

Report

Spring 2015

Recycle and Reward Pilot Project Report

South Ayrshire Council –
Troon Household Waste
Recycling Centre



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Zero Waste Scotland works with businesses, individuals, communities and local authorities to help them reduce waste, recycle more and use resources sustainably.

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1 Executive summary

Zero Waste Scotland supported a number of Recycle and Reward pilot projects in 2013. Each site has a separate report on its performance, and an overview report is also available.

South Ayrshire Council participated in the Recycle and Reward pilot project, funded by Zero Waste Scotland, to test how incentivised recycling facilities may affect recycling of drinks containers by local residents. This was the only pilot that was not in an ostensibly 'on the go' environment; no catering facilities are on site, and sales or items for disposal are unlikely to arise here. In fact, of course, people come to the site only to dispose of waste. This scheme was wholly separate from the pilot at Marr College, but some promotional material may have reached the same residents.

The council installed one Recycle and Reward machine at Troon Household Waste Recycling Centre (HWRC), one of four HWRCs serving 54,425 households in northern South Ayrshire (there are around 15,000 residents in Troon itself). However, the actual percentage of residents using the facility could not be robustly estimated.

The automated machine provided a reward in exchange for empty drinks containers returned for recycling through this facility. For each container recycled, one reward point was allocated and a voucher was printed corresponding to the number of items recycled. When 50 points had been accrued, the customer could exchange this for a token, which could then be redeemed for compost, which normally cost £2 per 70-litre bag. In effect this means that a single container is worth 4p in the scheme, though the available reward could be considered somewhat niche.

Target materials were aluminium cans and polyethylene terephthalate (PET) plastic bottles. Evaluation and monitoring of the pilot project was conducted by SKM and Nicki Souter Associates (NSA), to provide an independent assessment of performance and public acceptability of the system. The pilot period covered by the independent evaluation ran from 10 May until 26 September 2013. The council continued to supply scheme data to Zero Waste Scotland until December 2013. The machines complemented, rather than replaced, the existing recycling infrastructure provided by the council at the HWRC.

The following points address the overall pilot performance and key findings:

- A total of 6,905 containers were returned to the machine;
 - The quantities collected by the machine were low in weight terms at 120kg (0.12t). This is only 0.39% of the total recyclables collected from the site during the monitoring period (31.02t), but this higher figure includes all recycle streams at the HWRC.
 - A small sample of site visitors was surveyed (35), 40% of whom stated that they were aware of the pilot but only one third were aware of what materials the machine accepted. Only 17% of survey respondents had been aware of the pilot promotion.
 - The capture rate (as a percentage of containers sold) could not be calculated for this pilot; there is no meaningful measure of how many containers arise in the target area. Unlike most site-specific schemes, this scheme was designed to attract containers on to the site.
 - The majority (71%) of HWRC customers surveyed thought that the compost reward offered was appropriate. Over the monitoring period only 26% of vouchers issued were redeemed to obtain free compost. The survey of site users supports the belief that compost was a relevant reward: 97% of those surveyed on site had a garden, 49% used compost and 23% had previously bought compost at the HWRC. However, its appeal in the wider community is hard to gauge, and it was not felt cost-effective to explore this further.
 - Other rewards suggested included cash rewards (9%) and supermarket vouchers (6%).
 - A large majority of respondents from the site survey (77%) wanted to see the scheme continue, and 88% of survey respondents suggested that they would like the scheme to be rolled out to other
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outlets, with 57% suggesting supermarkets. Site staff were also positive about continuation, and felt the scheme had met their expectations.

Challenges in obtaining comparable baseline data, and some other key pilot parameters (such as site footfall), were significant in this pilot. Given these restrictions, and the unique context, some monitoring resources were focused on other sites, and findings for this pilot are therefore perhaps the least generalisable of all the pilot sites.

2 Pilot description

This section describes the pilot site at the Troon HWRC and the population targeted by the pilot. It then considers waste management systems in place before and during the pilot period, and then the detail of the Recycle and Reward scheme put in place, including sections on the communications and site resourcing requirements of the pilot. A final section describes any changes to the above introduced during the pilot period.

2.1 Background and context

Troon HWRC is located on Port Ranald Drive on the west side of the town centre, close to amenities including a Morrisons supermarket, the esplanade, ferry terminals and the town centre. It is one of four HWRCs covering the northern part of South Ayrshire Council area, the others being in Ayr, Girvan and Maybole. Together they serve 54,425 households. The site is closed on Mondays all year but is otherwise open every day, April until September, 10:00 to 18:00 (10:00 to 16:00 at weekends), and October until March, 10:00 to 16:00.

The following materials can be recycled at the site: all electronic and electrical equipment including strip lights; batteries; books, tapes, CDs and videos; car batteries and engine oil; cardboard; drinks cans and food tins; garden waste; gas cylinders (empty); glass bottles and jars; newspapers and magazines; scrap metal; textiles and shoes; water-based paint; and wood waste. It accepts household waste in a number of bays for recycling and disposal. Trade waste is disposed of using a permit system.

As it is an HWRC, the pilot machines were sited within the site and were not visible or accessible from outwith the site boundaries. A clear Perspex shelter housed the machine on site.

2.2 Waste management arrangements

Figure 1 shows the main recycling area and some of the recycling bays and containers.



Figure 1 Residual waste and recycling bays at Troon HWRC

There are 1,280-litre bins provided for the disposal of the following:

- dry mixed recycling (cans, plastic, paper, card);
- mixed cans; and
- colour-segregated glass.

The council does not weigh waste at the HWRC, but weighing does take place at a central bulking area, where waste sources are mixed, before onward transport to reprocessors or landfill. No baseline data were available for pre-pilot recycling of targeted materials at the site; however, during the pilot the mixed cans and dry mixed recycling were weighed for comparison with the materials passing through the machine.

Figure 2 shows the waste management material flow and system boundary before the pilot was implemented.

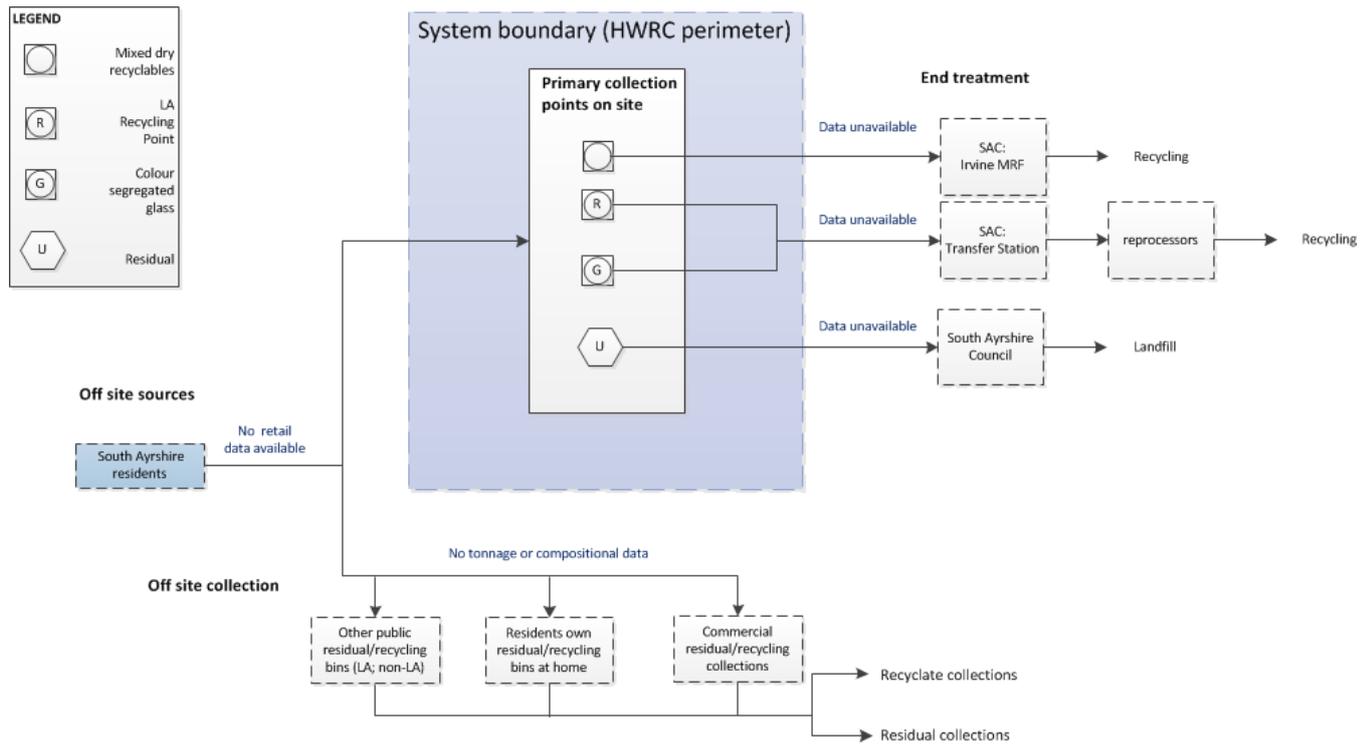


Figure 2 Flow of waste and waste data before the pilot

2.3 Target population

South Ayrshire Council covers an area of 1,222 square km and has a population of around 112,000. The pilot project focussed on Troon, and the communications were aimed solely at the residents of Troon, which has a population of 14,766 (2011 Census).

However, it seems likely the effective audience for the pilot is in fact much smaller. Not all residents would normally access the HWRC since there are also numerous other recycling points which accept the targeted containers and South Ayrshire Council provides all residents and commercial premises with a 'blue bin' service which accepts a range of recyclables, including the target materials for this pilot. It seems unlikely the pilot in itself would be sufficient to motivate a dedicated recycling trip to the HWRC under these circumstances, so the user base for the scheme is likely to be reflective of the user base for the HWRC, rather than the wider population of Troon. Additionally, as HWRC users are probably infrequent visitors, this may pose a further barrier to the formation of new habits around the Recycle and Reward scheme.

The compost reward could, however, have attracted more Troon residents than normal, though it would not be equally appealing to all, and unlike most other pilot sites, the reward in this case would need to be sufficient to justify a bespoke trip.

Troon HWRC does not capture unique user numbers, and so defining a realistic potential user base for this pilot is challenging.

2.4 Recycle and Reward approach

The Recycle and Reward machine was a Revendit C1500 which accepted clear PET plastic bottles and Aluminium cans. The machine was an indoor model therefore a clear Perspex shelter was constructed to allow the machine to operate effectively outside. This operational constraint had not

been planned for, and contributed to a delay in commencing the pilot. It may also have reduced the visibility of the machine within the site.

For each PET plastic bottle or Aluminium can recycled using the facility, one reward point was allocated and a voucher was printed which corresponded to the number of items recycled. When 50 points had been rewarded the customer could exchange the vouchers for a token (in the site office) which in turn could be exchanged for a 70 litre bag of compost (normally costing £2). In effect this means that a single returned container is worth 4p in the scheme – it also places quite a high recycling threshold (by number of items) to qualify for the reward.

Figure 3 shows waste management material flow and system boundary during the pilot.

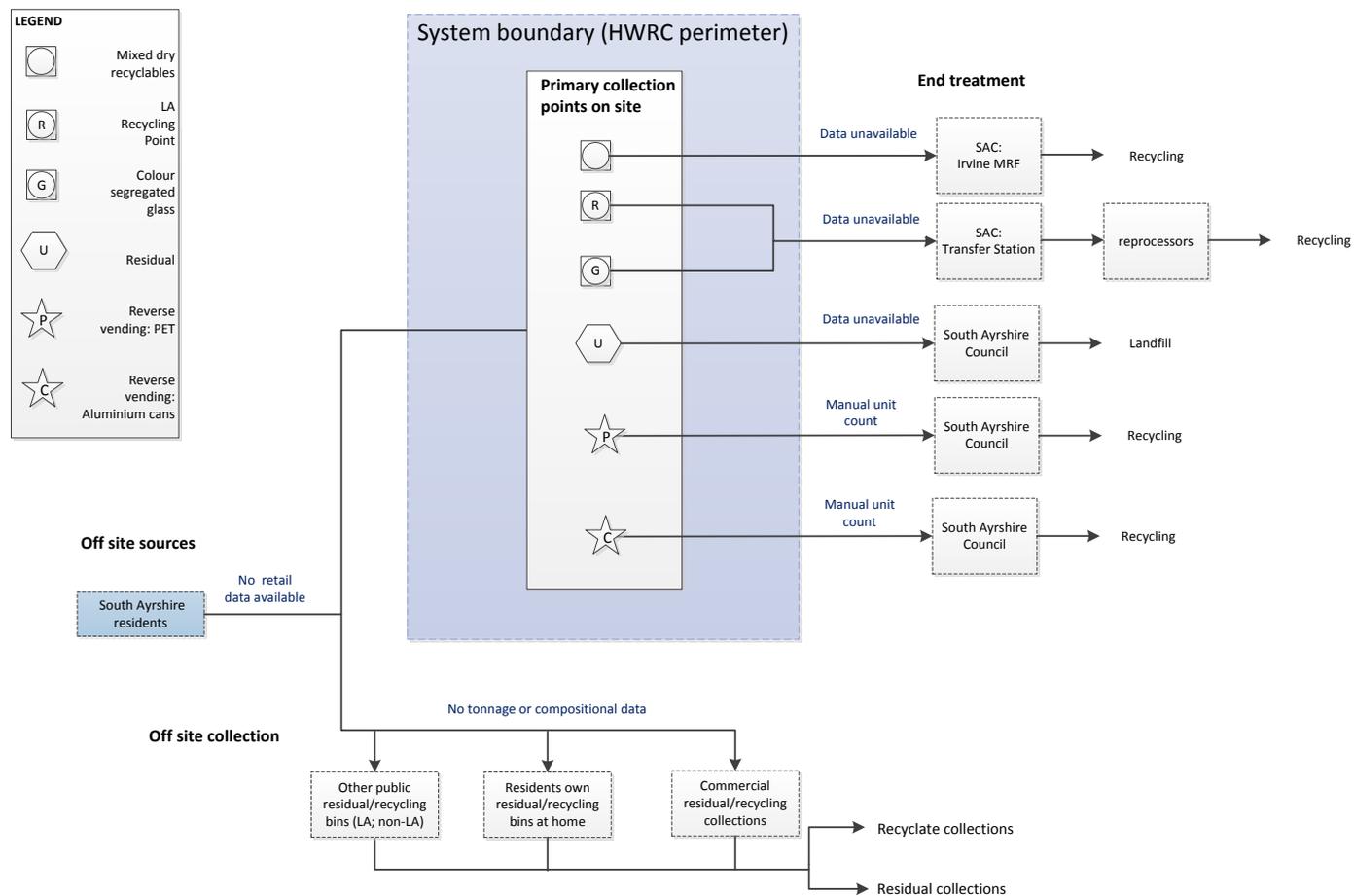


Figure 3 Flow of waste and waste data during the pilot

2.5 Promoting the scheme

Zero Waste Scotland provided communications support and resources to assist South Ayrshire Council to develop a communications plan and timetable of activities during the pilot project at Troon HWRC and Marr College. The plan covered both locations and was approved by Zero Waste Scotland, as were all graphics materials and supporting text.

2.5.1 Staff engagement

Local authority employees were identified as an important audience for two reasons. Firstly, they could help get the information out and the right messages across in response to customer enquiries;

secondly, many employees live in South Ayrshire, so they are also potential customers and service users.

The employees who were the main customer points of contact regarding the scheme were neighbourhood services staff (primarily those based at Troon Recycling Centre) and customer services staff (primarily those based at Troon Customer Service Centre and within the customer contact centre).

A detailed briefing note was distributed to the identified employee groups to ensure they knew the background to the project and had sufficient information to respond to customer enquiries, as well as contact details for further information if required. Staff training was carried out by Waste Aware staff. They provided regular support to attendants at the Recycling Centre to ensure that staff and recycling centre attendants were competent in the use of the Recycle and Reward machines.

An item on the Recycle and Reward project was included in council-wide emails, which go regularly to all staff with email access, to highlight the launch of the project.

2.5.2 Media/public relations

A programme of media/public relations (PR) opportunities was progressed throughout the duration of the project. The main target medium was local press, although PR angles were extended to maximise regional coverage. This started with a formal photocall and launch of the Recycle and Reward project in South Ayrshire. This took place on 19 June 2013, at Troon Recycling Centre, and was attended by council staff and local members as well as several pupils from the Eco Committee at Marr College (Marr College also participated in the pilot project) and the Community Police Officer. During the photocall, the machine featured prominently alongside bags of compost and other props to highlight the school's offer. Instructional posters were also available during the photocall.

2.5.3 Advertising

2.5.3.1 Door-to-door publication

Troon has a dedicated monthly publication, *Troon Going Out Guide*, which is distributed door to door to every household in the area. This provided an excellent opportunity to get information directly into the hands of potential customers and service users. This was undertaken during the week of 25 March 2013. Half-page adverts then followed in this publication on 26 April and 31 May.

2.5.3.2 Local newspaper

There is a Troon edition of the local newspaper. The opportunity was taken to maximise value for money with additional free editorial to sit alongside adverts. Adverts were taken in the weeks of 11 March, 15 April and 13 May.

2.5.4 Marketing communications

2.5.4.1 Flyers

Promotional flyers, one third of an A4 page, were produced and distributed by means of a schoolbag drop to every pupil in the Troon area, highlighting the Recycle and Reward facilities at both Troon Recycling Centre and Marr College.

Around 2,050 leaflets were required for the schoolbag drop. A print run of 3,000 was done, with the remainder split between Troon Customer Service Centre and Troon Recycling Centre, where they were distributed by recycling centre staff from 4 March.

2.5.4.2 Posters

Promotional posters were distributed to council and NHS facilities within Troon (including all schools), as well as post offices and local shops, highlighting the Recycle and Reward facilities available at the recycling centre and the reward on offer.

Tailored instructional posters were also produced for the recycling centre, providing clear and simple details on how to use the Recycle and Reward machine and how to claim the reward.

2.5.4.3 Signage

Existing signage within Troon Recycling Centre was adapted to highlight the availability and location of the Recycle and Reward machine, complemented with additional signage at the 'compost bay' and entrance to the site. Signage for Recycle and Reward was clearly visible at the machine.

2.5.4.4 Website

A dedicated web page was set up at www.south-ayrshire.gov.uk/recycleandreward to promote the project, highlighting the locations of the machines and the benefits of the scheme, and updating ongoing success. The page was promoted on marketing collateral and in press releases. The web page went live immediately following project launch and includes a regularly updated frequently asked questions (FAQ) section.

2.5.4.5 Social media

The primary social media route was Twitter, with regular messaging issued from point of launch and then on an ongoing basis. Tweets were issued regularly and linked through to the key web pages.

2.5.4.6 Elected members/MPs/MSPs

The primary route to inform elected politicians was through the weekly information note, which was emailed every Friday with news, updates, attachments and photos as appropriate. Members were also copied into news releases as they were issued, as well as the council-wide emails.

2.6 Changes during the pilot period

No major changes were made during the pilot.

3 Study method

The appendix gives greater detail on the method selected and the reasons for this. This section focuses on how these were applied in this specific location, first describing the approach to data collection on performance, and then the approach taken to the social research (obtaining user, non-user and staff feedback at the site). A final section considers challenges encountered in practice, and the extent to which this affects the conclusions that can be drawn about pilot performance.

3.1 Performance data collection

3.1.1 Machine throughput

Weekly readings of total units collected were obtained. It was not until after the pilot had ended that a split between cans and PET bottles was obtained by sorting a sample of machine loads. This determined that there was a 57:43 split between cans and PET bottles respectively. This split was then retrospectively assumed to apply to the quantities of all units returned each week, though it seems likely there will have been greater variation than this in practice.

3.1.2 *Waste and recycling data*

The council had estimates of the quantity of commingled recyclables collected on site, but, as identified above, did not weigh this recycle stream on site before the pilot. Materials collected via the machine were combined with these existing recycle streams when the machine was emptied. The council reported that, between May and the end of September 2013, 31.02t of recyclables were collected, including the units collected by the machines.

Unfortunately there were no baseline data for the corresponding period in 2012; however, the weight of material collected by the machines was calculated by applying standard weights to the container count. This is discussed in greater detail below, but the tonnage is very small compared with the total volume of recycling and, even with baseline data, it would be hard to confidently ascribe any change to the scheme, given natural variation and, potentially, other confounding factors, not least a modal shift from existing council recycling facilities.

3.1.3 *Retail and rewards data*

There are no sales of cans or PET bottles on site. The HWRC can theoretically attract material from across Troon. It was not possible to estimate the number of containers available for capture by this scheme, since there are too many local retail outlets to consider. In many ways this contextual factor makes this scheme the least comparable with the other pilot sites.

Vouchers from the machines were redeemed by taking them to the site office in exchange for a token that could then be used to obtain a bag of compost at another part of the site. Site operatives retained the vouchers throughout the pilot period to record redemptions. At the end of the pilot monitoring period on 27 September, the vouchers that had been redeemed were counted. Voucher dates were used to link redemptions to month of issue. In addition, the site operatives kept a monthly log of the number of bags of compost given to users in exchange for vouchers. This log allowed a cross-check against the voucher data.

3.2 Social research – quantitative survey and observations

The methods used to appraise customer and staff attitudes, behaviour and experience of using the Recycle and Reward machine at Troon HWRC were:

- observational analysis (limited to one day: Saturday 7 September 2013);
- quantitative face-to-face surveys (again limited to one day: Saturday 7 September 2013); and
- in-depth interviews (five in total).

Based on usage data from earlier in the pilot, this level of observational and survey work represented a scaling back from the original plan, and no response targets were set, as user numbers were expected to be low.

Greater detail on the methodologies employed are available in the report providing an overview of the pilots. This section highlights considerations that are unique to this site.

3.2.1 *Observational analysis*

During the observation day, only three transactions took place. One person may have been motivated to do so by the research team and another was a member of staff. This exceptionally low level was not foreseen. Although it was known in advance that transaction volumes were small, a Saturday was chosen for this study because it was considered likely to be the busiest day based on site feedback. Given the number of containers returned during the week in question, it would appear that use on the observation day was abnormally low. These limited data give little insight into behaviour.

3.2.2 Quantitative survey

Although a total of 35 surveys were completed, as discussed above there were very few users when the fieldwork was conducted, and thus almost all surveys completed were with non-users. The survey profile is below, but the demographic of the wider HWRC customers is unknown. Given this, and the small sample obtained, survey responses can be treated only as indicative of non-user knowledge and perceptions.

Age	Male	Female	Total
18–29	2	0	2
30–44	7	3	10
45–59	11	4	15
60+	4	4	8
Total	24	11	35

Table 1 Age profile of participants

3.2.3 In-depth interviews

Five in-depth interviews were carried out at the Troon HWRC and the council offices in Burns House in Ayr, with each interview lasting approximately 45 minutes.

The following people were interviewed:

- the service coordinator strategy and support officer;
- awareness and prevention officers (two); and
- HWRC site operatives (two).

3.3 Challenges encountered during fieldwork

A number of challenges were encountered in delivering the planned monitoring at this complex and comparatively open site. These are detailed in this section, including any implications for what can be concluded from this pilot.

The following data limitations were encountered at the pilots:

- By retrospectively allocating a material split to weekly data from the Recycle and Reward machine, material variation over time cannot be understood. However, it seems unlikely to have fluctuated widely, and the weekly and pilot totals can be considered robust. This limitation seems unlikely to seriously affect the analysis.
- Voucher and redemption data were available only monthly, rather than weekly. It cannot, therefore, be neatly matched to the returns data. Again, while greater granularity would be welcome, this limitation seems unlikely to seriously affect the analysis.
- The first three weeks of the pilot had contradictory redemption data (vouchers collected by site staff versus compost bags issued), since it appears that bags of compost were being issued for fewer than 50 voucher units.

- The lack of pre-pilot waste management data means that it is not possible to determine if the pilot has improved recycling levels overall at the site. It is possible that the Recycle and Reward machine has collected material that would have otherwise been recycled on the HWRC site (irrespective of questions concerning diversion from other recycling facilities and kerbside collections). It is, however, also worth observing that (even with baseline data) the relatively low weight of material collected in the machine compared with the other recycling facilities on site would have made any net impact hard to distinguish from other causes of variation in the site totals.
- The low number of machine users at the site on the day of the social research makes the data potentially unrepresentative. Whereas the methodology was adapted in advance to reflect an expectation of relatively low user numbers, the scarcity of users meant that on-the-ground survey and observational techniques could not obtain enough data for meaningful quantitative analysis. Some data can still be used to provide more qualitative insights, but any conclusions should be drawn cautiously.

Given these restrictions, and the atypical nature of the pilot context, this scheme received less monitoring resource than some other pilot sites once these limitations had been identified.

4 Pilot performance and operation

The following sections contain detailed quantitative and qualitative analyses of the schemes performance. Sections 4.1 and 4.2 compare the machine data with the reported recycling behaviours from the social research, which are broadly complementary. Section 4.3 considers the rewards issued and claimed in more detail, while section 4.4 focuses on the users' familiarity with the machines and how often they use them. Finally, sections 4.5 to 4.8 explore the potential wider implications of the pilot. This includes consideration of possible impacts on litter, net waste on site and improvements in recyclate quality. Finally we consider operational aspects of the pilot, focusing on machine reliability (both actual and perceived) and staffing implications.

4.1 Overview

Overall machine throughput data in terms of returns and rewards are shown in Table 2, with estimated weights for cans (~14g per can) and bottles (~22g) taken from SKM measurements at other pilots (assuming the cans and bottles are the same typical brands). While 6,905 units collected is a large number of items, it is only ~120kg in weight; that compares to around 31t of recyclables captured in total at the HWRC during the period. This is around 0.39% of the recyclables captured. However, as the HWRC does not hold weights for PET plastic and aluminium cans in isolation from overall recycling, this comparison tells us little about how much of these specific material streams is being captured, though it does indicate the difference to site totals will be minimal (especially as there is little evidence that material captured this way is necessarily additional to what would have gone into the other routes).

Category	Breakdown	Number	%
Returns (units)	Total aluminium cans	3,931	57
	Total PET bottles	2,974	43
	Total items	6,905	100
Returns (kg)	Total aluminium cans	55.6	–

	Total PET bottles	63.9	–
	Total units returned	119.6	–
Rewards	Total rewards issued	6,905	–
	Total rewards	2,250	33

Table 2 Summary of Troon HWRC pilot results

It should be noted that it was not possible to quantify the containers available for disposal at the HWRC (e.g. from local sales data), so it was not possible to estimate a sales-based capture rate as in other pilot projects.

Figure 4 depicts the weekly returns of cans and PET bottles. It should be noted that the exact breakdown of returns by cans and PET bottles was not known until the end of the pilot, when the two fractions were weighed from some machine samples. At this point a 57:43 split between aluminium cans and PET bottles was ascertained. This split has been applied evenly across all weeks retrospectively. It can be seen that the peak in usage came over August and early September. This possibly reflects overall footfall at the site during the summer months when people were visiting regularly with garden waste and also taking the opportunity to place cans and bottles in the machines, with the aim of also being able to obtain some free compost. This is, however, speculation, as no footfall data were available.

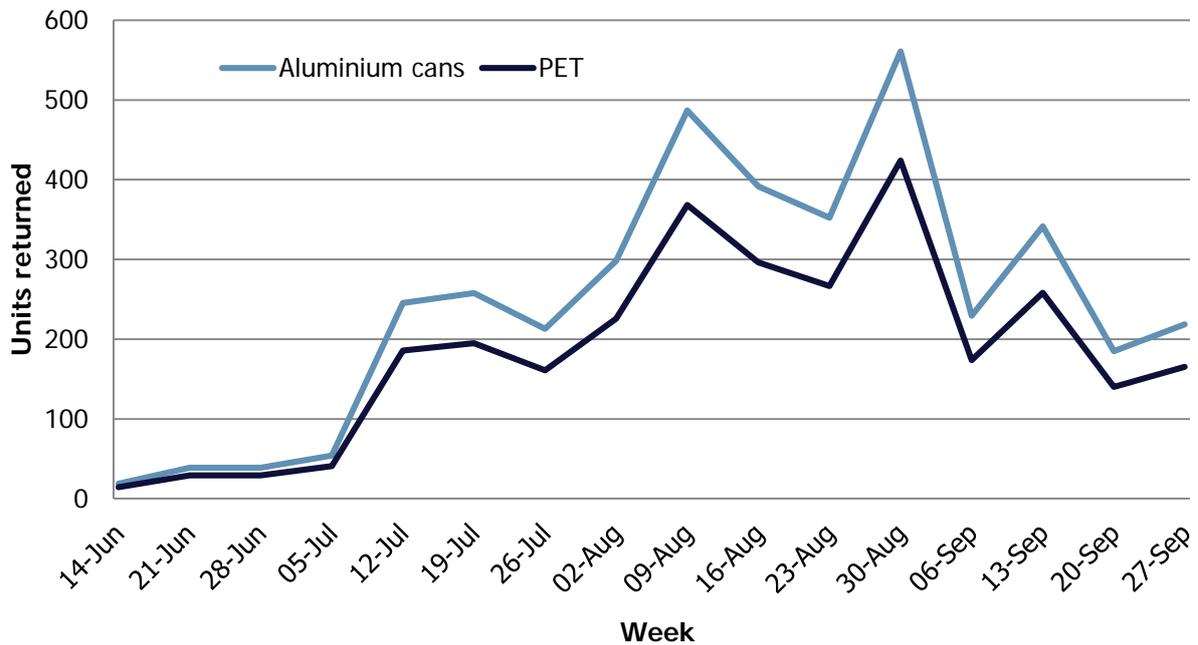


Figure 4 Weekly units returned to the machines

4.2 Social research insight into items recycled

The machine data shows that use of the scheme was relatively low, and this was supported by the experience of social researchers while on site. Although no site footfall data are held, just 35

interviews with customers were obtained during one day of surveying at a weekend. Staff observed that machine use was low initially, but picked up as more customers became aware of the scheme. This is supported by the return rates (Figure 4), which show a gradual increase through the summer. As well as customers with gardens (because of the compost reward), staff noted that the machine was also popular with parents and children.

4.3 Rewards issued and claimed

The rewards issued are based on the manual readings taken directly from the machine. Figure 5 shows the variation across the pilot period in terms of rewards claimed, i.e. vouchers redeemed in exchange for compost. The data are shown weekly to give a comparison with the returns data, but the actual figures were provided only monthly, hence the step profile.

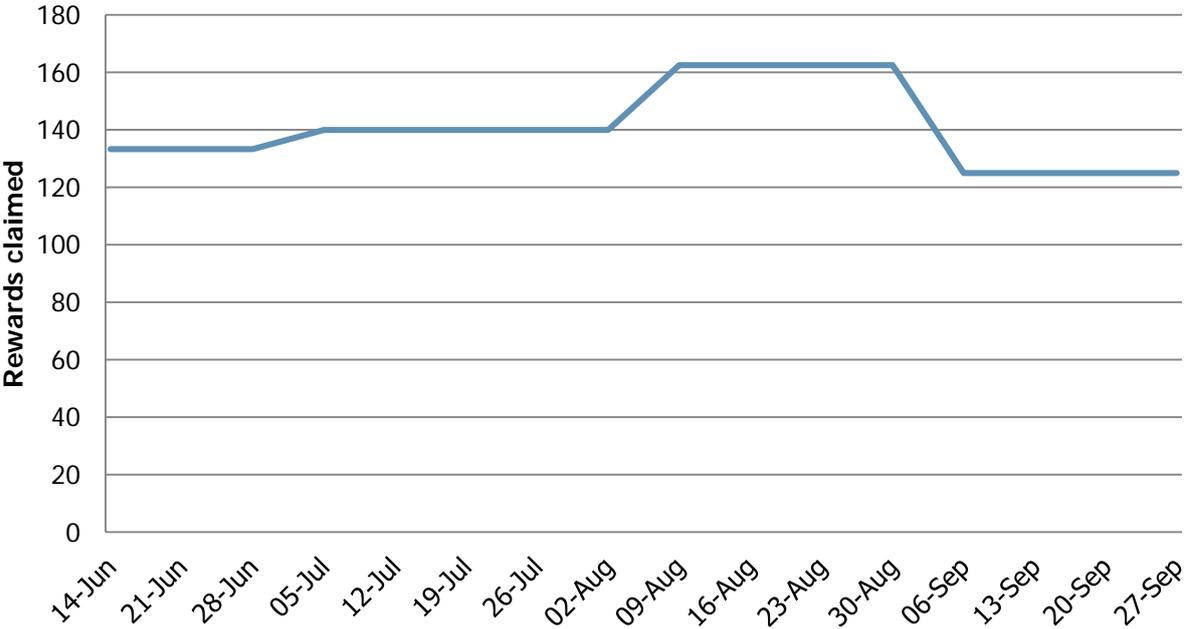


Figure 5 Weekly voucher redemptions

The number of voucher redemptions was calculated by ascertaining the number of tokens (and hence compost bags) issued each month and multiplying this by 50, as this was the number of voucher units needed to qualify for a bag of compost. It should be noted that in the first three weeks of the pilot more vouchers appear to have been redeemed than were issued. The reason for this is not known, but may be down to an incorrect allocation of bags of compost at the start of the pilot, i.e. bags being issued for fewer than 50 voucher units.

The rate of voucher redemptions remains below 40% throughout the pilot (the maximum being 38%) and was 26% on average as shown in Figure 6. The figure excludes the first three weeks of the pilot, during which there was some uncertainty around the true redemption figures as noted above.

There were differences in how people collected the reward: some people would collect the vouchers from the machine and the token from the site attendants and claim the individual bag of compost immediately, whereas others would collect several tokens before collecting multiple bags of compost.

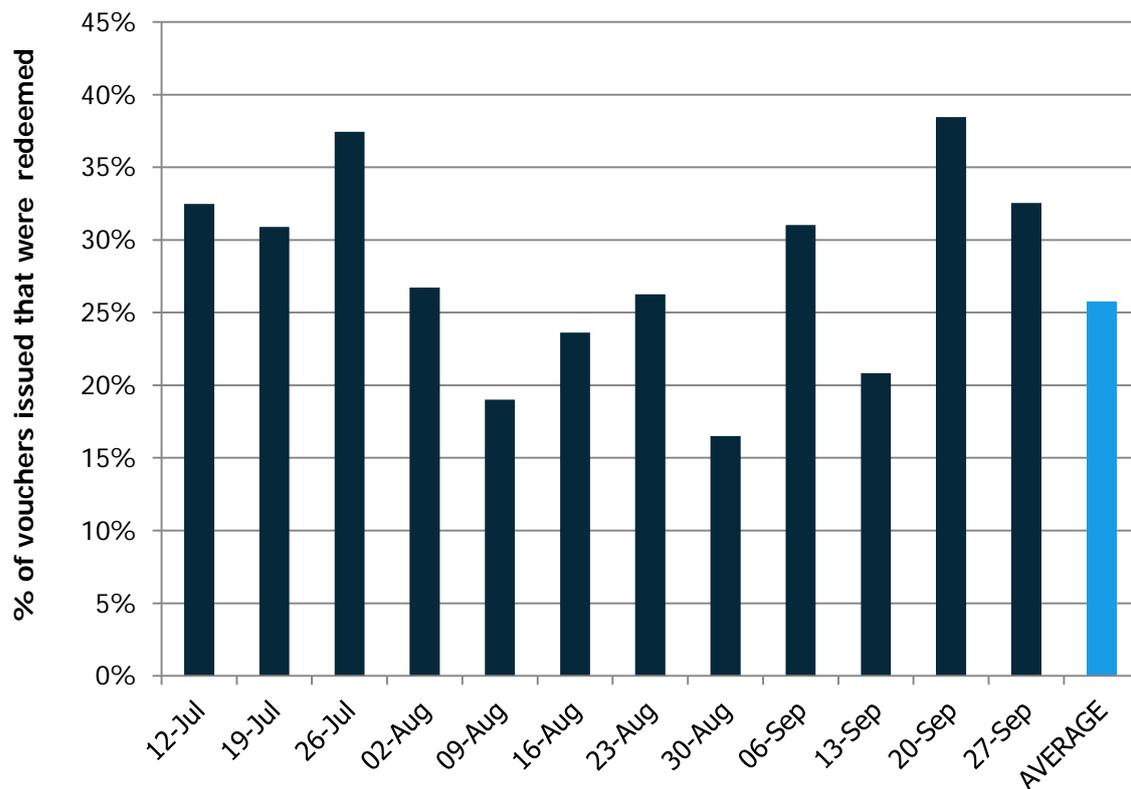


Figure 6 Weekly voucher redemption rates

The survey results (although a small sample) found that 71% of users and non-users combined thought that the reward was appropriate, so the relatively low level of voucher redemptions may be explained by other factors, such as the attractiveness of the reward. One issue established by the survey was that the rewards offered at the HWRC and Marr College were different, which caused some initial confusion for the HWRC customers. This was presumably due to the common promotional material for the two pilots and perhaps the fact that some HWRC customers had knowledge of the system at Marr College (e.g. they worked there or had children there). See section 5.3 for further discussion.

4.4 Awareness of the machine and its correct use

Of the small number of HWRC customers surveyed (35), 40% were aware that there was a Recycle and Reward machine located at the HWRC and that it accepted plastic bottles (31%) and aluminium cans (26%). One customer incorrectly mentioned glass. Six of the 35 people interviewed (17%) were aware of promotional activity, and indicated it had been effective. Of the non-users surveyed on site, 56% gave lack of awareness of the machine as a reason for not using it.

Staff commented that the machine tended to be used by repeat users and that, overall, customers appeared to like using the machine and found it easy to use. They indicated that the operational instructions on the machine might have been improved, as some customers had to ask staff how to use the machine, but once it was demonstrated to them they had then felt confident. The staff also noted that some customers were frustrated that the machine did not accept steel cans or coloured plastic bottles.

The staff interviewed indicated that overall the promotion had been effective, but identified the following key issues:

- The rewards offered at the HWRC and Marr College were different, which caused some initial confusion for the HWRC customers. This may have been partially because both schemes were promoted together and/or some users worked at Marr college or had children who attended it.
- When collecting compost, customers were required to bring their own bag. However, this was not explained in the advertising, so first-time customers were unaware of the procedure.
- Some of the promotional materials stated that all cans and plastic bottles could be recycled. However, the machine accepted only aluminium cans, not steel, and only clear plastic bottles were accepted, not coloured or opaque bottles.

4.5 Impact on litter

In general, the nature of this scheme is such that it might not be expected to influence littering. Those targeted are householders, and the site is one that would generally require a dedicated trip, rather than being located at the point where a container is emptied and finished with.

The majority of customers stated there had been no change in littering since the machine had been introduced, and that littering at the site itself had never been an issue, as the HWRC was well maintained by the site attendants. The site operatives, however, indicated that the introduction of the machine had improved littering in the town. They noted that one couple now carried out a 'street clean' and brought the items collected to be recycled at the machine to obtain compost. As this is the only scheme that is likely to attract drinks containers consumed in the home, it might be expected that its impact on litter would be minimal.

4.6 Impact on overall waste

No historic data on recycling at the site was available for the pre-pilot period. Thus, while overall recycle was measured during the pilot period, and the weight collected by the machines can be calculated, it was not possible to comment on whether or not the site as a whole saw an increase in recycling. Staff views on this were inconclusive.

The quantity of cans and bottles collected by the machine during the pilot was ~120kg, against ~31t of mixed cans and commingled materials collected from the site in total. Cans collected in the machines were put into the mixed cans bin that was already in place, while the PET bottles were put into the existing commingled bins. As noted earlier, this 120kg is just 0.39% of the recyclables captured overall at the site and it is not possible to determine whether this was additional recycling or diversion from other recycling facilities at the HWRC or elsewhere.

There was mixed opinion among staff about whether or not the introduction of the Recycle and Reward machine had any impact on the overall recycling carried out at the HWRC. The HWRC operatives believed there had been an increase in recycling, that more plastic bottles were now recycled as a result of the machine's introduction and that there had been a change in how people were recycling at the site, with some customers choosing to use the Recycle and Reward machine rather than other recycling facilities. Other staff members did not believe there had been any change in the amounts of materials being recycled at the HWRC since the machine was introduced. It is not possible to prove any of these views, as the baseline data are not available for comparison.

4.7 Impact on material quality

The machine accepted only aluminium drinks cans and clear PET drinks bottles. Opaque drinks bottles did not enable the sensors to detect the material and were therefore rejected.

Staff believed the recyclate stream was cleaner and imposed less of a requirement for further segregation, although, as noted above, when the machines were emptied the recyclable materials were bulked with recyclate from other sources during the actual pilot period. Consequently the benefits of cleaner material were not likely to be realised in practice.

4.8 Operational factors

This section considers the machine's technical reliability, and also how reliability was perceived by users and staff. It also considers the resourcing implications of the scheme for the site, specifically where these diverged from initial expectations.

4.8.1 *Machine reliability*

The machine at the site should have been suitable for outdoor use; however, the one delivered was an indoor model, which required a Perspex shelter to be built to house it. The council also had to undertake works before the pilot commencing to ensure that a suitable three-phase electrical connection was provided. These two aspects delayed the launch of the scheme. Some site staff felt that the shelter reduced the visibility of the machine and hence may have deterred use.

Overall, the machine was reliable and any operational issues were quickly fixed by the HWRC site staff. The main problem experienced was caused by customers putting materials in too quickly and causing the machine to jam. Although this was straightforward to fix, the time taken to resolve the issue did have an impact on the site operatives.

4.8.2 *Resourcing implications*

Setting up the pilot involved inputs from various people at South Ayrshire Council. The service coordinator strategy and support officer was involved in the selection of the Recycle and Reward pilot locations, the overall management and implementation of the scheme, including procurement of the machines for Troon HWRC (and for Marr College). The waste awareness and prevention officers were involved in the initial stages of the project and had helped the service coordinator strategy and support officer and Zero Waste Scotland to establish the pilot at the HWRC.

The machine was operated by HWRC site operatives, who were responsible for emptying the machine, decanting materials into other containers, ensuring the machine was operating effectively, collecting vouchers from machine users and issuing tokens/compost. They also kept a log of how often the machine was emptied and reported this information back to the waste awareness and prevention officers, who were then responsible for collating the data and passing the results onto SKM. These officers also reported weekly unit counter readings on the machine.

No extra staff were employed and no staff were dedicated full time to the pilot.

5 Public reactions to the pilot

In assessing public reactions, this section considers the views of only the target population for the scheme – which was also the target population for the social research – plus any site staff insight into this. It should be noted that only very limited feedback was collected from site users, because of low footfall (and machine use) on the day fieldwork was undertaken. This section first considers user and non-user views, the perceived appropriateness of the rewards and the legacy of the project. A final section summarises other issues and suggestions noted by respondents.

5.1 User views and motivation

As noted earlier, only one Recycle and Reward machine user was interviewed during the site survey work. The single user surveyed indicated the Recycle and Reward machine was very easy to use, easy to understand and reliable, and that her overall experience of the scheme was satisfactory. However, it is difficult to draw conclusions from a single response. The user indicated that the compost reward had motivated her and her partner to use the machine and they had already redeemed tokens for two 70-litre bags of compost.

Site operatives (in the in-depth interviews) felt that the compost reward had motivated their customers to use the machine. As many as 97% of customers surveyed had a garden, 49% used compost and 23% had previously bought compost at the HWRC. This suggests that the incentive offered would, at least potentially, be of interest to a high proportion of HWRC users.

Staff noted that HWRC customers were frustrated that the machine would not accept all cans and coloured bottles. The staff had been incorrectly informed that the machine could have been reset to allow these materials to be accepted but this was not been done during the pilot.

The main benefits identified with the Recycle and Reward by those using the HWRC were the provision of free compost, the pro-recycling message, the impact on recycling rates and wider environmental benefits. Most of the staff on site believed that incentivised recycling motivates customers to recycle more, though views on whether or not recycling had in fact increased were mixed (as noted earlier).

5.2 Non-user views

The vast majority of people interviewed at the HWRC indicated they had not used the machine. The main reasons for this were a lack of awareness (56%) and that they already recycled the target items (i.e. plastic bottles and cans) using their kerbside collection service (24%). Other reasons recorded were that they did not have much of this type of waste when visiting the HWRC (9%) and that they had no need for compost (6%).

5.3 Appropriateness of the rewards

The majority of HWRC customers (71%) surveyed thought that the compost reward offered was appropriate. It is interesting to reflect that positive responses to this question were received across a variety of pilot sites, with quite varied schemes and incentives involved. It may be hard to judge, therefore, if alternatives would have been just as acceptable.

The staff believed that the reward offered was suitable, generally well received and easy to administer. However, they felt it could have been improved by increasing the amount of compost given out for each token, perhaps doubling the amount of compost from one to two bags per 50 vouchers.

Other rewards suggested by customers were to expand the range of rewards on offer so that customers who did not have gardens would also be motivated to use the machine, such as cash rewards (9%) or supermarket vouchers (6%). Expanding the range of rewards to perhaps include the swimming and cinema vouchers offered at the pilot at Marr College, and/or offering an option to donate to charity, might also have broadened the appeal.

5.4 Legacy of the Recycle and Reward scheme

All staff stated that the scheme had been better than expected and they wanted the Recycle and Reward machine to be continued at the HWRC. They also agreed it encouraged customers to recycle.

Of the 35 customers surveyed, 77% said they would like to see the Recycle and Reward machine permanently located at the HWRC, though this should be considered in the context that very few of those spoken to were actual users.

5.5 Other observations

When the machine was initially installed at the HWRC, the site operatives were given a short training session which demonstrated how the scheme worked. There was then a delay in the pilot start date due to the requirement to build an external protective housing for the Recycle and Reward machine, and the site operatives indicated it would have been helpful if a refresher training session had been run at this point.

It was suggested that, overall, the training provided could have been improved by providing more operational details and further clarification about the ongoing maintenance and repair support offered. No further guidance or operating manuals were provided.

The selectivity regarding accepted materials (i.e. only clear plastics and aluminium cans) may also have complicated the communications challenge for the scheme. This level of detail cannot be easily conveyed with limited space on posters etc., especially when seeking to promote both this scheme and a different one at Marr College. The joint promotion of two different new schemes in the same geographical area may have had some advantages in terms of combined communications coverage, but some disadvantages in terms of detailed understanding of accepted items and rewards available.

Staff felt that three things in particular would have increased use of the machine:

- greater promotion of the scheme;
- ensuring that the machine would accept steel cans and coloured plastic bottles; and
- increasing the range of rewards offered, in line with Marr college.

These changes may well have a significant impact on machine use, although there are other factors, in particular the competing recycling facilities on site and at home, that complicate the picture.

6 Conclusions

There were practical problems initially in placing the machine on site, with the need for a three-phase power supply and a waterproof Perspex housing. This led to delays in launching the scheme, while the Perspex cover and location of the machine perhaps made it less prominent than it might have been. Once the pilot was up and running it did not significantly affect staff resource issues on site.

During the monitored pilot period 6,905 containers were recycled, with an increase from launch through into the summer months, but with a decline in September. This peak may have mirrored general site usage over the busy summer months; however, no footfall data are available to confirm or contradict this. Site staff observed that machine use was low initially, but picked up as more customers became aware of the scheme.

The number of containers returned seems low for the target area as a whole, if we consider the entire population of Troon as the target group. However, it seems likely that the effective target group for this pilot is effectively much smaller, given the actual levels of use of the HWRC, the fact that using it is likely to be part of a dedicated trip and that other recycling routes are readily available for Troon's residents (including at the HWRC itself). For non-gardeners, the opportunity and motivation to build this scheme into their routine may therefore have been relatively low, but this is speculative, given the limited customer feedback obtained (and the fact that wider resident opinions were not canvassed).

No beverages are sold on the HWRC and consequently it is not possible to calculate the sales-based capture rate in the same way as other schemes. Based on all drinks sales in Troon it would clearly be very small, but as discussed above, the effective target audience is arguably much smaller than this. The actual quantity of material collected by the machine was low, at 120kg (0.120t), reflecting both the number of containers returned and the lightness of the targeted materials. This is a very small proportion of all recyclate on the site, though the exact share of the targeted items collected on the site that were collected by the machine cannot be calculated because of data limitations.

In the absence of pre-pilot (baseline) data, it is not possible to comment on whether overall recycling at the site has increased or there was a modal shift. Given the low relative weight collected in the machine, even with baseline data it would be extremely difficult to detect any net change or attribute it to the scheme, given the natural variation that occurs.

Of the small sample of site visitors surveyed (35), 40% stated that they were aware of the pilot but only one third of customers were aware of what materials the machine accepted. Only 17% of survey respondents had been aware of the pilot promotion.

As well as customers with gardens, the machine was also popular with parents and children. Staff indicated that there had been a change in how people were recycling at the site. Staff also believed that the machine had proved easy for people to use.

Staff reported that initially the joint promotion of the Marr College and HWRC pilots in the same area (but with differing rewards) had caused some confusion for HWRC scheme users (who also may have had direct experience of the pilot at Marr College). There was also some feedback that the exact nature of the accepted bottles and cans had not been sufficiently clear to users.

While the reward offered could be considered quite niche, 97% of site users spoken to had a garden, with significant numbers buying compost and several having bought from the HWRC in the past. A total of 71% of those surveyed considered the reward 'appropriate' when asked. This should be considered in light of the fact that few respondents actually used the scheme, and voucher redemption across the pilot period was only 26% (excluding the first three weeks of erroneous data). Taking a wider perspective, across all pilot sites the majority of respondents considered the reward in place appropriate, even though in practice offerings were quite diverse. More detailed exploration of this issue might therefore challenge the initial reaction of respondents.

The staff believed that the reward offered was suitable and generally well received and easy to administer. However, they felt it could have been improved by increasing the amount of compost given out for each token, perhaps doubling the amount of compost from one to two bags per 50 voucher units.

Other rewards suggested by customers were to expand the range of rewards on offer so that customers who did not have gardens would also be motivated to use the machine, such as cash rewards (9%) or supermarket vouchers (6%). Expanding the range of rewards to perhaps include the swimming and cinema vouchers offered at the pilot at Marr College, and/or offering an option to donate to charity, might also have broadened the appeal.

Staff reported that the material collected from the machine was of higher quality than that normally collected, thanks to the lack of contamination from unwanted materials. However, it should be noted that the material was subsequently placed with other commingled recyclables on site, so no benefits were realised.

This scheme is unique among the pilot sites in that it is not located at a place where containers are generally consumed. While those containers finished with at home can be brought to the HWRC, they can also be disposed of via a kerbside collection. The scheme is arguably convenient only for those

already using the HWRC, or living very nearby, and this may mean the convenience–reward trade-off is less favourable than at some of the other pilots, including that at Marr College.

Given the pilot location and design, an impact on litter was not really to be expected, as site staff generally kept the HWRC clean and tidy. Anecdotally, site staff said one couple had collected littered containers from their home street with the specific intention of claiming compost. There was no other evidence of an anti-litter impact.

A large majority of survey respondents said they would like to see the pilot made permanent, although it should be noted that very few of those spoken to were currently using the scheme, and survey numbers were low. An even larger number said they would like to see the scheme rolled out to other outlets. Site staff were also positive about continuation, and felt the scheme had met their expectations.

7 Glossary of terms

- Capture rate: the proportion of targeted containers that are recycled through the system.
- Collection: the return of containers to the reverse vending machine.
- Deposit: the 10p charge placed on an in-scheme container.
- In-scheme: a container that was sold within the university with a deposit charged.
- Non-user: person who has not used the Recycle and Reward scheme, or has used it but does not intend to again.
- PET: polyethylene terephthalate.
- Reverse vending: accepting an item for recycling in a machine that issues a reward or other incentive.
- Shelf talker: card or sign attached to a shelf to highlight a product or promotion.
- Transaction: a visit to the reverse vending machine by a user placing one or more collected containers in the machine.
- Units/containers: the aluminium cans, PET plastic bottles or cups.
- User: person who has used the Recycle and Reward scheme more than once.

Appendix: monitoring methodology

The monitoring and evaluation work for the pilots was led by SKM Enviro (SKM), working in partnership with Nicki Souter Associates (NSA). At the educational sites, Zero Waste Scotland undertook additional data collection outside the trial period, so a complete dataset could be obtained for the autumn term.

The range and number of data collected varied somewhat by site, reflecting constraints on what sites knew, and the cost-effectiveness of obtaining certain types of data in some contexts. As the pilots progressed, the balance of monitoring was adapted to concentrate on those sites which would be most likely to provide useful learning. This particularly affected strand B, where it was felt that, firstly, concentrating some resources on key sites could help offset some of the limitations on the strand A data and, secondly, some sites were experiencing relatively low footfall and would be far less cost-effective to target in data collection terms.

Data collected and methods employed included the following. Some differences between sites are highlighted here, whilst the approach for specific sites is in tabular form below.

Strand A

Baseline retail sales data for the site – some sites had only annual data, others monthly and some only partial data. In one case (HebCelt) there were no historic data, and in another (Troon HWRC) no sales data were collected either before or during the trial, as the target area was too broad.

Pilot period retail data – all sites but Troon HWRC provided these data. Typically data were either weekly or monthly depending on the sales systems and number of outlets that were relevant to the site.

Baseline waste management data for the site – some sites had monthly data and one site (Dundee) sought to estimate weekly information. However, several sites had no baseline data. All sites struggled to provide detailed waste information (e.g. the composition of drinks containers by stream, or weights rather than volume-based estimates).

These are common challenges in trials of this type, and could be comprehensively tackled only by a year-long resource intensive pre-pilot monitoring period. In an attempt to improve understanding, in two cases (Heriot-Watt and the North Ayrshire schools) waste compositional analysis was undertaken before and during the trial. Site visits in all cases where it was appropriate also included visual estimates of container fill rates and contamination, and discussion with site staff to understand collection frequency, but, while this improved our understanding of material flows, it was insufficiently sensitive in itself to highlight change over the trial period.

Waste management data during the pilot period was available for all sites, but granularity and quality varied. Most sites knew their overall waste arisings and some knew recyclates within that. In two cases (as noted above) compositional analysis was undertaken to try to understand residual composition. Sites provided data from a mix of volume-based measures, weight information, and site and waste contractor information.

Returns data from the recycle and reward machine(s) and/or manual data during the trial period were collected. Where both were available they were sense-checked against each other. Typically the manual data were preferred in those cases where there was a contradiction (for example, switching the power on and off was found to have led to the machine resetting the count at one site).

Machines recorded transaction data in different levels of detail (daily, weekly or by individual transaction). Most machines recorded data by container type; in one case the machine collected mixed plastics and cans in a single receptacle and in this case the split of material was estimated during site visits.

The level of analysis that these data could be subjected to varied according to the format obtained.

Downtime data during the pilot period – some machines also provided telemetry data when they were offline (either for servicing or emptying, or because of a problem), and some sites provided these data. However, it was not always clear at all sites how long machines were down for.

Redemption rates during the trial period – the machines identified how many vouchers were issued (where this differed from the number of containers returned, e.g. where some containers did not attract a reward, or rewards were given to charity). Voucher redemption data were collected from the retail outlets either monthly or weekly. The level of analysis that these data could be subjected to varied according to the format obtained, and how closely they matched the machine data in time periods covered.

Site visits were conducted to understand waste management practice, to help gather baseline data and to build a relationship with the sites to facilitate the overall monitoring. SKM staff originally

proposed to visit each site (with the exception of HebCelt, which it was sensible to visit only during the pilot) at least twice (once before the pilot and once during it). However, for some sites the number of visits was increased, where it was felt this would enable the collection of better baseline data, addressing some of the gaps in pre-existing records.

Although not formally part of the monitoring process recorded here, all sites (except HebCelt, though other Zero Waste Scotland staff were present) received multiple visits from the Zero Waste Scotland project manager. Especially during the early trial period, these were often weekly for some of the bigger sites. Zero Waste Scotland staff were also available to troubleshoot problems remotely (by phone and email) and this also means we obtained data on much of the learning around set-up and installation. These visits were therefore invaluable both in delivering the pilots and also in providing insight into how they were functioning on the ground, and what was and was not working well. Visits included an assessment of reliability, and material quality, on several occasions. Zero Waste Scotland also made several other visits to sites to assess communications and scheme performance; these included informal 'mystery shopper'-style use of the machines. NSA also visited all sites where they conducted fieldwork at least once, and provided feedback on how well the scheme was functioning at the time of their visits.

Throughout the pilot period SKM, NSA and Zero Waste Scotland liaised closely on issues encountered.

In some cases, site visits included visual (including photographic) inspection of residual bins, recycling bins or the recyclate collected from the machines. In a few cases, site waste management staff were able to supplement data gathered this way independently of a visit from the monitoring team.

Strand B

Focus groups were concentrated on the university sites, which saw relatively high levels of use, and an audience that was accessible for this form of research. Despite the variation in scheme design, these three institutions are of course broadly similar in function, so it was also felt cross-site comparison would add most value to focus groups conducted in these contexts.

Face-to-face (and online) surveying was concentrated on the university sites and HebCelt, as these saw the highest footfall and were thus most appropriate for an in-situ survey technique. Thanks to patterns of use at these sites, an in-situ technique also has a good chance of reaching a representative set of users, and (albeit to a somewhat lesser extent) relevant non-users (i.e. those who use the public areas targeted, but not the scheme). The samples obtained in these cases do allow for quantitative analysis.

At Dundee, an online survey to students managed by the university also asked about reactions to the Recycle and Reward scheme, and the results were kindly shared with Zero Waste Scotland. These provide an interesting perspective, as the respondent base and time period differ somewhat from the external monitoring undertaken.

At the Ikea stores and Troon Household Waste Recycling Centre an interviewer was placed on site for a day in each case, but, as expected, relatively few interviews were obtained because of the lower footfall. The responses obtained here provide customer insight, but are too small to be analysed quantitatively.

In the school context it was felt that an online survey was a cost-effective alternative to face-to-face surveying (all students can be contacted in this way, and can be encouraged to participate by staff). Numbers were relatively small, but can be considered quantitatively (with caution).

An online survey was made available at Whitmuir (using its customer database), as it was felt that on site surveying would yield too few users to be worthwhile. Very little feedback was obtained via this route (which is also a somewhat selective sampling method, as not all customers are on the database – though regular customers, which the scheme expected to target primarily, were).

Observations were also concentrated on sites where footfall was highest, but were employed to some extent at all sites except Marr (as Zero Waste Scotland considered the schools in North Ayrshire to provide sufficient insight) and Whitmuir (where machine use was very low). The extent to which the observations can be analysed quantitatively is dependent on the number of transactions actually observed in each case.

Insight from formal observations is supplemented by the insight gained during site visits by SKM, NSA and Zero Waste Scotland throughout the trial period, and feedback from site staff (about both what they have observed, and what customers have told them). This provides a useful perspective, in conjunction with other sources, both on changing behaviour over time (in particular the extent to which the observed periods at the universities may have been atypical, as they were near the start of term) and on behaviour outwith the monitoring period (for example, use by cleaning staff at some sites particularly in the early morning).

In-depth interviews were carried out by NSA at a smaller number of sites. These sites were selected by Zero Waste Scotland on the basis that they would provide most additional insight. The interviews targeted a range of site staff including management, cleaning and retail staff. The excluded sites were those where Zero Waste Scotland had had particularly extensive contact throughout the trial period, and it was felt staff insight and reactions were already well understood. Zero Waste Scotland has fed into the reporting process in all cases.

General

Although presented as strands A and B in research design, with SKM undertaking the fieldwork and analysis for strand A and NSA doing so for strand B, the final reporting and analysis for all cases, and the overview report, have been led by SKM, working closely with both NSA and Zero Waste Scotland. Throughout the process, the project team across the three organisations met regularly to exchange information and insight, and, particularly in terms of insight into site management and scheme performance, all three organisations gained insight from their respective site visits. The reporting should thus be seen as an integrated report, drawing on both technical data and analysis, and quantitative and qualitative social research.

Key challenges in interpretation and analysis are highlighted in the main report at section 2.4, and where appropriate when presenting specific findings. Table A1 shows the detail of monitoring across sites, including variation.

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	Pilot Project	Hard' Performance Data - baseline (pre-pilot)		Hard' Performance Data - during pilot								Strand B				Other information	
		Baseline retail data	Baseline waste management data	RVM data manual record	RVM data telemetry	Retail data	Voucher data	Waste Management data	Machine downtime	Site visits	Other in depth analysis	Focus Groups	Depth interview (days)	Observational analysis (days)	Face-to-face surveys (total number)	Site Specific data limitations	Other supporting information
Universities	GCU	Supplied approximately weekly by the General Manager of Catering Services	Supplied as monthly data by the Sustainability Coordinator	Supplied approximately weekly by the General Manager of Catering Services	Machine supplier provided data approximately weekly.	Supplied approximately weekly by the General Manager of Catering Services	Supplied approximately weekly by the General Manager of Catering Services	Supplied monthly by the Sustainability Coordinator	Limited data from machine supplier (machine ID but not date/duration)	5	Photographic/observational bin audits (6:5 by SKM staff; 1 by GCU staff)	2	0	3	250	Early weeks recorded as a total value. No machine downtime data provided by GCU. Procurement of drinks containers based on existing process rather than sensitive to current patterns.	
	HWU	Comparable data not available	Annual data available	N/A	Machine supplier provided weekly; data available at an hourly level	Supplied weekly by the Hospitality Services Manager and Student Union Manager	Supplied weekly by the Hospitality Services Manager and Student Union Manager; machine supplier provided weekly data on vouchers issued	Unavailable so waste compositional analyses undertaken	Machine supplier provided weekly	3	2 waste compositional analyses (prior and during trial)	3	1	2.5	500	The data provided by Hospitality Services of units sold in retail outlets was initially understood to be PET bottles only as no cans were sold in retail outlets. However it became apparent in the latter stages of the trial that a small quantity of cans is indeed sold in retail outlets. This has led to an unidentifiable but small number of cans sales being reported as PET bottle sales	
	UoD	Provided by DUSA based on actual sales in the two campus shops during one term-time week, an estimated figure for weekly term-time vending machine sales and an estimate for expected sales (from shops and vending machines) during holiday periods.	Estimated weekly data on segregated recyclables provided by University based on container fullness rather than weight; estimated annual tonnages of segregated recyclables from teaching and admin buildings supplied by University waste manager; also monthly residual data excluding May to July 012	Supplied approximately weekly by the Environment and Sustainability Officer	Machine supplier provided data approximately weekly.	Supplied monthly by the Environment and Sustainability Officer/DUSA Shop and Vending Manager	Environment and Sustainability Officer provided data on the total amount invoiced by DUSA (variable frequency)	Data on for recycling from RotG banks, Halls of Residence supplied monthly by Dundee City Council; University Waste Manager supplied weekly data on University residual waste	Supplied approximately weekly by the Environment and Sustainability Officer; limited data from machine supplier (machine ID but not date/duration)	1	N/A	2	0	3	250		
HWRC	Troon	N/A	No data available	Total units data provided weekly by Council staff; data on bottle/can split only provided as overall ratio provided at end of trial	N/A	N/A	Monthly data provided by HWRC staff at end of trial	Material collected in combination with other recyclates so no data available	No data	2	N/A	0	1	1	1 day		
Schools	Marr College	Baseline vending sales data was available from DC7 Ltd but not from the school canteen	No data available	Weekly data provided by the community policeman	N/A	Weekly data supplied by canteen staff and monthly data for the vending machine was provided by DC7 Ltd	Data provided by the community policeman and the eco-committee	Only estimated data available	No data	2	N/A	0	1	0	50		
	NAC Schools	Monthly data supplied by each school's canteen staff	No data available	Janitor from each school provided a weekly record excluding summer holiday period	N/A	Monthly data supplied by each school's canteen staff	Monthly data supplied by each school's canteen staff	Only estimated data available so waste compositional analyses undertaken	Janitor from each school provided a weekly record excluding summer holiday period	3	2 waste compositional analyses (prior and during trial)	0	0	1	50 per school		
Retail	IKEA Edinburgh	Monthly data for Britvic vending machine sales only	Very little data available; initial visual inspection/weighting of recyclables to provide indicative daily data undertaken by SKM staff but access limited latterly	N/A	Daily data provided by machine supplier	Approximately four weekly provision of weekly data for relevant items sold in the restaurant and the Swedish Food Market by sustainability staff; data for store sales have been provided for PET and glass bottles	Approximately four weekly provision of weekly data for voucher redemption figures provided by sustainability staff	Some data on recyclables for a proportion of the trial period only	No data provided	4	Granular level telemetry data analysis	0	1	2	1 day per store		
	IKEA Glasgow	Monthly data for Britvic vending machine sales only	Monthly average residual waste data estimated based on volumes provided by store	N/A	Daily data provided by machine supplier	Approximately four weekly provision of weekly data for relevant items sold in the restaurant and the Swedish Food Market by sustainability staff; data for store sales have been provided for PET and glass bottles	Approximately four weekly provision of weekly data for voucher redemption figures provided by sustainability staff	Weekly residual data provided	No data provided	1	Granular level telemetry data analysis	0	1	2	1 day per store		
	Whitmuir	2012 unit sales provided for same period as pilot	Very little data available; initial visual inspection/estimation by volume of recycle and residual bins to provide indicative daily data undertaken by SKM staff; not possible to estimate fullness of glass banks (opaque)	N/A	Machine supplier provided at a weekly level	Weekly data provided by WO staff every few weeks	Machine supplier provided data on issued at a weekly level; weekly data on total redemptions provided by WO staff every few weeks	Weekly observations by WO staff of bags in the dry recyclables storage shed and residual bins where practicable	Machine supplier provided at a weekly level	1	N/A	0	1	0	Online - no target	Machine downtime data conflicting with staff experience due to issues with the quality of barcode stickers applied causing difficulty in machine reading	
Festival	HebCelt	None available	General waste and organics only for the 2012 festival	N/A	Machine supplier provided at a daily level	Hebcelt (beer cups; via Caroline) and 4 other vendors (bottles and cans); Based on stock purchased and left at end	Festival and machine supplier provided data on vouchers issued for prize winners	Council provided weighbridge data; supporting waste data gathered by SKM/Hebcelt team during festival via waste analyses	Manual observations only	Staff on-site the duration of entire festival	General waste analysis from litter pick / general waste	0	0	2	100		

Table A1 Breakdown of monitoring activity undertaken at each site



Zero Waste Scotland works with businesses, communities, individuals and local authorities to help them reduce waste, recycle more and use resources sustainably.

Find out more at zerowastescotland.org.uk
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