

<b>Title:</b> Extending the Single Use Carrier Bag charge to all retailers and reviewing the current 5p charge to 10p  <b>IA No:</b> <b>RPC Reference No:</b> RPC-4325(2)-DEFRA <b>Lead department or agency:</b> Defra	<b>Impact Assessment (IA)</b>			
	<b>Date:</b> 03/02/2021			
	<b>Stage:</b> Final Stage Impact Assessment			
	<b>Source of intervention:</b> Domestic			
	<b>Type of measure:</b> Secondary legislation			
<b>Contact for enquiries:</b> Dan Quinlan, Raminta Brazinskaite				

**Summary: Intervention and Options** **RPC Opinion:** Green

**Cost of Preferred (or more likely) Option (2019 prices, 2020 present value)**

Total Net Present Value	Business Net Present	Net cost to business per year (EANDCB in 2019 prices)	One-In, Three-OUT	Business Impact Target Status
£287.2m	£1016.4m	-£118.1m		Qualifying regulatory provision

**What is the problem under consideration? Why is government intervention necessary?**  
 In 2015, Government introduced the mandatory 5p charge for single use carrier bags (SUCBs) on all large retailers to tackle the negative impacts associated with their use on the environment, wildlife and societal costs. Since then the policy has successfully led to an 95% reduction in the usage of SUCBs by these retailers. 13 billion plastic bags have been taken out of circulation over the last two years. The policy excluded retailers with fewer than 250 employees from the charge. This was to avoid placing additional regulatory burdens on small businesses. However, small, medium and micro (MSMEs) retailers, airport retailers and civic and voluntary organisations' retail outlets circulated 3.2 billion (over 80%) SUCBs in 2018, or total of 74 SUCBs per person. Government intervention is required to further reduce SUCBs and associated negative impacts as has been done in Wales and Northern Ireland.

**What are the policy objectives and the intended effects?**  
 The overarching objective of this policy is to contribute to the commitments set out in the Resources and Waste Strategy to eliminate all avoidable plastic waste by 2042 and to encourage the move towards a circular economy for plastics that will increase resource efficiency and reduce waste and pollution. This policy measure intends to do that by increasing the existing mandatory charge of SUCBs and extending the charge to MSMEs, civic and voluntary organisations, and airport retail outlets without imposing unnecessary costs. This will lead to an overall reduction in SUCBs used, greenhouse gas emissions and litter associated with carrier bags.

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

**Option 1: Do nothing (Baseline)** In the absence of any further policy intervention, only large retailers are obligated to charge for SUCBs. Consumption of SUCBs moves from around 4.1bn in 2018 to 3.9bn in 2029.  
**Option 2: Extend the current 5p charging obligation to MSMEs.** This option will require all MSMEs, airport retailers and civic and voluntary organisations' retailers to start charging 5p for SUCBs. These organisations will not be expected to monitor and report on SUCBs sales. Extension of the 5p charge is expected to reduce the overall number of SUCBs distributed.  
**Option 3: Increasing the current 5p charge on SUCBs to 10p for large retailers only.** This option will require large retailers in England to charge a higher price for SUCBs. We assume continued use of SUCBs by MSMEs, airports and charity retailers.  
**Option 4: Increasing the current 5p charge on SUCBs to 10p for all retailers.** This option provides additional incentives to consumers to reduce SUCBs use at all retailers and encourage a sustained reduction. It is expected to reduce SUCBs usage even further than in Option 2. MSMEs, airports and charity retailers will not be expected to monitor and report on SUCBs sales.  
**This is the preferred option.**

Based on the consultation responses, we do not regard the existing voluntary approach to be a realistic alternative to regulation as it has not led to a consistent policy of charging across the MSME sector and charity outlets resulting in fragmented use of charging. Further, Defra's commissioned research on the ban of SUCBs have concluded that the ban is unlikely to be an effective policy approach on its own as it would require new measures related to, for example, bags for life usage and MSMEs obligations that go beyond the existing powers.

**Will the policy be reviewed?** It will be reviewed. **If applicable, set review date:** It is proposed to review this policy measure in 2025 – 5 years after its introduction

Does implementation go beyond minimum EU requirements?	No			
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: -0.32		Non-traded: 0	

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: 03/02/2021

# Summary: Analysis & Evidence

Policy Option 1

Description: Do nothing (Baseline)

## FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2020	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: 0	High: 0	Best Estimate: 0

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low			
High			
Best Estimate	£0m	£0m	£0m

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

No change from current situation – no net costs

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

No change from current situation – no net costs

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low			
High			
Best Estimate	£0m	£0m	£0m

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

No change from current situation – no net benefits

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

No change from current situation – no net benefits

### Key assumptions/sensitivities/risks

## BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs:	Benefits:	Net:	

# Summary: Analysis & Evidence

# Policy Option 2

**Description:** Extend the 5p SUCBs charging obligation to MSMEs and charity outlets.

## FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2020	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: 159.5	High: 236.1	Best Estimate: 201.7

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)	
Low	2.9	1	84.4	740.5
High	2.9		89.7	783.2
Best	2.9		86.2	753.7

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

MSMEs, airports and charity shops face familiarisation and IT costs in Year 1 (£2.5m, £0.02m, £0.2m respectively). No further costs to business expected. Consumers see costs from 5p charge at MSMEs, airport and charity outlets of £570m, as well as VAT paid as part of 5p charge (£101m), hidden costs from increased use of paper bags (£8m) and costs from increased use of bags for life (£30m), bin liners (£14m) and cotton tote bags (£14m). Government and public sector see increase in enforcement costs (£1.3m). All values are discounted over a ten year appraisal period (2021-2030).

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

Consumers will be inconvenienced by not having access to 'free' bags, but this will be mitigated by behavioural responses to the charge, i.e. increased re-use of bags.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)	
Low	0	0	108.7	942.7
High	0		112.9	976.6
Best	0		110.4	955.4

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

MSMEs retailer savings from reduced SUCB stocks (£139m) and 5p charge (£110m). Airport retailer savings from reduced SUCB stocks (£6m) and 5p charge (£3m). Charity retail outlets savings from reduced SUCB stocks (£33m) and 5p charge income (£101m). Donations of the 5p income to charitable causes by MSMEs (£347m) and airport retailers (£10m). Government VAT revenue on 5p charge (£114m). GHGs traded sector emissions savings (£10m), reduced litter costs (£32m), waste management savings (£10m), disamenity benefits from reduced litter (£42m) and increased amount of recycled carrier bags (£0.2m). All values are discounted over a ten year appraisal period (2021- 2030).

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

A major non-monetised benefit would be the benefits to wildlife in the marine and terrestrial environment with less damage to organisms from fewer littered bags or pieces of bags. Further, no economic benefits were quantified in terms of the production of alternative bags.

<b>Key assumptions/sensitivities/risks</b>	3.5
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The key uncertainties among the assumptions are around the extent of any switch to paper bags and bags for life by MSMEs, airports, charity shops and consumers. See Annex A for sensitivity analysis of assumptions.

## BUSINESS ASSESSMENT (Option 2)

<b>Direct impact on business (Equivalent Annual) £m:</b>			<b>Score for Business Impact Target (qualifying provisions only) £m:</b>
Costs: 0.3	Benefits: 86.9	Net: -86.5	
			-447.9

## Summary: Analysis & Evidence

## Policy Option 3

**Description:** Increasing the current 5p charge on SUCBs to 10p for large retailers only

### FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2020	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: -99.1	High: -76.4	Best Estimate: -67.4

COSTS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0.6	1	22.4	191.4
High	0.6		26.4	229.2
Best Estimate	0.6		22.0	191.4

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

Large businesses face familiarisation and IT costs in Year 1 of £0.4m. No further costs to business are expected. Consumers see costs from 10p charge at large retailers of £38m and VAT paid as part of 10p charge of £8m, hidden costs from increased use of paper bags (£69m) and costs from increased use of bags for life (£8m), cotton tote bags (£17m) and bin liners (£47m). Increased waste management costs (£4.8m) as a result of increased use of paper bags. Government and public sector see increase in enforcement costs (£0.1m). All values discounted over a ten year period.

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

Consumers will be inconvenienced by not having access to 'free' bags, but this will be mitigated by behavioural responses to the charge, i.e. increased re-use of bags.

BENEFITS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	0	14.7	130.1
High	0		12.9	115.0
Best Estimate	0		14.0	124.0

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

Large retailers see savings from reduced stocking, transport and storage costs for SUCBs (£54m). They donate majority of the additional income from the 10p charge to good cause (£29m) and keep an amount to cover remaining SUCBs stock costs (£9m). GHGs emissions savings (£2m). Disamenity benefits to society from reduced litter (£15m); increased recyclates of carrier bags (£0.5m). Government revenue from VAT paid on 10p charge (£8m). Savings from reduced litter costs (£7m). All values are discounted over a ten year period.

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

A major non-monetised benefit would be the benefits to wildlife in the marine and terrestrial environment with less damage to organisms from fewer littered bags or pieces of bags. Further, no economic benefits were quantified in terms of the production of alternative bags.

Key assumptions/sensitivities/risks	Discount rate (%)
	3.5

The key uncertainties among the assumptions are around the extent of any switch to paper bags and bags for life by consumers. See Annex A for sensitivity analysis of assumptions.

### BUSINESS ASSESSMENT (Option 3)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: 0.1	Benefits: 9.6	Net: -9.6	
			-49.5

# Summary: Analysis & Evidence

# Policy Option 4

**Description:** Increasing the current 5p charge on SUCBs to 10p for all retailers

## FULL ECONOMIC ASSESSMENT

Price Base Year 2019	PV Base Year 2020	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: 167.8	High: 329.3	Best Estimate: 297.3

COSTS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	5.0	1	125.9	1,120.1
High	5.0		139.7	1,226.0
Best Estimate	5.0		126.9	1,121.1

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

Large, MSMEs, airports and charity retailers face familiarisation and IT costs in Year 1 (£0.4m, £4.2m, £0.02m and £0.2m respectively). No further costs to business expected. Consumers see costs from 10p charge of £756m, as well as VAT paid as part of 5p charge (£151m), hidden costs from increased use of paper bags (£81m) and costs from increased use of bags for life (£49m), bin liners (£54m) and cotton tote bags (£20m). Government and public sector see increase in monitoring and enforcement costs (£1.3m). All values are discounted over a ten year appraisal period (2021-2030).

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

Consumers will be inconvenienced by not having access to 'free' bags, but this will be mitigated by behavioural responses to the charge, i.e. increased re-use of bags.

BENEFITS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	0	159.2	1,393.8
High	0		166.1	1,449.4
Best Estimate	0		162.3	1,418.4

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

Large retailer savings from reduced SUCB stocks (£55m) and 10p charge (£9m). MSMEs retailer savings from reduced SUCB stocks (£181m) and 10p charge (£153m). Airport retailer savings from reduced SUCB stocks (£10m) and 10p charge (£2m). Charity retail outlets savings from reduced SUCB stocks (£64m) and 10p charge income (£75m). Donations of the 10p income to charitable causes by large retailers (£27m), MSMEs (£483m) and airport retailers (£8m). Government VAT revenue on 10p charge (£151m). GHGs traded sector emissions savings (£13m), reduced litter costs (£48m), waste management savings (£4m), disamenity benefits from reduced litter (£136m) and increased amount of recycled carrier bags (£0.7m). All values are discounted over a ten year appraisal period (2021-2030).

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

A major non-monetised benefit would be the benefits to wildlife in the marine and terrestrial environment with less damage to organisms from fewer littered bags or pieces of bags. Further, no economic benefits were quantified in terms of the production of alternative bags.

<b>Key assumptions/sensitivities/risks</b>	<b>Discount rate (%)</b>	3.5
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The key uncertainties among the assumptions are around the extent of any switch to paper bags and bags for life by MSMEs, airports, charity shops and consumers.  
See Annex A for assumptions and sensitivity analysis.

## BUSINESS ASSESSMENT (Option 4)

<b>Direct impact on business (Equivalent Annual) £m:</b>			<b>Score for Business Impact Target (qualifying provisions only) £m:</b>
Costs: 0.6	Benefits: 122.8	Net: -122.2	
			-590.4

## Executive Summary

The Single Use Carrier Bags Charges (England) Order 2015 came into effect following the success of Single Use Carrier Bags Charges (Wales) in 2010. These are both pieces of domestic legislation and the UK has led the way in this area, acting before the EU Directive 2015/720 made requirements for Member States to take measures to reduce the consumption of lightweight plastic carrier bags.

The 5p charge has reduced the use of single use plastic bags (SUCBs) by 95% since the charge was introduced (2015 to 2020). The proceeds from the charge by large retailers have generated around £169.1 million and £22.9m was donated to good causes in 2018/19 alone.<sup>1</sup> The variety of good causes supported include arts, education, environment, health, heritage and sports as well as local causes chosen by customers and/or staff. There have also been further positive consequences as many businesses have taken significant steps to reduce consumption of single use plastic bags. Of the seven largest retailers and providers of SUCBs, six have already phased out or committed to phase out SUCBs in 2018 and 2019 respectively. Many supermarkets are also providing alternative, returnable, bags for life.

While the 5p charge has been an effective policy there remains scope to encourage further reduction in SUCBs use. Current policy excludes retailers with fewer than 250 employees from the charge. This includes all small and medium sized enterprises and micro businesses (MSMEs).<sup>2</sup> As part of our assessment we have also included civic and voluntary organisations' retail (charity) stores and retail stores operating in airports. Previously airport retailers were exempt from the charge, but our consultation responses have shown members of the general public and organisations support the proposal to remove the exemption. In considering the evidence and strong desire from key affected businesses, the government will include all MSME retailers, airport and charity retailers as part of the SUCBs charging.

At the time, the rationale to exclude these businesses was to avoid placing additional regulatory burdens on small businesses if required to report on the usage. However, our estimates indicate that MSMEs, airports and charity shops supplied 3.2 billion SUCBs in 2019 compared to 0.8 billion bags sold by large retailers, or more than 80% of total SUCBs. Some small retailers have chosen to introduce a 5p charge for SUCBs voluntarily. In March 2018, two trade bodies, the Association of Convenience Stores and the National Association of Retail Newsagents launched an initiative to encourage their members to introduce a 5p charge voluntarily in the continued absence of a mandatory approach. This has had some success with the Local Shop Report 2018 reporting 46% of convenience stores applying a voluntary charge. The trade bodies continue to express concern that many members are not prepared to charge unless a mandatory approach is introduced that "levels the playing field" to ensure those who are choosing to charge do not lose customers to other local retailers who choose not to charge. A mandatory charge for all SMEs and micro businesses will help to remove this barrier.

The consultation document sought views on a proposal for producers (UK manufacturers and importers) of plastic packaging to report annually on the number of SUCBs they place on the market as part of their existing reporting obligations under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007. Collection of this data will assist in the monitoring and evaluation of the policy and in the evidence necessary for a Post Implementation Review. This will require additional funding for the Environment Agencies to

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<sup>1</sup> Defra (2019), Single-use plastic carrier bags charge: data in England for 2018 to 2019.

<sup>2</sup> Business are being classified based on the number of employees an organisation has. Any business with 250+ employees is considered large. ONS Annual business survey data shows businesses which are registered for VAT and/or PAYE or with Companies House (BEIS: Business population estimates 2018 and ONS Annual business survey data). This includes all franchises such as McDonald's. A franchisee such as McDonalds with less than 250+ employees is considered an MSME.

amend their processes for systems to provide for the additional reporting requirement. Large retailers will continue to be required to keep a record of the number of bags sold and how the proceeds have been used. They have to be reported to government by the 31<sup>st</sup> of May each year.<sup>3</sup> Costs to producers of single use plastic packaging have not been quantified in this impact assessment due to data limitations.<sup>4</sup> However, as producers of single use plastic packaging already collect and report this data in aggregated form, costs of presenting the data separately to the relevant government agency will be very small (see page 16 for further information).

In our consultation document, we asked packaging producers if they envisage any additional costs of separately reporting on the number of single use carrier bags produced. One plastic packaging producer commented that “We effectively do this already in our methodology for this report” which supports our view that any costs would indeed be inconsequential. This approach will significantly enhance our data collection on SUCBs consumption levels in England and support our ability to quantify consumption levels of light weight plastic bags as part of the EU reporting requirement.

Some countries have implemented an outright ban on supply of SUCBs. The Government has discounted this option. We recognise in particular the role that a SUCB can play in spontaneous, unplanned purchasing and that alternative bag types can potentially have a significantly higher carbon impact than SUCBs. A paper bag, for example, must be used [3 or 4 times](#)<sup>5</sup> to achieve the same carbon impact as a SUCB used once. New measures would be required to avoid harmful consequences of such a ban, such as to discourage possible excessive use of bags for life (BFLs) along with incentives to return them once worn out. There are also concerns that since BFLs are replaced free of charge, this could lead to MSMEs having to bear the cost of constantly replacing BFLs for free with no additional sales revenue being generated. Such necessary measures go beyond the existing powers the Government has to amend the existing Order or the Packaging Regulations.

The impact assessment first considers the current situation to establish the baseline to compare against the proposed policy options. Option 2 assesses the impact of extending the 5p charge to all MSMEs, airports and charity outlets with no impacts on larger retailers. Option 3 considers the impact of increasing the levy to 10p for large retailers only and Option 4 assesses the impacts of increasing the levy to 10p for all retailers, including MSMEs, airports and charity outlets. This impact assessment concludes Option 4 is the preferred policy approach because it is likely to deliver the greatest net benefit to society based on the costs and benefits that could be monetised in this appraisal. It is expected to reduce SUCBs use across all retailers, with a drop at MSMEs outlets by approximately 80% by 2029. The net present value in our preferred Option 4 is £297.3m, suggesting that the benefits to society outweigh the costs.

Due to the uncertainty around the number of SUCBs placed on market by MSMEs, we have tested this key variable and its effect on the NPV of Option 4. Our analysis in Annex A shows that if SUCBs supplied by MSMEs drop by 67% (from 2.7bn in our best estimate to 1.1bn) the central scenario NPV of the policy is still significantly positive at £130m. However, it is expected that MSMEs supply more than 1.1bn of SUCBs as they make up the majority of businesses.

Covid-19 has not been reflected in this IA. Consumer behaviour changes due to COVID-19 have impacted retail trends, particularly grocery shopping, with more people opting to use online deliveries than before. ONS Data shows that from March to August 2020, the proportion of total sales that took place online was 10% higher than in the same period in 2019. However, as we have

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3 Defra, Carrier bags: why there is a charge.

4 It is unclear how many packaging producers of single use carrier bags are on the market.

5 Environment Agency (2011), *Life cycle assessment of supermarket carrier bags: a review of the bags available in 2006*.

not yet received the data on SUCB consumption for 2020 we cannot draw conclusions on the impact this has had on SUCB use or forecast longer term trends. Nonetheless, we expect there will have been an increase in the consumption of SUCB in 2020, in particular during the 6-month exemption period for charging for SUCB for online deliveries.

However, we do not expect the pandemic to change carrier bag consumption significantly in the long term. This is because, in September 2020 the charge for SUCB for online deliveries was reinstated and the exemption has not been reintroduced during subsequent lockdowns and even before the exemption expired supermarkets had started to offer bagless deliveries again. Furthermore, many supermarkets are taking additional action to reduce or even eliminate use of SUCB in their stores and in online deliveries (for example, Morrisons have removed SUCB from their stores completely and delivery drivers will collect SUCB for recycling). We will continue to monitor the carrier bags statistics to assess whether further research may be required to understand any longer-term impacts of covid-19 on single use carrier bag usage.

In all options, the use of BFLs, paper bags, cotton tote bags and bin liners is expected to rise but with total greenhouse gas emissions, litter disamenity costs and litter clearing costs and waste management costs<sup>6</sup> to decrease and recycling gross profit to increase. Large retailers will face some upfront costs under Option 3 and 4 and can continue to deduct administrative, monitoring and reporting costs. MSMEs, airport and charity retailers will face some modest upfront costs though will be able to keep the proceeds from the charge and are not expected to face any monitoring or reporting costs. Charities are expected to continue benefitting from the charge as retailers donate profits to charitable causes. Following large retailers' experience, we assume that other retailers will contribute around 76% to charitable projects. Consumers will face costs if they choose to use SUCBs in all retail outlets or to purchase other bag alternatives. The public sector is expected to see a slight increase in enforcement costs in all options, mainly in Options 2 and 4. Table 1 summarises the societal costs and benefits of considered options, with economic transfers formatted with italics.

**Table 1. Summary of costs and benefits for proposed options (discounted, 2021 to 2030)**

	<b>Option 2: extending 5p charge to MSMEs and charity shops</b>	<b>Option 3: 10p charge for large retailers only</b>	<b>Option 4: 10p charge for all retailers</b>
<b>Total costs (transfers in <i>italics</i>)</b>	<b>£753.7</b>	<b>£191.4m</b>	<b>£1,121.1m</b>
<b>Business familiarisation and IT costs</b>	MSMEs: £2.5m Airport retailers: £0.02m	Large retailers: £0.4m	Large retailers: £0.4m MSMEs: £4.2m Airport retailers: £0.02m
<b>Civic and voluntary organisations familiarisation and IT costs</b>	£0.2m	Nil	£0.2m
<b>Government and public sector costs</b>	£1.3m	£0.1m	£1.3m
<b>Waste management costs</b>	Nil	£4.8m	Nil
<b>Costs to consumers – increased use of paper bags</b>	£8m	£69m	£81m
<b>Costs to consumers – increased use of plastic bags for life</b>	£30m	£8m	£49m
<b>Costs to consumers – increased use of cotton tote bags</b>	£13m	£17m	£20m
<b>Costs to consumers – increased use of bin liners</b>	£14m	£47m	£57.3m
<b><i>Transfers:</i></b>			
<b><i>Costs to consumers – additional 5/10p charge (excluding VAT)</i></b>	<b><i>£570m</i></b>	<b><i>£38m</i></b>	<b><i>£756m</i></b>

<sup>6</sup> Except for waste management impacts in Option 3 – see Table 1.



<i>Costs to consumers - VAT paid on the 5/10p charge</i>	<i>£114m</i>	<i>£8m</i>	<i>£151m</i>
<b>Total savings (transfers in italics)</b>	<b>£955.4m</b>	<b>£124.0m</b>	<b>£1,418.4m</b>
<b>5/10p charge retained by retailers</b>	MSMEs: £109.5m Charity retailers: £100.5m Airport retailers: £3.2m	Large retailers: £9m	Large retailers: £8.5m MSMEs: £152m Charity retailers: £75m Airport retailers: £2m
<b>Savings to retailers from reduced stocking, transport and storage of SUCBs</b>	MSMEs: £138.7m Charity retailers: £32.7m Airport retailers: £6.2m	Large retailers: £54m	Large retailers: £55m MSMEs: £181m Charity retailers: £64m Airport retailers: £10m
<b>GHGs emissions savings from reduced circulation of SUCBs and increase of alternatives</b>	£10m	£2m	£13m
<b>Waste management savings from reduced circulation of SUCBs and increase in use of alternatives</b>	£10m	Nil	£4m
<b>Savings from reduced litter costs</b>	£32m	£7m	£48m
<b>Disamenity benefits to society from reduced littering</b>	£42m	£15m	£136m
<b>Gross profit from additional recycling</b>	£0.2m	£0.5m	£0.7m
<b>Transfers:</b>			
<i>Donations of 5/10p income to good cause from businesses</i>	<i>MSMEs: £347m Airport retailers: £10m</i>	<i>Large retailers: £29m</i>	<i>Large retailers: £27m MSMEs: £483m Airport retailers: £8m</i>
<i>Government revenue - VAT paid on top of 5/10p charge</i>	<i>£114m</i>	<i>£8m</i>	<i>£151m</i>
<b>Net present value (+ societal savings, - societal costs)</b>	<b>£201.7m</b>	<b>-£67.4m</b>	<b>£297.3m</b>

Note: Figures in the table may not add up due to rounding of numbers.

## The problem under consideration and rationale for Government intervention

The 5p charge has been an effective tool to reduce SUCBs use. However, in 2018 there were still estimated to be 993 million SUCBs being sold by large retailers and a further 3.2 billion being supplied by MSMEs, airport and civic and voluntary organisations' retail outlets.

MSMEs, airports and charity shops can voluntarily charge 5p for SUCBs, although we estimate that 61% are still given away free at the point of sale. Here, the cost of SUCBs are hidden in the price of goods. This means consumers are not incentivised to limit their consumption of SUCBs. Without further intervention, the consumption level could remain the same or even increase over time. The latter effect was seen in a report on the impacts of the plastic bag levy in Ireland.<sup>7</sup> Here plastic bag usage initially fell with introduction of the first levy in 2002 but rose again five years post levy.

The use of SUCBs imposes negative externalities on society. Their single use nature means they are susceptible to littering. This imposes both an environmental and a disamenity cost. Their production relies on non-renewable resources and generates greenhouse gas emissions. When disposed of correctly they impose waste management costs on society with some forms of disposal also generating greenhouse gas emissions.

These factors provide the rationale for government intervention to address this problem and to further reduce SUCBs consumption to the lowest possible levels.

SUCBs are defined in the Single Use Carrier Bags Charges (England) Order 2015 as bags, with handles, made of a lightweight plastic material the thickness of which is no greater than 70 microns. The Order sets out a number of exemptions to the obligation on businesses with 250 employees or more to charge 5p for SUCBs supplied at the time of sales of goods. There is no intention to amend the definition of SUCBs. Exemptions include the sales of unwrapped food (e.g. fresh fruit), meat, knives and returnable multi reuse bags (Bags for Life). The only proposed change to the list of exemptions is to remove that which applies to goods in transit sold at restricted areas at airports. Removal of this exemption will bring airports into line with other transit places such as bus and train stations. The exemption will continue to apply to sale of goods in transit (e.g. on trains and aeroplanes). This is because modes of transport will often cross borders (within the UK and beyond) in which legislation on supply of SUCBs will vary making it difficult for transport operators to apply the appropriate requirements.

## Policy objective and intended effects

The overarching objective of this policy is to contribute to the commitments set out in the Resources and Waste Strategy to eliminate all avoidable plastic waste by 2042 and to encourage the move towards a circular economy for plastics that will increase resource efficiency and reduce waste and pollution. This policy measure intends to do that by increasing the existing mandatory charge of SUCBs and extending it to MSMEs, civic and voluntary organisations, and airport retail outlets without imposing unnecessary costs. This will lead to an overall reduction in SUCBs used, greenhouse gas emissions and litter associated with carrier bags.

Data collection will support the monitoring and evaluation of the SUCB policy and its impact on the policy objective of eliminating avoidable plastic waste. The policy, combined with other measures (e.g. bans on plastic straws, cotton buds and stirrers) will rectify the negative environmental and

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<sup>7</sup> Green Budget Europe report, available online here

social impacts associated with the production, usage and disposal of plastic. The intended effects in particular include reductions in littering and ocean plastics.

Large retailers will continue to report on the number of bags they sell and are encouraged to donate the proceeds from the charge to good causes which are expected to benefit charities. The IA has considered evidence on the four main issues listed below:

- Extending the charge to businesses and civic and voluntary organisations with less than 250 employees. Thus, including micro, small and medium enterprises and retail outlets of civic and voluntary organisations with less than 250 employees but without any reporting requirements. This is reflected in Options 2 and 4.
- Increasing the charge to 10p. This is analysed in Options 3 and 4.
- Requiring “producers” (i.e. importers and manufacturers) of single use carrier bags to report the tonnage they place on the market (as an extension of existing packaging producer reporting obligations). This relevant to all options but baseline, i.e. Options 2-4.
- Remove exemption from the 5p charge for retailers in security restricted areas at airports. Options 2 and 4 analyse this.

The policy measures outlined in this IA aim to influence consumers to make more sustainable purchasing decisions. The experience in Ireland provides a body of evidence that suggests an increase in the charge will impact positively on consumer behaviour. In 2007, Ireland raised their plastic levy to €0.22 and saw a further 58% reduction in bag usage by 2012.

The responses to the consultation indicated overwhelming support for the proposed policy measures set out in Option 4 to increase the charge to 10p and extend it to small businesses. 74% of consumers supported the move to increase the charge to 10p. Those who did not support the increase to 10p charge generally felt it should be set even higher. The Government therefore believes the consultation responses provide a clear evidence from consumers that an increase to 10p will have an impact in consumer behaviour leading to reduced consumption of SUCBs. The proposal to extend the charge to small businesses attracted even greater support with 82% of consumers supporting the proposed measure.

Since the introduction of the charge in England the EU introduced Directive EU 2015/720 amending Directive 94/62/EU as regards reducing the consumption of lightweight plastic carrier bags. This measure included an annual target for Member States to reduce consumption of SUCBs to no more than 90 SUCBs per person by 31 December 2019 and 40 per person by 31 December 2025. The UK met the 2019 target with the most recent data<sup>8</sup> showing a reduction in use equivalent to each person in the population using 10 bags (from all retailers reporting) in 2019 to 2020, compared to 20 bags in 2018 to 2019, and 140 bags in 2014 before the charge was introduced<sup>9</sup>. The analysis in this IA indicates that the longer-term target will be achieved following the extension of the charge to MSMEs. The proposal to introduce an additional reporting requirement on producers of SUCBs will assist us to demonstrate the target has been met. Crucially, it will also assist in the monitoring and evaluation of impacts of the proposed policy measures. The UK left the EU on 31<sup>st</sup> January 2020, which means that compliance with the Member State target is not required. However, the Government is also clear that environment policy will not be undermined by leaving the EU. We therefore believe that being able to

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<sup>8</sup> <https://www.gov.uk/government/publications/carrier-bag-charge-summary-of-data-in-england/single-use-plastic-carrier-bags-charge-data-in-england-for-2019-to-2020>

<sup>9</sup> This data was not available at the time that the analysis was completed.

demonstrate that our level of ambition in relation to SUCBs is equal if not greater than that of our EU colleagues remains vital.

All considered options see a fall in the use of SUCBs in England, with most pronounced reduction in SUCBs usage expected for Options 2 and 4.

## Description of options considered

### **Option 1: Do nothing scenario (Baseline)**

This is the current situation. Only large retailers are obligated to charge for single use plastic bags. Latest published Defra data shows that large retailers have already seen single use carrier bags drop by 95% in the calendar year 2019/20 relative to 2014 since the charge was first introduced in 2015.<sup>10</sup>

Based on the consultation responses, we assume that around 39% of MSMEs voluntarily charge 5p for SUCBs, as part of their Corporate Social Responsibility, and therefore have seen the same reduction in the usage of bags as large retailers.<sup>11</sup> Airports and charity retail outlets continue to provide free SUCBs to customers (see Annex B.3 for methodology of SUCBs usage).

Consumers continue to pay indirectly for these bags through the price of goods. The costs to society of littered bags and greenhouse gas emissions from bag production remain at current levels.

In this scenario, consumption of SUCBs are estimated at 4 billion SUCBs (2019) and reduces slightly to 3.9 billion by 2029.

### **Option 2: Extend the charging obligation to MSMEs, remove exemption from airport retailers.**

This option will require all MSMEs, airport and civic and voluntary sector's retailers with less than 250 employees to start charging 5p for SUCBs. These businesses will not be expected to monitor and report on SUCBs sales. Extension of the 5p charge is expected to reduce the overall volume of SUCBs currently distributed.

Option 2 is also expected to reduce the use of non-renewable resources required for the production of SUCBs. It will reduce the cost to local authorities associated with transport, treatment and disposal of waste and litter caused by SUCBs and to effect a positive behaviour change across the whole sector.

### **Option 3: Increasing the current 5p charge on SUCBs to 10p in large retailers only**

This option will require only large retailer shops to start charging 10p for SUCBs. These businesses will continue to monitor and report on SUCBs sales. By increasing the charge we expect to reduce the amount of SUCBs supplied by large retailers further. Although a majority of large retailers such as Tesco have already taken measures to phase out single use carrier bags. This may be largely driven by Social Corporate Responsibility. Therefore, we expect this option to provide minimal societal and economic benefits.

MSMEs, airport retailers and civic and voluntary organisations with less than 250 employees remain exempt as was the case in the initial introductory 5p charge in 2015. They can voluntarily charge for the bags or give them out for free at the point of sale.

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<sup>10</sup> Defra (2019), Single-use plastic carrier bags charge: data in England for 2018 to 2019.

<sup>11</sup> See Annex B.13 for details.

## Option 4: Increasing the current 5p charge on SUCBs to 10p in all retailers

This option provides additional incentives to consumers to reduce SUCBs use at all retailer outlets. It is expected to reduce SUCBs usage even further than in Option 2 and 3. Large retailers will continue to monitor and report on the number of SUCBs they purchase and sale. Conversely, MSMEs, airport and civic and voluntary organisations' retailers will not be required to monitor or report on the number of SUCBs being sold. This is to reduce any regulatory burden placed on them.

### Alternative options to regulation

Based on the consultation responses, we do not regard the existing voluntary approach to be a realistic alternative to regulation. The voluntary approach has not led to a consistent policy of charging across the MSME sector, airports and charity outlets, resulting in fragmented use of charging. For example, the trade bodies continue to express concern that many members are not prepared to charge unless a mandatory approach is introduced that "levels the playing field" to ensure those who are choosing to charge do not lose customers to other local retailers who choose not to charge. A mandatory charge for all SMEs and micro businesses will help to remove this barrier.

Some countries have implemented an outright ban on supply of SUCBs. The Government has discounted this option. We recognise in particular the role that a SUCB can play in spontaneous, unplanned purchasing and that alternative bag types can potentially have a significantly higher carbon impact than SUCBs. A paper bag for example must be used 3 or 4 times<sup>12</sup> to achieve the same carbon impact as a SUCB used once. Nevertheless, Defra commissioned a study into the impacts of an outright ban on SUCBs in England<sup>13</sup>. That report concluded that additional measures would be required to avoid negative consequences of such a ban. These measures would need, for example, to discourage possible excessive use<sup>14</sup> of bags for life (BFLs) along with new policy incentives to return them once worn out. There are also concerns that since BFLs are replaced free of charge, this could lead to MSMEs having to bear the cost of constantly replacing BFLs for free, with no additional sales revenue being generated in order to fund such activities.<sup>15</sup> Such necessary measures go beyond the existing powers the Government has to amend the existing Order or the Packaging Regulations.

## Analysis of options

The economic impacts of all options were calculated in line with HM Treasury's Green Book guidelines. The analysis in this assessment is in line with the previous impact assessment on the Plastic Carrier Bags Charge from 2015.<sup>16</sup> Key industry information and estimates used in this assessment are sourced from publicly available data.

In assessing the impacts of the charge it is necessary to make assumptions about the likely change in bag usage following its introduction since all options 2, 3 and 4 will affect all types of carrier bag use. SUCBs usage in option 2 is estimated for MSMEs, airports and charity shops only, as they alone are affected by the policy measure. The effect of the charge on the usage of bags for life are also considered, as they are a possible substitute for SUCBs. Paper bags and bin

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<sup>12</sup> Environment Agency (2011), *Life cycle assessment of supermarket carrier bags: a review of the bags available in 2006*.

<sup>13</sup> Eunomia for Defra (2018), *Assessing the Economic Impacts of a Possible Ban on Single-use Plastic Carrier Bags*.

<sup>14</sup> Eunomia estimated an increase by 602 million of BFLs in the year immediately after the ban, or 6 billion over ten years if unmitigated. Our preferred Option 4 results in 828 million of additional BFLs over the same period.

<sup>15</sup> Eunomia for Defra (2018), *Assessing the Economic Impacts of a Possible Ban on Single-use Plastic Carrier Bags*.

<sup>16</sup> The impact assessment is available online here.

liners use is estimated because some increase in their use is expected as a result of consumers shifting to these alternatives.

Twenty-five responses to the consultation were received from non-governmental organisations. These were predominantly civic and voluntary organisations. The proposed measures typically do not directly impact on these organisations although the policy measures do support the overarching aims of many of these organisations which focus on an improved natural environment. Those that have retail outlets would in future be mandated to charge for carrier bags in options 2 and 4 and this is covered in the detailed analysis of the options. Retailers are free to donate income received from the charge to good causes. This impact is also covered in the detailed consideration of the options.

In the absence of comprehensive market data, assumptions have been made based on the previous impact assessment from 2015 using latest data where possible, comments received from the Regulatory Policy Committee, and consultation responses.

Wider impacts such as the cost of dealing with litter and waste management costs were accounted for using Scottish 2010 data (fishing industry), UK 2010 data (marine litter), Local Authority Revenue and Expenditure Financing: 2012-2013 data (street cleaning), UK 2011 data (Network Rail) and UK 2011-2012 data (Highways Agency). These were updated to 2019 prices.

Since the wider impacts are considered a low cost to businesses regulation, this method is considered appropriate and proportionate in line with the guidance laid out in the Better Regulation Framework Manual. Given the inherent uncertainty in some key data inputs, we have also conducted a sensitivity analysis of the main assumptions. See Annex for the key assumptions made, sensitivity analysis and methodology description.

#### Changes made to this Impact Assessment following consultation:

Following the consultation responses and comments received from the Regulatory Policy Committee, the final impact assessment changed in the following way:

- Voluntary charging by MSMEs: we assume that around 39% of the sector currently voluntarily charges for SUCBs. See Annex B – ‘Voluntary 5p charge by MSMEs’ for details.
- Sector disaggregation: The impact of removing the charging exemption at airports and charity shops has now been accounted for.
- Impacts of policy on SUCBs and BFLs levels: The IA uses the latest evidence, including data in England for 2017 to 2018, regarding the amount of SUCBs removed from circulation as a result of the policy change.
- Level of pass-through to consumers: The consultation IA assumed that income from the charge to MSMEs were passed to consumers in reduced prices to reflect their competitive nature. Given the lack of evidence of the exact level of pass-through, we assumed that that MSMEs either keep the 5/10p charge or donate that to charitable causes. The Retail Association of Small Retailers suggested that voluntarily charging MSMEs donate a majority of their income to good cause. The same assumption had been applied to airport and civic and voluntary organisations’ retail outlets now covered in the analysis.
- Wider economic impacts: The IA now accounts for the wider costs to consumers from purchasing SUCB alternatives such as BFLs, paper bags, cotton tote bags and bin liners. No business benefits have been estimated in regards to the increased sales of SUCBs as these tend to be imported from overseas.

- Litter disamenity benefits: The IA now monetises disamenity benefits to society associated with reduced littering (a secondary impact), resulting from reduced SUCBs in circulation and increase in their alternatives.
- Sensitivity analysis: The IA now explicitly identifies key variables to which the options' net present values are sensitive. We have tested the impacts of changes to these variables on the NPV for the preferred policy option. This is to determine the extent of change in assumptions required to render the option preferable relative to alternative policy options (see Annex A for further detail).

## Option 1 (Baseline) costs and benefits

This section establishes the baseline, or counterfactual, i.e. the projected impacts in the absence of a policy change. The costs and benefits of the other options will be assessed in relation to the baseline. To set the baseline, it is necessary to estimate current levels of bag use and expected trends. We expect continued reduction in the use of SUCBs by supermarkets and high street retailers as part of their response to consumer demand for plastic alternatives. It is not possible to predict the exact reduction in SUCBs without policy change, which is why we have tested three sets of baseline scenarios across low, best and high estimates in terms of the annual reduction in SUCBs usage (see Table 2 for our best estimate and Annex A – Table A.1 for low and high estimates). The continued reduction at supermarkets and high street retailers' sites should be consistent with existing efforts made by large businesses and consumers.

Since this option represents the status quo, there are no additional cost or benefits to this option. After the initial 80% decrease in bag usage when the 5p charge was introduced in 2015, there was a further decrease in SUCBs usage by large retailers in 2018 and 2019. This is due to the voluntary commitments made by some of the largest retailers and contributors of SUCBs to phase out the bags by the end of 2018 and the beginning of 2019 respectively.<sup>17</sup>

After these voluntary commitments are enacted we assume in our best estimate that the number of SUCBs at supermarkets fall by 2.5%. Other high street SUCBs sales are estimated to fall by 1.5% per year as they do not offer a wider range of alternative bags like BFLs or paper bags, therefore are assumed to see a slower drop in bags relative to supermarkets (see Annex A – Table A.1).

For MSMEs, the use of SUCBs grow by 1% per year unless they have introduced a voluntary 5p charge since 2015. For those 39% MSMEs with voluntary charging in place, we assume a drop by 87% by Year 3 (as observed by large retailers), followed by 1% reduction per year afterwards. See Annex B – 'Voluntary 5p charge by MSMEs' section for further details. For airport and civic and voluntary retail shops, we estimate the amount of bags sold at 61 million and 464 million in 2019 respectively.<sup>18</sup>

Table 2, below, shows an estimated number of millions of SUCBs used in England from 2018 to 2030. Please refer to the Small and Micro Business Assessment section (Table 24) with respect to the split of SUCBs across micro, small and medium businesses.

<sup>17</sup>See the article in The Grocer (2018).

<sup>18</sup> See Annex B.3.1 for methodology.

**Table 2. Projected SUCBs usage in baseline**

Unit of SUCB, millions	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Supermarkets</b>	277	92	90	88	86	83	81	79	77	75	73	72	70
<b>Growth rate</b>	-73%	-67%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%
<b>High street retailers</b>	705	695	684	674	664	654	644	634	625	616	606	597	588
<b>Growth rate</b>	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-2%
<b>All large retailers</b>	982	787	774	762	749	737	725	714	702	691	680	669	658
<b>MSMEs</b>	2,639	2,690	2,652	2,665	2,658	2,659	2,657	2,657	2,655	2,654	2,653	2,652	2,651
<b>Growth rate</b>	-7%	2%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>Airports</b>	59	61	63	64	66	68	70	72	73	75	77	80	82
<b>Growth rate</b>	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
<b>Charity shops</b>	464	464	464	464	464	464	464	464	464	464	464	464	464
<b>Growth rate</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>All retailers</b>	4,145	4,002	3,953	3,955	3,938	3,929	3,917	3,906	3,895	3,885	3,875	3,865	3856

Note: 2018 to 2030 are all projected estimates.

An estimated 3.2bn bags were circulated by MSMEs, airports and charity shops in 2019. This is derived using reported data on SUCBs sold by large retailers which is based on latest Defra reporting (see Annex B.3 for full methodology).<sup>19</sup>

MSMEs paper bag usage is assumed at 1% of total MSMEs, airports and charities bag usage. BFL usage is also assumed at 1% of total MSMEs bag usage, the remaining 98% are assumed to be SUCBs. See Annex B.3 for methodology on estimated bags used by MSMEs, airport retailers and civic and voluntary organisations.

### **Option 2: Extend the charging obligation to MSMEs, remove exemption from airport retailers.**

Option 2 extends the mandatory 5p charge for SUCBs paid by consumers to organisations with less than 250 employees and removes the exemptions from airport retailers from 2021. If the exemption on airport outlets is removed we estimate an additional 2% (61m) of single use carrier bags will be affected by the charge according to 2019 data.<sup>20</sup> To minimise the regulatory burden on these businesses, they will be exempt from monitoring and reporting requirements.

Large businesses are unaffected and continue operating as normal as they are already required to charge for SUCBs.

<sup>19</sup> Defra (2019), Single-use plastic carrier bags charge: data in England for 2018 to 2019.

<sup>20</sup> Exact statistics on single use carrier bags used at airports are not available. See Annex B.3.1 for the methodology used to estimate the number of SUCBs used.



Extending the 5p SUCB charge to MSMEs, airport and civic and voluntary organisations' retailers could result in a 46% decrease in SUCBs by 2025, or a decrease of 1.8bn billion.<sup>21</sup> The reductions assumed in the sectors of MSMEs currently not voluntarily charging, civic and voluntarily organisations and airport retailers reflect the experience observed in the sector of larger retailers and of impacts seen in other countries covering the whole retail sector with the charge. Those MSMEs that are already charging 5p on the voluntary basis are assumed to see no further impact.

**Table 3. Projected SUCBs usage in Option 2**

Millions	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Supermarkets</b>	277	92	90	88	86	83	81	79	77	75	73	72	70
<b>Growth rate</b>	-73%	-67%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%	-2.5%
<b>High street retailers</b>	705	695	684	674	664	654	644	634	625	616	606	597	588
<b>Growth rate</b>	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-1.5%	-2%
<b>All large retailers</b>	982	787	774	762	749	737	725	714	702	691	680	669	658
<b>MSMEs</b>	2,639	2,690	2,652	1,630	1,659	1,432	1,271	1,188	1,177	1,165	1,153	1,142	1,130
<b>Growth rate</b>	-7%	2%	-1%	-39%	2%	-14%	-11%	-6%	-1%	-1%	-1%	-1%	-1%
<b>Airports</b>	59	61	63	52	50	39	35	33	32	32	32	31	31
<b>Growth rate</b>	6%	3%	3%	-17%	-4%	-22%	-11%	-6%	-1%	-1%	-1%	-1%	-1%
<b>Charity shops</b>	464	464	464	390	377	295	261	244	242	240	237	235	232
<b>Growth rate</b>	0%	0%	0%	-16%	-4%	-22%	-11%	-6%	-1%	-1%	-1%	-1%	-1%
<b>All retailers</b>	4,145	4,002	3,953	2,834	2,835	2,503	2,293	2,179	2,153	2,127	2,102	2,077	2,052

Bags for life (BFLs) are a widely available alternative to SUCBs and their usage is expected to increase as a result of the 5p extension. Although they are reusable they will offset some of the benefits of reduced SUCBs use. We also assume some increased usage of paper bags and cotton tote bags. Finally, we also expect to see increased sale of bin liners as we assume consumers will no longer utilise SUCBs to dispose of waste. See Annex A for detailed bag usage estimates for each option.

The cost and benefits under option 2 are summarized below. These are explained in more detail in sections that follow. Table 4 presents the summary of monetised costs and benefits where all values are net costs or benefits when compared to Option 1 – baseline.

<sup>21</sup> See Annex B – Table B.1 for the methodology of assumed SUCB reduction rates across sub-sectors and rationale. Also, see Table A.5 for the detailed projected bag usage in Option 2.

**Table 4. Summary of impacts under Option 2, £ millions.**

	<b>Year 1</b>	<b>10 years appraisal period (discounted)</b>
<b>Total costs</b>	<b>£107.1m</b>	<b>£753.7m</b>
Familiarisation and IT costs to MSMEs and airport retailers	MSMEs: £2.5m Airport retailers: £0.02m	MSMEs: £2.5m Airport retailers: £0.02m
Familiarisation and IT costs to charities	£0.2m	£0.2m
Government and public sector costs	£0.2m	£1.3m
Costs to consumers – hidden costs from increased use of paper bags (MSMEs, charity shops, airport retailers)	£0.9m	£7.5m
Costs to consumers – increased use of bags for life (MSMEs, charity shops, airport retailers)	£0.9m	£30.2m
Costs to consumers – increased use of bin liners (MSMEs only) <sup>22</sup>	£0.4m	£14.1m
Costs to consumers – increased use of cotton tote bags	£0.5m	£13.5m
<i>Transfers:</i>		
<i>Costs to consumers - 5p charge at MSMEs, charities and airport retailers</i>	<i>£84.6m</i>	<i>£570.1m</i>
<i>Costs to consumers - VAT paid on the 5p charge (MSMEs, charity shops, airport retailers)</i>	<i>£16.9m</i>	<i>£114.0m</i>
<b>Total savings</b>	<b>£123.5m</b>	<b>£955.4m</b>
Proceeds from 5p charge retained by MSMEs (excluding VAT)	£15.9m	£109.5m
Proceeds from 5p charge retained by airport retailers (excluding VAT)	£0.5m	£3.2m
Savings to MSMEs from reduced stocks of SUCBs	£12.4m	£138.7m
Savings to charity shops from reduced stocks used for charitable projects	£1.5m	£32.7m
Savings to airport retailers from reduced stocks of SUCBs	£0.2m	£6.2m
GHGs emissions savings from reduced circulation of SUCBs and slight increase in alternatives <sup>23</sup>	£0.2m	£9.6m
Waste management savings from reduced circulation of SUCBs and slight increase in use of alternatives	£1.1m	£9.8m
Savings from reduced litter costs	£2.8m	£31.7m
Disamenity benefits from reduced litter	£3.7m	£42.3m
Additional gross profit to recycling sector	<£0.1m	£0.2m
<i>Transfers:</i>		
<i>Savings to charity shops from charging used for charitable projects</i>	<i>£16.3m</i>	<i>£100.5m</i>
<i>Donations to good cause (income from the charge received by MSMEs)</i>	<i>£50.3m</i>	<i>£346.7m</i>
<i>Donations to good cause (income from the charge received by airport retailers)</i>	<i>£1.7m</i>	<i>£10.2m</i>
<i>Government revenue - VAT paid on top of 5p charge from MSMEs, airport and charity shops</i>	<i>£16.9m</i>	<i>£114.0m</i>
<b>Net present value (+ societal savings, - societal costs)</b>	<b>£33.4m</b>	<b>£201.7m</b>

Note: Figures in the table may not add up due to rounding of numbers.

<sup>22</sup> We assume charity retail outlets and airport retailers do not sell bin liners.

<sup>23</sup> GHG impacts of bags for life, paper bags, cotton tote bags and bin liners are accounted for in our estimates. Paper bags generate the highest GHG emissions. See Annex B.5 for the methodology.

## Costs and benefits to businesses under Option 2

There were an estimated 253,000 stores<sup>24</sup> operated by MSMEs in the retail sector in England in 2017.

Based on 2018 BEIS Business population estimates, micro businesses<sup>25</sup> make up 96% of MSMEs. This could include, for example, off licenses, green grocers, market stalls and other small enterprises. We estimate approximately 891 retail outlets in airports in England (see Table B.6 for methodology).

The cost to MSMEs, airport associated with the extension of the charge under Option 2 consists of one off “transition” costs such as the training cost of employee time to read and understand the new legislation and IT costs to change tills and stocking systems. The total familiarisation and IT cost to MSMEs, airports under option 2 are estimated at £2.7m. These are one off costs in 2021 with no ongoing costs (based on the discussion with the Association of Convenience Stores – see Annex B.8 for methodology). Further, MSMEs and airport shops would see a reduction in the costs associated with stocking, storage and transportation of SUCBs. We estimate that they will generate around £12.6m in savings in the first year, increasing up to £29.2m by 2030 (refer to Annex B.1 for methodology). This represents a direct saving to businesses. MSMEs and airport stores also receive income of £68m from the 5p charge in the first year and £554m over the whole appraisal period (undiscounted). We assume that around 76% would be donated to good cause.<sup>26</sup> This equates to businesses keeping £16.4m in the first year and £139m over the ten year period.

Finally, producers (i.e. manufacturers and importers) who supply SUCBs to retailers would in future be required to separately report the number of SUCBs placed on the market as part of their annual data return (see ‘introduction’ and ‘policy objectives and intended effects’ sections to understand the rationale for this measure). Packaging producers are already required to report the total amount of plastic packaging placed in the GB market under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007. This additional requirement is intended to assist in measuring the impact of the proposed changes set out in each of the policy options.

We are unable to estimate the additional reporting costs to packaging producers as we do not have information on the number of producers supplying SUCBs to retailers. We expect the costs to be close to nil given the fact that these producers are already required to generate SUCB data internally to include in their annual report of total plastic packaging placed on the GB market. Companies that fall below the de-minimis threshold for reporting, as set out in the packaging regulations, would continue to be exempt. During consultation we asked packaging producers for their views and for evidence of any additional costs of separately reporting on the number of single use carrier bags produced. Of the small number of plastic packaging manufacturers that did respond to this question, one organisation stated that “We effectively do this already in our methodology for this report”. This supports our view that the costs are likely to be close to nil.

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<sup>24</sup> <http://www.retailresearch.org/retailatbay2018.php>, Retail at Bay 2018; table 6.1, pg. 27. See Table B.6 for the estimated number of airport stores and charity retail outlets.

<sup>25</sup> These are businesses with 0-5 employees – in our analysis we have also included a small number of businesses with 5-9 employees into this category.

<sup>26</sup> This is in line with the information voluntarily provided by large retailers – for every 5p carrier bag sold, 3.8p, or 76%, was donated to good causes.

**Table 5. Overview of costs and benefits to businesses under Option 2**

<b>Costs and savings to businesses, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
Familiarisation and IT costs to MSMEs	2.5	-	-	-	-	-	-	-	-	-
Familiarisation and IT costs to charities	0.2									
IT and familiarisation cost to airport retailers	0.02	-	-	-	-	-	-	-	-	-
<b>Total direct costs to business</b>	<b>2.7</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Savings to MSMEs from reduced stocking, transport and storage of SUCBs <sup>27</sup>	12.4	12.0	14.7	16.6	17.6	17.7	17.8	18.0	18.1	18.2
Savings to airport stores from reduced stocking, transport and storage of SUCBs	0.2	0.3	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.0
5p charge income kept by MSMEs	15.9	16.2	13.9	12.3	11.5	11.4	11.3	11.1	11.0	10.9
5p charge income kept by airport retailers	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
<b>Total direct business savings</b>	<b>29</b>	<b>29</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>31</b>
<i>Transfers:</i>										
5p charge donated to good cause by MSMEs and airport retailers	52	53	45	40	37	37	37	36	36	36

Note: Estimates may not add up due to rounding of numbers. All costs are undiscounted across the years.

### **Costs and benefits to civic and voluntary organisations under Option 2**

The Charity Retail Association estimates approximately 9,368 charity shops in England in 2017.

The cost to charity stores associated with the extension of the charge under Option 2 consists of one off “transition” costs such as the training cost of employee time to read and understand the new legislation and IT costs to change tills and stocking systems. The total familiarisation cost to charity shops under Option 2 are £0.2m. These are one off costs in 2021 with no ongoing costs (refer to Annex B.8 for methodology).

Further, charity shops would see a reduction in the costs associated with stocking, storage and transportation of SUCBs. We estimate that they will generate around £1.5m in savings in the first year, increasing up to £4.8m by 2030 (refer to Annex B.1 for methodology). This represents a direct saving to charities of £153.7m (undiscounted) over the appraisal period. Charities use 100% of their savings to fund their charitable projects.

Charities use 100% of their 5p proceeds to fund their charitable projects. This is equivalent to £16 million in the first year and £115m over the whole appraisal period. They are also assumed to received 5p income donations from MSMEs and airport retailers of £52m in the first year and £409m over ten years (undiscounted).

<sup>27</sup> Micro businesses are not expected to face storage and transport costs given the fact that they tend to keep only a limited stock of SUCBs. Thus, they save on purchase costs of SUCBs only, or £0.01 per bag in 2019 prices.

**Table 6. Overview of costs and benefits to civic and voluntary organisations under Option 2**

<b>Costs and savings to civic and voluntary organisations, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
IT and familiarisation costs to charities	0.2									
<b>Total direct costs</b>	<b>0.2</b>									
Savings from reduced stocking, transport and storage of SUCBs	1.5	1.8	3.5	4.2	4.5	4.6	4.6	4.7	4.7	4.8
Direct income to charity retailers from 5p charge	16.3	15.7	12.3	10.9	10.2	10.1	10.0	9.9	9.8	9.7
<b>Total direct savings</b>	<b>29.1</b>	<b>29.0</b>	<b>29.6</b>	<b>30.0</b>	<b>30.2</b>	<b>30.3</b>	<b>30.3</b>	<b>30.4</b>	<b>30.4</b>	<b>30.5</b>
<i>Of which transfers:</i>										
<i>5p charge donated to good cause by MSMEs and airport retailers</i>	<i>51.9</i>	<i>52.8</i>	<i>45.3</i>	<i>40.1</i>	<i>37.4</i>	<i>37.0</i>	<i>36.7</i>	<i>36.3</i>	<i>35.9</i>	<i>35.6</i>

Note: Estimates may not add up due to rounding of numbers. All costs are undiscounted across the years.

### **Costs and benefits to consumers under Option 2**

The main impact of Option 2 to consumers is the introduction of 5p charge at MSMEs, airport and charity outlets. Given the assumed reduction in SUCBs and substitution to alternatives, the costs to consumers in 2021 are estimated at £104m and dropping to £77m by 2030.

At present, consumers at majority of MSME, airport and charity retail outlets are provided with SUCBs free of charge, while the actual cost of the bags are embedded in the price of the goods and passed on to the consumer in full. The charge will remove this hidden cost.

Consumers are expected to spend an additional £0.9m in the first year of the policy change on new 'bags for life' (BFLs) which are expected to be substituted for SUCBs once the charge is in effect. The costs are estimated at £36m over the ten year appraisal period (undiscounted). We assume an increase in BFL usage of 16%<sup>28</sup> by 2023 relative to 2019. Likewise, we expect that consumers would further substitute to cotton tote bags, increasing their use by the same growth rates as for BFLs, or 16% over the initial three years. This implies additional costs of £0.5m in Year 1 and £16m over the whole period (undiscounted).

We expect that consumers would see a slight increase in hidden costs of paper bags of £0.9m in the first year and £8.7m over 10 years(undiscounted) (see Annex B.3.3 for methodology). This is driven by increased substitution to paper bags after the 5p charge is introduced. Where businesses switch to paper bags the associated costs are expected to be reflected in retail prices.

Finally, consumers will incur extra costs of £0.4m on bin liners in the first year of the charge since they will no longer have access to 'free' SUCBs, commonly used as bin liners, and £17m over the whole period.

At present, majority of consumers to MSMEs, airport retailers and civic and voluntary organisations are provided with SUCBs free of charge, while the actual cost of the bags reflected in the price of the goods and passed on to the consumer in full. Thus, one of the main benefits to consumers should be the reduction in hidden cost of SUCBs. Given limited evidence of the potential level of pass-through from retail sector to consumers, we assumed that any SUCBs stock cost savings are retained by retailers.

<sup>28</sup> Refer to Annex A – Table A.5 for BFL estimates and to Annex B.3.2 for methodology.

**Table 7. Costs and benefits (transfers in *italics*) to consumers in Option 2**

<b>Costs and savings to consumers, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
<i>Costs to consumers from 5p charge at MSMEs</i>	66.2	67.4	58.0	51.3	47.9	47.4	46.9	46.4	46.0	45.5
<i>Costs to consumers from 5p charge at Airport stores</i>	2.2	2.1	1.6	1.5	1.4	1.3	1.3	1.3	1.3	1.3
<i>Costs to consumers from 5p charge charity stores</i>	16.3	15.7	12.3	10.9	10.2	10.1	10.0	9.9	9.8	9.7
<i>VAT paid on 5p charge</i>	16.9	17.0	14.4	12.7	11.9	11.8	11.6	11.5	11.4	11.3
Hidden costs of paper bags	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Cost of BFLs	0.9	2.2	3.5	3.7	3.8	4.0	4.2	4.4	4.5	4.7
Cost of bin liners	0.4	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Costs of cotton tote bags	0.5	1.1	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.9
<b>Total costs</b>	<b>104.1</b>	<b>108.2</b>	<b>94.2</b>	<b>84.5</b>	<b>79.6</b>	<b>79.1</b>	<b>78.5</b>	<b>78.0</b>	<b>77.6</b>	<b>77.1</b>

Note: Estimates may not add up due to rounding of numbers

### **Costs and benefits to public sector under Option 2**

We expect the monitoring and enforcement costs to be fairly low because the charge for SUCBs has been widely accepted by the public, few complaints are received, and local authorities prioritise their activities based on risk so are not proactive in carrying out inspections. Representative bodies of small retailers have pressed for and will welcome the mandatory approach proposed and are therefore likely to work proactively with the MSMEs, airport and charity outlets to raise awareness of the obligations thus reducing the risk of non-compliance and consequential resource implications for regulators. Additionally, the mandatory approach will ensure a level playing field amongst MSMEs and unlike many regulations brings a net benefit to individual businesses rather than a net cost of compliance. For that reason and anecdotal evidence of high levels of compliance by large retailers we expect additional enforcement costs to be low.

Cost to public sector will be in the form of a marginal increase in enforcement costs due to the additional businesses coming under the charging obligation as well as familiarisation cost to public sector staff of reading and understanding the changes in legislation. Enforcement costs to Local Authorities are estimated at £0.2m per year while Government transition costs are one-off costs of £0.04m for regional training events (see Annex B.9 for methodology). There will also be costs to the Environment Agency of updating their systems to account for reporting by plastic packaging producers. The EA estimates these costs to be one-off costs of £0.1m in the first year of the charge.

The overall cost to Government is therefore estimated at £0.4m in the first year and then £0.2m per year thereafter. This covers costs in responding to complaints of non-compliance. We consider these to be a reasonable estimate since MSMEs have no incentive not to charge for SUCBs as they can retain all of the net revenue from the charge. Government is expected to see additional VAT receipts as a result of the charge. We expect to see VAT receipts from the charge of £17m in 2021 to around £11.3m in 2030. This is a transfer as VAT is a cost to consumers but revenue to Government.

**Table 8. Overview of undiscounted costs and benefits to public sector under Option 2**

Costs and savings to public sector, £m	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EA IT costs for producers to report on SUCBs	0.1									
Government transition costs <sup>29</sup>	0.04									
LAs enforcement costs	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
<i>Transfers:</i>										
<i>Government revenue on 5p charge - VAT paid for SUCBs</i>	16.9	17.0	14.4	12.7	11.9	11.8	11.6	11.5	11.4	11.3

### Wider impacts: greenhouse gas emissions, litter and waste management savings

Wider monetised impacts include greenhouse gas emissions, litter and waste management costs reflecting the use of SUCBs, BFLs, paper bags, cotton tote bags and bin liners in Option 2.

Litter costs account for single use carrier bags, bags for life and paper bags. There is no evidence to suggest that cotton tote bags or bin liners would be littered. Bin liners are only used in homes or businesses and therefore not littered. The lack of existing data on littered cotton tote bags can be explained by the fact that consumers need to purchase these bags and therefore there is an inherent value linked to that, reducing the likelihood of littering. Thus, there are benefits of having fewer SUCBs in circulation as this is likely to result in reduced litter costs.

While the number of plastic bags littered is likely to vary in the same proportion as the number of SUCBs and paper bags used, some of the costs of cleaning litter may be fixed, or may not vary in direct proportion to the number of bags littered. For example, litter bins will still need to be emptied and litter pickers will still need to be employed to pick up other items of litter. We expect that as a lower level of litter is reached (with fewer bags used and disposed of, bins filling up more slowly etc.) this would largely translate into lower costs for local authorities responsible for collecting litter.

We assume that 80% of the change in SUCBs use in any year results in lower costs from cleaning littered bags, i.e. a 1% fall in bag use results in a 0.8% fall in the cost of littered bags. There is no evidence to support a particular figure, so 80% is an assumption based on the reasoning that most but not all of the reduction in littered bags would result in a reduction in local authorities' litter costs.<sup>30</sup> On this basis, we estimate the litter savings to be £2.8m in 2021, or £37m over the whole period (undiscounted).

Second, waste management cost savings, which include costs of collection and transfer of waste related to use of bags to various treatment plants, are estimated at £1.1m in the first year, or £11.4m over the whole appraisal period (undiscounted) (see Annex B.4 for methodology).

There are also estimated greenhouse gases (GHGs) savings of £0.2m in the first year, and £11.8m in ten years (undiscounted). SUCBs are mostly imported from Asia, where around 70-90% of emissions arise during the extraction and manufacturing process. As per Government guidance, the traded price of carbon has been applied in this analysis to account for emissions which occur

<sup>29</sup> Include government costs of regional events in the first year. See Annex B.9.

<sup>30</sup> We further test different assumptions in low and high estimates – see Annex A.

overseas. The GHG impacts of the bag usage in Option 2 is monetised using BEIS 2018 updated short-term traded carbon values to be used for UK public policy appraisal.

Next, disamenity benefits to society from reduced litter have been estimated based on the amount of SUCBs, BFLs and paper bags littered and the willingness to pay per person in increased council tax. Annual disamenity benefits are estimated at £3.7m in the first year and £49.7m over the appraisal period (undiscounted).<sup>31</sup> Other monetised wider impacts include additional recycle revenue, and gross profit, to recycling facilities. In the first year, recycling facilities are estimated to see an additional £0.01m in additional revenue. Over the whole appraisal period we estimate the gross profit from additional recycles to be £0.2m (undiscounted) (see Annex B.10 for methodology). With respect to non-monetised benefits of Option 2, these can include the benefits to wildlife in the marine and terrestrial environment with less damage to organisms from fewer littered bags or pieces of bags. Cefas findings from 2018 revealed that, since the 5p charge on plastic bags was introduced, there has been an estimated 50% reduction in plastic bags in marine litter.<sup>32</sup> We expect that this outcome would be further reinforced under Option 2.

**Table 9. Overview of wider societal savings under Option 2**

<b>Wider costs and savings to society, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
GHGs emission savings	0.2	0.3	0.6	0.9	1.1	1.3	1.5	1.7	1.9	2.2
Cost savings from reduced litter	2.8	2.7	3.4	3.8	4.0	4.1	4.1	4.1	4.1	4.2
Waste management savings from reduced SUCBs and increase in alternatives	1.1	1.0	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Disamenity benefits from reduced litter to society	3.7	3.6	4.6	5.2	5.5	5.5	5.4	5.4	5.4	5.4
Gross profit to recycling facilities	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03	0.03
<b>Total wider societal savings</b>	<b>7.9</b>	<b>7.7</b>	<b>9.7</b>	<b>11.1</b>	<b>11.8</b>	<b>12.0</b>	<b>12.2</b>	<b>12.5</b>	<b>12.7</b>	<b>12.9</b>

<sup>31</sup> Refer to Annex B.12 for methodology.

<sup>32</sup> Maes, T. et al. (2018), *Below the surface: Twenty-five years of seafloor litter monitoring in coastal seas of North West Europe (1992-2017)*, Science of the Total Environment, The Centre for Environment, Fisheries and Aquaculture Science.



### Option 3: Increasing the current 5p charge on SUCBs to 10p for large retailers only

Option 3 increases the current mandatory SUCBs charge paid by consumers from 5p to 10p for all large retailers in England. MSMEs and civic and voluntary organisations retail outlets with less than 250 employees can voluntarily charge for the bags or give them out for free at the point of sale. Airport retailers remain exempt.

We assume the impact on large businesses would be lower than when the charge was first introduced in 2015. This is on the basis that increasing the charge will have a relatively lower behavioural impact on consumers that are already accustomed to the existing 5p charge.

Additionally, many large retailers have already phased out single use carrier bags in their stores, reducing consumers' access to SUCBs anyway. In particular, we assumed a 53% fall in single use carrier bags over a period of five years<sup>33</sup>, following Ireland's experience of increasing the plastic levy from €0.15 in 2002 to €0.22 in 2007. Following that, we assume a gradual reduction of 2-3% per year in the use of SUCBs from the fifth year of the charge.<sup>34</sup>

Bags for life (BFLs) are a widely available alternative to SUCBs and their usage is expected to increase. Although they are reusable they will offset some of the benefits of reduced SUCBs use. We also assume increased usage of paper bags and cotton tote bags. Finally, we also expect to see rise in the sale of bin liners after the increase of the charge as consumers will no longer utilise SUCBs to dispose of household waste.

The table below shows the estimated impact on SUCBs use. Please refer to Annex A for detailed estimates for all bag types in each sector.

**Table 10. Overview of SUCBs used in Option 3**

Millions	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Supermarkets	277	92	90	76	53	47	43	41	40	39	38	37	36
Growth rate		-67%	-3%	-15%	-31%	-12%	-8%	-5%	-3%	-3%	-3%	-3%	-3%
High street retailers	705	695	684	578	406	363	339	326	321	316	311	307	302
Growth rate		-2%	-2%	-16%	-30%	-11%	-7%	4.0%	1.5%	-2%	-2%	-2%	-1%
<b>All large retailers</b>	<b>982</b>	<b>787</b>	<b>774</b>	<b>654</b>	<b>458</b>	<b>410</b>	<b>383</b>	<b>367</b>	<b>361</b>	<b>355</b>	<b>350</b>	<b>344</b>	<b>338</b>
MSMEs	2,639	2,690	2,652	2,665	2,658	2,659	2,657	2,657	2,655	2,654	2,653	2,652	2,651
Growth rate			-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Airports	59	61	63	64	66	68	70	72	73	75	77	80	82
Growth rate		3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Charity shops	464	464	464	464	464	464	464	464	464	464	464	464	464
Growth rate		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
<b>All retailers</b>	<b>4145</b>	<b>4002</b>	<b>3953</b>	<b>3847</b>	<b>3647</b>	<b>3601</b>	<b>3574</b>	<b>3559</b>	<b>3554</b>	<b>3549</b>	<b>3545</b>	<b>3540</b>	<b>3536</b>

The cost and benefits under Option 3 are summarized below. These are explained in more detail in sections that follow. Table 11 presents the summary of monetised costs and benefits where all values are net costs or benefits when compared to Option 1 – baseline.

<sup>33</sup> 2020-2025

<sup>34</sup> See Annex B, Table B.1 – methodology on SUCBs usage reduction.

**Table 11. Summary of impacts under Option 3**

	Year 1 (2020)	10 years appraisal period (discounted)
<b>Total costs</b>	<b>£36.4m</b>	<b>£191.4m</b>
Familiarisation of reading and understanding new charge to large retailers	£0.4m	£0.4m
Government and public sector enforcement costs	£0.1m	£0.3m
Increased waste management costs from reduced circulation of SUCBs and increase in alternative bags	£0.4m	£4.8m
Costs to consumers – hidden costs from increased use of paper bags	£6.5m	£69.0m
Costs to consumers – increased use of bags for life	£0.3m	£7.5m
Costs to consumers – increased use of bin liners	£1.2m	£47.1m
Costs to consumers – increased use of cotton tote bags	£0.1m	£16.6m
<i>Transfers:</i>		
<i>Costs to consumers - 10p charge at large business outlets</i>	<i>£22.8m</i>	<i>£38.1m</i>
<i>Costs to consumers - VAT paid on the 10p charge</i>	<i>£4.6m</i>	<i>£7.6m</i>
<b>Total savings</b>	<b>£30.5m</b>	<b>£124.0m</b>
Savings to large retailers from reduced stocking, transport and storage of SUCBs	£2.2m	£53.8m
Savings from reduced litter costs	£0.3m	£6.7m
GHGs emissions savings from reduced circulation of SUCBs and increase in alternatives	£0.1m	£2.4m
Additional gross profit to recycling sector	<£0.1m	£0.5m
Disamenity benefits to society from reduced litter	£0.5m	£14.9m
<i>Transfers:</i>		
<i>10p charge donations to charities from large retailers</i>	<i>£17.3m</i>	<i>£28.9m<sup>35</sup></i>
<i>Government revenue - VAT paid as part of 10p charge</i>	<i>£4.6m</i>	<i>£7.6m<sup>36</sup></i>
<b>Net present value (+ societal savings, - societal costs)</b>	<b>-£6.0m</b>	<b>-£67.4m</b>

Note: Figures may not add up due to rounding of numbers.

### Costs and benefits to business

There were an estimated 22,000 stores<sup>37</sup> operated by large retailers in the retail sector in England in 2017 for which latest data was available. Based on 2018 BEIS Business population estimates, large businesses<sup>38</sup> make up 0.1% of all retailers.

<sup>35</sup> See above.

<sup>36</sup> See above – this applies to VAT costs as well.

<sup>37</sup> <http://www.retailresearch.org/retailatbay2018.php>, Retail at Bay 2018; table 6.1, pg. 27.

<sup>38</sup> These are businesses with 249+ employees.

The cost to business associated with the increase of the charge under Option 3 consists of one off “transition” costs such as the cost of an employee time to read and understand the new regulation. These cost are based on one hour of employee time and calculated on a per outlet basis. The familiarisation costs include the time necessary to read, understand and implement the new charging requirements at one hour of a retail assistant’s time per retail outlet and 0.5 hours of an IT professional time to reprogram systems to accept the new charge. The total familiarisation cost to businesses under this option equates to £0.4m in one off cost with no ongoing costs.<sup>39</sup>

Business face annual reporting costs of £1.9m. These costs were as a result of the 5p charge and continue to be incurred. Large retailers are required to report on the number of bags sold per year. Therefore, no additional reporting costs are assumed for this Option. No further costs to businesses are expected under Option 3.

As a result of reduced use of SUCBs following the 10p charge, businesses would see a reduction in the costs associated with stocking, storage and transportation. We estimate this reduction to be around £2.2m in the first year (2021) and £63m over the whole period (undiscounted).<sup>40</sup> This represents a direct saving to businesses. Businesses also receive income of £22.8m from the 10p charge in the first year and £39.7m over the ten year period. We assume all large retailers continue to donate majority (76%) of their proceeds from the sale of SUCB income to good causes and keeping the rest to cover remaining SUCB stock, transport and storage costs.<sup>41</sup>

Finally, producers (i.e. manufacturers and importers) who supply SUCBs to retailers would in future be required to separately report the number of SUCBs placed on the market as part of their annual data return (see ‘introduction’ and ‘policy objectives and intended effects’ sections to understand the rationale for this measure). Packaging producers are already required to report the total amount of plastic packaging placed in the GB market under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007. This additional requirement is intended to assist in measuring the impact of the proposed changes set out in each of the policy options.

We are unable to estimate the additional reporting costs to packaging producers as we do not have information on the number of producers supplying SUCBs to retailers. We expect the costs to be close to nil given the fact that these producers are already required to generate SUCB data internally to include in their annual report of total plastic packaging placed on the GB market. Companies that fall below the de-minimis threshold for reporting, as set out in the packaging regulations, would continue to be exempt. During consultation we asked packaging producers for their views and for evidence of any additional costs of separately reporting on the number of single use carrier bags produced. Of the small number of plastic packaging manufacturers that did respond to this question, one organisation stated that “We effectively do this already in our methodology for this report”. This supports our view that the costs are likely to be close to nil.

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39 See Annex B.8 for methodology.

40 These costs (per bag basis) are estimated as follows: Private costs per bag=0.2pence; Transport and storage =0.07pence. See Annex B.1 for further details.

41 This is in line with the information voluntarily provided by large retailers – for every 5p carrier bag sold, 3.8p, or 76%, was donated to good causes.

**Table 12. Overview of costs and benefits to large retailers under Option 3**

<b>Costs and savings to businesses, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
Familiarisation costs to large businesses	0.4	-	-	-	-	-	-	-	-	-
<b>Total direct costs</b>	<b>0.4</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
Total savings from reduced stocking, transport and storage of SUCBs	2.2	6.0	6.8	7.1	7.2	7.0	6.9	6.8	6.7	6.6
10p charge income kept by large retailers	5.5	1.7	0.8	0.4	0.2	0.2	0.2	0.2	0.2	0.2
<b>Total direct business benefits (in EANDCB)</b>	<b>7.7</b>	<b>7.7</b>	<b>7.6</b>	<b>7.5</b>	<b>7.4</b>	<b>7.2</b>	<b>7.1</b>	<b>7.1</b>	<b>6.9</b>	<b>6.8</b>
<i>Transfers:</i>										
<i>10p charge donated to good cause by large retailers</i>	<i>17.3</i>	<i>5.3</i>	<i>2.6</i>	<i>1.3</i>	<i>0.6</i>	<i>0.6</i>	<i>0.6</i>	<i>0.6</i>	<i>0.6</i>	<i>0.6</i>

**Costs and benefits to civic and voluntary organisations under Option 3**

There are no additional costs to civic and voluntary organisations under Option 3 since they are not asked to introduce the 10p charge. We assume that they will continue to receive donations from large retailers, equating to £17.3m in Year 1 and £30m over the whole period.

**Table 13. Overview of costs and benefits to civic and voluntary organisations under Option 3**

<b>Savings to civic and voluntary organisations, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
10p charge donated to good cause by large retailers	17.3	5.3	2.6	1.3	0.6	0.6	0.6	0.6	0.6	0.6

*Note: Estimates may not add up due to rounding of numbers. All costs are undiscounted across the years.*

**Costs and benefits to consumers in Option 3**

The major impact of Option 3 is the increase in the 5p charge to 10p on consumers buying SUCBs from large retailer outlets. Costs to consumers are estimated at £34m in the first year and £124m over the appraisal period (undiscounted).

As a result of the substitution effect (i.e. shift to other bag alternatives), consumers are expected to see an increase in costs of alternative bags. Where businesses switch to paper bags the associated consumer costs are expected to be reflected in retail prices.<sup>42</sup> As paper bags is the only alternative that is currently being given out for free, associated total hidden costs of paper bags to consumers are estimated at £81m over the appraisal period (undiscounted). Many retailers already charge for BFLs.

<sup>42</sup> The unit costs of paper bags are estimated at £0.30 in 2019 terms. See Annex B.3.3 for source and further details.

The expected initial increase in BFL usage is assumed to be 109% based on past experience from the Welsh and Irish charge for SUCBs.<sup>43</sup> However, we only assume 1% of large retailers see a 109% increase in bag usage within the first three years while the remaining 99% see BFLs rise by the annual growth rate of 3.4%.<sup>44</sup> We expect that the impact from the 5p charge would have already been prominent and an increase in the charge will only lead to a marginal increase in alternative bags, where SUCBs are still in circulation. The costs to consumers of increased BFL usage is therefore estimated at £8.9m over 10 years (undiscounted). Consumers will further incur extra costs of £56m (undiscounted) on bin liners after the charge since they will no longer have access to 'free' SUCBs, which are commonly used as bin liners.<sup>45</sup> Finally, we estimate additional costs of cotton tote bags to consumers of £21m over appraisal period (undiscounted).

VAT payment increase as a result of the increased charge in the first year (£4.6m) and £7.9m over the appraisal period (undiscounted).

**Table 14. Overview of costs and benefits to consumers (transfers in *italics*) under Option 3**

<b>Costs (+) and savings (-) to consumers, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
<i>10p charge at large retailers</i>	22.8	7.0	3.4	1.6	0.8	0.8	0.8	0.8	0.8	0.8
<i>VAT paid on the 10p charge</i>	4.6	1.4	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Costs of paper bags	6.5	6.8	7.1	7.5	7.9	8.3	8.7	9.1	9.6	10.0
Cost of plastic BFLs	0.3	0.6	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1
Cost of bin liners	1.2	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Costs of cotton tote bags	0.1	0.3	0.4	1.0	1.5	2.1	2.8	3.5	4.2	5.0
<b>Total costs</b>	<b>35.4</b>	<b>22.1</b>	<b>18.6</b>	<b>17.4</b>	<b>17.4</b>	<b>18.4</b>	<b>19.5</b>	<b>20.6</b>	<b>21.8</b>	<b>23.1</b>

### Costs and benefits to public sector in Option 3

We expect the monitoring and enforcement costs to be fairly low because the charge for bags has been widely accepted by the public, few complaints are received, and local authorities prioritise their activities based on risk so are not proactive in carrying out inspections. Following consultation responses, industry have welcomed the increase in the 5p charge to 10p in an attempt to reduce the environment impacts further. Many large retailers are already aware of the risk of non-compliance. For that reason and anecdotal evidence of high levels of compliance by large retailers we expect additional enforcement costs to be low for the increased charge.

There will also be ongoing costs to public sector for responding to complaints of non-compliance estimated at £0.2m per year (see Annex B.2 for methodology). There is little to no incentive for large retailers to deviate from the regulatory requirement which is why we expect the additional non-compliance costs to be minimal.

43 SUCB were seen to have fallen by 32 percentage points less when Ireland increased the plastic charge level from 15 cents in 2002 to 22 cents in 2007. Therefore we assume BFLs grow by 32 percentage points less (109%) than what was previously observed in Welsh BFL data (141%).

44 The long-term annual increase in usage of BFLs is calculated using the historical data provided by WRAP on Carrier bag usage 2010-2014 and England's population share which results in an average increase in BFL usage of 4.5% per year. See Annex B.3.2 for more detail on methodology.

45 The private cost of bin liners is taken as the average price of reported bin liners affected by the charge in Wales (swing and pedal bin liners) uprated for 2019 which is £0.05 per bag.

Environment Agency will also face one off costs of £0.1m in 2020 to amend existing IT system used for the National Packaging Waste Database to allow reporting of single use carrier bags by plastic packaging producers.

VAT revenue from the sale of single use carrier bags to government is estimated at £4.6m in the first year and £7.9m over the 10 year appraisal period.

**Table 15. Overview of costs and benefits to public sector under Option 3**

<b>Costs and savings to public sector, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
EA IT amendment costs for packaging producers	0.1									
Local Authorities enforcement costs	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
<i>Government revenue from VAT paid on top of 10p charge (transfer)</i>	4.6	1.4	0.7	0.3	0.2	0.2	0.2	0.2	0.2	0.2

### **Wider impacts: GHGs emissions, litter and waste management costs and savings**

Wider monetised impacts include greenhouse gas emissions, litter and waste management costs. Accounted for in these estimates are associated costs to SUCBs, BFLs, paper bags, cotton tote bags and bin liners. The methodology used for Option 3 is as described for Option 2 – please refer to the relevant section as well as Annex B.4, B.5 and B.11 and B.12. We report below on the main results of the option only.

Overall, waste management costs rise in this option by £0.4m in the first year and by £5.6m over the ten year appraisal period (undiscounted). This is largely driven by the increase in paper bags' waste disposal costs. However, we estimate litter cost savings of £0.3m in the first year and £7.9m over the appraisal period (undiscounted).

With increased use of bags for life and paper bags, and with reduced usage of single use carrier bags, we see an increase in recycling revenue, and gross profit, as more material is sent for recycling. We estimate an increase in the gross profit of £0.05m in the first year and £0.6m over 10 years (undiscounted). We also estimate carbon emissions savings of £2.9m over the ten years (undiscounted). Other monetised benefits include disamenity benefits to society from reduced litter of £17.5mm over the whole appraisal period. As before, non-monetised benefits include the benefits to wildlife in the marine and terrestrial environment with less damage to organisms from fewer littered bags or pieces of bags. Recent findings in 2018, from The Centre for Environment, Fisheries and Aquaculture Science Cefas revealed since the 5p charge on plastic bags was introduced, there has been an estimated 50% reduction in plastic bag marine litter.

**Table 16. Overview of wider societal savings under Option 3**

<b>Wider costs and savings to society, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
Waste management costs from reduced SUCBs and increased alternatives (excl. landfill tax)	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8
<b>Total wider societal costs</b>	<b>0.4</b>	<b>0.4</b>	<b>0.4</b>	<b>0.5</b>	<b>0.5</b>	<b>0.6</b>	<b>0.6</b>	<b>0.7</b>	<b>0.7</b>	<b>0.8</b>
GHGs emissions savings	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4
Savings from reduced litter costs	0.3	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8
Disamenity savings from reduced litter	0.5	1.8	2.0	2.0	2.0	2.0	1.9	1.8	1.8	1.7
Additional gross profit to recycling sector	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<b>Total wider societal savings</b>	<b>0.9</b>	<b>2.8</b>	<b>3.1</b>	<b>3.2</b>	<b>3.3</b>	<b>3.2</b>	<b>3.2</b>	<b>3.1</b>	<b>3.1</b>	<b>3.0</b>

### **Option 4: Increasing the current 5p charge on SUCBs to 10p for all retailers**

This policy option increases the current 5p charge on SUCBs to 10p for all retailers, including MSMEs, airport retailers and civic and voluntary organisations, to reduce further the number that are currently distributed. We expect that this would lead to additional reductions in the overall usage of SUCBs compared to Option 2.

By increasing the charge to 10p per bag, we assume the drop in SUCBs use as follows by 2025 (Year 5<sup>46</sup>):

- a 55% reduction in remaining SUCBs at supermarkets and 53% at high street retailers,
- a 73% reduction across the whole MSMEs sector,
- 84% reduction at airport retailers and civic and voluntary organisations (see Annex B.3.1 for methodology on percentage change in SUCBs as a result of the policy change).

Overall the use of SUCBs drop from around four billion in 2019 to less than 1.2 billion, or 71% reduction, by 2025.

These assumptions draw on the evidence from Republic of Ireland, Wales, Northern Ireland, Scotland and England. They all set the charge at 5p/cents with an average reduction in bags usage of around 81% across the countries. In the Republic of Ireland the charge was deliberately set at €0.15 which was six times higher than the average level that consumers reported as willing to pay for a bag to influence consumer behaviour. This led to a 92% reduction in bags use in the period of 2002-2007.<sup>47</sup> South Africa introduced their plastic levy in 2003 of 3 rand cents with an immediate 90% drop in single use plastic bags use.<sup>48</sup> Denmark introduced a tax on production of plastic bags in 1994 with plastic bag usage falling by 66% as retailers promoted the use of alternative bags.<sup>49</sup>

We believe that data on the introduction of charges in the Republic of Ireland provide a good insight for estimating the effects of an increased charge on plastic bags in England, particularly

<sup>46</sup> Period of 2020-2025

<sup>47</sup> Environmental Audit Committee, *Reducing bag use*.

<sup>48</sup> Dikgang et al. (2012), *Analysis of the plastic levy in South Africa*.

<sup>49</sup> Zero Waste Europe (2010), *Phasing out single-use plastic bags*.

because of their similar organisational/economic structure. In 2007, Ireland raised their plastic levy to €0.22 and saw a further 58% reduction in bag usage by the fifth year (2012). South Africa also raised their levy to 4 rand cents in March 2011 after it was observed that demand in plastic bags had been rising again. Increasing the levy resulted in little to no impact in the change in consumer behavior. This could be attributed to the difference in the organisational structure of developing countries relative to developed economies as well as relatively small increase in the original levy.

Tables 17 and 18 provides the summary of impacts in terms of the reduction of SUCBs and associated costs and benefits.

**Table 17. Overview of SUCBs use in Option 4**

Millions	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Supermarkets</b>	277	92	90	75.11	52	46	43	40.45	39	38	37	37	36
<b>Growth rate</b>	-73%	-67%	-3%	-17%	-31%	-11.5%	-7.5%	-5.0%	-2.5%	-2.5%	-2.5%	-2.5%	2.5%
<b>High street retailers</b>	705	695	684	573	402	360	336	323	318	313	309	304	299
<b>Growth rate</b>	-2%	-2%	-2%	-16%	-30%	-11%	-7%	-4%	-2%	-2%	-2%	-2%	-1%
<b>All large retailers</b>	<b>982</b>	<b>787</b>	<b>774</b>	<b>648</b>	<b>454</b>	<b>406</b>	<b>379</b>	<b>363</b>	<b>358</b>	<b>352</b>	<b>346</b>	<b>341</b>	<b>335</b>
<b>MSMEs</b>	2,639	2,690	2,652	1,471	1,263	1,038	857	716	709	702	695	688	681
<b>Growth rate</b>	-7%	2%	-1%	-44.5%	-14.2%	-17.8%	-17.4%	-1.0%	-1.0%	-1.0%	-1.0%	-1.0%	1.0%
<b>Airports</b>	59	61	63	23.39	22.56	18	13	10	10	10	10	10	10
<b>Growth rate</b>	6%	3%	3%	-63%	-4%	-22%	-24%	-24%	-1%	-1%	-1%	-1%	-1%
<b>Charity shops</b>	464	464	464	173	167	131	100	76.01	75	74	74	73	72
<b>Growth rate</b>	0%	0%	527	-63%	-4%	-22%	-24%	-24%	-1%	-1%	-1%	-1%	-1%
<b>All retailers</b>	<b>4,145</b>	<b>4,002</b>	<b>3,953</b>	<b>2,316</b>	<b>1,906</b>	<b>1,592</b>	<b>1,349</b>	<b>1,166</b>	<b>1,152</b>	<b>1,139</b>	<b>1,125</b>	<b>1,112</b>	<b>1,098</b>

**Table 18. Summary of impacts under Option 4 (transfers in *italics*)**

	<b>Year 1</b>	<b>10 years appraisal period (discounted)</b>
Total costs	<b>£206.3m</b>	<b>£1,121.1m</b>
Familiarisation and IT costs to large, MSMEs and airport retailers	Large retailers: £0.4m MSMEs: £4.2m Airport retailers: £0.02m	Large retailers: £0.4m MSMEs: £4.2m Airport retailers: £0.02m
Familiarisation and IT costs to charities	£0.2m	£0.2m
Government and public sector costs	£0.2m	£1.3m
Costs to consumers – hidden costs from increased use of paper bags	£6.9m	£80.6m
Costs to consumers – increased use of bags for life	£1.5m	£49.4m
Costs to consumers – increased use of bin liners <sup>50</sup>	£1.2m	£57.3m
Costs to consumers – increased use of cotton tote bags	£0.7m	£20.2m
<i>Transfers:</i>		
<i>Costs to consumers - 10p charge</i>	<i>£159.5m</i>	<i>£756.0m</i>

<sup>50</sup> We assume charity retail outlets and airport retailers do not sell bin liners.



<i>Costs to consumers - VAT on the 10p charge</i>	<i>£31.9m</i>	<i>£151.2m</i>
<b>Total savings</b>	<b>£230.1m</b>	<b>£1,418.4m</b>
Proceeds from 10p charge retained by MSMEs (excl. VAT)	£29.0m	£152.5m
Proceeds from 10p charge retained by large retailers	£5.3m	£8.5m <sup>51</sup>
Proceeds from 5p charge retained by airport retailers	£0.5m	£2.4m
Savings to large retailers from reduced stocks of SUCBs	£2.3m	£54.5m
Savings to MSMEs from reduced stocks of SUCBs	£14.3m	£180.6m
Savings to charity shops from reduced SUCBs stocks	£6.0m	£63.8m
Savings to airport retailers from reduced stocks of SUCBs	£0.8m	£10.3m
GHGs emissions savings from reduced circulation of SUCBs and increase in alternatives' use <sup>52</sup>	£0.3m	£12.7m
Waste management savings from reduced circulation of SUCBs and increase in use of alternatives	£0.4m	£4.3m
Savings from reduced litter costs	£3.5m	£48.2m
Disamenity benefits from reduced litter	£11.1m	£136.0m
Additional gross profit to recycling sector	£0.1m	£0.7m
<b>Transfers:</b>		
<i>Income to charity shops from 10p charging</i>	<i>£14.4m</i>	<i>£75.3m</i>
<i>Donations to good cause (income from the charge received by large retailers)</i>	<i>£16.9m</i>	<i>£26.8m<sup>53</sup></i>
<i>Donations to good cause (income from the charge received by MSMEs)</i>	<i>£91.8m</i>	<i>£482.8m</i>
<i>Donations to good cause (income from the charge received by airport retailers)</i>	<i>£1.5m</i>	<i>£7.7m</i>
<i>Government revenue - VAT paid on top of 10p charge</i>	<i>£31.9m</i>	<i>£151.2m</i>
<b>Net present value (+ societal savings, - societal costs)</b>	<b>£23.8m</b>	<b>£297.3m</b>

Note: Estimates may not add up due to rounding of numbers.

## Costs and benefits to businesses under Option 4

The cost to MSMEs, airport associated with the extension of the charge under Option 4 consists of one off “transition” costs such as the training cost of employee time to read and understand the new legislation. We have estimated the familiarisation costs (the time necessary to read, understand and implement the charging requirements) and IT costs to change tills and stocking systems. As like for Options 2 and 3, these cost are based on one hour of employee time and

<sup>51</sup> The impact of 10p charge reduction results in a net *decrease* in the amount of charge income over the whole appraisal period.

<sup>52</sup> GHG impacts of bags for life, paper bags, cotton tote bags and bin liners are accounted for in our estimates. Paper bags generate the highest GHG emissions.

<sup>53</sup> Given the expected drop in SUCBs sold by large retailers in Option 4, large retailers are expected to receive reduced income from 10p charge in later years, resulting in a net *decrease* of donations to good causes.

calculated on a per outlet basis. These familiarisation costs cover all businesses, even if they have been voluntarily charging 5p, as they now transition to a 10p charge.

Other one off costs include IT costs to change tills and stocking systems. The IT costs are calculated on a per retail outlet basis at the cost of ½ hour to reprogram systems to accept the new charge. This cost is applied to 95% of small and medium sized enterprises and 63% of micro businesses as we do not expect that all MSMEs have IT systems in place that will need amending (based on the discussion with the Association of Convenience Stores – see Annex B.8 for methodology). As a result, familiarisation and IT one off costs to MSMEs are estimated at £4.6m in the first year of the charge. Following the same methodology, and applying the estimated total of 891 outlets, airport retailers face minimal familiarisation and IT costs of £0.02m in the first year.

Large retailers are expected to incur costs of £0.4m to read and understanding the new 10p charge legislation. Large retailers would have previously incurred transition cost in the form of IT costs when the initial 5p charge was introduced in 2015. The analysis therefore assumes that there will be no additional cost associated with changing stocking systems and tills with this increase in the charge. Overall, the transition costs to all retailers are estimated at a total of £4.6m (Table 19).

As a result of reduced use of SUCBs by retailers, businesses would see lower costs associated with stocking, storage and transport of SUCBs. This is estimated to be £17.5m in the first year and £289m between 2021 and 2030 (undiscounted). Furthermore, all businesses receive income of £145m from the 10p charge in the first year or £681m over the 10 year period (undiscounted). As in Options 2 and 3, we assume that around 76% would be donated to good cause<sup>54</sup> This equates to businesses keeping £35m in the first year and £184m over the ten year period (undiscounted).

Finally, producers (i.e. manufacturers and importers) who supply SUCBs to retailers would in future be required to separately report the number of SUCBs placed on the market as part of their annual data return (see 'introduction' and 'policy objectives and intended effects' sections to understand the rationale for this measure). Packaging producers are already required to report the total amount of plastic packaging placed in the GB market under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007. This additional requirement is intended to assist in measuring the impact of the proposed changes set out in each of the policy options.

We are unable to estimate the additional reporting costs to packaging producers as we do not have information on the number of producers supplying SUCBs to retailers. We expect the costs to be close to nil given the fact that these producers are already required to generate SUCB data internally to include in their annual report of total plastic packaging placed on the GB market. Companies that fall below the de-minimis threshold for reporting, as set out in the packaging regulations, would continue to be exempt. During consultation we asked packaging producers for their views and for evidence of any additional costs of separately reporting on the number of single use carrier bags produced. Of the small number of plastic packaging manufacturers that did respond to this question, one organisation stated that "We effectively do this already in our methodology for this report". This supports our view that the costs are likely to be close to nil.

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<sup>54</sup> This is in line with the information voluntarily provided by large retailers – for every 5p carrier bag sold, 3.8p, or 76%, was donated to good causes.

**Table 19. Overview of costs and benefits to business under Option 4 (transfers in *italics*)**

Costs and savings to businesses, £m	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Direct costs</b>										
Familiarisation and IT costs to large retailers	0.4									
Familiarisation and IT costs to MSMEs	4.2	-	-	-	-	-	-	-	-	-
Familiarisation and IT costs to airport retailers	0.02									
<b>Total direct costs (in EANDCB)</b>	<b>4.6</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Direct savings</b>										
10p charge income kept by MSMEs	29.0	24.8	20.4	16.7	13.9	13.8	13.7	13.5	13.4	13.2
10p charge income kept by airport retailers	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Stock, transport and storage cost savings (large retailers)	2.3	6.1	6.8	7.2	7.2	7.1	7.0	6.9	6.8	6.7
Stock, transport and storage cost savings (MSMEs)	14.3	16.7	19.4	21.6	23.2	23.3	23.4	23.5	23.5	23.6
Stock, transport and storage cost savings (airport retailers)	0.8	0.9	1.0	1.2	1.3	1.3	1.3	1.4	1.4	1.5
<b>Total business savings (in EANDCB)</b>	<b>47.0</b>	<b>49.0</b>	<b>48.0</b>	<b>46.9</b>	<b>45.9</b>	<b>45.7</b>	<b>45.6</b>	<b>45.5</b>	<b>45.3</b>	<b>45.2</b>
<b>Transfers:</b>										
<i>Income from charging donated to good cause (large retailers)</i>	16.9	5.0	2.3	1.0	0.4	0.4	0.4	0.4	0.4	0.4
<i>Income from charging donated to good cause (MSMEs)</i>	91.8	78.7	64.5	53.0	44.1	43.7	43.2	42.8	42.4	41.9
<i>Income from charging donated to good cause (airport retailers)</i>	1.5	1.4	1.1	0.9	0.6	0.6	0.6	0.6	0.6	0.6
<b>Total transfers to civic and voluntary organisations</b>	<b>110.2</b>	<b>85.1</b>	<b>67.9</b>	<b>54.9</b>	<b>45.2</b>	<b>44.7</b>	<b>44.3</b>	<b>43.8</b>	<b>43.4</b>	<b>42.9</b>

### Costs and benefits to civic and voluntary organisations under Option 4

Costs to civic and voluntary organisations due to the introduction and increase of the charge consists of one off “transition” costs such as the cost of employee time to read and understand the new regulations. As like for Options 2 and 3, these cost are based on one hour of employee time and calculated on a per outlet basis. We have estimated the familiarisation cost (the time necessary to read, understand and implement the charging requirements) at one hour of a retail assistant’s time per outlet.

Other one off costs include IT costs to change tills and stocking systems. The IT costs are calculated on a per retail outlet basis at the cost of ½ hour to reprogram systems to accept the new charge.

The whole sector of charity retailers (9,368) is therefore expected to incur familiarisation cost of approximately £0.2m in the first year.

As a result of reduced use of SUCBs by charities, they would see a reduction in the costs associated with stocking, storage and transport of SUCBs. This is estimated to be £6m in the first year and £75m between 2021 and 2030 (undiscounted). They are assumed to use 100% of their savings for charitable activities.

Charity retailers receive income of £14.4m from the 10p charge in the first year or £85 million over the ten year period (undiscounted). In addition, we estimate that they will be donated £110m from businesses in the first year and £583m over the ten year period (undiscounted), which will flow directly to good causes.

**Table 20. Overview of costs and benefits to civic and voluntary organisations under Option 4 (transfers in *italics*)**

Costs and savings to businesses, £m	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Costs</b>										
Familiarisation and IT costs to charity retailers	0.2									
<b>Total direct costs</b>	<b>0.2</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>Savings</b>										
SUCBs 10p income	14.4	13.9	10.9	8.3	6.3	6.3	6.2	6.1	6.1	6.0
Stocking, transport and storage cost savings	6.0	6.1	6.9	7.5	8.0	8.0	8.0	8.1	8.1	8.1
<i>Income from charging donated to good cause by businesses</i>	110.2	85.1	67.9	54.9	45.2	44.7	44.3	43.8	43.4	42.9
<b>Total savings to charities (included in EANDCB)</b>	<b>130.7</b>	<b>105.2</b>	<b>85.7</b>	<b>70.7</b>	<b>59.5</b>	<b>59.0</b>	<b>58.5</b>	<b>58.0</b>	<b>57.5</b>	<b>57.1</b>

### Consumers costs and benefits under Option 4

The main impact of Option 4 is the introduction of 10p charge on all consumers buying SUCBs at large retailers, MSMEs, airports and charity retail outlets. Given that we assume a gradual reduction in the use of SUCBs and substitution to alternatives, the costs to consumers in 2021 are estimated at £202m, dropping to £105m by 2030. This equates to £1.3 billion over the whole appraisal period (undiscounted).

Consumers will face additional expenditure of estimated £1.5m in the first year on new 'bags for life' (BFLs) which are expected to be substituted for SUCBs once the charge is in effect. This is because we expect that consumers will purchase increased number of BFLs across the retail sector. Overall BFL costs to consumers are estimated at £59m over the whole period (undiscounted).

The expected initial increase in BFLs usage is estimated at 109% over three years based on past experience from the Welsh Irish charge for SUCBs.<sup>55</sup> However, as majority of large retailers would have phased out SUCBs by 2019, we assume most of these retailers would have already substituted to other bag alternatives. Therefore, the impact of the policy change will only affect 1% of the large retailers while the remaining 99% face an annual growth rate based on historic BFL data trends.

BFL data reported for the UK for the years 2010 to 2014 shows an average annual increase in usage of BFLs of 4% per year.<sup>56</sup> For supermarkets in England, an estimated annual increase of 3.4% from 2010-2014 is derived (see Annex B.3.2 for methodology). For high street retailers, we assume BFLs grow by 2% following evidence from Welsh data which showed a lower BFL annual increase on high street. For MSMEs, airport and charity outlets we assume BFLs grow by 3% per year after the initial spike. This is considered as a conservative approach because consumers may

<sup>55</sup> This is based on initial observed increase in Welsh supermarkets. Growth should slow after an initial spike, since bags for life are bought for reuse. As there is no evidence to determine how BFLs behave following an increase in the plastic bag levy, we used evidence seen in Ireland for single use carrier bags and applied this to BFLs. SUCB fell by 32 percentage points less when the charge was raised from 15 cent in 2006 to 22 cent in 2007. Therefore, using estimates from Wales of a 141% increase in BFLs when the charge was first introduced, we assumed BFLs increased by 109 (32 ppt lower) following an increase in the charge.

<sup>56</sup> This is calculated using the historical data provided by WRAP on Carrier bag usage 2010-2014 which showed an average increase in BFLs usage of 4% per year.

have already purchased them from larger retailers by now and take these with them when they shop at smaller retailers.

Further, consumers would incur extra costs of £1.2m on bin liners in the first year of the charge since they will no longer have access to 'free' SUCBs, commonly used as bin liners.<sup>57</sup> They will also face increased hidden cost of paper bags of £6.9m in 2021, with overall hidden costs of paper bags of £95m over the whole period (undiscounted). Finally, we expect consumers to further increase purchase of cotton tote bags, resulting in £0.7m costs in 2021 and £24m over the whole period (undiscounted).

At present, majority of consumers to MSMEs, airport retailers and civic and voluntary organisations are provided with SUCBs free of charge, while the actual cost of the bags reflected in the price of the goods and passed on to the consumer in full. Thus, one of the main benefits to consumers should be the reduction in hidden cost of SUCBs. Given limited evidence of the potential level of pass-through from retail sector to consumers, we assumed that any SUCBs stock cost savings are retained by retailers.

**Table 21. Overview of costs and benefits to consumers under Option 4 (transfers in *italics*)**

<b>Costs to consumers, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
<i>Costs to consumers from 10p charge at large retailers</i>	22.3	6.6	3.1	1.3	0.5	0.5	0.5	0.5	0.5	0.5
<i>Costs to consumers from 10p charge at MSMEs</i>	120.9	103.5	84.8	69.8	58.0	57.5	56.9	56.3	55.7	55.2
<i>Costs to consumers from 10p charge at airport stores</i>	1.9	1.9	1.5	1.1	0.9	0.8	0.8	0.8	0.8	0.8
<i>Costs to consumers from 10p charge at charity stores</i>	14.4	13.9	10.9	8.3	6.3	6.3	6.2	6.1	6.1	6.0
<i>VAT paid on 10p charge</i>	31.9	25.2	20.1	16.1	13.2	13.0	12.9	12.8	12.6	12.5
Hidden costs of paper bags	6.9	8.2	8.6	8.9	9.3	9.7	10.1	10.6	11.1	11.6
Cost of BFLs	1.5	3.6	5.8	6.0	6.3	6.6	6.9	7.2	7.5	7.8
Cost of bin liners		1.6	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
Costs of cotton tote bags	0.7	1.6	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1
<b>Total costs</b>	<b>200.5</b>	<b>166.1</b>	<b>144.9</b>	<b>121.9</b>	<b>104.9</b>	<b>104.9</b>	<b>105.0</b>	<b>105.0</b>	<b>105.2</b>	<b>105.4</b>

## Costs and benefits to public sector

We expect the monitoring and enforcement costs to be relatively low because the charge for bags has been widely accepted by the public, few complaints are received, and local authorities prioritise their activities based on risk so are not proactive in carrying out inspections.

Representative bodies of small retailers have pressed for and will welcome the mandatory approach proposed and are therefore likely to work proactively with the MSMEs sector to raise awareness of the obligations thus reducing the risk of non-compliance and consequential resource implications for regulators.

Additionally, the mandatory approach will ensure a level playing field amongst MSMEs, and unlike many regulations brings a net benefit to individual businesses rather than a net cost of compliance. For that reason, and anecdotal evidence of high levels of compliance by large retailers, we expect additional enforcement costs to be low.

Based on experience in Wales, approximately 30% of complaints related to the charge on single use carrier bags between October 2011 and February 2011 were about non-compliance by

<sup>57</sup> The private cost of bin liners is taken as the average price of those bin liners that were affected by the charge in Wales (swing and pedal bin liners) uprated for 2019 which is £0.05 per bin liner.

businesses. Associated costs to government stood at approximately £18,500. Using these estimates for England, compliance costs were uprated to 2019 prices, and then adjusted to reflect the proportion of large retailers, MSMEs, airport and civic and voluntary organisations retail outlets in England.

Cost to Local Authorities will be in the form of a marginal increase in enforcement costs relative to baseline due to the additional businesses coming under the charging obligation. Enforcement costs to LAs are estimated at £0.2m per year in responding to complaints of non-compliance which we consider is a reasonable estimate since MSMEs have no incentive not to charge for SUCBs as they can retain all of the net revenue from the charge.

There are also government transition costs of £0.04m for regional training events (see Annex B.9 for methodology).

The Environment Agency will also face IT set up costs of £0.1m to update the current systems to account for reporting by plastic packaging producers of single use carrier bags.

VAT revenue to government from the sale of SUCBs is estimated at £31.9m in the first year and £170m over the ten year period (undiscounted).

**Table 22. Overview of costs and benefits to public sector under Option 4 (transfers in italics)**

<b>Costs and savings to public sector, £m</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
EA IT set up costs for packaging producers to report on number of SUCBs	0.1									
Government transition costs <sup>58</sup>	0.04									
LAs enforcement costs	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
<b>Total public sector costs</b>	<b>0.4</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>	<b>0.2</b>
<i>Government revenue from VAT paid on top of 10p charge</i>	31.9	25.2	20.1	16.1	13.2	13.0	12.9	12.8	12.6	12.5
<b>Total public sector savings</b>	<b>31.9</b>	<b>25.2</b>	<b>20.1</b>	<b>16.1</b>	<b>13.2</b>	<b>13.0</b>	<b>12.9</b>	<b>12.8</b>	<b>12.6</b>	<b>12.5</b>

### **Wider impacts: GHGs emissions, litter and waste management savings**

As in other Options, wider monetised impacts include greenhouse gas emissions, litter and waste management costs. Accounted for in these estimates are associated costs to SUCBs, BFLs, paper bags, cotton tote bags and bin liners. The methodology used for Option 4 is as described for Option 2 – please refer to the relevant section as well as Annex B.4, B.5, B.11 and B.12. We report below on the main results of the option only.

Once accounting for the amount of littered BFLs, SUCBs and paper bags, we estimate litter cost savings at £3.5m in the first year and £56.7m over the appraisal period. Further, there are waste management savings of £0.4m in the first year of the charge and £5.1m over the ten year appraisal period (undiscounted). With increased use of bags for life and paper bags, and with reduced usage of single use carrier bags, we see an increase in recycling revenue, and gross profit, as more material is sent for recycling. This totals to £0.9m over the whole period. Next, there are also carbon savings of £0.3m in 2020 and £15.6m over the appraisal period (undiscounted). Other monetised benefits include disamenity benefits to society from reduced litter. Annual

<sup>58</sup> Costs to Government of conducting regional training events, see Annex B.9 for detail.

disamenity benefits have been estimated at £11.1m in the first year and £160m over the period (undiscounted).

Non-monetised benefits include the benefits to wildlife in the marine and terrestrial environment with less damage to organisms from fewer littered bags or pieces of bags. Recent findings in 2018, from The Centre for Environment, Fisheries and Aquaculture Science (Cefas) revealed since the 5p charge on plastic bags was introduced, there has been an estimated 50% reduction in plastic bag marine litter.<sup>59</sup>

**Table 23. Overview of wider societal savings under Option 4**

Wider savings to society, £m	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
GHG emissions savings	0.3	0.6	0.8	1.1	1.5	1.8	2.0	2.2	2.5	2.8
Savings from reduced litter costs	3.5	4.6	5.3	5.8	6.2	6.2	6.2	6.2	6.2	6.2
Waste management savings from reduced SUCBs and increase in alternatives	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.4
Disamenity benefits to society from reduced litter	11.1	13.5	15.3	16.7	17.7	17.5	17.3	17.0	16.8	16.6
Additional gross profit to recycling sector	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<b>Total wider savings</b>	<b>15.3</b>	<b>19.2</b>	<b>22.0</b>	<b>24.4</b>	<b>26.1</b>	<b>26.1</b>	<b>26.2</b>	<b>26.1</b>	<b>26.1</b>	<b>26.1</b>

## Small and Micro Business Assessment

When the Government announced in September 2013 its intention to introduce a charge for SUCBs, it stated that small retailers would be exempt from the charge.

In the response to the Call for Evidence<sup>60</sup> several representatives of small retailers, namely the Association of Convenience Stores and the National Federation of Retail Newsagents, argued against the exemption on the grounds that it would deprive small businesses of the financial savings gained from having to purchase and stock fewer plastic bags and being able to recover the costs of those that were used. Additionally, the British Retail Consortium argued against the MSMEs exemption as it would not result in a level playing field since many MSMEs (especially franchises) are in direct competition with larger retailers on high streets. In addition, a franchise retailer described three of their stores all operating under three different models which might be treated differently under the proposals.

Larger retailers also argued against the MSMEs exemption on the grounds that it would result in major differences in design between the charge in different parts of the UK (Wales and Northern Ireland have included all retailers in their charges). The Environment Audit Committee also called on the Government to include MSMEs, in the charge. Airport and charity shops that were previously exempt will also be required to now charge for SUCBs.

On the other hand, responses from some small organisations and the Charity Retail Association welcomed the exemption on the basis that setting up charging schemes would put a disproportionate administrative burden on small organisations. In separate discussions, the Federation of Small Businesses has supported the exemption on the same grounds.

After considering the various arguments the Government has opted to revise its initial decision of exempting MSMEs, airport and charity shopping outlets to include these businesses in the charge scheme. This is because MSMEs and civic and voluntary organisations' retailers now produce a

<sup>59</sup> Maes, T. et al. (2018), *Below the surface: Twenty-five years of seafloor litter monitoring in coastal seas of North West Europe (1992-2017)*, Science of the Total Environment, The Centre for Environment, Fisheries and Aquaculture Science.

<sup>60</sup> Single use carrier bags call for evidence.

substantial amount of SUCBs. MSMEs and charity retailers will be exempt from reporting to lessen the regulatory burden on them. Hence, Option 4 is the preferred option. The Government is committed to creating a better environment while considering the best possible way of reducing the burden on MSMEs.

Based on our analysis, a significant proportion (77%) of remaining SUCBs are used by micro businesses.<sup>61</sup> This clearly shows that extending the charge to SMEs but further exempting micro businesses would likely result in limited reduction in the use of SUCBs.

**Table 24. Estimated number of SUCBs used by MSMEs and charities, 2018, millions**

Number of SUCBs	2018
<b>Total MSMEs</b>	2,639
<b>Micro</b>	2,019
<b>Small</b>	309
<b>Medium</b>	311
<b>Charity retail outlets</b>	464

Separately, EU Directive 2015/720 requires Member States to take measures to achieve sustained reduction in consumption of SUCBs that bring consumption to 90 units per person by 31 December 2019 and/or measures to prevent SUCBs being provided free of charge to consumers. By 2025 the consumption should be reduced to 40 bags per person. The extension to MSMEs will assist the UK in meeting this target.

Table 25 shows how all Options compare against that target – only Options 2 and 4, which extend the charge to MSMEs, charities and airport retailers, achieve the 2025 target whilst continued focus on large retailers only (Option 3) would not result in a sufficient reduction in the number of SUCB bags per person.

**Table 25. Number of SUCBs per person, 2021-2030**

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>Baseline</b>	72	72	71	71	70	70	70	70	69	69	69
<b>Option 2</b>	72	50	50	44	41	39	39	38	38	38	37
<b>Option 3</b>	72	69	65	64	63	63	62	62	62	62	62
<b>Option 4</b>	72	40	33	27	24	22	21	21	21	21	20

Source: ONS England population projections<sup>62</sup>, number of SUCBs as modelled in relevant options

Table 26, below, shows the economic impact on MSMEs and civic and voluntary sector under all policy options. Despite the upfront familiarisation and IT costs, MSMEs and charity retail outlets will significantly benefit under Options 2 and 4, with net direct annual savings to MSMEs and charities of £95m in Option 4.

<sup>61</sup> This is based on the share of turnover of micro businesses in the overall MSMEs sector.

<sup>62</sup> ONS (2020), *Population projections for regions: Table 1*.



**Table 26. Summary of impacts on MSMEs and civic and voluntary sector**

<b>Costs and Benefits (£m)</b>	<b>Option 2</b>	<b>Option 3</b>	<b>Option 4</b>
Total costs	MSMEs: 2.5 Charity retailers: 0.2	Nil	MSMEs: 4.2 Charity retailers: 0.2
Total benefits	MSMEs: £248.2 Charity outlets: £490.1	Charity outlets: £28.9	MSMEs: £333.1 Charity outlets: £656.5
<b>Net present value (benefits – costs)</b>	<b>£735.6</b>	<b>£28.9</b>	<b>£985.2</b>
<b>Direct impact on Business (Equivalent Annual £m):</b>			
Direct costs	0.3	0.1	0.6
Direct benefits	86.9	9.6	122.8
<b>Net direct cost to MSMEs and civic and voluntary sector</b>	<b>-86.5</b>	<b>-9.6</b>	<b>-122.2</b>

## Summary and implementation plan

Option 4 is the preferred option because it is expected to bring the greatest net benefit to society (£297.3m) based on the costs and benefits that could be monetised in this appraisal, suggesting that the benefits to society outweigh the costs. Option 4 most upholds the objective to reduce single-use plastic bags use further across the whole England. The use of BFLs, paper bags, cotton tote bags and bin liners is expected to slightly rise as consumers are likely to shift away to other alternatives.

Overall, we expect reduced greenhouse gas emissions, litter clean-up costs and waste management costs. There will be costs on consumers, government and retailers, but the latter will be offset by the ability of retailers to reclaim their administrative costs from the charge so there is net benefit to business. Civic and voluntary organisations will further benefit from the charge as large retailers will be encouraged to donate remaining proceeds from the charge to charitable causes as encouraged in the initial 5p charge policy.

A Post Implementation Review on the current policy has been published in 2020. Thereafter, impacts of the introduction of the 10p charge for SUCBs will be closely monitored and the policy will be formally reviewed after five years. That period of time will allow for enough data collection on the effect of the policy, i.e. whether there has been any unacceptable unintended effects, such as a large scale substitution towards paper bags or BFLs without sufficient re-use, in which case the design and scope of the policy could be changed as necessary.

In the absence of data reporting obligations placed on these businesses, it is nevertheless important to ensure the impact of this change can be fully assessed. The Government will be introducing a requirement on producers of plastic packaging to separately report the number of SUCBs they place on the market in England, Scotland and Wales as part of their current reporting obligations under the Producer Responsibility Obligations (Packaging Waste) Regulations 2007 (as amended).

## Annex A: Key assumptions, risks and sensitivity analysis

Given the lack of existing data on aspects like the amount of SUCBs used by MSMEs or uncertainty around the actual impact of 10p charge, Defra conducted a sensitivity analysis of key assumptions to test the robustness of preferred Option 4.

Table A.1 lists the key assumptions in the quantitative analysis. We selected these assumptions for the sensitivity analysis on the basis of two criteria:

- their potential to significantly alter the benefits and costs of the policy as well as the trajectory in baseline (i.e. assumptions that affect 'all options' as stated in Table A.1);
- the degree of confidence in the assumptions made, i.e. we tested the impact of variables with low degree of certainty on the overall net present value

We list below our best estimate for each assumption, the source and rationale for the value, and a low and high estimate.

The key uncertainties among these assumptions are around the extent of any switch to paper bags and bags for life by MSMEs and consumers. For Options 2 and 3, assumptions are in line with the drop in single use carrier bags in Ireland from the year before the charge was raised (2007) compared to five years after the levy was increased (2012). For Option 4 the assumption is in line with the drop in single use carrier bags in Ireland from the year before the charge was introduced (2002) compared to when the plastic levy was increased (2007).

Consequently, we assume a larger drop in Option 4 compared to Option 2 and 3 but lower than the impact seen when the charge was first introduced. Our reasoning for this is that Option 4 is likely to see higher initial impact than under the extension of 5p charge only (Option 2). However, as consumers are already accustomed to the charge we do not expect the same impact as when the charge was first introduced.

Table A.2 presents the impact of these assumptions on the benefits, costs and net present values of all three policy options considered in the analysis. In particular, it shows the following in terms of considered options:

- Option 2 shows to be least resilient to the cumulative impact of applying either low or high assumptions as there is a highest variation in the overall net present value and thus societal impact.
- Option 3 delivers net societal benefit only in the case of using high assumptions. This reflects the risk of additional increase in the use of alternative bags with limited benefits delivered as a result of further reducing the amount of SUCBs sold by large retailers.
- Option 4 is similarly sensitive to the assumptions made across low, best and high estimates but delivers positive NPV across all three sensitivities.

Overall, this suggests that Option 4 is robust to the inherent uncertainty in the data, expected impacts, costs and benefits. We therefore argue that the risk of Option 4 ceasing to deliver net societal benefit is low. The obligation on packaging producers to report on the amount of SUCBs placed on the market should allow us to validate our modelling assumptions in forthcoming years.

**Table A.1 Key assumptions and the range of estimates**

Assumption	Best estimate	Rationale / Source	Low estimate	High estimate
Number of SUCB placed on market by 7 largest retailers (supermarkets)	All options: 92.3m in 2019	Single-use plastic carrier bags charge: data in England for 2017 to 2018 (Defra, 2018)	All options: 82.3	All options: 102.3
Fall in SUCBs in next five years following policy implementation	Options 2-4: See Table B.1	Based on evidence from England and Ireland (reporting from Department for communication, climate Action and Environment)	Options 2-4: Fall by 5 percentage points less	Options 2-4: Fall by 5 percentage points more
% annual fall in SUCBs use	All options: 2.5% for supermarkets and MSMEs 1.5% for high street retailers	Based on commitment made by one of the 7 largest retailers who are assumed to be the only seller of SUCBs post 2019	All options: 0% for supermarkets and MSMEs 0% for high street retailers	All options: 5% for supermarkets and MSMEs 4% for high street retailers
Number of bags on high street in the UK	All options: 3,499m in 2012 (85% SUPB, 10% paper, 5% BFL)	Based on WRAP data from 2008 and Retail Week data	All options: 3,000m	All options: 4,000m
Total number of SUCB bags given out by SMEs in England	All options: 3,455m <sup>63</sup> in 2012 (98% SUCB, 1% BFL and 1% paper bags)	See Annex B.3.1	All options: 3,000m	All options: 4,000m
% of LAs street cleaning costs associated with litter	All options: 70%	See Annex B.11	All options: 60%	All options: 80%
Number of bags for life placed on market by high street retailers	All options: Supermarkets (7 Largest retailers): 732 million in 2018 in England	Based on data reporting by the Environment investigation agency who estimated bags for life for the 7 largest retailers to stand at 1121million in the UK for the year ending June 2018.	All options: Supermarkets (7 Largest retailers): 532 million in 2018 in England	All options: Supermarkets (7 Largest retailers): 932 million in 2018 in England

63 SUCBs account for 98% of all bags given out by micro, small and medium retailers. BFLs, paper bags and bins lines are assumed to account for 1% each, hence SUCB estimates are uplifted to find estimates for BFLs, paper bags and bin liners. A 1% growth rate is then applied to get to 2018/19 estimates. A similar approach is taken with high street retailers.

Initial growth in PE bags for life after policy implementation	Options 2-4: Supermarkets and MSMEs: 109% High street: 99%	Based on Welsh data and reporting from Department for communication, climate Action and Environment. <sup>64</sup>	Options 2-4: Supermarkets and MSMEs: 114% High street: 104%	Options 2-4: Supermarkets and MSMEs: 104% High street: 94%
Subsequent annual growth in PE bags for life	Options 2-4: 4% in supermarkets 2% for high street retailers 3% for MSMEs	Based on WRAP reporting on carrier bag use. 2008 to 2014 data	Options 2-4: 2% in supermarkets 0% for high street retailers 5% for MSMEs	Options 2-4: 6% in supermarkets 4% for high street retailers 1% for MSMEs
% growth in paper bags	Options 2-4: 10% in Year 1 after the 5/10p charge is introduced in relevant sectors 5% p.a. after for MSMEs 0% for growth after for charities 8% growth after for airport retailers	Initial increase based on WRAP data reporting, 2011 to 2014 data. Airport annual growth rate driven by increased number of passengers. For charities, assumed no growth in paper bags after Year 1 given no available evidence.	Options 2-4: 2%	Options 2-4: 7%
% of bags recycled (all options)	Paper bags: 85% SUCB:5% BFL:5%	Based on WRAP plastic flow report 2017	Paper bags: 80% SUCB: 5% BFL: 5%	Paper bags: 90% SUCB: 15% BFL: 15%

**Table A.2 Impact of key assumptions on the options' costs, benefits and NPVs, £ millions**

	Low	Best	High
<b>Total benefits</b>			
Option 1:Baseline	-	-	-
Option 2: Extend 5p charge to MSMEs	£943	£955	£977
Option 3: Raise 5p charge to 10p for large retailers only	£130	£124	£115
Option 4: Raise 5p charge to 10p charge for all retailers	£1,394	£1,418	£1,449
<b>Total costs</b>			
Option 1:Baseline	-	-	-
Option 2: Extend 5p charge to MSMEs	£741	£754	£783
Option 3: Raise 5p charge to 10p for large retailers only	£191	£191	£229
Option 4: Raise 5p charge to 10p charge for all retailers	£1,120	£1,121	£1,226
<b>Net present value (2019 prices, 2020 base year)<sup>65</sup></b>			
Option 1:Baseline	-	-	-
Option 2: Extend 5p charge to SMEs	£160	£202	£236
Option 3: Raise 5p charge to 10p for large retailers only	-£99	-£67	£76
Option 4: Raise 5p charge to 10p charge for all retailers	£168	£297	£329

64 Since SUCB were reported to have fallen by 26 percentage points lower after the charge was raised to 15 cents in Ireland relative to first time introduction of charge. We assume bags for life grow by 26 percentage points lower applied to the growth of 141% seen in Wales between 2010 and 2012. High street retailers in wales saw SUCB fall by 10% less than supermarkets.

65 Low NPVs are estimated as comparing the high costs against low benefits and high NPVs as comparing the low costs against high benefits. Costs and benefits with low NPV are driven by low assumptions seen in Table A.1 while costs and benefits with high NPV are driven by high assumptions.

All Options are sensitive to the assumed supply of SUCBs by MSMEs. Therefore changes in the number of MSMEs' SUCB may vary our overall NPV. Table A.3 shows how responsive the NPV is to a change in the number of SUCBs supplied by MSMEs across the three sensitivities.

**Table A.3 Key assumptions and sensitivity analysis under Option 4, in £m**

Key variable(s)	Sensitivity	Assumption	NPV
Number of MSME SUCBs in 2019	Low	1,140	130.4
	Best	2,690	297.3
	High	5,770	388.9
Fall in MSME SUCBs by Year 5	Low	42%	146.8
	Best	73%	297.3
	High	97%	351.7

Note: There is no reported data on single use carrier bags used by MSMEs – see Annex B.3.1.

### Assumed bag usage under all options

#### Option 1: Baseline

The number of SUCBs reported by large retailers was estimated at 1.8 billion in 2017 for which latest data is available. 60% of bags were attributed to the seven main large retailers (Tesco, Asda, Morrisons, the Co-operative, M&S, Waitrose and Sainsbury's).

In baseline, we assume the number of single use carrier bags placed on market by the seven largest retailers fall by approximately -91% in 2019 relative to 2017 estimates.<sup>66</sup> This is attributed to bags being phased out by six of the seven largest retailers. At least five of the largest retailers committed to phase out bags by 2018 and one by 2019. One of the seven major retailers committed to reduce SUCB by 5% per year. A 2.5% drop in SUCBs post 2019 is chosen as a conservative estimate to reflect the voluntary commitment by retailers to phase out the bags due to their associated negative environmental impacts and change in consumer behaviour as they become accustomed to using alternative bags such as bags for life and paper bags. Bags on high street fall at a slower rate than those in supermarkets therefore a 2% drop is assumed. Welsh government SUCBs data for high street stores fell by 10 percentage points lower (70%) than supermarkets (80%) after introduction of the 5p charge. Also supermarkets offer a wider range of alternative bags unlike high street retailers that mainly offer paper bags or bags for life.

Furthermore, we assume a constant reduction in bags sold on high street and other large retailers of -2% per year from the 2017 estimates.

**Table A.4 Projected bag usage in Option 1 (millions) 2019-2030**

Baseline	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	19-30
SUCBs (supermarkets)	92	90	88	86	83	81	79	77	75	73	72	70	
Growth rate	-67%	-3%	-3%	-3%	-3%	-3%	-2%	-3%	-3%	-3%	-3%	-3%	-24%
SUCBs (high street retailers)	695	684	674	664	654	644	634	625	616	606	597	588	
Growth rate	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-15%
SUCBs (MSMEs)	2,690	2,652	2,665	2,658	2,659	2,657	2,657	2,655	2,654	2,653	2,652	2,651	
Growth rate	2%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%
SUCBs (airports)	61	63	64	66	68	70	72	73	75	77	80	82	

<sup>66</sup> At the time this analysis was undertaken the latest published data on SUCB by Defra was for the year ending 2018.

Growth rate	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	34%
SUCBs (charities)	464	464	464	464	464	464	464	464	464	464	464	464	
Growth rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BFLs (supermarkets)	1006	1040	1075	1111	1149	1187	1227	1269	1311	1356	1401	1448	
Growth rate	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	44%
BFLs (high street)	285	291	297	302	308	315	321	327	334	341	347	354	
Growth rate	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	24%
BFLs (MSMEs)	42	44	45	46	48	49	51	52	54	55	57	59	
Growth rate	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	38%
BFLs (airports)	23	25	27	28	30	32	34	36	38	41	43	46	
Growth rate	10%	7%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	96%
BFLs (charities)	5	5	5	5	5	5	5	5	5	5	5	5	
Growth rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Paper bags (high street)	681	715	750	788	827	869	912	958	1005	1056	1109	1164	
Growth rate	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	71%
Paper bags (MSMEs)	27	27	27	27	27	27	27	27	27	27	27	27	
Growth rate	2%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%
Paper bags (airports)	12	14	15	16	17	18	20	22	23	25	27	29	
Growth rate	12%	9%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	137%
Paper bags (charity)	5	5	5	5	5	5	5	5	5	5	5	5	
Growth rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bin liners (large retailers)	759	759	759	759	759	759	759	759	759	759	759	759	
Growth rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bin liners (MSMEs)	228	228	228	228	228	228	228	228	228	228	228	228	
Growth rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tote bags	137	141	146	150	155	160	165	170	175	181	186	192	
Growth rate	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	40%
Total bags usage	7,212	7,244	7,331	7,402	7,485	7,569	7,658	7,751	7,849	7,951	8,058	8,171	
Growth rate	-1%	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	13%

Note: Figures in the table may not add up due to rounding of numbers.

### **Option 2: Extending the 5p charge to MSMEs, airport and charity retailers**

Data on SUCBs use by MSMEs is not readily available, so it is necessary to make assumptions around SMEs contribution to SUCBs. Using their retail share, MSMEs (excluding airport and charity shops) accounted for around 27% of turnover in the retail trade industry in 2012. Therefore, we assumed they contribute 27% of the total proportion of SUCBs usage which equated to 3.4 billion bags in 2012.

Based on our previous analysis of SUCBs usage<sup>67</sup>, reduction in high street bags usage is typically at around 10% lower than supermarket SUCBs usage. The projected reduction in SUCBs usage takes this into account - by 2024, the SUCBs in MSMEs sector drop by 53% compared to 2019. Current SUCBs usage is assumed to grow at an average rate of 1% per year in baseline based on

67 Single use carrier bags charges (England) order 2015.

MSMEs retail share. In the absence of comprehensive data, we have assumed an inverse annual drop in SUCBs of -1% following the policy change. This is a conservative estimate.

**Table A.5 Projected bag usage in Option 2 (millions) 2019-2030**

Option 2	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	19-30
SUCBs (supermarkets)	92	90	88	86	83	81	79	77	75	73	72	70	
Growth rate	-67%	-3%	-3%	-3%	-3%	-3%	-2%	-3%	-3%	-3%	-3%	-3%	-24%
SUCBs (high street retailers)	695	684	674	664	654	644	634	625	616	606	597	588	
Growth rate	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-2%	-15%
SUCBs (MSMEs)	2,690	2,652	1,630	1,659	1,432	1,271	1,188	1,177	1,165	1,153	1,142	1,130	
Growth rate	2%	-1%	-39%	2%	-14%	-11%	-6%	-1%	-1%	-1%	-1%	-1%	-58%
SUCBs (airports)	61	63	52	50	39	35	33	32	32	32	31	31	
Growth rate	3%	3%	-17%	-4%	-22%	-11%	-6%	-1%	-1%	-1%	-1%	-1%	-49%
SUCBs (charities)	464	464	390	377	295	261	244	242	240	237	235	232	
Growth rate	0%	0%	-16%	-4%	-22%	-11%	-6%	-1%	-1%	-1%	-1%	-1%	-50%
BFLs (supermarkets)	1006	1040	1075	1111	1149	1187	1227	1269	1311	1356	1401	1448	
Growth rate	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	44%
BFLs (high street)	285	291	297	302	308	315	321	327	334	341	347	354	
Growth rate	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	24%
BFLs (MSMEs)	42	44	51	60	70	72	74	76	78	81	83	85	
Growth rate	3%	3%	16%	18%	16%	3%	3%	3%	3%	3%	3%	3%	101%
BFLs (airports)	23	25	32	40	50	53	56	60	64	67	72	76	
Growth rate	10%	7%	25%	28%	24%	6%	6%	6%	6%	6%	6%	6%	226%
BFLs (charities)	5	5	6	7	9	9	9	9	9	9	9	9	
Growth rate	0%	0%	24%	28%	24%	0%	0%	0%	0%	0%	0%	0%	96%
Paper bags (high street)	681	715	750	788	827	869	912	958	1005	1056	1109	1164	
Growth rate	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	71%
Paper bags (MSMEs)	27	28	30	30	30	30	30	30	30	30	30	30	
Growth rate	2%	3%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%
Paper bags (airports)	12	14	15	16	17	19	20	22	23	25	27	30	
Growth rate	12%	10%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	138%
Paper bags (charity)	5	5	5	5	5	5	5	5	5	5	5	5	
Growth rate	0%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%
Bin liners (large retailers)	759	759	759	759	759	759	759	759	759	759	759	759	
Growth rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bin liners (MSMEs)	228	228	238	278	278	278	278	278	278	278	278	278	
Growth rate	0%	0%	4%	17%	0%	0%	0%	0%	0%	0%	0%	0%	22%
Tote bags	137	141	147	153	159	164	169	175	180	185	191	197	
Growth rate	3%	3%	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	44%
Total bags usage	7,212	7,245	6,237	6,385	6,164	6,052	6,040	6,120	6,204	6,294	6,388	6,488	
Growth rate	-1%	0%	-14%	2%	-3%	-2%	0%	1%	1%	1%	2%	2%	-10%

Note: Figures in the table may not add up due to rounding of numbers.

**Option 3: Increasing the current 5p charge to 10p for large retailers only.**

We assume single use carrier bags drop by 16% in the calendar year the charge is raised to 10p (2021), and by 53% over the period of five years. Six of the seven major retailers would have phased out 90% of single use carrier bags placed on market by the end of 2019 relative to 2017 for which latest data is available. This figure relates to the amount of bags placed on market by the largest retailers only and not all (MSMEs and large) English retailers.

From 2026 onwards we assume a constant annual drop in SUCBs sold of -2.5% for the seven largest retailers and -2% for the remaining large retailers (including high street). This assumption is based on the commitment made by one of the seven largest retailers to reduce single use carrier bags by -5% per year. A conservative estimate of -2.5% was then selected for the seven largest retailers. Based on Welsh government data, high street retailers see a -10 percentage point drop in SUCB usage relative to supermarkets. Hence, we assumed a -1.5% fall in single use carrier bags after the initial drop.

Based on Welsh government data, reduction in high street bags usage is typically around 10% lower than that of supermarkets. The projected reduction in SUCBs usage takes this into account. Table A.6 shows the overall impact of the 10p charge on all carrier bags in England for all retailers. MSMEs, airports and charity shops continue operating as in the baseline.

**Table A.6 Projected bags usage under Option 3, millions, 2019-2030**

Option 3	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	19-30
SUCBs (supermarkets)	92	90	76	53	47	43	41	40	39	38.0	37.1	36.2	
Growth rate	-67%	-3%	-15%	-31%	-12%	-8%	-5%	-3%	-3%	-3%	-2%	-3%	-61%
SUCBs (high street retailers)	695	684	578	406	363	339	326	321	316	311	307	302	
Growth rate	-2%	-2%	-16%	-30%	-11%	-7%	-4%	-2%	-2%	-2%	-2%	-1%	-57%
SUCBs (MSMEs)	2690	2652	2665	2658	2659	2657	2657	2655	2654	2653	2652	2651	
Growth rate	2%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%
SUCBs (airports)	61	63	64	66	68	70	72	73	75	77	80	82	
Growth rate	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	34%
SUCBs (charities)	464	464	464	464	464	464	464	464	464	464	464	464	
Growth rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BFLs (supermarkets)	1006	1040	1078	1117	1158	1197	1237	1279	1322	1366	1413	1460	
Growth rate	3%	3%	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	45%
BFLs (high street)	285	291	297	304	311	317	323	330	337	343	350	357	
Growth rate	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	25%
BFLs (MSMEs)	42	44	45	46	48	49	51	52	54	55	57	59	
Growth rate	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	38%
BFLs (airports)	23	25	27	28	30	32	34	36	38	41	43	46	
Growth rate	10%	7%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	96%
BFLs (charities)	5	5	5	5	5	5	5	5	5	5	5	5	
Growth rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Paper bags (high street)	681	715	777	816	857	900	945	992	1041	1093	1148	1206	
Growth rate	5%	5%	9%	5%	5%	5%	5%	5%	5%	5%	5%	5%	77%
Paper bags (MSMEs)	27	27	27	27	27	27	27	27	27	27	27	27	
Growth rate	2%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-1%



Paper bags (airports)	12	14	15	16	17	18	20	22	23	25	27	29	
Growth rate	12%	9%	8%	8%	8%	8%	8%	8%	8%	8%	8%	8%	137%
Paper bags (charity)	5	5	5	5	5	5	5	5	5	5	5	5	
Growth rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Bin liners (large retailers)	759	759	793	928	928	928	928	928	928	928	928	928	
Growth rate	0%	0%	4%	17%	0%	0%	0%	0%	0%	0%	0%	0%	22%
Bin liners (MSMEs)	228	228	228	228	228	228	228	228	228	228	228	228	
Growth rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tote bags	137	141	146	151	156	162	169	175	182	190	197	205	
Growth rate	3%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%	4%	50%
Total bags usage	7,212	7,244	7,288	7,317	7,369	7,440	7,529	7,631	7,738	7,850	7,967	8,089	
Growth rate	-1%	0%	1%	0%	1%	1%	1%	1%	1%	1%	1%	2%	12%

Note: Figures in the table may not add up due to rounding of numbers.

#### **Option 4: increasing the charge to 10p for all retailers**

The increased charge of 10p is expected to reduce the use of SUCBs by 16% in 2021 for large retailers, 45% for MSMEs, and -63% for airport retailers and charity shops. All retailers see a substantial decrease until Year 5.<sup>68</sup> Table A.7 gives an overview of the expected use of carrier bags in Option 4.

**Table A.7 Projected Single Use Plastic Bags usage in Option 4 (millions)**

Option 4	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	19-30
SUCBs (supermarkets)	92	90	75	52	46	43	40	39	38	37	37	36	
Growth rate	-67%	-3%	-17%	-31%	-12%	-8%	-5%	-3%	-3%	-2%	-3%	-3%	-61%
SUCBs (high street retailers)	695	684	573	402	360	336	323	318	313	309	304	299	
Growth rate	-2%	-2%	-16%	-30%	-11%	-7%	-4%	-2%	-2%	-2%	-2%	-1%	-57%
SUCBs (MSMEs)	2690	2652	1471	1263	1038	857	716	709	702	695	688	681	
Growth rate	2%	-1%	-45%	-14%	-18%	-17%	-16%	-1%	-1%	-1%	-1%	-1%	-75%
SUCBs (airports)	61	63	23	23	18	13	10	10	10	10	10	10	
Growth rate	3%	3%	-63%	-4%	-22%	-24%	-24%	-1%	-1%	-1%	-1%	-1%	-84%
SUCBs (charities)	464	464	173	167	131	100	76	75	74	74	73	72	
Growth rate	0%	0%	-63%	-4%	-22%	-24%	-24%	-1%	-1%	-1%	-1%	-1%	-84%
BFLs (supermarkets)	1006	1040	1078	1117	1158	1197	1237	1279	1322	1366	1413	1460	
Growth rate	3%	3%	4%	4%	4%	3%	3%	3%	3%	3%	3%	3%	45%
BFLs (high street)	285	291	297	304	311	317	323	330	337	343	350	357	
Growth rate	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	25%
BFLs (MSMEs)	42	44	55	70	86	89	92	94	97	100	103	106	
Growth rate	3%	3%	25%	28%	24%	3%	3%	3%	3%	3%	3%	3%	150%
BFLs (airports)	23	25	31	40	50	53	56	59	63	67	71	76	
Growth rate	10%	7%	25%	28%	24%	6%	6%	6%	6%	6%	6%	6%	224%

<sup>68</sup> See Annex B, Table B.1 for methodology on the percentage drops in SUCBs usage.

BFLs (charities)	5	5	6	8	10	10	11	11	12	13	14	15	
Growth rate	0%	0%	30%	28%	24%	6%	6%	6%	6%	6%	6%	6%	214%
Paper bags (high street)	681	715	777	816	857	900	945	992	1041	1093	1148	1206	
Growth rate	5%	5%	9%	5%	5%	5%	5%	5%	5%	5%	5%	5%	77%
Paper bags (MSMEs)	27	27	27	29	29	29	29	29	29	29	29	29	
Growth rate	2%	-1%	2%	7%	0%	0%	0%	0%	0%	0%	0%	0%	8%
Paper bags (airports)	12	14	15	16	17	19	20	22	24	26	28	30	
Growth rate	12%	9%	9%	8%	8%	8%	8%	8%	8%	8%	8%	8%	141%
Paper bags (charity)	5	5	5	5	5	5	5	5	5	5	5	5	
Growth rate	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%
Bin liners (large retailers)	759	759	784	918	918	918	918	918	918	918	918	918	
Growth rate	0%	0%	3%	17%	0%	0%	0%	0%	0%	0%	0%	0%	21%
Bin liners (MSMEs)	228	228	235	275	275	275	275	275	275	275	275	275	
Growth rate	0%	0%	3%	17%	0%	0%	0%	0%	0%	0%	0%	0%	21%
Tote bags	137	141	147	154	161	166	171	177	182	188	194	200	
Growth rate	3%	3%	4%	5%	4%	3%	3%	3%	3%	3%	3%	3%	46%
Total bags usage	7,212	7,244	5,774	5,659	5,469	5,327	5,248	5,344	5,444	5,549	5,659	5,775	
Growth rate	-1%	0%	-20%	-2%	-3%	-3%	-1%	2%	2%	2%	2%	2%	-20%

Note: Figures in the table may not add up due to rounding of numbers.

## Annex B: Methodology description

This section briefly explains some of the methodological approaches applied across the options.

### **B.1: Business single-use carrier bags stocking costs**

Stocking costs are estimated on a 'per bag' basis multiplied by the total private costs per retailer. Total private costs per retailer are estimated at £0.3 in 2019 prices. The stocking costs reported include storage, transport and purchasing costs of single use carrier bags. These costs (per bag basis) are estimated as follows: Private cost per bag - £0.2; Transport and storage costs - £0.07. These are based on estimates from the final Scottish plastic bag levy impact assessment (Private costs) and Welsh single use carrier bag Impact Assessment. These have been updated to 2019 prices.

### **B.2: Government and public sector enforcement costs**

Government and public sector enforcement costs include staff training costs, complaints from customers resulting in investigation, complaints from business about other businesses, request for advice from consumers and businesses. Also included within the costs are enforcement contacts made with businesses including proactive inspections, test purchases, reactive visits as a result of complaints received, or letters of advice issued.

Costs are based on estimates seen in Wales between 2011 when the charge was first introduced and 2013 and are estimated at £42,356 per year in 2019 prices. Using the Welsh costs and a population factor of 17.3, enforcement costs for England are estimated at £783,316 in 2019 prices. We assume the 5p charge introduced in 2015 already had much of an impact. Therefore, as consumers and businesses are accustomed to the charge, we expect the enforcement costs to be relatively low under the new policy options relative to when the charge was first introduced.

Due to the uncertainty we assume 30% of the total is incurred in the low scenario, 20% in the best scenario (£0.2m per year) and 10% in the high scenario. These enforcement costs are assumed for Options 2 and 4 as they reflect the whole retailer sector costs. For Option 3, total enforcement costs are assumed to be needed only with respect to large retailers (i.e. 8% of all retailers), or £0.02m per year.

### **B.3: Carrier bags placed on market**

#### **B.3.1 Single use carrier bags**

Data on single use carrier bags in supermarkets and high street retailers are readily available. MSMEs (excluding airport and charity shops) single use carrier bags are estimated based on data reporting for large retailers in the UK. Estimates for England were derived based on the population share (83.84%). MSMEs bags are estimated by uprating (to 100%) the number of single use carrier bags placed on market by large retailers in 2012-using 2013 WRAP data.<sup>69</sup> Large retailers accounted for 73% (9.5 billion) of bags placed on market in 2012. In the same year, MSMEs accounted for 27% of retail trade. This had risen to 33% in 2018 - implying a 1% increase in retail trade per year. Therefore, using the retail trade share as a proxy, we assumed 27% of the bags placed on market were attributed to MSMEs and this was seen to grow by 1% per year, consistent with the retail trade share increase<sup>70</sup>. We expect our SUCBs estimates to cover online retailers as well given the business counts are solely based on the number of employees only.

Since there is no data reporting on the number of SUCBs sold by airport retailers we estimate the airport sales of SUCBs using the proxy of their retail share on the overall UK retail sales. First, we estimated airport retail sales to be £1.66bn in 2018. This is based on the retail sales reported by key UK airports: London Heathrow Airport (£716m<sup>71</sup>), Manchester, Stansted and East Midlands' airports (£181m<sup>72</sup>), London Gatwick airport (£177m<sup>73</sup>) and Aberdeen airport (£13m<sup>74</sup>). This retail outturn data is representative of 63% of UK airport passengers in 2018. We further estimated an aggregate revenue of Birmingham, Bristol, Glasgow and Edinburgh airports to be £248m in 2018. These were calculated by multiplying the number of passengers in each airport<sup>75</sup> by typical retail revenue per passenger<sup>76</sup> and uprating this overall estimate by 26% as, based on our calculations, this methodology (retail revenue per passenger x number of passengers) underestimates retail sales in reported airports by this percentage.<sup>77</sup> The estimate of £1.34bn for main nine UK airports, representing 81% of passengers, was then uprated to factor in all UK airports, estimating the sales of £1.66bn in 2018. This represents 0.4% of all UK retail sales and would likely be of similar proportion for England airports and overall sales as well.<sup>78</sup> We then used this retail share and

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69 WRAP (2013), *WRAP publishes new figures on carrier bag use*.

70 ONS Annual Business Survey data, acquired through private communication.

71 Airportwatch website, March 2019, *Heathrow in 2018 made 58.8% of total revenue from aeronautical; 24% from retail (which includes 4.24% – £126 million – from car parking)*.

72 MAG (2018), *Annual report and accounts for the year ended 31 March 2018*.

73 *Gatwick Airport Results* (2018).

74 Aberdeen International Airport Limited (2016), *Annual report and financial statements for the year ended 31 December 2015*.

75 World Airport Codes website, *UK Top 20 Airports*.

76 Average total revenue per passenger is £6.67, of which 66% is retail. See Steer Davies Gleave (2017), *Heathrow Airport – Review of Commercial Revenues*.

77 There could be a number of reasons for this difference, such as larger variation in the revenue per passenger across the UK airports meaning that applying an average revenue per passenger leads to inaccurate estimates. Uprating the estimate by 26% means that the airport revenue represents higher share in the total UK retail revenue and thus results in a higher estimate of SUCBs used by airport retailers compared to not using the 26% scaling factor.

78 UK retail sector revenue (excluding automotive fuel) in 2018 was £382bn. See ONS (2019), *Retail Sales Index, Value Seasonally Adjusted: Total Sales table*.

applied it to our 2014 total estimate of SUCBs in England (13,632 million) which suggests that there could be around 59 million SUCBs in circulation at English airports in 2018.<sup>79</sup> We then applied the growing trend in the number of passengers to derive our estimates of SUCBs at airport retailers over the coming years if they remain exempted. Based on our discussion with The Airport Operators Association (AOA), they had no recommendation for a more accurate method of ascertaining the usage of SUCBs across all UK airports, beyond a national data collection endeavour.

For charity shops, we use the ratio of charity organisations reported by the Charity Retail Association to the number of retailers in England. The Charity Retail Association estimates 9,368 charity shops in England in 2017. We use the number of stores in UK (328,132) reported in 2018 for 2017 by Retail at Bay<sup>80</sup>. From this we estimate the number of stores in England by using its population share (83.84%) and then assume the share of charity stores to be 3% of the aggregate (retail stores and charity shops), hence the number of stores are uplifted by 3% to make 100%. The reported number of single use carrier bags, BFLs and paper bags by all retailers are then also uprated by 3% to obtain the number of bags sold by charity shops.

The percentage change in SUCBs across options are estimated using existing evidence from England and Ireland.<sup>81</sup> All options see a reduced impact at high street retail sector as Welsh evidence suggests bag usage falls slower for the sector than for supermarkets due to the limited variety of bag alternative options sold. Table A.8 summarises the assumed growth rates of SUCBs under each option.

**Table B.1 Assumed impact of Options on SUCBs use across sectors<sup>82</sup>**

	<b>% change</b>	<b>Rationale</b>
<b>Baseline</b>		
<b>Supermarkets</b>	-2.5% p.a.	Large retailer commitment to reduce use by -5% per year, assumed half across the whole sector.
<b>High street</b>	-1.5% p.a.	Supermarkets value reduced by 1 percentage point given existing evidence of slower reduction in high street sector.
<b>MSMEs</b>	+1% p.a.	Following current growth in MSMEs retail sector share
<b>Airport retailers</b>	+3% p.a.	Based on expected growth in the number of passengers
<b>Civic and voluntary organisations</b>	0% p.a.	No evidence suggesting either reduction or growth in the sector
<b>Option 2</b>		
<b>Supermarkets</b>	-2.5% p.a.	As baseline
<b>High street</b>	-1.5% p.a.	As baseline
<b>MSMEs</b>	-90% reduction over 5 years for MSMEs currently not voluntarily charging (61%)  -1% fall for 39% of MSMEs voluntarily charging	Ireland: -90% reduction across the sector (from 328 to 33 million over period of 2002-2007)  -1% assumed as the inverse of the MSMEs retail growth rate of 1% p.a.
<b>Airport retailers</b>	-90% reduction over 5 years	Ireland: -90% reduction across the sector (from 328 to 33 million over period of 2002-2007)

<sup>79</sup> We used pre-5p charge estimates of SUCBs as further years would significantly lower our airport's SUCBs estimates and there should be no impact of 5p at airports at the moment given their exemption.

<sup>80</sup> Bamfield, J.A.N. (2018) *Retail At Bay 2018 Report*, May, Norwich: Centre for Retail Research.

<sup>81</sup> Department of Communications, Climate Action & Environment (2016), *Economic instruments to reduced usage of plastic bags: The Irish experience*.

<sup>82</sup> Please note that this policy is implemented in April 2021. This means only ¾ of the year is under the policy condition. Therefore some 2021 usage figures may not align with this table

<b>Civic and voluntary organisations</b>	-90% reduction over 5 years	Ireland: -90% reduction across the sector (from 328 to 33 million over period of 2002-2007)
<b>Option 3</b>		
<b>Supermarkets</b>	-58% reduction over 5 years	Ireland: -58% reduction following an increase in the charge from €0.15 to €0.22 (33 to 14 million in the period of 2007-2012)
<b>High street</b>	-56% reduction over 5 years	Ireland experience reduced by 2 percentage points to account for slower reductions observed at high street
<b>MSMEs</b>	+1% p.a.	As baseline
<b>Airport retailers</b>	+3% p.a.	As baseline
<b>Civic and voluntary organisations</b>	0% p.a.	As baseline
<b>Option 4</b>		
<b>Supermarkets</b>	-58% reduction over 5 years	Ireland: -58% reduction following an increase in the charge from €0.15 to €0.22 (33 to 14 million in the period of 2007-2012)
<b>High street</b>	-56% reduction over 5 years	Ireland's experience (above) reduced by 2 percentage points to account for slower reductions observed at English high street shops.
<b>MSMEs</b>	-92% reduction over 5 years for MSMEs currently not voluntarily charging (61%)  -58% fall for 39% of MSMEs voluntarily charging moving to 10p	Ireland: 92% reduction observed since the introduction of charging and increase to €0.22 (from 328 to 26 million in the period of 2002-2007)  Ireland: -58% reduction following an increase in the charge from €0.15 to €0.22 (33 to 14 million in the period of 2007-2012)
<b>Airport retailers</b>	-92% reduction over 5 years	As above
<b>Civic and voluntary organisations</b>	-92% reduction over 5 years	As above

### **B.3.2 Bags for life**

Bags for life are estimated based on WRAP's UK estimates reported for 2010 to 2014. Population share for England is then used as a proxy for bag share for England. Wrap data shows an average increase in BFL usage of 4% per year. Using WRAP data and the proxy for bag share, estimates for 2015 onwards in England assume a constant growth rate of 4.5% per year in England. We assume 3.4% annual growth rate in supermarkets, 2% for high street retailers and 3% for MSMEs in baseline. It is assumed that consumers may have already purchased BFLs from larger retailers and take these with them when they shop at smaller retailers. Our analysis assumes BFLs are reused up to nine times before they are disposed of.<sup>83</sup> Welsh 2016 Post Implementation Review found that the average number of re-uses for plastic BFLs was 25.5 and 43.6 for cotton tote bags for life.<sup>84</sup>

The baseline estimates of BFLs used by MSMEs and charity shops are assumed to represent 1% of the total SUCBs usage before the 5p charge was introduced, as per assumptions in the 2015 IA for smaller retailers. Airport retailers' pre-policy use of BFLs is estimated by looking at the proportions of SUCBs used in airports compared to the overall use (~1%) and then applying this share on the estimate of BFLs used across all the other sectors, resulting to 23 million BFLs used by airport retailers.

<sup>83</sup> WRAP (2011), *Material change for a better environment*.

<sup>84</sup> Welsh Government (2016), *Post Implementation Review of the Single Use Carrier Bag Charge in Wales*.

In terms of the expected impact of 5p/10p charging on the growth in BFLs, we have reviewed existing evidence and assumed 109% growth rate over three years. This is a mid-point estimate of the initial growth estimate reported by WRAP for Wales and used in Defra's 2015 impact assessment (141%) and of an estimate reported in Wales' 2016 Post Implementation Review (70%).<sup>85</sup>

### **B.3.3 Paper bags**

High street paper bags are assumed to account for 10% of bags placed on market by all high street retailers. In the absence of market data for high street retailers 10% is assumed to be unchanged from the 2015 impact assessment that used Welsh data. Using UK WRAP data for single use carrier bags (2012-2014) and using England's population share as a proxy to estimate the number of single use carrier bags placed on market, we upscale SUCBs in England to 100% (to include bags for life, paper bags and bin liners). We then apply our 10% estimate for paper bags.

For charities and MSMEs, 1% of total bags used are assumed to be paper bags, as per the 2015 impact assessment. Airport retailers' pre-policy use of paper bags is estimated by looking at the proportions of SUCBs used in airports compared to the overall use (~1%) and then applying this share on the estimate of paper bags used across all the other sectors, resulting to 12 million paper bags in 2019.

The hidden consumer cost of paper bags were updated to 2019 prices, from the 2015 impact assessment, to costs of £0.29p per paper bag.

### **B.3.4 Bin liners**

Estimates for bin liners in England are based on a WRAP study that reports on the number of bin liners sold in the UK. We applied the population share attributed to England as a proxy for the number of bin liners sold in England. Expected sales in bin liners vary only according to SUCBs consumption as there is very little information on how this would develop and if these costs would increase or decrease over time. In particular, the following growth rates are assumed across the options, following 2015 impact assessment: Option 1 – 0%; Option 2 – 24% increase over two years then no change in MSMEs introducing 5p charge; Option 3 - 24% increase over two years in large retailers then no change; Option 4 - 24% over two years in both MSMEs and large retailers.

The private cost of bin liners is taken as the average price of those bin liners that were affected by the charge in Wales (swing and pedal bin liners) updated for 2019, resulting in £0.05 costs per bag.

### **B.3.5 Cotton tote bags**

England's sales of cotton tote bags were estimated on the basis of Welsh 2016 Post Implementation Review, reporting 3.8 million of cotton tote bags in 2015, and then increased by the share of England's population.<sup>86</sup> This equates to 66 million in 2015. The total was then split across the same sectors in the same proportion as BFLs. In terms of the assumed growth rates across options, we applied the same rates as for BFLs. For example, in Option 4's MSMEs sector, this implies 109% growth over three years, followed by 3% annual growth afterwards.

The private cost of cotton tote bags are based on the bulk prices observed on the market – these can vary significantly depending on the type of bag and amount of sales. We used private cost of £0.44 per a printed cotton bag.<sup>87</sup>

## **B.4 Waste management costs**

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85 Welsh Government (2016), *Post Implementation Review of the Single Use Carrier Bag Charge in Wales*.

86 Welsh Government (2016), *Post Implementation Review of the Single Use Carrier Bag Charge in Wales*.

87 Cotton Shoppers website, printed cotton bag bulk prices.

Waste management costs are calculated based on the number of bags per year multiplied by the average cost per bag type. The average costs of disposal includes collection, sorting and transportation of waste to relevant waste and recycling treatment sites. These are calculated by finding the product of the average weight per bag and the sum of; i) the percentage of bags landfilled and littered times the sum of the median gate fees and residual waste collection cost and ii) the percentage recycled<sup>88</sup> times the collection and sorting costs for mixed recycling. Below is an example calculation for SUCBs:

- [landfilled (85%) + littered (5%)] X [median landfill gate fee (£22/t) + residual waste collection cost (£43.1/t)], and
- Recycled (10%) X collection and sorting costs for mixed recycling (£376.5/t)

Gate fees are based on WRAPs 2018 gate fee report<sup>89</sup>. Residual collection costs are based on 2011 average refuse waste collection costs cited in the 2012 plastic packaging impact assessment<sup>90</sup>. These have been updated to 2019 prices using the Office for National Statistics 2019 GDP deflators (2012-13 base year) published in the quarterly national accounts<sup>91</sup>.

## B.5 GHGs emissions

Here we consider the global warming potential (GWP) as a result of the different carrier bags being assessed in this IA (SUCBs, BFLs, paper bags, cotton tote bags and bin liners). The GWP is calculated based on the lifecycle greenhouse gas (GHG) emissions for each bag type as presented in the Environment Agency's life cycle assessment of supermarket carrier bags. GHG figures are estimated in carbon dioxide (CO<sub>2</sub>) terms for each bag type using a comparable functional unit. The functional unit in the study was based on the number of items that consumers could carry in a bag in a given month. The EA define it as "Carrying one month's shopping (483 items) from the supermarket to the home in the UK". One single use carrier bag was found to carry on average 5.88 items per shopping trip per day while a bag for life would carry an average of 7.78 items. 82.14 single use carrier bags were required to fulfil the functional unit (to carry one month's shopping (483 items)). The number of single use carrier bags used in a month was found to have associated GHG emissions of 1.578kg CO<sub>2</sub>e while bags for life had an associated GHG emissions of 1.385kg CO<sub>2</sub>e if reused 5 times.

Emissions have been calculated on a per bag basis by dividing the emissions per functional unit by the number of bags needed to fulfil the function (e.g. for SUPB, 1.578/82.14= 0.0192, so emissions are 19.2g CO<sub>2</sub>e per bag). The CO<sub>2</sub> factor for SUPB assumes no recycled content in the bags, and although this is no longer a reasonable assumption, EA sensitivity analysis shows that recycling SUPB has little effect on their GHG impact but SUPB made with recycled plastic are likely to have a lower GHG impact (See table B.1). As majority of single use carrier bags are imported, The EA lifecycle assessment accounts for the geographic coverage of GHG emissions to estimate emissions produced in the UK only. For SUCBs it accounts for the treatment of SUCBs as all plastic bags were produced abroad. For the production stage, global warming potential was estimated for the country in which it was produced e.g. 90% are assumed to be produced in China. Therefore the global warming potential in the UK was estimated for end of life and was assumed that SUCBs are generally incinerated. For example, SUCBs in the UK were used as feedstock in UK incinerators to estimate the amount of energy produced and associated GHG emissions, not in incinerators in the country of production.

88 Percentage of bags recycled: SUCBs (10%), BFLs (10%), and paper bags (85%).

89 WRAP (2018), *Comparing the costs of alternative waste treatment options – Gate Fees 2017/18 Final Report*.

90 Defra (2012), *Statutory Packaging Recycling Targets 2013-17 Impact Assessment*.

91 ONS (2019), *GDP quarterly national accounts time series*.

The EA calculate the lifecycle GHG emissions for each bag type based on a number of scenarios of re-use. Here, the figure for SUPB (1.578 kgCO<sub>2e</sub>) which assumes 40.3% are re-used as bin liners will be used (reflecting 2005 survey data from WRAP).<sup>92</sup> Paper bags are assumed to be used only once, as EA suggest is the case, resulting in a GWP of 5.523 kgCO<sub>2e</sub> per functional unit (85.0g per bag). Bags classified as PE by WRAP reporting are taken to correspond to LDPE bags in the EA report. 'Other' bags under WRAP reporting are predominantly woven PP but the closest corresponding category in the EA report is non-woven PP, so all 'other' BFL are assigned the GHG factors of non-woven PP bags. All BFL are assumed to be re-used nine times in the absence of a charge, as suggested by a WRAP study.<sup>93</sup> Welsh 2016 Post Implementation Review found that the average number of re-uses for plastic BFLs was 25.5 and 43.6 for cotton tote bags for life.<sup>94</sup>

Following the EA lifecycle assessment, the GHG benefits of re-use are accounted for by dividing the GWP of a bag with no re-use by the number of re-uses. This gives a GWP of 0.769 kgCO<sub>2e</sub> per functional unit (13g per bag) for PE BFL and 2.390 kgCO<sub>2e</sub> (36g per bag) for 'other' BFL and 1.57 kgCO<sub>2e</sub> (34g per bag) for cotton tote BFL. The life cycle stages considered are the extraction/production of raw materials, bag production processes, transportation, recycling and avoided products from re-use, and end-of-life/waste processes. Plastic bags are mostly imported from Asia with 70-90% of emissions over their life cycle arising in the extraction and production of raw materials and bag manufacturing processes.<sup>73</sup> Government guidance is that where emissions occur overseas, the traded price of carbon should be used for UK public policy appraisal. Monetised GHG emissions are calculated by estimating the product of; i) the number of bags reported per year, ii) EA life cycle greenhouse gas emissions per bag type<sup>95</sup> and iii) the BEIS traded carbon prices forecasted from 2021 to 2030.<sup>96</sup>

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92 The characteristics of SUPB (i.e. weight, GHG emissions per bag, cost etc.) are assumed to be the same for all retailers in the absence of more detailed evidence. If high street bags were generally thicker than supermarket bags, this would result in the benefits of Options 2, 3 and 4 being understated.

93 WRAP (2011), *Material change for a better environment*.

94 Welsh Government (2016), *Post Implementation Review of the Single Use Carrier Bag Charge in Wales*.

95 Environment Agency (2011), *Life cycle assessment of supermarket carrier bags: a review of the bags available in 2006*.

96 Department for Business, Energy & Industrial Strategy (2018), *Updated short-term traded carbon values – used for UK public policy appraisal*.



## B.6 Resource use

The change in the plastic charge policy will also affect resource use. Resource use can be measured by a proxy in terms of the total weight of the bags used, though this does not capture all resources used in the production of the bags. The total weight of bags used is calculated as the number of each type of bag multiplied by the average weight, with results shown in Table B.2. For SUPB, the average weight is taken as 7.5g which is the average supermarket bag weight from 2009-2012<sup>97</sup>. Bin liner weight is the average of pedal and swing bin liner weights from the WRAP study of Welsh bin liner usage, i.e. 8.3g<sup>98</sup>. Other weights are taken from the EA's life cycle analysis study, i.e. 55.2g for paper bags, 34.94g for PE BFL, 115.83g for PP BFL and 183g for cotton tote bags.

**Table B.2 Bags resource use in Option 1 (baseline), tonnes**

Weight of bags	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
SUCBs	32,096	32,115	31,975	31,900	31,803	31,717	31,630	31,547	31,465	31,385	31,307
BFLs	49,060	50,585	52,165	53,794	55,478	57,217	59,013	60,869	62,787	64,767	66,814
Tote bags	25,844	26,647	27,480	28,339	29,226	30,143	31,090	32,069	33,079	34,124	35,203
Bin liners	8,187	8,187	8,187	8,187	8,187	8,187	8,187	8,187	8,187	8,187	8,187
Paper bags	41,913	43,950	46,083	48,328	50,686	53,165	55,771	58,509	61,388	64,413	67,594
Plastic	89,344	90,887	92,327	93,882	95,468	97,122	98,831	100,603	102,439	104,340	106,308
<b>Total</b>	<b>157,101</b>	<b>161,484</b>	<b>165,890</b>	<b>170,549</b>	<b>175,381</b>	<b>180,430</b>	<b>185,692</b>	<b>191,181</b>	<b>196,906</b>	<b>202,876</b>	<b>209,104</b>

**Table B.3 Bags resource use in Option 2, tonnes**

Weight of bags	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
SUCBs	32,096	23,013	23,021	20,327	18,617	17,696	17,484	17,274	17,067	16,863	16,661
BFLs	49,060	50,999	53,161	55,398	57,149	58,957	60,826	62,759	64,757	66,822	68,958
Tote bags	25,844	26,865	28,003	29,180	30,077	31,003	31,958	32,944	33,961	35,010	36,092
Bin liners	8,187	8,273	8,608	8,608	8,608	8,608	8,608	8,608	8,608	8,608	8,608
Paper bags	42,010	44,147	46,281	48,526	50,885	53,364	55,970	58,710	61,589	64,615	67,796
Plastic	89,344	82,285	84,790	84,333	84,374	85,261	86,918	88,641	90,432	92,293	94,228
<b>Total</b>	<b>157,198</b>	<b>153,297</b>	<b>159,073</b>	<b>162,039</b>	<b>165,336</b>	<b>169,628</b>	<b>174,847</b>	<b>180,294</b>	<b>185,981</b>	<b>191,918</b>	<b>198,116</b>

<sup>97</sup> Calculated as the total SUCBs weight divided by the total number of SUCBs.

<sup>98</sup> WRAP (2013), *Effect of charging for carrier bags on bin liner sales in Wales*.

**Table B.4 Bags resource use in Option 3, tonnes**

Weight of bags	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>SUCBs</b>	32,096	31,241	29,611	29,240	29,018	28,901	28,860	28,821	28,782	28,746	28,710
<b>BFLs</b>	49,060	50,709	52,442	54,201	55,898	57,650	59,460	61,329	63,261	65,256	67,318
<b>Tote bags</b>	25,844	26,713	27,626	28,554	29,689	30,874	32,109	33,396	34,739	36,140	37,601
<b>Bin liners</b>	8,187	8,471	9,590	9,590	9,590	9,590	9,590	9,590	9,590	9,590	9,590
<b>Paper bags</b>	41,913	45,429	47,637	49,959	52,399	54,963	57,659	60,492	63,469	66,599	69,888
<b>Plastic</b>	89,344	90,421	91,643	93,031	94,506	96,141	97,909	99,740	101,633	103,592	105,618
<b>Total</b>	157,101	162,563	166,906	171,543	176,594	181,978	187,676	193,627	199,841	206,330	213,107

**Table B.5 Bags resource use in Option 4, tonnes**

Weight of bags	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>SUCBs</b>	32,096	18,803	15,480	12,931	10,956	9,469	9,356	9,245	9,135	9,027	8,920
<b>BFLs</b>	49,060	51,256	53,782	56,398	58,198	60,059	61,983	63,973	66,030	68,158	70,359
<b>Tote bags</b>	25,844	26,973	28,269	29,484	30,414	31,375	32,367	33,393	34,453	35,549	36,681
<b>Bin liners</b>	8,187	8,464	9,903	9,903	9,903	9,903	9,903	9,903	9,903	9,903	9,903
<b>Paper bags</b>	41,913	45,494	47,811	50,135	52,576	55,142	57,838	60,673	63,652	66,783	70,075
<b>Plastic</b>	89,344	78,523	79,164	79,231	79,057	79,430	81,242	83,120	85,068	87,088	89,182
<b>Total</b>	157,101	150,990	155,245	158,850	162,047	165,947	171,447	177,186	183,173	189,420	195,938

## B.7 Business savings pass-through

To account for uncertainty around the amount of pass through of proceeds from charging and savings from reduced stocking to businesses, we assume the following pass through from;

1. Reduced stocking costs of SUCBs (all retailers): Given highly competitive nature of retail sector these might be reflected in reduced consumer prices or other goods offers, however, we are not aware of any evidence indicating what degree pass-through was observed when introducing the 5p SUCBs charge. Thus, we assumed that businesses keep any savings associated with reduced stocking costs.
2. Charging (MSMEs and airport retailers)  
Of the total collected through the charge, we assume 76% would go to good cause and 24% kept by businesses. This is in line with the information voluntarily provided by large retailers – for every 5p carrier bag sold, 3.8p, or 76%, was donated to good causes.
3. Charging (Large retailers and charities)
  - As above, 76% donated to good causes and 24% kept by large retailers to cover their remaining costs of SUCBs.
  - We assume charities use 100% of proceeds/savings from charging/reduced stocking for charitable activities. This is because they are non-profit operating organisations.

Savings from the sale of single use carrier bags are the net costs between our policy options and baseline. The costs are calculated by multiplying the number of bags by the price per bag i.e. 5p or 10p. Refer to B.1 for an explanation of how stocking costs are calculated.

### **B.8 Business familiarisation and IT update costs**

Following the IA 2015 methodology, business familiarisation costs include (i) staff training costs of sales and retail assistants to read and understand the new legislation and (ii) IT service delivery staff to update IT systems. Staff training costs are calculated at 1 hour of staff time. The IT costs include half an hour costs of an IT assistant's time to update the systems in each retail store with the new charge.

All unit costs are based on 2005 data from the Cabinet Office<sup>99</sup> and have been updated to 2019 prices. Familiarisation (i.e. staff training costs) and IT costs are estimated at £9.09 and £21.43 per hour in 2019 prices respectively. Both costs are calculated on a per retail outlet.

Based on correspondence with representatives of the Association of Convenience Stores (ACS), Local Shop Report 2018 found that 63% of independent retailers have an electronic point of sale (EPoS) system, rising to 69% across the whole sector of convenience stores. 39% of English retailers are already voluntarily charging 5p per a SUCB (see calculation in 'Voluntary 5p charge by MSMEs').

Thus, under Option 2, we expect that the remaining micro business population (63% of remaining 61% of micro businesses, or 78,789 micro businesses) will need to amend their EPoS system and are therefore faced with IT costs. In terms of small and medium businesses, we estimate that 95% operate an EPoS system and, again, 61% of these would face additional IT costs.<sup>100</sup> In terms of familiarisation costs with new legislation (i.e. training staff costs), we assume that 61% of all MSMEs will face these costs as other businesses have already introduced the charge. There are no familiarisation and IT costs to large retailers.

Under Option 3, only large retailers would be affected.

Under Option 4, we applied the same approach as above but we expect that all MSMEs operating EPoS systems would need to amend them to charge 10p. All MSMEs would experience the staff training costs of sales and retail assistants to read and understand the new legislation.

We estimate the number of SMEs, micro businesses, airport and charity shops as shown in Table B.6.

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<sup>99</sup> Cabinet Office - Better Regulation Executive (2005) *Measuring Administrative Costs, UK Standard Cost Model Manual*.

<sup>100</sup> Given the received information of 69% of MSMEs having an EPoS system, with 63% for micro businesses, this implies that 95% of SMEs should have an IT system in place.

**Table B.6 Number of outlets by category**

Business type	Number of shop outlets in England
Large businesses	22,008
Micro businesses	205,009
Small and medium businesses	48,089
Airport outlets <sup>101</sup>	891
Charity shops	9,368

Source: Retail at Bay, Retail Association for Charities, Heathrow airport guide and Civil aviation authority

Consequently, we estimate the training costs to be the product of i) staff costs per hour (£9.09) times one hour and ii) the relevant number of shop outlets. Thus, in Option 4, micro businesses face £1.9m familiarisation cost of training staff (£9.09 x 1 hour x 205,009) and £1.4m IT update costs (£21.43 x 0.5 hour x 63% (proportion of independent retailers with an EPoS system) x 205,009).

The Association of Convenience Stores fully support the methodology described above in so far as it relates to MSMEs. They note that staff training on company policy in relation to supply of carrier bags will have been necessary for a number of years and will already be fully embedded in wider training for customer facing staff. They note that such provision would pre-date the introduction of the SUCBs charge in 2015 for large retailers since prior to that there were a range of approaches to supply of SUCBs across the retail sector. Nevertheless, some initial additional cost (as outlined above) will be incurred on the extension of the SUCBs charge to MSMEs. However, beyond that, for new staff, the revised requirements for supply of SUCBs would simply be embedded in their wider “on the job” training provision and hence no additional training costs would be incurred on an ongoing basis.

### **B.9 Government transition costs**

The main government transition costs are to run regional training events for Local Authorities. These are calculated as the product between the number of regions in England (9 regions) multiplied by the cost per training event (£2000) multiplied by the number of training events held per region following a new legislation (we assume two training events per region in the year the charge is introduced). This results in total £36,000 transition costs to government which is applied to Options 2 and 4. No Government transition costs are assumed for Option 3 given the existing 5p charge in large retailers’ sector.

### **B.10 Recycling revenue and gross profit**

Following the methodology of 2015 impact assessment, recycling revenue is calculated by estimating the product of i) the weight of the bags with the number of bags estimated to be placed on market, ii) the proportion of bags assumed to be recycled<sup>102</sup>, and iii) the price of recovered mixed LDPE/HDPE/paper. We estimate the price of recovered Mixed LDPE is £170 per tonne in 2018 prices, HDPE (£25) and recovered mixed paper (£60).

101 Heathrow website reports to have 299 retail outlets and restaurants for all terminals. Using Civil Aviation authority data, it accounts for 81.2 million of passengers in 2018. Manchester, Stansted and East Midlands airports reported 200 retail outlets together, representing 80m passengers. This suggests that number of retail outlets correlates with number of passengers. Pro-rating the collected sample of airports (56% of England’s passengers) to 100% results to an estimated number of 891 retail outlets at English airports.

102 10% of SUCBs and BFLs are assumed to be recycled, while 85% of paper is assumed to be recycled.

Finally, we apply an estimate of 60% gross profit on the total recycling revenue, as used by a WRAP financial assessment of recycling mixed plastics.<sup>103</sup>

### **B.11 Litter costs and disamenity benefits**

Litter costs are estimated using the number of single use carrier bags as marine litter, road side litter, and the costs to the fishing industry, marine litter costs to harbours, costs of rescuing vessels, street cleaning costs to local authorities, costs to highway agencies and network rail. Road side litter is used as a proxy to estimate the amount of litter on rail ways. Included are also costs of littering paper bags in streets, roads and the network rail.

Following the 2015 impact assessment methodology, we assume 70% of costs to local authority street cleaning (£927m in England when uprating to 2019 prices) is attributed to removing litter in the best estimate (60% in the low and 80% in the high estimate). Next, we assume that 80% of the change in SUCBs use in any year results in lower costs from cleaning littered bags, i.e. a 1% fall in bag use results in a 0.8% fall in the cost of littered bags. There is no evidence to support a particular figure, so 80% is an assumption based on the reasoning that most but not all of the reduction in littered bags would result in a reduction in local authorities' litter costs.

Therefore litter costs are estimated as the product between the numbers of SUCBs, bags for life and paper bags littered (see Table B.9 below) multiplied by the cost of road side cleaning, costs of rescuing vessels, street cleaning, marine litter costs to harbours and the proportion of reduction in bag use that translates into reduced cost of cleaning litter (i.e. 80% of 70% of local authority street cleaning). Only single use carrier bags, bags for life and paper bags are assumed to be littered as we are not aware of an evidence showing that bin liners or cotton tote bags are littered.

Disamenity benefits to society from reduced litter have been estimated based on the amount of SUCBs and paper bags littered and the willingness to pay per person in increased council tax.

A joint study by the University of Leeds and Loughborough University for Defra<sup>104</sup> on valuation of local disamenity of several environmental factors including litter found that people were willing to spend an additional £3.95 per month or £47.40 per year on council tax to see a one point reduction in litter on a 10 point scale from bad to good (0=bad, 10=good). The study results also show that respondents were willing to pay £39.50 for a move from the worst situation to the best. Rather than estimating the willingness to pay on a population basis, since council tax is paid per household, we estimate our disamenity benefits on a household basis, i.e. we assume the willingness to pay is per household.

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<sup>103</sup> WRAP (2009), *A financial assessment of recycling mixed plastics in the UK*.

<sup>104</sup> This study used a large sample size of 561 respondents, covering three cities, and a blend of inner-city, suburban and rural settings. Mark Wardman, Abigail Bristow, Jeremy Shires, Phani Chintakayala and John Nellthorp (2013) *Estimating the Value of a Range of Local Environmental Impacts*, Report for Department for Environment, Food and Rural Affairs.

**Table B.7 Key findings from UK study on litter**

	Current situation (0=Bad, 10=Good)	Willingness to pay for one point improvement. (Per household per month)	Value of a move from worst to best (Per household per month)
Litter	3.43	£3.95	£39.5

Source: Defra (2013), Local Environmental Quality: Valuing the neighbourhood in which we live.

Note(s): Rankings of other environmental factors can be found in the final report

Since the survey was framing costs on a council tax basis, scaling has been undertaken using the number of households in England and the percentage change in littered bags under each option relative to baseline. We assume 5% of single use carrier bags and 5% of paper bags are littered each year<sup>105</sup>. Table B.8 shows the estimates of SUCBs, BFL and paper bags in litter. The resulting number of bags littered per year in each option are presented in Table B.9.

**Table B.8 Summary of indicators used to estimate litter costs and disamenity benefits**

Number of households in England	22,932,566 <sup>106</sup>
Percentage of SUCBs and paper bags littered of total sales	5% for each type <sup>107</sup>
Percentage of BFL bags litter out of total sales	2.8% <sup>108</sup>
SUCBs and paper bags (% of total national litter)	0.61% <sup>109</sup>
Bags for life (% of total national litter)	0.17% <sup>110</sup>

<sup>105</sup> The percentage of SUCBs is based on the 2014/15 Local Environmental Quality Survey of England survey results. An estimated 10% of supermarket bags sold were littered in England. But as was seen in Ireland, following the charge, litter associated with carrier bags dropped by 4.7 percentage points from 5% in 2001 to 0.32% in 2002 and remained fairly flat. Therefore, we assume the percentage of carrier bags littered of the proportion of number sold dropped by 4.7 ppt from 10% to around 5%.

<sup>106</sup> ONS (2017), Families and households dataset.

<sup>107</sup> Keep Britain Tidy (2015), *The Local Environmental Quality Survey of England 2014/15*.

<sup>108</sup> Based on WRAP Cymru (2018), *The composition of litter in Wales*. Out of total plastic bags littered, 17.2% represented plastic BFL. Plastic BFLs accounted for 26.4% of total plastic bags sales (SUCBs and plastic BFLs). This suggests that plastic BFLs are littered in lower proportion to SUCBs. Using this observation and applying it to England estimates of BFLs sales in 2015 (90% SUCBs and 10% BFLs), this implies that around 18.6 million of BFLs were littered. In other words, we estimate that 2.8% of BFLs were littered out of total BFLs 664 million sales in 2015.

<sup>109</sup> Department of Communications, Climate Action and Environment (2018), *Litter monitoring body – system results 2017*.

<sup>110</sup> Give that 5% of SUCB and paper bag sales ending up in litter translates to 0.61% in the total litter composition, this means that for 2.8% of BFLs sales ending up in litter would translate to 0.17% in the total litter composition.

**Table B.9 Number of SUCBs, BFLs and paper bags littered in England per year, all options, millions (2020-2030)**

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Option 1: Baseline	SUCBs	198	198	197	196	196	195	195	194	194	193	193
	Paper bags	38	40	42	44	46	48	51	53	56	58	61
	BFLs	39	40	42	43	44	46	47	49	50	52	53
	Total	275	278	280	283	286	289	293	296	300	303	307
Option 2	SUCBs	198	142	142	125	115	109	108	106	105	104	103
	Paper bags	36	40	42	44	46	48	51	53	56	59	61
	BFLs	39	41	43	44	46	47	49	50	52	53	55
	Total	273	223	226	213	206	204	207	210	213	216	219
Option 3	SUCBs	198	192	182	180	179	178	178	177	177	177	177
	Paper bags	38	41	43	45	47	50	52	55	57	60	63
	BFLs	39	41	42	43	45	46	48	49	51	52	54
	Total	275	274	267	269	271	274	278	281	285	290	294
Option 4	SUCBs	198	116	95	80	67	58	58	57	56	56	55
	Paper bags	38	41	43	45	48	50	52	55	58	60	63
	BFLs	39	41	43	45	47	48	50	51	53	55	56
	Total	275	198	182	170	162	156	160	163	167	171	175

To estimate the disamenity associated with SUCBs, BFLs and paper bags, we estimate the product of the number of households in England, the estimated annual willingness to pay to see up to 4.5 points reduction in litter per household<sup>111</sup>, the percentage of litter accounted for by SUCBs, BFLs and paper bags, and the percentage decrease in littered bags observed under each policy option (relative to baseline) per year.

As the levels of litter vary significantly from area to area in the UK, there is a question of aggregating this information to provide an accurate UK wide average. Taking into account this uncertainty, and the rational that we cannot achieved no litter across the UK (i.e. see a 10 point improvement in litter), we therefore consider a 5 point average improvement (on a scale of 0-10). A 4.5 point reduction in litter was chosen as a conservative estimate, rather than using the central value of 5.

### **B.13 Voluntary 5p charge by MSMEs**

Following the consultation responses, we have reviewed our assumption of the number of smaller businesses retailers that might have introduced 5p charge for SUCBs already. In particular, we assume the following based on the limited existing evidence of voluntary charging:

- Around 15% of MSMEs introduced the charge already in 2015. This is based on the estimates provided by the Association for Convenience Stores in terms of the number of their members that indicated to opt to take part in the scheme.<sup>112</sup>
- Next, we assume that around 39% of MSMEs voluntarily charge 5p per SUCB since 2018. This is based on the survey results of the Local Shop Report 2018 that reported 46% of respondents voluntarily charging. However, given that these were survey results for Great

<sup>111</sup> Using the point scale of the study (0-10 point change in litter), we assume on average households will be willing to pay an amount to see up to a 4.5 point improvement in litter. Therefore the associated costs is estimated as £47.40 x 4.5=£213.80.

<sup>112</sup> Business Advice website (2015), *Small retailers want to be included in the 5p plastic bag charge*.

Britain, we estimated what would that imply in terms of English convenience stores only as Wales and Scotland have compulsory charging in smaller retailer sector already. Based on the number of MSMEs in retail sector across the nations, this implies that around 39% of English MSMEs have introduced the voluntary charge by 2018

- For 2015-2019 period, we then estimate the number of SUCBs that would be affected by the 5p charge. For example, we assume that 15% of all SUCBs used by MSMEs in 2015 (529 million) would see an initial drop of 83% in Year 1, 87% by Year 3 and then continued reduction by 1% per year. Those MSMEs that have not introduced voluntary charging are assumed to see an increase by 1% per year.

We assumed that these estimates would be representative of the whole MSMEs sector. This is possibly an overestimate given that ACS' active role, and resulting share of its members voluntarily charging, is likely not to be the case across all MSMEs offering SUCBs. However, we are not aware of any other estimates of voluntary charging that would confirm or reject this sector-wide assumption.

Consequently, Option 2 does not result in any change for 39% of SUCBs offered by MSMEs and have only a marginal impact in Option 4 on those MSMEs, once raising the charge to 10p.

## Annex C: Greenhouse gas emissions impacts

This section reports the estimated GHGs emissions impacts under considered options, following the methodology explained in Annex B. Given that most SUCBs are imported from overseas, we report any GHG emissions savings in relation to the traded carbon emissions sector.

Tables C.1 and C.2 present the tonnage of GHGs emissions savings and associated monetary value under our best estimate only.

**Table C.1 GHG traded emission savings, in kilo-tonnes of CO<sub>2</sub>e, 2021-30**

GHGs emissions savings, in mtCO <sub>2</sub> e	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Option 2	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Option 3	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Option 4	0.02	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.04	0.03

**Table C.2 GHG emission savings, in £ millions, 2021-2030**

GHGs emissions savings, in £m	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Option 2	0.2	0.3	0.6	0.9	1.1	1.3	1.5	1.7	1.9	2.2
Option 3	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Option 4	0.3	0.5	0.8	1.1	1.5	1.8	2.0	2.3	2.5	2.8