Ditching Disposables Stirling

Findings from the pilot trials

Steven Ogden, Green Gain
November 2023

ZERO WASTE SCOTLAND
greengain
transition Stirling
European Union
gov.scot
EUROPE & SCOTLAND
European Regional Development Fund
Investing in a Smart, Sustainable and Inclusive Future

Contents

1 Project Overview

The Ditching Disposables project piloted a return scheme for reusable cups across 3 different activities in Stirling, seeking to displace as many single-use cups as possible. The pilot encompassed the voluntary participation of 18 cafés and 2 shops, 5 individual events and 2 entertainment venues across the city over a six-month period.

During the full period of the trial a combined total of 17,800 single use cups were displaced across the 3 activities, 1.136 tonnes of CO_2e were saved and the participating businesses achieved combined costs savings of £2,225 in outgoings. A breakdown of these results and activities are noted in Figure 1 right.

Additionally, the pilot has served to identify several logistical and practical learnings which could be adopted by other organisations to improve, inform and advise their own journey into reusables cup loan schemes, the details of which are recorded within this report.

Figure 1: Summary of impacts

	Cups & lids	CO_2e	Cost	Weight
Cafés/ Shops	3,987	243 kg	£465	64kg
Events	610	37 kg	£92	10kg
Venues	13,203	856 kg	£1,668	856kg
Total	17,800	1,136 kg	£2,225	930kg

2 Introduction

2.1 Background

In June 2022, the Environmental Protection (Single-use Plastic Products) (Scotland) Regulations came into force, banning certain, problematic single-use plastics in Scotland [1]. Scotland has set a new precedent by being the first nation within the UK to ban numerous types of problematic single-use plastics.

With around 700 million of these single-use items used in Scotland every year [2], the regulations aim to encourage businesses to make the switch to reusable alternatives, helping to reduce litter and cut emissions.

In recognition of these changes, Zero Waste Scotland commissioned a 'Ditching Disposables' pilot project in Portobello, Edinburgh [3] to support a range of organisations to trial and implement sustainable alternatives to problematic single-use items.

These Stirling and the previous Portobello projects aimed to:

- Assist Zero Waste Scotland to counter rising misconceptions about disposables and educate communities on sustainable alternatives.
- Pilot approaches that prevent and reduce the use of single-use items in communities across Scotland at events, in community spaces, and with organisations and businesses.
- Develop and foster partnerships within the target communities to allow actions to be taken.
- Contribute evidence, and learnings to enable Zero Waste Scotland to provide clear guidance on tested solutions for a wide variety of ways to reduce the use of single-use items, along with practical advice on how to deliver them in engaging case studies.

While the Portobello project looked to implement alternatives for a wider range of single-use items, this pilot in Stirling focused more closely on reducing the consumption of single-use cups.

2.2 The pilot schemes

2.2.1 The concept for Ditching Disposables Stirling

Funded by Zero Waste Scotland, Ditching Disposables Stirling was a pilot project across central Stirling to trial a return scheme for reusable cups. Stirling is a city with a population of around 93,000, a large student population and a seasonal tourist industry. The central business district has a thriving independent café scene with around 30 cafés in the city centre.

The aim was to try and tackle the consumption of single-use cups in Stirling. According to research by Zero Waste Scotland, around 388.7 million single-use beverage cups are used every year in Scotland, equating to an estimated 4,567 tonnes of single-use cups and 583 tonnes of plastic lids [4].

Drinks-on-the-go are a huge part of our

[1] The Scottish Government (2022). Environmental Protection (Single-use Plastic Products) (Scotland) Regulations 2021: Guidance. [online] www.gov.scot. Available at: https://www.gov.scot/publications/environmental-protection-single-use-plastic-products-scotland-regulations-2021-guidance/ [Accessed 20 Feb. 2024].
[2] Zero Waste Scotland and Change Works (2022). Ditching Disposables Final Report. [online] Zero Waste Scotland. Available at: https://cdn.zerowastescotland.org.uk/managed-downloads/mf-u6jjro5n-1681915427d.
[3] Zero Waste Scotland and Change Works (2022). Ditching Disposables Final Report. [online] Zero Waste Scotland. Available at: https://cdn.zerowastescotland.org.uk/managed-downloads/mf-u6jjro5n-1681915427d.
[4] The Scottish Government (2024). Circular Economy and Waste Route Map to 2030. [online] www.gov.scot. Available at: https://www.gov.scot/publications/scotlands-circular-economy-waste-route-map-2030-strategic-environmental-assessment-environmental-report/pages/4/ [Accessed 20 Feb. 2024].

culture. Some customers try to be more sustainable by bringing a reuseable cup. However, this is not always convenient and are often forgotten. The alternative disposable cups, usually made of composite materials, can be difficult to recycle even where recycling points are available.

The rise in on-the-go consumption regarding single-use cups can be partly explained through recent events, economic and otherwise. The COVID-19 pandemic shifted out-of-home consumption towards more quick-service restaurants and takeaways, compared to traditional sit-in venues, which are more likely to provide single-use cups [5].

Figure 2: Café scheme poster

The reusable returnable cup schemes trialled in Stirling sought to test drinking vessels that fill a gap in the market. Instead of providing customers with another reusable cup option to buy and keep, Ditching Disposables Stirling was designed to provide customers with a cup that could be used, but conveniently returned so that it does not have to be carried around for longer than needed.

With the Ditching Disposable cups, customers paid a £1 deposit to borrow the cup and could then return it at the most convenient drop-off point across the network of participating businesses to receive their £1 back.

2.2.2 Who delivered Ditching Disosables Stirling?

The time and capital investment for the projects were provided by Zero Waste Scotland. The projects were managed, and part delivered by sustainability consultancy Green Gain, with the projects co-ordinated on the ground by environmental charity Transition Stirling.

2.2.3 What schemes were delivered through Ditching Disposables Stirling?

Three activities were delivered through the Ditching Disposables Stirling project.

Café scheme

Established a network of 20 organisations, comprising 18 cafés and two shops, to adopt stocks of Ditching Disposables branded, reusable, returnable cups and lids.

Event scheme

Involved trialling the reusable, returnable cups at five local events in Stirling, including two primary school summer fairs, two events run by Forth Environment Link (FEL), and The Hub at the UCI World Cycling Championships time-trial event in Stirling.

Venue scheme

The Tolbooth and the Albert Halls, two of Stirling's premier events venues and managed by Stirling Council, took part in the venues scheme. The trial involved half-pint and full-pint reusable and returnable plastic beer cups branded for each venue.
Further information can be found within this

[5] Food Standards Scotland (2021). The Out of Home Environment in Scotland. [online] www.foodstandards.gov.scot. Available at: https://www.foodstandards.gov.scot/publications-and-research/publications/out-of-home-scotland-2021 [Accessed 20 Feb. 2024].

document - Sections (2) The Café Scheme, (3) The Event Scheme and (4) The Venue Scheme. A detailed methodology explaining how each pilot project was set up is contained within the Appendices to this report.

3 The café scheme

No. cups & lids saved	CO_2e saving	Cost saving	Cup waste saving
3,987	243kg	£465	64kg

Figure 3: Café scheme cup in use

- Returnable cups and lids offered to customers for £1 deposit as an alternative to single-use, disposable cups and lids.
- Customers encouraged to return their cup and lid to any of the participating members of the scheme to either get their deposit back, swap the cup for a fresh one, or get a refill in the same cup.
- Participating cafés promoted the scheme, recorded data via their EPOS till systems (or manually for those using older tills) and washed the cups themselves if they had a dishwasher available.
- Transition Stirling promoted the scheme locally, provided support to redistribute cups and deposits across the network, and washed cups from cafés that did not have a dishwasher.

3.1 Findings and impacts

The café scheme had a total of 18 cafés and 2 shops involved. Two cafés withdrew during the trial, with the café owners citing time constraints as making it impractical for them. Over the course of the pilot project, the participating cafés and shops were asked to capture data on:

- Cups issued to customers
- Cups returned by customers
- Cups swapped (used for fresh)
- Cups refilled (using the same cup).

Data was reported back to Green Gain by the cafés monthly via a chat group.

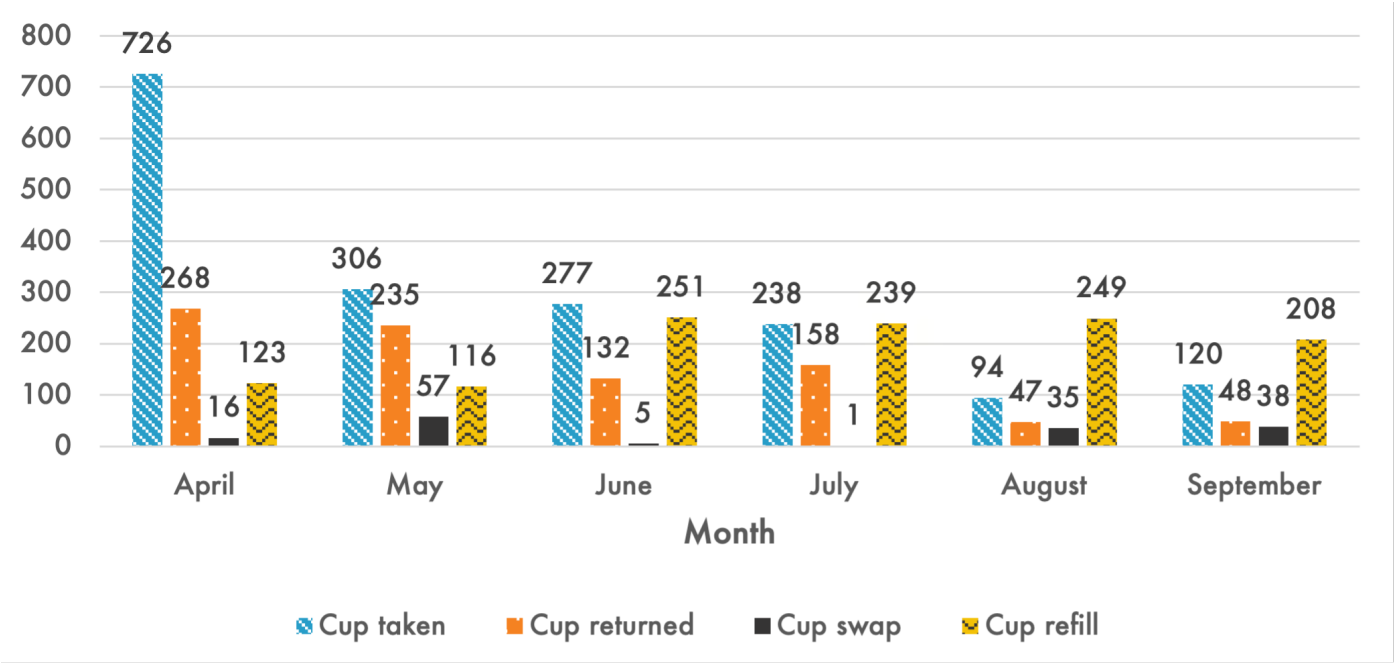
Data from the 6-month pilot are summarised below in figure 4, including the overall total for the pilot scheme. The results are illustrated in figure 5.

It should be noted that the data captured includes some estimated activity across the pilot. Cafés encountered challenges in

Figure 4: Café Scheme - 6 Month Pilot Data

Category	April	May	June	July	August	September	Total
Cup taken	726	306	277	238	94	120	1,761
Cup returned	268	235	132	158	47	48	888
Cup swap	16	57	5	1	35	38	152
Cup refill	123	116	251	239	249	208	1,186

Figure 5: Café Scheme - 6 Month Pilot Data (numbers of cups)



collecting data, with seasonal staff sometimes not recording activity properly (particularly returns, swaps and refills). Some cafés encountered issues with their till systems, whilst others used tally sheets which, again did not always capture all transactions. Based on feedback from the cafés, we can assume that actual activity may be higher than what was recorded.

Across the scheme, 1,761 cups were taken by customers, and 888 returned, which means around 50% are still in circulation. It was reported that 1,338 cups were either swapped or refilled during the pilot (Figure 4) with the majority of these refilled (1,186). Cafés have reported that a high proportion of customers using the scheme prefer to keep the cups and have them refilled repeatedly rather than returning or swapping them. This implies that a proportion of the cups still in circulation are repeatedly being refilled for reuse. Anecdotal information from customer surveys also shows that some customers are using the cups for refills at non-participating cafés where refill data is not being captured.

A total of 8 reusable cups were recycled across this scheme. These cups had been left by customers for a prolonged period without returning for cleaning and the odour being too strong for them to be washed and reused.

Over the six-month pilot, a total of 3,987 single-use disposable cups and lids were displaced by reusables across Stirling. This is the minimum total based on recorded data, with the actual impact anticipated to be higher. This would equate to 7,974 cups and lids if the same activity was (at a very rudimentary level) extrapolated for a full year, and 62,000 cups and lids over 10 years, all things be equal. This rough extrapolation does not account for the higher levels of activity in the first month or seasonal variations in activity. However, it provides a high-level illustration of the potential long-term impact.

The data in Figure 5 shows that cups taken from cafés were highest in the first month and gradually reduced month on month throughout the trail. Cup returns gradually rose from month two through to month four, after which they dropped off for the last two months. Cup swaps fluctuated through the trial, whilst cup refills rapidly increased in month three and continued at similar levels for the remainder of the pilot.

Of the cafés participating, most of the smaller independent cafés on the high-street turned over low levels of cup take-up activity during the trial. Many of these cafés are set up primarily to cater for sit-in customers and were therefore not anticipating high levels of returnable cup activity. Their involvement meant customers could access the returnable cups if they were after a takeaway from their

cafés. It also provided greater visibility for the scheme, whilst adding convenience for customers as all cafés in the network were able to take back cups after use.

There were four busier cafés in terms of returnable cup activity. These were Kings Park Pavilion (located on its own in the park at the west of the city); The Village Café, located at The Peak Leisure Centre to the east of the city; The Station Coffee House, located at Stirling railway station; and Piece Out, located at Stirling Enterprise Park and surrounded by other businesses. The locations of these cafés made them more suited to customers seeking a takeaway option. Both the Station Coffee House and The Village café also served all drinks (both sit in and takeaway) in single-use cups prior to the trial.

3.1.1 Carbon reduction impact

Determining the carbon reduction impact and long-term potential of the scheme is challenging. There is a lack of consensus on the number of reuses required from a returnable cup for this to have a lower CO_2 equivalent (CO_2e) impact than a single-use cup. This is due to the many variables at play in any specific scenario.

Also, the pilot project is a 6-month snap-shot of activity to test the delivery of a returnable cup scheme across a city centre setting. Full impacts would need to be measured over the life cycle of the cups (roughly 500 washes) to understand the true environmental benefits.

A life-cycle assessment (LCA) by Frugal Cup [6], which has been referenced by the House of Commons Environment, Food and Rural Affairs Committee, states that a conventional single-use card-based cup has a carbon footprint of 0.061kg CO_2e [7], assuming the cup is landfilled at end-of-life.

Over 6 months, the total cup usage was 3,987, from a supply of 1,761 cups. In addition, 888 cups were returned, meaning these will be used again. The reuse total therefore comes to 3,987 cups. On that basis, the reduction in CO_2e impacts relating directly to single use disposables avoided was 243kg of CO_2e (and very roughly 486kg CO_2e annually, if we assume the same activity levels for the second half of the year). Assuming an average cup weight of 0.016kg [8], the scheme has also diverted 64kg of cup waste from general waste (landfill or energy from waste).

However, the returnable cups have their own CO_2e impacts. An LCA carried out by the University of Exeter, Environment and Sustainability Institute [9] estimates the annual CO_2e from returnable plastic cups at 0.158kg CO_2e. If washing is accounted for, then this equates to a further 0.009kg CO_2e per cup per wash [10]. Carbon dioxide in washing is generated from the water treatment, electricity to heat the water and the detergent. The exact carbon emissions per use will vary with a number of factors such as the dishwasher model, fullness of the washer, the cleaning programme etc. The assumed figure makes general mid-range assumptions around these factors.

Washing impacts are perhaps over-estimated in this instance as all of the cafés suggested that they would include returned cups in a wash cycle that would have been taking place anyway for in-house crockery and cutlery. If we assume, on average, four washes per annum (that are additional to the regular

[6] FRUGALPAC (2020). 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. [online] Frugalpac. Available at: https://frugalpac.com/new-coffee-cup-study-reveals/ [Accessed 20 Feb. 2024].
[7] Frugalpac (2021). Written evidence submitted by Frugalpac (PW0021). [online] UK Parliament. Available at: https://committees.parliament.uk/writtenevidence/38828/pdf [Accessed 20 Feb. 2024].
[8] Powell, K., Letsinger, S., Sweeney, O., Cooper, B., Worth, C., Cole, G., Zero Waste Scotland and Resource Futures (2022). Consumption of Single-use Disposable Beverage Cups in Scotland and Impact of Policy Options Consumption of Single-use Disposable Beverage Cups in Scotland. [online] Zero Waste Scotland. Available at: https://cdn.zerowastescotland.org.uk/managed-downloads/mf-0qipu-bg-1686671922d [Accessed 20 Feb. 2024].
[9] Yan, X. (2023). Carbon Footprint of the Circular Returnable Cup: A Preliminary Life Cycle Assessment.
[10] United Baristas (2020). Why KeepCup can't save the world. [online] United Baristas. Available at: https://unitedbaristas.com/articles/think-pieces/why-keepcup-cant-save-the-world/ [Accessed 20 Feb. 2024].

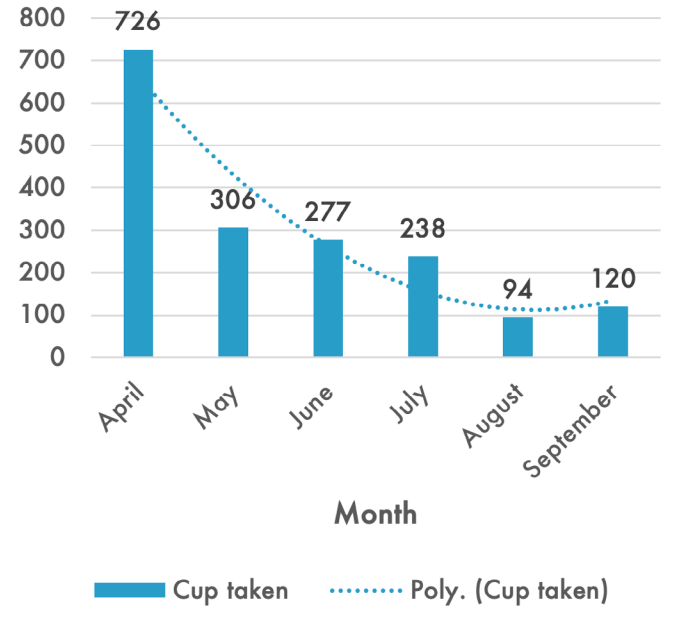
crockery wash cycles already taking place [11]) then this would come to 0.036kg per cup per year. The overall CO_2 impact of a returnable cup would be 0.194kg CO_2e.

Redistribution of cups across the scheme has not been accounted for as 95% of cup redistribution was undertaken on foot, with very little intervention needed across the scheme from the e-cargo bike.

As a basic estimate for indicative purposes, each returnable cup given to customers would need to be reused approximately 3.73 times (0.194 ÷ [0.061 - 0.009]) to become net positive, from a carbon impact perspective, compared to a standard single-use disposable cup.

Over 6 months, the reuse total of 3,987 cups suggests a reuse rate of 2.3 times per cup issued (assuming the 888 returned cups are subsequently used again). Whilst short of the breakeven target, this is the minimum reuse rate required. We know that reuses have been missed through errors with data capture and that there has been hidden activity with cups being used at non-participating cafés. In addition, the trend of supplying new cups was falling significantly, month on month.

Figure 6: Café pilot cup usage



In contrast, the reuse rate remained relatively static in the form of returns, swaps and refills across the trial, with a slight drop in months four and five.

Based on the trends for the second half of the pilot, the reuse rate for the six months beyond the pilot would be 3.3, which would be much closer to the breakeven point for the cups. The longer the project runs, therefore, the better the impact reduction on disposables.

3.1.2 Financial impact

The financial impact of the scheme is primarily to be found in the savings made by the cafés on purchasing new single-use cups and lids. An average standard single-use cup and lid costs approximately £0.15 [12]. This could be lower for cafés where bulk buying is an option but potentially higher for smaller cafés, who would see a higher unit saving from the disposable cups avoided. Based on a total 3,099 single-use disposable cups and lids being displaced over 6 months, around £465 were saved across the scheme.

For the four cafés with the highest takeaway turnover, the average monthly saving on cup purchases is:

- Kings Park Pavilion – £35
- The Village Café – £22
- Station Coffee House – £11
- Piece Out – £7

Further cost savings may have been achieved by The Village and the Station Coffee House. They only use disposable cups, consequently sit-in customers regularly dispose of their cups on site. Therefore, reusables offer a reduction in general waste, which over time could translate to cost savings. This data was not recorded as part of the pilot.

One other area of potential benefit is unclaimed deposits. Transition Stirling managed the balance of cups and deposits across the café during the project and at the

[11] Based on anecdotal feedback from the pilot cafés
[12] Default cost used by Circular&Co. (n.d.). Circular Returnable Cup Calculator. [online] Circular&Co. Available at: https://circularandco.com/cup-calculator [Accessed 20 Feb. 2024].

end of the pilot collated the surplus deposits from the cafés to compensate cups lost from the system.

For long-term schemes, the surplus deposits would be invested in new cups to replace the lost stock and ensure the long-term sustainability of the project. The participating cafés all combined cups for washing in existing loads, therefore no additional tangible costs were associated with washing beyond small amounts of additional time loading and unloading the cups.

All the cafés stated that, once up and running, there was little additional time and effort required to operate the scheme, beyond promoting this to customers, so no additional costs were incurred.

Few measurable economic benefits, beyond cost savings, were reported by the cafés, but this is partly due to the limited data collected. Cafés did not have the resource and capacity to track savings throughout the pilot as well as the cup data. One café felt that the scheme had brought new regular customers, albeit on a small-scale. Some of the cafés offered discounts for those using and reusing the returnable cups. In those instances, the savings on the disposable cups were offset by the discounts offered to customers.

Conversely, the discounts could also have encouraged additional sales and therefore generated additional revenue, according to feedback from the cafés. Each participating café received more exposure and promotion from participating in the pilot. Additional sales data was not collected by the cafés; therefore, it is not possible to conclude tangible economic impacts over the 6-month pilot.

3.2 Key learning - implications of this data

The key learnings for the café scheme are summarised under a series of sub-headings below. The findings have been drawn from a combination of learning during the pilot delivery, along with final feedback surveys with Transition Stirling, the Cafés and the public. Customers using the cup scheme were asked to complete an online survey. Face to face surveys were also undertaken with the general public to capture feedback from those that have not used the scheme.

3.2.1 Resourcing and set-up

For a city-wide scheme such as the Ditching Disposables Stirling scheme, it was important to have a lead partner, based in the city to manage the project on the ground. Transition Stirling fulfilled this role with funding support from Zero Waste Scotland to cover time and upfront capital expenditure.

Transition Stirling supported a range of key tasks to initiate the project including assisting Green Gain with café recruitment, development of guidance documents and methodology for operating the scheme.

Figure 7: Transition Stirling community hub

Recruitment should not be underestimated with significant time required to undertake repeat visits to cafés to build relationships, assess their needs, and bring them on board. Transition Stirling assisted with the onboarding of the recruited cafés, supplying the cups and helping train the key café personnel on the set up and operation.

Throughout the project Transition Stirling supported the cafés with troubleshooting, provided a redistribution service for cups and washed cups for the cafés without

dishwashers. An online chat group was set up to provide regular updates and communication across the café network, including managing cup numbers and redistribution. A couple of standalone cup drop off points were set up for customers to return their cups without receiving their deposit back. These were set up to improve drop off convenience for customers, Transition Stirling serviced and washed the cups from these during the pilot.

Transition Stirling also carried out a vital marketing role throughout the project, attending events, radio interviews, producing social media content, and speaking to the public to engage them in the scheme.

The project completion surveys showed that all the cafés found this set up and ongoing support from Transition Stirling invaluable as they do not have the time and resource to run the scheme independently between them.

3.2.2 Customer engagement

Customer engagement in a city-wide scheme like this is vital for participation and the ultimate success of the project. Promotional materials were developed by Zero Waste Scotland and supplied to each of the cafés to market the opportunity to customers. Scripts were developed to help staff succinctly explain the opportunity to customers. Individually, the cafés felt that they had sufficient promotional materials to make their customers aware of the cup scheme and how it works.

Figure 8: Café scheme strut card

The provision of a strut card to put on the counter which visually explained how the scheme worked was seen as the most useful marketing item.

Stickers were provided for cafés to place in their window to promote their involvement and to help customers find where to pick up / drop off a cup.

A couple of the cafés suggested this was too subtle and something more obvious such as branded bunting should be used to stand out as a participating café. However, most cafés did not want a huge display or poster in their window, particularly those trying to appeal to a younger demographic. The window sticker was a compromise to identify participation but not dominate the window space.

Figure 9: Café window sticker

All cafés were asked to introduce and explain the scheme to customers and to offer the returnable cup as an option to takeaway customers during the pilot. Most of the cafés actively promoted the returnable cup option to customers in the first month, with some really pushing the opportunity heavily to both regulars and new customers. This approach dropped off significantly after the first month, with many cafés (not all) then becoming reactive rather than proactive. If a takeaway customer asked for a returnable cup, they would provide this, but they would not proactively offer the option upfront. The reasons given by the cafés for this are varied. The primary reason is that regular customers (and staff) were becoming fatigued by the act of offering and explaining the scheme. For example, one café that went to great efforts to

promote the scheme during the first 6 weeks received customer feedback indicating they were becoming annoyed by the offering being repeated to them, resulting in the café pulling back on the promotion. Others found it hard to control how staff explained the scheme, noticing staff less comfortable talking about the returnable cups often avoided offering the option to customers. Seasonal staff changes and the use of short-term workers in the busier summer periods made it difficult to provide a consistent offering.

Another challenge in explaining the scheme to customers was time limitations. Small cafés tended to have quiet periods in the day and then extremely busy waves of activity in the morning and at lunchtimes. With one or two staff doing everything and queues building, the returnable cup scheme became a low priority with no time to explain or promote it to customers. Cafés would try and engage more with customers during quieter periods.

Common feedback from the cafés, particularly at the start of the project, was that customers were not aware of the scheme and so a lot of the responsibility fell on the cafés to explain this. Some cafés felt that a greater level of promotional build-up, prior to launch, might have helped through advertising on the radio, billboards, buses, and bus stops. This could also have included engaging with tourist operators to target the significant tourist population that descends upon Stirling across the spring and summer.

All cafés found tourists particularly hard to sell the scheme to for a combination of reasons. The first was language, with some foreign tourists not understanding the guidance or what was being explained by the cafés. This could potentially be addressed through more visual illustrations of how the scheme works, building on the strut card approach.

Secondly, tourists would often be on the way to Stirling Castle or the Wallace Monument where there was no participating café to return their cup to. They did not want to carry the cup round the tourist attraction. An attempt was made to try and address this part way through the pilot by locating a drop off container for the cups at Stirling Castle. This offered greater for customers albeit they were unable to reclaim their deposit.

Figure 10: Castle collection point

Unfortunately, the container at the castle did not prove successful, despite various types of signage being trialled to make its use as obvious as possible. The bin was primarily used for depositing single-use disposable cups. This type of issue could be addressed by engaging cafés at this location in the scheme or exploring other approaches.

Figure 11: Contents of collection point

3.2.3 Data capture

Data capture has been managed by the cafés either via their EPOS till systems or

using manual data capture sheets supplied by Transition Stirling. The cafés reported their data through to Green Gain monthly via a chat group, qualifying any challenges or issues with reporting.
All but two of the cafés consistently reported their data monthly, contact was lost with the other two cafés during the trial. All cafés liked having a chat group as a means for ongoing communication, citing it was quick, easy and relatively hassle free.

Data quality was mixed throughout the duration of the pilot. Data collection was compromised in some cafés by transactions not being recorded properly due to:

- Time pressures during busy periods.
- Short-term staff being less familiar with systems in busy summer periods.
- Issues with till systems not functioning properly.
- Limitations with till systems not capturing certain transactions.
- Manual data sheets going missing.

The cafés generally worked hard to capture data as well as they could within the context of so many operational pressures.

However, the feeling amongst cafés, and from Transition Stirling was that a more simplistic system that could enable a QR code on the cups to be scanned in an out, or when swapped or refilled would have made the process easier and more accurate.

3.2.4 Washing

Cup washing was carried out by individual cafés except for three that did not have a dishwasher. Cafés with dishwashers found that they could incorporate any dirty cups and lids into their existing wash cycles and no dedicated cycle was needed just for the cups and lids in isolation. Cafés washed their cups and lids to a minimum of 70°C, based on the advice of the cup manufacturer.

For the three cafés without dishwashers, Transition Striling collected and carried out washing on their behalf. Numbers collected for washing throughout the pilot were limited. The cafés would rinse the cups for collection, with only one wash a month required. Transition Stirling used a domestic dishwasher and found that this was very time consuming for washing cycles. If they were to run a scheme in future again, they would invest in an industrial dishwasher including racks to keep the cups stable during the wash.

The pilot cups are made from plastic and have narrow external ridges to help insulate the cups. This means that they can take some time to dry and sometimes require manual drying with a towel. Investing in drying racks will help to promote quicker and easier drying without taking up much space.

Some of the cafés used the cups for takeaway soups. It was found that for both hot drinks and soup, the cups did not stain after washing, including the all-white lids.

Figure 12: Drying rack

3.2.5 Cup redistribution

Transition Stirling found the maintenance and management of the scheme easier than anticipated. Customers could return their cups to any of the participating cafés to get their deposit back. Prior to the pilot commencing, it was anticipated that cups may migrate towards specific cafés, such as the Station Coffee House which is a key commuter and tourist destination. It is not possible to follow cup movements in detail as these were not

chipped for tracking. However, no café reported being inundated with cups at any point. This meant that redistribution of cups by Transition Stirling was limited to around a day a month throughout the trial.

3.2.6 Café leadership

The cafés which had the most success with delivering the scheme were those where the owners/managers really embraced the opportunity and enthused their staff in the concept. This highlights a need for continued drive and commitment from all staff, particularly management, to maintain momentum and ensure success of such schemes.

3.2.7 Incentives

It was not possible to run an incentive scheme across the café network as not all cafés were comfortable with this approach. However, five cafés did offer discounts on reusable cups and cup swaps/refills. The consensus across the cafés was that the discount was valued by those using the scheme, however, they did suggest it was not sufficient to incentivise significant behaviour change overtime.

Cafés were unwilling to test a charge on disposable cups at any level. Coming out of a challenging period for the hospitality sector, all the participating cafés were averse to any potential risk of losing customers. The consensus was that a charge would only be put in place if all the other cafés in Stirling were doing this. There was a feeling that any action at an individual business level would result in an immediate loss of customers.

3.2.8 Customer behaviour

All the cafés suggested that customers who had participated were very positive about both the scheme and the cups. According to the cafés, the most common reasons for customers not engaging in the scheme were: a lack of time (in a rush, or did not want to queue to return the cup); that they did not have a £1 coin (for cafés accepting cash deposits only); that it was not convenient to drop off (mainly tourists and students); or that they did not want to pay a deposit (less frequent than the other three reasons).

Another reason mentioned a few times was that the customer did not regularly buy takeaway drinks.

Figure 13: Customer instructions

In terms of aesthetic, the cups were designed to be noticeable, but not so attractive that customers would be tempted to keep or collect them. Transition Stirling observed that a negative byproduct of this approach was that younger customers were not talking about the cups on social media. Stirling has a high student population and the cups failed to grab the attention of student customers according to the cafés.

There are five cafés that cater heavily for student customers in Stirling centre. Three did not participate in the scheme and one dropped out early on. The cup scheme was less aligned with the general aesthetic and image of these cafés. The one café that was popular with students, and did participate, reported limited activity and interest in the cups.

However, the café reported that there was a disconnect with the University cafés not being involved. Students heading back to the University with a takeaway beverage had nowhere to drop the cups off at the University. Getting the University cafés onboard and participating could significantly address this issue for any future activity. Revisiting the cup design may be another consideration to make this more appealing, whilst maintaining a clear

message that this is meant to be returned for reuse.

The common theme reported by the cafés was that the Ditching Disposables cups were used as a 'bargain cup to keep' by customers, rather than as a cup intended to be quickly returned for washing and reuse, this preference is also backed up by the scheme data.

Some participating cafés reported customers saying '£1 is cheap for a reusable cup'. This indicates a mindset amongst customers that the cup is to be retained rather than returned.

Cafés were encouraged during the pilot to talk about the cups as 'returnable' rather than 'reusable'. Should the scheme be repeated, close attention would need to be paid to the wording of the scheme branding to encourage cup return.

Customers using the cups for refills is a positive finding, but ideally, the number being returned should be higher, with 50% of the cups given to customers still in circulation at the end of the pilot. The scheme had an ambition of avoiding cups being stored and accumulated at customers' homes, thereby not actively being used to displace single-use cups.

One unique challenge for the Station Coffee House at the railway station was that regulars purchasing a takeaway beverage in the morning had nowhere to drop their cup off at major stations further down the line (e.g. Edinburgh, Glasgow, Dundee, Aberdeen). Continuity of the scheme across other cities would significantly increase uptake, according to the café.

Three of the busier cafés also noted that the scheme had resulted in an increase in customers using their own bring cups. Data was not captured on this but a positive correlation between the scheme and other reusable cup refills was noticed in several cases.

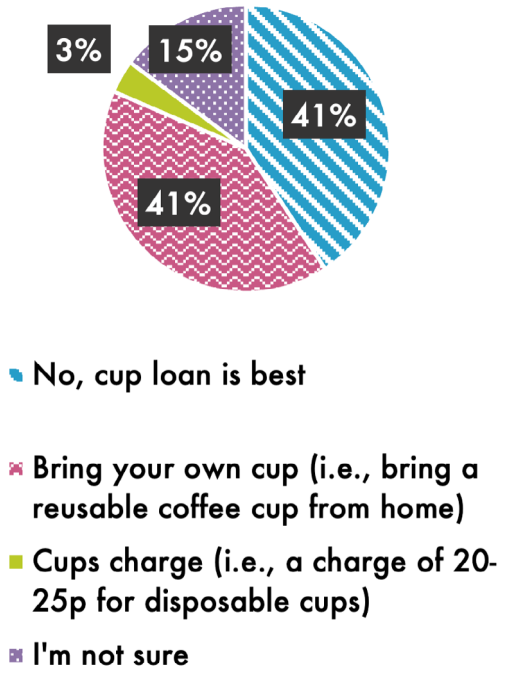
3.2.9 Customer feedback

The general public were surveyed as part of the pilot project via an online questionnaire (targeting users of the scheme and generating 30 responses) and through face-to-face surveys (targeting both users and non-users, achieving 25 responses).

The online survey explored customer understanding of the scheme. When customers were asked: "Do you know what the term 'cup loan scheme' refers to?", 85% responded positively. It should be noted, however, that those responding to the survey have already used the scheme and should have had the cup system explained to them by the cafés.

Approval of the Ditching Disposables Stirling Scheme was very high from the online survey results, with no negative responses and 78% 'strongly approving' of the scheme. When asked which approach was preferable for reducing waste, the cup return scheme and bring your own reusable cup were tied as the most popular responses at 41%. A charge on disposables was less popular.

Figure 14: Preferred approach for reducing waste



When asked for feedback on a Scotland wide returnable cup scheme like Ditching Disposables Stirling, 85% strongly approved, with only 4% disapproving.

A total of 89% of respondents felt that by participating in the scheme, they were having a positive impact upon the environment.

Again, 89% of customers felt that single-use plastics was an important issue for them, with 11% saying this is of moderate importance.

Customers were asked what would encourage them to choose a reusable cup. Discounts were highest at 61%, with a charge on disposables second at 17% and more information about the environmental benefits third at 11%.

The three key perceived barriers to using a reusable cup were inconvenience of return (48%), hygiene concerns (30%) and if customers had to bring their own cup (22%).

The face-to-face surveys of those using the scheme found that 80% of customers prefer to keep their cup and refill this rather than returning it to get their deposit back. This correlates with the feedback from the cafés. All of those using the scheme were very positive about their experience and all preferred the reusable cups to the disposables.

When asked what could be improved with the scheme, 80% said nothing, with customers seeming to like the simplicity involved. The recommendations to improve the scheme were focussed on its expansion so that it is available across all cafés/outside of Stirling. All users said that they would continue to use the scheme beyond the pilot.

Figure 15: Perceived barriers

Of the customers surveyed that did not use the scheme, 50% were not aware of it and 50% were aware but had not decided to use it.

Of those not aware, 70% suggested that they would now use the scheme having had it explained to them. The most common reason for not wanting to use the scheme in future is that the customer rarely buys takeaway drinks. One customer objected to using the cups on the basis that they are made from plastic.

For those aware of the scheme, but not using it, 30% said it was because they bring their own cup, 50% because they do not buy takeaway drinks often, and 20% because they prefer a disposable for convenience.

When asked if anything could be changed to get them using the scheme, 30% said that the scheme looks positive and they would be encouraged to use it next time, with one customer saying that it needs to be promoted much more heavily, and another customer saying it needs to be the default option. The remainder said no but, in most cases, this was because they do not buy takeaway often, or were not local. A number of customers suggested that they didn't want to have to carry the cup around with them or queue to return it after use.

In terms of perception of the cups across all customers not using the scheme, 95% of respondents liked the cups and preferred them to single-use cups.

The 5% negative responses stated they did not agree with the use of virgin plastic cups, preferring to see recycled content plastic cups being used instead.

Finally, when asked whether a separate charge on disposable cups would influence them to choose a reusable/returnable cup, 88% of respondents said 'Yes'.

3.3 Recommendations for good practice roll-out and replication

The Ditching Disposables Stirling café pilot

was developed to gain valuable learning about customer behaviour, and the practical operational challenges of a returnable cup scheme.

All but four of the cafés involved in the scheme were keen for the pilot to continue in its current form as it added significant value to customers, and the environment, with little additional effort required on their part.

The other four were in full support of the scheme but did not think it suited their specific set-ups. This was primarily because their cafés handle very little takeaway business, focussing mainly on sit-in custom. Where takeaways were purchased, it was typically by tourists heading up to Stirling Castle where there was no drop-off point until the final month of the pilot project. Having Stirling Castle as part of the pilot scheme could have positively influenced this.

3.3.1 Recommendations

The overall core of the pilot project was successful and provides a strong basis for replication in other towns and cities. Useful learning from this pilot, which could be incorporated into any future schemes, includes the following elements.

A dedicated part-time member of staff

To successfully launch and operate an expanded scheme would, in Transition Stirling's view, require someone to regularly manage communication across the network, troubleshoot issues, proactively market the scheme, recruit new cafés, redistribute cups (from time to time), gather/monitor data on performance, and promote its successes. Transition Stirling suggest that a member of staff working 2 to 3 days a week to the project would be required.

Service Charge

In order to contribute towards the ongoing management costs of the project, Transition Stirling has considered the potential to introduce a service charge for running a permanent scheme.

Rather than a flat fee, this would need to be a scaled charge related to the level of ongoing cup return activity. For some cafés, the level of reusable, returnable cup activity was too limited to justify a monthly service charge, and stated this would put them off participating in the scheme. For cafés with higher levels of activity, the feedback was that any charge would need to fall within the monthly saving the cafés make on purchasing single-use cups and lids.

The cafés could see the need for a service charge for keeping the scheme running but wanted to see additional value for their investment around broader promotion and marketing of the scheme to raise its profile amongst the general public.

The prospect of a service charge will be more viable with greater levels of returnable cup usage across the café network, as individual cafés will be experiencing greater savings on the purchase cost of single-use disposables.

A new cup design

A rethink of the cup design, to make these more appealing to a younger audience, with the potential to generate a natural buzz about the scheme would be the ambition of Transition Stirling, whilst treading the fine line of not making them so attractive that people want to keep them.

Simplifying data handling

Data capture is important for reuse schemes as it is the reuse of the cups overtime that demonstrates the saving on carbon emissions over time. A system to simplify this, using QR codes on the cups and scanners, would make for more accurate data capture. Unique QR codes can be laser-etched into the cups so that these do not wear off during washing. This would also make the process of managing the cups much easier for the cafés in terms of stock checks and understanding the savings they are making on disposables.

Electronic Payments

A few cafés accepted cash only payments for deposits, which presented a significant barrier to customers. This can have a negative impact on scheme perception if customers want to participate but find they cannot. Any future scheme would need all its membership cafés to

allow electronic payment for deposits in and out of the scheme.

Broader promotion leading up to the launch

A common point of feedback from the cafés was that customers were often not aware of the scheme, and this had to be proactively promoted to them. A broader promotional campaign leading into the launch would help to address this issue and quickly build scheme recognition and momentum moving into a launch. Consideration should also be given to other influencing factors, for example given the large student and tourist population in Stirling more effort would be needed to engage these audiences via relevant bodies and media.

Extend the scheme coverage

It is suggested that any similar schemes being implemented seek to include any relevant key destinations which would help join up the scheme across the entire area and encourage wider engagement of these key customer types.

Messaging

The prevalence of refill activity during the pilot was very encouraging. However, the intention is for customers to use and return the cups at their convenience. Targeted messaging, referring to the cups as 'returnable', or 'borrowed' cups may help to adjust customer understanding of their purpose.

No Deposits

An alternative approach to deposits could be considered by using a digital reusable cup system. Suppliers such as Vytal [13] offer an App-based system that customers download and register with.

With an app-based system, cups can then be taken without a deposit. However, if customers do not return cups within a specific timeframe, they are charged for the cost of the cup. However, there are alternative considerations with this sort of system.

Figure 16: Vytal cup and App

There is the initial expense of the cups for the business. Perhaps most significantly there is the time factor with customers having to download the App and register their details before accessing the cups. A major finding from the pilot is that takeaway customers in most settings are very time poor. There is the risk of low uptake to the scheme if time is a barrier. Accessibility of this type of system could potentially be a barrier for those customers not being able to download or use an App. Another potential barrier to uptake is the cost if a cup is not returned on time. If this is at around £10, it could be too significant a risk to potential customers.

Finally, this type of system uses cups with chips which are more challenging to recycle at end of life as the chip needs to be removed before the plastic can be recycled.

Similar networks of cafés could potentially set up their own scheme without third party involvement using good practice information and templates provided by Zero Waste Scotland at their reusables hub website [14]. Cup redistribution could be managed relatively easily between the cafés themselves via a chat group. The pilot project demonstrated that there is a need for leadership to deliver and manage such a scheme.

[13] Vytal (n.d.). Vytal - The sustainable reusable packaging system. [online] en.vytal.org. Available at: https://en.vytal.org/ [Accessed 20 Feb. 2024].
[14] Zero Waste Scotland (2023). Reducing single-use. [online] www.zerowastescotland.org.uk. Available at: https://www.zerowastescotland.org.uk/resources/reducing-single-use [Accessed 5 Mar. 2024].

This could take the form of a local charity, one of the participating cafés themselves, a local authority, or an enterprising individual. Ambitious schemes with a large number of members that are well marketed will require greater levels of ongoing support and maintenance, and these are best suited to a model such as the pilot project in Stirling.

A small village or town scheme with 5 to 10 cafés could quite feasibly be operated and managed by the cafés themselves as long as there is one or two of those cafés willing to take the lead and invest a small amount of time to maintain and manage the scheme.

3.3.2 The impact of policy measures

The Scottish Government is considering introducing a charge on single-use disposable cups and has signalled that a future key milestone will be a public consultation to inform draft regulations [15].

Such a policy measure could have a profound impact on consumer behaviour in relation to reusable, returnable cups, such as those trialled by the Ditching Disposables Stirling Pilot.

When asked about proposals for a mandatory charge on single-use cups, all the participating cafés were in favour. Most of the cafés want to participate in a returnable cup scheme. For those that no longer wanted to continue, each suggested that such a charge on single-use cups would make them reconsider their decision as they would need to be able to offer an alternative for customers to avoid the charge.

The majority believed that such a charge would encourage the public to opt for the reusable, returnable option to a much greater extent than they do currently. Several cafés also commented that such a shift is essential for reusable, returnable cup schemes to truly work. One of the busier cafés suggested that the Ditching Disposables Stirling scheme currently relies on the general public "doing the right thing" and that this will only ever result in a modest uptake in the offering. The same café suggested that a financial mechanism is required to alter customer behaviour.

A couple of participating cafés suggested that the charge would need to be at a relatively noticeable level before it has an effect. Their reasoning for this was the fact that their discounts for using returnable cups (of up to £0.25) were only attractive to a limited percentage of their takeaway customers. The main priority for customers was seen as the speed at which they could get their desired drink and leave. A charge will need to be significant enough to offset customers' convenience in order to change their behaviour. The cafés making these points suggested a charge of between £0.30 to £0.40 would be needed to bring about behaviour change.

Transition Stirling would like to see measures for a single-use charge go ahead. This could be the springboard for launching a permanent scheme. It would significantly encourage participation levels amongst cafés that did not take part in the pilot. It would also garner much greater attention from the press and consumers, offering a viable and affordable alternative to customers in response to the changes.

Whether a reusable, returnable cup scheme is developed on a national or local scale, the key learning is that it must be, quick, easy, and convenient for customers to use as well as for cafés to implement and operate.

[15] The Scottish Government (2023). Single-Use Disposable Cups Charge Advisory Group minutes: June 2023. [online] www.gov.scot. Available at: https://www.gov.scot/publications/single-use-disposable-cups-charge-advisory-group-june-2023/#:~:text=ST%20also%20signalled%20that%20a [Accessed 5 Mar. 2024].

4 The event scheme

No. cups & lids saved	CO_2e saving	Cost saving	Cup waste saving
610	37kg	£92	10kg

- **Schools** - batch of cups and lids lent to schools for them to use at their drink stalls, charging customers a £1 deposit in the same way as the cafés. Transition Stirling then picked up the cups at the end of the event for washing.
- **FEL Events** - FEL paid the deposits to borrow the cups to provide to delegates during refreshment breaks. Transition Stirling collected the cups at the end for washing and refunding the deposits for returned cups.
- **UCI event** - Transition Stirling hosted a stall for customers to pay a deposit for cups to use at the various pop-ups operating onsite. Cups were also supplied directly to the pop-ups serving hot drinks for them to use directly. Transition Stirling then collect returned cups for washing at their stall.

4.1 Findings and impacts

The event scheme provided alternatives to single-use disposables across five separate events.

The event hosts were asked to capture data on:

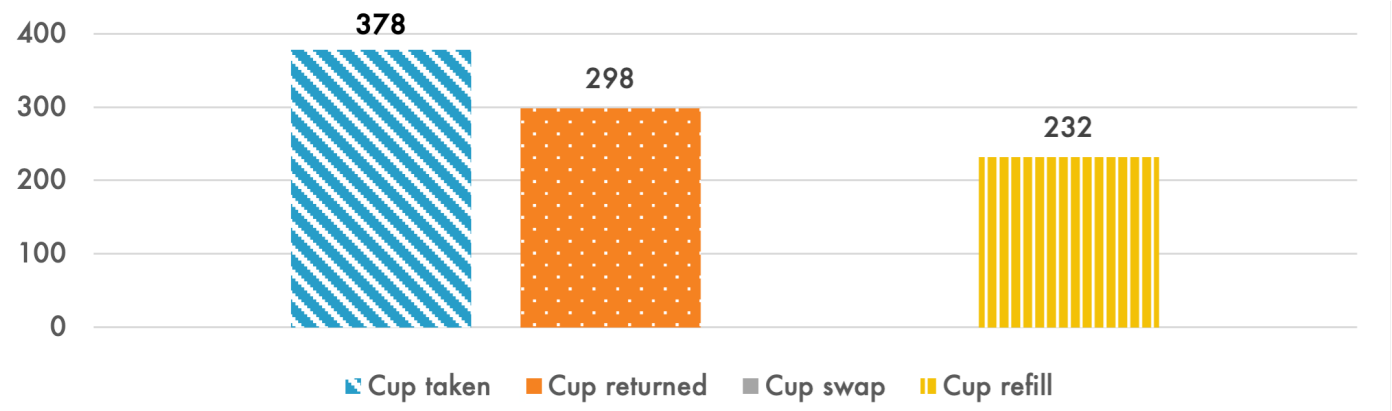
- Cups issued to customers.
- Cups returned by customers.
- Cups swapped.
- Cups refilled.

The results are summarised in Figure 17 and 18 below.

Figure 17: Venue Scheme - Pilot data from 5 events

Category	St Ninians Primary	Cambusbarron Primary	FEL Food Event	FEL Bike Event	UCI Event	Total
Cup taken	100	100	75	35	68	378
Cup returned	86	90	55	35	32	298
Cup swap	0	0	0	-	0	0
Cup refill	3	4	225	-	0	232

Figure 18: Event Scheme – number of cups across 5 events



A total stock of 180 cups and lids were used to supply the 5 events. Across those events there were 378 uses, with a further 232 refills, making a grand total of 610 uses.

The data from the two school events was very similar. At these events, cups were supplied directly from a drinks stall to customers in exchange for a deposit, which they received back on returning their cup. Refills were limited as customers would typically stay only long enough for one drink. The majority of cups were returned, but some customers did decide to keep them (10-15%).

FEL paid the deposits to effectively hire the cups to supply their delegates for the two conference-style events. The FEL bike event was a smaller, evening event and so refills were limited, and all the cups were returned. The food event was over a full day, with three formal breaks and therefore a much greater opportunity for refills. This explains why refills were much higher for this event. Some delegates clearly liked the cups with 25% being kept by attendees rather than returned. This may have been a result of delegates not paying the deposit themselves and perhaps mistaking the cups for gifts to keep rather than return. Clearer communication may have mitigated this and should be incorporated into any future events of this type.

The UCI World Cycling Championships saw the largest proportion of cups kept by customers with 53% (36 cups) retained. Various factors may have influenced this. For example, customers paid a deposit for their cup but could then explore the various fan zones of the event across the city. To return their cup to get their deposit back, customers would have to return to the event hub. However, additional return points across other fan zones or communication on where the cups could be returned may have helped to alleviate this.

Some customers may have chosen to either keep their cup or return it to a café nearby, hence the lower return rate. This is purely speculation based on the circumstances customers were presented with at the event.

The general uptake across the UCI event was much lower than anticipated. The opportunity to use the cups at the event came up at the very last minute which prevented detailed planning and limited any opportunities to provide additional drop off points. The event hub where the cup stall was located was also very quiet across the three days. The big screen was not working on two of the days of the event and fans seemed to prefer the other fan zones, so there was limited activity at the hub.

4.1.1 Carbon reduction impact

A starting stock of 100 cups and lids were used as the basis for the event trials. Across the events, 80 cups were kept by customers and lost from the system. These were replaced, meaning that 180 cups and lids were used in total. Across the events there was a total of 610 uses. This makes for an overall reuse rate of 3.4.

On that basis, the reduction in CO_2e impacts relating directly to single use disposables avoided was 74kg CO_2e annually, if we assume the same activity levels for the second half of the year [16]. Assuming an average cup weight of 0.016kg [17], the scheme has also diverted 10kg of cup waste from general waste (landfill or energy from waste).

It was established in the previous section (3.1.1) that each returnable cup given to customers would need to be reused approximately 3.73 times to become net positive. Therefore, a net carbon saving will be achieved after six events.

If cup returns were to continue at the levels experienced during the event pilot (with the exception of the UCI event) then the reuse rate

[16] From Section 3.3.1 and the LCA by Frugal Cup stating that a single-use card-based cup has a carbon footprint of 0.061kg CO_2e, assuming the cup is landfilled at end-of-life.
[17] Powell, K., Letsinger, S., Sweeney, O., Cooper, B., Worth, C., Cole, G., Zero Waste Scotland and Resource Futures (2022). Consumption of Single-use Disposable Beverage Cups in Scotland and Impact of Policy Options Consumption of Single-use Disposable Beverage Cups in Scotland. [online] Zero Waste Scotland. Available at: https://cdn.zerowastescotland.org.uk/managed-downloads/mf-0qipu-bg-1686671922d [Accessed 20 Feb. 2024].

would continue to increase the more events delivered. The greater levels of control over the fate of the cups by the event hosts and the captive environment of the customers makes it easier to get the cups back to use them again.

4.1.2 Financial impact

The financial impact of the event pilot was again centred around the saving on single-use cups that would have needed purchasing. With 610 single-use cups and lids being avoided in total, the direct cost saving across the events was £92 [18]. However, the event hosts also saved on waste and cleanup costs, along with washing the cups – a service which was provided by Transition Stirling.

The cups were perceived to add significant value to customers' overall experience (discussed in Section 4.2.2 of the report). Whilst not a direct economic gain, it does boost the overall quality of the venue offering.

4.2 Key learning - implications of this data

4.2.1 Operational findings

In contrast to the café pilot scheme, the event pilot was more straight forward for Transition Stirling to deliver.

The set up was generally simple to mobilise with cups dropped off at the venue (on the morning of the event or the night before).

Training and guidance of staff/volunteers serving drinks was provided along with promotional materials and cup use tally charts.

Cups were then collected and taken away for washing at the end of the events. Deposits were handed over to Transition Stirling to replace any missing cups. Those deposits could then be used to replenish Transition Stirling's base stock.

The main operational challenge for Transition Stirling was the washing of the collected cups. Some event hosts cleared the cups unrinsed into plastic sacks at the end of their events. Many of the cups still contained liquid, resulting in a messy unloading and cleaning process on return to site.

Figure 19: Stall at school fair

The unloading and cleaning worked much more efficiently when cups were emptied, lightly rinsed and stacked for return following an event. This has helped to inform future stipulations on what Transition Stirling requires from event customers.

An approach tested by Transition Stirling was to get event customers to sign a participation agreement prior to engaging in the scheme. This document set out what the event customer would receive from Transition Stirling along with requirements in relation to use of the cups, promo materials, data capture and management of dirty cups for collection. This approached ensured that expectations were managed for both parties and there were no unwanted surprises on the day itself.

4.2.2 Event holder feedback

Feedback was obtained from two of the five event holders. One of these was St Ninian's Primary School who ran a school fair, and the other Forth Environment Link who hosted two of the events in the style of conferences.

[18] From Section 3.1.2 - An average standard single-use cup and lid costs approximately £0.15

Figure 20: FEL event using the cups

Both hosts found the preparation support and guidance provided by Transition Stirling very helpful, giving them everything they needed to deliver a successful event. For FEL, one aspect which could have been given more attention was promoting the cup system more proactively before the events.
Their events were delivered at short-notice, and so there was a missed opportunity to include in event programme materials and on social media. St Ninians did do this and found it useful in order to prime customers on what to expect on the day of the event.

Across the events, the general awareness of the café scheme was limited, with typically around 5% of customers familiar with the cups. This meant that there was a clear role for the event hosts to explain the purpose of the returnable cups and how they should be used.

Refill activity varied according to the event type, with the day-long conference-style events resulting in multiple refills compared to an evening event or a full day event that customers only attend for a few hours.

The cups were generally very well-liked by customers/delegates at the events, with some wanting to buy them as cups to keep. The day-long FEL conference event had the highest proportion of cups taken away by delegates (25%) with the other FEL evening event having all cups returned. The St Ninians school fair had 14% of cups taken away by customers.

Given the desire of some customers to keep the cups, clear communication on how and where to return the cups is essential to maximise return rate. The delegates at the FEL event were not paying a deposit themselves (this was paid up front to Transition Stirling by FEL), so this would help to avoid monetary losses by the event host.

St Ninian's, who were charging customers a £1 deposit, felt that this level was about right. They were using cash only, so £1 coins were easily manageable and affordable.
As the event was a school charity fair, many of the customers asked (on returning their cup) that their deposit be donated to the charity.

Feedback on the scheme itself was very positive from all users. All were keen on the environmental aspect and there was a desire to see this rolled out on a permanent basis.

The main benefits reported by the event hosts were:

- avoiding the impacts from using disposables.
- not having to buy disposable cups and lids.
- not having to clear up the rubbish from the cups and lids and then dispose of this.
- not having to wash the cups in-house.
- helping to educate people on waste reduction.
- a good fit with environmental policies and commitments.
- easy for customers to refill.
- practically easier than using crockery.

Figure 21: Cups in use at event

- a visual showcase of a local sustainable initiative.
- a good PR story.

The event hosts stated that there had been measurable financial and time economic benefits from not having to buy disposable cups and lids, not having to clear up and manage the waste from disposables, and also not having to wash the cups in this instance.

4.3 Recommendations for good practice roll-out and replication

All of the event hosts were keen to use the cups for events in the future and were willing to pay to use the cups for these. There is therefore evidence of demand for a charged service.

Transition Stirling found the events easier to manage than the café scheme. As such, they are planning to keep a stock of cups to continue to supply local events on a small-scale, initially.

If a successful commercial service for events could be gradually established, then this could help contribute towards a funded part-time post to deliver a permanent café scheme, with the two operations working in parallel.

4.3.1 Recommendations

The pilot tested the approach successfully, and Transition Stirling would convert this into a commercial service where customers are charged to use the cups for events. The following require further consideration for other similar schemes being introduced.

Commercial dishwasher

A commercial dishwasher would be much better suited for washing cups from events in bulk. Transition Stirling trialled this with a local business partner and saved significant time on washing cycles compared to their domestic dishwasher. Drying racks for the cups would also be a useful investment to help speed up drying times and save on space.

Participation agreement

Establishing a participation agreement which includes details on how cups should be prepared for collection at the end of events to prevent unnecessary mess. For example, the cups will need to be rinsed, stacked and stored in a bag or container for collection, or an additional charge will be levied.

Commercial charge

A menu of options is likely to be the most flexible option so that event hosts can choose which services they require. Prices would be provided according to the number of cups/lids requested; for delivery and collection of the cups; for a washing service; and finally for a member of staff to help host a stand or counter for the event. The pilot events hosts agreed that this would then allow them to select relevant services according to circumstances.

Option to buy cups

The option for event hosts to buy their own cups was discussed. One of the hosts suggested keeping their own small stock for internal meetings and team events. Having a full stock of cups for external events in this scenario was not an attractive option due to limitations on storage space.

Pre-event promotion

Creating content and narrative describing the scheme and how it works for inclusion in programmes, in social media and in any other media promoting the event. This will ensure that customers are familiar with the cups and the approach prior to attending.

4.3.2 The impact of policy measures

If the Scottish Government was to go ahead with a charge on disposable cups, the event hosts suggested that this would not change their approach as they are all fully on board with using reusable, returnable cups following the pilot. However, this development would inevitably increase demand for similar services across Scotland.

5 The venue scheme

No. cups & lids saved	CO_2e saving	Cost saving	Cup waste saving
13,203	856kg	£1,668	856kg

- Glass cannot be used inside the venues for live performances and single-use plastic disposables have previously been used.
- The project involved issuing half and full-pint reusable, returnable plastic cups branded for each venue. Customers were then issued the half/pint cups as the only option for live events for a £1 deposit, which was reimbursed on return at the end of the event.

5.1 Findings and impacts

Data was captured by Stirling Council for the returnable cups uses at each event at the Tolbooth and Albert Halls venues.
Data was captured over a 7-month period for the use of both half-pint and full-pint returnable cups. Stirling Council had to analyse information from its till systems to summarise the data. The till systems held data for the number of cup deposits per cup type. However, it was not possible to capture accurate data on the number of refills via the tills.

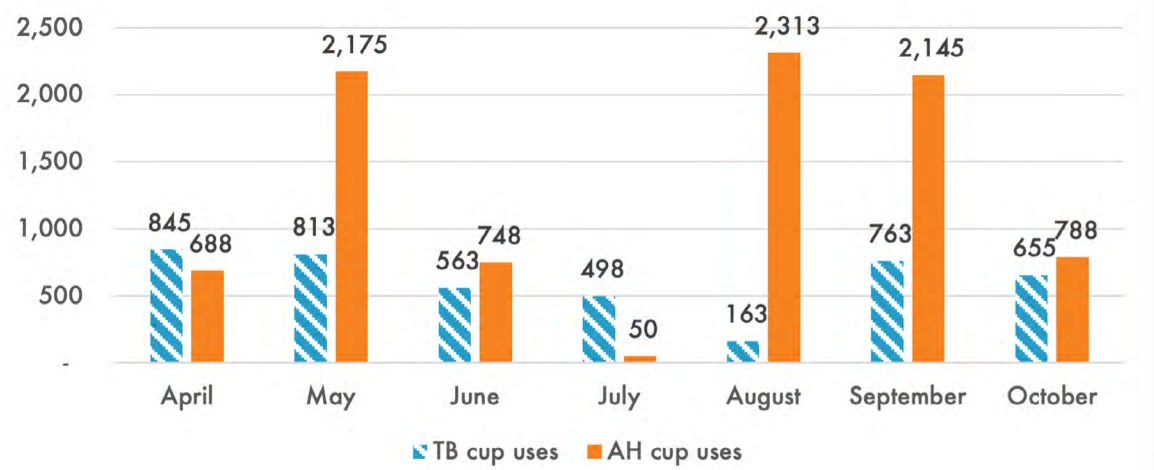
Figure 22: Tolbooth venue

Instead, experienced bar managers were consulted at each venue to estimate the average number of refills at the events. This multiplier was applied to give the total usage figures (Figures 23 and 24).

Figure 23: Venue Scheme - Pilot data from 5 events

Category	No. events	Total attendees	No. pint cup uses	No. half pint cup uses	Total cup uses	Total per attendee
Tolbooth	27	2,613	3,208	1,090	4,298	1.6
Albert Halls	21	10,548	6,048	2,858	8,905	0.8

Figure 24: Reusable half/pint cup uses by month for the Tolbooth and Albert Halls



Over the course of the 7-month pilot, the collective saving for both venues was 13,203 single-use half/pint cups (9,256 pint / 3,948 half-pint). Extrapolated for a full year, this would be 22,635 single-use cups saved (15,867 pint / 6,768 half-pint).

It should be noted that the total events held at each venue was higher than the numbers recorded in Table 5.1 Some of the events could use glassware and crockery, therefore the half/pint cups were not needed at these events (13 in total). In addition, there were two events where data was not captured due to till issues and 4 events where disposables had to be used at the Albert Halls due to the kitchen being refurbished (July). This is why the totals are much lower for the Albert Halls that month (Appendix 2: Figures 7.1 and 7.2).

The total half/pint cup use is generally much higher for the Albert Halls, despite a lower number of events, as the venue is much larger, as is the average attendance.

The average ratio of cups uses at the Tolbooth was 75% pint cups and 25% half-pint cups. At the Albert Halls it was similar with 70% pint cups and 30% half-pint cups.

Half/pint cup usage did fluctuate for some events, with half-pint cups used exclusively for events aimed at younger audiences (e.g., The Glee Final Challenge), and pint cups used exclusively in some cases, such as for the use of the Tolbooth as a Media Centre for the World Cycling Championships.

For the Tolbooth, the average half/pint cup uses per attendee was 1.6, and significantly lower for the Albert Halls at 0.8. However, an event was held by the Albert Halls which was a series of short talks with over 5,500 people attending some but not all of the talks and the vast majority not using the bar at all. If numbers for this event are reduced to a more realistic proportion of attendees using the bar, then overall cup uses per attendee for the Albert Hall over the 7 months reverts to 1.5 – very similar to the Tolbooth.

It should be noted that this figure is not the reuse rate for each half/pint cup over the pilot as many attendees did not buy drinks at all. Accurate data on the number of half/pint cup reuses was not captured by the venues, but bar managers estimated that this averages around 2-3 uses per customer (with 2.5 uses a mid-point estimate across average customer types at both venues).

Figure 25: Albert Halls Venue

The total half/pint cup stock was counted at the completion of the trial, demonstrating losses across both venues totalled 2%. Most of the losses were due to customers wanting to keep the half/pint cups as a souvenir.

5.1.1 Carbon reduction impact

The supplier of the half/pint cups for the venues trial is a company called Happy Cups. They have not conducted their own lifecycle analysis (LCA) on the cups but refer to a study on very similar cups conducted by Hope Solutions [19].
Their LCA shows that the impact of a single-use disposable plastic cup is -0.07kg CO_2e.

In comparison, the impact of manufacturing a reusable polypropylene pint cup is 168g CO_2e, with the impact of washing the cup 6.2g CO_2e. The breakeven point for a reusable cup is therefore 2.6 uses (168g ÷ [70g – 6.2g]).

The total stock across both venues is 6,500 cups (pint and half-pint), but the requirements were over-estimated. Only around 60%

[19] Hope Solutions Services Ltd (n.d.). Sustainability Studies. [online] Hope Solutions. Available at: https://www.hopesolutions.services/resources/ [Accessed 5 Mar. 2024].

(4,000 cups) are actively being used. The remainder is spare stock to cover any losses from customers taking cups away over time.

With 13,023 half/pint cup reuses over the initial seven months, the reduction in CO_2e impacts relating directly to single use disposables avoided was 912kg CO_2e (and 1,563kg t when roughly extrapolated over 12 months). It should be noted that this figure does not account for the manufacture of the replacement reusable half/pint cups and their washing. If washing is accounted for across the pilot (9,023[20] x 0.0062kg = 56kg CO_2e) then the net impact is 856kg.

The reuse rate per cup for the 4,000 active half/pint cups is therefore around 3.2. This means that the scheme has already exceeded the breakeven point for the active half/pint cups, with every additional use now generating further environmental benefit at a rate of 63.8g of CO_2e per single-use disposable cup avoided (accounting for the impact of washing).

5.1.2 Financial impact

Although the half-pint cups were funded for the trial, with Stirling Council funding the pint glass, the initial outlay for the cups would have been £0.54 per cup (for both sizes). For 6,500 cups, the total cost was £3,510.

The collective saving across both venues was 13,203 half/pint cups (9,256 pint / 3,948 half pint) at the end of the pilot. According to the venues, the typical price for a single-use disposable cup is around £0.10 per pint cup and £0.05 per half pint cup. The saving in the first 7 months was £1,120. If this data is extrapolated for a full year (22,635 cups), then the savings would be approximately £1,925. The payback on the initial investment in the cups would therefore be two years.

Some deposits accumulated where half/pint cups were not returned by customers. These were retained by the businesses as funds for purchasing replacement half/pint cups when needed.

Although not measured, the venues also reported staff time savings on clearing up the half/pint cups after events as customers would typically bring most of the cups back themselves. An estimate by the venues was an hour of an individual's time saved per venue – roughly a £15-20 saving per event.

The venues also significantly reduced the quantities of waste generated after each event. The disposable cups were not previously being recycled after events. Whilst light in weight, the half/pint cups are voluminous if not stacked and can therefore take up significant room in general waste containers. Over the course of a year, the 13,203 single-use cups avoided have reduced waste collection requirements. This was not tracked by the venues as part of the pilot. However, it is estimated that this could save (at a conservative estimate) 20 uplifts of an 1100 litre waste bin per annum across the two venues (based on volume). At a typical commercial rate of £26 per uplift [21], this could save Stirling Council an additional £520[22] per annum (and roughly £28 in landfill tax).

This brings total savings over the pilot to £1,668.

5.2 Key learning - implications of this data

5.2.1 Operational findings

The overall response to the half/pint cups by both the venues and the customers has been extremely positive.

The returnable half/pint cup scheme was promoted using posters across each venue and by staff explaining the scheme to customers.

[20] 13,023 uses – 4,000 cup starting stock = 9,023 washes

[21] Stirling Council (2024). Waste and recycling for businesses. [online] Stirling Council. Available at: https://www.stirling.gov.uk/bins-and-recycling/waste-and-recycling-for-businesses/ [Accessed 5 Mar. 2024].

[22] This is includes: bin rental, collection and disposal, excluding VAT and landfill tax (LFT) charged at £102.10/tonne. WRAP's business waste weights calculator estimates the bulk density of an 1100ltr bin full of rigid plastics as 0.014tonnes. Based on 20 saved uplifts, the tonnage would be 0.28tonnes per annum. LFT would be ~£28.50.

Minimal sales promotion was required for this specific scheme as it was the default option for customers using the two venues. If they wanted a drink, they had to use these cups. Many customers were already familiar with this type of approach from other venues and so staff were not overburdened with having to explain the concept to customers in the early stages of piloting the half/pint cups.

There were some isolated instances of pushback from customers in the early stages about the £1 payment. However, once bar staff had explained to the customers that they could get their deposit back by returning the half/pint cup, they were satisfied with the approach.

During the pilot, the Albert Halls hosted the Scottish Album of the Year Awards. Many influential people from the music industry were in attendance, including promoters and venue operators. Stirling Council received considerable feedback from those customers on how great the reusable cup scheme was. The Scottish Music Industry Association are going to recommend it to any other venues they work with.

In terms of the half/pint cups themselves, both customers and staff have emphasised their preference for drinking from this style of cup compared to single-use disposables. Therefore, the drinking experience of customers has been enhanced as a result of the pilot project.

The deposit system worked well. Both venues were able to accept cash or electronic payments for the cup deposits. Customers could then get a refill in the same cup or swap this for a fresh one. A float of £1 coins was kept in place behind the bar at both venues to enable customers paying in cash to rapidly receive their deposit back. This was then reconciled with the till system after each event. Some customers did not want their deposit back and ask this to be put in the tips jar or charity box.

Payment preference differed at each venue with 75% of payments at the Tolbooth electronic, and the Albert Halls closer to a 50/50 split. This would also vary across events depending on the audience type and demographic.

The quantity of half/pint cups used and the quantity by cup size also varied by event type and timing. For example, a spoken-word event, midweek would use a lot less half/pint cups than a lively tribute band event on a weekend. An event aimed at children might serve soft drinks only and therefore only use half pint cups.

The design of the half/pint cups themselves can have an impact on scheme retention. It is advisable for venues to try and keep the cup design as simple as possible so that customers are not tempted to keep them.

Half/pint cup losses were primarily due to customers wanting to keep them and take them away. Staff would stand at the exits at the conclusion of each event and would remind people to take their cups back if they were still carrying them. In some cases, customers still preferred to take them away. Half/pint cup losses reduced significantly overtime as the cups became less of a novelty to customers.

Throughout the pilot, the half/pint cups stood up well to washing and there were no damaged half/pint cups removed from circulation. The only issues were with two cups that became stained by lipstick that could not be removed. These cups were eventually recycled.

As a general estimate by Stirling Council, around 90% of half/pint cups were returned to the bar area with 10% left in other areas of the venue. According to Stirling Council, these would be left unreturned as some customers did not want to be delayed leaving by waiting to get their deposit back. This could be due to making a train on time or beating the traffic. The venues reported that some customers would linger and clear up left over cups to reclaim the deposits themselves.

The advantage with the deposit method was that most of the cups were cleared up at the end of each event. This significantly reduced the cleanup time for staff and also reduced the quantities of waste generated after each

event.

5.2.2 Venue feedback

Stirling Council encountered challenges with the ongoing tracking of data on half/pint cup uses throughout the trial. The till systems were not set up to specifically record returnable half/pint cup uses and reuses, partly because the Albert Halls was using a very old till system which had significant limitations.

The staff at the venues therefore had to go back through the till data after each event to pick out the relevant data manually and work out the impacts. This was a time consuming and inefficient approach. Since investing in a new till system for the Albert Halls, this approach has been addressed by both venues to make data capture automated moving forwards.

Both venues used commercial dishwashers to clean the cups and encountered few issues, with the cups in good condition following multiple washes throughout the pilot. Happy Cups claim the half/pint cups can be washed 'hundreds of times', so the full extent of the cups' robustness could not be tested during the trial.

The venues fed back that the half/pint cups take much longer to dry than standard glasses or crockery. The venues would tend to stack them in a pyramid for 24 hours to dry between events and had enough stock to avoid the need to wash and dry them for reuse at the same event. However, manual drying was required if a venue was running a matinee and evening event on the same day, which took up extra staff time. Space constraints at the Tolbooth also meant that stacking for drying was not particularly convenient. These were the only practical issues caused by the half/pint cup scheme overall. In order to address this, both venues are considering investing in the drying racks referred to earlier in the report (Section 3.2.4).

5.3 Recommendations for good practice roll-out and replication

Stirling Council was very satisfied with the performance of the cup scheme at both the Tolbooth and Albert Halls venues.

5.3.1 Recommendations

The scheme had minimal negative impacts upon the existing operation of events. The only exception being the additional washing and drying of the cups. This is only an issue with back-to-back events on the same day where time is required to manually dry the cups.

This additional time burden is more than off-set by the improved customer experience, the reduced time spent cleaning up cups from the venues after events, and the reduced waste disposal levels at each venue.

Both the Albert Halls and the Tolbooth are now continuing with the scheme on a permanent basis and have tweaked the system to improve data capture via the tills so that they can easily monitor progress without having to go back through the data manually.

5.3.2 The impact of policy measures

Any change in policy to introduce a mandatory charge for single-use disposables will not impact upon the scheme at the Tolbooth and Albert Halls. This is because Stirling Council plan to continue with the scheme to phase out single-use cups.

6 Concluding comments

6.1 Impacts

The Ditching Disposables Stirling project has successfully piloted three schemes to reduce the consumption and disposal of single-use cups.

The learning from these can be used to inform similar schemes looking to replicate this approach in towns and cities across Scotland.

The headline impacts of the schemes are summarised in Figure 26:

Figure 26: Summary of impacts

Scheme	No. cups & lids saved	CO_2e saving
Café	3,987	243 kg
Event	610	37 kg
Venue	13,203	856 kg

For all three schemes, the hosts and the customers, were very positive about the objectives, the cups and the operation of the projects. For the events and venue schemes, both will continue to operate in the future.

The event and venue schemes were relatively simple to implement and operate with little risk to the businesses beyond the initial investment in cups and time to get the schemes established. Such systems could easily be replicated by other organisations using the findings in this report.

The city-wide café pilot schemes proved a more challenging undertaking. However, the pilot project has proven that it is possible to establish and successfully operate such a scheme. There are many ways a scheme like this could be set up and the most appropriate way might differ depending on location. Practically testing this type of scheme has given Transition Stirling (and the participating cafés) the confidence that this can work with the right set-up and conditions in place.

6.2 Policy change for success

A key consideration is the role of government policy in incentivising customers to choose reuseable returnable options through the introduction of a mandatory charge on single-use, disposable cups.

The experience of the café network in Stirling was that the uptake of a reusable returnable option has its limitations without customers being given a financial incentive to make that choice. The evidence from the pilot demonstrates that discounts and rewards alone are insufficient to change behaviour on a significant scale. A mandatory charge on disposables, which all cafés must apply, would provide a level playing field and was seen by the cafés as a necessary step to change customer behaviour – and only then if this is set at the right level.

Transition Stirling will now explore funding options for establishing a permanent city-wide café scheme for reusable returnable cups in Stirling. If a regulation is implemented creating a mandatory charge on single-use disposable cups, then Transition Stirling would ideally like to launch a new scheme prior to the charge coming into place so that it can capitalise on the media impact of such an announcement and already have an alternative solution in place for customers.

The permanent scheme will learn from the many useful findings of the Ditching Disposables pilot and establish an expanded network. They will implement an approach that addresses the practical issues and barriers identified in the pilot to ensure greater levels of customer uptake and a long-term sustainable scheme.

6.3 Sources of further information

If you are considering establishing your own scheme to replace single-use disposables with reusable returnables, then there are a number of resources available that could help.

Zero Waste Scotland has established a Ditching Disposables information hub.

7 (Appendix 1) Methodology

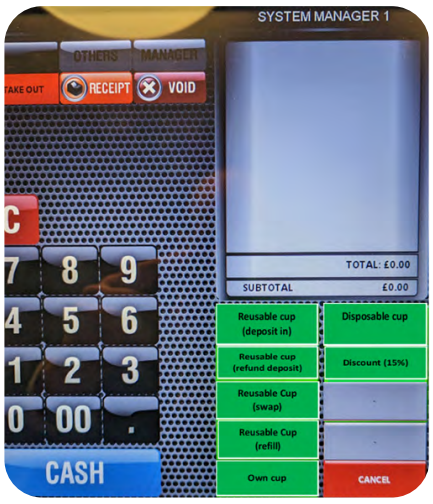
7.1 The café scheme

Cafés were recruited from across central Stirling to join the Ditching Disposables scheme. In total, 18 cafés were recruited, along with 2 shops and a cup pickup/drop off point located at Zero Waste Scotland's offices (for the use of their staff only). All the participants were invited to join a scheme online chat group to share updates and develop a close-knit network.

Cafés were all allocated with guidance packs, visually outlining the full process from customer order to cup return and what to do at each stage. Guidance was also provided on cup washing according to Food Standards Agency, along with sample scripts for staff to follow when explaining the scheme to customers.

Cafés were provided with training on how to operate the scheme. Data collection was set up via the cafés' EPOS till systems, with buttons set up to log deposits in, deposits returned, cup swaps and cup refills.
For those without modern till systems, manual tally sheets were provided to record ongoing activity in the same way, with photographs of the completed tally sheet submitted monthly via the chat group.

Figure 27: EPOS till screen



Marketing support was provided to each café, with window stickers, posters, counter toppers and a strut card (visually explaining the scheme) provided to each café.

Figure 28: Café promotional materials

Each café was allocated a starting stock of cups and lids according to its average weekly takeaway sales. The cups provided were CORRETTO™ cups supplied by a company called Bockatech to a design agreed with Zero Waste Scotland.

Figure 29: Example reusable cup

These are lightweight, 12oz cups made from polypropylene so that they can be easily recycled at the end of their life. This was confirmed in liaison with Stirling Council's

kerbside recycling scheme. They are suitable for around 500 washes and the cups were branded with various reuse messages.
The single size was chosen to cater for the most popular sizes of coffee products and to keep things simple for redistribution.
Scheme users paid £1 to take away a hot or cold beverage, or soup, in a reusable, returnable cup. They had the convenience of being able to return the cup to get their deposit back at any of the participating cafés/ shops. It was anticipated that some cups would migrate over time, with cups being returned to some cafés more than others.

Local community group, Transition Stirling, took on the role of redistributing cups across the network. Cafés low on stock could exchange their excess deposits for fresh cups and lids.

Cafés with too many cups could exchange returned cups for £1 deposits to reconcile their till systems. This was managed on a fortnightly basis by Transition Stirling to keep cafés as close to their original stock allocation as possible.

Figure 30: E-Cargo bike

Transition Stirling leased an E-Cargo bike for the duration of the pilot project to support this redistribution of cups and to help promote the scheme to the general public.

Cafés were expected to wash returned cups themselves. However, three cafés did not have dishwashers. Transition Stirling collected dirty cups and lids from these cafés and washed them on their behalf, dropping off clean cups in their place.

A map of the café locations was developed, along with a website landing page for the scheme.

Figure 31: Map of participating cafés

Zero Waste Scotland produced a short, customer focussed video, explaining how the scheme works in under 30 seconds.
This was promoted on social media by Transition Stirling, Green Gain, and Zero Waste Scotland whilst being circulated to the participating cafés for them to promote on their own social media channels.

Figure 32: Café promotional materials

Other social media collateral, including images, and narrative, statistics and events were developed and circulated to the cafés to promote throughout the pilot. Those cafés active on social media then undertook their own promotion of the scheme.

Cafés were asked if they would be willing to charge customers separately for disposable cups, but all cafés felt this was too high risk, with customers likely to go elsewhere. Not all cafés were supportive of trialling discounts

and rewards with the cups. Coming out of a challenging last two years of trading, some cafés could not afford to offer drinks giveaways. As such, no formal reward scheme was put in place across Ditching Disposable participants. Individual cafés were free to set their own discounts and rewards. A total of 5 cafés offered a discount ranging from 10-15% or a 20-25p discount. Only one café decided to charge for disposable takeaway cups (at 20p per cup).

Figure 33: Café promotional materials

The majority of the participating cafés were set up to take deposits by both cash and card. However, five cafés were able to take and return deposits by cash only due to restrictions with their till and book-keeping systems. The scheme was launched with a photocall and press release.

Additional promotional support was provided by Zero Waste Scotland, Go Forth Stirling, and Stirling Council. Transition Stirling worked to promote the scheme throughout the pilot project, attending local events, producing social media posts and promoting via radio interviews.

The qualitative impacts of the café scheme were assessed through a series of surveys with both the cafés and customers. Café surveys were conducted face-to-face both halfway through the project and at the end of the pilot. The surveys offered the opportunity for the cafés to provide feedback on what went well, what could be improved, operational aspects, customer participation, financial impacts and any added value.

Customer feedback was obtained through a combination of face-to-face and web-based surveys. Surveys concentrated on obtaining feedback in relation to the cups, the deposits, the brand/marketing, quality of experience, the scheme ethos, and the practicality of the scheme.

7.2 The event scheme

The event scheme was established as an extension of the café scheme. There were no preconceived plans to service events with the returnable cups as part of the pilot project. However, demand came from a range of organisations and the decision was made to test the cups in an event scenario.

In total, the cups were tested across five events including:

- Two primary school fairs
- Two events run by Forth Environment Link (FEL)
- The UCI World Cycling Championships.

Figure 34: UCI World Cycling Championships

For the school events, Transition Stirling provided an allocation of cups to each organisation along with training, tally sheets, promotional materials and a collection and washing service. The schools both hosted a drinks stall and attendees paid a £1 deposit for the cups in the same way as at a café, returning the cups to receive their £1 back

when finished.

For the FEL events, a different approach was taken as these were corporate style events with presentations and workshops on food, transport, sustainability, and partnership working themes. For these events, FEL paid the deposits up front to borrow a specific number of cups and lids for the events.

Transition Stirling then provided the same service with the cups, marketing materials, training as well as cup collection and washing. Attendees at the events were allocated a cup and encouraged to keep and reuse this throughout the day, returning this at the end of each event.

For the UCI World Cycling Championships, Transition Stirling had a stall for the three days at the Event Hub which was at the start line for the cycling time trials. Also located at the hub were various food and drink pop-ups.

Transition Stirling allocated cups to three of the pop-ups which served hot drinks to their customers. Cups were then handed out by the pop-ups for a £1 deposit.

Once finished, customers returned their cups to the Transition Stirling stall, which had two containers – one saying: "Great Idea", and one saying: "Not for me". Customers could then return their cups and provide feedback on the scheme at the same time.

7.3 The venue scheme

The venue scheme was trialled at The Albert Halls and The Tolbooth, in partnership with Stirling Council.

Reusable, returnable, polypropylene pint and half-pint cups were put in place to replace the single-use disposables. These were sourced from Happy Cups (a stock of 4,500 pint cups and 2,000 half-pint cups), suitable for up to 500 washes. As with the café scheme, cups, training, guidance documents and marketing materials were provided to the venues to set up their schemes. Each venue used their EPOS till systems to collect data on drinks sales for each size of cup with this data collected monthly.

Customers paid their £1 deposit at the bar and were encouraged by posters and venue staff to return their half/pint cups to the bar for refills or to get their deposit back once finished. Staff also stood at the venue exits at the end of events to encourage customers to return their half/pint cup.

Figure 35: Venue pint/half pint cups

Figure 36: Venue poster

8 (Appendix 2) Tolbooth and Albert Hall trial

Figure 37: Reusable cup uses by month and cup type for the Tolbooth

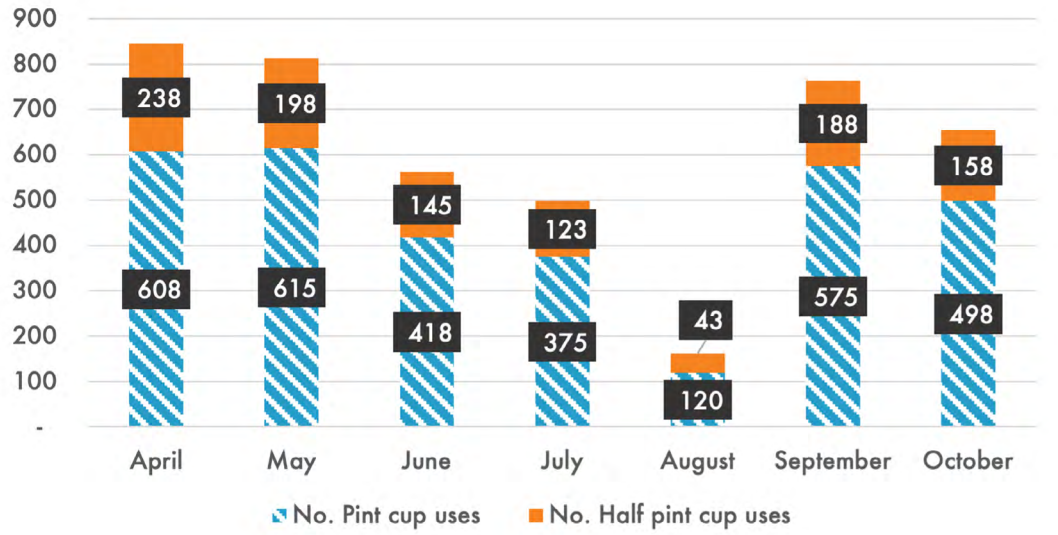
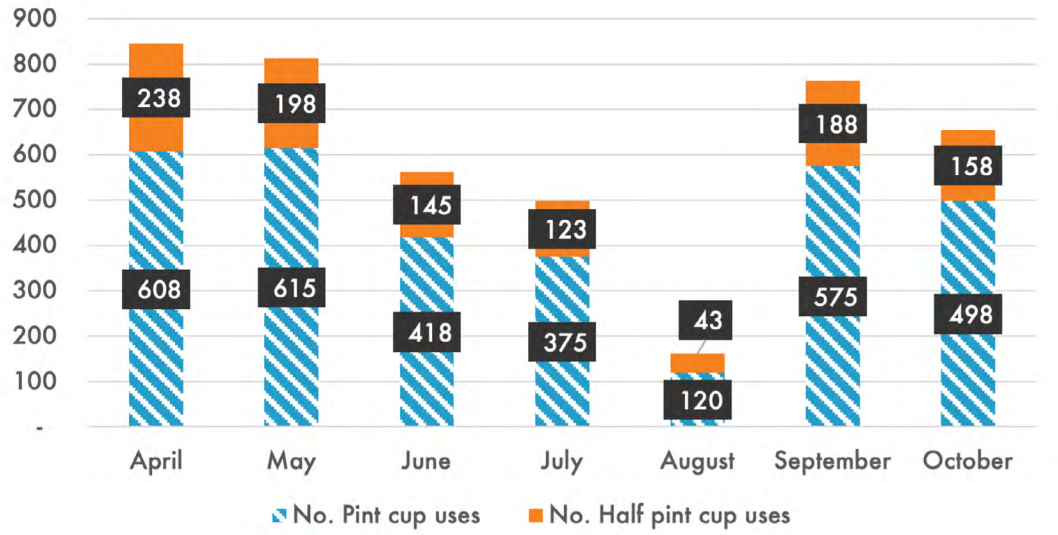


Figure 38: Reusable cup uses by month and cup type for the Tolbooth



ZERO WASTE SCOTLAND

greengain

transition Stirling

European Union

gov.scot

EUROPE & SCOTLAND
European Regional Development Fund
Investing in a Smart, Sustainable and Inclusive Future