion of total tonnage processed at these sites (expected 0.5% of all tonnage), as highlighted in table 50.

## IMPACT OF PEPR ON CONSUMERS

### *Average impacts*

Under pEPR, packaging producers will take on the costs of collecting and disposing of packaging waste from households. This is a cost transfer for local authorities who currently pay for these services. It is possible that producers will pass these costs onto their consumers in the form of higher prices. In the previous IA, these potential price impacts on consumers were recognised as a key cost of pEPR but were not quantified. We have subsequently undertaken research on how businesses are likely to react to the reforms and have quantified likely price changes for consumers.

Although some packaging producers will be exempt from pEPR due to the de minimis threshold, it is assumed that the majority of packaging producers will be liable. Hence the fees will largely represent an **industry-wide** cost increase with all firms facing an increase in cost.

To calculate the exact cost pass through rate (CPT), defined as the amount of the cost increase that is passed onto consumers via increased prices, we would need to make use of measures of the elasticity of demand and the elasticity of the supply in the market for which obligated produces operate<sup>158</sup>. Due to a lack of the data necessary

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<sup>158</sup> Elasticity of demand and supply refer to the extent that demand and supply change when the price of a good changes. If they are inelastic, when price changes the quantities demanded and supplied respond little. The cost pass through depends on the elasticity of demand relative to the elasticity of supply in the relative market. If the elasticity of demand is large relative to the elasticity of supply (i.e. demand reacts more to a change in price than supply) the pass-through rate will be low while if the elasticity of demand is small relative to the elasticity of supply (i.e. demand reacts less to a change in price than

to estimate the relevant elasticity of demand and supply we have instead adopted an approach based on market structures<sup>159160</sup>. As explained by the Office of Fair Trading (OFT) the potential cost pass through will theoretically sit between the two extremes of the cost pass through under monopoly, which is 50%, and that under perfect competition which is 100%<sup>161</sup>. In light of this, we have used these figures as a low estimate and high estimate. The central estimate has been obtained as a most likely scenario from the OFT based on a literature review of empirical research conducted by them. It should be noted that perfect competition is regarded as widely non-existent in reality, and likewise that the industries impacted by pEPR are almost certainly not pure monopolies. As the high and low scenarios correspond to these market structures, they should be viewed as theoretical maximums and minimums, rather than outcomes which are likely to actually materialise.

**Table 53: Percentage of increase in cost due to pEPR that is passed on to consumers**

<b>Low scenario (Pure monopoly)</b>	<b>Central Scenario</b>	<b>High Scenario (Perfect competition)</b>
50%	85%	100%

*Impact on an average household*

The total increased cost faced by all businesses impacted by pEPR collectively will be equal to the target net cost recovery. Assuming the cost pass through rate applies the same to all businesses, we can apply each of the rates in Table 53 to this figure (inflated to 2023 prices, plus VAT at 20%)<sup>162</sup> to estimate the total annual cost passed on to consumers collectively via increased prices under each scenario. The ONS have estimated that there were 28.4 million households in the UK in 2023<sup>163</sup> and based on this we have calculated that the change to yearly expenditure for the average household will fall between £27.98 and £55.95 depending on the cost pass through rate with central increase being £47.56. This corresponds to a change to weekly expenditure of between £0.54 and £1.07 a week, with a central estimate of £0.91.

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supply) the pass-through rate will be high. For a more in-depth explanation of the role elasticities play in cost pass through, see: Microsoft Word - 524 OFT Cost Pass-Through Final R.docx (publishing.service.gov.uk)

<sup>159</sup> Models of different market structures, the assumptions they make underpinning how prices are set, imply how firms will change prices in response to a change in cost and hence they will pin down a theoretical pass-through rate.

<sup>160</sup> Market structures in economics refer to the characteristics of the market which determine the behaviour of firms within that market. Monopoly and perfect competition are two such market structures. Monopoly refers to where there is only 1 firm that sells the given good and as such this firm can decide the price at which it sells. Perfect competition refers a market where there are a very large number of firms and as such none have the ability to set the price at which they sell.

<sup>161</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/320912/Cost\\_Pass-Through\\_Report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/320912/Cost_Pass-Through_Report.pdf)

<sup>162</sup> The total pEPR payment inflated to 2023 prices is £1.326bn without the addition of VAT and £1.592bn with its addition.

<sup>163</sup> [Families and households in the UK - Office for National Statistics \(ons.gov.uk\)](https://www.ons.gov.uk/families-and-households-in-the-uk)

**Table 54: Increases in cost due to pEPR**

	Low Scenario	Central Scenario	High Scenario
<b>Consumers weekly per household, £</b>	0.54	0.91	1.07
<b>Increase as a proportion of weekly spend<sup>164</sup></b>	0.09%	0.16%	0.19%
<b>Consumers yearly per household, £</b>	27.98	47.56	55.95

This assumes that households do not adjust consumption in response to pEPR meaning we assume that they consume the same goods in the same quantities as they did before pEPR. This is a reasonable assumption to make as although noticeable when aggregated in weekly terms, the actual price impact per product is low and unlikely large enough to provoke changes to consumption even if consumers were to be quite price sensitive with regard to pEPR impacted goods<sup>165</sup>.

#### *Impact on CPI*

WRAP previously conducted analysis on behalf of Defra to estimate the impact of pEPR on Consumer Price Index (CPI) inflation. This provides an alternative method for estimating the average impact on consumers. Using Valpak’s PackFlow reports<sup>166</sup>, it can be shown that consumer (which is used as a proxy for household) packaging is generally grocery and non-grocery retail packaging.

According to the Office of National Statistics (ONS) the value of retail sales (excl. automotive fuel) in 2023 was £462bn.<sup>167</sup> Based on the assumption that producers pass on 85% of their obligation, this would lead to retail sales increases of around £1.4bn. This is a 0.29% increase. When considering the basket of goods that make the CPI, the categories closely related to grocery and non-grocery retail<sup>168</sup> accounted for 24% of the weighted basket in 2023. Under the assumption that pEPR does not have an inflationary impact on other categories, a 0.29% rise in retail sales would increase CPI by 0.07%.

**Table 55: Impact of pEPR on CPI**

	Low	Central	High

<sup>164</sup> This is based on the average household weekly spend of 592 taken from the ONS.

<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/bulletins/familyspendingintheuk/april2018tomarch2019>

<sup>165</sup> That is not to say that we assume consumers are not demand inelastic, rather that these price impacts are insignificant.

<sup>166</sup> <https://wrap.org.uk/resources/report/packflow-covid-19-reports>

<sup>167</sup> <https://www.ons.gov.uk/businessindustryandtrade/retailindustry/datasets/poundsdatatotalretailsales>

<sup>168</sup> ‘Food and non-alcoholic beverages’, ‘Alcoholic beverages and tobacco’, ‘Clothing and footwear’ and ‘Furniture, household equipment and maintenance’

<b>Increase in value of retail sales</b>	0.17%	0.29%	0.34%
<b>Increase in CPI</b>	0.04%	0.07%	0.08%

### *Distributional Impacts*

To get an indication of the distributional impacts of an increase in consumer prices, we can apply the £0.91 per week increase to average weekly expenditure by income decile.<sup>169</sup>

**Table 56: Increase in weekly expenditure by income decile**

Decile	10	20	30	40	50	60	70	80	90	100	Average
<b>Weekly expenditure (£)<sup>170</sup></b>	267.3	312.1	400.8	456.3	508.8	574.8	631.7	704.7	799.0	1022.9	<b>567.7</b>
<b>Percentage change in expenditure</b>	0.34%	0.29%	0.23%	0.20%	0.18%	0.16%	0.14%	0.13%	0.11%	0.09%	<b>0.16%</b>

This analysis assumes that all households will see their weekly expenditure rise by the average amount in nominal terms. This is likely a simplifying assumption as the impact on weekly spending will be determined by the specific selection of goods purchased by a household with factors including:

- The number of goods purchased by a household (buying more goods is likely to be somewhat correlated with the amount of packaging used)
- The relative proportion of prices paid for these goods that cover packaging costs (packaging costs for some goods will be proportionally higher than others)
- The relative difficulty in recycling the packaging on goods purchased (this will impact the modulated fee on that packaging)

This analysis is therefore limited; however, it does give some indication of the magnitude of the impact of cost rises on consumers on average and from different income deciles. Although lower income groups may see higher price rises than higher incomes groups, this increase is expected to be low, with the lowest income decile seeing increases of around 0.34%.

pEPR is a transfer from government to businesses, and it should therefore be considered that households will benefit indirectly through savings to the public sector, equal to Local Authority disposal cost payments for managing household packaging. This may have a positive impact on households through increased public expenditure.

## **IMPACT ON TRADE**

<sup>169</sup> 2023 dataset: [Family spending workbook 1: detailed expenditure and trends - Office for National Statistics \(ons.gov.uk\)](https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/familyspendingworkbook1detailedexpentureandtrends)

<sup>170</sup>

<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/expenditure/datasets/familyspendingworkbook1detailedexpentureandtrends>

## **pEPR**

Producers will only be obligated for packaging intended for consumption (and therefore disposed of) in the UK. The same obligation will apply to packaging regardless of whether it was produced in the UK or imported. Any packaging produced, or filled, in the UK but exported for consumption outside the UK will not be covered under the requirements.

Specifically, businesses who are responsible for the import of filled packaging into the UK for sale will face an obligation under pEPR. Where the importer is not based in the UK, it will be the first UK-based owner of the packaging who takes this obligation. It should be noted that importers of packaging are already obligated under the current producer responsibility regulations.

Similarly, businesses based in the UK who operate a website, or any other means by which information is made available over the internet, through which persons based outside the UK, other than the operator, are able to offer filled or unfilled packaging for sale in the UK (whether or not the operator also does so), will have a reporting obligation. This is a new requirement and closes a loophole whereby packaging and packaged products sold by overseas sellers through online marketplaces are not captured.

As the reporting requirements will be the same for domestically produced and imported packaging, there is not expected to be any distortions on trade.

## **IMPACT ON COMPETITION**

A number of businesses and markets across the packaging supply will to be impacted by pEPR. However, following an in-depth competition assessment we do not expect there to be any concerning and significant impacts on competition. The reasons for this conclusion are set out below.

The CMA in their competition impact assessment guidelines outline 4 broad areas of concern that ought to be considered<sup>171</sup>:

- 1) whether the policy directly or indirectly limits the number or range of suppliers
- 2) whether it limits the ability of suppliers to compete
- 3) whether it increases incentives to collude and
- 4) whether it limits the choices and information available to consumers.

### **Scheme administrator**

Regarding the potential impact of the SA on competition, we can ask what pre-existing markets the SA may enter and distort and also what markets it may create. As detailed in the government response the SA will undertake the following functions, it will:

1. Undertake strategic and operational planning.
2. Calculate household packaging waste management costs to be paid by producers.
3. Determine the fee rates paid by producers for different types of packaging.
4. Calculate costs to be paid by individual producers annually.
5. Make payments to those who have incurred the household packaging waste management costs (LAs).
6. Provide strategic oversight and allocate funding for campaigns.
7. Provide support to producers in data reporting.

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<sup>171</sup> Competition impact assessment - Part 2: guidelines (publishing.service.gov.uk)

## 8. Prepare annual reports.

In summary alongside providing a number of administrative and supportive functions, it primarily calculates what the cost for managing household waste is, how it ought to be recovered via fees, how the recovery is spread across producers; and then it makes payments of these fees to LAs.

The key functions of the SA therefore imply two main relationships. Firstly, a relationship with packaging producers – in determining the fees they pay and obtaining fees from them (functions 3 and 4). The SA will essentially act as an additional regulator of the market for packaging, such that it distorts the market in favour of packaging with the lowest management costs and environmental impact. The competition impacts of this on the packaging market are discussed in the next sections.

The second key relationship is with the LAs who incur household packaging waste management costs. The SA determines their household packaging waste management cost requirements and makes payments to them (functions 2 and 5). The SAs function and involvement vis a vis LAs does not constitute a competitive relationship in the sense the SA is a market actor. It rather provides finance to LAs to continue providing the service they already provide. The impact on markets LAs are involved in is discussed in more detail below.

### **Obligated producers and the packaging sector**

We can consider the impacts on both obligated sellers of filled packaging (i.e., brand owners) and on the manufacturers of that packaging itself (the packaging sector)<sup>172</sup>. As the obligations will fall primarily on brand owners the impact on the former is greater and more direct than on the latter, and the impacts in that market are indirect knock-on effects.

The key intervention into the packaging market is the imposition of pEPR fees. In Year 1 of the scheme, producer fees will be proportional to the amount of packaging they place on the market through the use of base fees (in £/tonne of packaging placed on the market). These base fees will vary across the 8 packaging material categories, reflecting variations in LA waste management costs for these different materials. From Year 2 of the scheme, materials with a worst environmental impact (in a first instance less recyclable materials) will attract higher fees as a result of the implementation of fee modulation. Producers will also face costs associated with the running of the scheme administrator and regulation. There will also be data reporting costs relating to the reporting of tonnage data on the Report Packaging Data (RPD) online portal.

Concerns related to the first point raised by the Competition and Markets Authority – whether this will result in a reduction in the number or range of producers – while being most pertinent to pEPR, does not pose significant concerns to competition in this market. Firstly, pEPR does not directly limit the number of suppliers in this market. Any potential limitation that could arise will be indirect, due to producers not being able to financially meet the requirements. Furthermore, this outcome – though possible – we do not foresee as concerning.

Costs to producers of complying with pEPR payments are likely to be more significant and it must be considered whether this cost could cause some firms out of the market enhancing the market power of those that remain operative. A concern may be that the costs of pEPR are equivalent or similar across all producers, and hence would disproportionately impact smaller and medium sized firms, driving them out of the market and enhancing

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<sup>172</sup> Although it is recognised that these lines are often blurred such that brand owners may also be packaging manufacturers.

the market power of the larger firms better placed to absorb these costs. Indeed, the CMA guidelines note the importance of small businesses as a source of competitive constraint.

However, the most significant costs of pEPR are expected to be largely proportional to size. Notably fee payments depend on the amount of packaging placed on the market, which is correlated with the size of the business. Data reporting costs are also anticipated to be higher for larger producers. It is currently uncertain whether regulator costs will be split across producers equally – in a worst-case scenario they may be the same for all producers and hence will constitute a higher burden on smaller producers. Despite this however, regulator fees are expected to be small and hence seem unlikely to be large enough to provoke market exit from smaller producers. It is also worth mentioning that the smallest businesses will also be excluded due to the de minimis. A more detailed analysis of the impact on smaller businesses is found in the SaMBA section.

As well as potentially causing incumbent firms to leave, it ought to be considered whether pEPR fees – which will raise the cost of entry – are significant enough to deter new entrants to enter. The post-policy competitive constraint relative to the baseline may hence be reduced as the threat of new entrants entering is lowered. The key issue to consider here is the size of the costs relative to the size of revenues. Total costs on average per producer are expected to be around £208,000 a year. The median revenue of current producers can be obtained from the National Packaging Waste Database (NPWD) and was found to be around £26 million<sup>173</sup>. Thus, for the average producer, cost increases due to pEPR are less than 1% of revenue. This cost is unlikely to be high enough to reduce new entrants to the sector.

Another consideration is how producer base fees – to be set by the Scheme Administrator based on LA net management costs – will impact different material sectors. Variations in costs across these sectors will mainly arise from 1) differences in base fees across materials, which reflect local authority waste management net costs and 2) variations in the weight of packaging units, with heavier units attracting higher fees for producers. These fees will be variable, and so are not expected to place a disproportionate impact on smaller producers or new entrants. There is potential for indirect competition impacts across materials, reflecting their underlying difference in cost. These impacts are however uncertain as they depend on a range of market and business financial drivers that can vary significantly across industries and individual companies. This includes specific price elasticities, the ability of producers to pass through costs, the size of payments relative to turnover as well as variations in virgin packaging material and recyclate costs. The consumer impacts section above estimates that the majority of cost, under the central scenario, would be passed through. In the wider context, average producer costs are small in relation to producer revenue (though this will differ between producers), and competition across packaging materials has many non-price elements, such as design and perceived quality. Another distinct issue arises due to the proposed modulation of pEPR fees. Certain producers who are important for competition (e.g., sellers of a cheaply packaged version of a good) may use packaging materials that are cheaper, but more difficult to recycle and hence may attract greater fees. Hence somewhat asymmetrical costs would be imposed, at least until these producers switch packaging types. This would be concerning if it disproportionately advantages these firms relative to the others such that they were forced to leave the market because they were not able to switch packaging material types, i.e., a new barrier to entry. It should be noted that guidance on modulated fees should be published in 2025 and modulated fees will not be implemented until

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<sup>173</sup> As pointed out in the Eonomia De Minimis report

(<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20670&FromSearch=Y&Publisher=1&SearchText=Extended%20Producer%20Responsibility&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>), there are some turnover outliers in the NPWD database hence the median was seen as a more robust measure of the average.



2026. This will give producers who use unfavourable packaging time to adjust before costs are imposed, ensuring there is a more level playing field by the time modulation in pEPR is implemented.

The switching of packaging types fee modulation seeks to provoke may have a knock-on impact in the packaging sector (producers of packaging). Manufacturers of packaging materials that attract a higher fee may face a fall in demand. If they are competing with packaging manufacturers who produce low fee attracting materials, they will be supplying to the same market and as such they may no longer be able to compete in that market and the market power of remaining producers would be augmented. Two mitigating factors should be noted regarding this. Firstly, that the market for packaging is a global market, any reduction in demand due to pEPR needs to be weighed against global trends which should lessen the impact. Secondly, it is possible that the manufacturers of packaging may be able to switch packaging types relatively easily (within the same material type). As noted, modulated fees will not be coming in until 2026. As such producers will have time to think about what packaging types are more viable to sell and switch, if necessary, before any negative impacts.

The second point of concern from the CMA is on the limitation of suppliers' ability to compete. In a sense pEPR places restrictions on the nature of the packaging as it will penalise the use of unrecyclable packaging types. While this may appear to constitute a limitation, on all other aspects of packaging, suppliers will retain the ability to differentiate their products and compete. For example, they may still vary their branding and packaging design. As such we cannot say, as per the CMA guidance, that the measure 'substantially influences [...] the characteristics of the product supplied'. It should also be noted that regardless of competitive concern, this is the key function of the policy – the societal cost of packaging is becoming internalised in this market. Most importantly, it should be considered that packaging is not the primary concern of consumers, and modulated fees should account for the ability of producers to switch to alternative packaging types such that this does not cause a lessening in the number of products on the market.

The third point raised by the CMA is regarding the supplier's incentives to compete. The key things to look at here are whether policy directly or indirectly impacts incentives to collude. Incentives to collude tend to increase as producers share more information amongst each other and indeed under pEPR obligated producers report a lot more data to the SA and regulator. However, data on individual metrics ought not to be shared more broadly than the SA and regulators, and while the SA will publish annual reports on packaging and fees paid, this information is aggregated. As noted by the CMA, this carries a lesser risk of provoking collusion. Collusion may also increase if there are changes to market conditions. A given market will be more prone to collusion if there are fewer firms, and they are more similar. With regard to this it ought to be noted that the number of obligated producers potentially impacted by pEPR is around 10,500. As such a significant number of producers would have to leave for this number to reduce to such an extent that there are few enough firms operative to increase incentives collude. Given the prior discussion on the impact on the number of firms in the market, this does not seem likely. There are also likely to be a significant number of producers in the packaging sector<sup>174</sup> and we anticipate no direct incentives to collude being imposed on the packaging sector.

The final area raised by the CMA is regarding the choices and information available to consumers. pEPR may restrict consumers ability to spur competition between firms by choosing who to purchase from. As noted, consumers choice may become more limited in what types of packaging they can purchase as unrecyclable packaging types are phased out. Certain consumers may be forced to purchase goods in packaging that is of a

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<sup>174</sup> NPWD data suggest there are around 500 producers under the category 'Converter': those converting raw material into packaging.

higher quality and price than they prefer. We foresee however no restriction in consumers being able to decide from which packaging producers they purchase from; nor should the information available that aids consumers in the choice of supplier be reduced. It ought also to be emphasised, that the packaging of a product is not the primary concern of the consumer – rather the actual product. Though packaging types may become less varied there should be no reduction in the availability of actual products.

### **Public Sector**

Competition concerns regarding the impact of pEPR on the public sector will not relate directly to impacts on LAs, but rather on the markets they in turn operate in. LAs will retain the choice to provide waste management services in house or to outsource to private waste management companies. It is unlikely these markets will be impacted as all that is changing is how the service is paid for by LAs; receiving as they now will payments from the SA to cover these costs. In terms of efficiency, it should be noted that although finance is provided by the SA, LAs will need to prove that their costs are necessary costs towards an efficient and effective service, and the SA has power to determine what costs are reasonable for each authority, based on benchmarking of LAs with similar characteristics. As such, there will be pressure on LAs to remain efficient were they to provide services in house or to outsource.

### **Reprocessors and exporters**

Reprocessors and exporters will be required to register with a regulator and report data on the quantity and quality of packaging waste recycled or exported for recycling. Exporters will also be required to obtain greater evidence that the exported packaging waste was received at its final recycling site. As with other actors in the supply chain, there may be concerns regarding the associated costs of these measures indirectly limiting the number or range of suppliers who are able to compete in the market. Stakeholders have however advised us that collecting this information is already necessary for business purposes as the price paid for inputs and price gained for outputs depends significantly on quality and quantity. As these businesses already collect this data, these burdens are likely to be small.

Regarding mandatory registration costs however, it was suggested by stakeholders that the number of reprocessors and exporters who are currently in scope but unaccredited would be low, hence the impacts of these costs on changing market structure would likely be small. Additionally on a per business basis costs of compliance are relatively small (expected here to be £3.0k). Furthermore, the businesses that are unaccredited are also assumed to be small and – though it is liable to change – in the expected scenario regulation will be organised such that smaller reprocessors or exporters pay a lower regulator fee of £500. Hence these costs are expected to be very minimal and unlikely significant enough to provoke changes to the market structure.

### **Materials Facilities**

EPR will also impose costs on materials facilities as they will be required to undertake enhanced sampling and compositional analysis (financing the capital and operational costs for this) as well as meet regulator and familiarisation costs. These additional costs increase the cost of entry to the sector and may reduce the number of competitors. It should also be noted that some MRFs are already required to submit sampling and compositional data under the current regulations and as such they have something of an incumbency advantage having already made the capital and operational investments necessary to comply with pEPR. It should be noted however that, as discussed in the cost benefit analysis section, these requirements are only expected to increase costs by around 1.0-1.5%.

Increased operational costs related to sampling are also expected to be lower for larger materials facilities, likely due to economies of scale, and we have found a negative correlation between cost per tonne and site size. As

such, smaller facilities are at a greater risk of being unable to compete as effectively in this market due to pEPR. In light of this, we have introduced a de minimis exemption to protect the smallest firms from an unduly cumbersome disadvantage here and so they should remain in the market as an important competitive constraint.

### **Compliance schemes**

Additionally, to the key actors across the supply chain, we can consider compliance schemes. It is proposed that compliance schemes wishing to operate under the pEPR system will need to apply for approval under the new pEPR regulations. Approval will depend on a fit and proper person test. This constitutes a minimum standard in the market which may result in a direct reduction in competitors, particularly low-quality ones. There are currently 44 packaging compliance schemes registered with the regulators and these adjustments are not expected to be significant.

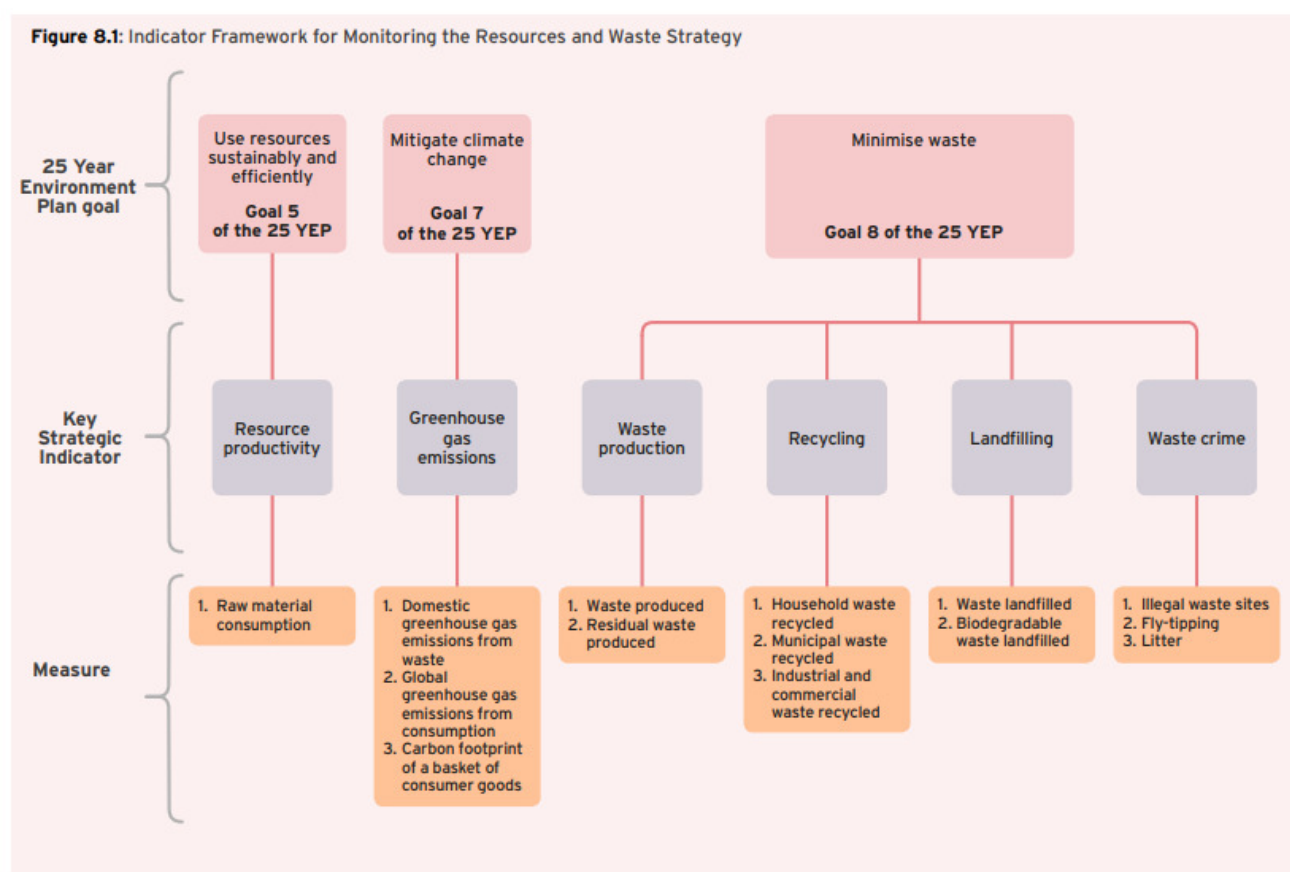
### **Waste management companies**

Since the consultation IA the decision has been taken to focus solely on pEPR payments to local authorities for household packaging waste. We are not planning to introduce pEPR payments to cover packaging collected from NHM businesses at this time, and therefore there will be no centrally set fees for this packaging. Producers will cover partial costs of NHM packaging waste collections through the PRN system; however this is the current situation. There is therefore not expected to be any impact on contracts between waste management companies and businesses disposing of packaging waste.

## SECTION 9: MONITORING AND EVALUATION PLAN

### Current monitoring arrangements

Monitoring change is focused on our intended outcomes, namely reductions in resource use and waste production and improvements in waste management (more recycling, less landfilling and less waste crime). The changes are part of a ‘golden thread’ which leads upwards to the objectives of the 25 Year Environment Plan<sup>175</sup>, the Clean Growth Strategy, the Industrial Strategy, and the Litter Strategy. The framework of indicators is set out on page 139 of the Resources and Waste Strategy<sup>176</sup> and shown below for ease of reference.



The framework was devised prior to the focus on Net Zero, to which all three 25YEP goals are relevant. We have set out our approach to monitoring change in our *Monitoring Progress* report (available [here](#)<sup>177</sup>).

### Current data collection regimes

<sup>175</sup> <https://www.gov.uk/government/publications/25-year-environment-plan>

<sup>176</sup> <https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england>

<sup>177</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/907029/resources-and-waste-strategy-monitoring-progress.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/907029/resources-and-waste-strategy-monitoring-progress.pdf)

Data on waste is limited, something we are addressing through our work on waste tracking, which is due to be implemented, subject to consultation and legislative change, in 2025. pEPR will also ensure more granular data is collected from across the packaging waste supply chain:

- Packaging producers are now required to provide more granular data of the amount and types of packaging they place on the market. This includes greater detail on sub-packaging categories (for example plastic polymer type) as well as whether that packaging is likely to end up in household, non-household, or binned waste.
- First Points of Consolidation (FPoC), including Transfer Stations (TS) and Material Recovery Facilities (MRF) will be required to undertake additional sampling and compositional analysis, which will enable a better understanding of the proportion of packaging in input waste streams, and contamination, from different sources. This will mean collecting data from a wider range of Materials Facilities (MFs), and greater detail provided by those already reporting data.
- All reprocessors and exporters of packaging for recycling will be required to report data on the amount of packaging they recycle. This will fill a data gap whereby the requirements are essentially voluntary, and some businesses may choose not to report. There will also be a requirement to increase the granularity of data provided.

In the meantime, we rely on the Defra-funded WasteDataFlow reporting platform for local authority collected waste, on work delivered by WRAP, on our own in-house models (MELMod<sup>178</sup> and FoWST<sup>179</sup>), and on bespoke Defra-funded measurement initiatives.

### **Proposed monitoring arrangements**

Defra are undertaking a system-level evaluation of the Resources and Waste policies, which includes pEPR. The evaluation launched in February 2022 and is an independent, externally commissioned theory-based impact and economic evaluation at the strategy level and a process evaluation at the policy level.

As part of the evaluation, a pEPR monitoring and evaluation framework has been developed using a Theory of Change. A list of indicators of change have been mapped against this. These include measurable, meaningful and manageable indicators of outcomes (or proxy indicators) and impacts. The evaluation has identified available data sources and new approaches to gathering necessary data against identified indicators. And will continue to define and collect data on additional indicators relevant to delivery and implementation. Available monitoring data will be reported (approximately) annually in the Monitoring Progress publication.

### **External influencing factors**

The context within which pEPR will be implemented is extremely complex, with many interacting parts, policies and actors. Key factors which may influence the outcome of pEPR, which are not under our control, include:

- Decisions made by local authorities to do with implementing Simpler Recycling in England.
- The growth of domestic reprocessing markets, as well as changes to the packaging waste export market.
- Wider consumer pressures on packaging producers which influence packaging design and recyclability.

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<sup>178</sup> Methane Emissions from Landfill Model (MELMod). A model used to estimate methane generation in landfill.

<sup>179</sup> Fates of Waste Simulation Tool (FoWST). A model used to estimate waste sector GHG emissions.

The evaluation aims to take account not only of the Collection and Packing Reforms but also activities of other actors across other policies looking to contribute to similar outcomes. Similarly, the evaluation aims to identify unintended outcomes as well as intended outcomes, and that we assess both benefits and disbenefits, as whether an outcome is felt as a 'good' or 'bad' thing depends on who is affected, how and when.

### **Early indications that policies are not working as intended**

The commissioned process evaluation will be carried out in parallel to policy implementation, to help us understand what is and is not working, get feedback from stakeholders and make corrections to design, implementation and regulation if needed. It will provide evidence to defend pEPR in the face of unjustified external criticism, but also enable us to quickly stop policies which are not working as intended, or which may be causing hardship.

### **Performance evaluation**

The commissioned strategy-level impact evaluation will enable us to make a formal assessment of policy performance compared with expectations.

The impact evaluation will gather quantitative and qualitative evidence about the difference pEPR is making against expected outcomes, which aspects are working, which are not working so well, and recommendations for future improvements. Following from this, we will be able to use the data to estimate cost-benefits and to satisfy any commitments we have made to carry out formal reviews.

### **Further Review and Post Implementation Review**

A review of the impact of pEPR will occur in the 2027/28 financial year. This review will focus on aspects such as a decision on whether pEPR payments should be extended to non-household packaging, and whether data collection is sufficient (for example whether Material Facility sampling and compositional analysis is providing sufficiently accurate data).

Further, the producer de minimis, to be retained at £2m turnover and 50t of packaging for the time being, will be kept under view. This review will be enhanced by the collection of data from producers between £1-2m turnover and 25-50t of packaging supplied. This data will significantly improve Government's understanding of the number of producers below the current de minimis as well as the amount and types of packaging they supply.

A Post Implementation Review of pEPR will occur two years after regulations come into force.

## SECTION 10: ANNEXES

### ANNEX A: CURRENT PACKAGING REGULATIONS

Under the Packaging Waste Regulations, obligated producers<sup>180</sup> are required to meet recycling targets set by Government. The regulations do not require obligated producers to collect or recycle their own packaging to meet their share of the UK packaging waste recycling targets. Rather, they must obtain evidence of recycling known as Packaging Waste Recycling Notes (PRNs) or Packaging Waste Export Recycling Notes (PERNs) equivalent to their obligations. These evidence notes are issued by accredited packaging waste reprocessors and exporters, respectively, and are obtained by packaging producers either directly or through a compliance scheme acting on their behalf. An accredited reprocessor or exporter can issue PRNs or PERNs equivalent to the amount of packaging waste reprocessed (e.g. 100t of packaging reprocessed allows the reprocessor to 'sell' 100 PRNs)<sup>181</sup>.

The evidence notes have two functions. First, they are a 'counting tool' for the quantities of packaging waste that is recycled and provide the evidence on which producers demonstrate they have complied with their obligations, and UK packaging recycling rates are determined. Second, they are a way to channel producer funding to support recycling operations. This internalises some of the costs of recycling packaging waste to producers.

The Packaging Waste Regulations establish a de minimis threshold, exempting businesses which have a turnover below £2m and who supply under 50t of packaging a year. Targets on obligated producers ('business targets') are set higher than the equivalent UK recycling rate to account for this exempt packaging. This means that obligated producers pick up a share of the cost of meeting the targets for businesses that fall below this de minimis threshold.

Businesses obligated under the Packaging Waste Regulations can choose how to comply. They can:

- Contract directly with reprocessors/exporters and acquire PRNs and PERNs equivalent to their obligation (known as individual compliance); or
- Join an approved compliance schemes who manage compliance on behalf of their members; this includes managing the reporting of their packaging data and acquiring evidence (PRNs/PERNs). Most obligated producers have chosen to join a compliance scheme.

The price of evidence notes is determined by the market; they can vary in price in response to a range of factors, such as the availability of the supply of recyclable materials; the price of raw materials; the price of secondary materials; the availability of evidence; and the level at which the recycling targets have been set. The total income raised through the sale of PRNs/PERNs has therefore varied from year to year. For example, between 2010 and 2019, the annual income from the sale PRNs/PERNs has ranged from £28 million to a high of £595 million in 2023<sup>182</sup>.

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<sup>180</sup> An obligated producer includes any business involved in the packaging supply chain, i.e. one that manufactures raw materials for packaging, converts raw materials into packaging, uses packaging to wrap/contain goods, or sells or imports packaged products. The 'responsibility' for the packaging is currently split between these actors in the supply chain.

<sup>181</sup> Further details on the existing regulations are available at <https://www.gov.uk/guidance/packaging-producer-responsibilities>

<sup>182</sup> Reprocessor & Exporter UK Reports are published annually on the National Packaging Waste Database

## ANNEX B: UK GOVERNMENT AND DEVOLVED ADMINISTRATION COMMITMENTS

The **UK Government's** commitments include:

- 25 Year Environment Plan for England (2018)
  - Commitment to reform the Producer Responsibility system (including the Packaging Waste Regulations) to incentivise producers to take greater responsibility for the environmental impacts of their products.
- UK government commitment to meet net zero domestic greenhouse-gas emissions by 2050.
- A manifesto commitment to move towards a circular economy

During 2020 **Welsh Government** undertook a consultation and engagement programme as a precursor to its next Waste Strategy – *Beyond Recycling – A strategy to make the circular economy in Wales a reality*. The strategy sets the ambition for Wales to become a zero-waste nation by 2050, meaning any discarded materials are recycled and re-circulated within the Welsh economy, with no loss of materials from the system – effectively a 100% recycling rate from all sectors. To support this *Beyond Recycling* sets high level objectives to tackle littering and to increase the range of plastic materials collected for recycling and develop more recycling infrastructure and end markets in Wales. In *Beyond Recycling* Welsh Government commits to work with the other governments of the UK in developing legislation for Extended Producer Responsibility for packaging (pEPR) and then over time to develop an pEPR approach for additional products such as tyres, textiles, bulky wastes (for example furniture, mattresses, and carpets) and products used in construction.

The key aim of the Waste Management Plan for **Northern Ireland** is to set out Northern Ireland's intentions to work towards a sustainable and circular economy. This means using the "waste hierarchy" (waste prevention, preparing for re-use, recycling, recovery and finally disposal as a last option) as a guide to sustainable waste management. It is Northern Ireland's intention to revise the current Northern Ireland Waste Management Strategy - "*Delivering Resource Efficiency*" to include the fundamentals of the European circular economy package. The expectation is that the revised strategy would include Northern Ireland's intentions on meeting the revised European municipal waste targets for recycling and landfill, introducing extended producer responsibility arrangements and a Deposit Return Scheme for drinks containers, meeting higher packaging waste recycling targets, and adopting measures in relation to reducing all forms of littering.

In **Scotland** circular economy policy is set out in *Making Things Last: a circular economy strategy for Scotland*. This policy is underpinned by key principles, which include 'applying the waste hierarchy' and preventing waste and promoting reuse, and 'Polluter pays' meaning those who produce pollution should bear the costs of managing it to prevent damage to the environment or human health. Implementation is supported by a series of targets relating to increasing recycling, reducing food waste, reducing overall waste, and reducing the use of landfill. The Scottish Government has recently consulted on additional legislative measures to support a circular economy and is working with the UK Government and other devolved administrations on measures, including legislation, which will give new impetus to circular economy businesses and a modern, effective, and efficient resource management system. This includes working jointly with the UK, Welsh, and Northern Ireland Governments on reforming the packaging regulations and introducing extended producer responsibility. Separately Scottish Government have regulations in place to introduce a Deposit Return Scheme for single-use drinks containers in 2027.



## ANNEX C: PRE-EPR SWITCHES

As well as those initiated by the introduction of modulated fees, it is expected that some packaging material switches will be made before the date they are introduced. Based on discussions with WRAP we have included a small number of switches which are expected to occur before pEPR is in place and are outside the scope of the analysis done using the Eunomia model. It is expected that some of these switches will occur due to producers anticipating the introduction of modulated fees and preparing for the introduction of pEPR<sup>183</sup>. However, not all these switches will be attributable to pEPR, as producers will respond to other influences to adopt more recyclable packaging, for example commitments under the UK Plastics Pact<sup>184</sup>, the Plastic Packaging Tax or for their own business reasons. These switches are therefore divided between the baseline and pEPR options. This is an arbitrary split and sensitivity analysis was undertaken to understand the impact of using different assumptions.

The switches included in this IA were recommended by WRAP who have expert knowledge on the recyclability of packaging types and likely substitutes. As in the consultation IA, this analysis concentrates on switches between plastic polymers as this is where there is the clearest evidence of potential substitutes. Polyvinyl chloride (PVC) and polystyrene (PS) are identified as currently difficult to recycle and therefore likely to see diminished use by producers. A significant number of PS and PVC packaging items placed on the market are in the form of pots, tubs and trays (PTT) and based on recommendations by WRAP, we have assumed that a significant proportion of these packaging types will be substituted for more recyclable polymers before pEPR is introduced. Some will remain in use at the introduction of pEPR, however due to their current low recyclability these are expected to be phased out quickly under pEPR as indicated by the Eunomia model<sup>185</sup>. PS and PVC PTTs are assumed to be mainly substituted for polyethylene terephthalate (PET) equivalent with small amounts switching to polypropylene (PP) and polyethylene (PE).

The Table C.1 shows the tonnage of PS and PVC in the pEPR options compared to the baseline for the years before 2025. The difference in PS and PVC placed on the market can be explained by switches related to PTTs which occur before modulated fees are in place.

**Table C.1: Difference in PS and PVC in pEPR Option and Baseline, tonnes**

	2022	2023	2024
<b>PS</b>	-1,855	-3,404	-5,156
<b>PVC</b>	-754	-1,383	-518
<b>Total</b>	-2,609	-4,787	-5,675

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<sup>183</sup> It is worth noting that whilst we have modelled these switches, these are not definitive figures and are subject to change depending on the structure of modulated fees that are agreed on in Phase 2 of engagement with WRAP.

<sup>184</sup> <https://wrap.org.uk/taking-action/plastic-packaging/the-uk-plastics-pact>

<sup>185</sup> It should be noted that UK nations are in the process of consulting on a ban of PS food and drinks containers. If such policy were to be introduced before EPR, benefits relating to switched away from PS packaging would likely move to the baseline. Annex B describes sensitivity analysis on these assumptions and shows how this might impact the NPV.

Within the analysis PS and PVC are assumed to switch to PET, PP and PE as well as high-density polyethylene (HDPE), which are all based on discussions with WRAP. Table C.2 shows the difference in tonnage of these polymers in the municipal sector under the pEPR and baseline options.

**Table C.2: Difference in HDPE, PE, PET and PP in pEPR Option and Baseline, tonnes**

	2022	2023	2024
<b>PE</b>	38	69	105
<b>PET</b>	2,015	3,696	5,599
<b>PP</b>	557	1,021	1,547
<b>Total</b>	2,609	4,787	7,251

Black plastic was also identified by WRAP as a packaging category likely to be phased out significantly before the introduction of pEPR. As part of their analysis Eunomia sought to disaggregate plastic POM data to allow for the analysis for modulated fees on the use of black plastic and have therefore estimated the amount of household-like plastic placed on the market. Eunomia made the simplifying assumption that all household-like black plastic packaging is in the form of PTTs. WRAP has advised that almost all black PTTs will switch to an alternative by 5, and therefore we have assumed that the majority of black plastic PTTs currently placed on the market will switch to a non-black equivalent of the same polymer type before 2025 in the pEPR option. Since the consultation IA we discussed these assumptions further with plastic industry stakeholders. They suggested that the assumed placed on the market tonnage of black plastic packaging was likely too high. We have therefore reduced this for the final impact assessment.

**Table C.3: Difference in Black Plastic PTTs in pEPR Option and Baseline, tonnes**

	2022	2023	2024
<b>Black PTT</b>	-4,319	-7,112	-10,774

We expect that some of this switching will occur due to producers preparing for modulated fees however producers are likely to be influenced by other pressures to make these changes. To attribute some of the impacts of these switches to modulated fees, it is assumed that these switches would have occurred at a slower rate under the baseline option. Due to a lack of evidence, switches in the baseline are set to occur half as quickly as under the pEPR option. As this is an arbitrary assumption, sensitivity analysis is included. The low option here assumes that none of these switches are attributable to pEPR and would have occurred under the baseline option. The high option assumes that all pre-5 switches are attributed to modulated fees.

The consequence of these switches is that packaging is diverted from residual waste to recycling. This will impact the cost of collecting and treating packaging in both the HH and NHM sectors as well as increasing the amount of recycled material available in secondary material markets. Finally diverting plastic away from landfill and energy for waste (EfW) will reduce greenhouse gas emissions. Table C.4 shows the costs and benefits of these switches in

the period 2022-2023 under each option. This shows that there are £0.3m additional costs and £3.7m additional benefits from the central option compared to an option in which switches are fully captured under the baseline over this period. This is £3.4m net benefits. Assuming that all impacts are attributable to pEPR adds £0.6m additional costs and £7.2m benefits totalling £6.6m net benefits.

**Table C.4: Discounted Additional Costs and Benefits from Packaging Switches Prior to pEPR (2022-24)**

<i>£m</i>	Low	Central	High
<b>Costs</b>			
Landfill Tax loss to HMT	£0	£0.3	£0.6
Total Costs	£0	£0.3	£0.6
<b>Benefits</b>			
GHG emissions savings	£0	£1.2	£2.4
Additional material revenue for recycling sector	£0	£1.0	£1.9
Reduced cost of collection and treatment of HH residual waste (incl. landfill tax)	£0	£1.2	£2.2
Reduced cost of collection and treatment of HH recycling	£0	£0.3	£0.6
Total Benefits	£0	£3.7	£7.2
<b>Total</b>			
Net benefits	£0	£3.4	£6.6

## ANNEX D: METHODOLOGY IN BASELINE PACKAGING PLACED ON THE MARKET METHODOLOGY

The PackFlow reports detail the POM tonnages in both the consumer and non-consumer sectors. These sectors are used as a proxy for Household (HH) and Non-Household (NH) packaging waste within the IA. Almost all NH packaging identified in the PackFlow reports is Commercial and Industrial (C&I)<sup>186</sup>. Non-Household Municipal (NHM) refers to the wider municipal sector that includes businesses and public organisations producing household like packaging waste. NHM is essentially the household-like element of C&I packaging waste. Within this IA the portion of C&I that is not NHM is referred to as “other C&I”.

pEPR modulated fees are expected to cover all household packaging. It is therefore important to determine the amount of non-consumer packaging that is household-like in nature. This is difficult as non-consumer industries may use packaging that is household-like and that which is not. The PackFlow reports point out that packaging in the hospitality sector is likely to be almost entirely household-like. However, it is not clear to what extent other non-household sectors will use household-like packaging.

Due to the uncertainty in the data, we have used several methods to calculate the amount of household-like packaging in the non-household sector on top of that contributed by hospitality. For our central estimate we assume that 56% of C&I packaging, as estimated in the PackFlow reports, is NHM. This is the estimate of the proportion of C&I waste which is NHM using waste arising data.

It is recognised that estimates of the total amount of packaging differs when using POM methods and data on waste collected by local authorities and private businesses. Waste arising derived data usually results in higher estimates of POM. This could be due to moisture content or contamination, and uncertainty over how much of the waste collected is household like packaging specifically. In contrast there is uncertainty in the amount of packaging POM not currently captured by the NPWD, such as that supplied by unobligated producers. Although the PackFlow reports attempt to account for this, it is possible that this is still underestimated. Therefore, based on recommendations by WRAP, we have used the upper POM estimate from the PackFlow reports<sup>187</sup> as the central POM estimate in the IA for both the HH and NHM POM figures.

As in the DRS and Simpler Recycling IAs we have taken POM data for DRS materials from Valpak’s Deposit Return Scheme for Drinks Containers<sup>188</sup> report. Future POM projections are taken from Valpak’s Impact on Packaging Policy Reforms on UK Secondary Material Markets<sup>189</sup> report, again in line with the Simpler Recycling and DRS IAs. These are based on projections from the PackFlow reports and provide a business as usual (i.e. no DRS/Simpler Recycling) view of future trends. It is assumed that Simpler Recycling and DRS:

- Will not impact the total amount or composition of packaging on the market.

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<sup>186</sup> The PackFlow reports also identify a small amount of Agriculture and Construction and Demolition packaging which is classed as NH but is not C&I.

<sup>187</sup> The upper error margins.

<sup>188</sup> <https://www.valpak.co.uk/more/reports/deposit-return-schemes-for-drinks-containers>

<sup>189</sup> Valpak (2020), “The Impact of Proposed Packaging Policy Reform on the UK’s Secondary Materials Market”, unpublished report for WRAP.

- The DRS return rates assumed in this Impact Assessment are 70% in the first year, 80% in the second and 90% for the third full year onwards as set out in the policy statement of January 2023<sup>190</sup>; and that all captured and non-captured DRS materials are out of scope of pEPR and this IA.

Subsequently, this amount of packaging is therefore removed from the baseline option<sup>191</sup> as well as the preferred option.

Table D.1 shows the DRS materials placed on market in 2022. As the implementation of DRS will differ across DA's<sup>192</sup>, we have assumed DRS material tonnage will increase every year in line with the total POM growth trend, based on the Valpak secondary markets report<sup>193</sup> for the central estimate.

**Table D.1: 2022 DRS Packaging placed on the market**

Drinks containers	Household POM Kilo-tonnes (Kt)	NHM POM Kilo-tonnes (Kt)	Total POM Kilo-tonnes (Kt)
Glass bottles	1,260	420	1,680
Aluminium cans	160	16	177
Steel cans	0	0	0
Plastic PET bottles	164	69	233
<b>Total</b>	<b>1,585</b>	<b>505</b>	<b>2,090</b>

Source: Valpak's Deposit Return Scheme for Drinks Containers report

### Estimates of Non- Household Municipal

This section discusses the uncertainty around NHM waste tonnage and provides a range of estimates of the potential cost of collecting NHM packaging waste.

To understand the amount of waste generated by the NHM sector, two key methodologies can be used. The first is using data on the amount of packaging placed on the market (POM). WRAP and Valpak publish the material specific PackFlow reports, which most recently estimated the amount of packaging POM in 2019. These reports also included forecasts for the amount of packaging POM up until 2022, as to account for the impacts of Covid-19 in the short-medium term. These reports compliment data reported by producers to the Environment Agency and other regulations through the National Packaging Waste Database (NPWD) by accounting for packaging which is currently unobligated. The PackFlow reports also estimate the split of packaging between sectors, including consumer and non-consumer, with more detailed breakdowns for some materials. Although POM refers to where packaging enters the market rather than where it is collected once it becomes waste it is possible to make some inference from this. Consumer packaging is that which is sold by retailers directly to consumers. It can be assumed that most of this packaging is consumed, and therefore collected as waste, at home. Conversely, it is expected that non-consumer packaging will largely be collected from businesses and public organisations. There is however likely to be some exceptions, for example where consumers purchase food from a supermarket which is then eaten, and the packaging disposed of, at work. The reverse is also possible for example where a drink is purchased at a café

<sup>190</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1130296/DRS\\_Government\\_response\\_Jan\\_2023.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1130296/DRS_Government_response_Jan_2023.pdf)

<sup>191</sup> DRS covers the following beverage containers: PET bottles, aluminium and steel cans and glass bottles.

<sup>192</sup> We have assumed an 'All-in' DRS in Wales, and an 'All-in no glass' in England, Northern Ireland, and Scotland from October 2027.

<sup>193</sup> Valpak, (2019) The impact of proposed packaging policy reforms on the UK's secondary materials markets

and then consumed at home. It is not known to what extent this occurs, nevertheless POM data is able to give an indication of the amount of packaging in circulation and where is likely to be disposed of.

Alternatively, waste arising data can be used to determine where packaging is disposed of. Generally, waste arising methods combine an estimate of the amount of waste produced with data from waste composition analysis where samples of waste are examined to determine the make-up of waste from a particular sector. NHM waste is a subset of total Commercial and Industrial (C&I) waste and NHM waste arising estimates generally adapt C&I data to determine the amount that is NHM. WRAP have developed a model using Waste Data Interrogator (WDI) data and sector specific waste composition analysis to estimate the amount and composition of NHM waste. As explained above, estimates of packaging based on waste arisings data tend to be higher than POM estimates.

The sector where the strongest data exists is the household or consumer sector and here POM and waste arising based estimates differ by a relatively small amount. For example, PackFlow reports estimate 5,266 Kt of consumer packaging POM in 2022<sup>194</sup>. WRAP waste arising estimates give a figure of 5,950Kt of packaging waste collected from households in the UK in 2017<sup>195</sup>. This is around 11% higher than the POM estimate. There is however a much higher amount of uncertainty with NHM data.

The main estimates in this analysis are calculated based on POM figures from *both* the PackFlow reports cited throughout this paper, as well as additional assumptions. As to estimates of NHM POM from 2025 onwards, we use POM data from the published 2023 PackFlow reports and apply growth rates from Valpak's secondary market reports to uplift these tonnages to 2025 levels.

The PackFlow reports break non-consumer estimates down into sub-sectors. From there it is possible to determine C&I packaging. It is however difficult to then extract the amount of packaging that is household-like as different sectors will supply packaging to this sector to differing extents. The estimates of C&I packaging which is non-household municipal are calculated using the different methods described above.

**Table D.2: NHM tonnage estimates 2024**

	Tonnage
Central	3,671kt

### Central estimate

For this estimate we use high level waste arisings data to calculate the proportion of total C&I waste which is NHM. It is then assumed that this proportion would be similar to the proportion of **C&I packaging** which is NHM. For the first consistent recycling consultation impact assessment (now Simpler Recycling), WRAP estimated the total

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<sup>194</sup> [PackFlow report -plastic packaging](#), [PackFlow report-metal packaging](#) ; [PackFlow-paper/card](#); [Wrap -glass packaging](#) ; [Wrap-wood packaging](#)

<sup>195</sup> England estimates taken from WRAP's household waste collection costs modelling. Figures uplifted to UK level using methodology outlined in Section 5.

amount of NHM waste to be 20.3Mt<sup>196</sup> in England in 2017. Defra estimated that in the same year there was 36.1Mt of C&I waste in England<sup>197</sup>. 56% of C&I waste is therefore estimated to be NHM.

At a material level 56% of metal C&I packaging was assumed to be NHM. Based on discussions in the glass PackFlow reports 100% of non-consumer glass was assumed to be household-like. 18% of non-consumer wood packaging was considered the maximum proportion that could be household-like. This is the proportion comprising such as cases, boxes and crates. This may be an overestimate however as this proportion of wood only makes up 2% of the estimated total NHM packaging. To account for the reduced proportion of wood considered NHM, the NHM proportion of paper/card and plastic were inflated slightly to 65% and 60% respectively.

Within the paper/card and plastic PackFlow reports, C&I is made up of hospitality, retail back of store and manufacturing and other sectors. As discussed, hospitality is likely to be made up almost entirely of household-like packaging. For the other two categories it is unclear to what extent this packaging is NHM. WRAP, within their NHM waste arising analysis, however, estimate that 44% of NHM materials which could be collected as dry recyclates are collected from retailers and wholesalers. A significant amount of this material is likely to be packaging. In both reports the manufacturing and other category makes up the highest proportion of C&I packaging (56% and 65% respectively). In the paper/card report manufacturing makes up around a third of this packaging while other services make up around two thirds. Other services represent European Union NACE codes G-U<sup>198</sup> and includes sectors identified by WRAP within their waste arising analysis as producing NHM waste such as education, health and office. WRAP also identify a small amount of manufacturing waste which is NHM. A similar combination of sectors is included within this category in the plastic report however it is less clear of the proportional splits. It is therefore reasonable to assume that there is a significant amount of NHM packaging in these sectors.

The method to further break down the tonnage for each material into the individual packaging formats for use in the modulated fees model is as follows. The tonnage for each material was split into hospitality and other NHM. The composition of the hospitality tonnage remained the same as estimated for option 1. The composition for the remaining tonnage was assumed to match the overall non-consumer composition from the PackFlow reports.

This method produced a total NHM POM estimate of 3,981kt in 2024.

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<sup>196</sup> [https://consult.defra.gov.uk/environmental-quality/consultation-on-consistency-in-household-and-busin/supporting\\_documents/recycleconsistencyconsultia.pdf](https://consult.defra.gov.uk/environmental-quality/consultation-on-consistency-in-household-and-busin/supporting_documents/recycleconsistencyconsultia.pdf)

<sup>197</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/918270/UK\\_Statistics\\_on\\_Waste\\_statistical\\_notice\\_March\\_2020\\_accessible\\_FINAL\\_updated\\_size\\_12.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/918270/UK_Statistics_on_Waste_statistical_notice_March_2020_accessible_FINAL_updated_size_12.pdf)

<sup>198</sup> NACE codes are the statistical classification of economic activities for the EU

## ANNEX E: RECYCLED TONNAGES IN BASELINE METHODOLOGY

Recycled tonnages for each packaging material are also taken from the PackFlow reports.

Again, the reports provide a useful amount of detail of recycling tonnages for different packaging formats however additional assumptions from Eunomia’s analysis were also used to provide further granularity. Unlike with the POM estimates, the PackFlow reports do not provide recycling estimates by sub-sector for the non-consumer sector. Eunomia use commercial municipal<sup>199</sup>, complemented by household<sup>200</sup>, waste composition data to estimate the recycling rate of individual NHM packaging materials. These recycling rates are then multiplied by the NHM POM by packaging material to estimate the recycled tonnage as shown in Table E.1. The remaining non-consumer recycled tonnage from the PackFlow reports was assumed to be ‘other’ C&I waste. For aluminium and steel, metal recycling from IBA is also factored in.

**Table E.1: Baseline recycling projections in tonnes (excluding packaging in scope of DRS) – best estimate**

Packaging material	2025			2029			2034		
	Recycling, Kt			Recycling, Kt			Recycling, Kt		
	HH	NHM	Other C&I	HH	NHM	Other C&I	HH	NHM	Other C&I
<b>Plastic</b>	467	51	449	653	60	467	689	62	487
<b>Wood</b>	7	132	518	7	131	517	7	131	513
<b>Aluminium</b>	6	10	27	7	10	29	8	11	32
<b>Steel</b>	200	47	113	199	48	113	199	48	113
<b>Paper/Card</b>	1,390	2,215	1,038	1,406	2,448	1,050	1,437	2,502	1,073
<b>Glass</b>	1,353	502	-	1,337	510	-	1,320	504	-
<b>Fibre based composite</b>	22	6	-	38	7	-	39	7	-
<b>Total</b>	3,446	2,961	2,145	3,649	3,214	2,176	3,700	3,264	2,219

This leads to NHM recycling rates that are generally lower than those for ‘other C&I’. That non-household, household-like packaging has a lower recycling rate than non-household-like packaging is not an unreasonable assumption for some materials, however the recycling rates for plastic and paper/card ‘other C&I’ are particularly high.

For plastic this seems reasonable based on the PackFlow reports. The reports estimate significantly higher non-consumer plastic recycling rates than those for consumer plastic, largely driven by a close to 100% plastic film collection rate. In line with data used for the Simpler Recycling IA, it is assumed that household-like film will be relatively low whereas C&I film, not in scope of pEPR modulated fees, is known to be widely recycled. The majority of the recycled film identified by the reports is therefore likely to be other C&I.

<sup>199</sup> WRAP, 2019, National municipal commercial waste composition, England 2017, Prepared by Eunomia Research & Consulting Ltd

<sup>200</sup> WRAP, 2019, Bristol, National Household Waste Composition 2017, prepared by Eunomia Research & Consulting Ltd.



It is less clear from the PackFlow reports whether the same trend should be expected for non-consumer paper/card however other C&I paper/card will include a significant amount of transit and backhauled secondary packaging.

The PackFlow reports estimate high metal recycling rates, particularly for steel, which is estimated to have a consumer recycling rate above 100%. As discussed in the report, it is possible that some steel recycling captured as coming from consumer is actually from non-consumer sources. One uncertainty here is calculating the proportion of metal recycling recovered from Incinerator Bottom Ash (IBA). For this analysis the tonnages of metal collected for recycling (i.e. at the kerbside, HWRC, bring bank) were taken from the PackFlow reports however an alternative method was used to calculate metal recovered from IBA. This method was taken from Eunomia's modulated fees analysis, albeit with some assumptions updated. The alternative approach enabled greater flexibility in the modelling by allowing us to break the IBA recovered tonnage down by individual packaging format and for different sectors. For example, the former was useful for incorporating the impacts of DRS in the baseline.

The method of calculating the amount of metal collected for recycling through IBA consisted of extracting the tonnage of packaging waste sent to incineration for each packaging format and calculating the proportion of this which is recovered through IBA. The residual tonnages were assumed to be the POM tonnages not recycled. Of these it is assumed that 81.5%<sup>201</sup> of household packaging waste and 39%<sup>202</sup> of non-household packaging waste is sent to EfW. Estimates of the proportion of the tonnage sent to incineration which is extracted from IBA for each metal was then applied to these figures. It was assumed that 80%<sup>203</sup> of steel and 70% of aluminium<sup>204</sup> sent to incineration is recovered for recycling from IBA. The recycling rates in Table E.2 include metal recycled from IBA. The tonnage recovered through IBA using this estimate is lower than in the PackFlow leading to slightly lower overall metal recycling rates.

The impacts of Simpler Recycling are taken from WRAP's modelling of the HH and NHM collection costs in the Simpler Recycling IA. All packaging in scope of DRS in each Nation is removed from the analysis as this will not be in scope of pEPR payments. It is assumed that metal drinks cans and plastic PET drinks bottles are in scope of DRS in all Nations. Glass drinks bottles are assumed in scope of DRS in Wales only, consistent with the intentions of Welsh Government. It is assumed all DRS schemes will be in place by October 2027.

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<sup>201</sup> This is in line with WRAP's household collection costs modelling which uses data from Waste Data Flow to estimate the split of household waste sent to EfW and Landfill.

<sup>202</sup> From Tolvik 2021 it is estimated that 4,940kt of residual from C&I sources is sent to incineration (IBA and RDF). Total municipal C&I is estimated at 12,680kt. This is calculated as 26,846kt (the implied total municipal residual tonnage in Tolvik 2021) minus 14,238kt (the total household residual tonnage in 2020, from UK stats on waste). [https://www.tolvik.com/wp-content/uploads/2021/05/Tolvik-UK-EfW-Statistics-2020-Report\\_Published-May-2021.pdf](https://www.tolvik.com/wp-content/uploads/2021/05/Tolvik-UK-EfW-Statistics-2020-Report_Published-May-2021.pdf)

<sup>203</sup> Grosso M, Biganzoli L and Rigamonti L (2011) A quantitative estimate of potential aluminium recovery from incineration bottom ashes, Resources, Conservation and Recycling, 55, pp1178-84; Suggests that 70% of steel sent to incineration is captured. Valpak's metal flow covid edition report, estimates that 112kt of steel is captured through IBA. Based on their estimate that 157kt is sent to residual, assuming an 81.5% residual to EfW rate would suggest an over 100% capture rate for steel packaging sent to EfW.

<sup>204</sup> [https://www.alufoil.org/files/images\\_alufoil/sustainability\\_and\\_recycling/05-Recycling\\_and\\_Recovery\\_of\\_Aluminium\\_Foil\\_Packaging/FACT\\_-SHEET-Alu\\_recovery\\_bottom\\_ashes\\_FEB14.pdf](https://www.alufoil.org/files/images_alufoil/sustainability_and_recycling/05-Recycling_and_Recovery_of_Aluminium_Foil_Packaging/FACT_-SHEET-Alu_recovery_bottom_ashes_FEB14.pdf); as quoted in the Valpak's metal flow reports, 60-80% of aluminium packaging is shown to be captured. This is dependent on the thickness of the material with foil rates at the lower end and cans at the higher end. 70% is assumed a reasonable average point.

Once we had established historical recycling tonnages for the sector, we applied the change in recycling growth rate from WRAP’s analysis for the Simpler Recycling FIA to these tonnages<sup>205</sup>. This was done on a material basis and applied to the core packaging materials in scope of Simpler Recycling. For household materials it was possible to extract the increase in recycling for each packaging material. For the NHM sector this was not possible due to limitations with waste arisings data. For the NHM sector the recycling rate was therefore increased by the same proportion for all materials in scope.

Table E.2 shows the recycling rates under a baseline option which excludes DRS materials. The removal of DRS materials reduces the total packaging recycling rate, as well as the recycling rate for the relevant material types, as DRS materials tend to be highly recycled compared to other packaging types.

**Table E.2: Baseline recycling rates excl. DRS materials – best estimate (includes HH, NHM and C&I)**

	2025				2029				2034			
	HH	NHM	Other C&I	Total by packaging type	HH	NHM	Other C&I	Total by packaging type	HH	NHM	Other C&I	Total by packaging type
<b>Plastic</b>	40%	17%	95%	49%	54%	19%	95%	58%	55%	19%	95%	59%
<b>Wood</b>	55%	55%	39%	42%	55%	55%	39%	42%	55%	55%	39%	42%
<b>Aluminium</b>	60%	26%	45%	40%	62%	26%	45%	40%	62%	26%	45%	40%
<b>Steel</b>	91%	43%	97%	81%	91%	45%	97%	81%	91%	45%	97%	81%
<b>Paper/ Card</b>	78%	87%	95%	77%	78%	95%	95%	90%	78%	95%	95%	90%
<b>Glass</b>	68%	92%	-	69%	68%	95%	-	74%	68%	95%	-	74%
<b>Fibre Based Composite</b>	40%	7%	-	19%	68%	7%	-	28%	69%	6%	-	29%
<b>Total recycling rate</b>	66%	77%	70%	66%	69%	82%	70%	74%	69%	82%	71%	73%

<sup>205</sup> The reason for only using growth rates is due to the differences between the datasets used for the NHM waste estimates, in which WRAP data includes both packaging and non-packaging recycling. WRAP’s NHM tonnage estimates use data from the Waste Data Interrogator (WDI) which is significantly different from the POM estimates produced by WRAP and Valpak. Thus, we applied the annual growth improvements from WRAP’s NHM data to the actual POM tonnages.

## ANNEX F: PRN SYSTEM

Under pEPR, producers will still need to provide evidence of meeting recycling obligations for all packaging. As an interim measure, and to facilitate this, producers will continue to obtain Packaging Recycling Notes (PRNs) and Packaging Export Recycling Notes (PERNs) on all packaging. Where producers are obligated to make pEPR payments, they will be required to make an additional payment to bring their contribution for the management of household packaging to full net costs. This will be calculated as the costs incurred by local authorities of household packaging waste management, minus the price paid by reprocessors for recyclable material which incorporates the value of the PRN. The revenue from PRN/PERNs reduces the net cost to reprocessors of reprocessing packaging waste, which in turn allows reprocessors to pay a higher price for recyclable materials. This reduces the net waste management costs paid by LAs and businesses.

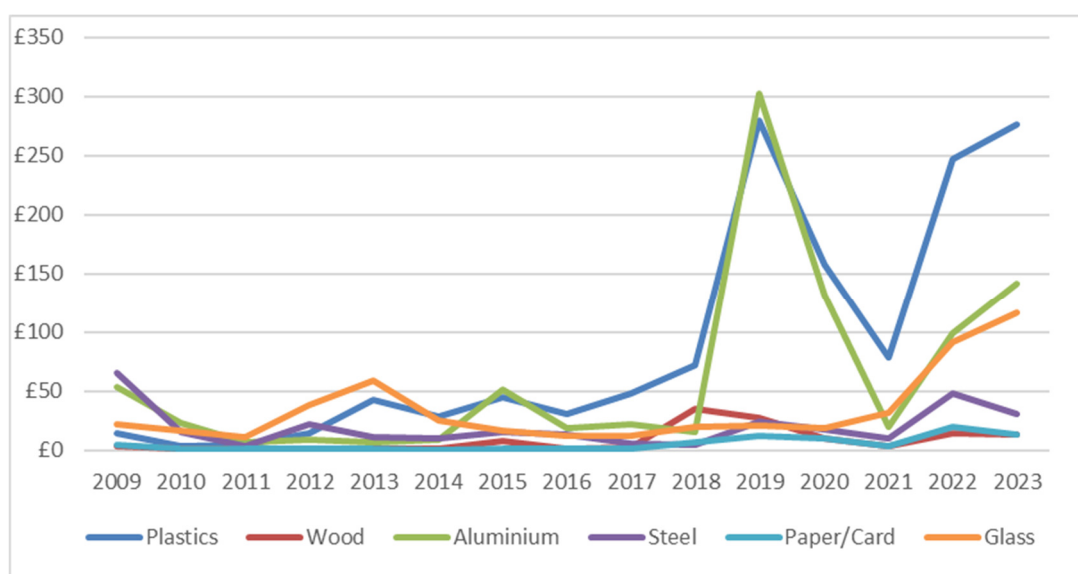
To ensure that producers of household packaging pay no more than the net cost of managing household packaging, reprocessors must pass down the value of the PRN/PERNs they supply in the prices they pay for recyclable material. This relies on an efficient market. It is acknowledged that the PRN/PERN market does not currently function at full efficiency. In particular it is recognised that significant price fluctuations and a lack of transparency may be curtailing the ability of buyers and sellers in the market to trade efficiently. There have been examples, in the past, of larger reprocessors/exporters holding back PRN/PERNs thereby creating the perception of a shortage and driving a rise in prices. This is not illegal but does not help the functioning of the system. A further consultation on additional reforms to increase the efficiency of the PRN/PERN market introduced new reporting requirements for reprocessors and exporters: moving from quarterly to monthly for packaging waste recycled as well as new requirements to report price and revenue data for PRN/PERNs issued. It also introduced new reporting categories for the revenue received from the sale of PRNs by reprocessors and exporters and a 'fit and proper person' for reprocessors, exporters and operators of a Compliance Scheme.

There must also be sufficient demand for packaging recyclate, and enough competition such that reprocessors pay the market price for recyclable materials. As well as expected increased demand for recycled packaging materials, the falling cost of recycling and measures such as the plastic packaging tax means demand for recyclate is also stimulated by the packaging recycling targets set by government. In addition, a key impact of the packaging EPR, DRS and Simpler Recycling is to provide reprocessors with more certainty of supply of materials to help stimulate investment in UK recycling. It is acknowledged that markets for certain types of packaging such as plastic film and fibre-based composite materials may take time to develop, however the reforms should provide sufficient incentives to businesses to develop these markets.

### ***PRN Costs***

Under the current packaging producer responsibility system, obligated producers are required to meet recycling targets set by the government. They do this, as described in Annex 1, by obtaining evidence of recycling (PRN/PERNs) from accredited reprocessors or exporters. The cost of this evidence varies by material depending on several factors, including how economically feasible it is to recycle the different packaging materials and the market perception of how much evidence is available. PRN prices have varied over time, with the prices for some materials showing more volatility than others. This is shown in Figure F.1.

**Figure F.1 - Historical trends of PRN price per tonne by material 2009-2023 observed data**



Source: Source: The Environment Exchange – average PRN prices

In Table F.2 we show the projected PRN prices assumed for the low, central, and high scenarios. These are calculated as such:

- Low – The minimum of either the average price from 2021 - 2023, or the 2023 price.
- Central – The maximum of either the average price from 2021 - 2023, or the 2023 price.
- High – The highest price over 2021 - 2023.

**Table F.2: Projected PRN price for baseline, £ - best estimate**

	Low	Central	High
<b>Plastic</b>	£200	£276	£276
<b>Wood</b>	£11	£14	£15
<b>Aluminium</b>	£87	£142	£142
<b>Steel</b>	£30	£31	£48
<b>Paper/Card</b>	£12	£13	£20
<b>Glass</b>	£80	£117	£117

To estimate the cost to producers of purchasing evidence to comply with their recycling obligation in a specific year, the total obligated tonnage per material<sup>206</sup> is multiplied by the relevant PRN price.

<sup>206</sup> The recycling obligation is the amount of packaging waste that is required to be recycled for obligated producers to meet their obligations and achieve the statutory packaging recycling targets. Obligated producers demonstrate they have met their obligations by purchasing PRNs or PERNs from accredited reprocessors and exporters.

**Table F.3: Compliance costs to packaging producers of purchasing PRN evidence – best estimate, £m**

	2025	2029	2034
<b>Plastic</b>	£291.7	£356.3	£374.0
<b>Wood</b>	£5.8	£5.7	£5.7
<b>Aluminium</b>	£14.5	£16.0	£17.5
<b>Steel</b>	£12.7	£12.8	£12.7
<b>Paper/Card</b>	£59.4	£62.7	£64.1
<b>Glass</b>	£191.0	£190.2	£187.8
<b>Total</b>	£575.1	£643.8	£661.9

Operational costs (PRN scheme)

As discussed in the main text (data reporting costs), it is assumed that compliance schemes will charge a membership fee which covers the cost of collating and reporting data, as well as regulatory advice. We assume that compliance schemes will also charge an issuing fee for PRNs purchased on behalf of members. This is an additional charge on top of the price of the PRN. The costs of procuring PRNs are based on Waste Care’s charges<sup>207</sup>. These range from £0.5-£2 per tonne of PRN, the conservative price of £1 has been assumed<sup>208</sup>.

**Table F.4: PRN issuing costs, £m**

	2025	2029	2034
<b>Cost of procuring PRNs</b>	£8	£9	£9

<sup>207</sup> Waste Care PRN charge - <http://www.wastecare.co.uk/compliance-services/packaging-compliance/costs-and-fees>

<sup>208</sup> We have used the lowest proposed price from WasteCare research, £1 to avoid overestimating the net benefit of an EPR system compared to the current PRN system.

## ANNEX G: MATERIALS FACILITIES

### Number of facilities in scope

In 2019, 101 MRFs provided sampling data through WRAP's MF Reporting Portal, which covers MFs in England and Wales. With the widening scope of sampling to all FPoC, research was conducted to understand the number of sites that would come into scope. WRAP and Waite Resources Management conducted analysis of permit returns data for each of the four nations, filtering by European Waste Catalogue (EWC) code to capture potentially in scope sites. This data included several site types that were not expected to be in scope, such as skip hire, HWRCs and civic amenity sites which were manually removed. Some other sites were removed based on the judgement of the consultants.

Overall, 1330 sites, run by 768 unique operators, were adjudged to be potentially classed as a materials facility. This largely consisted of TSs and MRFs. Only facilities which receive waste from multiple sources for consolidation or undertake sorting of the waste would be in scope of the sampling regulations. The MF data analysed was not able to show where waste was sourced from, and it was therefore not possible to exclude sites which only consolidated waste from one supplier. To try to mitigate this, site handling below 100t were also excluded as it was felt that these were more likely to handle waste from one supplier. This removed 162 further sites. Once accounting for the de minimis, with sites below 1,000 removed, the total was 935. This estimate has been revised down from 935 based on an improved filtering process on the raw data, and consultation with devolved regulatory agencies including the EA and SEPA, and colleagues from the Welsh Government and DAERA. In-scope sites are now assumed at 268:

- 153 in England
- 44 in Wales
- 41 in Northern Ireland
- 30 in Scotland

### Cost survey

To understand the costs to MFs associated with the new sampling requirements, WRAP and Waite Resources Management surveyed potentially in scope facilities, asking for details on any current sampling costs as well as estimates of any additional costs under the new requirements. 33 businesses were contacted, with 12 providing a response. Although a small sample size, the responses did cover both LA and private operated sites as well as a variety of different sized sites, ranging from 1,500t to 160,000t per year. For each site, costs were provided for current costs, and expected additional costs under the new regulations. For each, costs were broken down into capital and operational cost. Many sites also provided more detailed commentary of how these costs were calculated. For example, operational costs were almost exclusively made up of operative staff salaries. Capital costs covered a range of items, including weighing scales, sampling tables, sorting conveyor and portable buildings.

As sites had differing opinions on the extent to which new equipment and staff would be needed (for example one site believed that their current equipment would be sufficient and costed no additional capital costs), current and additional costs were added together to estimate the total capital and operative costs needed for each site. For all sites, operative costs were significantly higher than capital costs. On average, once capital costs were depreciated over the life of the equipment, capital costs made up 4-8% of annual costs. For one outlier, around 40% of annual costs were capital, however this site appeared to have costed in the purchasing of software which reduced the need for staff.

Note, all MF analysis shown in this Impact Assessment are not included in the EANDCB but shown for transparency.

## ANNEX H: PACKAGING COLLECTION COSTS BY NATION

Northern Ireland cost information was collected by WRAP who then modelled future costs based on the same methodology to their England collection costs modelling. Analysts from the Welsh Government collected current cost and tonnage data and then provided this to WRAP who were able to model costs in future years and ensure that the approach used was largely in line with analysis for England and Northern Ireland.

Zero Waste Scotland (ZWS) provided Defra with outputs from their modelling of Scottish household collection and disposal costs. Having collected data from local authorities in confidence, they were unable to provide the full modelling and were only able to provide aggregated estimates for each waste stream. Further analysis was conducted by Defra to estimate the packaging element of these costs for the IA.

**Table H.1: Collection, disposal, and transition costs from ZWS modelling, £m**

Category	Kerbside residual	Kerbside dry	Disposal	Landfill tax	Transition costs
Rural inaccessible councils	£16	£4	£28	£9	£8
Rural accessible councils	£26	£7	£44	£18	£21
Urban councils	£55	£10	£55	£14	£40
Mixed, mainly urban, no city councils	£26	£11	£43	£16	£25
Mixed, mainly rural councils	£16	£5	£29	£12	£13
<b>All Scottish councils</b>	<b>£139</b>	<b>£37</b>	<b>£198</b>	<b>£69</b>	<b>£107</b>

Packaging residual waste costs were estimated using the following method. Collection costs were estimated by multiplying the kerbside residual waste costs by the proportion of packaging in residual waste in Scotland by weight (21%). This was taken from household waste composition produced by Eunomia for WRAP<sup>209</sup>.

To estimate the disposal costs, specific data on the tonnage of target dry materials collected for recycling and in residual waste in Scotland, provided by ZWS were used. Using the same waste composition analysis, non-packaging dry material was removed from these tonnages. Packaging in scope of the Scottish DRS system as also removed. The remaining packaging in residual tonnages were multiplied by a disposal cost per tonne. This was estimated by first estimating the proportion of residual waste sent to landfill (71%) and EfW (29%) in Scotland<sup>210</sup>. For the proportion sent to landfill, the Scottish Landfill tax rate (£91.35<sup>211</sup>), was added to the assumed landfill gate fee used

<sup>209</sup> <https://wrap.org.uk/sites/default/files/2021-10/WRAP-national-household-waste-comparison-2017.pdf>

<sup>210</sup> Waste Landfilled in Scotland and Waste Incinerated in Scotland; <https://www.sepa.org.uk/environment/waste/waste-data/waste-data-reporting/waste-data-for-scotland>

<sup>211</sup> <https://www.gov.scot/policies/taxes/landfill-tax/>

by WRAP in their household collection modelling (£27.91). Again, the EfW gate fee used by WRAP in their household collection modelling was used (£84.15).

**Table H.2: Kerbside residual tonnage by material type (Scotland)**

Category	Kerbside residual								
	Paper (all)	Card	Cans Al & Fe	Food and drink cartons	Container Glass	Plastic bottles	Plastic PTT	Plastic film	Foil and aerosols
<b>Rural inaccessible councils</b>	7,245	2,460	1,227	318	5,706	1,317	3,772	6,608	796
<b>Rural accessible councils</b>	22,971	8,224	4,389	801	14,334	5,051	9,007	18,436	2,333
<b>Urban councils</b>	32,454	19,123	6,550	1,115	22,006	11,825	12,290	23,182	3,765
<b>Mixed, mainly urban, not city councils</b>	28,315	9,993	4,603	689	18,605	5,981	10,265	20,721	2,833
<b>Mixed, mainly rural councils</b>	13,482	4,330	2,310	350	7,689	3,019	4,756	10,857	1,367
<b>All Scottish councils</b>	104,467	44,130	19,078	3,273	68,339	27,193	40,090	79,804	11,093

Packaging related dry recycling costs were estimated as follows. Collection costs were estimated by multiplying the total dry collection costs by the proportion of packaging in dry collections by partially compacted volume. A specific estimate for Scotland was not available and the proportion used by WRAP in their England collection costs modelling was used (78%). This was considered appropriate as waste composition analysis<sup>212</sup> shows that the proportion of packaging in dry recycling by *weight* is similar in England and Scotland.

<sup>212</sup> <https://wrap.org.uk/sites/default/files/2021-10/WRAP-national-household-waste-comparison-2017.pdf>



**Table H.3: Kerbside recycling tonnage by material type (Scotland)**

Category	Kerbside recycling								
	Paper (all)	Card	Cans Al & Fe	Food & drink cartons	Container Glass	Plastic bottles	Plastic PTT	Plastic film	Foil and aerosols
<b>Rural inaccessible councils</b>	10,007	4,077	1,098	89	682	1,414	355	253	37
<b>Rural accessible councils</b>	18,509	6,912	1,979	333	6,103	3,584	1,356	922	292
<b>Urban councils</b>	15,068	6,475	2,009	308	11,902	3,401	1,264	783	291
<b>Mixed, mainly urban, not city councils</b>	22,173	9,422	2,947	462	13,717	5,449	2,020	1,110	427
<b>Mixed, mainly rural councils</b>	7,738	3,231	602	101	4,864	1,926	922	778	177
<b>All Scottish councils</b>	73,494	30,117	8,636	1,293	37,267	15,775	5,918	3,847	1,225

To estimate net recycling end-of-life treatment costs, target dry materials tonnages were again taken from the ZWS analysis. As with residual waste tonnages, these were adjusted to remove non packaging materials as well as packaging in scope of DRS. The number of local authorities signed up to the Scottish Charter for Household Recycling was used as a proxy for waste collected as multi-stream (93%). It is assumed that LAs would receive material revenue for this packaging. Revenue per tonne rates were assumed for each high-level material type. Where possible these were aligned with WRAP household collection costs modelling. The proportion not collected as multi-stream (7%) was assumed to go to a Material Recycling Facility (MRF) for sorting, with councils paying a gate fee. In line with WRAP's modelling, a MRF gate fee of £60 per tonne was assumed. This accounts for the lower value of this material once DRS packaging is removed.

Lastly, it was assumed that a certain proportion of costs associated with local authorities transitioning to the Scottish Charter for Household Recycling would relate to packaging. As the Charter includes separate food and dry collections, the proportion of packaging in food and dry recycling collections (60%) was used<sup>213</sup>. It was multiplied by total transition costs, added to the packaging recycling collection costs and annualised over the appraisal period.

**Table H.4: Estimated packaging costs (Scotland)**

	Costs (£m)
<b>Packaging residual collection</b>	£29
<b>Packaging residual disposal</b>	£18
<b>Packaging recycling collection</b>	£29
<b>Packaging recycling treatment</b>	-£2
<b>Packaging recycling collection transition (annualised over 7 years)</b>	£6
<b>Total net packaging costs</b>	<b>£80</b>

<sup>213</sup> <https://wrap.org.uk/sites/default/files/2021-10/WRAP-national-household-waste-comparison-2017.pdf>

## ANNEX I: MODULATED FEES APPROACH

Defra commissioned Eunomia to analyse and make recommendations on the logistics of both a modulated fees and deposit based pEPR scheme<sup>214</sup>. Based on the findings in the report and following consultation with stakeholders, modulated fees were considered the more pragmatic and effective approach.

A further objective of Eunomia's work was to suggest indicative fee levels and appraise the likely impacts of a modulated fees approach on producers. This included considering the impact of modulated fees on producers' behaviour in terms of packaging placed on the market. As part of this work Eunomia developed a model to provide indicative fees for 80 packaging types as well as assess the potential impact of these fees on producer behaviour and on packaging recycling rates. Defra have further adapted this model to quantify indicative impacts of modulated fees for this analysis.

The model analyses the impact of a modulated fees approach based on the recyclability of a packaging type, based on the recycling rate of that packaging type. As a consequence of a high modulated fee, producers either take action to increase the recycling rate of that packaging type (to lower the fee in subsequent years) or switch to packaging with a lower fee. The overall recycling rate will increase as individual packaging types see increased recycling rates, or where producers switch from lower to higher recycled packaging.

The model can run different scenarios based on the specification of modulated fees. Within the impact assessment Defra have used the following scenario:

- Fees are placed on packaging by weight (rather than by item).
- Fees are modulated based on the material specific recycling rate<sup>215</sup>.

It should be noted that decisions on the workings of modulated fees will be down to the Scheme Administrator, and the scenarios used in the Eunomia analysis, and this IA are purely indicative.

The overall fee (per tonne) for each packaging type is the net of two elements:

- The base fee is the net collection and treatment cost for that sub-material type.
- The recyclability fee is the main modulation and is based on the recycling rate. The lower the recycling rate, the higher the fee. This can be a positive or negative fee (the fee will be negative if the recycling rate of the packaging type is higher than the average recycling rate by material).

All fees across all materials sum to the net cost of managing household packaging. The fee for each packaging type will change on an annual basis as recycling rates change over time.

Within the model a high modulated fee assigned to a packaging type will impact producer's decisions in two main ways:

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<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=20310&FromSearch=Y&Publisher=1&SearchText=Extended%20Producer%20Responsibility&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description>

<sup>215</sup> This aspect of the modulation calculates the fee for a packaging type by calculating the distance from recycling rate of that packaging to the average recycling rate. This average recycling rate can either be material specific or across all materials. For example, the fee for PS PTTs can be calculated by determining how close its recycling rate is from the general plastic recycling rate or the overall recycling rate for all materials.

- Producers will take action to try to increase the recycling rate of that sub-material in order that the fee is lower in the next year.
- Producers will switch to a sub-material with a lower fee.

It is assumed that materials with a low recycling rate and therefore a high fee in a given year will see an increase in the recycling rate in the next year because of this. The model is set up so that sub-materials with low recycling rates will see rates increase more quickly than those with higher recycling rates – the exception being those packaging types with very low recycling rates (less than around 20%) which are considered very difficult to recycle and therefore will experience only small increases in the recycling rate.

Producers can also switch from a sub-material with a high fee to one with a lower fee. The *amount* of a particular sub-material which is switched in a given year is based on the mechanics of the model. Essentially the lower the recycling rate of that sub-material, the higher the proportion of that material that will switch. The *substitute* sub-material(s) it is possible for this sub-material to switch to must be pre-defined. If no substitute material is pre-defined for a particular material, no switching will occur.

For this analysis, only a small number of known switches were included. Based on discussions with WRAP these are:

- PS will switch to PP and PET.
- PVC will switch to PE and PET.
- Black plastic will switch to non-black plastic of the same polymer.

## ANNEX J: COST AND BENEFIT SUMMARY TABLES, PRESENTED USING 2023 AS THE PRICE YEAR

In this annex we present the tables in our “Introduction and Evidence Summary” using GDP deflator figures from the Office for Budget Responsibility’s (OBR) March 2024 forecasts<sup>216</sup> to inflate costs and benefits to 2023 prices, the latest full year.

A summary of costs and benefits of the reform using 2023 prices are set out below.

<i>Present Value, 2023 Base Year (2025-34) £m</i>	<b>Impact on Business</b>	<b>Direct/Indirect</b>	<b>Option 1</b>
<b>Transition Costs</b>			
Producer - pEPR Familiarisation	Yes	Direct	£2.8
Materials Facility - Capital and Familiarisation	Yes	Indirect (sits in separate regulations)	£2.4
Reprocessor/Exporter - Familiarisation	Yes	Direct	£0.8
Public Sector - IT Investment	No	Direct	£117.1
<b>Costs</b>			
Producer - Household Packaging Waste management (Kerbside collections) - Transfer	Yes	Direct	£12,079.8
Producer - Household Packaging Waste management (HWRC) - Transfer	Yes	Direct	£415.2
Producer - Scheme Administrator (incl. IT)	Yes	Direct	£161.1
Producer - Compliance Scheme	Yes	Direct	£131.6
Producer - Regulator	Yes	Direct	£176.8
Producer - SA Comms Campaigns	Yes	Direct	£129.4
Materials Facility - Operational Costs	Yes	Indirect (sits in separate regulations)	£27.7
Materials Facility - Regulator	Yes	Indirect (sits in separate regulations)	-£1.2
Reprocessor/Exporter - Regulator	Yes	Direct	£0.2
Reprocessor/Exporter - Additional Data	Yes	Direct	£5.0
Public Sector - Landfill Tax Loss - Transfer	No	Indirect	£29.6
<b>Benefits</b>			
Society - GHG Emission Savings	No	Indirect	£212.9
Producer - Net Collection Cost Savings	Yes	Indirect	£217.0
Reprocessor - Secondary Material Market	Yes	Indirect	£53.7

<sup>216</sup> <https://obr.uk/efo/economic-and-fiscal-outlook-march-2024/>

Public Sector - Household Packaging Waste management (Kerbside, HWRC) - Transfer	No		£12,495.0
Public Sector – IT Investment Cost Recovery	No	Direct	£86.1
<b>Total Costs</b>			£13,278.5
<b>Total Benefits</b>			£13,064.8
<b>NPV</b>			-£213.7

As outlined earlier in this Impact Assessment, MF costs have been removed from the EANDCB, as they are introduced under separate regulations. They are shown in the central case for full transparency. Further details on this can be found in Section 5.

<i>Present Value – 2023 base year (2025-34) £m</i>	<b>Option 1</b>
<b>Transition Costs</b>	
Producer - pEPR Familiarisation	£2.8
Reprocessor/Exporter - Familiarisation	£0.8
<b>Costs</b>	
Producer - Household Packaging Waste management (Kerbside collections) - Transfer	£12,079.8
Producer - Household Packaging Waste management (HWRC) - Transfer	£415.2
Producer - Scheme Administrator (incl. IT)	£161.1
Producer - Compliance Scheme	£131.6
Producer - Regulator	£176.8
Producer - SA Comms Campaigns	£129.4
Reprocessor/Exporter - Regulator	£0.2
Reprocessor/Exporter - Additional Data	£5.0
<b>Total Costs</b>	£13,102.9
<b>Total Benefits</b>	£0.0
<b>Net Costs</b>	£13,102.9
<b>EANDCB (Annualised)</b>	£1,522.2