

Knowledge Account on Disposable Coffee Cups/ Single-Use Disposable Beverage Cups

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Expert Panel on Environmental Charging and Other Measures**

Disposable Coffee Cups

Past drivers

Increasing use of single-use packaging to facilitate 'on-the-go' sales models
Increase in coffee consumption and proliferation of coffee shops
Disposable Coffee Cups (DCCs) a symbol of consumer convenience
BBC's *Hugh's War on Waste: The Battle Continues* revealed scale of DCC waste
The "blue planet" effect has raised awareness amongst consumers and led to growing pressure on industry and government to take action on single-use items

Future drivers

Scottish Government's National Performance Framework
The European Strategy for Plastics in a Circular Economy (2018)
UK Plastics Pact
DCCs currently considered for inclusion in Scottish Deposit Return Scheme
Potential inclusion in future Extended Producer Responsibility scheme

Where are we now?

- UK consumes an estimated 2.5 billion DCCs/year (~200 million in Scotland)
- DCCs are predicted to increase to 310 million per annum in Scotland by 2025
- Ubiquitous 'on-the-go' service models and 'throwaway culture'
- Less than 1 in 400 DCCs are recycled (0.25%); likely less in Scotland
- DCCs generate ~4,000 tonnes waste/year in Scotland (assuming avg. DCC is 20g)
- DCCs production and waste generates ~5,900 tonnes of CO₂e/year in Scotland
- Around 40,000 DCCs littered in Scotland annually
- Typical plastic-lined paper DCCs are technically recyclable, but;
 - Only 3 plants capable of processing DCCs exist in UK (none in Scotland)
 - 'On-the-go' consumption prevents source separated collection

Where do we want to be?

- Comprehensive measures adopted to reduce environmental impact of DCCs, prioritised by life cycle assessment and waste hierarchy
- DCCs sold and charged separately to the hot drink product inside
- Major DCC reduction enabled by convenient access to reusable cups
- Increased DCC recycling rates enabled by on-street recycling facilities and DCCs manufactured from more readily recyclable materials
- Greater public awareness of environmental impact of DCCs and pro-environmental changes in consumer behaviour
- The waste management requirements of biodegradable DCCs (and other packaging) is well understood by public and businesses
- Coordinated activity across whole coffee retail subsector
- Knowledge exchange with wider waste management initiatives

Key evidence gaps

- What are the barriers and drivers to changing consumer behaviour on DCCs?
- Would a charge for DCCs be effective at reducing DCC waste on a national level?
- Is there an optimal charge value for DCCs? Should a Scottish charge take the form of tax ('latte levy'), or simply a retail requirement?
- Do observed reuse rates in DCC charge studies persist over longer periods?
- Does a DCC charge have positive spillover effects on other consumer behaviours?
- What are the optimal conditions for a reusable cup deposit return system?
- What impact would a reusable cup deposit return system have on reuse rates if paired with a DCC charge and other behaviour change measures?

Current initiatives

Reusable cup discounts are offered by most retailers but are ineffective
Localised field trials of disposable cup charges have proven more effective
Local and national reusable cup schemes operating in Germany
Scottish Carrier Bag Charge (2014)
Scottish Litter Strategy (2014)
Expert Panel on Environmental Charges and Other Measures (EPECOM)

Knowledge Account – Disposable Coffee Cups

A Introduction

1. In recent years there has been a significant increase in the use of disposable cups for consuming tea, coffee and other hot beverages, following common usage we refer to these hot drinks cups as disposable coffee cups (DCCs). Estimates indicate that the UK uses 2.5 billion DCCs per annum, however this figure may be as high as 5 billion¹. Using the lower bound and Scotland's share of the UK population, this equates to around **200 million DCCs consumed per annum in Scotland**.
2. DCCs consist of the cup, as well as a lid and heat sleeve, and environmental impacts result from each of these components. Assuming an average unit weight of 20g (inclusive of cup, lid and heat sleeve), an estimated 4,000 tonnes of DCC waste is generated each year in Scotland². The CO₂e emissions associated with producing and disposing of a DCC are approximately 1.5 times the weight of the cup itself, with more than half of this coming from the plastic lid. DCCs in Scotland therefore produce an estimated 5,900 tonnes of CO₂e per year.
3. Within the UK, only 1 in 400 DCCs (0.25%) are believed to be recycled¹, and this number is likely lower in Scotland due to lack of reprocessing capacity. The conventional DCC features a paper structure fused to an internal plastic lining which means that it cannot be recycled in the standard paper waste stream, and instead must be collected separately and sent to a specialised processing plant, of which there are only three in the UK, and none in Scotland.
4. Beyond the technical recycling challenges, DCCs are also consumed and disposed of 'on-the-go'. To effectively capture them for recycling, consumers must have reasonable access to, and be inclined to use, suitable recycling facilities at the point their DCCs are ready for disposal. Providing specialised on-street DCC recycle bins is expensive and impractical while high degrees of contamination can render their contents effectively unrecyclable. DCCs which are not recycled are most likely to go to landfill where they produce methane, a greenhouse gas 25 times more potent than CO₂.
5. An estimated 500,000 DCCs are littered in the UK each day (est. 40,000/day in Scotland) making them one of the most littered items. As DCCs are relatively large, these act as 'beacons of litter' attracting disproportionately more littering³ while contributing to litter-related disamenities and overall plastic pollution.
6. Measures to address DCCs should be prioritised according to the Waste Hierarchy and lifecycle analysis⁴, starting with prevention, then reuse, recycling, and finally residual disposal. **Reduction in the number of DCCs used is therefore the optimal outcome** followed by increased recycling.

¹ [House of Commons Environmental Audit Committee \(2018\) Disposable Packaging: Coffee cups. Second Report of Session 2017–19](#)

² Calculations conducted by Zero Waste Scotland

³ [Keep Britain Tidy \(2017\) Written evidence to the House of Commons Environmental Audit Committee](#) (Accessed 02/11/2018)

⁴ [Scottish Government \(2017\) Guidance on applying the waste hierarchy](#)

The Waste Hierarchy⁵



7. From an environmental perspective, reusable cups (RCs) are preferred to DCCs. RCs, however, are typically heavier than DCCs, requiring more material and energy to produce and as a result need to be used multiple times before the environmental 'break-even point' is reached, after which the RC is environmentally superior.
8. Overall, replacing DCC usage with the use of reusable cups will act as a waste prevention technique. This would support more sustainable consumption, improved waste management systems, and reduced littering, however, **this will require a major shift in existing 'on-the-go' service models and the way consumers behave and make choices.**

B Recent trends

9. The issue of plastic waste has recently grown in public and policy consciousness following the broadcast of television documentaries *Blue Planet II*, which highlighted plastic pollution in the marine environment, and *Hugh's War on Waste: The Battle Continues* which revealed the scale of DCC consumption and waste in the UK.
10. In Scotland, a number of groups and organisations are taking initiatives to reduce usage of DCCs and other disposable plastics. For example, the *No Single Use Plastics – Shetland*⁶ campaign is aiming to completely cut out single-use plastics such as straws and cups by the end of 2018 with local businesses pledging to remove these items. The Scottish Parliament and Glasgow City Council have banned plastic straws from their premises.
11. Globally, national and municipal authorities are taking actions to reduce disposable plastics⁷. Santa Monica now prohibits all single-use plastics in the delivery of prepared foods, this includes straws, lids, utensils, plates, bowls, trays, containers, stirrers, cups,

⁵ [Scottish Government \(2017\) Guidance on applying the waste hierarchy](#)

⁶ <https://www.facebook.com/shetlandagainstsingleuseplastics/> (Accessed 02/11/2018)

⁷ [United Nations Environment Programme \(2018\) Single-use plastics: A Roadmap for Sustainability](#)

and lid plugs⁸. In France, starting in 2020, most plastic cups, plates and cutlery will be totally banned⁹. The EU has announced draft plans that would, if progressed, see single-use cutlery, cotton buds, straws and stirrers banned from 2021¹⁰.

12. In response to growing public concern about the environmental impacts of plastic more generally and DCCs in particular, café retailers and catering companies have undertaken a range of efforts to increase recyclability, and recycling outcomes of DCCs. These include better recycling provision, biodegradable cups, removing DCCs, and offering discounts to customers with reusable cups.
13. In summer 2018, the Scottish Government removed all DCCs from its estates, requiring all customers to use their own RC or one of the ceramic mugs provided. While in June 2018, the English high street coffee chain Boston Tea Party stopped providing DCCs, requiring customers to sit in, bring their own RC or pay a deposit to use the company's "loan cup scheme"¹¹¹². The supermarket Waitrose also stopped providing DCCs in 2018¹³.
14. In order to encourage customers' usage of reusable cups, a number of coffee retailers, including Costa, Starbucks and Pret a Manger, have offered discounts to customers bringing their own reusable cup. These discounts, typically £0.25-£0.50, are given to customers who take their beverage in their own reusable cup. In July 2018, Starbucks introduced a charge of £0.05 for paper cups, supplementing their £0.25 reusable cup discount, and in doing so became the first major coffee chain to charge customers for DCCs¹⁴.
15. Many businesses have replaced plastic-lined paper DCCs with 'biodegradable' alternatives, however, these products are in fact, 'compostable' and therefore do not break down during anaerobic digestion or in the natural environment. There are two overarching problems with compostable DCCs, and compostable packaging in general. First, businesses and consumers generally assume 'biodegradable is better', failing to realise that this is only true if items are appropriately disposed of; some studies suggest 'biodegradable' products are littered more often as they are perceived as less harmful to the environment¹⁵. Second, the existing waste system is not designed to collect and manage compostable packaging which is often indistinguishable from non-compostable products. As a result, nearly all biodegradable packaging is sent to landfill where it too produces methane gas.

⁸ <https://www.santamonica.gov/press/2018/08/15/santa-monica-city-council-approves-expanded-ban-on-single-use-plastics> (Accessed 02/11/2018)

⁹ <https://www.independent.co.uk/news/world/europe/france-bans-plastic-cups-plates-cutlery-energy-transition-for-green-growth-a7313076.html> (Accessed 02/11/2018)

¹⁰ <http://www.europarl.europa.eu/news/en/press-room/20181009IPR15501/plastic-oceans-meps-back-eu-ban-on-polluting-throwaway-plastics-by-2021> (Accessed 02/11/2018)

¹¹ <http://bostonteatparty.co.uk/blog/post.php?s=2018-04-23-boston-tea-party-bans-single-use-coffee-cups> (Accessed 02/11/2018)

¹² <http://www.bbc.co.uk/news/uk-43879019> (Accessed 02/11/2018)

¹³ <https://www.bbc.co.uk/news/business-43709656> (Accessed 02/11/2018)

¹⁴ <https://www.starbucks.co.uk/promo/5pcup> (Accessed 02/11/2018)

¹⁵ [House of Commons Environmental Audit Committee \(2018\) Disposable Packaging: Coffee cups. Second Report of Session 2017–19](#)

16. Some café retailers have introduced in-store DCC recycle bins to capture source separated materials and have procured dedicated DCC recycling services from waste management companies. However, these bins are only effective if customers consume their drinks in store (in which case a DCC is unnecessary) or return to store to dispose of their DCC after-use. In-store recycling is therefore unsuited to 'on-the-go' coffee consumption. Other initiatives have involved introducing dedicated on-street DCC bins¹⁶. A study has shown however, that on-street DCC bins do not collect high volumes of cups and are prone to contamination¹⁷. The Glasgow Cup Movement, a collaborative project between Keep Scotland Beautiful, waste companies, quick service restaurants and packaging interest groups, aims to improve recycling and reprocessing rates for single-use cups across the Glasgow region
17. To be affordable and recyclable in practice, **DCCs should not require a separate collection and recycling system** but rather, be made of materials already compatible with existing on-street recycling infrastructure and collection systems.
18. An emerging trend among fast food and café retail chains is the 'zero waste to landfill' concept. Companies can achieve zero waste to landfill by ensuring that all waste produced is either reused, recycled, composted, or sent to energy recovery¹⁸. Energy recovery through incineration in the UK is typically cheaper than landfill, so this makes good business sense however, it is less preferable in the waste hierarchy than waste prevention. 'Zero waste to landfill' is different from 'zero waste' which involves eliminating waste from all business activities and fundamentally challenges the *take-make-waste* paradigm that existing business models are built around. There is also a view that 'zero waste to landfill' claims capitalise on low public awareness of waste incineration as a residual treatment option, allowing the public to infer that all waste is being recycled, and may limit further action towards waste prevention at the top of the waste hierarchy.

C Past drivers of change

19. Over the last two decades, consumer demand for coffee in the UK has grown dramatically, surpassing tea as the drink of choice¹⁹. Growing demand for coffee has led to the proliferation of coffee shops across the UK from 5,000 sites in the year 2000, to an estimated 20,000 in 2018. Today, 1 in 5 people in the UK are believed to visit a coffee shop every day, and approximately one half of all hot drinks are sold in disposable cups.
20. Single-use items have become a defining feature of our economy and consumer culture, transforming the way products and services are provided, and systems operate. In health and personal care, single-use items have become the go-to solution for ensuring hygiene and cleanliness. In the food system, single-use packaging dominates our

¹⁶ <https://www.hubbub.org.uk/Event/recycle-your-coffee-cup-with-the-squaremilechallenge> (Accessed 02/11/2018)

¹⁷ Hubbub (2017). #1 Moreshot Coffee Cup Recycling Project: Final Project Report.

¹⁸ <https://www.carbontrust.com/news/2017/03/what-is-zero-waste-to-landfill/> (Accessed 02/11/2018)

¹⁹ <https://www.independent.co.uk/life-style/uk-coffee-week-2018-british-people-drinking-millions-cups-day-consumption-rise-a8307206.html> (Accessed: 02/11/2018)

supermarket shelves and dictates how products are produced, stored, transported and sold. In the hospitality sector, single use packaging, cutlery, straws, napkins, and sauce pouches have given rise to 'on-the-go' service models. **The growing dependence on single use packaging such as DCCs which complement the 'on the go' and 'throwaway' culture has increased the volume of waste generated every day.**

21. A major obstacle preventing greater recycling of single-use items has been the pace at which new products, materials and composites are placed on the market by manufacturers, without prior consultation with the waste management sector which is forced to react to new materials after they've already entered the waste stream. Reorienting to process these materials takes time and significant investment, assuming a market for the processed output even exists. The result is companies deploying new products and materials externalise the costs required to ensure they are properly recycled at end of life, which artificially lowers the cost of 'innovation'. It is widely recognised that the sheer number of different materials, particularly plastics, within the waste stream acts as a barrier to higher recycling rates. Were manufacturers and producers required to finance the infrastructure required to recycle their new products and materials, it is likely there would be a shift towards fewer materials and 'innovations', and an improvement in recycle rates.
22. Recent successful efforts to raise awareness of the detrimental effects of marine plastics have resulted in a series of high profile industry announcements; from supermarket Iceland pledging to be plastic free from 2023 and the UK Plastics Pact signed by 42 large UK retailers and food companies which aims to eliminate "unnecessary single-use plastic packaging" amongst other similar pledges by 2025²⁰. This flurry of announcements can be attributed to the unprecedented level of public engagement and concern about the adverse effects from waste products and may present a welcome environment for further policy developments on this topic.

D Future drivers

23. Consumer demand for coffee will continue to rise. Estimates suggest that the number of coffee shops will also increase with the number of sites rising from 20,000 at present, to more than 30,000 by 2025, along with a concurrent increase in the numbers of DCCs²¹. Using the lower estimate of current DCC usage in the UK (2.5 billion), this would imply an annual usage of 3.75 billion across the UK, or 310 million in Scotland. Efforts to reduce DCC usage now will accrue significant benefits over this timeframe.
24. In the Programme for Government 2017, the Scottish Government announced the intention to form an Expert Panel to provide advice to the government on a range of problematic waste materials. DCCs were specifically mentioned as a focus²². At the same time the Scottish Government made a commitment to introduce a deposit return scheme for recyclable waste materials such as single-use drinks containers.

²⁰ <http://www.bbc.co.uk/news/business-43901328> (Accessed: 02/11/2018)

²¹ [House of Commons Environmental Audit Committee \(2018\) Disposable Packaging: Coffee cups. Second Report of Session 2017–19](#)

²² [Scottish Government \(2017\) A nation with ambition: the Government's Programme for Scotland 2017-2018.](#)

Consultation to inform the design of this scheme and the materials to be included took place during summer 2018 with results expected in 2019.

25. Inclusion of DCCs in the Scottish deposit return scheme was an option considered in this consultation. This would encourage consumers to return DCCs to participating locations to reclaim their deposit. Currently, no jurisdiction is operating a deposit return scheme which includes DCCs and it is unclear whether this will be taken forward in Scotland. If DCCs were included in the deposit return scheme it is likely new DCC reprocessing capacity would be required.
26. In January 2018, the UK Parliament's Environmental Audit Committee issued a report on DCCs which recommended a mandatory £0.25 charge for DCCs across the UK (the so-called 'Latte Levy'). The value of the proposed charge is informed by the widespread £0.25 reusable cup discount offered by major retailers. While a charge and a discount can be interchanged without affecting the price for the consumer, evidence suggests that a charge would be more effective than a discount in encouraging consumers to use a reusable cup – which suggests that retailers may lose more revenue from a charge compared to the current discount. Retailers lose revenue every time that a drink is sold at the discounted price because the value of the discount is higher than the price retailers pay for a DCC²³. However because very few of their customers take up the offer of a discount, the total revenue lost is quite small. If more customers switch away from DCCs as a result of the charge, then a greater proportion of sales will be at the lower price – possibly resulting in a larger loss of revenue for retailers. This may explain why the proposed £0.25 charge has been opposed by both café retailers and the packaging industry.
27. Several surveys have found high public support for DCC charges. A 2017 YouGov survey commissioned by the Marine Conservation Society found 74% of UK respondents (72% of Scottish respondents) would support a DCC charge²⁴. Two surveys conducted by Zero Waste Scotland as part of field trials found a similar level of support among customers exposed to a DCC charge²⁵.

²³ Market research conducted by Zero Waste Scotland indicated DCCs (including cup, sleeve and lid) can be purchased for <£0.10

²⁴ [Marine Conservation Society \(2017\)](#). (Accessed: 02/11/2018)

²⁵ Middlemass (2018); Zero Waste Scotland (2018) publication pending.

E Current interventions and their impact

28. **Changes in consumer behaviour are required if a reduction in DCC usage is to be realised.** To date a number of interventions have been implemented aimed at disrupting existing behaviours and nudging consumers to use reusable cups. These interventions are focussed around RC discounts, DCC charges and environmental messaging. Interventions which separate the price into two components, the drink and the cup, make consumers aware that they are purchasing two items and have been shown to be effective at encouraging RC usage.

Reusable cup discounts

29. Most major UK coffee retailers have offered a £0.25 discount (or equivalent) to customers bringing their own reusable cup, however, evidence and testimony from retailers themselves indicates that these discounts are ineffective at driving reuse behaviour, with reuse rates among major retailers consistently around just 1-2% of sales²⁶. In 2015, Starbucks doubled its discount to £0.50 but six months later retracted it stating that it had no impact on reuse rates. In 2018, Pret a Manger increased its discount to £0.50²⁷.

30. The difficulty in increasing RC use has been underestimated by major retailers, as evidenced by the experience of Starbucks. In 2008, Starbucks set a goal to sell 25% of drinks in reusable cups by 2015. To support this objective, the company sold a selection of reusable cups in store, and offered customers a £0.25 discount, however, by 2011, the reuse rate remained at less than 2%. In response, the company revised its 2015 target to a reuse rate of just 5% and introduced additional measures including the sale of a £1 RC, and a £0.50 reusable cup discount. In 2015 the reuse rate remained less than 2%.

Disposable cup charges

31. The Scottish carrier bag charge is a good illustration of how application of a (minimal) charge can drive behavioural change and a reduction in single-use items. Like DCCs, single use carrier bags were seen as both convenient for the consumer and an environmental problem. In Scotland, a £0.05 charge on all carrier bags was implemented in 2014 and drove an 80% decrease in use in the first year of implementation, equivalent to 650 million fewer bags in circulation²⁸. An important difference between carrier bags and DCCs however, is the convenience of their reusable alternatives.

32. A number of studies have shown that a **DCC charge**, similar to the plastic bag charge, whereby disposable cups are sold separately from the beverage itself, **is more effective at driving reusable cup usage than a reusable cup discount**. This is attributed to 'loss aversion' or prospect theory which finds people will do more to avoid a perceived

²⁶ [House of Commons Environmental Audit Committee report \(2018\) Disposable Packaging: Coffee cups. Second Report of Session 2017–19](#)

²⁷ <https://www.theguardian.com/environment/2018/jan/02/pret-a-manger-doubles-discount-for-bringing-reusable-coffee-cups> (Accessed: 02/11/2018)

²⁸ [Zero Waste Scotland \(2015\). Carrier Bag Charge 'One Year On'](#). (Accessed: 02/11/2018)

loss than to obtain a perceived gain of equal value²⁹. These studies are summarised below:

- a. A field trial in Cardiff applied a range of measures aimed at increasing RC usage across university and business café sites over a 5-week period. A £0.25 DCC charge was applied to a single site alongside other measures while RC discounts were applied to multiple sites. The study found reusable cup discounts had no effect on RC use, while the DCC charge significantly increased the reuse rate, with no impact on sales. The study also found offering financial incentives (+3.4%), reusable alternatives (+4.3%), and clear messaging (+2.3%) all positively affected reuse rates, with a combined net increase of (+12.3%)³⁰.
- b. Winchester University³¹ implemented a £0.25 DCC charge across 3 café sites and issued free reusable cups to new and returning students at the start of term. This increased RC use from 21% to 33% (a net increase of 55%), saving 65,000 DCCs in the first year of implementation, with no reduction in sales.
- c. In a 2018 trial with the Hubbub Foundation, Starbucks applied a £0.05 DCC charge across 35 stores in London selected to represent 'typical' demographics. Reuse rates more than doubled from 2.2% to 5.8% (a net increase of 164%)³² which is notable given the charge was just 20% of the value of the pre-existing reusable cup discount (£0.25). The study found that transient customers such as tourists and shoppers are more difficult to affect (2.7%), whilst regular customers such as office workers (3.8%) and residents (3.7%) were most likely to change to reusable cups. Following the trial, Starbucks announced it would be expanding the charge to all 950 UK stores³³.
- d. Numerous other organisations are known to have applied DCC charging. The University of California (Berkeley) implemented a \$0.15 charge and reported a six-fold increase in RC use³⁴. Tufts University applied a \$0.25 charge, and the reusable cup use rate increased from 3% to 8%, an increase of 163%³⁵. Other organisations, including the University of Edinburgh, have implemented DCC charges in the last year (2018) though published data is not yet available.
- e. Zero Waste Scotland has undertaken two full field trials in which 'cost-neutral' DCC charges were applied such that there was no net change in the cost of a beverage served in a DCC, the original price simply being split between beverage and cup. For example, under a cost-neutral charge, a coffee previously sold in a DCC for £2.00 would only cost £1.75, with an additional £0.25 charge for the

²⁹ Barberis, N. C. (2013) Thirty Years of Prospect Theory in Economics: A Review and Assessment, *Journal of Economic Perspectives*, 27 (1), 173-196.

³⁰ Poortinga, W. and Whittaker, L (2018) Promoting the Use of Reusable Coffee Cups through Environmental Messaging, the Provision of Alternatives and Financial Incentives, *Sustainability*, 10 (3), 873.

³¹ [Chew Fancy a Brew? Presentation. University of Winchester \(2018\)](#) (Accessed: 02/11/2018)

³² https://issuu.com/hubbubuk/docs/hubbub_starbucks_coffee_cup_charge (Accessed: 02/11/2018)

³³ <https://www.starbucks.co.uk/promo/5pcup> (Accessed 02/11/2018)

³⁴ https://serc.berkeley.edu/paying-the-price-of-disposable-cups-at-caffe-strada/#_ftn3 (Accessed: 02/11/2018)

³⁵ [Fisher, L.E. \(2008\) Signalling change: Studying the effect of price signals on disposable hot beverage cup consumption, Thesis. Tufts University.](#) (Accessed: 02/11/2018)

DCC. These studies found simply splitting the cost of a cup of coffee between the beverage and the DCC resulted in a significant increase in RC use without negatively impacting sales or raising costs for consumers. They also found strong customer support for cost-neutral charging³⁶.

- f. In one of these two field trials, cost-neutral DCC charges were put in place of existing reusable cup discounts at four public sector catering locations over a five-week period. Baseline sales and reuse data from the five weeks before the trial, as well as the five weeks corresponding with the trial in the previous year were compared against trial data. The study found both £0.05 and £0.10 charges significantly increased reuse rates (average increase of 185% across the four sites) without impacting drink sales. Customer survey data found strong support for the charge and a desire to see DCC charging applied more widely. Many respondents stated the charge encouraged them to buy a RC.
 - g. In the other study, Zero Waste Scotland and NHS Scotland partnered to implement a £0.10 DCC charge at University Crosshouse Hospital in Ayrshire, reducing the price of hot drinks by £0.10 to ensure cost neutrality. In addition, plastic-lined paper DCCs and polystyrene soup cups were replaced with 100% polypropylene DCCs which could be recycled within the existing waste system, and Crosshouse staff were provided with free, reusable and 100% recyclable cups. In addition to paying £0.10 less for their drinks, staff using any reusable cup also obtained a stamp towards a free 10th drink. RC use increased from 1% pre-trial to 43% during the trial, while the recycle rate increased from 0% (the previous cups being unrecyclable) to 75%. Staff survey results showed strong support for making trial conditions permanent across NHS Scotland sites and for more retailers implementing DCC charges.
 - h. A 2016 Zero Waste Scotland study³⁷ explored the importance of convenience in consumer decisions to use a RC, comparing reuse rates at 5 workplace cafés with the average 1-2% reuse rates among major café retailers. The study found the average reuse rate (31%) was significantly higher at the workplace cafes, irrespective of the RC incentives offered. A likely explanation is the increased convenience, since employees can store their RCs on site (in their desk or locker) and avoid the inconvenience of carrying them around, except to and from the café. Workplace culture may also play a role.
33. While charging for DCCs reduces their consumption, it does not address the inconvenience of RCs which is a key barrier to their wider use. Unlike reusable carrier bags which can be easily carried in a pocket or purse, RCs tend to be bulky, require cleaning between uses and come with the risk of leakage and mess. As a result, they are a less convenient solution than reusable bags. **To increase RC use, as well as making DCCs less desirable, the accessibility and convenience of RCs must also be improved.**
34. If measures are not taken to improve the convenience and accessibility of RCs, financial incentives need to be high enough to compensate for the perceived inconvenience. A

³⁶ Middlemass (2018); Zero Waste Scotland (2018) publication pending.

³⁷ Zero Waste Scotland (2016). Unpublished.

YouGov study commissioned by Keep Britain Tidy found incentives \geq £0.50 would be required to cause a significant behavioural shift towards reuse. Future research to understand the shadow price of convenience in consumer decisions around RC use would help inform future policy.

35. The evidence shows that requiring DCCs to be sold separately to their hot drink contents is an effective way of changing consumer behaviour. **More research is needed, however, to better understand the barriers and drivers that lead consumers to change their behaviour**, or not, in the face of DCC charges and other interventions. Studies examining the impacts of carrier bag charges suggest that pre-existing intrinsic environmental motivations³⁸ and socio-economic background³⁹ are important drivers in reusable bag behaviour change. Studies of plastic bag charges also suggest that whilst the policy has been effective at increasing reusable bag usage, it has had limited 'spillover' to encouraging other pro-environmental behaviours⁴⁰.

Reusable cup schemes

36. Another mechanism for increasing reusable cup usage is a deposit return system. Under such systems, café customers pay a deposit for a reusable cup which they can choose to keep or return to any participating retailer in exchange for their deposit. The returned RC is then washed and reintegrated into the deposit return system. This system provides consumers with most of the convenience of a DCC, while maximising the environmental benefits of RCs by reducing the total number required (through resource sharing) and maximising their reuse. They could also offer environmental benefits over customers bringing their own cup by ensuring that cups are washed in efficient industrial dishwashers. RC deposit return systems are common at German Christmas markets throughout the UK, and are increasingly prevalent in Germany's café retail sector and have recently been introduced in cities in Australia.
37. The City of Freiberg, Germany (pop. 250,000) signed up 105 cafés (60-70% total) to a scheme whereby cafés receive reusable cups issued by the city, then provide these to customers in exchange for a €1.00 deposit. Customers can keep the cup or return it to any participating cafe for washing to re-enter circulation upon which they receive back their deposit. Notably, vendors were reluctant to impose parallel charge on DCCs to encourage customers to use the reusable cup⁴¹.
38. RECUP is a Germany-wide deposit system for coffee-to-go reusable cups. Users register with an app which shows participating retailers, who pay €1.00/day to be part of the system. Consumers pay a €1.00 deposit to obtain their beverage in a RECUP and can then return the cup to any participating retailer in exchange for their deposit. RECUPs are made of 100% recyclable polypropylene can be washed and reused up to

³⁸ Jakovcevic, A., Steg, L., Mazzeo, N., Caballero, R., Franco, P., Putrino, N. & Favara, J. (2014) Charges for plastic bags: Motivational and behavioral effects, *Journal of Environmental Psychology*, 372-380.

³⁹Rivers, N., Shenstone-Harris, S., & Young, N. (2017) Using nudges to reduce waste? The case of Toronto's plastic bag levy, *Journal of Environmental Management*, 188, 153-162.

⁴⁰ Thomas, G.O., Poortinga, W. and Sautkina, E. (2016) The Welsh Single-Use Carrier Bag Charge and behavioural spillover, *Journal of Environmental Psychology*, 47, 126-135.

⁴¹ <https://www.sbs.com.au/food/article/2018/01/24/germany-citys-answer-disposable-coffee-cups-genius> (Accessed: 02/11/2018)

500 times. The RECUP scheme has been highly successful and is now operating across Germany, enabling rail passengers to purchase a coffee in Munich and return the cup in Berlin. RECUP also sells collapsible silicon based lids which customers can carry with them and fit to any RECUP⁴².

F Outstanding Evidence Gaps

- Consumer behaviour:
 - What are the drivers behind increasing consumption of 'on-the-go' coffee?
 - What are the barriers to increased consumer usage of reusable cups?
 - How can consumer habits around acceptable cup behaviour best be disrupted?
- DCC Charges: Evidence suggests that DCC charges affect increased use of RCs however, a number of key evidence gaps are outstanding:
 - Would a charge for DCCs be effective at reducing DCC waste?
 - Will a DCC charge be as effective on a national level as on a localised level?
 - Are reuse rates observed during DCC charge field trials sustained long-term?
 - Does a DCC charge have positive spillover effects on other consumer behaviours?
 - Is there an optimal DCC charge value? From a behavioural perspective, and in terms of business (both national retail franchises and small independent businesses), what is the best cost-benefit ratio?
 - What other policies are needed alongside a charge to maximise cup reuse?

If a DCC charge is implemented at a national scale in Scotland:

- Should a specific charge value be imposed, or left to retailers to decide?
 - Should it be a tax, or simply an obligation to sell DCCs separately?
 - If a tax, how would it be regulated, managed and revenue spent?
 - What would be the equalities implications of a DCC charge?
- Improving the accessibility and convenience of RCs:
 - What is the shadow price of convenience with respect to DCC and RC use?
 - What are the optimal environments and conditions for RC deposit return systems (e.g. airports, rail networks, shopping malls etc)?
 - What are the combined impacts of integrated DCC charging and RC deposit return systems?
 - How to minimise the transaction costs for both customers and retailers under an RC deposit return system (e.g. reverse vending and washing machines)?

⁴² <https://recup.de> (Accessed: 14/11/2018)