Single-Use Disposable Beverage Cups Charge

Strategic Environmental Assessment: Environmental Report

August 2024

Scottish Government
Riaghaltas na h-Alba

Contents

1. Non-technical summary

1.1 Introduction

The Circular Economy (Scotland) Bill, passed unanimously by the Scottish Parliament in June 2024, gives Scottish Ministers new powers to require suppliers of single-use items to charge a minimum amount for such items, through the introduction of a new section 87A into the Climate Change (Scotland) Act 2009[1], with the policy aim of reducing consumption and therefore reducing the environmental harm caused[2]. The Scottish Government intends that an early use of such powers will be to introduce a minimum charge on single-use disposable beverage cups.

The Scottish Government is therefore proposing to make regulations requiring suppliers of beverages in single-use disposable beverage cups to charge a minimum amount for such cups. The policy aim is to reduce the consumption of single-use disposable beverage cups and therefore reduce the environmental harm caused. This will support the overall ambition to tackle our throwaway culture by avoiding unnecessary waste and use fewer resources. This aligns with a wider ambition to promote reusable alternatives as part of the shift towards a circular economy in Scotland.

1.2 Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) is a statutory requirement under the Environmental Assessment (Scotland) Act ('the 2005 Act'), to assess the likely significant environmental effects that a public plan, programme, or strategy (PPS) will have on the environment if implemented. The process identifies how adverse environmental effects can be avoided, minimised, reduced, or mitigated and how any positive effects can be enhanced. It also allows the public to give their view on the programme and its potential environmental impacts.

The SEA comprises the following key stages:

1. Screening**:** determining whether a PPS (in this instance, the proposed charge on single-use disposable beverage cups) requires an SEA. The Screening Report was issued to statutory consultees on 30 November 2023.
2. Scoping: establishing the scope and approach of the SEA, including the initial environmental topics to include, the context (a review of other PPSs and the environmental baseline), and the assessment methodology, with the information presented in a scoping report, which is subject to a 5-week consultation. The scoping report was issued to statutory consultees on 30 November 2023. An extended consultation period ran until 18 January 2024.
3. Environmental assessment: identifying, describing, and assessing the likely significant effects of the proposed charge.

[1] Climate Change (Scotland) Act 2009
[2] Circular Economy (Scotland) Bill

4. Environmental report: outlining the findings from the environmental assessment, consistent with the requirements of Schedule 3 of the 2005 Act. This report is the Environmental Report.
5. Main consultation: consulting on the draft policy alongside the environmental report;
6. Post adoption statement (PAS): producing a statement to outline how the assessment and consultation responses have been considered within the finalised plan. This will be produced once the final version of the policy has been agreed and adopted.
7. Monitoring: monitoring the effects of implementation. This will be an ongoing exercise to determine the impacts of the charge evaluate its success in achieving its aims.

The SEA approach has been amended where appropriate in response to the comments received from statutory consultees during the consultation period on the combined Screening and Scoping Reports. A summary of the responses received and corresponding actions taken is set out in Appendix A: Addressing responses from consultative authorities.

1.3 Results

1.3.1 Summary of results

The impacts of the proposed charge identified in this assessment are summarised below:

Table 1 Summary of impacts against each environmental topic

Climatic Factors	Biodiversity	Water	Human health	Soil	Material Assets	Landscape and visual impacts
+	++	+/-	+/-	+	++	++

Key

++	Positive impacts
+	Minor or uncertain positive impacts
+/-	Uncertain or both positive and negative impacts

The following sections summarise the overall impacts expected within each of the environmental topics as a result of the proposed charge. The underlying evidence and calculations are set out in section 5.

1.3.2 Climatic factors

While it is not possible to quantify with certainty what the carbon impact of the proposed charge will be, it is anticipated that a net reduction in greenhouse gas emissions will be observed. This is due to an expected decrease in demand for single-use disposable beverage cups in favour of reusable alternatives, which, over their lifetime, are likely to have a lower contribution to climate change.

1.3.3 Biodiversity

A reduction of between 62.1 and 159.4 million cups expected to be placed on the market by 2035[3] is likely to lessen the associated burden on habitats and species in areas where raw materials are extracted and where manufacturing and disposal activity takes place.

As a result of an estimated 0.4 – 12.1 million fewer cups and 0.2 – 6.0[3] million fewer lids being littered in Scotland each year after 10 years of the charge, it is anticipated that resultant environmental damage to ecosystems will be lessened due to reduced exposure to harmful leachates.

1.3.4 Water

The proposed charge is anticipated to increase water use due to increased use of reusable beverage cups requiring regular cleaning, either by hand or in a dishwasher. This will be partially offset by reduced demand for single-use disposable beverage cups, and the associated water use in their production[4].

The charge is expected to improve water quality in Scotland due to a reduction in littered single-use disposable beverage cups and a corresponding drop in associated leachates such as microplastics.

1.3.5 Human health

The proposed charge is expected to have an impact on the materials from which consumers drink hot and cold beverages. As different materials will demonstrate different levels of migration, the human health impact of the proposed charge is dependent upon the material of the reusable alternatives adopted.

Some positive mental health effects may be seen among the population as a result of the charge achieving litter reductions.

[3] Consumption of Single-use Disposable Beverage Cups in Scotland, 2023
[4] Reusable coffee cups life cycle assessment and benchmark, Edge for KeepCup, 2018

1.3.6 Soil

As a result of fewer single-use disposable beverage cups and lids being littered in Scotland following the implementation of the charge, it is anticipated that resultant damage to soils will be lessened due to reduced contamination e.g. from microplastics.

1.3.7 Material assets

The proposed charge is estimated to reduce the number of single-use disposable beverage cups placed on the Scottish market by between 24.4% and 45.9%[3], thus reducing the amount of paperboard, plastics, and bioplastics consumed and ultimately disposed of or littered. Encouraging the use of reusable alternatives to throwaway packaging will help to normalise and embed circular economy behaviours in Scotland.

1.3.8 Landscape and visual impacts

It is estimated that between 0.4 and 12.1 million fewer single-use disposable beverage cups and between 0.2 and 6.0 million fewer lids will be littered in Scotland each year after 10 years of the charge[5]. This is anticipated to enhance the appearance of outdoor spaces in Scotland by reducing volumes of litter which can detract from the landscape's natural beauty.

2. Introduction

2.1 Background

A priority in a more circular economy is to avoid unnecessary waste and use fewer resources. In recent years, there has been a significant increase in the use of single-use disposable beverage cups, and it is estimated that 388.7 million single-use disposable beverage cups were placed on the market in Scotland in 2021-22[6]. This equates to 71 single-use disposable beverage cups per capita per year, one of the highest compared to other nations within the European Union. Within this report it is estimated that around 62% were used for single-use disposable beverage cups for hot beverages and 38% of these were used for cold beverages.

The Circular Economy (Scotland) Bill, passed unanimously by the Scottish Parliament in June 2024, gives Scottish Ministers new powers to require suppliers of single-use items to charge a minimum amount for such items, through the introduction of a new section 87A into the Climate Change (Scotland) Act 2009[7], with the policy aim of reducing consumption and therefore reducing the environmental harm caused[8]. The Scottish Government intends that an early use of such powers will be to introduce a minimum charge on single-use disposable beverage cups. This report is published alongside a

[5] Consumption of Single-use Disposable Beverage Cups in Scotland, 2023
[6] Ibid
[7] Climate Change (Scotland) Act 2009
[8] Circular Economy (Scotland) Bill

consultation document setting out our proposals for how a minimum charge on single-use beverage cups would look. In that document we propose that:

- a charge of at least 25p should apply to all single-use beverage cups when an individual buys a drink of any kind, to maximise coverage and ensure the charge is easily understood;
- the charge will apply regardless of cup material, and therefore would include cups made of biodegradable material or bio-based plastics. While it can be argued that these are more sustainable than traditional plastics, they are still single-use and present their own sustainability challenges including a lack of recycling infrastructure and frequency of littering;
- that there will be a limited number of exemptions based on purpose or setting, for instance when a drink is free, in non-retail hospital and care settings, in schools and when a drink is bought from a vending machine;
- retailers should be able to retain reasonable implementation costs from the charge, in line with the approach taken for the single use carrier bags charge; and
- that net proceeds of the charge should be used for the advancement of environmental protection or improvement, or to any other purposes that may be reasonably regarded as analogous.

This approach aligns with the Scottish Government's commitment to keep pace with or exceed the EU Directive on single-use plastics (Single-Use Plastics (SUP) Directive - Directive (EU) 2019/904) where able to do so and in a manner that contributes towards maintaining and advancing standards. Article 4 (consumption reduction) of the Directive requires necessary measures to be taken to achieve an ambitious and sustained reduction in the consumption of single-use plastic cups for beverages (and food containers). Under the Environmental Protection (Single-use Plastic Products) (Scotland) Regulations 2021, a ban on some of the most problematic items, including single-use cups made of expanded polystyrene (EPS), came into force in Scotland in June 2022[9].

To support the development of a single-use disposable beverage cups charge the Scottish Government has established the Single-Use Disposable Cups Charge Advisory Group to provide advice and expertise on development of a minimum charge on single-use disposable beverage cups charge[10]. The Group undertook stakeholder engagement to gain more insight into key issues. Scottish Government has also undertaken further stakeholder engagement to gain more insight into key issues and, through Zero Waste Scotland, commissioned a research paper on 'Consumption of Single-use Disposable Beverage Cups in Scotland'[1]. The paper was published in June 2023 and lays out the single-use disposable beverage cup usage in Scotland, potential impact of a charge as well as international examples of alternative reusable cup schemes.

This builds on the work of the Expert Panel on Environmental Charging and Other Measures (EPECOM) which reported on single-use disposable beverage cups in 2019.

[9] Environmental Protection (Single-use Plastic Products) (Scotland) Regulations 2021
[10] Scottish Government, Single-Use Disposable Cups Charge Advisory Group

The Panel concluded that the evidence showed that: “Environmental charges, notably price-based interventions, have been shown to be effective at reducing consumption and should be considered in tandem with other preventative measures. The Panel believes that a charge is more effective at reducing consumption and increasing reusable cup use.”[11]

Loss aversion theory shows individuals have a higher sensitivity to potential losses than to gains[12]. This would mean charging for products has a stronger impact on behaviour change than offering a discount.

The Scottish Government is therefore seeking to make regulations requiring suppliers of beverages in single-use disposable beverage cups to charge a minimum amount for such cups. The policy aim is to reduce the consumption of single-use disposable beverage cups and therefore reduce the environmental harm caused. This will support the overall ambition to tackle our throwaway culture by avoiding unnecessary waste and use fewer resources. This aligns with a wider ambition to promote reusable alternatives as part of the shift towards a circular economy in Scotland.

The planned charge on single-use disposable beverage cups forms part of a suite of measures being taken forward by the Scottish Government to reduce our reliance on single-use items, including the implementation of the Environmental Protection (Single-use Plastic Products) (Scotland) Regulations 2021 in June 2022 and an increase to the charge placed on single use carrier bags.

In 2022, the Government and Devolved Administrations committed to introduce a UK-wide mandatory takeback requirement for fibre-based composite cups through Extended Producer Responsibility for Packaging (pEPR). Mandatory takeback would require sellers of filled fibre-based composite cups that employ 10 or more full time equivalents (FTEs) s to provide for the separate collection of used cups (either generated in-store or consumed 'on-the-go').

This policy would be a complementary measure to the cups charge and help achieve circular economy goals. As outlined in the Circular Economy (Scotland) Bill Policy Memorandum[13], charging for single-use disposable beverage cups is expected to reduce consumption of single-use disposable beverage cups, promoting behavioural change and moving consumers to reusable alternatives. Mandatory takeback would help improve the recycling of remaining fibre-based single-use disposable beverage cups.

[11] Single-use disposable cups: EPECOM recommendations, Scottish Government, 2019
[12] How Incentive Framing Can Harness the Power of Social Norms. Organizational Behaviour and Human Decision Processes, 2019, Lieberman et al
[13] Circular Economy (Scotland) Bill, Policy Memorandum, Scottish Parliament, 2023 – paragraph 63

2.2 What is strategic environmental assessment?

Strategic Environmental Assessment (SEA) is a statutory requirement under the Environmental Assessment (Scotland) Act 2005[14] ('the 2005 Act'), to assess the likely significant environmental effects that a public plan, programme, or strategy (PPS) will have on the environment if implemented. The process identifies how adverse environmental effects can be avoided, minimised, reduced or mitigated and how any positive effects can be enhanced. It also allows the public to give their view on the programme and its potential environmental impacts.
SEA comprises the following key stages:

1. Screening: determining whether a plan/programme/strategy (in this instance, the proposed charge on single-use disposable beverage cups) requires an SEA. The screening report was issued to statutory consultees on 30 November 2023.

2. Scoping: establishing the scope and approach of the SEA, including the initial environmental topics to include, the context (a review of other plans, programmes, and strategies and the environmental baseline), and the assessment methodology, with the information presented in a scoping report, which is subject to a five-week consultation. The scoping report was issued to statutory consultees on 30 November 2023. An extended consultation period ran until 18 January 2024.

3. Environmental assessment: identifying, describing, and assessing the likely significant effects of the proposed charge.

4. Environmental report: outlining the findings from the environmental assessment, consistent with the requirements of Schedule 3 of the 2005 Act. This report is the environmental report.

5. Main consultation: consulting on the draft policy alongside the environmental report.

6. Post adoption statement (PAS): Producing a statement to outline how the assessment and consultation responses have been considered within the finalised plan. This will be produced once the final version of the policy has been agreed and adopted.

7. Monitoring: monitoring the effects of implementation. This will be an ongoing exercise to determine the impacts of the charge evaluate its success in achieving its aims.

The SEA approach has been amended where appropriate in response to the comments received from statutory consultees during the consultation period on the combined screening and scoping reports. A summary of the responses received and

[14] Environmental Assessment (Scotland) Act 2005

corresponding actions taken is set out in Appendix A: Addressing responses from consultative authorities.

3. Approach to the assessment

3.1 Scope of the assessment

This assessment considers the estimated impacts of the proposed charge on single-use disposable beverage cups across Scotland, focusing on the 10-year period from implementation in 2025 to the year 2035.

The proposed charge applies to all single-use disposable beverage cups, for both hot and cold drinks.

Table 2 sets out the environmental topics scoped into this assessment, as proposed in the scoping report. 'Cultural heritage and the historic environment' and 'Air' have been scoped out of this assessment since no significant direct impacts are anticipated in either of these areas. Feedback from the consultation on the scoping report indicated that all statutory consultees were satisfied with the environmental topics proposed. Following feedback from NatureScot on the scoping report, some of the objectives have been amended to include environmental enhancement and maximisation of opportunities for benefit as well as environmental protection and avoidance of negative impacts.

Table 2: Scope of environmental topics assessed

Biodiversity	Human health	Soil	Water	Air	Climatic Factors	Material Assets	Cultural heritage and the historic environment	Landscape and visual impacts
In	In	In	In	Out	In	In	Out	In

3.2 Environmental objectives

The anticipated impacts of the proposed charge have been assessed against each of the following environmental objectives, as set out in the scoping report (and amended following advice from consultees).

Climatic factors

- Reduce greenhouse gas (GHG) emissions resulting from the production and disposal of single-use disposable beverage cups.

Biodiversity

- Maximise opportunities to improve the quality of natural habitats by avoiding pollution and habitat loss associated with the production and disposal of single-use disposable beverage cups in terrestrial, coastal, and marine ecosystems; and

- Avoid adverse impacts to habitats and species resulting from littered single-use disposable beverage cups.

Human health

- Avoid adverse impacts to human health resulting from exposure to food contact materials.

Soil

- Enhance soil quality in Scotland by reducing soil pollution (e.g. microplastics) from littered single-use disposable beverage cups.

Water

- Promote sustainable use of water resources in the production and maintenance of different types of beverage cups; and
- Enhance water quality in Scotland by reducing pollution from littered single-use disposable beverage cups in bodies of water.

Material assets

- Reduce consumption of virgin materials used to produce single-use disposable beverage cups;
- Maximise potential to embed a circular economy in Scotland by encouraging consumers to opt for reusable alternatives to single-use disposable beverage cups; and
- Reduce loss of materials to landfill, energy recovery, or litter in the form of waste single-use disposable beverage cups.

Landscape and visual impacts

- Enhance the appearance of outdoor spaces in Scotland by reducing the volume of littered single-use disposable beverage cups in the environment and the associated negative visual impacts.

3.3 Consideration of reasonable alternatives

The Environmental Assessment (Scotland) Act 2005 requires that reasonable alternatives be assessed. This assessment will consider the environmental impacts of the proposed charge against the reasonable alternative of not implementing the charge, i.e., ‘do nothing’, or continue with ‘business as usual’. As the commitment to introduce a charge has been made by the Scottish Government, and it is not a requirement of existing legislation, it is considered reasonable to assume that if this charge were not implemented, no equivalent measure would be introduced as an alternative.

Under a ‘do nothing’ or ‘business-as-usual scenario’, it is anticipated that some voluntary arrangements would be put in place. For example, single-use disposable beverage cup recycling schemes, discounts for bringing your own reusable cup, or single-use disposable beverage cup charges could be arranged by businesses voluntarily. Indeed, some retailers have such schemes already in place.

However, these would not be on a national scale and without a mandatory minimum charge, if the charge for single-use disposable beverage cups is set too low, the impacts are expected to be minimal. For example, EPECOM research suggests that a 5 pence charge on single-use disposable beverage cups does not change consumer behaviour[15]. Mandatory takeback schemes may be introduced as part of the reforms to pEPR, though it is not anticipated that this would impact consumption of single-use disposable beverage cups, only the recycling of them.

Feedback on the scoping report indicated that statutory consultees were satisfied with the proposed reasonable alternative.

3.4 Environmental principles

The assessment in this SEA has followed the guiding principles in Section 13(1) of the Continuity Act. These principles are:

- The principle that protecting the environment should be integrated into the making of policies;
- The precautionary principle as it relates to the environment;
- The principle that preventative action should be taken to avert environmental damage;
- The principle that environmental damage should as a priority be rectified at source; and
- The principle that the polluter should pay.

The assessment objectives encompass the principles that environmental damage should be prevented or reduced by the policy in question. The assessment highlights any outcomes of the proposed policy that may be expected to cause environmental damage.

The introduction of a charge on single-use disposable beverage cups is guided by many of these principles. The charge is being implemented with the aim of protecting the environment from the negative impacts of single-use material consumption and waste. The charge is guided by principles of taking preventative action to avert environmental damage and the rectification of impacts at source; seeking to address the environmental impacts of single-use items by reducing their consumption in the first instance.

[15] Single-use disposable cups: EPECOM recommendations, Scottish Government, 2019

3.5 Assessment methodology

This SEA has been undertaken on a topic-by-topic basis, assessing the anticipated impact of the proposed charge against each of the agreed environmental topic objectives presented in section 3.2. The assessment has been guided by the environmental principles set out in section 3.4.

Step 1: Review of relevant literature

Existing life cycle assessments, studies, and academic literature have formed the basis of the initial research stage of this assessment.

A number of key variables and uncertainties were identified as unknowns in this topic area. These are set out in section 5.1, and any assumptions made stated throughout the assessment.

Estimates formed as part of a report[16] commissioned by Zero Waste Scotland on the consumption of single-use disposable beverage cups in Scotland were used to ascertain the expected changes in volumes of cups placed on the market in response to a charge under three different scenarios.

Conclusions from other literature sources were combined with these estimates to present three possible scenarios (low, medium, and high impact) for the quantifiable environmental effects of the proposed charge.

Step 2: Supplementary data

It was proposed in the scoping report that any additional data that could not be obtained from the literature review would be sought using a life cycle inventory database, with processes modelled in life cycle assessment (LCA) software.

Throughout the course of the experiment, this step was not deemed necessary. Wherever results from LCA studies needed to be amended to better reflect the situation in Scotland, existing results (such as those taken from the Scottish Waste Environmental Footprint Tool) were used to supplement the data instead of using LCA databases and software to build up results from scratch.

Step 3: Relating back to environmental objectives

Following the literature review and subsequent calculations, the estimated changes in consumption, behaviours, and corresponding environmental impacts were related back to the environmental objective set out in section 3.2.

Step 4: Consideration of cumulative effects

Interactions between identified impacts under the different environmental topics were considered qualitatively to identify any conflicting or enabling outcomes.

[16] Consumption of Single-use Disposable Beverage Cups in Scotland, Zero Waste Scotland, 2022

4. Environmental baseline and related plans, programmes, and strategies

4.1 Circular economy and single-use packaging regulations

The Circular Economy (Scotland) Bill, passed unanimously by the Scottish Parliament in June 2024, gives Scottish Ministers new powers to require suppliers of single-use items to charge a minimum amount for such items, through the introduction of a new section 87A into the Climate Change (Scotland) Act 2009[17], with the policy aim of reducing consumption and therefore reducing the environmental harm caused[18]. The Scottish Government intends that an early use of such powers will be to introduce a minimum charge on single-use disposable beverage cups.

Other provisions in the bill include:

- Publishing a strategy for a circular economy every five years and creating new circular economy targets;
- Restrictions on the disposal of unsold consumer goods;
- Creating new powers and responsibilities regarding local authority collection of household waste, including allowing Scottish Ministers to set local authority recycling targets;
- More enforcement powers to tackle issues such as litter and flytipping; and
- Reporting on waste and surplus.

The Scottish Government launched a consultation on Scotland's Circular Economy and Waste Route Map to 2030[19] in January 2024. The route map sets out how Scotland intends to deliver its sustainable resource use and circular economy ambitions, including making use of the new powers included in the Circular Economy (Scotland) Bill.

The Route Map is designed to drive progress in three key areas:

1. Setting the strategic direction and laying foundations for how we will deliver our system-wide, comprehensive vision for Scotland's circular economy from now to 2030 – based on responsible production, responsible consumption, and maximising value from waste and energy.
2. Setting out priority actions from now to 2030 to accelerate more sustainable use of our resources across the waste hierarchy. We acknowledge the progress we have made against our existing 2025 waste reduction and recycling targets, the areas we have fallen short, and the lessons we can learn as we set out the framework for what comes next.

[17] Climate Change (Scotland) Act 2009
[18] Circular Economy (Scotland) Bill
[19] Scotland's Circular Economy and Waste Route Map to 2030, Scottish Government, 2024

3. Reducing emissions associated with resources and waste. Ahead of the next Climate Change Plan (CCP)[20], the Route Map sets out the opportunities we will take to decarbonise the waste sector.

Measures in the Route Map are grouped under four strategic aims, reflecting the span of the waste hierarchy:

1. Reduce and reuse;
2. Modernise recycling;
3. Decarbonise disposal; and
4. Strengthen the circular economy.

The first strategic aim of the Route Map includes a proposal to develop a prioritised approach to the introduction of environmental charges to tackle consumption of problematic products and promote a move to more sustainable alternatives by 2025-26. Specifically, the Route Map commits to the introduction of a charge on single-use disposable beverage cups by 2025.

This approach aligns with the Scottish Government's commitment to keep pace with, or exceed, the European Union Directive on the Reduction of the Impact of Certain Plastic Products on the Environment (Single-Use Plastics (SUP) Directive – Directive (EU) 2019/904)[21] where able to do so and in a manner that contributes towards maintaining and advancing standards. The EU SUP Directive underscores the substantial adverse effects on the environment, health, and economy caused by specific plastic products, particularly single-use items. This directive builds upon the 'European Strategy for Plastics in the Circular Economy'[22], providing a dedicated legal framework to elevate the level of commitment seen in national measures targeting litter prevention and reduction, with a specific emphasis on single-use plastics. The directive introduces measurable and quantitative reductions at the national level in the production and consumption of single-use plastic products. It also advocates for harmonised technical standards, improved product design, extended producer responsibility schemes, and differentiated labelling standards for particular items.

The Environmental Protection (Single-use Plastic Products) (Scotland) Regulations 2021[23] were laid in the Scottish Parliament in November 2021 and came into force June 2022. The regulations make it an offence for businesses to manufacture or to supply the following items: "single-use expanded polystyrene beverage cups including covers and lids; single-use expanded polystyrene beverage containers including caps and lids; single-use expanded polystyrene food containers; single-use plastic cutlery including forks, knives, spoons and chopsticks; single-use plastic plates; and single-use plastic beverage stirrers". The regulations also make it an offence for businesses to supply single-use plastic straws and balloon sticks, subject to exceptions allowing them to be provided in specific circumstances. The regulations define single-use as: "a product that

[20] Securing a green recovery on a path to net zero: climate change plan 2018–2032 - update - Scottish Government, 2020
[21] Directive on the Reduction of the Impact of Certain Plastic Products on the Environment, 2019, The European Union
[22] European Strategy for Plastics in the Circular Economy, European Commission
[23] The Single-use Plastic Products (Scotland) Regulations 2021

is not conceived, designed or placed on the market to accomplish, within its life span, multiple trips or rotations by being returned to a producer for refill or reused for the same purpose for which it was conceived".

The reformed UK packaging EPR scheme[24] will be the first UK scheme to implement full net cost recovery, mandatory labelling, and modulated fees. It aims to increase packaging recycling rates and will set a new minimum standard for UK pEPR schemes.

The scheme will replace existing regulations under powers in the Environment Act 2021 and will work in tandem with the Packaging (Essential Requirements) Regulations 2015[25] which set standards for placing packaging on the market.

Key features of the revised scheme are that:

- Producers pay the full net cost of efficient and effective household packaging waste collections, and the costs of managing packaging waste from public bins;
- Evidence notes must be purchased by producers for packaging disposed of through commercial waste services;
- Producers pay modulated fees based on the recyclability of packaging placed on the market;
- Mandatory labelling will indicate recyclability of packaging in kerbside collections;
- Improved reporting of packaging placed on the market;
- Mandatory takeback and recycling of fibre-based, single-use disposable beverage cups by retailers; and
- In Scotland and Wales, producers will pay the cost of clearing littered packaging.

4.2 Climatic factors

The Climate Change (Scotland) Act 2009[26] ('the 2009 act') sets out Scotland's commitment on tackling climate change. The 2009 act sets out the statutory framework for greenhouse gas emissions reduction in Scotland and set targets for reduction in emissions of the seven Kyoto Protocol greenhouse gases by 80% by 2050, compared to the 1990-1995 baseline level. The 2009 act was amended in 2019 through the Climate Change (Emissions Reduction Targets) (Scotland) Act27 ('the 2019 Act'). The 2019 Act set targets to reduce Scotland's emissions of all greenhouse gases to net-zero by 2045 at the latest, with interim targets for reductions of at least 56% by 2020, 75% by 2030, 90% by 2040. The 2019 Act also requires that annual greenhouse gas emissions targets are set, by order, for each year in the period 2021-2045. Following the initial phase of target-setting, the annual targets are set in nine-year batches.

'The Handbook of Climate Trends Across Scotland'[28] shows that the effects of climate change are already being felt in Scotland. Although the effects and severity of climate

[24] Extended producer responsibility for packaging: who is affected and what to do, UK Government, 2022
[25] Packaging (Essential Requirements) Regulations 2015
[26] The Climate Change (Scotland) Act 2009
[27] The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019
[28] The Handbook of Climate Trends Across Scotland, SNIFFER, 2006

change is expected to vary by location, there is significant evidence in the literature to support that significant changes in precipitation, snowfall, seasonality, cloud cover, humidity, wind speeds, soil moisture, rising sea levels and other extreme weather events may occur[29]. The significant climate change impacts of material consumption and waste, along with the critical mitigating impact of resource efficient, circular economy policies have been firmly established in academic literature. Zero Waste Scotland's report 'The Carbon Impacts of the Circular Economy (2015)'[30] estimates that over two thirds of Scotland's carbon footprint is directly related to material consumption and, to a lesser extent, waste.

'The Scottish Waste Environmental Footprint Tool'[31] found that, in 2022, both paper and cardboard and plastic waste were among the top five highest contributors to climate change of all household waste streams.

This assessment will focus on how a charge on single-use disposable beverage cups is expected to contribute to changes in Scotland's greenhouse gas emissions through a reduction in consumption and subsequent disposal of single-use disposable beverage cups in favour of reusable alternatives.

4.3 Biodiversity

'Scotland's Biodiversity Strategy for 2045 (2020)'[32] lays out the Scottish Government's plan for a 'nature positive' Scotland by 2045. The document defines nature positive as 'reversing the downward curve of biodiversity loss so that levels of biodiversity are once again increasing, bending the curve of biodiversity loss'. The strategy lists a set of outcomes that cover various environments including land and seascapes, rivers, lochs, wetlands, and coastal areas. The strategy also includes a list of priority actions for 2030, which are split into the following categories:

- Accelerating restoration and regeneration;
- Expanding and connecting protected areas and improving their condition;
- Nature-friendly farming, fishing, and forestry;
- Recovering and protecting vulnerable and important species; and
- Investing in nature.

Biodiversity is commonly used as a measure of the health of an ecosystem and helps to provide the ecosystem services that are the basis of life including the regulation of air and water, soil formation, nutrient cycling, flood regulation and pollination[33]. In May 2019, the proportion of nationally protected nature sites reported as being in a 'favourable' condition decreased by 0.8% from 79.7% in 2018 to 78.9%. Despite this

[29] Fifth Assessment Report (AR5), IPCC, 2014
[30] The Carbon Impacts of the Circular Economy, Zero Waste Scotland, 2015
[31] Scottish Waste Environmental Footprint Tool: 2022 Household Waste Results Summary, Zero Waste Scotland, 2024
[32] Scotland's Biodiversity Strategy for 2045, Scottish Government, 2022
[33] Strategic Environmental Assessment of the Update to the Climate Change Plan 2018-2032 Environmental Report, Scottish Government, 2020

recent decrease, the current status represents a 2.9% percentage point increase since the current protocols were established in 2007[33].

Litter as a result of incorrectly disposed of single-use disposable beverage cups can negatively impact biodiversity through entanglement and ingestion. Plastics in the environment can also act as vector for other pollutants[33]. Plastic litter is estimated to lead to the mortality, either directly or indirectly, of one million seabirds, 100,000 marine mammals, including 30,000 seals and 100,000 turtles, globally every year either through entanglement or ingestion[34]. These impacts can negatively affect species' ability to hunt, avoid predators and reproduce. This can result in deficiencies in a habitats ability to host a variety of individual species and provide nesting sites. These impacts will also influence the services the ecosystem can provide for human populations, such as food production and carbon sequestration[33].

This assessment will seek to determine whether the proposed charge will impact on the Scottish Government's plans for a nature positive Scotland or impact Scotland's biodiversity through changing levels of litter resulting from consumption of single-use disposable beverage cups.

4.4 Human health

The Food Safety Act 1990[35] is a piece of UK legislation that aims to ensure the safety and hygiene of food throughout the food production and distribution chain. It places the responsibility of food safety onto food businesses to ensure the products they sell are safe for consumption. The act also empowers food hygiene regulations, which set standards for the handling, preparation, and storage of food. The Materials and Articles in Contact with Food (Scotland) Regulations 2012[36] aim to ensure the safety of food and protect public health by establishing specific requirements for materials and articles used in the food industry. These regulations were made by Scottish Ministers exercising powers given through the Food Safety Act 1990 and implemented a number of EU Directives all related to materials coming into contact with food. This includes regulation on plastic materials and articles intended to come into contact with food[37].

There may also be mental health benefits arising from the anticipated reduction in littered cups. The 'Scottish Litter Survey'[38] found that the effects of litter on local residents' health and wellbeing was among respondents' top three concerns, ranking third after the impact on animals and the environment and negative perceptions of the neighbourhood. The majority of people frequently spotted single-use hot and cold beverage containers littered in their local area.

The Carnegie Trust also found that those who reported the highest incidence of environmental incivilities such as litter were more likely to report anxiety, depression,

[34] Marine Litter Issues, Impacts and Actions, Marine Scotland, 2011
[35] The Food Safety Act 1990
[36] The Materials and Articles in Contact with Food (Scotland) Regulations 2012
[37] Regulation (EU) 10/2011 on plastic materials and articles intended to come into contact with food, European Union, 2011
[38] Scottish Litter Survey, Keep Scotland Beautiful, 2023

poor health, smoking, and poor exercise than those with more positive views on this aspect of their local environment[39]. Another study[40] investigated the effect of litter on psychological reactions to marine environments. The study found that photographs of un-littered coasts tended to provide participants with a sense of happiness and less stress while photographs exhibiting littered coasts caused participants to exhibit stress and a lack of the positive psychological benefits that coastal environments normally provide.

This assessment will focus on how a charge on single-use disposable beverage cups could impact the health of the population of Scotland, for example, through changes in exposure to food contact materials and mental health benefits arising from reductions in litter.

4.5 Water

The European Water Framework Directive[41] sets objectives on the condition of water bodies including rivers, lochs, transitional and coastal waters, and groundwater resources. Assessments of the chemical and ecological status and consideration of the biodiversity status are required as indicators of water quality. The Water Environment and Water Services (Scotland) Act 2003 and the Water Environment (Controlled Activities) (Scotland) Regulations 2011 set out water environment protection and improvement in the Scottish context.

Scotland's water provides a wide range of benefits such as the provision of drinking water and as a resource for use in agriculture and industry[42]. These water resources also support a rich diversity of habitats and species, attract tourism, promote recreation, and provide for the sustainable growth of the economy[43]. Most of Scotland's seas, coasts, and estuaries are in good or excellent condition, with nearly half of rivers in Scotland in good condition or better and almost two thirds of lochs in good or high condition. Around 80% of Scotland's groundwater is in good condition, although there are regions with widespread problems, for example, in central Scotland[44].

Water use is present in the manufacture phase of single-use disposable beverage cups and in both the manufacture and use phase of reusable alternatives[45]. Literature suggests that reusable cups use significantly lower quantities of water during the manufacture phase when compared to single-use alternatives[46]. However, this will depend on the design of the cup and the materials used to manufacture it.

---

[39] Pride in Place: Tackling Incivilities, Carnegie Trust UK, 2012
[40] Factors That Can Undermine the Psychological Benefits of Coastal Environments: Exploring the Effect of Tidal State, Presence, and Type of Litter, Wyles et al., 2016
[41] The European Water Framework Directive
[42] Scotland's Freshwater, Scotland's Environment, 2023
[43] Scotland's State of the Environment Report 2014, Scotland's Environment, 2014
[44] Rivers and Canals, Scotland's Environment, 2014
[45] Environmental payback periods of reusable alternatives to single-use plastic kitchenware products, Fetner, H., Miller, S.A., 2021
[46] Consumption of Single-use Disposable Beverage Cups in Scotland, Zero Waste Scotland, 2022

The use phase of reusable cups is the most significant contributor to the water use in the life cycle of reusable cups, and this phase is dominated by washing[46]. Therefore, how reusable cups are washed is an important variable. The method of washing (e.g. dishwashing or handwash) will have a significant effect on the water usage in the use phase[47].

There is evidence in literature that links microplastic pollution of coastal and marine environments with incorrect disposal of single-use disposable beverage cups[48]. As there are very few plastic free single-use disposable beverage cups[49] on the market in Scotland, it can reasonably be assumed that littered cups are a contributor to microplastic pollution in Scotland's water bodies. Pollution from microplastics can pose a threat to Scotland's water quality as they can be ingested by species at all trophic levels. Ingestion can cause impairment which can affect an organism's ability to avoid predators, hunt for food, or reproduce, which in turn can lead to a reduction in affected species[50].

4.6 Soil

The EU Soil Strategy for 2030[51] sets out measures to protect and restore soils and ensure they are used sustainably. It sets objectives to achieve healthy and resilient soils by 2050, with interim actions by 2030. It includes a new Soil Health Law by 2023 to ensure a high level of environmental and health protection. It is one of the key deliverables from the EU Biodiversity Strategy for 2030[52] and will contribute to the European Green Deal[53] objectives.

At a national level, the Scottish Soil Framework (2009)[54] set out a vision that soils are recognised as a vital part of the economy, environment, and heritage, to be safeguarded for existing and future generations. The framework was created to promote sustainable management and protection of soils consistent with the economic, social, and environmental needs of Scotland. It describes seven main classes of soil function, namely:

- Providing the basis for food and biomass production;
- Controlling and regulating environmental interactions: regulating water flow and quality;
- Storing carbon and maintaining the balance of gases in the air;
- Providing valued habitats and sustaining biodiversity;
- Preserving cultural and archaeological heritage;
- Providing raw materials; and

[47] Environmental payback periods of reusable alternatives to single-use plastic kitchenware products, Fetner, H., Miller, S.A., 2021
[48] Ibid
[49] Consumption of Single-use Disposable Beverage Cups in Scotland, Zero Waste Scotland, 2022
[50] Wet wipes containing plastic – proposed ban: strategic environmental assessment, Scottish Government, 2023
[51] The EU Soil Strategy for 2030, European Commission, 2021
[52] EU biodiversity strategy for 2030, European Commission
[53] European Green Deal, European Commission
[54] Scottish Soil Framework, Scottish Government, 2009

- Providing a platform for buildings and roads.

Soil is a non-renewable resource which supports a wide range of natural processes and underpins much of our natural environment, helping to provide a wide range of environmental, economic, and societal benefits. In 2011, it was estimated that the loss of just 1% of soil carbon as carbon dioxide would triple Scotland's annual GHG emissions[55].

As mentioned in section 4.5, virtually all single-use disposable beverage cups on the market in Scotland contain plastic and can therefore be responsible for microplastic pollution in the environment if disposed of incorrectly. The links between declining soil health and microplastic pollution are well documented in literature[56]. Presence of microplastics in soil are categorised as 'long term stressors' and can have potential negative effects on human health, natural ecosystems, and climate change, impacting our ability to grow crops and other food sources for humans and animals[56].

This assessment will investigate the contribution a charge on single-use disposable beverage cups could have towards reducing soil pollution. This would be achieved through reducing littering of these items and resultant soil pollution such as microplastics from plastic cups, lids and linings of fibre-based cups.

4.7 Material assets

As mentioned in section 4.1, the Circular Economy (Scotland) Bill[57] contains new powers to support Scotland's transition towards a circular economy, and Scotland's draft Circular Economy and Waste Route Map to 2030[58] sets out how such powers will be used to deliver Scotland's circular economy ambitions. One of the strategic aims of the Route Map is to 'reduce and reuse' waste, building an economic system that moves away from items that are designed to be disposable and towards responsible consumption and reuse. These aims will bring significant environmental benefits by preserving valuable materials for as long as possible and reducing our reliance on virgin resources.

The National Litter and Flytipping Strategy[59], published in June 2023, seeks to build on the progress made since 2014's Towards a Litter-Free Scotland[60] to tackle litter and flytipping in Scotland and acknowledge the wider context of the circular economy and Scotland's net zero aims. The strategy covers three broad themes: behaviour change, services and infrastructure, and enforcement. Data and research is also covered as a cross-cutting element of the strategy.

[55] The State of Scotland's Soil, SEPA, 2011
[56] Impacts of Microplastics on the Soil Biophysical Environment, Environmental Science & Technology, Anderson Abel de Souza Machado, et.al, 2018
[57] Circular Economy (Scotland) Bill
[58] Scotland's Circular Economy and Waste Route Map to 2030, Scottish Government, 2024
[59] The National Litter and Flytipping Strategy, Scottish Government, 2023
[60] Towards a Litter-Free Scotland, Scottish Government, 2014

This assessment will seek to determine how a charge on single-use disposable beverage cups will help to reduce consumption of virgin materials and reduce waste, both in the form of litter and in the residual waste stream.

4.8 Landscape and visual impacts

The Fourth National Planning Framework (NPF4)[61] was adopted by the Scottish Ministers on 13 February 2023, following approval by the Scottish Parliament in January. The framework sets out a national spatial strategy for Scotland, including spatial principles, regional priorities, national developments and national planning policy. The strategy will be relevant to wider policies and strategies relating to land use. The framework recognises the significant progress requires to reach Scotland's 'net zero' goals will require new development and infrastructure across Scotland, as well as adaptation to the impacts of climate change that are already locked in, including increased flood risk, water scarcity, environmental change, coastal erosion, impacts on forestry and agriculture, extreme weather events, and risks to health, food security and safety.

While the NPF4 has been included in the landscape and visual impacts section of this assessment, it should be noted that it will also be relevant in areas such as biodiversity and climate factors and will additionally be considered in relation to these areas.

Scotland's landscapes are internationally renowned. Scotland's distinctive landscapes are a significant part of the country's natural and cultural heritage and make a significant contribution to both the country's economic performance and the wellbeing of its people[62]. There are currently two national parks (Loch Lomond and the Trossachs, and the Cairngorms) and 40 National Scenic Areas (NSAs) in Scotland with over 13% of Scotland's land area classified as an NSA[62]. NatureScot's Landscape Policy Framework[63] describes an overarching aim: "To safeguard and enhance the distinct identity, the diverse character and the special qualities of Scotland's landscapes as a whole, so as to ensure tomorrow's landscapes contribute positively to people's environment and are at least as attractive and valued as they are today".

NPF4 also recognises the importance of access to nature and greenspaces and the mental and physical health benefits they can bring. Greenspaces within urban areas tend to suffer more from littering[64], therefore having the greatest potential to benefit from the introduction of measures to reduce consumption of single-use items. According to survey by Keep Scotland Beautiful[65], single-use disposable beverage cups are estimated to make up 0.5% (by number found) of all litter. In addition, a survey carried out by Zero Waste Scotland found that 86% of respondents had witnessed someone

[61] The Fourth National Planning Framework, Scottish Government, 2023
[62] Strategic Environmental Assessment of the Update to the Climate Change Plan 2018-2032 Environmental Report, Scottish Government, 2020
[63] NatureScot's Landscape Policy Framework
[64] The 2022 Scottish Litter Survey reported that only 25% respondents from urban areas reported seeing litter 'rarely' or 'never', compared to 39% of those responding in rural areas.
[65] Composition of Litter in Scotland, Keep Scotland Beautiful, 2016

dropping litter in the last 12 months, with 10% stating they have intentionally dropped litter in the last 12 months[66].

The Scottish Litter Survey in 2023[67] noted that those living in less affluent areas are significantly more likely to view litter as a problem locally. 83% of those in the least affluent neighbourhoods viewed litter as a problem locally. This compares to 56% in the most affluent areas. Some of the most commonly reported littered items (by percentage of people agreeing with the statement) were food containers, wrappers, and packaging (69%); plastic drinks bottles (55%); and with single-use (hot and cold) drinks containers (52%). This assessment will seek to determine whether the proposed charge will contribute to changes in the volume, nature, and visual impact of litter in Scottish landscapes.

5. Assessment of likely environmental impacts

5.1 Key variables

The environmental impact of a charge on single-use disposable beverage cups is highly dependent on a number of variables, some of which are unknown. For instance, the resultant change in demand for single-use disposable beverage cups; the mass, material and recycled content of the cups in question; the disposal method; the number of times the average consumer reuses their reusable cup; and the method of washing. Given the unknowns in this area, this assessment is dependent upon a number of assumptions, which are set out throughout this section. Where appropriate, the assessment has been conducted against three different potential scenarios to acknowledge the uncertainty of the underlying assumptions.

5.2 Anticipated behaviour change

A Resource Futures report commissioned by Zero Waste Scotland in 2022[68] sets out the following scenarios for the expected change in demand for single-use beverage cups resulting from the introduction of a 25 pence charge. Results cover a 10-year period from 2025-2035, and are measured against a baseline of increase in demand over 10 years.

Scenario 1: 15.4% reduction in the number of single-use beverage cups placed on the market (POM) by 2035, which is equal to 62.1 million single-use disposable beverage cups. This is **24.4% less** than estimated for the same year (medium baseline estimate) if a charge wasn't implemented.

Scenario 2: 28.3% reduction in the number of single-use beverage cups placed on the market by 2035, which is equal to 114.2 million single-use disposable beverage cups.

[66] Introducing Market Restrictions on Problematic Single-Use Plastic Items in Scotland Strategic Environmental Assessment, Scottish Government, 2020
[67] Scottish Litter Survey, Tracking public perceptions and attitudes towards litter and littering behaviour, Keep Scotland Beautiful, 2023
[68] Consumption of Single-use Disposable Beverage Cups in Scotland, Zero Waste Scotland, 2022

This is **36% less** than estimated for the same year (medium baseline estimate) if a charge wasn't implemented.

Scenario 3: 39.4% reduction in the number of single-use beverage cups placed on the market by 2035, which is equal to 159.4 million single-use disposable beverage cups. This is **45.9% less** than estimated for the same year (medium baseline estimate) if a charge wasn't implemented.

The underlying annual changes in demand under the three scenarios set out above are as follows. It should be noted that the percentages presented below represent a year-on-year decrease in cup consumption for each of the given periods.

	Scenario 1	**Scenario 2**	**Scenario 3**
Decrease in single-use disposable beverage cups POM in 2026 and 2027	3% per year	6.5% per year	10% per year
Decrease in single-use disposable beverage cups POM in 2028 and 2029	2% per year	3.5% per year	5% per year
Decrease in single-use disposable beverage cups POM in 2030-2035	1% per year	2% per year	3% per year

The magnitude of these estimates is in line with a 2021 study published by WRAP[69], which reaches an assumption that a charge of 25 pence per single-use item can be expected to lead, on average, to a 7.5% increase in the take-up of reusable alternatives, displacing single-use items. The items in question in this study are fibre cups, plastic cups, and fibre based food packaging. The study assumes that the use of single-use cups (or containers) reduces in line with the increase in take-up of reusable alternatives, and that total food and drinks sold per year are not impacted by the introduction of such charges. It is noted, however, that this may be a conservative estimate since sales may be impacted if total purchase prices rise as a consequence of these charges, as is likely.

5.3 Climatic factors

The environmental impact of using reusable cups instead of single-use disposable beverage cups depends on the number of times a reusable cup is used. The exact number required for environmental net benefit is sensitive to a number of factors including what the cup is made from, how the cups are washed, and the method of disposal of single-use beverage cups. The review also finds that reusable cups can

[69] Single-use Cups and On-the-Go Fibre-composite Food Packaging, WRAP, 2021

have a lower carbon impact, even if very high recycling rates of single-use disposable beverage cups could be achieved.

The results from a selection of studies are compared in the table below to compare the carbon impacts of certain single-use disposable beverage cups and reusable alternatives.

Table 3: Summary of results from life cycle analysis studies comparing single-use and reusable cups

Source	Number of uses assumed	Impact of single-use cup (g CO2e)	Impact per use of reusable cup(s) (g CO2e)	Comments
Edge (2018)[70]	250	36.8(paper) – 65.6 (compostable)	8.4 (KeepCup The Brew Cork) – 17.2(Polypropylene)	Disposal mix not representative of Scotland (results represent an average across geographic zones Australia, USA, and Europe)
Foteinis (2020)[71]	500	29.9 (paper)	9.2 (Polypropylene with silicone band)	Assumes disposal by landfill
CupClub (2018)[72]	132	60.5(PLA) – 65.2 (paper)	32.3 (CupClub polypropylene cup with low density polyethylene lid) – 38.9 (ceramic)	Returnable packaging service using RFID technology (now known as Club Zero) N.B. fewer uses assumed
Martin, Bunsen and Ciroth (2018)[73]	750	52.9 (paper)	Using dishwasher: 1.5 (ceramic mug) – 1.8(ceramic portable cup with lid) Handwashing: 4.9 (ceramic mug) – 7.1 (ceramic cup with lid)	N.B. Greater number of uses assumed

[70] Reusable coffee cups life cycle assessment and benchmark, Edge for KeepCup, 2018
[71] How small daily choices play a huge role in climate change: The disposable paper cup environmental bane, Foteinis, 2020
[72] CupClub Sustainability Report 2018, CupClub, 2018
[73] Case Study Ceramic cup vs. Paper cup, Martin, Bunsen, and Ciroth, 2018

Intertek (2020)[74]	N/A s	26.2 (recycled 'Frugal Cup') – 33.1 (paper)	N/A – study compares disposable options only	Incineration scenario quoted here (as opposed to headline results of study which assume landfill).
University of Exeter[75]	N/A	N/A	0.3 plus washing impacts	This does not include impacts of washing. Scaled down to one use from an assumed 500 uses over lifetime for comparison.
Hope Solutions [76]	75	17.2 (paper) – 70.0(plastic)	8.4 (reusable plastic) – 8.6 (reusable stainless steel)	Cold drinks cups. N.B. Lower number of uses assumed compared to other studies listed

The majority of the studies investigated above are related to the impact of a 'coffee cup', focusing on the use of cups for hot drinks. A study investigating the lifecycle impacts of cold beverage cups in Thailand[77] also found that reusable cups had a lower environmental impact than single-use plastic cups for cold drinks: multiple-use stainless steel cups resulted in lower greenhouse gas emissions than PP, PET, and PLA single-use cups. These results were sensitive to the level of recycled material used in the stainless steel cups, assuming a middle scenario of 50% recycled content.

It is estimated that in Scotland, 62% of single-use disposable beverage cups are used for hot beverages and 38% cold beverages[78].

For the purposes of this assessment, we will adopt the results from Foteinis (2020)[79] for hot drinks cups, as this study is based on data for single-use and reusable cups in the UK, offering the most relevant scenario for Scotland and including the whole life cycle impacts, including the washing of reusable cups. We therefore assume that, over a

[74] New coffee cup study shows recycled paper coffee cup has 60% lower carbon footprint than normal cups and would save more than 200 billion litres of water and up to 200 million trees a year, Frugalpac, 2020
[75] Carbon Footprint of the Circular Returnable Cup: A Preliminary Life Cycle Assessment, Prof Xiaoyu Yan, 2023
[76] It Doesn't Stack Up, Hope Solutions
[77] Choice of materials for takeaway beverage cups towards a circular economy, Changwichan and Gheewala, 2020
[78] Consumption of Single-use Disposable Beverage Cups in Scotland, Zero Waste Scotland, 2022
[79] How small daily choices play a huge role in climate change: The disposable paper cup environmental bane, Foteinis, Journal of Cleaner Production, 2020

lifetime of 500 uses, a reusable cup is responsible for greenhouse gas emissions equivalent to 4.6kg CO2e.

For the single-use equivalent, we will take the example of a fibre-based cup from the same study. The disposal scenario needs to be amended as follows to better reflect the situation in Scotland after 2025, by which time the landfilling of biodegradable municipal waste will be banned, so it is more reasonable to assume that cups will be incinerated not landfilled. It was estimated that in 2018, fewer than 0.25% of lined fibre coffee cups were recycled[80]. Given this extremely low recycling rate, we exclude recycling from the calculations for the time being. We subtract the 11.04g CO2e per cup attributed to landfill impacts, replacing it with the net benefit of 1.6g CO2e achieved through energy recovery by incineration in Scotland (see Table 4 for a breakdown of the calculation). The resultant overall carbon impact of one single-use disposable fibre-based beverage cup is 17.2 g CO2e per cup. Over 500 uses (i.e. 500 beverages), this results in a total carbon impact of 8.6kg, 87% higher than the reusable equivalent.

Table 4 Calculation of replacement carbon impact of incinerating one fibre-based cup

Mass of fibre cup (kg)	0.01200	kg
Mass of plastic lining (kg)	0.00090	kg
Carbon factor for paper and cardboard incineration (kgCO2e/kg)[81]	-0.26870	kg CO2e / kg
Carbon factor for plastic incineration (kgCO2e/kg)[81]	1.79827	kg CO2e / kg
Impact of fibre cup (kgCO2e)	-0.00322	kg CO2e
Impact of plastic lining (kgCO2e)	0.00162	kg CO2e
Total impact of incinerating entire cup (kgCO2e)	-0.00161	kg CO2e

For cold drinks cups, we adopt the results from Hope Solutions[76], where a single-use plastic cup has an impact of 0.07kg CO2e, and a reusable equivalent has an impact of 0.0084kg CO2e per use, assuming a total of 75 uses. The net saving is then 61.6g CO2e per use.

On this basis, we conclude that a charge on single-use disposable beverage cups is expected to result in a reduction in greenhouse gas emissions. The literature review has demonstrated that the results of life cycle assessments of single-use and reusable cups are variable, depending on the assumptions and methodology used. As the exact changes in emissions are highly sensitive to consumer behaviour and changes to the baseline recycling rate, it is not possible to determine the exact reduction in emissions that will be seen nationwide. Communications to encourage consumers to remember their reusable cups, and to opt for the most energy efficient washing methods may help to maximise the expected environmental benefits.

[80] Disposable Packaging: Coffee Cups, House of Commons Environmental Audit Committee, 2018
[81] Scottish Waste Environmental Footprint Tool, Zero Waste Scotland, 2024

Environmental objectives

Reduce greenhouse gas emissions resulting from the production and disposal of single-use disposable beverage cups

The consumption (and hence corresponding production and disposal) of single-use disposable beverage cups in Scotland is predicted to fall by between 62.1 million and 159.4 million cups per annum by 2035[82].

Related greenhouse gas emissions from the production and disposal of these cups will fall. This will be offset to an extent by the emissions associated with the production and maintenance (i.e. regular washing) of reusable cups, though a net decrease in overall emissions is anticipated.

Additional data on consumer behaviours, in particular relating to reusable cup use, would be beneficial to allow for well-informed ongoing monitoring of the emissions savings (or impact) resulting from this policy.

SEA Impact: Positive (offset to uncertain extent)

While it is not possible to quantify with certainty what the carbon impact of the proposed charge will be, it is anticipated that a net reduction in greenhouse gas emissions will be observed. This is due to an expected decrease in demand for single-use disposable beverage cups in favour of reusable alternatives, which, over their lifetime, are expected to have a lower contribution to climate change.

The studies considered in this assessment suggest that it is reasonable to expect a reduction in emissions in the region of 8g CO2e per avoided single-use cup, though this will be highly sensitive to materials used, consumer behaviour, and disposal method.

The proposed charge is therefore expected to meet the objective of reducing GHG emissions resulting from the production and disposal of single-use disposable beverage cups. The extent to which this objective is achieved should be monitored as part of the monitoring and evaluation framework described in Section 6.

5.4 Biodiversity

According to a survey by Keep Scotland Beautiful[83], drinks cups are estimated to make up 0.5% of all litter. An estimated half a million single-use disposable coffee cups are littered every day in the UK[84], or 4% of all cups placed on the market. Scaling this either by population for Scotland, or applying the 4% figure to the annual 388.7 million cups placed on the Scottish market gives approximately 15 million cups littered in Scotland per year.

[82] Consumption of Single-use Disposable Beverage Cups in Scotland, Zero Waste Scotland, 2022
[83] Keep Scotland Beautiful, Litter Composition in Scotland 2023
[84] Disposable Packaging: Coffee Cups, House of Commons Environmental Audit Committee, 2018

Littered cups, lids, and sleeves can pose a threat when left in wildlife habitats due to risk of entrapment, ingestion, and leakage of microplastics. On a larger scale, small items of litter may travel from place to place by wind or water, and may carry bacteria or invasive organisms with them, taking foreign species to new or isolated regions and potentially disturbing fragile ecosystems. Litter may also negatively impact biodiversity through entanglement and ingestion. Plastic litter is estimated to lead to the mortality, either directly or indirectly, of one million seabirds, 100,000 marine mammals, including 30,000 seals, and 100,000 turtles globally every year either through entanglement or ingestion[85].

There is evidence to suggest that littered single-use disposable beverage cups could pose a threat to habitats and their resident species through chemical migration too. For example, a study conducted in 2023 by Almroth et al[86] examined the impacts of leachates from polypropylene cups, polystyrene lids, and polylactic acid (PLA) lined paper cups on the growth and development of aquatic midge larvae. The results of the study indicated that single-use disposable beverage cups of all materials tested could induce toxic effects in water and sediment environments. As these items are littered in the environment, they can leach toxic chemicals that may impact biota after just one week.

The aim of a charge on single-use disposable beverage cups is to reduce consumption of the targeted items, as well as shifting consumer attitudes towards the perceived value of single-use items. This is anticipated to reduce littering of these items, and in turn have a positive impact on biodiversity in Scotland, particularly in areas prone to litter.

While there may be similar environmental risks associated with plastic reusable beverage cups, these are less likely to be littered, so exposure to habitats and species is less common.

The WRAP report[87] assumes that a 25 pence charge on single-use disposable beverage cups would reduce littering at the same rate as the drop in demand for cups in the first instance. This assumption does not consider whether those more likely to drop litter could be more likely to purchase a single-use disposable beverage cup for 25 pence instead of opting for reusable alternatives. Nor does it factor in other behaviour change interventions which may help to address littering in coming years, for example, the ambitions within the National Litter and Flytipping Strategy. For the purposes of this assessment, we will retain the assumption that 4% of the cups placed on the market will be littered, meaning the number of cups in the litter stream would decrease directly in line with reductions in the number of cups placed on the market. We assume that the same litter rate applies to lids.

It is recommended in Section 6.3 that prevalence of single-use disposable beverage cups in the litter stream is monitored as part of the ongoing monitoring and evaluation of this policy.

---

[85] Marine Litter Issues, Impacts and Actions, Marine Scotland, 2011

[86] Single-use take-away cups of paper are as toxic to aquatic midge larvae as plastic cups, Almroth et al, Environmental Pollution, 2023

[87] Single-Use Cups and On-the-Go Fibre-composite Food Packaging, WRAP, 2021

Assuming that littering of disposable cups and lids decreases in line with demand, by 2035 we can expect to see annual litter reductions in the region of the estimates shown in Table 5, against each scenario described in section 5.2:

Table 5 Comparison of single-use cups and lids placed on the market and littered in 2035 with and without prior implementation of charge. Results are based on Zero Waste Scotland report 'Consumption of Single-use Beverage Cups in Scotland[88]', with a 4% assumed litter rate applied across all scenarios for both cups and lids.

2035 Projections (1 year)		**Baseline**		**Charge Implemented**		**Impact of Charge**	
		Cups (millions)	**Lids** (millions)	**Cups** (millions)	**Lids** (millions)	**Cups** (millions)	**Lids** (millions)
Scenario 1	**POM**	353.3	176.7	342.2	170.8	**-11.1**	**-5.9**
	Littered	14.1	7.1	13.7	6.8	**-0.4**	**-0.2**
Scenario 2	**POM**	450.0	225.0	290.1	151.0	**-159.9**	**-74.0**
	Littered	18.0	9.0	11.6	6.0	**-6.4**	**-3.0**
Scenario 3	**POM**	546.6	273.3	245.0	122.3	**-301.6**	**-151.0**
	Littered	21.9	10.9	9.8	4.9	**-12.1**	**-6.0**

A reduction in consumption of single-use disposable beverage cups as a result of the proposed charge is expected to reduce littering of these items, thus reducing the resultant damage to habitats, species, and biodiversity in Scotland.

The extraction of virgin material required to produce single-use disposable beverage cups can also have negative impacts on biodiversity due to local pollution and habitat loss, for example, unsustainable forestry management in the supply chain of paper cups can contribute heavily to biodiversity loss[89]. A reduction in extraction of virgin materials is likely to lead to lower impacts on habitats and species in regions where materials are extracted and processed e.g. tree felling to produce paperboard for cups. One report found that only 31% of a global sample of packaging companies reported taking any action to progress on biodiversity-related commitments[89].

The disposal of single-use disposable beverage cups, even when not littered, can also have damaging effects on biodiversity. The Scottish Waste Environmental Footprint Tool found that in 2022, both paper and cardboard, and plastics were among the top five waste streams in terms of their impacts on biodiversity loss, contributing 11% and 8% respectively to the total biodiversity impact of household waste in 2022[90].

Environmental objectives:

Maximise opportunities to improve the quality of natural habitats by avoiding pollution and habitat loss associated with the production and disposal of single-use disposable beverage cups in terrestrial, coastal, and marine ecosystems:

[88] Consumption of Single-use Beverage Cups in Scotland, Zero Waste Scotland, 2022

[89] Paper & Packaging Report 2023, Bain & Company, 2023

[90] It should be noted that these results include the impacts of the generation of this waste, and are not limited to direct impacts of disposal.

The proposed charge is expected to result in a reduction in consumption of single-use disposable beverage cups and lids, as well as a likely resultant reduction in littering of these items. The charge is therefore likely to benefit ecosystems which may be under threat from virgin material production and disposal as well as areas where cups may be littered; improving the overall quality of affected natural habitats.

Avoid adverse impacts to habitats and species resulting from littered single-use disposable beverage cups:

As the proposed charge is expected to result in a reduction in the number of single-use disposable beverage cups and lids littered in the environment, risks to habitats and species from material pollution, microplastics, and chemical leachates will be reduced.

SEA Impact: Positive

A reduction of between 62.1 and 159.4 million single-use disposable beverage cups expected to be placed on the market by 2035 is likely to lessen the associated burden on habitats and species in areas where raw materials are extracted and where manufacturing and disposal activity takes place.

As a result of between 0.4 and 12.1 million fewer single-use disposable beverage cups and between 0.2 and 6.0 million fewer lids being littered in Scotland each year after 10 years of the charge, it is anticipated that resultant environmental damage to ecosystems will be lessened due to reduced exposure to harmful leachates.

5.5 Water

The proposed charge is expected to affect water consumption in two areas:

- The water used in the production of single-use disposable beverage cups, in particular fibre-based cups: a reduction in demand for these items will reduce associated water consumption;
- The water required to regularly clean a reusable cup.

The charge is also expected to impact levels of water pollution resulting from the production, disposal, and littering of single-use disposable beverage cups.

An Edge study commissioned by KeepCup[91] collected data on washing habits of KeepCup users through an open survey with 2,430 respondents. The survey aimed to determine the share of users that adopt machine washing, rinsing, or hand washing as the usual cleaning method for their KeepCup. 67% respondents reported that they would handwash their 'Original' KeepCup, 16% would rinse it, and 17% would machine wash[92].The study found that over a year of drinking 250 coffees, the expected water use of a reusable cup was between 0.33m^3 and 0.41m^3. The equivalent coffee consumption over a year using 250 single-use paper or compostable cups resulted in a lower water

[91] Reusable coffee cups life cycle assessment and benchmark, Edge for KeepCup, 2018

[92] It should be noted that the study assumed lower levels of machine washing (5%) for 'The Brew Cork', as it was recommended to hand wash this particular design.

consumption of 0.12m^3 and 0.05m^3 respectively. Another study[93] found that conventional single-use paper coffee cups require 0.58 litres of water per cup, i.e. 0.29m^3 for 500 beverages.

This suggests that the proposed charge could result in greater water consumption due to the cleaning requirements of reusable alternatives to single-use disposable beverage cups, though the exact difference is not certain. There is potential to reduce the water consumption associated with washing reusable cups by encouraging consumers to incorporate their reusable cups in full machine washes instead of washing by hand with hot water. Approximately 44% of Scottish households own a dishwasher[94], while the study only assumed 5-17% consumers would machine wash their cups. In the majority of cases, reusable cups would be washed as part of a full dishwasher load: the Energy Saving Trust reported in 2013 that 77% individuals who self-reported their water use behaviours claimed to fill their dishwasher to capacity before turning it on[95]. This suggests there is scope to reduce the water consumption associated with the use of reusable cups through encouraging consumers to machine wash them as part of a full dishwasher cycle.

However, as explored in section 5.4, single-use disposable beverage cups have been demonstrated to release harmful leachates in aquatic environments. Assuming litter reductions within the range set out in Table 5 are achieved, the proposed charge would reduce the risk of littered cups reaching and polluting bodies of water in Scotland.

Environmental objectives

Promote sustainable use of water resources in the production and maintenance of different types of beverage cups:

It is anticipated that this policy will result in an increase in the use of reusable cups. A resultant increase in water use is likely due to the regular cleaning requirements for reusable cups.

This will be offset to an extent by a reduction in the water use required in the production of single-use disposable beverage cups.

The overall net impact of the policy on water consumption is uncertain, though literature suggests that the additional water required to clean reusable cups is likely to outweigh the water use savings from reduced production of their single use counterparts.

Enhance water quality in Scotland by reducing pollution from littered single-use disposable beverage cups in bodies of water:

As the proposed charge is expected to result in a reduction in the number of single-use disposable beverage cups and lids littered in the environment, risks to water quality

[93] New coffee cup study shows recycled paper coffee cup has 60% lower carbon footprint than normal cups and would save more than 200 billion litres of water and up to 200 million trees a year, Frugalpac, 2020
[94] Family spending workbook 4: expenditure by household characteristic, Office for National Statistics, 2020
[95] At home with water, Energy Saving Trust, 2013

from material pollution and microplastic and chemical leachates in aquatic environments will be reduced.

SEA Impact: Both negative and positive effects

The proposed charge is anticipated to increase water use due to increased use of reusable beverage cups requiring regular cleaning, either by hand or in a dishwasher. This will be offset to an extent by reduced demand for single-use disposable beverage cups, and the associated water use in their production.

The charge is expected to contribute to the protection of water quality in Scotland on a local scale due to a reduction in littered single-use disposable beverage cups and a corresponding drop in associated leachates such as microplastics.

5.6 Human health

Food and beverage packaging can release a variety of substances into food and drink, and represent a source of human exposure to hazardous chemicals, for example, perfluoroalkyl and polyfluoroalkyl substances (PFAS)[96]. PFAS are used in paper and cardboard food packaging and there is strong evidence to suggest they can have negative effects on the immune system[97]. Suspected carcinogens were also found in paper coffee cups in a Danish consumer test in 2019[98]. Single-use plastic cups could also be responsible for exposure to chemicals, with 853 food contact chemicals found in recycled PET in a review conducted in 2023[99].

Another study found that takeaway polyethylene-coated cups and transparent polystyrene and polypropylene cups released microplastics into the contained beverages, and that release was promoted by high temperatures and, in the case of polyethylene-coated cups, enhanced by acidic carbonated beverages too[100].

However, risks from food (and beverage) contact materials are not limited to single-use items. The 2023 review mentioned above[99] also found 509 food contact chemicals in reusable plastic food containers, of which 372 were detected to migrate into the food (or food simulant). This experiment included polycarbonate and polypropylene (among other materials), both of which are commonly used to produce reusable beverage cups.

Other reusable materials have also been a cause for concern in recent months. The Food Standards Agency issued a notice to retailers[101] to inform them that they should not be selling plastic containers or utensils containing bamboo and other plant-based

[96] Food packaging: safety first, Zero Waste Europe, 2023
[97] How “forever chemicals” might impair the immune system, Carolyn Beans, Proceedings of the National Academy of Sciences, 2021
[98] Test: Unwanted chemicals in colorful food packaging, Stine Müller, Forbrugerrådet Tænk, 2019
[99] Hazardous chemicals in recycled and reusable plastic food packaging, Geueke et al, Cambridge Prisms: Plastics, 2023
[100] Release of microplastics from disposable cups in daily use, Chen et al, Science of The Total Environment, 2023
[101] Notice to retailers: Plastic containers or utensils containing bamboo, Food Standards Agency, 2023

materials such as rice husks, wheat straw, and hemp due to concerns over their safety. A call for evidence was launched to investigate the long term safety implications of these food contact materials[102]. The presence of bamboo (and similar plant-based matter) in plastic materials such as reusable food and drink containers was determined by the Committee on Toxicity to result in the migration of plastic components, such as formaldehyde or melamine, into food or drink above their legal limit[101].

Use of inert materials, such as stainless steel, ceramic, and glass, may reduce exposure to food contact materials from reusable cups, as significant chemical diffusion from within these materials is not likely[103].

More research is needed in this area in order to draw firm conclusions on the human health impacts of changes in behaviour around the materials used to consume beverages.

If an increase in the overall cost of a beverage were to affect a consumer's decision on whether or not to purchase the beverage at all, there could be health implications, depending on the beverage in question. However, no evidence was found to suggest that a charge on single-use disposable beverage cups would result in a drop in demand for the beverages themselves.

There may also be positive impacts on mental health and wellbeing if the charge is successful in achieving a reduction in litter. The Carnegie Trust found that those who reported the highest incidence of environmental incivilities such as litter were more likely to report anxiety, depression, poor health, smoking, and poor exercise than those with more positive views on this aspect of their local environment[104]. Another study[105] investigated the effect of litter on psychological reactions to marine environments. The study found that photographs of un-littered coasts tended to provide participants with a sense of happiness and less stress while photographs exhibiting littered coasts caused participants to exhibit stress and a lack of the positive psychological benefits that coastal environments normally provide.

Environmental objectives

Avoid adverse impacts to human health resulting from exposure to food contact materials:

The studies explored above suggest that there could be risks to human health from exposure to microplastics and leachates from other food contact materials. However, whether such risks are increased or decreased as a result of the proposed charge depends heavily on the reusable alternatives adopted. Materials such as glass, steel, and ceramics are known to demonstrate low levels of migration[103], while certain plastic

[102] Call for Evidence: Plastic food contact materials containing bamboo and similar plant-based material as additives, Food Standards Agency, 2023.
[103] Migration, Jane Muncke, Food Packaging Forum, 2013
[104] Pride in Place: Tackling Incivilities, Carnegie Trust UK, 2012
[105] Factors That Can Undermine the Psychological Benefits of Coastal Environments: Exploring the Effect of Tidal State, Presence, and Type of Litter, Wyles et al., 2016

reusable cups (e.g. polypropylene and polycarbonate)[106] could increase a consumer's exposure to food contact chemicals.

SEA Impact: Uncertain

The proposed charge is expected to have an impact on the materials from which consumers are drinking beverages. As different materials will demonstrate different levels of migration, the human health impact of the proposed charge is dependent upon the material of the reusable alternatives adopted.

Some positive mental health effects may be seen among the population as a result of the charge achieving litter reductions.

5.7 Soil

Anticipated reductions in littered cups are set out in section 5.4, alongside the links between single-use disposable beverage cups and leachates of chemicals and microplastics. A reduction in the number of single-use disposable beverage cups consumed in Scotland, and a subsequent reduction in associated littering and pollution, is expected to have a positive impact on soil quality in Scotland. Impacts are expected to be localised, and the overall impact on Scotland's soil quality is not expected to be significant.

Environmental objectives

Enhance soil quality in Scotland by reducing soil pollution (e.g. microplastics) from littered single-use disposable beverage cups

The proposed charge is likely to reduce the number of single-use disposable beverage cups littered in Scotland, and therefore lower the risk of contaminating soils with leachates such as microplastics. On a national scale, given that not all littered single-use cups will end up in contact with soils, the overall impact on soil quality is not expected to be major.

SEA Impact: Minor positive

As a result of between 0.4 and 12.1 million fewer single-use disposable beverage cups and between 0.2 and 6.0 million fewer lids being littered in Scotland each year after 10 years of the charge, it is anticipated that resultant damage to soils will be lessened due to reduced contamination e.g. from microplastics.

5.8 Material assets

According to a study commissioned by Zero Waste Scotland in 2022[107], a total of 4,566.6 tonnes of material is estimated to have been placed on the Scottish market in

[106] Hazardous chemicals in recycled and reusable plastic food packaging, Geueke et al, Cambridge Prisms: Plastics, 2023

[107] Consumption of Single-use Disposable Beverage Cups in Scotland, Zero Waste Scotland, 2022

the form of single-use disposable beverage cups in 2021-22 (including both plastic and fibre-based cups). Of the 4,566.6 tonnes material placed on the market, 1,338.8 tonnes are estimated to be plastics. In addition to the cups themselves, 583.1 tonnes of material were estimated to be placed on the market in the form of lids.

The study goes on to compare the mass of plastic estimated to be placed on the Scottish market in the year 2035 with and without the introduction of a charge in 2025. Across the three scenarios set out in section 5.2, the report estimates a reduction of between 98.6 and 1,327.2 tonnes plastic placed on the market in the form of cups and lids in 2035 as a result of the charge.

In 2018, it was estimated that only 0.25% of lined fibre coffee cups are recycled[108]. While this could rise in future years as a result of packaging Extended Producer Responsibility requirements, significant progress is necessary in this area given the extremely low baseline. In line with the waste hierarchy, reduction in generation of waste should be prioritised over recycling. However, given the proposed charge is not anticipated to eliminate the use of single-use disposable beverage cups, efforts to improve recycling and recycled content of these items should continue.

Given the low recycling rate, a large proportion of the material placed on the market is destined for the residual waste stream. In Scotland from 2025 onwards, this will largely be incineration due to the upcoming ban on landfilling biodegradable municipal waste in December 2025.

The Zero Waste Scotland report[107] found from a series of stakeholder interviews that a possible unintended consequence of the charge is that it could affect private companies' desire to fund single-use disposable beverage cup recycling initiatives and reduce recycling of single-use disposable beverage cups. While it is right that, in line with the waste hierarchy, reduction and reuse should be prioritised over recycling, given the significant number of single-use disposable beverage cups that will still be placed on the market after the charge is implemented, it is important to mitigate against any unintended consequences affecting cup recycling initiatives.

Environmental objectives

Reduce consumption of virgin materials used to produce single-use disposable beverage cups:

The charge is estimated to reduce the number of single-use disposable beverage cups placed on the Scottish market by between 24.4% and 45.9%, thus reducing the amount of paperboard, plastics, and bioplastics consumed.

Maximise potential to embed a circular economy in Scotland by encouraging consumers to opt for reusable alternatives to single-use disposable beverage cups:

Introducing a financial disincentive to encourage consumers to use fewer single-use disposable beverage cups is expected to encourage circular economy behaviours as

[108] Disposable Packaging: Coffee Cups, House of Commons Environmental Audit Committee, 2018

consumers who refill reusable cups instead of purchasing a disposable one will avoid the charge. This is commonly known as a 'habit disrupter'.

Reduce loss of materials to landfill, energy recovery, or litter in the form of waste cups:

A significant proportion of single-use disposable beverage cups, in particular fibre-based cups, are disposed of by landfill or incineration (increasingly the latter after 2025 in Scotland). The anticipated reduction in single-use items consumed and ultimately disposed of or littered will mean less material is wasted in the form of discarded single-use disposable beverage cups as a result of the proposed charge.

SEA Impact: Positive

The charge is estimated to reduce the number of single-use disposable beverage cups placed on the Scottish market by between 24.4% and 45.9%, thus reducing the amount of paperboard, plastics, and bioplastics consumed and ultimately disposed of or littered. Encouraging the use of reusable alternatives to throwaway packaging will help to normalise and embed circular economy behaviours in Scotland.

5.9 Landscape and visual impacts

According to survey by Keep Scotland Beautiful[109], drinks cups are estimated to make up 0.5% of all litter.

Furthermore, Keep Scotland Beautiful reported in their 2022 Scottish Litter Survey[110] that 87% respondents believed litter to be an issue across Scotland. A socioeconomic divide was identified, with 81% respondents in the deprived neighbourhoods reporting seeing litter 'very' or 'somewhat' often, compared to 68% in the least deprived neighbourhoods. The survey found that food and drink packaging was perceived to be the most frequent type of litter, and people perceived single-use drinks containers to be 'much more' or 'somewhat more' common in the past 12 months leading up to the survey. The results presented single use (hot and cold) drinks containers as the sixth most frequently sighted category of litter.

People's perception of the neighbourhood and its effects on local residents' wellbeing were deemed the second and third most concerning impact of litter in the survey[110] respectively, after the impacts on animals and the environment.

Another project conducted by the Marine Conservation Society (MCS) predicts that, in a 3km radius around Oban, there will be almost 1000 single-use cups littering the shore each year[111]. MCS Beachwatch 2022 found that plastic and polystyrene cups were recorded on 58% of the beaches cleaned in Scotland[112].

[109] Litter Composition in Scotland 2023, Keep Scotland Beautiful, 2023
[110] Scottish Litter Survey, Keep Scotland Beautiful, 2022
[111] Transitioning beyond single-use plastic drinks cups: an emergent social marketing case study in Scotland, Carrigan, Wells, and Mackay, Emerald, 2023
[112] Beachwatch 2022: What you found, Marine Conservation Society, 2022

A charge on single-use disposable beverage cups and the estimated resultant reduction in consumption of these items is likely to have a knock-in effect on the levels of cups littered in Scotland. As set out in Table 5, between 0.4 and 12.1 million fewer cups and between 0.2 and 6.0 million fewer lids are estimated to be littered in Scotland each year after 10 years of the charge.

There is an obvious link between levels of litter and positive visual impacts on Scottish landscapes. The charge is anticipated to reduce the number of single-use disposable beverage cups littered across Scottish landscapes, thus improving the visual appearance of affected areas.

Environmental objectives

Enhance the appearance of outdoor spaces in Scotland by reducing the volume of littered single-use disposable beverage cups in the environment and the associated negative visual impacts:

Due to the anticipated reduction in consumption and subsequent littering of single-use disposable beverage cups in Scotland, the proposed charge is expected to protect Scottish landscapes from the negative visual impacts of litter, thus enhancing their appearance.

SEA Impact: Positive

It is estimated that between 0.4 and 12.1 million fewer cups and between 0.2 and 6.0 million fewer lids will be littered in Scotland each year after 10 years of the charge. This is anticipated to enhance the appearance of outdoor spaces in Scotland by reducing volumes of litter which can detract from the landscape's natural beauty. This is expected to enhance the visual impact of landscapes and outdoor spaces in Scotland.

5.10 Cumulative impacts

It is anticipated that there will be interdependencies and synergistic effects among the environmental topics explored above. For instance:

- Changes to the climate can impact biodiversity, requiring habitats and species to adapt to new conditions. Some habitats and species will degrade and suffer as a result of significant climate change. Likewise, healthy ecosystems, environments, soils, and peatlands can help to curb the effects of climate change. In this way, the emissions reductions anticipated as a result of the proposed charge will enhance the benefits experienced in Scottish ecosystems, and vice versa.
- Preserving material assets and avoiding unnecessary disposal of valuable resources will also reduce the greenhouse gas emissions from the production of new materials and the disposal of waste. This will enhance the benefits expected under climatic factors.
- The effects of the charge seen on landscape and visual impacts is directly linked to those affecting material assets: if less material is lost to the economy as litter, this means lower volumes of this material is detracting from the visual appearance of Scottish landscapes. Likewise, every piece of litter blighting these

landscapes represents wasted material that's value is lost to the circular economy.

- Cumulative impacts will be seen between soil and water. Where soils are located near bodies of water, pollution can easily spread between the two. Furthermore, the biodiversity within the habitats located here will experience benefits from improved soil and water quality. Polluted waterways and soils also pose a threat to human health if the pollution find its way into the food supply chain. Hence, we can also expect indirect benefits to human health from the charge.
- Human mental health is linked to landscape and visual impacts, as positive wellbeing impacts can be expected from litter reduction and improved visual quality of landscapes.
- Impacts on human health resulting from changes in exposure to food contact materials may also impact water: if reusable materials are repeatedly washed, leachates may find their way into water systems. Increased use of cleaning products such as detergent may also negatively impact water quality.
- Though scoped out of this assessment, some indirect impacts on air quality may arise as a result of a reduction in cups disposed of by incineration. These impacts are not expected to be significant.

The nature of the overall impacts of the proposed charge on each of the environmental topics investigated is summarised below.

Climatic Factors	**Biodiversity**	**Water**	**Human health**	**Soil**	**Material Assets**	**Landscape and visual impacts**
+	++	+/-	+/-	+	++	++

Key

++	Positive impacts
+	Minor or uncertain positive impacts
+/-	Uncertain or both positive and negative impacts

6. Maximisation of benefits, mitigation, monitoring, and evaluation

6.1 Maximisation of environmental benefits

The following actions could be considered in order to maximise the benefits identified throughout this assessment:

- A communications campaign could be developed to encourage consumers to promote the move to reusable cups and to remember their reusable cups;
- Guidance could be given to businesses on running reuse and return schemes (e.g. deposit return) for reusable cups to make it easier for consumers to reduce their consumption of single-use disposable beverage cups;
- Consumers should be encouraged to wash their reusable cups as part of a full dishwasher load where possible instead of by hand under a hot tap to reduce water consumption; and
- Support and advice should be offered to businesses to promote how the revenue received from the proposed charge could be used depending on final policy development.

6.2 Mitigation of unintended consequences

- Further research into migration from food contact materials could help to inform advice to consumers on which materials are safest for use as reusable beverage cups;
- It should be acknowledged that it is expected that a significant number of single-use disposable beverage cups will still remain on the market after the implementation of the charge. Efforts to improve the recycling rates of these items should still continue, and initiatives to improve recycling infrastructure or increase the recycled content of these items should not be neglected following the introduction of the charge;
- Research could be conducted to determine the most environmentally friendly cleaning method for reusable cups, and advice provided to consumers and businesses running reuse schemes; and
- Further research could be conducted to determine the most environmentally friendly options on the Scottish market for both reusable and single-use disposable beverage cups.

6.3 Monitoring and evaluation

It is recommended that a formal monitoring and evaluation plan is drawn up as soon as possible, with the collection of baseline data treated as a priority in advance of the introduction of any charge. Indicators should be agreed alongside a process for capturing consistent, reliable, and accurate data.

This assessment has highlighted some knowledge gaps, for example, surrounding consumer behaviours towards reusable cups. Improving our understanding of the

baseline in these areas will help to improve the quality of assessment that can be undertaken once the charge has been introduced.

Clear objectives should be set to confirm what the charge is expected to achieve and the timeframes in which it should aim to do so. These objectives can then form the basis of an evaluation. Consultation responses from the public and other stakeholders should be used to help inform these objectives.

Appendix A: Addressing responses from consultative authorities

All statutory consultees were content with the proposed 12-week public consultation period and so this will be retained. Extracts from each of the consultee's feedback on the proposed scope and content of the assessment are set out below alongside the corresponding actions taken, where appropriate.

Consultee	Consultation response extract	Commentary/ Action taken	Relevant location in report
Nature Scot	'…it would perhaps be useful to expand the environmental objectives to consider enhancement and maximisation of environmental benefits as well as protection.'	Environmental objectives expanded to include maximising opportunities for environmental benefit and enhancement of the natural environment. Wording of some objectives was amended, and an additional objective inserted under Material Assets.	0 Environmental Objectives
	'We strongly support the inclusion of PPS such as the Scottish Biodiversity Strategy and NPF4. The reference to NPF4 sits under Landscape and Visual Impacts and whilst NPF4 does put the natural environment at the forefront, it would be useful to clarify if NPF4 will also be considered in relation to the other SEA topics, for example Biodiversity and Climate Change.	Acknowledgement of the impact of the Fourth National Planning Framework on climatic factors and biodiversity included in the consideration of related PPS.	4 Environmental Baseline and Related PPS
	'Using a topic-by-topic approach, along with SEA objectives, to assess the environmental impacts is supported. The consideration of secondary, cumulative, and	Proposed approach was retained, including the consideration of secondary, cumulative, and synergistic effects.	5 Assessment of likely environmental impacts and 0 Cumulative impacts

	synergistic effects is also welcomed here.'		
SEPA	'We agree with the proposed scope of the assessment and are satisfied that there are no reasonable alternatives. It is noted that the assessment will be undertaken on a topic-by-topic basis we are content with this approach. We welcome the proposals to identify strategies to maximise environmental benefits as part of the assessment process.'	The scope of environmental topics to be assessed was retained, and the assessment proceeded on the basis of no reasonable alternatives (i.e. assessing against a business-as-usual baseline).	0 Scope of the assessment and 0 Consideration of reasonable alternatives
Historic Environment Scotland	'… we agreed that significant effects on the historic environment as a result of the proposal were unlikely. We therefore note that the historic environment has been scoped out of the assessment. Therefore, on the basis of the information provided, we are content with this approach and are satisfied with the scope and level of detail proposed for the assessment.'	Cultural heritage and the historic environment remains scoped out of the assessment.	0 Scope of the assessment

Appendix B: SEA Compliance Checklist

Environmental Report Requirements

Relevant sections of the Environmental Assessment Act	**Section(s) of this report**
14 (2) The report shall identify, describe and evaluate the likely significant effects on the environment of implementing—	
(a) the proposals in the plan or programme; and	5 Assessment of likely environmental impacts
(b) reasonable alternatives to the plan or programme.	0 3.3 Consideration of reasonable **alternatives**
14 (3) The report shall include such of the information specified in schedule 3 as may reasonably be required.	
Information referred to in schedule 3	
1. An outline of the contents and main objectives of the plan or programme, and of its relationship (if any) with other qualifying plans and programmes.	0 2.1 **Background** and 4 Environmental baseline and related plans, programmes, and
2. The relevant aspects of the current state of the environment; and the likely evolution thereof without implementation of the plan or programme.	4 Environmental baseline and related plans, programmes, and
3. The environmental characteristics of areas likely to be significantly affected.	4 Environmental baseline and related plans, programmes, and
4. Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (as last amended by Council Directive 97/62/EC).	4 Environmental baseline and related plans, programmes, and
5. The environmental protection objectives, established at international, Community or Member State level, which are relevant; and the way those objectives and any environmental considerations have been taken into account during its preparation.	4 Environmental baseline and related plans, programmes, and
6. The likely significant effects on the environment, including— a) on issues such as – i) biodiversity and natural heritage; ii) population;	5 Assessment of likely environmental impacts

iii) human health; iv) fauna; v) flora; vi) soil; vii) water; viii) air; ix) climatic factors; x) material assets; xi) cultural heritage and historic environment, including architectural and archaeological heritage; xii) landscape; xiii) the inter-relationship between the issues referred to in heads (i) to (xii). b) short, medium and long-term effects. c) permanent and temporary effects. d) positive and negative effects. e) secondary, cumulative and synergistic effects.	
7. The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the marine spatial plan or programme.	0 Maximisation of benefits, mitigation, monitoring, and evaluation
8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of expertise) encountered in compiling the required information.	0 3.3 Consideration of reasonable **alternatives**
9. A description of the measures envisaged concerning monitoring in accordance with section 19.	0 6.3 Monitoring and **evaluation**
10. A non-technical summary	1 Non-technical summary

This publication is available at **www.gov.scot**

Any enquiries regarding this publication should be sent to us at

The Scottish Government
St Andrew's House
Edinburgh
EH1 3DG

ISBN: 978-1-83601-558-1 (web only)

Published by The Scottish Government, August 2024

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA
PPDAS1473818 (08/24)

w w w . g o v . s c o t