Report

Evaluation of the Absorbent Hygiene Products Collection Trials in Scotland

June 2013

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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Front page image: Front cover of Perth & Kinross Council's AHP information leaflet

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Executive Summary

The Waste (Scotland) Regulations 2012 represent the most significant development in recycling that Scotland has seen and are designed to help realise the true value of resources with the potential to boost the economy and create green jobs in the process. These regulations will play a key role in helping Scotland reach its ambitious target of 70% recycling of all waste by 2025.

In the context of the on-going drive to attain the 70% recycling target for all waste, the ban on municipal biodegradable waste going to landfill, and the introduction of food waste recycling services; one of the main remaining components which will remain within the residual fraction of household waste will be Absorbent Hygiene Products (AHPs) currently estimated to form 4.8% of household residual waste.

Zero Waste Scotland provided funding to trial different AHP collection services from households in four Scottish Local Authorities.

- Service Type 1: 120 litre external wheeled bin; no sacks; bin presented weekly at kerbside; took place over two collection routes in Dunblane and Plean, Fallin and Cowie within Stirling Council;
- Service Type 2: 120 litre external wheeled bin and 30 litre tiger sacks (six month supply of 130 sacks); bin presented weekly at kerbside, took place in Crieff within Perth & Kinross Council;
- Service Type 3: 87 litre Slim-Jim container and 80 litre blue recycling sacks (six month supply of 130 sacks); 80 litre blue recycling sacks presented weekly at kerbside; took place in Auchterarder within Perth & Kinross Council;
- Service Type 4: 80 litre blue recycling sacks (six month supply of 52 sacks) and 30 litre tiger sacks (six month supply of 130 sacks); 80 litre blue recycling sacks presented weekly at kerbside; took place in Tulloch in Perth within Perth & Kinross Council;
- Service Type 5: 1100 litre container located at HWRCs and 80 litre red or blue recycling sacks (initial supply of 5 sacks per household); public responsible for transporting sacks to the HWRC where replacement sacks (up to 5 at a time) were provided by HWRC Attendants; two trials took place at Wellwood HWRC near Dunfermline within Fife Council and Stobcross HWRC in Coatbridge within North Lanarkshire Council.

This Technical Report presents a summary of the:

- Methods used to monitor and evaluate the performance of the trials;
- Results for each trial using a number of key performance indicators;
- Comparison of the performance between the trials; and
- Recommendations for the schemes to be modelled in the Worked Example Report.

The following monitoring and evaluation methods were used to appraise the performance of each of the AHP trials.

Trial Stage	Monitoring and Evaluation Method
1. Pre-Intervention	Waste Compositional Analysis
	Risk & Hazard Assessment
	Qualitative Behavioural Research (Focus Groups)
	Quantitative Behavioural Research (Pre-Survey)
2. Intervention	Opt-In Rate
	AHP Tonnage Capture
	Contamination Monitoring
	Set-Out and Participation
	Waste Compositional Analysis
	Waste Diversion (Average Yield, Capture Rate)
	Campaign Strategy Delivery
	Community Engagement Strategy
3. Post-Intervention	Cost Evaluation
	Quantitative Behavioural Research (Post-Survey)

The results for each trial, using a number of key performance indicators and providing a comparison of the performance between the trials, are summarised below:

- Opt-in rates were the key variable which affects service performance.
- Kerbside AHP recycling services performed better than HWRC AHP recycling services in terms of opt-in rates, public satisfaction, cost per tonne and the tonnage diverted.
- Kerbside services with collection containers were preferred over the sack only service in terms of opt-in rate and public satisfaction.
- AHP campaign materials and engagement activities were effective at encouraging the public to opt-in and use the services correctly. Contamination was less than 0.1% for each of the trial services.
- Households are motivated to use AHP kerbside recycling services primarily due to the environmental benefits, including the recognition that it is good to recycle these types of products; and that the provision of a specific AHP collection container also provides additional capacity in their residual bin.

Summary of the Performance for the Scottish Local Authority AHP Trials

	Service Type 1: Kerbside 120L Wheeled Bin, No Sacks	Service Type 2: Kerbside 120L Wheeled Bin, 30L Tiger Sacks	Service Type 3: Kerbside 80L Blue Sacks, 87L Container	Service Type 4: Kerbside 80L Blue Sacks, 30L Tiger Sacks	Service Type 5: 1100L HWRC Container, 80L Blue Sacks	Service Type 5: 1100L HWRC Container, 80L Red Sacks
Estimated % AHP Households in Trial Area	13%	5%	10%	20%	14%	10%
Number of AHP Households in Trial Area	685	96	138	212	525	595
Opt-In Rate	33%	89%	57%	21%	7%	16%
Number of Opted-In Households	226	85	78	44	36	98
Average Participation[1]	82%	78%	76%	72%	85%	86%
Median Set Out Rate[2]	63%	46%	56%	56%	N/A	N/A
Average Total Weekly Tonnage	0.82	0.57			0.14	0.25
Actual Average Yield (kg/hh/wk)[3]	3.63kg	2.88kg			3.88kg	2.59kg
Caputure Rate[4]	75%	86%			85%	86%
Overall Customer Experience	High	High	High	Medium	Medium	Low

Recommendations for a range of future AHP kerbside recycling services, taking into consideration the findings of the Scottish AHP Trials, are:

- Opt-in kerbside collection services for people who use AHP performed better and were more publically acceptable than the HWRC collection services;
    - Customers will find kerbside collection services easy to use and householders are unlikely to experience problems when using this type of collection services;

[1] The average of the participation rates from Survey 1 and 2. Participation rates are calculated from set-out values over three consecutive weeks for each survey.
[2] Median of the six set out rates derived in three weeks of Survey 1 and three weeks of Survey 2.
[3] The average yield of the whole trial was calculated from the average weight of AHP material collected weekly in each trial divided by the estimated weekly average number of opted-in households.
[4] The average yield was divided by the total expected AHP arisings derived from the waste compositional analysis to give the proportion of household AHP waste that was recycled compared to the amount that was found in the residual waste prior to the trial commencing.

  - Householders are motivated to use kerbside recycling services primarily due to the environmental benefits, including the recognition that it is good to recycle these types of products; and that the provision of a specific AHP collection container also provides additional capacity in the residual bin;

- Kerbside collection services should be offered on a weekly basis;
- Customer satisfaction with kerbside recycling services was high irrespective of the container type;
- For a successful AHP kerbside collection service households should be provided with a container or bin with sufficient capacity for a weekly AHP collection and consideration should be given to providing sacks:
  - For a 120 litre external bin presented at kerbside, use an annual supply of 30 litre tiger sacks (3 per week); for a proportion of incontinence product users there may be a requirement for additional sacks;
  - For an 87 litre indoor or outdoor container use an annual supply of 80 litre blue recycling sacks (2 per week) to present at kerbside;
- AHP sack only kerbside collection services are less acceptable than container type systems; one third of householders are likely to use their own container to store their recycling sacks before collection;
- All recycling sacks should be provided with ties;
- Communications to support the introduction of AHP kerbside recycling services should include:
  - An introductory leaflet;
  - Bin or container decal (where appropriate) or reminder postcard emphasising the materials that can and cannot be recycled using this type of service;
  - Direct community engagement activities to relevant target groups;
  - A4 posters to support community engagement activities.

A number of scenarios have been included in a separate report that shows worked examples of AHP collections in Scottish local authorities. You can find the report here: www.zerowastescotland.org.uk/content/worked-example-report-collection-absorbent-hygiene-products-scottish-households

Contents

1 Introduction

1.1 Background to the Scottish AHP Trials

The Waste (Scotland) Regulations 2012 represent the most significant development in recycling that Scotland has seen and are designed to help realise the true value of resources with the potential to boost the economy and create green jobs in the process. These regulations will play a key role in helping Scotland reach its ambitious target of 70% recycling of all waste by 2025.

Key points within these regulations which impact on Local Authorities include:

- Local Authorities to provide a recycling service for key materials (paper, cardboard, metal, glass and plastics) to all households by 1 January 2014;
- Local Authorities to offer a food waste recycling service in non-rural areas from 1 January 2016;
- A ban on material collected for recycling going to landfill or incineration;
- A ban on municipal biodegradable waste going to landfill by 1 January 2021.

In the context of this on-going drive to attain the 70% recycling target for all waste, the ban on municipal biodegradable waste going to landfill, and the introduction of food waste recycling services; one of the main remaining components that will remain within the residual fraction of household waste will be Absorbent Hygiene Products (AHPs) currently estimated to form 4.8% of household residual waste.

If this waste stream could be successfully removed from the residual stream and recycled this could:

- Make a contribution to the overall recycling rate and landfill diversion rate;
- Reduce the amount of biodegradable waste being sent to landfill. 89% of the total weight of an average full nappy is biodegradable; and
- Produce new products and contribute to closed loop recycling.

Zero Waste Scotland agreed to support four Scottish Local Authorities who indicated they were willing to carry out a 6-month trial of collecting AHPs from households, utilising different collection schemes.

Prior to the trials commencing Zero Waste Scotland carried out an assessment of the operational, logistical and risk requirements for each of the collection systems being proposed by the four Councils; this Scoping Report is detailed in Appendix 1.

Zero Waste Scotland provided funding to the four Councils to support the funded trials and a project manager was contracted with the objective to:

- Successfully deliver trials of Absorbent Hygiene Products (AHPs) to households in the 4 Scottish local authorities through support, advice, research and communication delivered collaboratively with the participating Councils; and
- Evaluate the impact of the trials on a number of key performance indicators and report on this to Zero Waste Scotland.

1.2 Overview of AHP Recycling Technology and AHP Products

1.2.1 ***AHP Recycling Technology***

Knowaste Limited recently opened the UKs first absorbent hygiene products (AHP) recycling plant in West Bromwich, capable of turning AHPs into recycled products. The company is the first specialist recycling company in the UK to offer recycling facilities for the recycling of disposable nappies, adult incontinence and feminine hygiene products, known collectively as absorbent hygiene products or AHP's[5].

The facility in West Bromwich processes up to 36,000 tonnes per annum of AHP and the key stages to recycle these materials and to produce value products for onward reprocessing are:

- The AHP waste is conveyed to an autoclave and is opened and sterilised;
- The AHP materials are then shredded and materials are separated;
- Fibres are reclaimed and baled for recycling;
- Plastics continue to granulation and washing processes and are then pelletised and bagged for recycling.

1.2.2 ***AHP Products***

1.2.2.1 Plastics

- Knowaste have secured outlets in the UK that will manufacture the following items from the plastic pellets; plastic wood, bollards, roof tiles, trunking, and a new AHP container that could be used to collect the waste as part of a AHP kerbside collection service.

1.2.2.2 Fibre

The company have:

- Agreed with a major manufacturer of pet litter that they can purchase all of the fibre production from the West Midlands plant of circa 20,000 tonne per annum;
- Run successful trials using the fibre off-take to make cardboard in the UK and processed over 700 tonnes; and
- Commissioned a European wide study of the fibre market and have identified the following established outlets for the fibre; tarmac, concrete, bricks, tile adhesive, insulation, composites, pet litter, horse bedding and brake linings.

1.3 AHP Collection Services

Four Scottish Local Authorities trialled five different AHP collection services:

- Service Type 1: 120 litre external wheeled bin; no sacks; bin presented weekly at kerbside; took place over two collection routes in Dunblane, Plean, Fallin and Cowie within Stirling Council;

[5] The Knowaste facility has recently announced it's closing it's West Bromwich facility: http://www.letsrecycle.com/news/latest-news/councils/uk2019s-only-nappy-recycling-plant-closes

- Service Type 2: 120 litre external wheeled bin and 30 litre tiger sacks (six month supply of 130 sacks); bin presented weekly at kerbside, took place in Crieff within Perth & Kinross Council;

- Service Type 3: 87 litre Slim-Jim container and 80 litre blue recycling sacks (six month supply of 130 sacks); 80 litre blue recycling sacks presented weekly at kerbside; took place in Auchterarder within Perth & Kinross Council;

- Service Type 4: 80 litre blue recycling sacks (six month supply of 52 sacks) and 30 litre tiger sacks (six month supply of 130 sacks); 80 litre blue recycling sacks presented weekly at kerbside; took place in Tulloch in Perth within Perth & Kinross Council;

- Service Type 5: 1100 litre container located at HWRCs and 80 litre red or blue recycling sacks (initial supply of 5 sacks per household); public responsible for transporting sacks to the HWRC where replacement sacks (up to 5 at a time) were provided by HWRC Attendants; two trials took place at Wellwood HWRC near Dunfermline within Fife Council and Stobcross HWRC in Coatbridge within North Lanarkshire Council.

These trials were carried out to monitor and evaluate the performance of each of the trialled AHP collection services in terms of operations and public acceptability using a number of key performance indicators and to allow a comparison to be made between the service types. This report provides key findings from the monitoring and evaluation activities undertaken as part of the AHP collection service trials. See Appendix 2 for the full results and methodology of each activity.

2 Summary of the Methodological Approach

The following monitoring and evaluation methods were carried out to appraise the performance of each of the trialled AHP collection services and to allow a comparison to be made between the service types. A summary of these methods is displayed in Table 1:

Table 1: Summary of AHP Monitoring and Evaluation Methods

Trial Stage	Monitoring and Evaluation Method
Pre-Intervention	Waste Compositional Analysis
	Risk & Hazard Assessment
	Qualitative Behavioural Research (Focus Groups)
	Quantitative Behavioural Research (Pre-Survey)
Intervention	Opt-In Rate
	AHP Tonnage Capture
	Contamination Monitoring
	Set-Out and Participation
	Waste Compositional Analysis
	Waste Diversion (Average Yield, Capture Rate)
	Campaign Strategy Delivery
	Community Engagement Strategy
Post-Intervention	Cost Evaluation
	Quantitative Behavioural Research (Post-Survey)

2.1 Pre-Intervention Evaluation

2.1.1 ***Operational***

2.1.1.1 Waste Compositional Analysis

A waste compositional analysis (WCA) was carried out to obtain an understanding of the available yields of Absorbent Hygiene Products (AHPs) in each of the local authority trial areas. This was done using households in each of the trial areas who had elected to opt-in to the trials prior to the AHP containers being distributed. The WCA was broadly representative of the AHP opted-in population.

Uplifted waste was sorted into the categories listed in Table 2.

Table 2: WCA Categories

User Category	Product Category
1. Nappy Users	a. Nappies
	b. Associated Nappy Products
	c. Incontinence Products
	d. Associated Incontinence Products
	e. Feminine Hygiene Products
	f. Residual Waste
2. Incontinence Product Users	a. Nappies
	b. Associated Nappy Products
	c. Incontinence Products
	d. Associated Incontinence Products
	e. Feminine Hygiene Products
	f. Residual Waste
3. Unknown Users	a. Feminine Hygiene Products
	b. Residual Waste

2.1.1.2 Risk and Hazard Assessment

Specific risk assessments were undertaken for the collection and management of AHP wastes during the trial period for each of the AHP collection service types within each of the local authority areas. Hazards were identified and appropriate control measures were planned and advised.

2.1.2 Campaign and Communications

2.1.2.1 Qualitative Behavioural Research

Qualitative research using Focus Groups was undertaken with the public to develop the AHP communication materials.

2.1.2.2 Quantitative Behavioural Research (Pre-Survey)

1,000 households were surveyed face to face on the doorstep (250 in each of the four Council areas) to explore public attitudes, behaviours and willingness to use an AHP recycling service and to inform the development of the communication materials. The 2001 Scottish Census Results Online (SCROL) Analyser Tool was used to produce a statistically representative sample stratified by housing type and age demographics for each area (see Table 3).

Table 3: Pre-Trial AHP Survey Sample

	HOUSING TYPE Profile				TOTAL	AGE Profile			
	Detached	Semi	Terr	Flat		18-29	30-44	45-59	60+
Stirling	93	84	73	0	250	55	56	65	74
Crieff	55	33	22	0	110	47	55	66	82
Auchterarder	43	18	18	0	79				
Tulloch	7	21	33	0	61				
Fife	72	64	41	73	250	49	60	65	76
North Lanarkshire	14	60	71	105	250	50	66	67	67

This data was also used to estimate the percentage of households using AHP within each of the trial areas.

2.2 Intervention Evaluation

2.2.1 ***Operational***

2.2.1.1 Opt-In Rate

The opt-in rate measures the acceptability of the AHP service by the individual local authority AHP-using households. These were calculated using the actual uptake figures for each trial area compared to the estimated number of households using AHP within each of the trial areas reported from the pre-trial quantitative survey.

2.2.1.2 AHP Tonnage Capture and Contamination Monitoring

Tonnage figures were reported weekly using weighbridge data for each local authority trial area[6] and sent by Knowaste to NSA for verification. Information was also provided by Knowaste on the level of contamination present in each load.

2.2.1.3 Set Out and Participation

Set Out and Participation - Kerbside
Participation and set out analysis was conducted twice for each of the kerbside services; shortly after the start of the trials and again near the end of the trials. For each participation study, information was collected over three consecutive AHP collection cycles. The data collected included:

- The number of AHP containers presented for each service type;
- The fill level of the 120 litre and 140 litre bins; and
- Any visible contamination.

The set out rate measured the proportion of households that put out AHP containers (bins or sacks) during one collection opportunity.

The participation rate measured the number of individual households which set out an AHP container (bins or sacks) at least once in a consecutive three week collection period. The data was sub-divided to detail specific nappy and incontinence product participation.

[6] Tonnages for Stirling and North Lanarkshire were produced using Stirling Council's vehicle and weighbridge prior to uplift by Knowaste. Perth & Kinross and Fife tonnages were produced using the Knowaste vehicle and the weighbridge for each Council.

The fill level of the 120 and 140 litre bins in the Stirling and Crieff trials was measured by a visual check and assigned a grade to each bin indicating whether it was less than half full, full or overflowing. This procedure checked that the capacity of the 120 litre bins were sufficient for households.

The contamination level was measured by a visual check for the 120 and 140 litre bins in Stirling and Crieff.

Set Out and Participation - HWRC

Set out and participation analysis was not undertaken for the HWRC schemes because these were 'bring' collection services rather than kerbside services. As an alternative, a claimed participation rate was to be derived using household surveys. A short survey was developed to capture the following information:

- Average number of AHP bags deposited per week;
- Average recycling frequency;
- Percentage of AHP waste recycled.

Participating households requesting additional sacks at the two participating HWRCs were asked to complete the survey by Recycling Attendants. Surveys were to be conducted twice for each of the HWRC services.

2.2.1.4 AHP Waste Compositional Analysis

The AHP waste compositional analysis was undertaken by Knowaste at the AHP recycling plant in West Bromwich and was used to quantify the relative proportions of nappy and incontinence product waste collected from opted-in households in each of the trial areas.

The uplifted tonnage of AHP was two tonnes; therefore a cone and quarter method was used to reduce the collected load to 10% (200kg)[7]. The sample was then checked to ensure that the each of the individual trials was represented approximately proportionally to its contribution to the overall load. The sack colour and types were used to identify the specific AHP trial. Table 4 details the product categories used in this analysis.

Table 4: AHP Compositional Analysis Product Categories

Product Category
a. Nappies
b. Incontinence Products
c. Feminine Hygiene Products
d. Wipes, Cotton Buds and Cotton Wool
e. Disposable Gloves/Aprons
f. Feeding Tubes/Bags
g. Syringes

2.2.1.5 Waste Diversion

To assess the performance of each AHP trial scheme, the average yield and capture rates were calculated.

Average Yield (kg/hh/wk)

[7] The AHP Waste Compositional Analysis excluded AHP waste from North Lanarkshire due to low collection frequency.

The average weight of AHP material collected from all participating households in each trial area during the three week participation and set out period was divided by the number of opted-in households to give an average yield (kg/hh/wk). The average yield of the whole trial was calculated from the average weight of AHP material collected weekly in each trial divided by the estimated[8] weekly average number of opted-in households.

Capture Rate (%)

The average yield was divided by the total expected AHP arisings derived from the waste compositional analysis to give the proportion of household AHP waste that was recycled compared to the amount that could have been recycled.

2.2.2 Campaign and Communications

2.2.2.1 Campaign Strategy Delivery

A campaign strategy was developed for each of the trial areas. This included the identification of the specific communication materials and methods to be used within each trial area, including a launch event and associated PR activities, a community engagement programme and the close of trial messaging.

The following communication materials were designed for each of the AHP service types (see Appendix 3):

- Introductory leaflet: posted to every household in the trial areas used to provide AHP-using households with information on the trial collection scheme in their area, the materials which could be recycled and the recycling process for AHP. Households were provided with a telephone number and/or email address to opt-in to the service and the leaflet stated what the service consisted of and how to use it (see Figure 1);
- A6 postcard: delivered to all opted-in households with the sacks and/or bins, reiterating the materials which could be recycled as part of the AHP service;
- A3 and A4 posters: produced to promote the service in local shops, community centres, nurseries, health care centres, libraries and other community outlets (see Figure 2);
- A5 bin decal for the 120 litre bins and 87 litre Slim-Jim container: reiterated the materials which could be recycled as part of the AHP service (see Figure 3);
- Bin decals for the 1100 litre containers at HWRCs: reiterated the materials which could be recycled as part of the AHP service;
- Thank you and close of trial letters: advised of the trial end date, the final collection day, the uplift procedure for containers and thanked people for participating.

[8] Opt-in dates of new households entering the scheme after the start of the trial were not always available.

Figure 1: AHP Introductory Leaflet for Auchterarder (Perth & Kinross) Trial

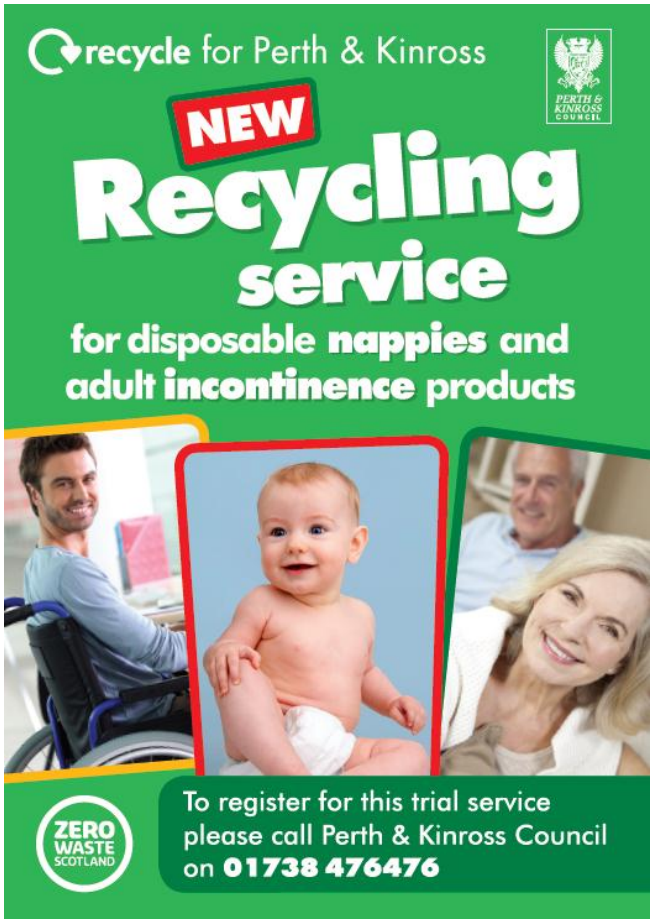

Figure 2: Perth & Kinross AHP Trial Poster

Figure 3: Stirling AHP Trial Bin Decal

A campaign strategy was developed for each AHP service type detailing when each of the communication materials and community engagement activities were to be undertaken.

2.2.2.2 Community Engagement Strategy

The following opportunities to directly engage with organisations and outlets across each of the trial communities were identified:

- Locations for posters to be displayed;
- Locations where additional leaflets could be distributed;
- Relevant groups, organisations or institutions for face-to-face engagement.

2.3 Post-Intervention

2.3.1 Operational

2.3.1.1 Cost Evaluation

The costs of each AHP trial were calculated including the initial capital expenditure and on-going running costs for each service according to the actual cost incurred during the trial period (outlined in Table 5). It should be noted that the actual costs of the trial are unlikely to represent the true cost of operating an AHP collection service if fully rolled out, assuming a treatment facility was available in Scotland.

Table 5: Cost Categories Used in Cost Evaluation

Cost Category	Expenditure
Capital	Containers: 120 litre and 140 litre wheeled bins, 87 litre Slim-Jim containers
	Recycling Sacks: 30 litre tiger sacks and 80 litre blue and red recycling sacks
	HWRC Containers
	Design and Production of Communication Materials
Revenue	Collection Crew
	Vehicle Hire
	Vehicle Maintenance
	Bin Washing
	Fuel
	Haulage[9]

The following costs were excluded from the calculations:

- The Knowaste gate fee was waived for the trial period, normally £80-£100 per tonne;

[9] For the purposes of the trials, the AHP materials were transferred to the Knowaste recycling plant in West Bromich. Therefore the haulage costs are higher than would be expected for an AHP service with a recycling plant in Scotland.

- NSA project management costs for overseeing the implementation, project management and monitoring and evaluation of the trials, including the waste composition and participation rate analysis;

- Vehicle and container depreciation costs.

The Cost Evaluation will present the overall cost of the trial, cost per tonne of AHP collected and the cost per opted-in household.

2.3.2 Campaign and Communications

2.3.2.1 Quantitative Behavioural Research (Post-Survey)

The survey sampled two groups using two distinct sampling methodologies for 308 households in total:

- Those households who had opted-in to the service. The post-trial survey was used to assess customer experience and satisfaction for each of the trials. A Random Sampling Formula was applied to the final number of opted-in households in each trial area to determine the sampling sizes required in each area for a statistically robust sample (see Table 6). The total number of households surveyed was 263.

- Those households who had not opted-in to the service. The post-trial survey was used to explore the reasons customers had chosen not to opt-in to the AHP trials in each area. A Random Sample Formula was applied to those households who were using AHP during the pre-survey but did not opt-in to the service, to determine the sampling sizes required in each area for a statistically robust sample (see Table 6). The total number of households surveyed was 45.

Table 6: Post-Trial AHP Survey Sample

	"Opt In" Sample Size for Post Trial*	"Did Not Opt In" Sample Size for Post Trial*	Total Sample Size
Fife			
Dunfermline	44	10	54
North Lanarkshire			
Coatbridge	18	18	36
Stirling	**105**	**7**	**112**
Cowie	20	1	21
Dunblane	49	3	52
Fallin	17	3	20
Plean	19	0	19
Perth and Kinross			
Auchterarder	36	2	38
Crieff	39	3	42
Tulloch	21	5	26
Total	263	45	308

3 Results

The results section is divided into two sections[10]. These provide:

- A summary for the individual AHP service types with further information provided for each trial in the appendices.
- A comparison of performance for the different AHP service types.

3.1 Service Type Results

3.1.1 ***Service Type 1: Stirling Trial***

Service Type 1: This is an opt-in kerbside collection service and consists of a 120 litre wheeled bin. The householder was asked to place the used AHP products into the bin. The bin was then presented weekly at kerbside for collection using an RCV and transported to the AHP recycling plant, located in West Bromwich once per week.

Pre-Intervention

3.1.1.1 Waste Compositional Analysis

The average weight of AHP waste produced per household each week in the Stirling trial area was determined by the waste compositional analysis as 4.82kg/hh/wk.

3.1.1.2 Risk & Hazard Assessment

A Risk & Hazard Assessment was produced for Stirling Council (Appendix 4).

3.1.1.3 Qualitative Behavioural Research

The development of the Stirling AHP communication materials were informed by the Focus Group research.

3.1.1.4 Quantitative Behavioural Research (Pre-Trial Survey)

In total 250 households were surveyed in Stirling as detailed in Table 7. The initial trial in Stirling was due to take place across 10 areas to 9,156 households. However, following discussion with Stirling Council and ZWS it was agreed that the trial size would be reduced to 4 areas; Dunblane, Plean, Fallin and Cowie to 5,269 households to ensure the trials could be serviced within existing operational constraints.

[10] Cost and percentage data in the results section have been rounded to the nearest whole number; weights have been reported to two decimal places.

Table 7: Pre-Trial Survey Profile Stratified by Housing Type and Age for Stirling

	Housing Type Profile				Total Surveys	Age Group Profile[11]			
	Detached	Semi	Terr	Flat		18-29	30-44	45-59	60+
TOTAL	87	85	78		250	55	56	65	75
Bannockburn	13	13	13		39				
Bridge of Allan	12	4	2		18				
Cowie	3	9	11		23				
Deanston	3	1	1		5				
Doune	8	4	2		14				
Dunblane	39	17	11		67				
Fallin	2	13	11		26				
Plean	2	7	6		15				
St Ninians	3	7	9		19				
Whins of Milton	2	10	12		24				

A summary report of the Stirling Council AHP Pre-Trial Survey was produced (Appendix 5). The key findings from this report were:

- The estimated proportion of AHP-using households was 13% equating to 685 households; 72% nappy users and 28% incontinence product users;
- Willingness to use the service amongst AHP-using households was 88% equating to 603 households. This estimate for the number of households who might opt-in was used by the local authority to plan the infrastructure requirements.
- The perceived primary benefit identified by potential AHP service users was identified as reducing waste in the residual bin with the main perceived concern being the potential smell.

Intervention

3.1.1.5 Opt-In Rate

In total, there were 5,269 households in the Stirling Council trial area. From the pre-trial survey the estimated number of households using AHP was 685, and the actual uptake of this service was 226 giving an overall opt-in rate of 33%.

3.1.1.6 AHP Tonnage Capture

In 37 weeks, a total of 30.35 tonnes of AHP waste was collected from the Service Type 1 (Stirling) trial, giving an average weekly yield of 0.82 tonnes.

[11] The sample was stratified by age for the combined trial area, but not within the individual sub-trials due to the complexity and time associated with quota sampling of this type for these trials. The age profile of AHP users was unknown at the start of the process.

3.1.1.7 Contamination Monitoring

No significant contamination was observed (less than 0.1%).

3.1.1.8 Set Out and Participation

The average participation rate for all households in the Stirling trial was 82%. Average participation amongst nappy users was 82% and 80% amongst incontinence product users. The median set-out rate was 63%. The capacity of the 120 litre was sufficient for opted-in households; 88% of household bins were less than half full, 12% of bins were more than half full but not overflowing and less than 1%[12] of bins were found to be overflowing during the participation and set out monitoring.

3.1.1.9 Waste Compositional Analysis

Based on the Knowaste Waste Compositional Analysis 21% (42kg) of the AHP sample was attributable to the Stirling trial with the detailed composition of the sample outlined in Table 8.

Table 8: Knowaste waste Compositional Analysis Results for Stirling

Product	Stirling
Nappies	86.2%
Incontinence Products	1.4%
Feminine Hygiene Products	2.9%
Wipes/cotton buds/cotton wool	5.2%
Disposable gloves/aprons	2.6%
Feeding tubes/bags	1.7%
Average weight per bag (kg)	**n/a**
Syringes	0

3.1.1.10 Waste Diversion

The average weight of AHP waste produced per household each week in the Stirling trial area was determined by the waste compositional analysis as 4.82kg/hh/wk giving a total expected yield of 1.09 tonnes from all opted-in AHP-using households per week. However, the actual tonnage data collected from Stirling was 0.82 tonnes per week which gives an average yield per household of 3.63kg/hh/wk, and a capture rate of 75%.

3.1.1.11 Campaign Strategy Delivery

Introductory leaflets were delivered to 5,269 households in Dunblane, Plean, Fallin and Cowie. The initial opt-in period lasted approximately four weeks. The 120 litre bins were delivered with decals and reminder postcards to the participating households. Thank you and close letters were delivered to all participating households at the beginning of March 2013 to inform of the trial end and to thank people for participating.

3.1.1.12 Community Engagement Strategy

The community engagement strategy for Stirling consisted of two key activities:

[12] Four bins in total. One was overflowing due to a lack of access (snow) the week before. The rest had all presented the week before with less than half a bin.

- Distribution of posters (22) and leaflets (228) to local outlets to encourage further uptake and awareness of the service. The full distribution list is detailed in Appendix 6;

- Further community engagement targeted existing E-bin (medical waste) customers and households who had larger capacity 360 litre residual bins to persuade them to switch to the new AHP service. These community engagement activities resulted in a 7% increase in uptake as displayed in Figure 4.

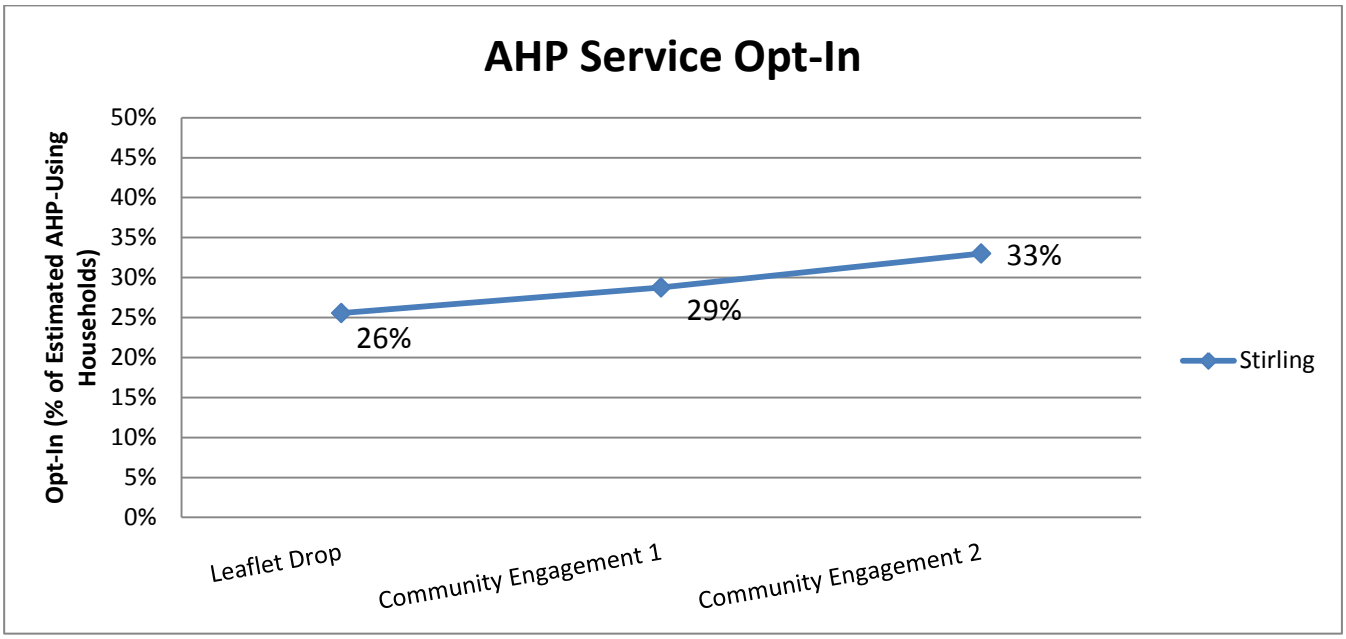

Figure 4: Stirling AHP Trial Opt-In Rate with Community Engagement Activities. The leaflet drop signalled the beginning of the opt-in period for all trials. Community engagement timescales and activities varied.

Post-Intervention

3.1.1.13 Cost Evaluation

The initial capital expenditure and revenue costs are presented in Table 9 for the AHP trial in Stirling. Costs presented are the actual costs incurred in setting up and operating the trial.

Table 9: Initial Capital Expenditure and Revenue Costs for Stirling

Cost Category	Expenditure	Cost
Capital	Containers[13]	£11,750
	Recycling Sacks	N/A
	HWRC Containers	N/A
	Design and Production of Communication Materials	£6,488
Revenue	Collection Crew	£7,762
	Vehicle Costs[14]	£12,638
	Vehicle Maintenance	£470
	Bin Washing	£792
	Fuel	£3,154
	Haulage to West Bromwich	£14,338

3.1.1.14 Quantitative Behavioural Research (Post-Trial Survey)

A Random Sampling Formula was applied to the final number of opted-in households (226) to determine the sampling size of 105 required for a statistically robust sample. The opt-in survey profile was further stratified for analysis into:

- Those who opted in but never used the service;
- Those who opted in but were no longer using the service; and
- Those who continued to use the service.

A Random Sampling Formula was applied to those households who were using AHP during the pre-survey but did not opt-in to the service, to determine the sampling size required for a statistically robust sample (9 households).

In total 114 households were surveyed.

A summary report of the Stirling AHP Post-Trial Survey was produced (Appendix 7). The key findings from this survey were:

[13] The number of containers purchased was based on the estimated number of households willing to use the service from the pre-trial AHP survey report. As such, some containers went unused during the trial period.
[14] Vehicle costs were based on hire rather than procurement.

- Customer satisfaction with this service was extremely high and the service was considered easy to use and householders were unlikely to experience problems when using the service. 97% of opted-in households would use this service if it was offered on a permanent basis.

- Most households presented their bin for collection once per week irrespective of the fill level. While a fortnightly collection service would be acceptable for the majority of households, approximately one third of households considered this frequency insufficient for their needs. Therefore, in order to attract the maximum number of households to the service, collections should be weekly.

- The 120 litre bin was considered to be suitable for AHP collection as it was of sufficient size and easy to use.

- Householders were motivated to use this service with the main reasons cited as the environmental benefits, including the recognition that it was good to recycle these types of products; and the provision of a specific AHP collection container provided additional capacity in the residual bin.

- The communication materials used in this trial were effective in engaging and informing the public in how to opt-in and use the service with the opt-in leaflet being most effective. Further communication materials could provide additional information to households on what products are produced from the AHP recycling as recall was low.

*3.1.2 **Service Type 2: Crieff Trial (Perth & Kinross)***

Service Type 2: This is an opt-in kerbside collection service and consists of a 140 litre wheeled bin with an annual supply of 30 litre tiger sacks (5 per week). The householder was asked to place the used AHP products into the tiger sacks and then place those into the wheeled bin. The bin was then presented weekly at kerbside for collection using a Tipmaster and transported to the AHP recycling plant, located in West Bromwich once per week.

Pre-Intervention

3.1.2.1 Waste Compositional Analysis

The average weight of AHP waste produced per household each week in the Crieff trial area was determined by the waste compositional analysis as 3.34kg/hh/wk.

3.1.2.2 Risk & Hazard Assessment

A Risk & Hazard Assessment was produced for Perth & Kinross Council (Appendix 8).

3.1.2.3 Qualitative Behavioural Research

The development of the Crieff AHP communication materials was informed by the Focus Group research.

3.1.2.4 Quantitative Behavioural Research (Pre-Trial Survey)

In total 250 households were surveyed in Perth & Kinross as detailed in Table 10. The total number of households in the trial was 1,927.

Table 10: Pre-Trial Survey Profile Stratified by Housing Type and Age for in Perth and Kinross

	Housing Type Profile					Age Group Profile[15]			
	Detached	Semi	Terr	Flat	Total Surveys	18-29	30-44	45-59	60+
Total	105	72	73		250	47	55	66	83
Auchterarder	43	18	18		79				
Crieff	55	33	22		110				
Tulloch	7	21	33		61				

A summary report of the Crieff AHP Pre-Trial Survey was produced (Appendix 9). The key findings from this report were:

- Estimated proportion of AHP-using households was 5% equating to 96 households; 83% nappy users and 17% incontinence product users;
- Willingness to use the service amongst AHP-using households was 100% equating to 96 households. This estimate for the number of households who could opt-in was used by the local authority to plan the infrastructure requirements.

[15] The sample was stratified by age for the combined trial area, but not within the individual sub-trials due to the complexity and time associated with quota sampling of this type for these trials. The age profile of AHP users was unknown at the start of the process.

- The perceived primary benefit identified by potential AHP service users was identified as environmental benefits of better for the environment and reduced waste sent to landfill with no key concerns.

Intervention

3.1.2.5 Opt-In Rate

In total, there were 1,927 households in the Crieff trial area and from the pre-trial survey it was estimated that the proportion of AHP users was 5%. The estimated number of households using AHP was 96, and the actual uptake of this service was 85 giving an overall opt-in rate of 89%.

3.1.2.6 AHP Tonnage Capture

In 32 weeks, a total of 18.75 tonnes of AHP waste was collected from the Service Type 2, 3 and 4 (Perth & Kinross) trials, giving a combined average weekly yield for all three trials of 0.57 tonnes. It was not possible to uplift separately from the three trial areas in Perth & Kinross, therefore only amalgamated average figures are provided.

3.1.2.7 Contamination Monitoring

No significant contamination was observed (less than 0.1%).

3.1.2.8 Set Out and Participation

The average participation rate for all households in the Crieff trial was 78%. Average participation amongst nappy users was 80% and 70% amongst incontinence product users. The median set-out rate was 46%. The capacity of the 140 litre bin was sufficient for the opted-in households.

3.1.2.9 Waste Compositional Analysis

Based on the Knowaste Waste Compositional Analysis 21% (42kg) of the AHP sample was attributable to the Crieff trial with the detailed composition of the sample outlined in Table 11.

Table 11: Knowaste waste Compositional Analysis Results for Crieff

Product	Crieff
Nappies	86.9%
Incontinence Products	3.1%
Feminine Hygiene Products	1.7%
Wipes/cotton buds/cotton wool	3.6%
Disposable gloves/aprons	2.4%
Feeding tubes/bags	2.4%
Average weight per bag (kg)	**1.17**
Syringes	6

3.1.2.10 Waste Diversion

The average weight of AHP waste produced per household each week in all three Perth & Kinross trial areas was determined by the waste compositional analysis as 3.34kg/hh/wk giving a total expected yield of 0.69 tonnes from all opted-in AHP-using households per week. However, the actual tonnage data collected from all three Perth & Kinross trials was 0.57 tonnes per week which gives an average yield per household of 2.88kg/hh/wk, giving a capture rate of 86%.

3.1.2.11 Campaign Strategy Delivery

Introductory leaflets were delivered to 1,927 households in Crieff. The initial opt-in period lasted approximately eight weeks[16]. The 120 litre bins and 30 litre sacks were delivered with decals and reminder postcards to the 85 participating households. Thank you and close letters were delivered to all participating households at the beginning of March 2013 to inform of the trial end and to thank people for participating.

3.1.2.12 Community Engagement Strategy

The community engagement strategy for Crieff involved the distribution of posters (25) and leaflets (93) to local outlets to encourage further uptake and awareness of the service. The full distribution list is detailed in Appendix 10. These community engagement activities resulted in a 37% increase in uptake as displayed in Figure 5.

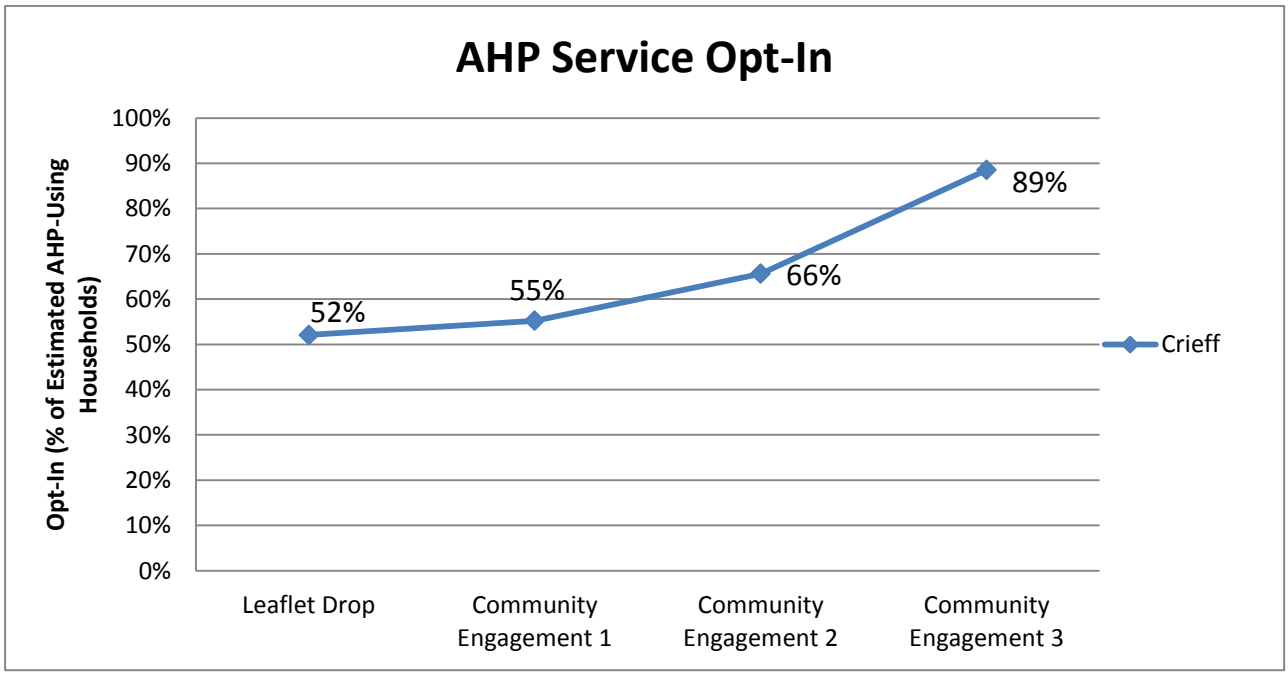

Figure 5: Crieff AHP Trial Opt-In Rate with Community Engagement Activities. The leaflet drop signalled the beginning of the opt-in period for all trials. Community engagement timescales and activities varied.

Post-Intervention

3.1.2.13 Cost Evaluation

The initial capital expenditure and revenue costs are presented in Table 12 for the AHP trials in Perth & Kinross. Costs presented are the actual costs incurred in setting up and operating the trials.

Individual costs are provided for each element of the three Perth & Kinross trials where available. However, several of the costs are presented as an average across the three AHP collection schemes.

[16] Extended opt-in period due to delay in procurement of containers.

Table 12: Initial Capital Expenditure and Revenue Costs for Perth & Kinross

Cost Category	Expenditure	Crieff	Auchterarder	Tulloch
Capital	Containers[17]	£2,068	£7,165	N/A
	Recycling Sacks	£4,656		
	HWRC Containers	N/A		
	Design and Production of Communication Materials	£2,322	£2,322	£2,322
Revenue	Collection Crew[18]	£9,510.15	£7,727.00	
	Vehicle Cost	£2,591	£2,105	
	Vehicle Maintenance[19]	£3,600		
	Bin Washing	£218	N/A	
	Fuel	£3,264		
	Haulage to West Bromwich	£14,338		

3.1.2.14 Quantitative Behavioural Research (Post-Trial Survey)

A Random Sampling Formula was applied to the final number of opted-in households (85) to determine the sampling size of 39 required for a statistically robust sample. The opt-in survey profile was further stratified for analysis into:

- Those who opted in but never used the service;
- Those who opted in but were no longer using the service; and
- Those who continued to use the service.

A Random Sampling Formula was applied to those households who were using AHP during the pre-survey but did not opt-in to the service, to determine the sampling size required for a statistically robust sample (3 households).

In total 42 households were surveyed.

A summary report of the Crieff AHP Post-Trial Survey was produced as detailed in Appendix 11. The key findings from this survey were:

- Customer satisfaction with this service was high, it was considered easy to use and householders were unlikely to experience problems when using the service. 100% of opted-in households would use this service if it was offered on a permanent basis.

[17] The number of containers and sacks purchased was based on the estimated number of households expected to opt-in from the pre-trial AHP survey report.
[18] All Perth & Kinross trials operated a Saturday uplift requiring overtime staff costs.
[19] Vehicle maintenance, bin washing and fuel were estimated costs.

- Most households presented their bin for collection once per week irrespective of the fill level[20]. While a fortnightly collection service would be acceptable for the majority of households, approximately one fifth of households considered this frequency insufficient for their needs. Therefore, in order to attract the maximum number of households to the service, collections should remain weekly.

- The 120 litre bin and 30 litre tiger sacks were considered to be suitable for AHP collection, but some users experienced difficulty tying sacks.

- Three tiger sacks per week were considered to provide sufficient capacity for the majority of households. However, for a proportion of incontinence product users there was a requirement for additional sacks.

- Householders were motivated to use this service with the main reasons cited as the environmental benefits, including the recognition that it was good to recycle these types of products; and the provision of a specific AHP collection container provided additional capacity in the residual bin.

- The communication materials used in this trial were effective in engaging and informing the public in how to opt-in and use the service with the opt-in leaflet being most effective. Further communication materials could provide additional information to households on what products are produced from the AHP recycling as recall was low.

[20] Fill level data is available in the monitoring and evaluation appendix: 5 overflowing bins in Survey 1; two of these had not presented for the previous two weeks, three had presented over half full bins the week before.

3.1.3 Service Type 3: Auchterarder Trial (Perth & Kinross)

Service Type 3: This is an opt-in kerbside collection service and consists of an 87 litre container which can be stored inside or outside the home with a supply of 80 litre blue recycling sacks (5 per week). The householder was requested to place the used AHP products into the blue recycling sacks and place those into the container to store prior to collection. The recycling sacks were then presented weekly at the kerbside for collection using a Tipmaster and transported to the AHP recycling plant, located in West Bromwich, once per week.

Pre-Intervention

3.1.3.1 Waste Compositional Analysis

The average weight of AHP waste produced per household each week in the Auchterarder trial area was determined by the waste compositional analysis as 3.34kg/hh/wk.

3.1.3.2 Risk & Hazard Assessment

A Risk & Hazard Assessment was produced for Perth & Kinross Council (Appendix 8).

3.1.3.3 Qualitative Behavioural Research

The development of the Auchterarder AHP communications materials was informed by the Focus Group research.

3.1.3.4 Quantitative Behavioural Research (Pre-Trial Survey)

In total 250 households were surveyed in Perth & Kinross as detailed in Table 13. The total number of households in the trial area was 1,384.

Table 13: Pre-Trial Survey Profile Stratified by Housing Type and Age for in Perth and Kinross

	Housing Type Profile					Age Group Profile[21]			
	Detached	Semi	Terr	Flat	Total Surveys	18-29	30-44	45-59	60+
Total	105	72	73		250	47	55	66	83
Auchterarder	43	18	18		79				
Crieff	55	33	22		110				
Tulloch	7	21	33		61				

A summary report of the Auchterarder AHP Pre-Trial Survey was produced as detailed in Appendix 12. The key findings from this report were:

- Estimated proportion of AHP-using households was 10% equating to 138 households; 75% nappy users and 25% incontinence product users;
- Willingness to use the service amongst AHP-using households was 100% equating to 138 households. This estimate for the number of households who could opt-in and was used by the local authority to plan the infrastructure requirements.

[21] The sample was stratified by age for the combined trial area, but not within the individual sub-trials due to the complexity and time associated with quota sampling of this type for these trials. The age profile of AHP users was unknown at the start of the process.

- The perceived primary benefit identified by potential AHP service users was identified as environmental benefits with no key concerns raised.

Intervention

3.1.3.5 Opt-In Rate

In total, there were 1,384 households in the Auchterarder trial area and from the pre-trial survey it was estimated that the proportion of AHP users was 10%. The estimated number of households using AHP was 138, and the actual uptake of this service was 78 giving an overall opt-in rate of 57%.

3.1.3.6 AHP Tonnage Capture

In 32 weeks, a total of 18.75 tonnes of AHP waste was collected from the Service Type 2, 3 and 4 (Perth & Kinross) trials, giving a combined average weekly yield for all three trials of 0.57 tonnes. It was not possible to uplift separately from the three trial areas in Perth & Kinross, therefore only amalgamated average figures are provided.

3.1.3.7 Contamination Monitoring

No significant contamination was observed (less than 0.1%).

3.1.3.8 Set Out and Participation

The average participation rate for all households in the Auchterarder trial was 76%. Average participation amongst nappy users was 76% and 74% amongst incontinence product users. The median set-out rate was 56%.

3.1.3.9 Waste Compositional Analysis

Based on the Knowaste Waste Compositional Analysis 33% (66kg) of the AHP sample was attributable to the Auchterarder trial with the detailed composition of the sample outlined in Table 14.

Table 14: Knowaste waste Compositional Analysis Results for Auchterarder

Product	Auchterarder
Nappies	93.8%
Incontinence Products	0.0%
Feminine Hygiene Products	3.3%
Wipes/cotton buds/cotton wool	1.1%
Disposable gloves/aprons	1.1%
Feeding tubes/bags	0.8%
Average weight per bag (kg)	**2.75**
Syringes	2

3.1.3.10 Waste Diversion

The average weight of AHP waste produced per household each week in all three Perth & Kinross trial areas was determined by the waste compositional analysis as 3.34kg/hh/wk giving a total expected yield of 0.69 tonnes from all opted-in AHP-using households per week. However, the actual tonnage data collected from all three

Perth & Kinross trials was 0.57 tonnes per week which gives an average yield per household of 2.88kg/hh/wk, and capture rate of 86%.

3.1.3.11 Campaign Strategy Delivery

Introductory leaflets were delivered to 1,384 households in Auchterarder. The initial opt-in period lasted approximately eight weeks[22]. The 87 litre containers and 80 litre recycling sacks were delivered with decals and reminder postcards to the 78 participating households. Thank you and close letters were delivered to all participating households at the beginning of March 2013 to inform of the trial end and to thank people for participating.

3.1.3.12 Community Engagement Strategy

The community engagement strategy for Auchterarder involved the distribution of posters (28) and leaflets (175) to local outlets to encourage further uptake and awareness of the service. The full distribution list is detailed in Appendix 13. These community engagement activities resulted in a 16% increase in uptake as displayed in Figure 6.

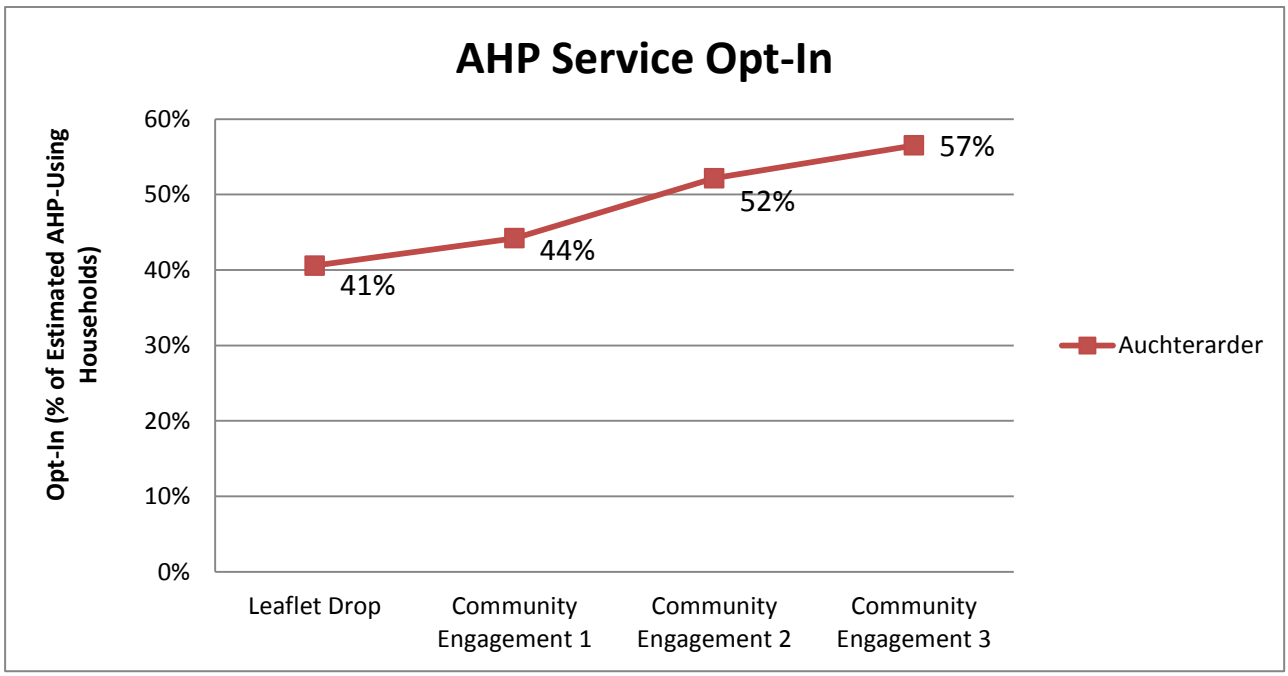

Figure 6: Auchterarder AHP Trial Opt-In Rate with Community Engagement Activities. The leaflet drop signalled the beginning of the opt-in period for all trials. Community engagement timescales and activities varied.

Post-Intervention

3.1.3.13 Cost Evaluation

The initial capital expenditure and revenue costs are presented in Table 15 for the AHP trials in Perth & Kinross. Costs presented are the actual costs incurred in setting up and operating the trials.

[22] Extended opt-in period due to delay in procurement of containers.

Individual costs are provided for each element of the three Perth & Kinross trials where available. However, several of the costs are presented as an average across the three AHP collection schemes.

Table 15: Initial Capital Expenditure and Revenue Costs for Perth & Kinross

Cost Category	Expenditure	Crieff	Auchterarder	Tulloch
Capital	Containers[23]	£2,068	£7,165	N/A
	Recycling Sacks	£4,656		
	HWRC Containers	N/A		
	Design and Production of Communication Materials	£2,322	£2,322	£2,322
Revenue	Collection Crew[24]	£9,510.15	£7,727.00	
	Vehicle Cost	£2,591	£2,105	
	Vehicle Maintenance[25]	£3,600		
	Bin Washing	£218	N/A	
	Fuel	£3,264		

3.1.3.14 Quantitative Behavioural Research (Post-Trial Survey)

A Random Sampling Formula was applied to the final number of opted-in households (78) to determine the sampling size of 38 required for a statistically robust sample. The opt-in survey profile was further stratified for analysis into:

- Those who opted in but never used the service;
- Those who opted in but were no longer using the service; and
- Those who continued to use the service.

A Random Sampling Formula was applied to those households who were using AHP during the pre-survey but did not opt-in to the service, to determine the sampling size required for a statistically robust sample (2 households).

In total 40 households were surveyed.

A summary report of the Auchterarder AHP Post-Trial Survey was produced as detailed in Appendix 14. The key findings from this survey were:

[23] The number of containers and sacks purchased was based on the estimated number of households willing to use each service from the pre-trial AHP survey report.
[24] All Perth & Kinross trials operated a Saturday uplift requiring overtime staff costs.
[25] Vehicle maintenance, bin washing and fuel were estimated costs.

- Customer satisfaction with this service was high, it was considered easy to use and householders were unlikely to experience problems when using the service;

- Most households presented one 80 litre blue recycling sack for collection per week irrespective of the fill level. It is recommended that a weekly collection service be maintained as a fortnightly collection service was acceptable to only half of households.

- Overall customer satisfaction with the 87 litre container was high although slightly lower than that for the 120 litre wheeled bins. This is primarily due to the lid type on the container. A container with an alternative, more robust, lid should be considered. Most households stored the 87 litre container outside or in a shed or garage.

- Customer satisfaction with the 80 litre blue recycling sacks was high, although some households would have preferred sacks to be provided with ties. The majority of households used one AHP sack or less per week indicating the provision of two recycling sacks per household per week would be sufficient.

- Householders were motivated to use the service with the main reasons cited as the environmental benefits, including the recognition that it was good to recycle these types of products; and the provision of a specific AHP collection container provided additional capacity in the residual bin.

- The communication materials used in this trial were effective in engaging and informing the public in how to opt-in and use the service with the opt-in leaflet being most effective. Further communication materials could provide additional information to households on what products are produced from the AHP recycling as recall was low.

3.1.4 Service Type 4: Tulloch Trial (Perth & Kinross)

Service Type 4: This is an opt-in kerbside collection service consisting of two types of AHP recycling sacks; 30 litre tiger sacks (5 per week) and 80 litre blue recycling sacks (2 per week). The householder was asked to place the used AHP products into the tiger sacks and then place those into the blue recycling sacks. The blue recycling sacks were then presented weekly at kerbside for collection using a Tipmasters and transported to the AHP recycling plant, located in West Bromwich, once per week.

Pre-Intervention

3.1.4.1 Waste Compositional Analysis

The average weight of AHP waste produced per household each week in the Tulloch trial area was determined by the waste compositional analysis as 3.34kg/hh/wk.

3.1.4.2 Risk & Hazard Assessment

A Risk & Hazard Assessment was produced for Perth & Kinross Council (Appendix 8).

3.1.4.3 Qualitative Behavioural Research

The development of the Tulloch AHP communication materials were informed by the Focus Group research.

3.1.4.4 Quantitative Behavioural Research (Pre-Trial Survey)

In total 250 households were surveyed in Perth & Kinross as detailed in Table 16. The total number of households in the trial area was 1,059.

Table 16: Survey Profile Stratified by Housing Type and Age for in Perth and Kinross

	Housing Type Profile					Age Group Profile[26]			
	Detached	Semi	Terr	Flat	Total Surveys	18-29	30-44	45-59	60+
Total	105	72	73		250	47	55	66	83
Auchterarder	43	18	18		79				
Crieff	55	33	22		110				
Tulloch	7	21	33		61				

A summary report of the Tulloch AHP Pre-Trial Survey was produced as detailed in Appendix 15. The key findings from this report were:

- Estimated proportion of AHP-using households was 20% equating to 212 households; 58% nappy users and 42% incontinence product users;
- Willingness to use the service amongst AHP-using households was 92% equating to 195 households. This estimate for the number of households who could opt-in and was used by the local authority to plan the infrastructure requirements.

[26] The sample was stratified by age for the combined trial area, but not within the individual sub-trials due to the complexity and time associated with quota sampling of this type for these trials. The age profile of AHP users was unknown at the start of the process.

- The perceived primary benefit identified by potential AHP service users was identified as environmental benefits with no key concerns raised.

Intervention

3.1.4.5 Opt-In Rate

In total, there were 1,059 households in the Tulloch trial area and from the pre-trial survey it was estimated that the proportion of AHP users was 20%. The estimated number of households using AHP was 212, and the actual uptake of this service was 44 giving an overall opt-in rate of 21%.

3.1.4.6 AHP Tonnage Capture

In 32 weeks, a total of 18.75 tonnes of AHP waste was collected from the Service Type 2, 3 and 4 (Perth & Kinross) trials, giving a combined average weekly yield for all three trials of 0.57 tonnes. It was not possible to uplift separately from the three trial areas in Perth & Kinross, therefore only amalgamated average figures are provided.

3.1.4.7 Contamination Monitoring

No significant contamination was observed (less than 0.1%).

3.1.4.8 Set Out and Participation

The average participation rate for all households in the Tulloch trial was 72%. Average participation amongst nappy users was 68% and 100% amongst incontinence product users. The median set-out rate was 53%.

3.1.4.9 Waste Compositional Analysis

Based on the Knowaste Waste Compositional Analysis 12% (24kg) of the AHP sample was attributable to the Tulloch trial with the detailed composition of the sample outlined in Table 17.

Table 17: Knowaste waste Compositional Analysis Results for Tulloch

Product	Tulloch
Nappies	75.4%
Incontinence Products	0.0%
Feminine Hygiene Products	3.8%
Wipes/cotton buds/cotton wool	12.5%
Disposable gloves/aprons	0.0%
Feeding tubes/bags	8.3%
Average weight per bag (kg)	**2.67**
Syringes	3

3.1.4.10 Waste Diversion

The average weight of AHP waste produced per household each week in all three Perth & Kinross trial areas was determined by the waste compositional analysis as 3.34kg/hh/wk giving a total expected yield of 0.69 tonnes from all opted-in AHP-using households per week. However, the actual tonnage data collected from all three Perth & Kinross trials was 0.57 tonnes per week which gives an average yield per household of 2.88kg/hh/wk, and capture rate of 86%.

3.1.4.11 Campaign Strategy Delivery

Introductory leaflets were delivered to 1,059 households in Tulloch. The initial opt-in period lasted approximately eight weeks[27]. The 80 litre blue recycling sacks and 30 litre tiger sacks were delivered with the decals and reminder postcards to the 44 participating households. Thank you and close letters were delivered to all participating households at the beginning of March 2013 to inform of the trial end and to thank people for participating.

3.1.4.12 Community Engagement Strategy

The community engagement strategy for Tulloch involved the distribution of posters (7) and leaflets (36) to local outlets to encourage further uptake and awareness of the service. The full distribution list is detailed in Appendix 16. These community engagement activities resulted in a 7% increase in uptake as displayed in Figure 7.

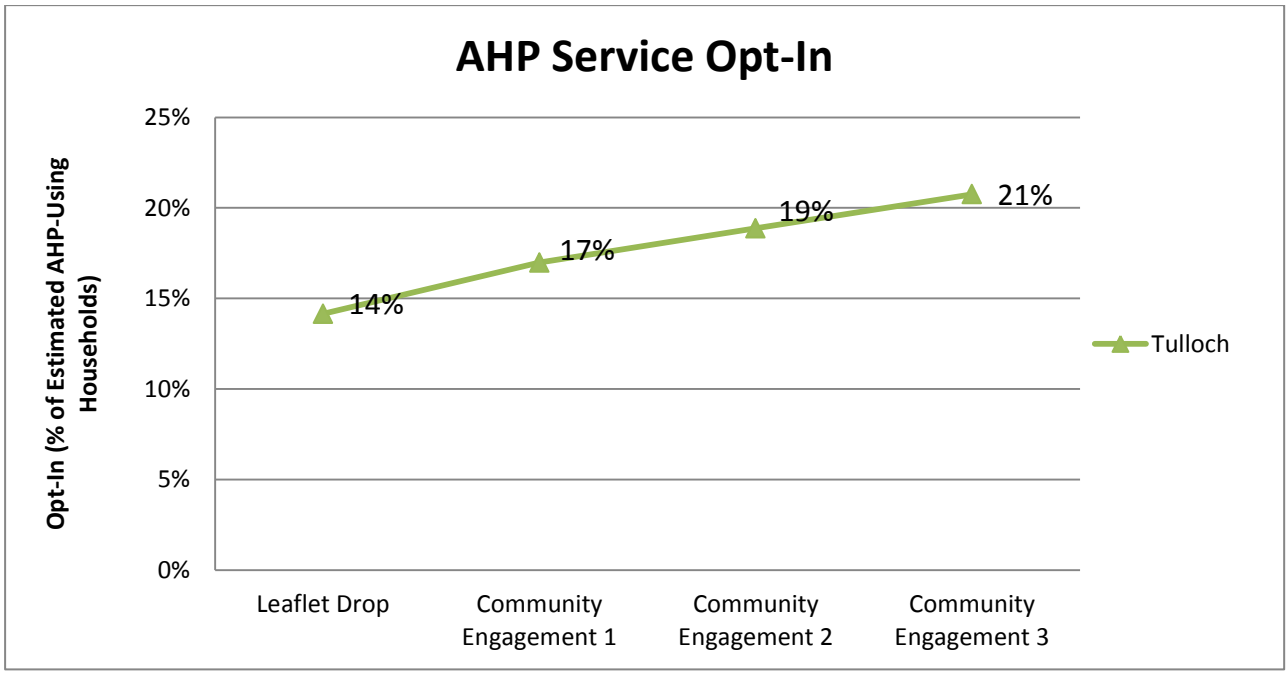

Figure 7: Tulloch AHP Trial Opt-In Rate with Community Engagement Activities. The leaflet drop signalled the beginning of the opt-in period for all trials. Community engagement timescales and activities varied.

Post-Intervention

3.1.4.13 Cost Evaluation

The initial capital expenditure and revenue costs are presented in Table 15 for the AHP trials in Perth & Kinross. Costs presented are the actual costs incurred in setting up and operating the trials.

Individual costs are provided for each element of the three Perth & Kinross trials where available. However, several of the costs are presented as an average across the three AHP collection schemes.

[27] Extended opt-in period due to delay in procurement of containers.

Table 18: Initial Capital Expenditure and Revenue Costs for Perth & Kinross

Cost Category	Expenditure	Crieff	Auchterarder	Tulloch
Capital	Containers[28]	£2,068	£7,165	N/A
	Recycling Sacks	£4,656		
	HWRC Containers	N/A		
	Design and Production of Communication Materials	£2,322	£2,322	£2,322
Revenue	Collection Crew[29]	£9,510.15	£7,727.00	
	Vehicle Cost	£2,591	£2,105	
	Vehicle Maintenance[30]	£3,600		
	Bin Washing	£218	N/A	
	Fuel	£3,264		

3.1.4.14 Quantitative Behavioural Research (Post-Trial Survey)

A Random Sampling Formula was applied to the final number of opted-in households (44) to determine the sampling size of 21 required for a statistically robust sample. The opt-in survey profile was further stratified for analysis into:

- Those who opted in but never used the service;
- Those who opted in but were no longer using the service; and
- Those who continued to use the service.

A Random Sampling Formula was applied to those households who were using AHP during the pre-survey but did not opt-in to the service, to determine the sampling size required for a statistically robust sample (5 households).

In total 26 households were surveyed.

A summary report of the Tulloch AHP Post-Trial Survey was produced (Appendix 17). The key findings from this report were:

- Customer satisfaction with this service was high, it was considered easy to use and householders were unlikely to experience problems when using the service.

[28] The number of containers and sacks purchased was based on the estimated number of households willing to use each service from the pre-trial AHP survey report.
[29] All Perth & Kinross trials operated a Saturday uplift requiring overtime staff costs.
[30] Vehicle maintenance, bin washing and fuel were estimated costs.

- Most households presented one 80 litre blue recycling sack for collection per week irrespective of the fill level. While a fortnightly collection service would have been acceptable for the majority of households, approximately one third of households considered this frequency insufficient for their needs. Therefore, in order to attract the maximum number of households to the service, collections should remain weekly.

- The 80 litre blue recycling sacks were considered suitable for AHP collection, although some households would have preferred sacks to be provided with ties or an outdoor container in place of the blue recycling sacks. One third of households were using their own container to store their recycling sacks at their homes before collection.

- The 30 litre tiger sacks were considered suitable for AHP collection, although some households would have preferred sacks to be provided with ties and scented. Three tiger sacks per week would provide sufficient capacity for the majority of households. However, for a proportion of incontinence product users there may a requirement for additional sacks.

- Householders are motivated to use this service with the main reasons cited as the environmental benefits, including the recognition that it was good to recycle these types of products and that the provision of a specific AHP collection container provided additional capacity in the residual bin.

- The communication materials used in this trial were effective in engaging and informing the public in how to opt-in and use the service with the opt-in leaflet being most effective. Further communication materials could provide additional information to households on what products are produced from the AHP recycling as recall was low.

*3.1.5 **Service Type 5: Coatbridge Trial (North Lanarkshire Council)***

Service Type 5: This is an opt-in HWRC collection service consisting of 1280 litre container located at the Stobcross HWRC. Each householder is provided with an initial supply of five 80 litre blue recycling sacks and is asked to place the used AHP products into the sacks before transporting these to the HWRC. The replacement sacks are provided by Recycling Attendants. The collected AHP is then transported to the AHP recycling plant once per week.

Pre-Intervention

3.1.5.1 Waste Compositional Analysis

The average weight of AHP waste produced per household each week in the Coatbridge trial area was determined by the waste compositional analysis as 4.56kg/hh/wk.

3.1.5.2 Risk & Hazard Assessment

A Risk & Hazard Assessment was produced for North Lanarkshire Council (Appendix 18).

3.1.5.3 Qualitative Behavioural Research

The development of the Coatbridge AHP communication materials were informed by the Focus Group research.

3.1.5.4 Quantitative Behavioural Research (Pre-Trial Survey)

In total 250 households were surveyed in Coatbridge as detailed in Table 19. The initial trial in Coatbridge was due to take place with 17,323 households. However, following discussion with North Lanarkshire Council and ZWS it was agreed that the trial size would be reduced to 5,277 households to ensure the trials could be serviced within existing operational constraints.

Table 19: Pre-Trial Survey Plan Showing Property Type and Age Demographics

	Housing Type Profile					Age Group Profile			
	Detached	Semi	Terr	Flat	Total Surveys	18-29	30-44	45-59	60+
Coatbridge	14	60	71	105	250	50	66	67	67

A summary report of the Coatbridge AHP Pre-Trial Survey was produced as detailed in Appendix 19. The key findings from this report were:

- Estimated proportion of AHP-using households was 14% equating to 739 households; 69% nappy users and 33% incontinence product users;
- Willingness to use the service amongst AHP-using households was 67% equating to 495 households. This estimate for the number of households who could opt-in and was used by the local authority to plan the infrastructure requirements.
- The perceived primary benefit identified by potential AHP service users was identified as environmental benefits with the main perceived concern being the transportation of waste to the recycling centre.

Intervention

3.1.5.5 Opt-In Rate

In total, there were 5,249 households in the Coatbridge trial area and from the pre-trial survey it was estimated that the proportion of AHP users was 10%. The estimated number of households using AHP was 525, and the actual uptake of this service was 36 giving an overall opt-in rate of 7%.

3.1.5.6 AHP Tonnage Capture

In 31 weeks, a total of 4.28 tonnes of AHP waste was collected from the Service Type 5 (Coatbridge) trial, and an average weekly yield of 0.14 tonnes.

3.1.5.7 Contamination Monitoring

One load of AHP waste was noted to be contaminated with building materials by Knowaste.

3.1.5.8 Set Out and Participation

No HWRC participation surveys were returned for Coatbridge and therefore it was not possible to calculate a participation rate.

3.1.5.9 Waste Compositional Analysis

The AHP Waste Compositional Analysis excluded AHP waste from North Lanarkshire due to the low collection frequency from this location.

3.1.5.10 Waste Diversion

The average weight of AHP waste produced per household each week in Coatbridge was determined by the waste compositional analysis as 4.56kg/hh/wk giving a total expected yield of 0.16 tonnes from all opted-in AHP-using households per week. However, the actual tonnage data collected from the Coatbridge trial was 0.14 tonnes per week which gives an average yield per household of 3.88kg/hh/wk, and capture rate of 85% amongst participating households.

3.1.5.11 Campaign Strategy Delivery

Introductory leaflets were delivered to 5,249 households in Coatbridge. The initial opt-in period lasted approximately four weeks. The 80 litre blue recycling sacks were delivered with the reminder postcards to the 36 participating households. Thank you and close letters were delivered to all participating households at the beginning of March 2013 to inform of the trial end and to thank people for participating.

3.1.5.12 Community Engagement Strategy

The community engagement strategy for Coatbridge involved the distribution of posters (35) and leaflets (94) to local outlets to encourage further uptake and awareness of the service. The full distribution list is detailed in Appendix 20. These community engagement activities resulted in a 1% increase in uptake.

Post-Intervention

3.1.5.13 Cost Evaluation

The initial capital expenditure and revenue costs are presented in Table 20 for the Coatbridge AHP trial. Costs presented are the actual costs incurred in setting up and operating the trial.

Table 20: Initial Capital Expenditure and Revenue Costs for Coatbridge

Cost Category	Expenditure	Cost
Capital	Containers	N/A
	Recycling Sacks: 80 Litre Blue Recycling Sacks[31]	£213
	HWRC Containers	£1,066
	Design and Production of Communication Materials	£5,229
Revenue	Collection Crew	£0.00
	Vehicle Hire	£0.00
	Vehicle Maintenance	£0.00
	Bin Washing	£0.00
	Fuel	£0.00

3.1.5.14 Quantitative Behavioural Research (Post-Trial Survey)

A Random Sampling Formula was applied to the final number of opted-in households (36) to determine the sampling size of 20 required for a statistically robust sample. The opt-in survey profile was further stratified for analysis into:

- Those who opted in but never used the service;
- Those who opted in but were no longer using the service; and
- Those who continued to use the service.

A Random Sampling Formula was applied to those households who were using AHP during the pre-survey but did not opt-in to the service, to determine the sampling size required for a statistically robust sample (18 households).

In total 38 households were surveyed.

A summary report of the Coatbridge AHP Post-Trial Survey was produced (Appendix 21). The key findings from this report were:

- The primary motivation for opting-in to this service was the environmental benefit. The recognition that AHP recycling would result in more space in the residual bin was lower than found for kerbside services.
- Customer satisfaction with the overall service was lower than found for the kerbside schemes due to the requirement to transport AHP waste to the HWRC.

[31] The number of sacks purchased was based on the estimated number of households willing to use each service from the pre-trial AHP survey report and the reduced trial area.

- Customer satisfaction with the 80 litre blue recycling sacks was high; the number of sacks used per week varied between less than one and four.
- There was a higher proportion of people who started then stopped using the service as a result of the additional effort required.
- Approximately half of participating households indicated that a kerbside service would be preferable.
- The communication materials used in this trial were effective in engaging and informing the public in how to opt-in and use the service with the opt-in leaflet being most effective. Further communication materials could provide additional information to households on what products are produced from the AHP recycling as recall was low.

3.1.6 Service Type 5: Dunfermline Trial (Fife Council)

Service Type 5: This is an opt-in HWRC collection service consisting of 1280 litre container located at the Wellwood HWRC. Each householder is provided with an initial supply of 5 80 litre red recycling sacks and is asked to place the used AHP products into the sacks before transporting these to the HWRC. The replacement sacks are provided by Recycling Attendants. The collected AHP is then transported to the AHP recycling plant once per week.

Pre-Intervention

3.1.6.1 Waste Compositional Analysis

The average weight of AHP waste produced per household each week in the Dunfermline trial area was determined by the waste compositional analysis as 3.02kg/hh/wk.

3.1.6.2 Risk & Hazard Assessment

A Risk & Hazard Assessment was produced for Fife Council (Appendix 22).

3.1.6.3 Qualitative Behavioural Research

The development of the Dunfermline AHP communication materials were informed by the Focus Group research.

3.1.6.4 Quantitative Behavioural Research (Pre-Trial Survey)

In total 250 households were surveyed in Dunfermline as detailed in Table 21. The total number of households in the trial area was 5,920.

Table 21: Pre-Trial Survey Profile Stratified by Housing Type and Age for Dunfermline

Postcode Sector	Housing Type Profile				Total Surveys	Age Group Profile[32]			
	Detached	Semi	Terri	Flat		18-29	30-44	45-59	60+
Total	72	64	41	73	250	49	60	65	76
KY12 0	19	18	12	30					
KY12 8	41	37	21	32					
KY12 9	12	9	8	11					

A summary report of the Dunfermline AHP Pre-Trial Survey was produced (Appendix 23). The key findings from this report were:

- Estimated proportion of AHP-using households was 10% equating to 592 households; 80% nappy users and 20% incontinence product users;
- Willingness to use the service amongst AHP-using households was 60% equating to 355 households. This estimate for the number of households who could opt-in and was used by the Local authority to plan the infrastructure requirements.

[32] The sample was stratified by age for the combined trial area, but not within the individual sub-trials due to the complexity and time associated with quota sampling of this type for these trials. The age profile of AHP users was unknown at the start of the process.

- The perceived primary benefit identified by potential AHP service users was identified as reducing waste in the residual bin with the main perceived concern being the transportation of waste to the recycling centre.

Intervention

3.1.6.7 Opt-In Rate

In total, there were 5,947 households in the Dunfermline trial area and from the pre-trial survey it was estimated that the proportion of AHP users was 10%. The estimated number of households using AHP was 595, and the actual uptake of this service was 98 giving an overall opt-in rate of 16%.

3.1.6.8 AHP Tonnage Capture

In 31 weeks, a total of 7.7 tonnes of AHP waste was collected from the Service Type 5 (Dunfermline) trial, giving an average weekly yield of 0.25 tonnes.

3.1.6.9 Contamination Monitoring

No significant contamination was observed (less than 0.1%).

3.1.6.10 Set Out and Participation

Only 17 surveys were returned for the HWRC participation surveys 1 and 2. It was therefore not possible to calculate a participation rate using these results as participation survey interviews are required to be undertaken with all opted-in households. Conducting interviews with fewer households will significantly increase the error associated with the result.

3.1.6.11 Waste Compositional Analysis

Based on the Knowaste Waste Compositional Analysis 13% (26kg) of the AHP sample was attributable to the Dunfermline trial with the detailed composition of the sample outlined in Table 22.

Table 22: Knowaste waste Compositional Analysis Results for Dunfermline

Product	Dunfermline
Nappies	90.8%
Incontinence Products	1.5%
Feminine Hygiene Products	0.0%
Wipes/cotton buds/cotton wool	3.5%
Disposable gloves/aprons	4.2%
Feeding tubes/bags	0.0%
Average weight per bag (kg)	**3.25**
Syringes	4

3.1.6.12 Waste Diversion

The average weight of AHP waste produced per household each week in the Dunfermline trial area was determined by the waste compositional analysis as 3.02kg/hh/wk giving a total expected yield of 0.30 tonnes from all opted-in AHP-using households per week. However, the actual tonnage data collected from the

Dunfermline trial was 0.25 tonnes per week which gives an average yield per household of 2.59kg/hh/wk, giving a capture rate of 86%.

3.1.6.13 Campaign Strategy Delivery

Introductory leaflets were delivered to 5,947 households in Dunfermline. The initial opt-in period lasted approximately four weeks. The 80 litre red recycling sacks were delivered with the reminder postcards to the 98 participating households. Thank you and close letters were delivered to all participating households at the beginning of March 2013 to inform of the trial end and to thank people for participating.

3.1.6.14 Community Engagement Strategy

The community engagement strategy for Dunfermline involved the distribution of posters (33) and leaflets (90) to local outlets to encourage further uptake and awareness of the service. The full distribution list is detailed in Appendix 24. These community engagement activities resulted in a 3% increase in uptake.

Post-Intervention

3.1.6.15 Cost Evaluation

The initial capital expenditure and revenue costs are presented in Table 23 for the Dunfermline AHP trial. Costs presented are the actual costs incurred in setting up and operating the trial.

Table 23: Initial Capital Expenditure and Revenue Costs for Dunfermline

Cost Category	Expenditure	Cost
Capital	Containers	N/A
	Recycling Sacks: 80 Litre Red Recycling Sacks[33]	£5,904
	HWRC Containers	£0.00
	Design and Production of Communication Materials	£6,654
Revenue	Collection Crew	£0.00
	Vehicle Hire	£0.00
	Vehicle Maintenance	£0.00
	Bin Washing	£0.00
	Fuel	£0.00
	Haulage	£14,338

[33] The number of sacks purchased was based on the estimated number of households willing to use each service from the pre-trial AHP survey report.

3.1.6.16 Quantitative Behavioural Research (Post-Trial Survey)

A Random Sampling Formula was applied to the final number of opted-in households (98) to determine the sampling size of 46 required for a statistically robust sample. The opt-in survey profile was further stratified for analysis into:

- Those who opted in but never used the service;
- Those who opted in but were no longer using the service; and
- Those who continued to use the service.

A Random Sampling Formula was applied to those households who were using AHP during the pre-survey but did not opt-in to the service, to determine the sampling size required for a statistically robust sample (10 households).

In total 56 households were surveyed.

A summary report of the Dunfermline AHP Post-Trial Survey was produced (Appendix 25). The key findings from this report were:

- The primary motivation for opting-in to this service was the environmental benefit. The recognition that AHP recycling would result in more space in the residual bin was lower than found for kerbside services.
- The customer satisfaction with this service was lower than found for the kerbside schemes due to the requirement to transport AHP waste to the HWRC.
- Customer satisfaction with the 80 litre red recycling sacks was high, although some households would have preferred sacks to be provided with ties. The majority of households used one AHP sack or less per week. Overall indications were the provision of three recycling sacks per household per week would be sufficient.
- There was a higher proportion of people who started then stopped using the service as a result of the additional effort required.
- Approximately half of participating households indicated that a kerbside service would be preferable.
- The communication materials used in this trial were effective in engaging and informing the public in how to opt-in and use the service with the opt-in leaflet being most effective. Further communication materials could provide additional information to households on what products are produced from the AHP recycling as recall was low.

3.2 Comparison of the Performance of the AHP Service Types

A summary of the key outputs from each of the trials is provided in Tables 24 and 25 to allow comparison between the services in terms of performance, cost and customer satisfaction.

The following conclusions can be drawn from the comparison of the AHP trial schemes:

- There is significant variation between the proportions of AHP-using households in each area, therefore an average rate of 12%[34] may be more useful when modelling anticipated uptake in a local authority area.
- Opt-in rates are the key variable which affects service performance.
- On average, 3% of households who opt-in to an AHP service type will never use the service.
- 10% will stop using the service at some point. The main reason for this is that the service is no longer required. For the purposes of modelling any future AHP service it should be assumed that an equal number of people will opt-in during a similar time period as the need for the service arises. There is therefore a steady state for the number of opted-in households at any one point provided the service is advertised on a recurring basis e.g. annually.
- Kerbside AHP recycling services performed better than HWRC AHP recycling services in terms of opt-in rates, public satisfaction, cost per tonne and the tonnage diverted.
- Kerbside services with collection containers were preferred over the sack only service in terms of opt-in rate and public satisfaction.
- Limited comparisons can be made between the four service types in Perth & Kinross and Stirling due to the use of amalgamated yield data for Perth & Kinross. An average yield per household per week across all trials provides a more useful figure for estimating the expected yield in a Local authority area.
- AHP campaign materials and engagement activities were effective at encouraging the public to opt-in and use the services correctly where the service itself was acceptable to the householder. The introductory leaflet was the most effective material in encouraging people to opt-in to the service. Direct community engagement activities e.g. visiting mothers and toddlers groups, further increased the opt-in numbers. Contamination was less than 0.1% for each of the trial services.
- Households are motivated to use AHP kerbside recycling services primarily due to the environmental benefits, including the recognition that it is good to recycle these types of products; and that the provision of a specific AHP collection container also provides additional capacity in their residual bin.

[34] The figure for the average number of households using AHP of 12% has been compiled from the pre-trials AHP survey, based on 1,000 surveys across four Local Authority areas.

Table 24: Comparison of AHP Trial Schemes

	Service Type 1: Kerbside 120L Wheeled Bin, No Sacks	Service Type 2: Kerbside 120L Wheeled Bin, 30L Tiger Sacks	Service Type 3: Kerbside 80L Blue Sacks, 87L Container	Service Type 4: Kerbside 80L Blue Sacks, 30L Tiger Sacks	Service Type 5: 1100L HWRC Container, 80L Blue Sacks	Service Type 5: 1100L HWRC Container, 80L Red Sacks
Estimated % AHP Households in Trial Area	13%	5%	10%	20%	14%	10%
Number of AHP Households in Trial Area	685	96	138	212	525	595
Opt-In Rate	33%	89%	57%	21%	7%	16%
Number of Opted-In Households	226	85	78	44	36	98
Average Participation	82%	78%	76%	72%	85%	86%
Median Set Out Rate	63%	46%	56%	56%	N/A	N/A
Average Total Weekly Tonnage	0.82	0.57[35]			0.14	0.25
Estimated Average AHP Yield (kg/hh/wk) from WCA	4.82kg	3.34kg			4.56kg	3.02kg
Actual Average Yield (kg/hh/wk) from Weighbridge	3.63kg	2.88kg			3.88kg	2.59kg
Capture Rate from Opted-In Households	75%	86%			85%	86%
Overall Customer Experience	High	High	High	Medium	Medium	Low

[35] It was not possible to uplift separately from the three trial areas in Perth & Kinross therefore only amalgamated average figures are provided for Average Weekly Tonnage, Estimated Average AHP Yield from WCA, Actual Average Yield from Weighbridge and Capture Rate.

Table 25: Cost Comparison of AHP Trial Schemes

Cost Category	Expenditure	Cost					
		Service Type 1: Kerbside 120L Wheeled Bin, No Sacks	Service Type 2: Kerbside 120L Wheeled Bin, 30L Tiger Sacks	Service Type 3: Kerbside 80L Blue Sacks, 87L Container	Service Type 4: Kerbside 80L Blue Sacks, 30L Tiger Sacks	Service Type 5: 1100L HWRC Container, 80L Blue Sacks	Service Type 5: 1100L HWRC Container, 80L Red Sacks
Capital	Containers	£11,750	£2,068	£7,165	N/A	N/A	N/A
	Recycling Sacks	N/A	£4,656			£213	£5,904
	HWRC Containers	N/A	N/A			£1,066	£0
	Design and Production of Communication Materials	£6,488	£2,322	£2,322	£2,322	£5,229	£6,654
Revenue	Collection Crew	£7,762	£9,510	£7,727		£0	£0
	Vehicle Cost	£12,638	£2,591	£2,105		£0	£0
	Vehicle Maintenance	£470	£3,600			£0	£0
	Bin Washing	£792	£218			£0	£0
	Fuel	£3,154	£3,264			£0	£0
	Haulage	£14,338	£14,338			£0	£14,338

The following conclusions can be drawn from the comparison of the costs of the AHP trial schemes:

- The unit cost of the 87 litre containers used in Service Type 3 (£44.78) was significantly higher than the cost for the 120 litre and 140 litre wheeled bins in Service Types 1 and 2 (£23.50 and £18.80 respectively).
- The cost of hiring an RCV for Service Type 1 was significantly higher than the use of Tipmasters for Service Types 2, 3 and 4.
- The initial capital costs for the HWRC schemes were significantly lower than those for the kerbside schemes.

3.3 AHP Risk and Hazard Assessment

AHP is treated as hygiene / offensive waste not clinical waste and the Department of Health categorise offensive waste from municipal sources as EWC code 20 01 99.

Waste of this type should not be compacted unless in accordance with the conditions of an environmental permit/waste management licence and procedures should be in place to contain, minimise, and monitor any potential bio-aerosol release.

4 Recommendations for Future AHP Service Provision

The following recommendations have been made when considering future AHP service provision.

Kerbside collection services for AHP recycling will deliver higher opt-in rates, customer acceptability, satisfaction and ultimately better performance than an HWRC collection service.

Recommendations for a range of future kerbside AHP recycling services, taking into consideration the findings from the Scottish AHP Trials, are:

- Opt-in kerbside collection services for people who use AHP performed better and were more publically acceptable than the HWRC collection services;
    - Customers will find kerbside collection services easy to use and householders are unlikely to experience problems when using this type of collection services;
    - Householders are motivated to use kerbside recycling services primarily due to the environmental benefits, including the recognition that it is good to recycle these types of products; and that the provision of a specific AHP collection container also provides additional capacity in the residual bin.
- Kerbside collection services should be offered on a weekly basis;
- Customer satisfaction with kerbside recycling services was high irrespective of the container type;
- For a successful AHP kerbside collection service households should be provided with a container or bin with sufficient capacity for a weekly AHP collection and consideration should be given to providing sacks:
    - For a 120 litre external bin presented at kerbside, use an annual supply of 30 litre tiger sacks (3 per week); for a proportion of incontinence product users there may be a requirement for additional sacks;
    - For an 87 litre indoor or outdoor container use an annual supply of 80 litre blue recycling sacks (2 per week) to present at kerbside.
- AHP sack only kerbside collection services are less acceptable than container type systems; one third of householders are likely to use their own container to store their recycling sacks before collection;
- All recycling sacks should be provided with ties;
- Communications to support the introduction of AHP kerbside recycling services should include:
    - An introductory leaflet;
    - Bin or container decal (where appropriate) or reminder postcard emphasising the materials that can and cannot be recycled using this type of service;
    - Direct community engagement activities to relevant target groups;
    - A4 posters to support community engagement activities.