

<b>Title:</b> Impact Assessment of proposed GB implementation of amendments made to the Basel Convention on Plastic Waste  <b>RPC Reference No:</b> RPC-DEFRA-5033(1) <b>Lead department or agency:</b> Defra <b>Other departments or agencies:</b>	<b>Impact Assessment (IA)</b>
	<b>Date:</b> 4 December 2020
	<b>Stage:</b> Final
	<b>Source of intervention:</b> Domestic
	<b>Type of measure:</b> Secondary legislation
	<b>Contact for enquiries:</b> Policy lead: Patrick McKell, Lead Analyst: Ahamad Akbor (WasteMovements@defra.gov.uk)
<b>Summary: Intervention and Options</b>	<b>RPC Opinion: Green Rated; Fit for purpose</b>

Cost of Preferred (or more likely) Option (in 2019 prices)	
<b>Total Net Present Social Value</b>	<b>Business Impact Target Status</b>
-£166.5m	Non Qualifying provision

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

It is common practice for contaminated and mixed plastic waste to be shipped to countries with emerging economies in pursuit of lower treatment cost. These transboundary movements are often to countries which do not have the capacity to manage the waste effectively resulting in dumping and incineration of waste contributing to significant pollution. Incinerating contaminated plastic waste, for instance, releases toxic pollutants which are harmful to human health. Where waste is dumped, costs of marine plastic pollution alone is estimated at US\$13bn of environmental damage to ecosystems per year. At present, waste managers face no incentives to improve this situation as they do not directly bear the costs of the pollution generated if the waste is not managed effectively. In addition, they may avoid the costs associated with transferring waste to be appropriately dealt with (repatriation) if they cannot be traced. These represent negative externalities with costs borne by wider society. Government intervention is necessary to correct this externality and to place greater controls on exports of plastic wastes to mitigate adverse effects and more effectively enforce the polluter pays principle.

In May 2019, the Basel Convention was amended to include contaminated and mixed plastic waste (referred to as 'Y48') in a legally binding framework which will require prior informed consent (PIC) to be obtained from regulators in the countries of dispatch, transit and destination for shipments, and exporters to obtain a financial guarantee to provide for the costs of returning the waste to the UK if it cannot be recycled in the destination country. The UK is a Party to the Basel Convention and obliged to implement these changes. The proposed International Waste Shipments (Amendment) (Plastic Waste) Regulations 2020 will give effect to the Basel changes domestically, allowing the UK regulators to implement and enforce them.

**Note – the proposed statutory instrument will be limited in its territorial scope to Great Britain. Under the terms of the Ireland - Northern Ireland Protocol the EU legislation on waste shipments (Regulation (EC) No 1013/2006) will continue to have effect in Northern Ireland.**

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

The policy objectives of the Basel Convention amendments are to reduce the environmental damage which can result from transboundary shipments of low quality and mixed plastic waste. Its provisions are devised to encourage plastic waste exporters to improve the quality of the material they export meaning it is more uniform and more likely that it can be recycled. This should reduce the likelihood of dumping wastes in landfill or the ocean and incineration of low quality plastic waste or non-target waste.

The requirements for prior informed consent and financial guarantees ensure that waste exporters are more likely to factor potential costs from poor quality exports in their decisions to export. Greater transparency will allow regulators in the destination country to reject contaminated and mixed plastic waste imports if necessary and so place greater responsibility on exporters to ensure waste can be recycled effectively in the destination country. Financial guarantees to cover repatriation or clean up costs will also create an incentive to improve the quality of plastic waste exports as this will reduce the risk premium associated with their exports.

This will lead to greater efficiency in exporters' decision making on whether to export contaminated and mixed plastic waste or to improve the quality of their shipments so that PIC is not required, as they must account for the external costs of their shipments in decision-making. To measure the success of the policy or levels of compliance, we will be monitoring the number of notifications made; the amount of waste being suitably recovered in the destination country or GB; and the number of illegal exports of plastic waste being repatriated to GB by destination countries.

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

Option 0 - Do nothing

The UK does not implement the Basel amendments into its domestic Law.

Option 1 – Preferred option (minimum approach)

Domestic legislation will be updated to reflect the 2019 amendments to the annexes of the Basel Convention. Critically, this means the GB regulators will have the power to implement and enforce these changes and we will avoid the reputational damage that would result from non-implementation. From 1 January 2021, all exporters of qualifying plastic waste will be required to apply to the relevant GB regulator for approval to export these wastes under the prior informed consent procedure specified under the Basel Convention and obtain the required financial guarantee to insure the export in case its need to be repatriated, or risk the return of their shipments at their cost.

**Will the policy be reviewed?** It will be reviewed. **If applicable, set review date:** December 2025

Does implementation go beyond minimum EU requirements?

No

Is this measure likely to impact on international trade and investment?

Yes

Are any of these organisations in scope?

**Micro**  
Yes

**Small**  
Yes

**Medium**  
Yes

**Large**  
Yes

What is the CO<sub>2</sub> equivalent change in greenhouse gas emissions?  
(Million tonnes CO<sub>2</sub> equivalent)

**Traded:**  
N/A

**Non-traded:**  
N/A

***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: Rebecca Pow

Date:  
07/12/2020

# Summary: Analysis & Evidence

## Policy Option 1

Description:

### FULL ECONOMIC ASSESSMENT

Price Base Year 2020	PV Base Year 2021	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: -503.0	High: -65.5	Best Estimate: -175.9

Business Net Present Value (£m) -175.9	Net cost to business per year (£m) 20.4
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COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0.1	7.6	65.5
High	0.1	58.4	503.0
Best Estimate	0.1	20.4	175.9

#### Description and scale of key monetised costs by 'main affected groups'

The best estimate for total costs to business is £175.9m. The largest component of this is £102.8m for notification fee costs to inform the competent authorities of dirty mixed plastic waste exports. There are also costs for obtaining a financial guarantee in case exports are repatriated (£28.6m) and other administrative costs (£44.5m). Of the 208 GB businesses that export plastic waste, we have assumed that all businesses will be impacted by this regulation. These businesses are of varying sizes, including waste brokers who export waste and larger businesses who deal with waste up the hierarchy. We would expect these costs to fall significantly if businesses opt to clean and sort their waste as an alternative to export. This is not presented as our central case but explored within sensitivity analysis.

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

We have not monetised the potential costs to exporters if notified waste is rejected by the competent authorities of receiving countries, or if receiving countries do not have capacity to process forms which results in delays for exports. To model such costs, we would have to assume that some countries are unable to meet the requirements of the Basel Convention. We have not made this assumption for the purpose of our cost benefit analysis.

#### Description and scale of key monetised benefits by 'main affected groups'

We have not been able to monetise the benefits of this regulation and so all benefits are captured qualitatively within the non-monetised benefits section.

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

There are four key non-monetised benefits:

1. International environmental and health benefits associated with tackling illegal dumping of waste.
2. Reduced repatriation costs due to improved exporter responsibility.
3. Avoiding reputational damage that would arise in the case of non-implementation.
4. Regulators have better information on the market for plastic waste exports.

<b>Key assumptions/sensitivities/risks</b>	<b>Discount rate</b>	3.5
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- Available capacity for clean and sort and sector response: We assume businesses will continue to export with the additional PIC control costs. They can avoid this by choosing to clean and sort their waste domestically although this is dependent on available infrastructure capacity. We have assumed that no capacity or recycling facilities will be developed over the appraisal period. If there was capacity, our analysis demonstrates the policy measure would have a positive NPV. This assumption is set out in more detail in section 6.1.7 and we have also presented a sensitivity if capacity were available in sections 7.6-7.10.
- Total plastic waste exports: we do not have data on non-packaging plastic waste exports, so have made assumptions using plastic packaging waste data.
- Proportion of plastic waste exports that are Y48: the costs of the policy are very sensitive to the proportion of waste that is classed as Y48, so we have conducted sensitivity analysis to account for this uncertainty.

#### BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m: N/A
Costs:	20.4	Benefits: 0	

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# Evidence Base

## 1. Introduction

1. Plastic pollution has become one of the most pressing environmental issues globally, as rapidly increasing production of disposable plastic products overwhelms the world's ability to deal with them. Part of this issue is the serious environmental pollution caused by the unchecked transboundary shipment and inadequate management of contaminated and mixed plastic wastes, which are more difficult to recycle and more likely to result in being disposed of.
2. Emerging economies in particular, face challenges in managing the rapidly growing volume of plastic waste generated by their citizens combined with the imports of waste from countries with developed economies who seek lower processing costs than in their own countries. Conversely, countries with developed economies face challenges if they have not developed sufficient capacity to manage and recycle plastic waste and have come to rely heavily on the continued availability of lower cost sorting and recycling capacity in other countries. This means that many shipments of plastic waste are currently exported, largely unchecked, from countries with developed economies to countries with emerging economies - who are less able to manage this waste effectively. In many instances, these exports cannot be suitably recycled in the destination country and instead end up in landfills, or are dumped, burned, or find their way into the ocean. The damage caused is difficult to reflect in monetary terms but is known to be significant. For example, it is estimated there are 150m metric tonnes of plastic in the global ocean, and the economic costs of this is estimated at US\$13bn of environmental damage to ecosystems per year<sup>1</sup>.
3. The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal is the most comprehensive global environmental treaty on hazardous and other wastes. It has 187 member countries ('Parties') and aims to protect human health and the environment against the adverse effects resulting from the generation, management, transboundary movements and disposal of hazardous and other wastes. For countries that are members of the Organisation for Economic Cooperation and Development (OECD) the Basel Convention is supplemented by an OECD Council Decision on the Control of Transboundary Movements of Wastes Destined for Recovery Operations which provides a legal framework for the control of waste movements between OECD countries. The OECD Decision allows members of the OECD to diverge from Basel controls, subject to the need for consensus, in respect to movements of waste between OECD countries.
4. Several countries that are parties to the Basel Convention recognised the environmental pollution caused by the transboundary shipment of contaminated and mixed plastic wastes. In a bid to address this problem, at the last Conference of the Parties to the Basel Convention (COP-14, 29 April–10 May 2019) amendments to Annexes II and IX were agreed with the objectives of enhancing the control of the transboundary movements of plastic waste and clarifying the scope of the Convention as it applies to such wastes.
5. The amendments to the annexes to the Convention specify a new category of plastic waste that will be subject to the Convention's prior informed consent (PIC) procedure. The prior informed consent procedure is the backbone of the Convention. It requires that shipments of hazardous and specified mixed wastes are approved by regulators in the country of dispatch, destination and where applicable transit before the shipment can commence. In addition, Parties to the Convention are required to ensure that any transboundary movements of

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<sup>1</sup> UNEP. (2014) Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry. URL: [www.unep.org/pdf/ValuingPlastic/](http://www.unep.org/pdf/ValuingPlastic/).

hazardous wastes which are subject to the PIC procedure are covered by insurance, bond or other guarantee as may be required by the State of import or any State of transit which is a Party. This insurance is required to meet the costs of repatriation of the waste if it cannot be recovered or recycled in the country of destination or if an accident occurs during its transport which requires remediation. Currently shipments of non-hazardous plastic wastes destined for recycling operations fall outside the scope of the prior informed consent procedure. Prior regulatory approval is not currently required for these waste shipments.

6. The amendments agreed at the COP will clarify when and how the Convention applies to plastic waste. Through decision BC-14/12, the COP approved the following changes to annexes to the Convention:
  - Annex II (waste that requires special consideration: subject to the PIC procedure): addition of new entry “Y48” covering all plastic waste, including mixtures of plastic waste, except for the plastic waste covered by entry “B3011” in Annex IX;
  - Annex IX (waste presumed to be non-hazardous: not subject to the PIC procedure): addition of new entry “B3011”, replacing current entry “B3010”, covering plastic waste consisting exclusively of one non-halogenated polymer or resin, selected fluorinated polymers or mixtures of polyethylene, polypropylene and/or polyethylene terephthalate, provided the waste is destined for recycling in an environmentally sound manner and almost free from contamination and other types of wastes.
7. The Basel Convention and the OECD Decision are implemented in the EU (and in the UK during the current Transition Period) through directly applicable EU legislation (Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste). Consequently, amendments to the Basel Convention and/or the OECD Decision would in normal circumstances be implemented through an amendment to the EU legislation and there would be no need for UK legislation to implement changes to the international rules.
8. However, the EU legislation required to implement the Basel amendments was delayed by negotiations within the OECD on the approach to be taken by OECD countries to implement the Basel amendments within the OECD Decision. An objection lodged by the United States of America in August 2019 to the automatic integration of the Basel Convention amendments into the OECD Decision triggered a negotiation process. Subsequent negotiations between OECD countries failed to reach consensus on how to incorporate the changes made to the Convention into the OECD Decision. On 24 June 2020 agreement was finally reached in an OECD working party that the OECD system will be amended to state that there is no consensus and that it will be for each OECD country to control shipments of non-hazardous plastic wastes in conformity with its domestic legislation and international law. For the UK this means that shipments of contaminated and mixed plastic wastes, PVC and PTFE waste from the UK to other OECD countries should now be governed by the amendments made to the Basel Convention in 2019.
9. On the 8 May 2020, the European Commission issued a consultation document which contained draft legislation to implement the Basel amendments. Legal advice obtained by Defra clarified that the draft legislation would not take effect during the Transition Period and that consequently the UK government would have to develop legislation to implement the Basel Convention amendments in Great Britain. Following the EU consultation process a subsequent draft delegated act issued by the Commission on the 24 June 2020, amended to take account of the conclusion of the OECD negotiations, confirmed the initial assessment that implementing legislation would be required for Great Britain.
10. This is a final impact assessment and we have not produced a consultation stage IA or gone to consultation on this legislative change because the scope of the requirement is clearly set

by the Basel Convention. In other words, there is nothing to consult on in terms of policy, and to do so would be in contravention of the Cabinet Office Consultation Principles.

11. Finally, by transposing the Basel changes into domestic law we are undertaking the minimum we are legally obliged to do. However, the Government's ambition in this area clearly goes beyond the amendments to the annexes of the Basel Convention agreed in May 2019. Tackling plastics pollution, both in the UK and internationally, is a priority for the Government. The Conservative Party launched their election manifesto on 24th November 2019. The manifesto included a commitment to: "... ban the export of plastic waste to non-OECD countries, consulting with industry, NGOs and local councils on the date by which this should be achieved."
12. This commitment was subsequently reaffirmed in the Queen's Speech delivered to both Houses of Parliament on the 19 December 2019. We intend to consult on this policy in 2021 and will engage in extensive evidence gathering in advance of this.

## 2. Problem under consideration

13. Serious environmental pollution is caused by the unchecked transboundary shipment and inadequate waste management of low quality and mixed plastic wastes, which are difficult to recycle and more likely to be disposed of in a polluting way. This is a challenge that is rooted in unsustainable production and consumption patterns and poor solid waste management. Including lack of infrastructure, lack of adequate legal and policy frameworks and poor enforcement, including on interregional cross-border trade of plastic waste, and a lack of financial resources.
14. Global plastic production has increased steadily and has reached over 300 million tonnes a year<sup>2</sup>. At present, many plastic waste shipments are exported, largely unchecked, from developed economies to emerging economies - who are less able to manage this waste effectively. Indeed, plastic pollution is most visible in Asian and African nations, where waste management systems are often inefficient or non-existent. This pattern causes serious environmental damage. Marine plastic litter is a global environmental problem which poses environmental, economic, health, aesthetic and cultural threats. This includes degradation of marine and coastal habitats and ecosystems that incur socioeconomic losses in marine-based sectors globally. An estimated 80% of all marine pollution is caused by human activities on land in the form of solid waste leakage including plastic from inadequate waste management and urban storm-water run-off<sup>3</sup>. Air and land pollution from plastic waste also pose significant environmental challenges. A Leeds University study (Breaking the Plastic Wave, July 2020) revealed that each year nearly 30 million tonnes of plastic waste is dumped on land, nearly 50 million tonnes is burned in the open, and 11 million tonnes ends up in the world's oceans. Although burning reduces the amount of waste being discarded onto land and into the seas, it generates potentially toxic fumes and contributes to greenhouse gas emissions.
15. This level of pollution is predicted to rise on an annual basis and the same study projects that by the year 2040, 133 million tonnes of plastic waste will be burnt, and 77 million tonnes dumped on land, with 29 million tonnes ending up in the oceans<sup>4</sup>.

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<sup>2</sup> UNEP: Our planet is drowning in plastic pollution, <https://www.unenvironment.org/interactive/beat-plastic-pollution/>

<sup>3</sup> UNEP: Marine Litter and Plastic Pollution, <https://www.unenvironment.org/cobsea/what-we-do/marine-litter-and-plastic-pollution#:~:text=An%20estimated%2080%20per%20cent,inadequately%20treated%20waters%20from%20industries%3B>

<sup>4</sup> Breaking the Plastic Wave, a comprehensive assessment of pathways towards stopping ocean plastics pollution, 2020, [https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave\\_report.pdf](https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave_report.pdf)

16. In response to these concerns, the amendments made to Annexes II and IX of the Basel Convention in May 2019 were agreed by the Conference of the Parties with the objectives of enhancing the control of the transboundary movements of plastic waste and clarifying the scope of the Convention as it applies to such wastes. This includes introducing a requirement for prior informed consent (PIC) from regulators in the country of dispatch, transit and destination for shipments of specified plastic waste before a shipment can take place, which includes a requirement to obtain a financial guarantee to insure the export in case it needs to be repatriated. The plastic wastes specified in the amendments were considered by the Conference of the Parties to be more difficult to recycle and more likely to contribute to environmental pollution. They are specifically: contaminated and mixed plastic wastes, waste polymers of vinyl chloride (PVC) and polytetrafluoroethylene (PTFE) wastes. These are mainly dirty, mixed and contaminated plastic waste which have been simplified to 'Y48' for other sections of this Impact Assessment.
17. The UK is a Party to the Basel Convention and obliged to transpose these changes into its domestic law. The proposed statutory instrument (The International Waste Shipments (Amendment) (Plastic Waste) Regulations 2020), which is the subject of this Impact Assessment, will give effect to the Basel changes in the UK, which come into force globally on the 1 January 2021. The proposed statutory instrument will ensure the regulators in GB can implement and enforce the amendments made to the Convention.

### **3. Rationale for intervention**

18. Exposure to toxic pollutants released from plastics is harmful to humans, animals and to the environment. Government intervention is necessary to place better controls on the exports of low quality, contaminated and mixed plastic wastes in order to mitigate these adverse effects. Without intervention current market incentives are insufficient to support behaviour optimal for society.
19. As described above, many businesses in developed countries, including the UK, continue to export contaminated and mixed plastics, claiming it is recycled in the receiving country. In many instances, these transboundary movements are often to countries which do not have the capacity to manage the waste effectively and instead the material ends up being burned, sent to landfill, or simply dumped and then finds its way into the ocean. This can cause significant harm to humans, animals and the environment. The resulting damage can be permanent, as plastic can take hundreds of years to breakdown.
20. Furthermore, the pollution caused by plastics is a transboundary issue which affects emerging economies as well as the UK. Not addressing this issue could result in a tipping point for global environmental toxicity that will result in a collective failure to halt biodiversity loss, climate change, and ultimately result in increased costs for society and businesses.
21. At present, waste managers face no incentives to improve this situation as they do not directly bear the costs of the pollution generated if the waste is not managed effectively. In addition, they may avoid the costs associated with transferring waste to be appropriately dealt with (repatriation) if they cannot be traced. These represent negative externalities with costs borne by wider society. Government intervention is necessary to correct this externality and to place greater controls on exports of plastic wastes to mitigate adverse effects and more effectively enforce the polluter pays principle.
22. The Basel amendments also address informational failure, as many emerging economies, for the first time, will have information about the plastic wastes entering their country and will be able exercise discretion over which shipments they are prepared to accept. The GB



regulators will also have access to sufficient information to implement and enforce the correct export procedures for these wastes.

#### **4. Policy objective**

23. The primary policy objective of the Basel Convention amendment is to reduce environmental damage which results from transboundary shipments of mixed and contaminated plastic waste. We will do this by ensuring that GB regulators can implement and enforce the amendments made to the annexes of the Basel Convention. These introduce a requirement for prior informed consent (PIC) from the regulators in the country of dispatch, transit and destination for shipments of specified plastic waste before a shipment can take place, and for a financial guarantee to be put in place by the exporter to insure the shipment in case it needs to be repatriated.
24. These provisions seek to encourage exporters of plastic waste to improve the quality of their export materials. In other words, plastic waste exports should be more uniform and less likely to be contaminated. In turn, this increases the likelihood of recycling the material in the receiving country, reducing the chance that plastic waste will be dumped in landfills and the ocean, or incinerated.
25. Requiring PIC for shipments of Y48 plastic wastes also facilitates greater scrutiny of these exports, ensuring that plastic waste exporters are more likely to take account of the potential costs from poor quality exports in their decision to export. In addition, greater transparency will also empower regulators in the destination country to reject contaminated and mixed plastic waste shipments if necessary and so place greater responsibility on exporters to ensure that their export materials can be suitably recycled in the destination country. Similarly, the financial guarantees, which cover potential repatriation and clean-up costs, also provides an incentive to improve the quality of plastic waste exports, since this will reduce the risk premium associated with their exports.
26. By factoring in the external costs of their exports into decision making, there will be greater efficiency in exporters' decision making on whether to export mixed and contaminated waste, or to improve the quality of their shipments so that PIC is not required.
27. The main indicator of success, or measures of compliance, will be monitoring how much additional waste is being notified and the amount of waste being suitably recovered or recycled in the destination country or GB. Another indicator of success will be how many illegal exports of plastic waste are repatriated to GB by destination countries for non-compliance with the Basel changes. The number of repatriations determines the quality of the material that is being exported – if large quantities of waste is being repatriated this will demonstrate that UK exporters are not adhering to the new rules.

#### **5. Policy options considered**

##### **5.1. Policy Option 0 – Do Nothing Scenario**

28. The UK does not implement the Basel amendments.
29. For modelling purposes, our counterfactual assumes that in the 'do nothing' scenario businesses would face the current status quo and that the Basel amendments would not be applied in the UK or internationally.

30. This would mean that businesses would not face the cost of PIC controls and would continue to export Y48 waste as they do now. This counterfactual is the primary one used for our economic appraisal, as it gives clarity on the additional costs and benefits faced by GB businesses and society resulting from the Basel Convention amendments.

## **5.2. Policy Option 1 – Implement Basel amendments into UK law (Final Government Position)**

31. Domestic legislation will be updated to reflect the changes to the annexes of the Basel Convention and from 1 January 2021, all GB based exporters of Y48 waste will be required to obtain PIC and financial guarantees prior to shipment of these wastes.

32. Compared to our counterfactual, this results in additional costs: businesses will have to pay notification fees and obtain financial guarantees. The benefits from the policy intervention are the avoided harms of fewer dirty mixed waste shipments, which are unsuitable for recovery or being recycled in the destination country, and avoided costs for fewer waste repatriations.

33. On the other hand, exporters could choose to clean and sort their waste so that it is no longer classed as Y48, if this is more profitable.

34. We have modelled the scenario where businesses continue to export with the PIC controls for our main analysis which is captured in the summary sheets of the IA. We also present a sensitivity where there is infrastructure capacity available for cleaning and sorting which is the other option that businesses could take. Continuing to export with PIC controls is the more conservative scenario in terms of higher costs, as businesses will maintain the status quo to export bearing additional costs for PIC. It is possible that businesses may opt for clean and sort if this presents higher margins when PIC requirements come into force and if there is infrastructure capacity available for them to clean and sort. This assumption is explained further in section 6.1.7.

## **5.3. Policy options against alternative counterfactual**

35. An alternative counterfactual could assume that other countries implement the Basel Convention amendments, whereas GB does not. Under this scenario, the UK would predominantly export plastic waste to countries who will be implementing the Basel amendments from January 2021, but would not implement the reform in its domestic legislation.

36. Although this could be a likely scenario, this does not provide a transparent demonstration of the new costs that businesses would face. As a result, we only briefly cover the impacts of policy intervention (option 1) against this counterfactual in narrative terms.

Implications of Policy Option 0 under the alternative counterfactual

37. If a destination country makes clear to the GB regulator that they have adopted the Basel amendments to require PIC, the GB regulator can process an application on that basis. If waste then arrives at the destination country without PIC, the receiving competent authority can ask for it to be repatriated. Under this counterfactual, to continue to export legally under the law of the receiving country of waste, GB businesses could voluntarily comply with the Basel Convention amendments. GB businesses could voluntarily obtain a financial guarantee and submit a notification application, including the fee, to the GB regulators. GB regulators could then notify the competent authorities in the destination

country, but there wouldn't be a domestic requirement to do so. Of course, GB businesses could also voluntarily clean and sort to avoid the cost of the financial guarantee and notification fee.

#### Implications of Policy Option 1 under the alternative counterfactual

38. Compared to this baseline, introducing a domestic requirement for businesses will not change or result in additional costs to businesses. The benefit of introducing domestic legislation would be avoiding reputational damage that comes from failing to implement international law, especially as the Government's manifesto has committed to ban the export of plastic waste to non-OECD countries, a more ambitious measure than the Basel changes. There is also an additional benefit for GB regulators having the ability to effectively enforce the Basel amendments. This would enable the GB regulator to stop unnotified Y48 waste before it is exported to the destination country, resulting in fewer repatriation costs as it prevents the unnotified wastes being sent to the receiving country in the first place.
39. We therefore recognise that implementing domestic legislation may not result in additional costs to businesses, but for this IA, we have presented the counterfactual where such costs are captured under the policy intervention (option 1).

## 5.4. Alternatives to regulation

40. The requirement to implement PIC controls for dirty, mixed and contaminated waste comes from the Basel Convention, an international treaty to which the UK is a Party. A voluntarily led initiative would not satisfy the requirements of the Basel Convention and would not be effective in this context.

## 6. Risks and assumptions

### 6.1. Key assumptions

#### 6.1.1. Appraisal Methodology

41. The costs and benefits for the options considered are expressed in 2020 real prices and discounted from a present value base year of 2021. We have used a discount rate of 3.5% to reflect social time preferences in line with the HMT Green Book Supplementary Guidance. The costs and benefits are appraised from 2021-2030, which is over 10 years from when the regulation is expected to come into force.
42. Table 1 below summarises the other key assumptions used in our cost benefit analysis. It reflects the key data sources and assumptions used across the IA. The uncertainty column reflects the quality of the data and assumptions made. Where we think uncertainty is particularly high, we will seek to obtain further information through future evidence gathering. Further detail justifying the rationale behind these assumptions is given in sections 6.1.2 – 6.1.11.

Table 1: Key assumptions used in the cost-benefit analysis

Assumption description	Assumption	Data source	Uncertainty
Total GB plastic packaging waste exports	609,000 tonnes	NPWD	Low
Total GB plastic non-packaging waste exports	176,000 tonnes	WRAP	High
GB shipments of plastic waste to EU countries	5,541	HMRC	Low
Total GB shipments of plastic waste to all countries	10,915	Proxy based on HMRC	Medium
Proportion of plastic packaging waste exports that are Y48	35%	NPWD	Medium
Proportion of plastic non-packaging waste exports that are Y48	35%	NPWD	High
Number of plastic waste exporters affected	208	HMRC/NPWD	High
Sector response: Capacity available for clean and sort	0%		High
Cost and revenue from cleaning and sorting non-packaging plastic waste (£/tonne)	Cost: £159, Revenue: £198	Valpak (2020)	High
% loss of value in PERN after cleaning and sorting	10%	Letsrecycling.com (2020) & WRAP	High
Business compliance with regulations	100%		Medium

#### 6.1.2. Total plastic waste exports: tonnage

43. Great Britain exports approximately 609,000 tonnes of plastic packaging waste exports. This estimate is based on the National Packaging Waste Database (NPWD), which consists of information provided by accredited plastic packaging waste exporters to the UK competent authorities.
44. For non-packaging plastic waste exports, it is estimated that there are approximately 176,000 tonnes of exports from Great Britain based on information provided by the Waste and Resources Action Programme (WRAP). WRAP is a registered UK Charity and is an industry expert in waste policy, and have information, tools and practical advice that help to support government and businesses. The non-packaging plastic waste sector is largely unregulated, and more reliable estimates following stakeholder engagement could not be obtained.
45. WRAP was only able to provide estimates for total exports of non-packaging plastic waste, as opposed to breaking the information down per shipment or business. Again, these evidence gaps are due to the sector's lack of regulation. In order to fill evidence gaps surrounding exports of non-packaging plastic waste exports, we will look to tender a substantial research project as part of our future consultation work regarding more ambitious proposals under the plastic manifesto commitment. We recognise the significance of this evidence gap and it is important to note we will be gathering further information in this area.

#### 6.1.3. Total plastic waste exports: shipments

46. The number of shipments inform the number of notifications made and financial guarantees that need to be obtained.

47. Based on the number of export shipment declarations to HMRC, the UK exports 6106 shipments of plastic waste to non-EU countries. We assume there are approximately 5373 GB shipments to non-EU countries based on the proportion of plastic waste exports in GB.
48. Movements from the UK to the EU are not recorded on the Customs Handling of Import and Export Freight (CHIEF) database. These are recorded as dispatches which are not an accurate reflection of the number of shipments<sup>5</sup>. To estimate GB shipments to EU countries, we have used the value of UK exports to EU and non-EU countries from the HMRC data. We have assumed that the 5373 GB shipments to non-EU countries make up 49% of the total number of GB shipments to all countries. This gives us an estimate of 10,915 (100%) for the total number of GB shipments of plastic waste and an estimated 5541 (51%) shipments to EU countries.
49. Lastly, for the purpose of our cost benefit analysis, we have assumed that the exports of plastic waste will remain constant from 2021 until 2030. It is important to reflect that it is not possible to accurately forecast what will happen in the export market as a result of new policies, and other factors such as EU Exit, exchange rate impacts, international prices, and Covid-19. These factors have therefore been excluded from our analysis.

#### 6.1.4. Proportion of plastic waste exports that are Y48

50. The costs faced by business are particularly sensitive to this assumption, since the proportion of Y48 underpins how many notifications need to be made, or how much waste will need to be cleaned and sorted. We have therefore produced sensitivity analysis to account for this.
51. Table 2 captures the proportion of plastic waste categorised as Y48 across different scenarios. The low scenario represents the scenario with our lowest estimate for the proportion of Y48, whereas the high scenario represents the scenario with the highest estimate for the proportion of Y48.

Table 2: proportion of plastic waste exports that are Y48

Type of plastic waste	Low	Central	High
Plastic packaging	13%	35%	100%
Non- packaging plastic	13%	35%	100%

52. For our central case assumption, we have assumed that 35% of plastic packaging waste exports are Y48. This is based on the total amount of plastic packaging waste exports from the NPWD. The competent authorities have given Defra estimates for what would be a fair representation of Y48 plastics which is largely mixed bottles, pots tubs and trays and 80:20 plastic, and other plastic packaging, which amounts to 35% of all plastic packaging waste exports. This is our best estimate, as it reflects the views and informed opinion of regulators on what will be captured as Y48. The regulators will be enforcing the Basel Convention amendments and so have the best knowledge of what is notifiable.
53. For non-packaging plastic waste, we do not have information on the proportion that is Y48. We have therefore assumed 35% of non-packaging plastic is Y48 which is the same as

<sup>5</sup> Dispatches are required for trade statistics, but traders making these are only required to do so where the threshold exceeds £250,000. Dispatches are therefore not an accurate reflection of number of shipments.

plastic packaging. We think this is a conservative assumption or an overestimate because non-packaging plastic wastes are likely to be free of contamination and more likely to be processed domestically. This is supported by the view of WRAP who suggest that non-packaging plastics sourced from commercial and industrial waste streams tend to be cleaner. Further detail justifying the low and high assumptions can be found in annex A.

#### 6.1.5. Number of plastic waste exporters affected by the regulation

54. According to HMRC data, there are 236 firms that export plastic waste in the UK. This captures the exporters of both packaging plastic waste and non-packaging plastic waste. We assume that 208 of the firms operate in Great Britain, based upon the proportion of plastic waste exports from Great Britain.

55. We assume all GB businesses exporting plastic wastes will be affected by the regulation although there may be some that do not export Y48 wastes. This assumption affects the overall familiarisation costs faced by businesses.

#### 6.1.6. Imports of plastic waste

56. We have not accounted for the impacts of Y48 imports in our cost benefit analysis. The Basel Convention will require companies exporting waste to notify the competent authority of their respective country who will then notify the competent authorities of the receiving country.

57. If GB businesses wish to import plastics, it is the responsibility of the exporting country to ensure that waste has been notified. This would not fall in scope of the GB regulatory measure and so we have not considered these impacts. GB regulators will enforce the regulations by repatriating illegal imports of waste from the country of origin, but that will be a cost faced by non-GB businesses and therefore falls out of scope of our analysis.

58. We expect foreign businesses to continue to export waste to GB after the inclusion of fees. These costs could possibly be absorbed by the exporter to remain competitive, or this may be passed on to GB importers. It is important to reflect that GB businesses are unlikely to import wastes that need to be cleaned and sorted in the UK, so it is expected that Y48 imports would be minimal.

#### 6.1.7. Available capacity for clean and sort and sector response

59. Businesses have two options once prior informed consent (PIC) controls on the exports of Y48 wastes are introduced:

- A) Pay the notification fees and financial guarantees for continuing to export Y48 waste.
- B) Clean and sort plastics to the standard so that it wouldn't be classed as Y48.

60. Businesses will choose to implement the option that is profit maximising and available to them. Currently our evidence from WRAP suggests that clean and sort would be the profit maximising option, however, firms continue to export despite this. It appears that there are other barriers to industry for cleaning and sorting which may include capacity constraints. We have therefore assumed there is no current capacity and that no future recycling facilities will be developed over the appraisal period. Theoretically, it is possible that this capacity may develop over time, especially if incentives have changed in the market to

make cleaning and sorting a relatively favourable option compared to exporting. This means we may expect businesses to invest in building cleaning and sorting infrastructure over the long term, although this depends on the precise level of investment needed. However, as we cannot observe the barriers currently preventing this, we have assumed they will still be in place and so our main scenario assumes there is no capacity to clean and sort.

61. We therefore assume all businesses will pay fees to continue to export waste which represents the potential highest costs businesses could face. We have however, modelled a sensitivity analysis of the other extreme where we have relaxed this assumption by assuming there is 100% capacity available for clean and sort. This provides a holistic view of the impacts of the Basel amendments. This sensitivity is reflected in sections 7.6-7.10.
62. We will be seeking to gather more information to understand current capacity and private investment decisions towards developing future infrastructure capacity. This information will also be gathered to assess the Basel amendments as well as the manifesto pledge to ban plastic waste exports to non-OECD countries
63. Lastly, it is very unlikely that Y48 waste will be sent to residual treatment (landfill and incineration) in the UK, because of the new regulations that have been introduced. From October 2020, landfill and incineration operators will not be allowed to accept plastic waste that is separately collected for reuse or recycling and has not undergone any other treatment operation such as cleaning and sorting<sup>6</sup>.

#### 6.1.8. Cost and revenues of cleaning and sorting non-packaging plastic waste

64. We model the costs and benefits associated with this scenario based on a report produced by Valpak (2020) who are a leading packaging waste compliance scheme operator. It is worth noting that the report only gives the costs and benefits associated with cleaning and sorting plastic packaging waste. As a result, we have made the simplifying assumption that these would be the same for non-packaging plastic waste. This approach has been agreed by WRAP, but we will be seeking to gather more information on non-packaging plastic cleaning and sorting costs as part of future evidence gathering. Further detail on this issue is discussed in sections 7.6-7.10.

#### 6.1.9. Value from selling plastic waste export recovery notes (PERNs)

65. The business return to waste is determined by the economic value of a tonne of plastic and the value of PERNs which are available if the waste is destined for recycling. PERNs are issued by exporters as evidence of the amount of packaging waste recovered/recycled when the waste is exported rather than reprocessed in the UK and can be cashed in as part of producer responsibility liabilities. The obligations for PERNs are calculated at the start of each year, based on the projection of packaging handled by those businesses and the prevailing UK targets. PERNs are then bought and sold throughout the year. This price of PERNs determines the margins businesses make from exporting waste.

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<sup>6</sup> Regulatory triage assessment: Circular economy package – 2020 measures, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/904511/circular-economy-policy-statement-annex2.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904511/circular-economy-policy-statement-annex2.pdf)

Table 4: Price of PERNs (£/t)

2020 £ per tonne	January	February	March	April	May	June	July	August	Average
PERN values	240 – 300	275 – 350	250 – 350	245 – 270	200 – 250	120 – 230	90 – 145	35 - 85	182 - 248
Average PERN value	270	313	300	258	225	175	118	60	215

66. PERNs have a market value that is volatile and differs from month to month with the lowest value recorded at £35/t and highest at £350/t in 2020 and the average at £215/t. This is based on Letsrecycle.com, who are the UK’s leading independent dedicated website for businesses, local authorities and community groups involved in recycling and waste management. The value is likely to increase when there is a perception that there is not enough evidence in the market to meet targets and so depends on the relative supply and demand and any potential perceptions of scarcity.

67. For the scenario where businesses continue to export with PIC costs, the value of PERNs would be the same as the counterfactual. It is still however, an important indicator of whether it is commercially viable for businesses to export. This is explained further in annex C.

68. For the clean and sort scenario, we assume a 10% reduction in the value of PERNs as some non-target material (material that is capable of being recycled but not a target material for that recycling facility) is filtered out during the clean and sort process. This results in the PERN value being lost for the tonnage of waste that cannot be recovered or recycled. This assumption was provided by WRAP and is captured as a cost in the clean and sort scenario compared to the baseline. The assumed value of PERNs for our analysis is £215/t which is the average across 2020. We have produced sensitivity analysis around the differing losses in the value of PERNs to reflect the volatility in prices. This is presented in annex C.

#### 6.1.10. Compliance with regulation

69. For the purpose of our cost benefit modelling, we have assumed that 100% of businesses would be compliant with the regulations. There are of course businesses who may circumvent the Basel amendments by illegally exporting waste. We cannot predict this and so have excluded this from our analysis.

70. As part of our monitoring and evaluation (section 15), we will be seeking to gather further information to understand the success of the policy measure and to monitor compliance.

#### 6.1.11. International implementation of Basel Amendments

71. For modelling purposes, our counterfactual assumes that in the ‘do nothing’ scenario, businesses would face the current status quo and that the Basel amendments would not be applied internationally. This means that under policy option 1, businesses will face the costs of the Basel amendments.

72. In reality, other countries will be implementing the Basel amendments and the costs of compliance would occur irrespective of the domestic implementation of the Basel amendment. This is because businesses could continue to export legally under the law of the receiving country of waste by voluntarily obtaining a financial guarantee and submitting a notification application, including the fee, to the GB regulators. This is explained in more detail in section 5.3.



## **6.2. Risks**

### **6.2.1. Other countries not having capacity to process notifications or refusing Y48 waste**

73. It is possible that some emerging economies may struggle to process notifications, which could result in the delay or cancellation of GB exports. For the purpose of our analysis, we assume all countries will be able to meet the requirements of the Basel amendments.
74. Furthermore, some countries may simply refuse to accept Y48 waste. If such a scenario occurs, GB businesses could face costs for obtaining a financial guarantee and paying notification costs, only for their exports to be delayed or simply refused. This could mean businesses would have to resort to cleaning and sorting plastics domestically or paying notification fees for exporting waste to another country at their expense.

### **6.2.2. Businesses cease trading**

75. It is possible that the costs from introducing PIC may result in businesses ceasing to trade in Y48 exports. This however, will not result in fewer costs being faced by businesses overall, as that waste is expected to be dealt with by another business. The micro impacts on SMBs is covered within section 12.

## **7. Monetised and non-monetised cost of each option**

### **7.1. Option 0 (do nothing)**

76. For modelling purposes, our counterfactual assumes that businesses face the current status quo and that the Basel amendments are not applied internationally. This means that businesses do not face the cost of prior informed consent controls and would continue to export Y48 waste as they do now. This means they face zero costs under option 0. This counterfactual is the primary used for our economic appraisal, as it gives clarity on the overall costs and benefits faced by GB businesses and society resulting from the Basel Convention amendments.

### **7.2. Option 1 – UK implementation of Basel Reforms (final government position)**

77. The UK implements the Basel reforms requiring that businesses will pay notification fees and obtain financial guarantees in order to continue exporting Y48.
78. Compared to our counterfactual, this will result in additional costs: businesses will have to pay notification fees and obtain financial guarantees. The requirement to obtain financial guarantees and notify competent authorities work in parallel to internalise the external cost to businesses to export dirty mixed waste, whilst ensuring that the cost is borne up front. It also increases transparency in shipments. The benefits from the policy intervention are the avoided harms of fewer dirty mixed waste shipments, which are unsuitable for recovery or recycling in the destination country and avoided costs for fewer waste repatriations.
79. On the other hand, exporters could choose to clean and sort their waste to avoid the fees if this is more profitable. As stated previously, businesses have two options once prior informed consent (PIC) controls on the exports of Y48 wastes are introduced:

- A) Pay the notification fees and financial guarantees for continuing to export Y48 waste.

B) Clean and sort plastics to the standard so that it wouldn't be classed as Y48.

80. We have modelled the scenario where businesses continue to export with the PIC controls for our main analysis. We also present a sensitivity where there is infrastructure capacity available for cleaning and sorting which is the other option that businesses could take.
81. Currently our evidence from WRAP suggests that clean and sort would be the profit maximising option, however firms continue to export despite this. It appears that there are other barriers to industry for cleaning and sorting which may include capacity constraints. We have assumed these barriers remain in place under option 1, and that no current capacity and future recycling facilities will be developed over the appraisal period. This is a conservative assumption, as we assume all businesses will pay fees to continue to export waste which represents the potential highest costs businesses could face. Costs may, however, tend towards the clean and sort scenario in the longer term, if clean and sort supply capacity rises to meet demand. This assumption is explained further in section 6.1.7.

Table 5: Exporting margins vs cleaning and sorting margins

	Baseline	Option 1 – continue to export	Option 1 - sensitivity: 100% capacity to clean and sort
Costs for exporting (£/tonne)	£250	£250	£250
PIC export costs (£/tonne)	N/A	£74	N/A
Revenue for exporting (£/tonne)	£150	£150	£150
Additional revenue from clean and sort (£/tonne)	N/A	N/A	£39
PERN (£/tonne)*	£35 to £350	£35 to 350	£32 to 315
Comparable margin (£/tonne)	<b>-£65 to £250</b>	<b>-£139 to £176</b>	<b>-£30 to £254</b>

82. Our modelling demonstrates that the margins from exporting with the PIC costs could still be positive, although it is less than the margin from cleaning and sorting. The clean and sort scenario results in greater margins than the baseline due to additional revenue from selling higher quality plastics. This suggests that most businesses would opt for clean and sort, if there were spare capacity. The possible reasons why businesses are not currently cleaning and sorting could be due to the cost of infrastructure investment needed to meet capacity and because there may not be demand for cleaned and sorted material in some countries, who would prefer to buy unsorted waste and clean and sort it cheaper than GB businesses. A thorough explanation of these figures and how they have been calculated are provided in annex B.
83. Whether continuing to export is commercially viable depends on the value of PERNs. This is explained in section 6.1.9. We have accounted for the value of PERNs on margins and differing rates of non-target material lost under clean and sort using a range of values in annex C.

### 7.3. Monetised costs for option 1: Implement the Basel amendments into GB law

#### 7.3.1. Overall costs to business

84. In the main scenario which forms the summary sheets at the top of the IA, we have captured the costs of 100% of businesses continuing to export Y48 after the inclusion of additional PIC control costs.

85. Some businesses may find it commercially unviable to export after the inclusion of additional PIC costs, resulting in them exiting the market. Their collection of waste is likely handled by other businesses, which means that although some firms may exit the market, the overall costs to business will remain unchanged. These impacts are discussed in more detail in the wider impacts (Section 11) and in the small and micro business impact assessment (Section 12).

86. The costs considered in scope of option 1 include: the cost of paying notification fees to the regulator, the cost of financial guarantees, and administration and familiarisation costs associated with the new regulation. A breakdown and further explanation of these costs are presented below in 2020 real prices and in discounted terms. These costs are summarised in the 'summary of costs and benefits' in section 8.

### 7.3.2. Notification fees

87. Introducing prior informed consent controls (PIC) on the shipment of Y48 waste will require businesses to pay notification fees to the regulators. The notification fee covers the costs that regulators face to process the notifications and compliance monitoring costs. This cost recovery, however, does not include enforcement costs.

88. Within a shipment of Y48 waste, the export of each container of Y48 is classed as a movement. GB regulators have provided a conservative estimate of the average notification fee per shipment to cover the movement of multiple containers. This amounts to approximately £3,130 per shipment. This figure is based on information held by the regulators on existing notifiable wastes. It is likely an overestimate of costs, but it reflects the best information we could collect at this point in time. We will be seeking to assess the actual costs of Y48 notifications once the Basel amendments are introduced.

89. Under our central scenario, we assume 35% of plastic packaging waste exports are Y48. From HMRC data and our assumptions set out in Section 6.1.3, there were a total of 10,915 GB shipments of plastic waste exports in 2019.

90. We have calculated notification fees from 2021 onwards using 2019 plastic waste exports data as a proxy. The calculation is as follows:

- Notification costs (per annum) = proportion of waste that is Y48 (%) x Number of shipments exported x average notification fees
- £11.9m = 35% x 10,915 x £3,130

Table 6: summary of notification costs

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Undiscounted costs (£m)	£11.9	£11.9	£11.9	£11.9	£11.9	£11.9	£11.9	£11.9	£11.9	£11.9	<b>£119.4</b>
Discounted costs (£m)	£11.9	£11.5	£11.1	£10.8	£10.4	£10.1	£9.7	£9.4	£9.1	£8.8	<b>£102.8</b>

91. The total costs for notification fees are estimated at £102.8m in discounted terms over the period 2021-2030. These costs depend on the number of movements made under each notification and the total number of exports in future years. As stated in the key assumptions section, we have assumed a constant rate of exports across future years.

### 7.3.3. Obtaining financial guarantees

92. Exporters must put in place a financial guarantee or equivalent insurance ('financial provision') for all notified waste shipments to and from GB. This is to provide the competent authorities with guaranteed resources to act if things go wrong with a notified shipment, including, for example, arranging and paying for the return of the waste to the country of origin. The guarantee must be worked out on a 'worst case scenario' basis. For example, the cost of disposal or recovery should take account of the possibility that the waste could contain contaminants which the consignee (person receiving the waste) cannot deal with in an environmentally sound manner, resulting in repatriation to GB.
93. For existing controls of notifiable waste, shipments of notified waste have not ever been repatriated to GB. This is because the large costs of the financial guarantee provide an incentive to business to ensure that waste can be suitably recovered or recycled in the receiving country. This is also reinforced by the regulator of the receiving country having discretion over whether to accept notifiable waste to begin with. We have assumed there are no additional costs for notified Y48 being repatriated after the Basel amendments are introduced, with the large costs of financial guarantees acting as a deterrent.
94. The cost of obtaining the financial guarantee itself which covers the cost of the application fee charged by the Bank or financial institution, is estimated based on discussions with regulators and notifiers. The information collected suggests that an average financial guarantee amounts to £43,500, with the fee for the financial guarantee estimated at 1-2% of this overall cost. Using the upper bound of 2%, we estimate the fee for obtaining the financial guarantee to be £870.
- Costs for obtaining financial guarantees (per annum) = proportion of waste that is Y48 x number of shipments exported x average bank fee for obtaining financial guarantee
  - £3.3m = 35% x 10,915 x £870

Table 7: Summary of costs for obtaining financial guarantees (£m)

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Undiscounted costs (£m)	£3.3	£3.3	£3.3	£3.3	£3.3	£3.3	£3.3	£3.3	£3.3	£3.3	<b>£33.2</b>
Discounted costs (£m)	£3.3	£3.2	£3.1	£3.0	£2.9	£2.8	£2.7	£2.6	£2.5	£2.4	<b>£28.6</b>

95. Total costs for obtaining the financial guarantee is estimated at £28.6m in discounted terms over the period 2021-30.

#### 7.3.4. Administrative costs

96. Businesses are expected to face a one-off cost to familiarise themselves with the new regulations and procedures. Of the 208 businesses affected under our central scenario, we approximate familiarisation to take 3 working days or 22.5 hours per business. This is based on information provided by regulators and an existing notifier of waste under the current waste shipment reforms. The time taken includes familiarisation with the waste shipments framework; reading and understanding the guidance for accessing the online international waste shipment (IWS) system; and understanding the waste classifications system, including what waste can travel under the same notifications.
97. There are also ongoing administration costs for businesses to process forms for notification fees and financial guarantees for each individual shipment of waste. This includes the time taken for completing a notification on IWS online; calculating the cost of the financial guarantee and completing forms; sourcing a financial institution and agreeing the contract

for the guarantee; and sourcing other information for the annexes concerning recovery costs, customs details and the contract. The best evidence available to us indicates that this will take up to 7 working days or 49 hours. This is based on information provided by regulators and an existing notifier of waste under the current waste shipment reforms.

98. Typically, the type of employee dealing with these tasks will be a waste disposal and environmental services manager. Therefore, we have assumed the value of time for businesses is based on the hourly wage from the ONS Annual Survey of Hourly Earnings (ASHE)<sup>5</sup>. The costs to businesses are then increased by 30% to factor non-wage costs (NI contribution and other employment costs). The calculation of these costs are as follows:

- Familiarisation costs (one off) £129k = 208 businesses x 22.5 hours x £21.23 (gross hourly pay) x 1.3 (non-wage costs)
- Admin costs for notification procedures and financial guarantee (ongoing) £5.2m = 35% (proportion of Y48) x 10,915 (No of GB shipments) x 49 hours x £21.23 (gross hourly pay) x 1.3 (non-wage cost)

Table 8: Summary of ongoing administration costs

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total
Undiscounted costs (£m)	£5.2	£5.2	£5.2	£5.2	£5.2	£5.2	£5.2	£5.2	£5.2	£5.2	<b>£51.6</b>
Discounted costs (£m)	£5.2	£5.0	£4.8	£4.7	£4.5	£4.3	£4.2	£4.1	£3.9	£3.8	<b>£44.4</b>

Table 9: Familiarisation costs (one off)

Year	2021	Total
Undiscounted costs (£m)	£0.1	<b>£0.1</b>
Discounted costs (£m)	£0.1	<b>£0.1</b>

99. We have taken a conservative approach for estimating admin costs, which is likely to be an overestimate of costs. Although each financial guarantee will need individual consideration by businesses and banks, larger businesses are likely to achieve some time efficiency savings resulting from familiarisation with the process for handling multiple financial guarantees.

#### 7.4. Non-monetised costs for option 1: Implement the Basel amendments into GB law

##### 7.4.1. Rejection of waste exports and capacity shortfall to process forms

100. It is possible that the competent authority of a receiving country may not have capacity to process forms or may choose to reject the notification of waste exports. This means that waste will either have to be exported to another country or will need to be handled domestically. However, businesses will still have incurred the costs of notifying regulators and obtaining a financial guarantee. We have not accounted for this in our analysis, because there is significant uncertainty on how other countries could respond to the Basel amendments, and because we have assumed other countries would be compliant. The rejection of waste that is sent for recovery could be subject to disputes.

101. The GB competent authorities will also have discretion to reject a notification of waste exports if they believe it is not compliant with the existing regulations, which only allow for plastic waste to be exported for the purpose of recovery or being recycled. If a notification is rejected, businesses may have to incur additional administration costs. We anticipate this risk to be low as the competent authorities have a call service to support any businesses enquiries.
102. Lastly, because of the introduction of notification fees and the requirement to obtain financial guarantees, this will increase the costs to businesses for legally exporting waste. This could increase the likelihood of some businesses illegally exporting plastic by mislabelling their waste so that it isn't notified to the competent authorities. This issue will be addressed by existing controls and forthcoming waste shipment regulations to strengthen enforcement and prosecution.

## **7.5. Non-monetised benefits for option 1: Implement the Basel amendments into GB law**

103. Exporting plastic waste that cannot be suitably recovered or recycled and that is illegally dumped in the destination country causes significant harms to human health and the environment. These impacts are difficult to monetise because we don't know how many shipments of plastic waste are being dumped illegally. The endpoint harms caused by plastics are also not clear cut, which makes them difficult to monetise. Therefore, the benefits of the policy have been qualitatively reflected below.

### **7.5.1. Environmental and health benefits**

104. The key aim of the Basel Convention amendment is to reduce the exports of contaminated and mixed plastic wastes, which are difficult to recycle. It also aims to reduce exports that are not being sent for the purpose of recovery. Pollution caused by plastic waste is classed as a negative externality, as those costs would be borne by wider society, instead of the exporters, who are responsible for safely managing waste. These problems are exacerbated in emerging economies that typically have lower capacity to deal with contaminated and mixed plastic wastes.
105. The pollution caused by plastics is a transboundary issue which affects emerging economies, as well as the UK. Not addressing this issue could result in a tipping point for global environmental toxicity that will result in a collective failure to halt biodiversity loss, climate change, and ultimately result in increased costs for society and businesses. This transboundary issue, which causes harm to global ecosystem services and to the marine environment, will adversely impact all countries including the UK.
106. Introducing prior informed consent controls for these dirty mixed or contaminated plastic wastes will help to reduce the likelihood of plastic waste being dumped, incinerated, ending up in landfill, or finding its way into watercourses in the receiving country. The run-off from landfill can also risk these plastics entering the marine environment. A Leeds University study (Breaking the Plastic Wave, July 2020) revealed that each year nearly 30 million tonnes of plastic waste is dumped on land, nearly 50 million tonnes is burned in the open, and 11 million tonnes ends up in the world's oceans<sup>7</sup>. Although burning reduces the amount of waste being discarded onto land and into the seas, it generates potentially toxic fumes and contributes to greenhouse gas emissions.

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<sup>7</sup> Breaking the Plastic Wave, a comprehensive assessment of pathways towards stopping ocean plastics pollution, 2020, [https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave\\_report.pdf](https://www.pewtrusts.org/-/media/assets/2020/07/breakingtheplasticwave_report.pdf)

107. It is estimated that 1.5% – 4.5% of all global plastics production ends up in the oceans every year<sup>8</sup>. All plastic items fragment overtime and are ingested by a wide range of organisms. Marine debris harms over 800 species, including 40% of the population of marine mammals and 44% of seabird species that are affected by marine debris ingestion<sup>9</sup>. Plastic can be retained in animals' stomachs and can impede dietary habits, which can cause physical damage to their digestion system, reduced digestive ability and starvation. It is estimated that there is already around 150 million metric tonnes of plastic in the global ocean, and the economic costs of this are estimated at US\$13bn of environmental damage to ecosystems per year<sup>10</sup>.
108. As stated, improper plastic waste treatment can also result in increased risks of exposure to chemicals due to improper handling, disposal or incineration. For example, Indonesia's plastic waste import volume doubled between 2017 and 2018. In Bangun, this resulted in residents burning the piles of plastic waste to reduce the volume of waste clogging streets and scattered around houses. In Tropodo, the plastic waste was used to fuel local tofu factories<sup>11</sup>. Eggs collected in the communities were found to contain hazardous banned chemicals including dioxins, flame retardant, and the toxic chemical PFOS. The analysis found high levels of dioxins, polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs), short-chain chlorinated paraffins (SCCPs) and perfluorooctane sulfonate (PFOS) in eggs from local free-range chickens. Many of these chemicals are persistent organic pollutants which are the most toxic chemicals known to mankind and are regulated globally under the Stockholm Convention<sup>12</sup>. Some of these chemicals are known to cause cancer, affect reproductive systems, interfere or alter the body's hormones, cause birth defects and other neurological disorders.
109. We have not been able to monetise damages resulting from improper treatment of Y48 waste as the direct impacts from chemical pollution are not straightforward to accurately establish or monetise. The damage caused are known to be significant and so have been qualitatively captured above.

#### 7.5.2. Improved exporter responsibility

110. Currently some plastic waste is exported illegally by GB businesses as the waste is not suitably recovered or recycled in the receiving country. If these Y48 waste shipments are caught by the competent authorities of the receiving country, it would be repatriated at the cost to either the exporter, their shipping line, and if it is not possible to trace the exporter, at the cost of the GB competent authorities. These costs are significant and burdensome.
111. The introduction of financial guarantees will incentivise businesses who wish to export legally to improve the quality of their wastes so that they can prove to the bank their waste is at lower risk of being repatriated. By doing so, they can pay a lower premium to the bank.
112. The improved quality of waste reduces the overall risk of waste being repatriated. This saves money for both businesses and Government.

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<sup>8</sup> <https://www.sciencemag.org/news/2015/02/here-s-how-much-plastic-enters-ocean-each-year>

<sup>9</sup> United Nations Factsheet: Marine pollution 2017, URL: [https://sustainabledevelopment.un.org/content/documents/Ocean\\_Factsheet\\_Pollution.pdf](https://sustainabledevelopment.un.org/content/documents/Ocean_Factsheet_Pollution.pdf)

<sup>10</sup> UNEP. (2014) Valuing Plastics: The Business Case for Measuring, Managing and Disclosing Plastic Use in the Consumer Goods Industry. URL: [www.unep.org/pdf/ValuingPlastic/](http://www.unep.org/pdf/ValuingPlastic/).

<sup>11</sup> Basel Action Network (2019, Plastic Waste Poisons Indonesia's Food Chain, URL: <https://www.ban.org/news/2019/11/15/ag47nlb6sxlsc3l7cbamas9xoaqpej>

<sup>12</sup> All POPs listed in the Stockholm Convention, URL: <http://chm.pops.int/TheConvention/ThePOPs/ListingofPOPs/tabid/2509/Default.aspx>

### 7.5.3. Avoided reputational damage

113. Under the counterfactual, the UK would not transpose the 2019 amendments to the annexes of the Basel Convention into its domestic law. This would mean that the UK would be in breach of its obligations under the Basel Convention and the regulators in GB would not have the power to implement and enforce the changes made to the international controls, meaning they would be unable to inspect and intercept unsuitable plastic waste shipments leaving GB.
114. This would also be reputationally damaging to the UK, especially as the Government's manifesto has committed to ban the export of plastic waste to non-OECD countries, a more ambitious measure than the Basel changes.

### 7.5.4. Informational improvement

115. Under the policy option of continuing to export Y48 waste with PIC controls, the key principle is that businesses must notify the competent authority and pay a corresponding notification fee before engaging in export activity. The notification fee covers the costs that regulators face to process the notifications and compliance monitoring costs. Exporters must also put in place a financial guarantee or equivalent insurance ('financial provision') for all notified waste shipments to and from GB. This is to provide the competent authorities with guaranteed resources to act if things go wrong with a notified shipment, including, for example, arranging and paying for the return of the waste to the country of origin.
116. As well as providing regulators with the necessary financial resources to implement the Basel Convention amendment, the notification process vastly improves the information that regulators hold on the shipments of Y48 waste to and from GB. Clearly, this helps to promote informed decision making and sound regulatory action. Furthermore, boosting the informational and financial resources that the regulator holds helps to facilitate step change to meeting the Government's manifesto commitment to ban the export of plastic waste to non-OECD countries, a more ambitious measure than the Basel Convention amendment.

## 7.6. Option 1 – sensitivity: 100% capacity to clean and sort

117. We have produced sensitivity analysis to demonstrate an alternative scenario where we assume that instead of no infrastructure capacity to clean and sort, GB has capacity to clean and sort 100% of Y48. This is the main sensitivity we have considered in our analysis and so has been included in the main body of the IA.
118. By relaxing the assumption on clean and sort capacity, GB implements the Basel Convention Amendment, but we have assumed all businesses choose to clean and sort plastics such that they wouldn't be classed as Y48.
119. As stated, we do not have information on the UK's future cleaning and sorting capacity. Our evidence suggests that clean and sort would be the profit maximising option, however, firms continue to export despite this. It appears that there are other barriers to industry for cleaning and sorting which may include capacity constraints. If cleaning and sorting is the more efficient option in the long term, we would expect businesses to invest in building cleaning and sorting infrastructure over time, although this depends on the precise level of investment needed. This option could therefore be seen as a long term estimate of the impacts of the Basel amendments assuming that any other barriers that exist have been addressed. In our main analysis we conservatively assume that existing barriers to clean and sort remain in place and that businesses will pay fees to continue to export waste.



Costs may tend towards the clean and sort scenario in the longer term, if clean and sort supply capacity rises to meet demand.

## 7.7. Monetised costs for option 1 – sensitivity: 100% capacity to clean and sort

### 7.7.1. Costs of cleaning and sorting

120. For illustrative purposes, this scenario captures the costs of 100% of businesses cleaning and sorting their plastic wastes after the UK implements the Basel Convention amendments. In this case, businesses clean and sort their waste so that it is no longer classified as Y48, rather than continuing to export dirty mixed plastic.

121. The costs in scope of this scenario are costs associated with cleaning and sorting plastic wastes. Waste can be handled domestically through a clean and sort process, so that it is no longer classified as Y48. Based on a Valpak (2020) report commissioned by WRAP, we have obtained the average costs of cleaning and sorting a tonne of plastic packaging waste. The information in the Valpak report itself is largely generated from industry engagement.

Table 10: costs of cleaning and sorting plastic packaging waste from Valpak (2020) report

Packaging material	Processes required to meet new standard	Potential cost to meet new standard (£/t)
Plastic (rigid)	Pre-sort, washing line, drying	£125
Plastic (films)	Pre-sort, washing line, baling	£200

122. The costs presented above in table 10 are based on the input weight into the recycling process. They are informed by current market knowledge and are indicative of all processes including waste disposal costs of any additional residues or non-target materials. We deem these estimates to be reliable averages and proportionate, based on the information we have been able to gather.

123. For non-packaging plastic wastes, we do not have available information on the costs of cleaning and sorting, so we assume that the costs are the same as for plastic packaging waste. As stated earlier, this assumption was agreed by WRAP, but we will be seeking to gather more information on non-plastic packaging wastes.

124. For our central scenario, we assume that approximately 35% of 785,000 tonnes of plastic packaging waste and non-packaging plastic exports will need to be cleaned and sorted. For plastic packaging waste, based on information in the Valpak report, we assume 55% of Y48 waste is categorised as rigid plastics, and 45% is plastic film. For non-packaging plastics, we do not have available data for the costs of cleaning and sorting, so we have assumed these are the same costs as for plastic packaging. This assumption is a simplification we have had to make in the absence of evidence. The calculation per year is as follows:

$$\text{£43.6m [costs of cleaning and sorting]} = ((55\% \times \text{£125/t}) + (45\% \times \text{£200/t})) \times 35\% \text{ [proportion that is y48]} \times 785,000 \text{ [tonnage of packaging plastic and non-packaging plastic waste that is Y48]}$$

Table 11: Undiscounted and discount costs of cleaning and sorting per year

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Totals
Undiscounted costs (£m)	£43.6	£43.6	£43.6	£43.6	£43.6	£43.6	£43.6	£43.6	£43.6	£43.6	<b>£435.6</b>
Discounted costs (£m)	£43.6	£42.1	£40.7	£39.3	£38.0	£36.7	£35.4	£34.2	£33.1	£32.0	<b>£374.9</b>

### 7.7.2. Loss of value in PERN for non-target material

125. The value exporters sell waste for is determined by the economic value of a tonne of plastic and the value of PERNs which provides the evidence that businesses need to prove they have met the producer responsibility requirements of the packaging waste regulations. Further details on PERNS can be found in section 6.1.9.

126. For the clean and sort scenario, we assume a 10% reduction in the value of PERNs as some non-target material that cannot be recycled is filtered out during the clean and sort process. This results in the PERN value being lost for the tonnage of waste that cannot be recovered or recycled. This assumption was provided by WRAP and is captured as a cost in the clean and sort scenario compared to the baseline.

127. The average value of PERNs in 2020 amounts to £215/t. The loss of value in PERNs is calculated as follows:

- Loss of PERNs - £5.9m = 10% [loss of non-target material] x £215/t x 785,000 tonnes [tonnage of plastic and non-packaging plastic waste exports] x 35% (proportion of y48)

Table 12: Undiscounted and discount costs of PERN loss

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Totals
Undiscounted costs (£m)	£5.9	£5.9	£5.9	£5.9	£5.9	£5.9	£5.9	£5.9	£5.9	£5.9	<b>£59.1</b>
Discounted costs (£m)	£5.9	£5.7	£5.5	£5.3	£5.1	£5.0	£4.8	£4.6	£4.5	£4.3	<b>£50.8</b>

128. Total costs for the loss of PERNs is estimated at £50.8m in discounted terms over the period 2021-30. We have produced sensitivity analysis around the costs faced by businesses for differing rates of non-target material lost in annex C.

### 7.7.3. Familiarisation costs

129. Businesses are expected to face a one-off cost to familiarise themselves with the new regulations and procedures. Of the 208 businesses affected under our central scenario, we approximate familiarisation to take 3 working days or 22.5 hours per business. This is based on information provided by regulators and an existing notifier of waste under the current waste shipment reforms. Under the clean and sort option, we expect businesses will need to familiarise themselves with the new requirements before they decide whether to clean and sort. The time taken includes familiarisation with the waste shipments framework; reading and understanding the guidance for accessing the online international waste shipment (IWS) system; and understanding the waste classifications system, including what waste can travel under the same notifications.

130. The calculations for this are the same as under Option 1 – Implement the Basel amendments into GB law (businesses continue to export y48) in section 7.3.4. This amounts to £0.1m in the year 2021.

## **7.8. Non-monetised costs for option 1 – sensitivity: 100% capacity to clean and sort**

### 7.8.1. Administration costs

131. We do not know if there are additional administrative costs for cleaning and sorting plastic waste. Some businesses may choose to change their supply chains if the costs of PIC controls are prohibitive, which may result in additional costs for sourcing sorters and cleaning companies who deal with plastic waste. However, many UK plastic recyclers also export to feed their operations elsewhere in the world or to recover any material they can't deal with. Assuming they have spare sorting capacity, some of the waste that is exported could be dealt with by the same businesses.

### 7.8.2. Infrastructure investment

132. At present our margins calculation demonstrates that it is more profitable to clean and sort waste for exporting compared to the baseline. This suggests there could be a lack of capacity in clean and sort infrastructure. If there is demand for cleaning and sorting plastic waste and a lack of capacity, UK recyclers will be incentivised to invest in infrastructure. We do not know how much investment will be required or how the costs will be distributed across businesses, but an expansion of domestic cleaning and sorting capacity would be required if the majority of businesses chose to clean and sort their plastic waste after the UK implements the Basel Convention amendments. We will be seeking to gather more information to understand private investment decisions towards developing infrastructure capacity and whether Government support is necessary, following the manifesto pledge to ban plastic waste exports to non-OECD countries.

## **7.9. Monetised benefits for option 1 – sensitivity: 100% capacity to clean and sort**

### 7.9.1. Overall benefits to business

133. The benefits considered in scope for this scenario include: the revenue gained from selling higher grades of plastic after being cleaned and sorted. Again, this information has been sourced from the Valpak (2020) report.

### 7.9.2. Revenue from cleaning and sorting plastic waste

134. The added revenues are the additional revenue gained from selling higher grades of plastic after being cleaned and sorted. These estimates are based on UK market prices for packaging materials, with the revenues accounting for the fact that output material weights will be lower than before clean and sort. These revenues are average or indicative; and in reality, revenues will differ by the process and the precise nature of the material that is supplied.

Table 13: Revenues from cleaning and sorting plastic wastes from Valpak (2020) report

Packaging material	Processes required to meet new standard	Potential added revenue from processing to meet new standard (£/t)
Plastic (rigid)	Pre-sort, washing line, drying	£175
Plastic (films)	Pre-sort, washing line, baling	£225

135. As stated above, for our central case, we assume 35% of 785kt of plastic waste will need to be cleaned and sorted. For plastic packaging waste, based on information in the Valpak report, we assume 55% of Y48 waste is categorised as rigid plastics, and 45% is plastic film. For non-packaging plastic waste, we do not have available data for the costs of cleaning and sorting and so we have assumed these are the same costs as for plastic packaging. The calculation per year is as follows:

- £54.2m [revenue of cleaning and sorting] = ((55% x £175) +(45% x £225)) x 35% [proportion that is y48] x 785,000 [tonnage of plastic and non-packaging plastic that is Y48]

Table 14: Undiscounted and discounted benefits for cleaning and sorting per year

Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Totals
Undiscounted revenue (£m)	£54.2	£54.2	£54.2	£54.2	£54.2	£54.2	£54.2	£54.2	£54.2	£54.2	<b>£541.9</b>
Discounted revenue (£m)	£54.2	£52.4	£50.6	£48.9	£47.2	£45.6	£44.1	£42.6	£41.2	£39.8	<b>£466.5</b>

### 7.10. Non-monetised benefits - sensitivity: 100% capacity to clean and sort

136. The benefits of reducing illegal waste shipments, decreasing environmental harm and avoiding reputational damage also apply for the clean and sort option. For more detail on these effects, please refer to section 7.5.

#### 7.10.1. Infrastructure investment

137. If there is demand for cleaning and sorting plastic waste and a lack of capacity, UK recyclers will be incentivised to invest in infrastructure. It is difficult to isolate the precise benefits that arise from this, but private infrastructure investment has multiplier effects which is associated with economic growth. This includes employment gains from new workers that are required to operate the infrastructure, as well as increases in productivity in the recycling process due to the availability of better technology.

#### 7.10.2. Transition to a circular economy

138. Infrastructure investments can also support the transition to a circular economy. This involves reducing waste to a minimum and recycling existing products as much as possible. Facilitating this transition is important, given an increasing population and finite supply of resources. As well as reducing pressure on the environment, the transition to a circular economy approach can help to extract more economic value from the recycled plastics. These benefits will support a step change to further ambitious proposals such as the Government's manifesto commitment to ban the export of plastic waste to non-OECD countries, a more ambitious measure than the Basel Convention amendment.

## 8. Summary of costs and benefits

Table 15: Summary of discounted costs for option 1 (continue to export Y48 under PIC controls)

	Discounted costs from baseline (£m)		
Present value	Central (35% Y48)	Low (13% Y48)	High (100% Y48)
PIC notification fees	£102.8	£38.2	£294.1
PIC financial guarantee	£28.6	£10.6	£81.7
PIC administration costs	£44.4	£16.5	£127.0
PIC familiarisation costs	£0.1	£0.1	£0.1
<b>Total cost</b>	<b>£175.9</b>	<b>£65.5</b>	<b>£503.0</b>
<b>Net benefit</b>	<b>-£175.9</b>	<b>-£65.5</b>	<b>-£503.0</b>

Table 16: Summary of undiscounted costs for option 1 (continue to export Y48 under PIC controls)

	Undiscounted costs from baseline (£m)		
Undiscounted costs	Central (35% Y48)	Low (13% Y48)	High (100% Y48)
PIC notification fees	£119.4	£44.4	£341.6
PIC financial guarantee	£33.2	£12.3	£95.0
PIC administration costs	£51.6	£19.2	£147.6
PIC familiarisation costs	£0.1	£0.1	£0.1
<b>Total cost</b>	<b>£204.3</b>	<b>£76.1</b>	<b>£584.3</b>
<b>Net benefit</b>	<b>-£204.3</b>	<b>-£76.1</b>	<b>-£584.3</b>

Table 17: Summary of discounted costs and benefits for option 1 – sensitivity: 100% capacity to clean and sort (clean and sort plastic waste domestically)

	Discounted costs and benefits from baseline (£m)		
Present value	Central (35% Y48)	Low (13% Y48)	High (100% Y48)
Cleaning and sorting costs	£374.9	£139.4	£1,072.6
Cleaning and sort: familiarisation costs	£0.1	£0.1	£0.1
Cleaning and sorting: loss of PRN value	£50.8	£18.9	£145.3
Cleaning and sorting revenue	£466.5	£173.5	£1,334.4
<b>Net benefit</b>	<b>£40.5</b>	<b>£15.0</b>	<b>£116.4</b>

Table 18: Summary of undiscounted costs and benefits for option 1 – sensitivity: 100% capacity to clean and sort (clean and sort plastic waste domestically)

	Undiscounted costs and benefits from baseline (£m)		
Undiscounted costs and revenue	Central (35% Y48)	Low (13% Y48)	High (100% Y48)
Cleaning and sorting costs	£435.6	£162.0	£1,246.1
Cleaning and sorting: familiarisation costs	£0.1	£0.1	£0.1
Cleaning and sorting: loss of PRN value	£59.1	£21.9	£168.8
Cleaning and sorting revenue	£541.9	£201.5	£1,550.3
<b>Net benefit</b>	<b>£47.1</b>	<b>£17.5</b>	<b>£135.3</b>

139. Tables 15-18 summarise the costs and benefits of both the policy options described: continuing to export under PIC controls and cleaning and sorting plastic waste domestically. The costs and benefits are given in both discounted and undiscounted terms. The difference in the figures for the low, central, and high scenario, are due to the differing rates for the assumed proportion of waste classed as Y48. This is explained in further detail in Annex A.
140. The clean and sort scenario results in a positive net benefit compared to the baseline. due to the additional revenue from selling higher quality plastics. The high scenario for clean and sort where we assume 100% of exports are Y48 therefore results in a higher overall net benefit. This only serves as an illustrative scenario and there are many possible reasons why businesses are not currently cleaning and sorting. Over time, businesses may invest in clean and sort infrastructure capacity, and as this develops, the costs and benefits may tend towards the clean and sort scenario. The NPV will, however, be lower due to potential upfront costs of infrastructure investment.

## **9. Rationale and evidence to justify the level of analysis used in the IA**

141. The evidence used across the IA has been gathered from a range of data sources, including the NPWD, relevant competent authorities across Great Britain, WRAP and Valpak (a leading packaging waste compliance scheme operator). We have also informally engaged with the British Plastics Federation who are a leading trade association for the UK Plastic Industry, with around 500 members from across the supply chain. The evidence used in the IA reflects the best possible evidence we could obtain at this given point in time.
142. As a result of delays in OECD negotiations, legal advice obtained by Defra clarified that the EU draft legislation would not take effect during the transition period and that consequently the UK government would have to develop legislation to implement the Basel Convention amendments within Great Britain. The draft delegated act issued by the Commission on the 24 June 2020, amended to take account of the conclusion of the OECD negotiations, confirmed this. As a result, we have not had time to procure evidence or engage industry extensively. We will however, engage industry next year on the Basel Convention amendments, as well as more ambitious proposals outlined in the government's manifesto commitment to ban plastic waste exports to non-OECD countries.
143. For our analysis, we have taken a proportionate approach to capture the potential costs that businesses may face. We have captured the costs of the PIC as our main scenario, and have modelled a sensitivity where businesses may choose to clean and sort if there is spare capacity. The largest area of uncertainty is the infrastructure capacity and barriers industry face for cleaning and sorting. Our evidence suggests that clean and sort would be the profit maximising option, however, firms continue to export despite this. It appears there are barriers to industry for cleaning and sorting which may include capacity constraints. We have therefore assumed there is no current capacity and that no future recycling facilities will be developed over the appraisal period. We have also presented an additional sensitivity to demonstrate the impacts if capacity were available. This is presented in section 7.6-7.10. We will be seeking to gather more information to understand current capacity and private investment decisions towards developing future infrastructure capacity.
144. Another large evidence gap is the data on non-packaging plastic waste. Due to scarcity of data, and because the market is largely unregulated, our knowledge of the market for non-packaging plastic waste is limited. We have therefore made similar assumptions for non-plastic packaging using information we have obtained for plastic packaging. This is a

simplified approach, and it is possible that the market for non-packaging plastic waste could differ considerably. It is not possible to gather further information without tendering a substantial research project which will not be ready in time for laying the legislation this year. Furthermore, the information obtained from such a project could be limited. As part of our plastic manifesto commitment, we will seek to gather further information on non-packaging plastics over the next year.

145. Lastly, a particularly sensitive assumption is the proportion of plastic waste exports that are classified as Y48. We have carried out sensitivity analysis to account for this uncertainty using a range of information from WRAP, competent authorities and information provided in the NPWD. We have also produced sensitivity analysis around the volatility in the value of PERNs which affect the revenue gained by businesses for exporting.

## **10. Direct costs and benefits to business calculations**

146. The regulatory measure is a non-qualifying regulatory provision (NQR) which does not need to be listed in the annual Business Impact Target (BIT) report. The administrative exclusion applies as the regulatory provision is to meet international obligations under the Basel Convention.

147. The Equivalent Annual Net Direct Cost to Businesses (EANDCB) for the proposed measure in 2019 prices and discounted to a 2020 present value base year is £19.3m for option 1 (central case for exporting with PIC), whilst the business net present value is estimated at -£166.5m (2019 prices, 2020 present value base year). The EANDCB in 2020 prices and discounted to a 2021 present value base year amounts to £20.4m. For this analysis we included the following costs:

- Notification fees
- Costs for obtaining financial guarantees
- Administration and familiarisation costs

148. The introduction of financial guarantees will incentivise businesses who wish to export legally to improve the quality of their wastes so that they can prove to the bank their waste is at lower risk of being repatriated. By doing so, they can pay a lower premium to the bank. In the absence of evidence, we have only been able to reflect these avoided costs qualitatively. The resulting EANDCB is therefore likely to be less than estimated.

149. For illustrative purposes, we have also captured the EANDCB if businesses were able to clean and sort Y48 wastes. The EANDCB in 2019 prices and discounted to a 2020 present value base year is -£10.1m for option 1 - sensitivity (central case for cleaning and sorting), whilst the business net present value is estimated at £86.6m (2019 prices, 2020 present value base year). The EANDCB in 2020 prices and discounted to a 2021 present value base year amounts to -£10.6m. For this analysis we included the following costs and revenues:

- Cleaning and sorting costs
- Cleaning and sorting: loss of PERN value
- Cleaning and sorting revenue

150. The negative EANDCB value indicates an overall benefit to businesses for cleaning and sorting if 100% clean and sort capacity were available from 2021. This doesn't capture any potential upfront costs of infrastructure investment needed to meet clean and sort capacity.

We will be seeking to gather more information on capacity for our assessment of more ambitious reforms such as the plastic waste manifesto commitment.

## **11. Wider impacts**

151. Some plastic waste exports are handled by large waste management companies (WMC) who are vertically integrated and deal with waste up the hierarchy. These businesses are often engaged with collecting waste, have recycling parts to their business based in the UK and other parts of the world, and they may have their own shipping lines. They could choose to export to either feed their operations elsewhere in the world or to recover material more efficiently outside of the UK. These businesses collect plastic waste from local authorities (LAs) or from commercial businesses who produce plastic waste. These wastes are sold by LAs and waste producers for collection or could require LAs or producers to pay a gate fee to have their plastics collected. This depends on the quantities and quality of plastic waste being collected.
152. The introduction of additional PIC costs could result in WMCs passing on some of these costs to businesses by charging them more or lowering their quote for the buy cost of waste. This could impact businesses who produce Y48 although we do not know by how much as there are a vast number of plastic waste producers in the UK and their uses of plastics are across many commercial operations. For example, this could include the retail and hospitality sectors; scrap plastic waste from warehouses and or glazing companies; and other commercial operations requiring plastics. Lastly, the WMCs could also choose to absorb these costs to remain competitive and to retain market share, and so the introduction of fees may not impact waste producers.
153. Some plastic wastes exports are handled by smaller businesses. These could include businesses engaged in collecting wastes and arranging for exports or businesses who act solely as 'brokers' by purchasing wastes from waste collectors for the purpose of exporting for recovery. Once PIC is introduced, brokers have the option of absorbing costs or passing them on by reducing their buy cost of wastes. Our analysis demonstrates that the average margins after accounting for PIC would reduce the likelihood of these businesses to continue operating depending on the value of PERNs and how it affects their balance sheet. Exiting the market doesn't necessarily mean these businesses would go into administration as they could choose to export plastics that are not Y48, or export other forms of waste such as paper, metals and glass if that is part of their existing operations.
154. Furthermore, the introduction of a financial guarantee will incentivise businesses who wish to export legally to improve the quality of their wastes, thereby reducing the overall risk of waste being repatriated. This may result in exporters, GB authorities and shipping lines being at lower risk of bearing these costs.
155. If there was capacity available for cleaning and sorting and businesses opted for this, it would have a favourable impact on UK recyclers who will benefit from additional revenue and demand. This may have an impact on the price of waste and the margins gained by businesses across the waste hierarchy. We will be seeking to gather more information on this as part of evidence gathering on the plastic waste manifesto commitment.

## **12. Impact on small and micro businesses**

156. In 2019, there were 236 exporters of plastic wastes in the UK, who exported £97m worth of plastic waste. We do not know whether these are large or small businesses from the HMRC data, as it is commercially sensitive information which cannot be shared with Defra. We do however, have information on 133 GB plastic packaging waste exporters, who are



accredited under the PERN. Of these 133 businesses, 111 businesses have been identified as either small or micro<sup>13</sup>. It should be noted that the export operation of some businesses is carried out by affiliated companies that are a part of wider groups and so they may not actually be SMBs. Our estimates are therefore likely to be overestimated. For the remaining 75 GB businesses, who export plastic waste including non-packaging plastic wastes, we are not able to identify whether they are small or micro.

157. In our central case scenario, we assume 208 GB businesses are engaged with the export of Y48 plastics. We do not know whether small businesses registered under PERNs will be handling Y48, but if we assume the same proportion of SMBs for those accredited by PERNs (83%) for the total population of GB businesses under the central case, this will amount to approximately 173 businesses.
158. Of the 173 SMBs affected, it is possible that the PIC costs could disproportionately impact them as they will face a higher cost on average per notification compared to larger businesses who can notify multiple movements of waste under one notification and thus pay a lower fee on average per movement of waste. Larger businesses can therefore achieve some form of economies of scale compared to SMBs. The impacts of this regulation could possibly result in SMBs exiting the market depending on how the costs affect their balance sheet, or it could lead to them shifting to trading other forms of waste that are non-notifiable. This includes non Y48 plastics, paper, metals and glass if those wastes are part of their existing operations.
159. The margins for businesses exporting plastic packaging waste are already volatile. The sell value of waste exports is determined by the economic value of a tonne of plastic and the value of PERNs which provides the evidence that businesses need to prove they have met the producer responsibility requirements of the packaging waste regulations. The value of PERNs has historically been volatile and so many of the SMBs accredited under PERNs have already faced large swings in their margins for exporting. The additional inclusion of PIC fees may result in some businesses that operate on the margin to exit the market for Y48 exports.
160. Our calculation of the average margin for plastic wastes across all businesses after the inclusion of PIC costs (fees and admin costs) amounts to £-139/tonne to £176/tonne. This calculation is further described in Annex B. We do not know how representative this figure is for smaller businesses as we do not know the market share for medium to large businesses in comparison to the SMBs. We are therefore not able to say how much costs would fall onto SMBs.
161. It is not possible for SMBs to be exempt from the measures under the policy intervention as doing so would result in GB contravening the Basel Convention. Furthermore, the central aim of these measures is to implement the 'polluter pays' principle. The management of waste exports to receiving countries need to be effectively implemented and monitored by UK regulators to ensure compliance with the international rules, and so businesses will need to bear these costs to prevent damage to human health and the environment.
162. There is support available to SMBs who can consult with the relevant competent authorities for assistance on how to comply with the international rules. This would involve the relevant competent authorities providing guidance, advice and training to small businesses.

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<sup>13</sup> These businesses are defined as small and micro under the HMRC definition although we have made some adjustments for businesses not listed under company house but are known to be large - <https://www.gov.uk/annual-accounts/microentities-small-and-dormant-companies>

### **13. A summary of the potential trade implications of measure**

163. Out of the 187 countries that are parties to the Basel Convention, all have agreed to implement the reforms regarding Y48 wastes. Only Canada and Turkey have requested more time to implement the reforms in respect of imports into their countries. Exporters based in Canada and Turkey will have to comply with the changes made to the Convention for any plastic waste they export to Basel parties or face repatriation costs. The Basel Convention is an international convention which is compatible with World Trade Organisation (WTO) rules for the trade of plastic waste and wouldn't therefore lead to any trade disputes. To clarify this relationship, the WTO is mandated under paragraph 31(i) of the WTO Doha Ministerial Declaration to consider the relationship between WTO rules and "specific trade obligations" set out in Multilateral Environmental Agreements (MEA)<sup>14</sup>.
164. The requirement for businesses to provide prior informed consent will not differ across domestic and foreign countries who will be following international regulation. There is a possibility that some emerging economies may struggle to process notifications which could result in the delay or cancellation of GB exports. This is however, speculative and any negative impact on GB exporters cannot be estimated.
165. The PIC controls will not apply to intra-EU movements of Y48 waste. The EU is one customs territory, and so movements of plastic waste from and across EU member states (MS) do not count as an "export". This means that if an EU country wishes to send Y48 to a recycling facility in another EU country, there will be no requirement for PIC as the EU is not implementing PIC for intra-EU movements of Y48. As GB will no longer be part of the EU, GB companies will face additional costs relative to EU MS for exporting Y48 to the EU which may make them less competitive. However, the majority of Y48 exports are likely to go to the less developed countries that are outside of the EU, so this issue is unlikely to be prevalent. If there is a loss of competitiveness for GB businesses, this may encourage them to clean and sort domestically.
166. The impacts on exports after the introduction of the Basel amendments is dependent on whether the alternative of cleaning and sorting waste and selling recycled material domestically is more attractive than exporting Y48 with PIC costs. For the purpose of our analysis, we assume that businesses would continue to export with the PIC costs, although we have presented a sensitivity if there was capacity available for cleaning and sorting. This assumption is explained in further detail in section 6.1.7.

### **14. Summary and preferred option with description of implementation plan**

167. We plan to lay a statutory instrument (The International Waste Shipments (Amendment) (Plastic Waste) Regulations 2020) under the negative procedure in early December to implement the required changes to the retained European Union waste shipment regulations. This statutory instrument will come into force on 1 January 2021.
168. The GB regulators will be responsible for the ongoing operation and enforcement of these new arrangements. Specifically:
- The Environment Agency is the regulator in England;
  - Natural Resources Wales is the regulator in Wales;
  - The Scottish Environmental Protection Agency is the regulator in Scotland.

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<sup>14</sup> WTO Doha Ministerial Declaration - [https://www.wto.org/english/thewto\\_e/minist\\_e/min01\\_e/mindecl\\_e.pdf](https://www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.pdf)

## 15. Monitoring and Evaluation

169. The impact of the regulation will be monitored by assessing the number of notifications that have been made for the exports of Y48 plastic wastes. We will also be assessing the number of repatriations of Y48, should there be any. The number of repatriations determines the quality of the material that is being exported. If large quantities of waste are being repatriated, this will demonstrate that UK exporters are not adhering to the new rules.
170. Defra is planning to consult on the plastic manifesto commitment over the next year and as part of this, we will be seeking to gather more information on the impacts of the Basel amendments through issuing a call for evidence. We will be collecting information from businesses on how the amendments have impacted them, the costs they've faced as result, and to gather more information on the non-plastic packaging sector. We will also be looking to assess if businesses have changed their behaviour as a result of the regulation by changing their operations to cleaning and sorting plastics.
171. It is important to note that the policy cannot be amended since it is an international obligation, but monitoring and evaluation will allow us to understand the level of compliance and whether further support is needed for businesses.

## 16. Annex A – Sensitivity analysis for proportion of Y48

172. The costs businesses face is particularly sensitive to the assumption for the proportion of plastic waste exports that are Y48 as this determines the number of shipments of Y48 that needs to be notified and financial guarantees that need to be obtained. Under the clean and sort sensitivity, it will determine the tonnage of waste that needs to be cleaned or sorted. In light of this, and our lack of information on non-packaging plastics, we have produced illustrative ranges to account for this uncertainty in our analysis. The methodology underpinning the central assumption that 35% of plastic waste exports are classified as Y48 is set out in Section 6.1.4. However, it is important to explain how the assumptions for the other scenarios were calculated.
173. For the high scenario (scenario with the highest proportion of Y48), 100% of plastic waste exports are assumed to be Y48. This is based on the Valpak (2020) report, which estimates that 95% of rigid plastic wastes and 100% of film plastic wastes would have to be cleaned and sorted in order for the waste to be upgraded. We view this as a significant overestimate. This is because the NPWD database, which contains information that is submitted by accredited exporters of plastic waste and supervised by GB environmental regulators, includes single polymers that we know wouldn't require cleaning and sorting. Our central case assumption is more likely to be an accurate reflection of what is Y48, since the regulators are better positioned to know what is notifiable based on their expertise. The high Y48 scenario is however, useful for illustrating the worst possible outcome in terms of costs.
174. For the low scenario (scenario with the lowest proportion of Y48), 13% of plastic waste exports are assumed to be Y48. This is based on calculations derived from the NPWD (2019) database. We alter the central scenario assumption of 35% by excluding 'other plastic packaging' from our classification of what counts as Y48 waste. 'Other plastic packaging' is likely to be mixed as it hasn't been categorised as a single polymer, but this scenario takes an optimistic view that these plastics are not Y48.

175. Section 8 shows how costs can vary significantly depending on the proportion of plastic waste exports that are classed as Y48. For all scenarios, the calculations are exactly the same, except for the proportion of Y48.

## 17. Annex B – Margins for exporting with PIC controls against margins for cleaning and sort

176. This section considers the margins for exporting after the inclusion of additional costs for PIC against the costs of cleaning and sorting waste. This helps assess whether businesses on average will choose to continue exporting or clean and sort waste. It should be noted that whether businesses can clean and sort their waste will also depend upon the infrastructure capacity available in the UK.

Table 20: Exporting margins vs cleaning and sorting margins

	Baseline	Option 1: continue to export	Option 1: clean and sort
Costs for exporting (£/tonne)	£250	£250	£250
PIC export costs (£/tonne)	N/A	£74	N/A
Revenue for exporting (£/tonne)	£150	£150	£150
PERN (£/tonne)*	£35 to £350	£35 to 350	£32 to 315
Additional revenue from clean and sort (£/tonne)	N/A	N/A	£39
Comparable margin (£/tonne)	<b>-£65 to £250</b>	<b>-£139 to £176</b>	<b>-£30 to £254</b>

177. Table 20 illustrates that the margin for clean and sort ranges from -£30 to £254 in comparison to -£139 to £176 with the PIC costs. This demonstrates that exporting with PIC controls is less favourable than cleaning and sorting on average, and so our presentation of costs are likely overestimates. We assume that businesses export their waste after cleaning and sorting it, although it can be sold domestically. WRAP have not provided us with the revenue from selling waste domestically and so we have made a simplification that this is broadly the same as the revenue from exporting. In reality, the sell price of waste may differ to domestic prices and there are additional costs for transport of wastes when exporting.

178. Our analysis demonstrates most businesses would opt for clean and sort, if there were spare capacity. The possible reasons why businesses are not currently cleaning and sorting could be due to the cost of infrastructure investment needed to meet capacity and because there may not be demand for cleaned and sorted material in some countries, who would prefer to buy unsorted waste and clean and sort it cheaper than GB businesses. Another potential reason is that lower grade material even if it is cleaned and sorted can still produce a lower quality end product, which may not be profitable to sell on. Our analysis represents the average margin gained from clean and sort and so it is a static

example. In reality, some reprocessors may not be keen to accept the lower grade material as it could contaminate their higher grade material inputs making the output less profitable.

179. We have provided a breakdown of how the figures in table 20 have been derived below.
180. The average cost for exporting a ton of plastic waste amounts to £250/tonne and is based on information in the WRAP Materials Pricing Report and The Environment Exchange. The average revenue of exporting plastic waste is approximately £150/tonne on average based on estimates made by WRAP.
181. We have calculated the costs of PIC controls in £/tonne by taking the total cost of notifications fees, obtaining a financial guarantee and other admin costs and dividing this by the total tonnage of Y48. This amounts to £74/tonne.
182. The revenue for PERNs is explained in section 6.1.9. We have taken the lowest and highest value of PERNs over 2020 to reflect a range in the revenue businesses receive for each tonnage of waste exports. For the clean and sort scenario, we assume a 10% reduction in the value of PERNs due to non-target material being filtered out in the clean and sort process.
183. The net revenue from cleaning and sorting is based on the weighted average costs and revenues for cleaning and sorting rigid plastics and plastic films. The costs and revenues associated with cleaning and sorting plastic wastes were outlined in Sections 7.6-7.10 and are demonstrated again below.
184. Based on information from the Valpak (2020) report, we assume 55% of Y48 waste is categorised as rigid plastics, and 45% is plastic film. Hence, our calculation for the margins (£/tonne) of cleaning and sorting are calculated as follows:
- Revenue (£198/tonne) = ((55% x £175) +(45% x £225))
  - Costs of cleaning and sorting (£159/tonne) = ((55% x £125) +(45% x £200))
  - Additional revenue (£39/tonne) = Revenue (£198/tonne) – Costs (£159/tonne)

## **18. Annex C – Sensitivity analysis on loss of value in PERN after clean and sort**

185. The assumed value of PERNs for our analysis of the clean and sort scenario is £215/t which is the average value across Jan-Aug 2020. We have assumed a 10% reduction in that value as some non-target material that cannot be recycled is filtered out during the clean and sort process. This assumption has been provided by WRAP.
186. Because the value of PERNs is so volatile and the assumed loss in non-target material could differ across plastic wastes, we have produced sensitivity analysis on this.
187. The graph below captures the comparable margins (£/tonne) under the baseline (exporting without PIC fees), option 1 (exporting with PIC fees) and option 1 (cleaning and sorting). We show how these margins differ depending on the value of PERNs and the assumed % loss in PERN value under the cleaning and sorting option.
188. From the graph, we see that the breakeven point differs between the baseline, option 1 (exporting with PIC) and option 1 – sensitivity (cleaning and sorting). Under the baseline, where firms export without PIC fees, it becomes profitable to export once the value of

PERNs exceeds around £100 per tonne. Conversely, after the introduction of PIC costs, which are estimated to be £74 per tonne, pushes the breakeven point up to the level at which PERNS is roughly £174 per tonne. The graph also shows that the comparable margins are more favourable for cleaning and sorting, even when the percentage loss of PERN value is more substantial. The relative attractiveness of cleaning and sorting, however, diminishes when the PERN value increases. When the PERN values approach £200, for example, the comparable margin becomes higher under the baseline than for clean and sort when there is a 20% loss in PERN values. This is because as the PERN values increase, the additional revenue that is gained from cleaning and sorting is offset by the increasingly valuable non-target material that is filtered out in the cleaning and sorting process.

