


Moving towards zero waste

A Sustainable Waste Management Strategy for the University of Worcester

2013/14 – 2018/19

BLACK BIN LANDFILL



crisp packets & sweet wrappers
foil snack wrappers

foil
caps corks tops lids pumps cling film


black plastic
microwave ready meal dishes polystyrene

plastic bags take away coffee cups
plastic bags & take away cups

fruit
vegetables apple cores banana skins orange peel

meat bones fish dairy
tea bags coffee grounds bread pastries

GREEN BIN RECYCLING



cardboard
thin boxes cereal ready meals corrugated thick cardboard egg boxes kitchen and toilet roll tubes flatten cardboard boxes and tubes remove inner packaging


mixed glass bottles jars
no tops corks or caps labels can be left on all colours accepted

cartons milk juice
smoothie cartons soup custard rinse no need to squash cartons plastic spouts can be left on


food tins drink cans
aerosols sweet tins biscuit tins metal lids rinse push sharp lids inside tins labels can be left on no need to squash

paper
newspapers magazines Phone directories journals catalogues brochures junk mail leaflets greetings cards letters envelopes keep paper flat remove plastic wrappers you can compost your shredded paper at home


plastic bottles drinks cleaning bleach detergent fabric conditioner yoghurt pots
cream and custards ice cream tubs soups and sauce margarine containers fruit and vegetable punnets meat and fish cake and pastry trays egg boxes labels can be left on rinse bottles and containers no black plastic tops or caps no need to squash




foil snack wrappers




cling film & tin foil, corks, lids, pumps




ready meal dishes




plastic bags & take away cups




fruit & vegetables




meat, bones, fish dairy, bread




cardboard




mixed glass bottles & jars




cartons



food tins & drink cans






paper



plastic bottles & containers

USE THE RIGHT BIN

THE MORE YOU RECYCLE THE LESS GOES TO LANDFILL

Introduction

1. The first Zero Waste Strategy was adopted by the University in December 2007. Much was achieved during the lifetime of the strategy and this new strategy builds on that success. It is written with a new trade waste and recycling contract in place and within the context of the new strategic Plan 2013-2018.
2. The university has expanded since 2007 doubling in size and significantly increasing the number of sites. Since the introduction of the first Waste Strategy the University has made significant progress in increasing re-use and recycling and the focus of this strategy is to continue to promote re-use and eliminating waste. Areas that the university would like to concentrate on during this strategy includes the introduction of food waste segregation throughout the estate (currently Halls only), actions to manage resources more efficiently, implement further measures to prevent and minimise waste, continue to develop waste recycling campaigns to encourage participation, ensure recycling facilities are consistent across the University to maximise recycling, initiate waste minimisation projects with key departments, develop a centralised waste compound and produce and implement a waste disposal policy.

National Policy

3. The UK consumes natural resources at an unsustainable rate and contributes unnecessarily to climate change. Each year the UK generates approximately 290 million tonnes of waste, which causes environmental damage and costs businesses and consumers money. The Government first published in 2011 a waste policy designed to help move towards a zero waste economy in England. As the demand for materials grows worldwide, raising input costs, the government encourages organisations to adopt the 'waste hierarchy'. This sets out five steps for dealing with waste, ranked according to environmental impact. Prevention, which offers the best outcomes for the environment, is at the top of the priority order, followed by preparing for re-use, recycling, other recovery and disposal, in descending order of environmental preference.
4. All businesses listed on the London Stock Exchange will have to report their levels of greenhouse gas emissions from the start of the next financial year. The UK is the first country to make it compulsory for companies to include emissions data for their entire organisation in their annual reports. The introduction of the reports will be reviewed before the government decide to extend to all large companies from 2016.
5. Understanding the total carbon footprint that includes the full scope of greenhouse gas emissions is growing in importance for HEFCE. They are requiring institutions to have a carbon management plan and to report scope 3 emissions from 2013. In developing the Carbon Management Strategy (CMS) the University took a holistic view of carbon management and its environmental responsibilities. Believing that the most effective approaches to emissions reductions are broad ones which adopt a wide range of approaches and targets rather than focussing solely on (for example) energy provision and consumption. Raising environmental awareness, encouraging behavioural change and publicising best practice are essential elements in securing widespread commitment to environmental improvement and thus to the achievement of carbon reduction targets.

The CMS set the following targets:

- a 5% p.a. reduction in carbon emissions in scopes 1 & 2, against a 2008-09 baseline, from 2010 to 2015;
- a 3% reduction p.a. against the 2008-09 baseline from 2015 to 2020;

- reductions in scope 3 emissions will match those for other scopes;

Waste management

6. We are continually working at ways of minimising the amount of waste we produce and reducing the volume of waste sent to landfill. The University is aware of the importance of the waste hierarchy and the need to reduce, re-use and re-distribute materials. Waste management procedures are improving year-on-year and we aim to reduce greenhouse gas (GHG) emissions from waste/recycling per FTE by 5% annually from 2011-12 baseline to 2015 by maximising re-use, re-distribution and recycling. Early initiatives within the first Zero Waste strategy included:
 - Improving the waste storage facilities in the Woodbury Waste and Recycling Compound
 - At the end of each academic year, the University offers students the opportunity to donate any items they do not want to take home to a charity.
 - New recycling awareness materials; including posters, bin stickers, and leaflets aimed at staff, students and nursery pupils
 - Introducing cardboard compacting on site – a large skip is now used.
 - Implementing a 'Not in the Bin' facility to encourage the re-distribution of unwanted stationery amongst departments
 - Developing partnerships through the Social Enterprise Waste and Recycling Forum to increase re-use and re-distribution of unwanted furniture and equipment in the local community.

Recycling schemes are also in place across the campus for toner and printer cartridges, mobile phones, glass, computer equipment, books, batteries, cardboard, textiles and shoes.

Current Performance

7. The university has measured and reported its waste and recycling as part of its carbon reporting since 2006. Detailed breakdown, including comparison each year, is published in annual sustainability reports available on the university [website](#). The table below gives the most recent data. This shows that since last year the carbon emissions associated with the waste and recycling generated by the university activities has reduced. Significantly more waste streams are now recycled, therefore despite increasing the amount of waste generated because of the growth of the university, the carbon associated with waste per FTE has reduced by 54.08%.
8. For completeness the table below also shows the tonnages of construction waste. The level of construction waste varies each year dependant on capital development and refurbishment programmes. The university is committed to reducing its construction waste sent to landfill, and regularly reports this through the WRAP reporting portal.
9. The table below shows amounts of waste and recycling generated by the Universities operations and the carbon emissions associated with each waste stream/disposal method.

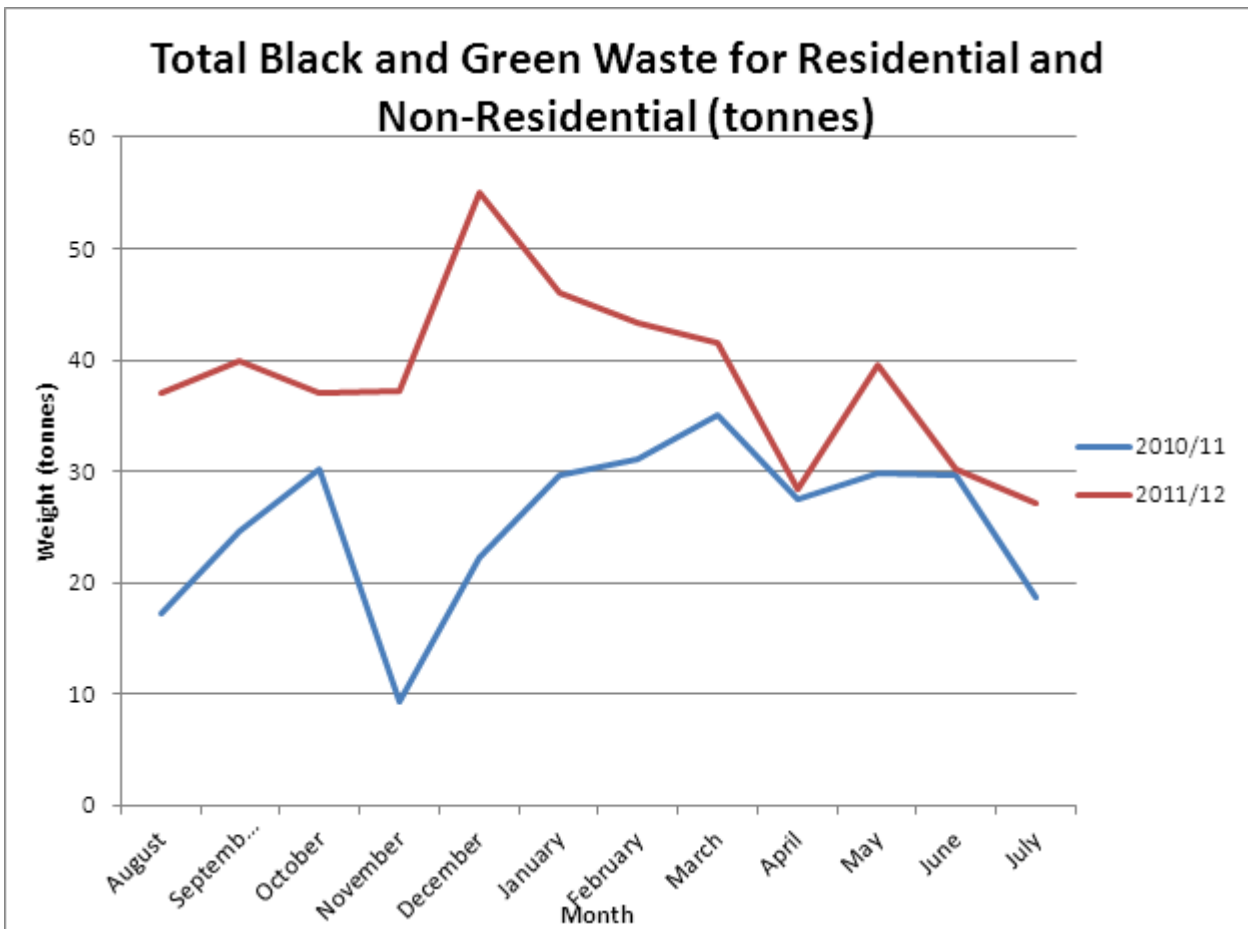
	Weight in tonnes 2011/12
Waste & Recycling - Academic	299.83
Waste & Recycling - Residential	272.14
Total	571.96
Construction waste - landfill	5.54 plus arena
Construction waste - recycled	70.61 plus arena
Site	Carbon Emissions
Non-Residential	17,608
Residential	17,627
Total	35,235 kg
	35.23
Percentage reduction of the carbon emissions per FTE student/staff	54.08
Per FTE student/staff	0.0045

	2010/11		2011/12	
	Tonnes weight	Tonnes carbon	Tonnes Weight	Tonnes carbon
Recycled	113	73.2	218	35.23
Incinerated	0		266	
Landfill	277		87	

10. There are many different waste stream generated by the operations of a university and the following table shows the volumes of waste produced by waste category, and splits it between residential and non-residential parts of the estate.

2011/12									
	Weight kg	Tonnes	(Preparation for Re-use)	Recycling		Energy Recovery ⁷		Composting	Landfill
				Open Loop ^{3, 6}	Closed Loop ³	Combustion	Anaerobic Digestion (AD)		
Non-Residential									
Black bin - Municipal waste	144,940	144.9399		34.79		82.62			27.54
Green bins - Municipal waste	43,232	43.232		31.56		9.94			1.73
Skip General Waste	61,799	61.7992		14.83		35.23			11.74
Municipal Waste Total		249.9711		81.18		127.78			41.01
Chemicals- Commercial & Industrial Waste	1,608	1.608							1.61
Scrap Metal	22,316	22.316		22.32					
Printer & Toner Cartridges - Commercial & In	2,030	2.03			2.03				
Clothings	436	0.436	0.44						
Confidential Waste - Paper	13,160	13.16		13.16					
Electronic/Scientific Lamp - WEEE Mixed	110	0.11		0.11					
Skip WEEE - WEEE Mixed	3,340	3.34		3.34					
Skip Cardboard - Paper and board: Mixed (as	6,610	6.61		6.61					
Clinical Waste	244	0.244				0.24			
Furniture		0							
Sub-total		299.8251	0.436	126.71	2.03	128.03	0	0	42.62
Residential									
Black bin - Municipal waste	222,809	222.8086		53.47		127.00			42.33
Green bins - Municipal waste	49,328	49.328		36.01		11.35			1.97
Municipal Waste Total				89.48		138.35			44.31
Sub-total		272.1366	0	0	0	0	0	0	0

11. The following graph compares Black and Green bin waste (residential and non-residential) for the last two years.



	2011/2012	Black Uplifts	Black Weight	Green Uplifts	Green Weight
Residential					
Henwick Grove		3,216	192,975	802	32,064
City Campus		203	12,203	178	7,104
Albany Court		93	5,554	80	3,200
Sansome Halls		132	7,903	170	6,800
Foresters Hall		70	4,174	4	160
Residential total		3,713	222,809	1,233	49,328
Non Residential					
Henwick Grove		2,025	121,503	534	21,376
City Campus		128	7,683	118	4,736
Riverside		89	5,366	10	400
The Garage		106	6,369	22	880
Henwick Grove (Kitchens)			-	176	7,040
Henwick Grove (Recycle Centre)			-	220	8,800
Student Union Bar		67	4,020		
Non Residential total		2,416	144,940	1,081	43,232

12. As noted in paragraph 8 above, the volume of waste generated by the university operations has increased, due primarily due to growth. By increasing the opportunities for recycling on campus, the percentage reduction of the carbon emissions per FTE student/staff has reduced significantly- by 54.08%.

Targets

13. The University has set annual quantitative and qualitative targets for a number of years, and the Environment Committee reviews and manages the progress. **These annual targets are set within the parameters of the overarching absolute carbon reduction targets of the CMS.** Results are published annually within a Sustainability Annual Report. The Table below sets out the 2012-13 qualitative and quantitative targets.

Policy	Qualitative targets	Quantitative targets
<p>Re-use resources whenever possible rather than dispose of them</p> <p>Encourage the use of recycled materials and recycling initiatives</p> <p>Comply with all relevant environmental legislation, regulations and requirements</p>	<p>to reduce greenhouse gas (GHG) emissions from waste/recycling per FTE by 5% annually from 2011-12 baseline to 2015</p>	<p>Implement food waste recycling in all student halls September 2012</p> <p>Implement food waste recycling in academic space from January 2013</p> <p>Report on construction waste for smaller estates projects that do not require SWMP within the ½ waste to landfill reporting tool by June 2013</p> <p>Implement refresher training programme on waste disposal procedures, hazardous waste and manual handling techniques for key staff such as porters, cleaners, technicians by June 2013</p> <p>Promote Recycling, Green Impact to students and staff to increase re-use and recycling awareness with a range of campaigns promotional material</p> <p>Promote internal UniCycle network to encourage re-distribution and re-use by March 2013</p> <p>Implement repair cafes to promote reuse initiatives February 2013</p> <p>Ensure Zero Waste initiatives includes all off campus and university managed halls and establish a 'swap shop' swishing event for students</p> <p>Evaluate possibility of establishing a repair/reuse workshop for furniture repair scheme and set targets for 2014</p>

Environmental Impacts

14. The impact that waste has on the environment can be summarised as follows:

'Less waste sent to landfill reduces methane and other greenhouse gas emissions which contribute to climate change. Correct disposal and storage of all waste has environmental and human benefits in terms of reduced pollution and risk to health, reduced depletion of natural resources/deforestation, soil erosion and habitat loss. Significant benefits in terms of rodent/pest control and minimisation of waste storage facilities. Reduced potential contamination and eco-toxicity and the negative contribution to climate change arise from CO2 emissions and resource use from transport and some energy-inefficient recycling processes.'

Minimising the amount of waste sent to landfill, storing and dealing effectively with waste prior to disposal and increasing the amount re-used or recycled is clearly a priority.

Legislation

15. Waste and waste disposal is subject to numerous pieces of legislation, with new legislation coming into force regularly. The University's environmental legal register identifies 15 pieces of waste legislation, which currently affect the University. These range from The Waste Electrical and

Electronic Equipment for the disposal of electronic and electrical goods to Environmental Permitting (England and Wales) Regulations 2007 SI 3538 which covers the storage, treatment or disposal of controlled waste onsite, including composting and burning green waste and compacting of cardboard. Monitoring changes in the law and the implications of changes to the University's operations is an important factor in this Waste Strategy. Being able to respond to change and resourcing, both with physical changes to infrastructure and processes, and keeping staff informed of changes are important to the management and continual improvement of our environmental performance. Article 4 of the revised EU Waste Framework Directive (Directive 2008/98/EC) sets out five steps for dealing with waste, ranked according to environmental impact – the 'waste hierarchy'. The waste hierarchy has been transposed into UK law through the Waste (England and Wales) Regulations 2011. The Regulations came into force on 29 March 2011.

16. Prevention, which offers the best outcomes for the environment, is at the top of the priority order, followed by preparing for re-use, recycling, other recovery and disposal, in descending order of environmental preference.

Stages	Include
Prevention:	Using less material in design and manufacture. Keeping products for longer; re-use. Using less hazardous materials
Preparing for re-use:	Checking, cleaning, repairing, refurbishing, whole items or spare parts
Recycling:	Turning waste into a new substance or product. Includes composting if it meets quality protocols
Other recovery:	Includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis which produce energy (fuels, heat and power) and materials from waste; some backfilling
Disposal:	Landfill and incineration without energy recovery

Location of waste and recycling facilities

17. A central waste compound was created a few years ago on St Johns campus, and waste and recycling compounds have been invested in in all new halls developments and new sites. However there is a need for further investment. The university invested in its own 1,100 litre euro bins and has over time swapped their use from rubbish to recycling as the campus users have become better at segregating waste streams. We have also invested in food caddies for all the student flats allowing food segregation which is then collected on a weekly basis. Further investment in micro chipping the euro bins will allow accurate waste weights. Although we have separate waste compounds consideration may be given to centralising all streams in one location.

Cost Reduction

18. The University spent £62k last year and is on target to spend £91k in 2012/3 on waste disposal. Continuing the implementation of sustainable waste management practices offers the opportunity to cut costs through effective resource management. A number of the waste streams produced by the University have considerable market value and if collected and segregated properly, the University can receive rebates from recyclers. Typically this includes waste streams like metal. Additional savings will also be realised through waste minimisation projects. The cost of disposing of waste by

landfill is also becoming more expensive, year on year. The standard rate of landfill tax has risen significantly recently and from 1 April goes up from £64/tonne to £72/tonne. It will continue to increase by £8 / tonne per year until at least 2014, and introduce a floor so that that the rate will not fall below £80 per tonne until at least 2020. This provides a greater financial incentive to reduce, re-use and recycle waste. Haulage costs are also increasing in line with increased fuel prices. Waste management is therefore a costly activity. The University's strategy aims to reduce the amount of waste produced and capture as much possible value from recyclable waste streams.

Resources and Training

19. Most of the waste generated by the University is removed from the campuses under one contract. Smaller contracts are in place for specialist waste streams, confidential waste, WEEE waste, batteries, clinical waste, textiles, and toners. The last two waste streams are given to support a number of charitable enterprises.
20. Campus services staff are responsible for the segregation and collection of waste streams on campus and manage the external contracts. They provide an internal waste collection service from all areas of the campuses. Students are responsible for emptying their own waste directly into eurobins, both rubbish and recycling, and food. Cleaning staff are responsible for emptying waste bins and recycling bins in office and teaching areas.
21. The University has skips for cardboard and a (capacity 20m³) permanently on site located in the recycling compound at the rear of Woodbury Building. Estates contractors are no-longer permitted to utilise these facilities, and they are used primarily for surplus furniture which cannot be re-used, non re-useable fixtures and fittings and green waste by the grounds team.
22. Staff have undertaken a number of training courses including waste legislation, however further training would be beneficial to keep all staff involved up to date with this complex heavily legislated area. As the staff are operational it may be worthwhile looking at e learning opportunities in CIWM courses.

Waste streams

23. At the University of Worcester, waste is generated from the following activities:

- Office/administrative activities
- Laboratory teaching, which produces chemical waste
- Demolition, construction and refurbishment of buildings
- Grounds maintenance
- Maintenance of a transport fleet and parking facilities
- Catering services
- On-campus residential accommodation
- Students' Union shop, social and catering outlets
- Much of the waste produced at the University falls into two specific categories – hazardous and non-hazardous. In addition, there is a significant amount of catering waste.

Hazardous Waste produced by the University is summarised below:

Type and Method of Disposal of Hazardous Waste

Type of Waste	Method of Disposal
Batteries	Small number generated - recycling introduced May 09
Chemicals	Review and disposal of all chemicals on campus carried out, new storage facilities completed this is controlled mainly by the lab technicians, with the register for Chemicals being kept in the control room.
Electronic/Electrical Equipment	Disposed of in accordance with the WEEE Directive - under control of our waste contactor.
Fluorescent Tubes	Stored in specialist containers and removed periodically by our waste contractor
Fridges and refrigeration Equipment	Stored in a designated area and collected by our waste contractor.
IT equipment	Disposed of in accordance with WEEE Directive and/or donated to charity
Mobile Phones	Disposed of in designated boxes and collected by Green source solutions for recycling and re-use when required
Nappies/sanitary items	PHS Group
Oils	Waste contractor
Paint	Waste contractor
Products containing CFCs	Waste Contractor
Solvents	Waste Contractor
Toner and printer cartridges	Disposed of in designated recycling boxes and collected by Greensource Solutions for recycling and re-use as and when required

Non Hazardous Waste is summarised below:

Type and Method of Disposal of Non-Hazardous Waste

Type of waste	Method of Disposal
Books	Collected by Print Waste or donated to local charity shops/Education resources for Africa
Cardboard	Skip on site and removed by Lawrence's for recycling.
Furniture	Some re-used and some deposited in skips provided by Waste Contractor and removed to landfill
Magazines, card, paper ,glass, cans (aluminium and steel), plastic – office/ catering and from Halls of Residence	Lawrence's
Paper – confidential	Collected by Print waste contractor and disposed of in accordance with directive.

Catering

24. WRAP (waste and resources action programme) undertook a detailed waste audit of the catering facilities and a summary of their findings is shown in the tables below. In understanding their findings it's important to understand the definitions of 'avoidable' and 'unavoidable' food waste. These are given below.

Avoidable food waste is food waste that was, at some point prior to disposal, edible (e.g. a slice of bread, apples, meat) and could have been eaten if it had been better portioned, managed, stored and/or prepared. 'Avoidable' food waste also includes some food items that may or may not be eaten as a matter of consumer preference: such as bread crusts and jacket potato skins.

Unavoidable food waste is food waste that is not, and has not been, edible under normal circumstances (e.g. meat bones, egg shells, pineapple skin, tea bags, potato skins from chip production).

Kitchen/catering waste projected over the year

Waste Type	Tonnes per year	Percent of total weight
Avoidable food waste	6.77	44.74%
Unavoidable food waste	5.30	35.05%
Potential recyclables thrown away in kitchen/catering waste	1.29	8.55%
Other wastes	1.76	11.65%
Total kitchen/catering waste	15.13	100.00%
Of this total, the amount that was packaging waste	1.76	11.66%

Potential annual cost and carbon savings through avoidable food waste prevention on campus

Potential greenhouse gas savings (tonnes CO2 equivalent/year) through avoidable food waste prevention	26.41
Potential annual cost savings through avoidable food waste prevention	£8,125

The future

25. There is a huge potential for waste reduction at source, better waste segregation, more repair and re-use/ re-distribution of educational and office equipment and resources and recycling will all assist in this process. There is already a strong focus on improving reuse and recycling and to make Worcester among the best performing of the universities in the UK for its elimination, reuse and recycling over the long-term. The provision of the reuse schemes, behaviour change programmes like the award winning joint scheme with Worcester City Council, and Green Impact staff programmes means much of the ground work has already been set in place and just requires further investment in resources and effort.
26. The figures above indicate that there is great scope for the University to improve its performance in the sustainable management of waste. Now the University significant growth period is plateauing a concentration on further behaviour change messages will help. The amount of

waste generated and the costs of disposing of it are dependent on the number of staff, the number of students living on and visiting the campus, and the number of visitors. Possible measures of institutional activity include financial turnover, floor space occupied, and the total numbers working on campus. However, at the University of Worcester, the full-time equivalent (fte) of staff and students is probably the best indicator because it represents the most important driver of waste creation – people. **Recent quantitative targets reflect this.**

27. An important element in moving towards zero waste is the repair and/or re-use of redundant goods to prolong their lives which will reduce financial outlay on new goods and reduce the environmental cost of landfill. However, the re-use – or re-distribution of goods – necessitates connecting those with items they no longer have a use for, with those who do have a use for them, or who can repair or refurbish the goods into a usable product again. The University has already engendered strong links with local, regional and national community groups and organisations in an effort to ensure that still useable goods are passed on for repair and re-use. It will be important to strengthen and extend these links in future.



Katy Boom/Tom Taylor

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Full revision 2018/19

Action Plan

Action	Who	When	Action will assist in meeting target relating to:				
			Prevention	Preparing for re-use	Recycling	Other recovery	Disposal
Student/staff behaviour change	KB	ongoing	X	X	X		
food waste segregation throughout the estate (currently Halls only),	TT	July-September 2013			X	X	X
Central re-use	TT	August 2013		X			
Training	TT	ongoing	X	X	X	X	X
Auditing	KB/TH	April 2013	X	X	X	X	X
actions to manage resources more efficiently	TT	ongoing	X				
implement further measures to prevent and minimise waste,	TT	June 2013	X				
ensure recycling facilities are consistent across the University to maximise recycling	TT	December 2013			X		
initiate waste minimisation projects with key departments,	TT	January 2014	X				
develop a centralised waste compound	TT	July 2014					X
produce and implement a waste disposal policy	TT	July 2013					X
Review paper use of students	KB/AR/KS	Dec 2013	X				