

2014-2022

University of Canterbury Waste Plan



Sustainability Office
University of Canterbury
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A model showing off op-shopped clothes at Eco Runway 2012, part of the Waste Watchers launch

Executive Summary

Managing waste responsibly is a key issue for the University of Canterbury as we gradually improve processes around sustainability.

This Waste Plan, 2014-2022 falls out of the UC Sustainability Strategy 2012-2022. It outlines the journey UC has been on regarding waste issues over the last fifteen years, establishes some waste reduction targets and key problems that need to be resolved, and creates a programme of work in short, medium and long term increments in order to address those issues.

It is suggested that waste targets to reduce contamination in landfill and recycling should be set at <10% which is ambitious by today's standards. Beyond this, we need to set targets to reduce the total amount of waste being sent to these waste streams, and this is acknowledged in this plan.

The intention behind this approach is to meet our aspiration to be a place in which the University uses physical resources and works with our people in ways that are fair, equitable and defensible, and which leave "an appropriate legacy for future generations."

Beyond reducing contamination rates, which is the low hanging fruit, opportunities are present to reduce waste upstream by introducing improvements into our procurement chain, but also downstream by finding ways to send more of our waste to composting, to be returned to the earth in ways that enhance it rather than destroy it, as we are currently doing.

This is a living document, which will, of necessity, need to change over time as the context changes around us.



Publicity photo (2009) for the Recycling Pamphlet, which was translated into three languages.

Introduction

Requirement for a Waste Plan

Since the new waste system came into effect in 2009 the University has had a much more complete picture of its waste profile. With reporting improving around eWaste, metals and greenwaste in 2013 this picture is becoming more complete. However, there is still no overarching 'approach' to waste at UC, and there have been no waste targets set (although some are foreshadowed in the draft Sustainability Strategy, which this Waste Plan falls out of).

Through the Engineering Services Operational Plan for 2014 the Director of Learning Resources has tasked the Sustainability Office with developing a campus wide waste management plan and a range of solid-waste reduction initiatives. In doing so, the Sustainability Office has been required to work with the Capital, IT Services, Campus Services and Remediation teams in the development of a site wide waste management plan. Further, it must work with Engineering Services, Campus Services and Mastagard (now owned by Envirowaste) on a programme to bring UC's solid waste streams down in volume and cost. The initial focus for this will be the waste stream associated with the decanting process, as staff are shifted to new spaces while their buildings are remediated.

This Plan addresses various aspects of the waste system at UC, including the public facing bins, waste behind the scenes and the collection systems involved. It suggests setting specific targets.

The Waste Context

In Christchurch there are only two waste service providers that can meet the University of Canterbury's needs for a comprehensive separated waste system. Both of these companies are owned off-shore by companies based in mainland China and in Hong Kong. While UC uses one of these companies for the bulk of its waste collection services (including landfill, co-mingled recycling, paper, organics, cardboard, batteries, light tubes, hard fill, dry waste and coal ash), it is worth noting that other contractors collect metals, landscaping waste and electronic equipment from UC.

Both of the main players are well-established and robust, so there is no immediate threat to the University from having such a limited pool to draw from. However, there are risks emerging regarding what these companies will and will not accept. Bearing in mind the University's intention of moving towards more sustainable practice, which is also seen as a marketing advantage for the University, it is important that our waste providers are moving in the same direction. This is especially important given the fact that for many people the presence of a functional recycling system is the litmus test for whether an organisation takes sustainability seriously.



Compost bins at the Okeover Community Gardening have been taking some of UC's waste for over a decade .

In 2013 the University's waste services provider informed UC that it would no longer accept takeaway coffee cups in the recycling. This was particularly difficult given how high profile conversation about coffee cups had already been. Not only was this a sustainability reversal, but the public information was very expensive to manage and, of course, landfill is more expensive than recycling. In this instance the driver was Chinese markets (as discussed below). UC needs to future proof itself against such situations.

Furthermore, it should be highlighted that while landfill prices are high in 2014 relative to other waste streams, it is highly likely that landfill prices will continue to increase. Furthermore, the landfill at Kate Valley has a limited life and the current site there is due to close in 2041. As UC intends to continue operating beyond this date, it will need to think carefully about how it intends to manage landfill waste in the future, and this needs to begin now.

This Plan seeks to answer key risks around:

- Escalating costs
- Lack of options of waste services providers
- Reputation

Vision

The University of Canterbury has long prided itself as a leader in environmental and sustainability performance. In 2011 the UC Sustainability Office worked with selected students and the Senior Management Team to develop a working definition of sustainability that our subsequent plans could reflect. This definition was "The fair, equitable and defensible use of physical and human resources which leaves an appropriate legacy for future generations."

Our vision for UC is therefore one in which the University uses physical resources and works with our people in ways that are fair, equitable and defensible, and which leave "an appropriate legacy for future generations."

Clearly, this will involve reducing our waste. Our vision for waste at UC is to continue on a path towards closing the waste/resource loop, so that we don't consume and dispose of materials in the linear process we are now embedded in. We aim, through improvements in the procurement and disposal chain, to shrink what we send to landfill and increase what we recycle and, even better, compost. Our resource use should nourish the environment around us rather than continue to degrade it.



Okeover Community Garden: an example of how UC can have a restorative approach to waste issues.

Background

Short Description

Prior to the 2009 contract with Mastagard, UC's numerous waste streams were handled by a plethora of separate contractors. The administration associated with this was an expensive overhead and reporting was extremely sketchy. It was not possible prior to 2009 to provide anything like an accurate picture of what was occurring within the waste stream. Therefore, there was no question of setting targets or even determining a plan. Financial Services believe that from day one the new system saved the University about one third of the total costs of managing our waste streams.

Brief History of UC's Waste Systems¹

The Environment and Resource Use Committee (ERUC) first raised the issue of the University's disposal of paper, aluminium and plastic bottles in 1996.² ERUC then looked into how recycling could be encouraged campus wide and also how to implement a collection of recyclable aluminium drink cans.³

¹ This section is based on research conducted by Agnete Gundersen, 'A History of Sustainability Initiatives at the University of Canterbury, 1970-2011 (UC Sustainability Office, University of Canterbury, 2012),
www.sustain.canterbury.ac.nz/summer/History_of_Sustainability_Initiatives_at_UC.pdf

² ERUC, *ERUC minutes*, 20 June 1996, Sustainability Office Collection.

³ *Ibid*, 16 May 1997.

In 1998, ERUC began co-operating directly with Christchurch City Council officers to discuss external waste collection and a more effective, efficient and cheap approach towards internal recycling organisation.⁴

At the same time, students, mainly from the Kakariki Environmental Club dumped a large quantity of paper outside the Vice Chancellor's office, which helped him to realise the scale of paper waste and gave UC the impetus to look more intentionally at its recycling programme.⁵ Peter Molony, as Director of Facilities Management, created the role of Recycling Coordinator, and appointed Kakariki's Jo O'Brien to the role.⁶ Initial efforts were ad hoc and voluntary, with some departments taking the initiative to get involved.⁷

Paper and cardboard recycling

In mid-2000 the now-familiar burgundy coloured trays were distributed through all offices and around the James Hight Library, for paper collection. Cardboard collection was also in place.⁸ In February 2001, Jo O'Brien stated in an article in

⁴ ERUC, *ERUC minutes*, 21 August 1998.

⁵ Peter Molony: Interview, 26 January 2012, Christchurch and Kate Hewson: Interview, 30 November 2011, Christchurch.

⁶ Peter Molony: Interview, 26 January 2012, Christchurch and Kate Hewson: Interview, 30 November 2011, Christchurch.

⁷ ERUC, *ERUC minutes*, 15 June 1999, Sustainability Office Collection

⁸ Email from Kate Hewson to Agnete Gundersen 1 February 2012.



The original four-bin system with inadequate labelling (2010)



The re-designed system, with clearly labelled bins (2012)

the 'Chronicle' that the UC produced enough waste to fill the entire Registry building in a year.⁹

Audits for paper and cardboard recycling in early 2001 revealed that more than two tonnes were being recycled each week.¹⁰ In 2002, the Environmental Projects Coordinator, Kate Hewson, reported in the Chronicle that compared to pre-recycling waste records, UC had sent close to 25% less departmental waste to landfill in the last year, equivalent to 60 tonnes less waste.¹¹

The first outdoor recycling station

In 2001, Jo O'Brien started a trial outdoor recycling station during Orientation Week. This scheme collected glass and plastic bottles, and cans. Due to its great success, two outdoor recycling stations were set up: one outside James Hight café and the other outside the UCSA building.¹² Kakariki members emptied the bins and sorted the recyclables into categories. Then, the sorted items were dropped at the CCC transfer station for free by Facilities Management.



The first recycling station at UC (2001)

⁹ Ben Weston, 'Recycling efforts take another leap', (Chronicle 15 February 2001) pp.1-2. <http://www.comsdev.canterbury.ac.nz/chronicle/2001/36-02.pdf>. Accessed on 12 February 2012.

¹⁰ ERUC, *ERUC minutes*, 26 April 2001, Sustainability Office Collection.

¹¹ Kate Hewson, 'Recycling scheme expanded to reduce campus waste', (Chronicle 30 May 2002), p. 6. <http://www.comsdev.canterbury.ac.nz/chronicle/2002/37-08.pdf>. Accessed on 6 February 2012.

¹² Email from Kate Hewson to Agnete Gundersen, 1 February 2012.

Eventually, the job got too big for the Kakariki volunteers and a student was employed to maintain the two recycling stations in 2002.¹³

In 2004, a pilot recycling project was established and tried out in three departments; Facilities Management, Continuing Education and Geography. These departments had the internal recycling scheme going until 2008/2009 when it was implemented throughout the whole University.¹⁴ This introduced the public facing 'four bin' system to take organics, paper, co-mingled recycling and landfill. There have been no significant alterations to the system since 2009.

It also involved the removal of personal rubbish bins from all offices, and their replacement by 2 litre 'ice cream' containers. Instead of cleaners emptying these bins early in the morning, now staff were expected to empty their own bins in an effort to discourage wasteful practices. While this move was controversial at the time, it quickly became part of accepted practice at UC and is now rarely questioned. The expanded recycling system coincided with the new waste contract for UC, which encompassed most of the University's waste streams. In addition, recycling for scrap metal and fluorescent light tubes was brought on-stream as soon as it was available in Christchurch.¹⁵ In 2009/2010, UC finally got full



¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid.

detailed waste disposal statistics for the first time. Previously, disposal details had been only available for some of the waste streams.¹⁶

Toner cartridges

The issue of toxic photocopy cartridges and how to dispose of toxic waste was resolved by April 2001 when a recycling scheme for them was set up. Each department collected them in a box and when full, the University Warehouse collected these. The University Warehouse would also pick up computers and electrical equipment no longer in use.¹⁷ By 2013 Ricoh collected all toner cartridges for re-use.

*University of Canterbury eDay – 2008*¹⁸

The first University eDay was held on October 8th and 9th, 2008. Organised by Facilities Management, Canterbury Educational Printing Services and IT Services, nearly three full truckloads of monitors, computers, printers, cables and other eWaste were collected for ethical disposal and/or recycling.

The collection greatly exceeded organizers' expectations with a bewildering array of computer related equipment emerging from the depths of the many

¹⁶ Email from Kate Hewson to Agnete Gundersen, 16 February 2012.

¹⁷ Kate Hewson, 'Recycling scheme expanded to reduce campus waste', (Chronicle 30 May 2002), p. 6. <http://www.comsdev.canterbury.ac.nz/chronicle/2002/37-08.pdf>. Accessed on 6 February 2012.

¹⁸ These sections on eWaste were written by Karl Ashton of UC's ITS department.



Colleges and Service Units that participated. Many items were very old indeed and some even harked back to a much earlier mainframe driven computing environment within the University of Canterbury.

Working through RemarkIT Solutions, the University was fortunate to be able to work in with the Christchurch wide eDay held in October of that year.

Most of the eWaste from the University event was shipped to Singapore, where a fully accredited plant deconstructed the equipment into reusable or recyclable parts, including the extraction of copper, gold and other valuable metals.

eWaste Disposal Service – 2009

The 2008 eDay provided UC the opportunity to have a 'spring-clean' and to remove eWaste dating back to the 1980s. Although highly successful, this event was logistically expensive to continue as a yearly exercise. Consequently, a splinter group of the UC Sustainability Office (the now defunct IT Sustainability Group) took the initiative to address the growing interest in managing eWaste at the University.

In 2009 the eWaste Disposal Service was drafted by Karl Ashton with the intent of coordinating the required information and logistics to manage the various UC service units and contractor involved. In contrast to the 2008 eDay, the objective of this pilot was to operate small regular collections of eWaste to be passed to a local recycler for ethical disposal and/or recycling.



Learning Resources Technical Support was an intermediary to the service. This was in part to ensure there was a level of consistency with the operation; ensure relevant IT asset information was recorded against Financial Services' fixed asset records; ensure OLA's and SLA's were met with Distribution Services and the external recycler; ensure IT equipment had been data sanitised to their guidelines; and, provide the opportunity to reuse parts elsewhere on campus to support the non-warranty repair service of their IT workshop portfolio.

Service delivery was designed and motivated by several external influences, including the guidance outlined in the NZ Ministry for Environment, *ICT Guidelines Environmental Sustainability OCT 2007* (Retired document).¹⁹

IT Recycling Service – 2014

With the eWaste Disposal Service successfully piloted within Service Units and participating Colleges, service rebranding and greater support and cooperation from all Departments has finally been achieved. This cooperation has allowed IT Services to manage computing equipment across the UC more effectively by providing improved hardware life-cycle management. That is, re-



¹⁹ NZ Ministry for Environment, *ICT Guidelines Environmental Sustainability OCT 2007*, Section: Obsolescence and spare parts, Guideline 2.9: Require spare parts and service to be available for the expected life of the equipment. Require information on the expected life of the equipment.

deployable equipment is retained and refurbished to be utilised elsewhere on campus; and, equipment no longer meeting business function is processed appropriately and finally channelled through our nominated recycler.

Current Situation

Overview of the System

The University of Canterbury's current waste system includes four prominent waste streams that face 'outwards', and for which we are well recognised: co-mingled recycling, organics, paper and landfill. However, in addition to these four there are many other waste streams that many users of the university campus would not be aware of. These include polystyrene, cardboard, document destruction, batteries, light tubes, metals, hard fill (concrete), dry waste (including mainly wooden items), ewaste and landscaping waste.

Overview of the waste profile – 2013

Figure 1 shows UC's 2013 waste profile by weight. The largest portion of this profile is from coal ash (26 per cent of the total), followed by co-mingled recycling (19 per cent) and landfill (17 per cent).

Figure 2 shows this profile not by weight but by cost. The costliest part of our waste stream is landfill (30 per cent of the total cost), followed by coal ash (18 per cent) and co-mingle (18 per cent). It is noteworthy that the cost of landfill is so high given that it accounts for only 17 per cent of the tonnage.

It is worth pointing out in addition to this that whereas dry waste accounts for only 6 per cent of the waste by weight, it accounts for 12 per cent of the cost. The

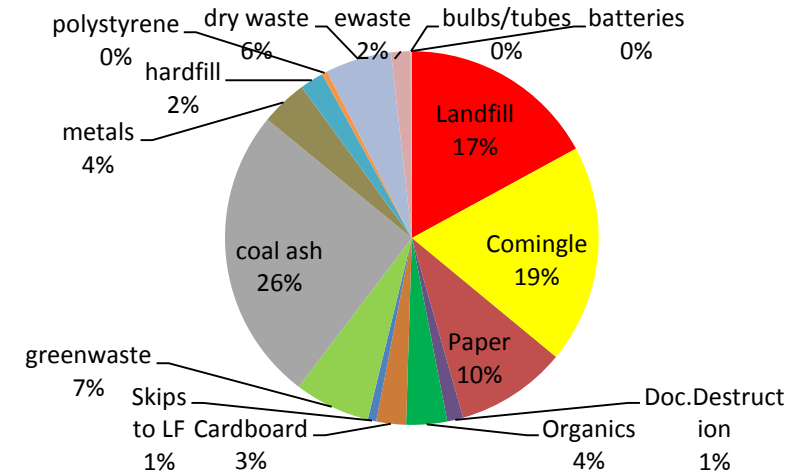


Figure 1: UC Waste Profile by Weight

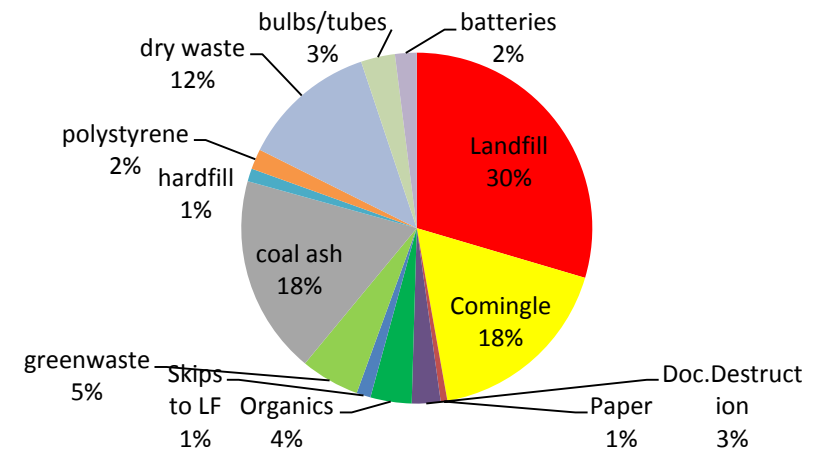


Figure 2: UC Waste Profile by Cost

opposite is true for cardboard and paper. These are 3 per cent and 10 per cent of the total weight, respectively, but only 1 per cent of the total cost collectively.

Metals currently account for 4 per cent of the total tonnage, but this is sold on and effectively becomes income. It is possible that the same could be true for other parts of the waste stream in time (for example through the on-sale of compost produced on site).

Figure 3 aggregates the waste streams into either waste that we have diverted from landfill, and waste not diverted from landfill. In 2014 74 per cent of UC's waste was diverted from landfill (1079 tonnes). This figure includes coal ash, which is complex (as discussed below).

There are many ways of reading this data, and these different ways will affect the strategies designed around dealing with the waste stream. This UC Waste Plan takes the following variables into account: weight, cost (actual and cost per tonne), landfilled or not, distance the items travel to be disposed of and toxicity using a very simple matrix (see Figure 4). The higher the rating the better that item is performing against the various indicators. **Looking at each of these variables it is obvious that the areas that need the most work are landfill, co-mingle and coal ash.** It also seeks to reflect the values encapsulated in UC's definition of sustainability: 'The fair, equitable and defensible use of physical and human resources which leaves an appropriate legacy for future generations.'

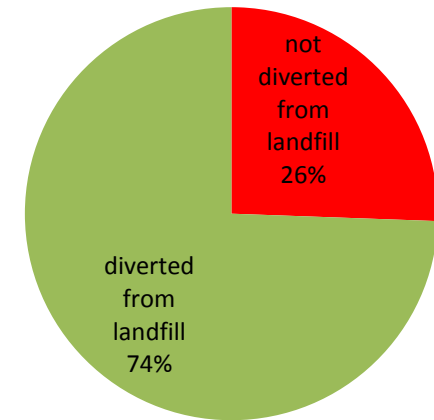


Figure 3: Proportions of UC Waste going to Landfill

Weighting UC's Waste

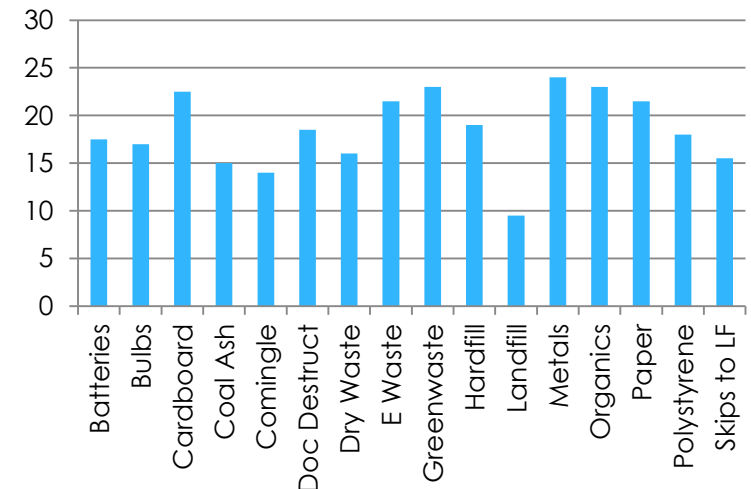


Figure 4: UC's Waste Stream weighted against various indicators

Issues with the current system

Coal Ash

At present UC's coal ash is distributed around one of Christchurch's race courses. Because it isn't being landfilled this has been regarded as a suitable solution to what would otherwise be a very large contribution to the landfill. However, it is far from certain that this really is an acceptable solution. Coal ash can be a very toxic substance, and as a result of a recent spillage on the Dan River in North Carolina, the American Environmental Protection Agency is considering introducing regulations around its storage and disposal. While this is not currently affecting legislation in New Zealand, it points to the fact that spreading this coal ash on soil for years on end is not good environmental practice. The inevitable turn from coal to a more sustainable form of heat provision at UC will resolve this issue in time²⁰; in the meantime a better form of disposal should be investigated.

Recycling Reversals and Coffee Cups

A separated waste stream allows for more improvements to be made within each stream. It had been hoped that gradually more items would be moved from the landfill category into the recycling category as technology improved. However, the reverse appears to be the case. This has been driven not by technological innovations but a booming market in recycling in overseas markets. The result of

²⁰ The problem of coal ash is another driver for the Carbon Zero 2050 vision for UC.



Takeaway cups: icon of the waste system

this has been that these buyers of recyclable materials have become increasingly choosy about what they are prepared to buy, and are understandably opting for those materials that will give them the highest return. Lower grade plastics, mixed materials and paper products with plastic or wax finishes are therefore being rejected.

For UC the iconic product that represents this conundrum is the takeaway coffee cup. Originally these cups, and their lids, were recyclable. However, due to changing needs in overseas markets the cups themselves are now no longer accepted. The University's waste services provider informed UC of this change in mid 2013 and an extensive communications process kicked in to get the message about the change to the wider campus community.

Through this process the Sustainability Office concluded that an estimated minimum of 250,000 takeaway cups are sold on campus per annum.²¹ At 11 grams each this equates to 2.7 tonnes of additional waste going to landfill. It must be remembered that the additional disposal cost of sending cups to landfill is less than \$1000. However, the risk to the University in not keeping co-mingled waste suitably clean could run into tens of thousands of dollars given the fact that should this be rejected by the end point buyer because of contamination originating at UC, an entire container load could be sent back at our expense.

²¹ Noting that actual sales figures are commercially sensitive.

Coffee cups are anticipated to be only the first of many 'recyclable' products that will actually revert to 'landfill'. UC has already been warned that products such as plastic packaging for food are likely to become landfill items in the very near future. Because landfill is one of the most expensive components of our waste stream (and will only become more expensive), UC needs to be future proofing itself against such reversals.

Public Information

In 2012 the Sustainability Office rolled out a new colour coded public information package across the whole campus. This was considered to be leading edge at the time and made it as simple as possible for bin users to know where to dispose of each item. However, in 2013 the information needed to be corrected to take account of the coffee cup change. This required redesigning the stickers and relabeling thousands of bins and posters. By April 2014 this re-stickering was still not completed, because there were inadequate back-end resources to do this job efficiently. It was estimated that the whole re-stickering and re-postering project cost around \$10,000 (including labour). Using the current information system, and given the changes we can anticipate are coming, this expense may become a two-yearly requirement.

The drive for biodegradable

UC Waste Watchers Please Recycle



Recycling *Please empty containers of all food and liquids first*

- Coffee Lids
- No Coffee Cups
- Plastic Bottles
- Glass Bottles
- Cans
- Tins
- Sushi Containers
- UCSA Sandwich Packs
- Plastic Food Containers
- Plastic Carrier Bags
- Yoghurt Potties
- Plastic Plates
- Milk Bottles
- Cardboard Potties

Organics *Please remove all packaging first*

- Fruit and Peels
- Tea Bags
- Sandwiches
- Cakes
- Meat
- Coffee Grounds
- Cut Flowers

Paper *Clean paper only please. Leave cardboard and pizza boxes next to bins*

- Clean Paper
- Envelopes
- Newspapers and Magazines
- Books
- Course Readers
- Exercise Books
- Cardboard Packaging

Landfill *Anything else that can't currently be recycled*

- Coffee Cups (recycle lids)
- Polystyrene
- Soiled Paper
- Coffee Stirrers, Chopsticks and Disposable Cutlery
- Terrapaks
- Plastic Food Wrap
- Foil Food Wrap

eWaste, Toner Cartridges, Batteries and Postage Items. There are specific collection points and procedures for these items. Please see the website for how to recycle these items. For more on recycling and waste go to www.sustain.canterbury.ac.nz/waste

Revised Waste Watchers poster (2013)

Both café providers on campus have in the past been part of the Waste Working Group, and have said they are committed to offering biodegradable cups and plates to their customers. The University has asked them all not to do this until those cups can be composted (currently this is not an option because the composting plant our waste services provider takes organics to cannot decompose these items).

Ultimately, however, UC will need to take compostable packaging, both because of consumer demand and also to keep costs down. Some universities internationally are starting to pull together their biodegradable waste streams and generate compost that can either be applied to grounds (especially edible garden projects), or sold for a profit.

The shift to biodegradable and/or compostable packaging is a key opportunity for closing the waste/resource loop at UC. A trial with Selwyn District Council using their HotRot system is being conducted in 2014, organised by the Sustainability Office.

Electronic equipment

There appears to be scope for reputational enhancement through the creation of a formal gifting programme for retired but still usable computer equipment.

Options for charity gifting are currently not available with the existing resources and funding. Legislative changes and existing NZ Acts of Parliament may restrict or prohibit sustainable or workable initiatives.

'Waste Watchers'

As a result of Sharon McIver's 2011 report 'The Revelations of Rubbish', a decision was made to overhaul the signage for the four publicly facing waste streams of landfill, co-mingle, paper and organics. A fixed term position of 'Waste Reduction Educator' was created to oversee this process and to develop community engagement events that would bring attention to waste issues on campus and encourage people to be more careful about which bins they used. Collectively, this bundle of work evolved into a programme called 'Waste Watchers'. The Waste Education Coordinator position was terminated in 2012 due to funding constraints.

Public Information

An upgrade of information posters and bin labels was rolled out across the whole campus early in 2012 which included images of items to be placed in different bins. Each waste stream was branded with its own bright colour (see Figure xx). This removed much long-standing confusion about where certain items should go (takeaway cups being the classic example of this).

Bin Hoods

The bin hoods were changed from grey hoods with a large hinged flap (which was universally disliked by users as it was often grimy) to colourful hoods with open slots. Each colour related to one of the four waste streams and matched the new stickers.



Interior rubbish bin stacks (2012)

Events

Several events were run during 2012 under the banner of Waste Watchers, including a stream clean-up, a waste free market and, most famously, a fashion show called 'Eco Runway' which promoted upcycled, recycled, and sustainably made clothes. Two hundred people attended the show. The show took the message about waste to a new audience and garnered national media attention.

Eco Office Programme

The Eco Office Programme was launched by the Vice Chancellor in 2011 and is aimed at assisting office staff to improve their practices around sustainability, and to make this engaging and fun. The programme is intended to legitimise discussion about sustainable practice within the office environment, where office politics can sometimes preclude such discussions taking place. One of the main strands running through this programme is waste.

The Waste Working Group

The Waste Reduction Educator established a Waste Working Group in 2011 to help improve coordination of waste reduction efforts across the campus, and to share information. Members were from



Modelling op-shopped clothes at Eco Runway (2012)

the University of Canterbury Students' Association, Café 101 and Cleaning Services, and sometimes included representatives of the University's primary waste services provider, Mastagard. As well as resolving certain operational details as they arose, the Waste Working Group also aided the development of the waste component of the ten year Sustainability Strategy, 2012-2022.

Increased Community Awareness

The University student community has been surveyed since 2011 on its attitudes, knowledge and beliefs about sustainability. The 2011 and 2013 surveys each also asked for awareness of specific UC sustainability programmes, including the waste system. Knowledge of this has increased in that time from 81 per cent to 87 per cent, and those who actively use this have increased from 49 per cent to 65 per cent, which indicates that the work of the Waste Education Coordinator made a substantial difference.



Promotional poster for Eco Runway (2012)

Earthquakes and the Waste Profile

The Sustainability Office has noted significant increases in volumes and costs associated with UC's waste stream post-earthquakes. The graphs to the side show increases of landfill and waste diverted from landfill by weight and cost.²² This equates to a 17 per cent increase in weight and a 22 per cent increase in cost for landfill and a 39 per cent increase in weight and a 65 per cent increase in costs for waste diverted from landfill between 2010 and 2013. The comingled recycling component of this waste diverted from landfill has increased 39 per cent by weight and 75 per cent by cost in the same period. Some of the differences in cost can be accounted for by changes in the rates charged, but mostly they are the result of an increased waste stream.

One reason for the increase is that post-earthquakes UC has taken on the majority of the UCSA's waste stream since the UCSA and some of its services have shifted into the new 'Undercroft' space in the James Hight Library.

Another reason is that large numbers of staff have been required to shift offices at short notice so that their buildings can be remediated.

It should be stressed that these figures do not reflect construction waste from any building demolition, or dry waste such as furniture coming out of buildings.

²² Landfill here refers to both standard wheelie bins and skips to landfill. Waste diverted from landfill here refers to comingled glass/plastic/cans, paper, document destruction, organics and cardboard. It does not include coal ash.

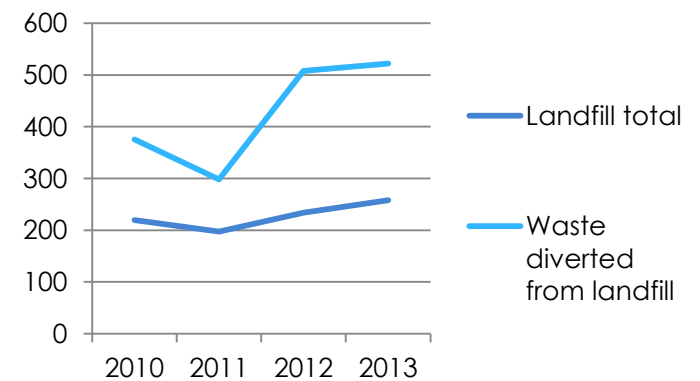


Figure 5: Waste destination, 2010-13 (in tonnes)

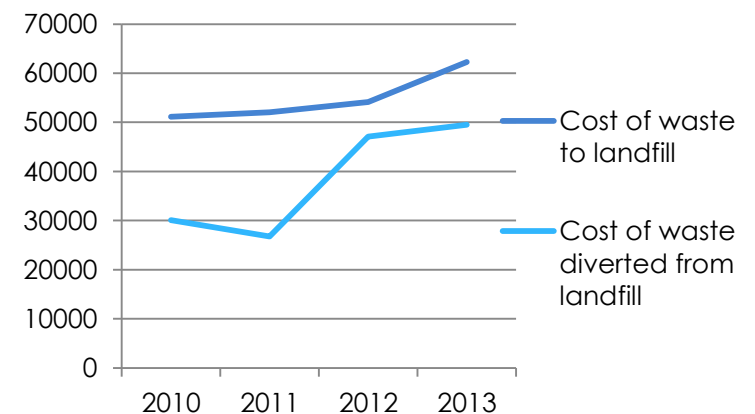


Figure 6: Cost of UC's Waste, 2010-13 (in NZD)

Waste Analysis

Waste audits of various sorts have been undertaken at UC since at least the 1990s. The images on the right show a fairly large scale audit undertaken in 2002.

2010/11

The first detailed study of UC's waste stream was undertaken by Sharon McIver in 2010/11 and was completed just prior to the February 22nd earthquakes. She found that 'whilst the organics and paper recycling system is generally working well, there is some evidence to suggest that the landfill bins are still being used more than the general recycling bins for items that are recyclable. This is borne out by the fact that there were far more landfill bags collected than general recycling bags... and that the total amount of recyclables found in the general recycling bags was less than those found in landfill.' Paper and coffee cups were the main items found during this audit.

McIver also itemised the specific landfill items most commonly contaminating recycling (and vice versa) and this information informed the design of the new stickers and posters.

The full report can be found here:

http://www.sustain.canterbury.ac.nz/documents/UC_Waste_Audit_2011.pdf.



2014

The 2014 Waste Audit, conducted through the Sustainability Office has revealed good progress in some areas and some challenges in others.

- Contamination of co-mingled recycling appears to have dropped from 35% in 2010/11 to less than 20% in 2014
- Paper recycling is highly successful in the office environment (100% clean in the History Building) but is contaminated in more public spaces. There are significant collection issues associated with this.
- About 20% of co-mingled recycling currently collected is actually being incorrectly sent to landfill.
- 12-30% (depending on location) of the contents of landfill bins are composed of organics. For the UCSA production kitchens contamination or landfill with organics is more than 50%.
- The most significant (by weight) recyclables being incorrectly deposited in landfill bins in the most public areas are, in order, food containers, glass bottles, plastic bottles and cans/tins.

Recommendations arising from this include:

- Enhanced education campaigns around the most important contaminants
- Attention to problems of collection (potentially more training is required)
- Training of UCSA staff about correct use of landfill and organics bins.



Contaminated landfill bag from UCSA production kitchen



Contaminated landfill bag from the Undercroft

- Address the cost model used to charge the UCSA for waste collection.

Improvement Options

The 2014 waste audits have revealed a number of immediate areas for improvement. Fortunately these can be attended to immediately. As discussed in the earlier sections, however, there are also a great many opportunities for reducing UC's solid waste impact that will require some system changes and should be phased in over time. The following sections outline the changes envisioned by the units involved in developing this plan in short, medium and long term increments.

Reducing landfill, coal ash and co-mingled recycling

There is an urgent need to both reverse the trend towards ever higher rates of landfill produced by UC observed in 2013. This is an extravagant way to deal with waste and is the result of a range of factors that need to be handled collectively (see below). Likewise, while coal ash is not going to reduce in the short or medium terms, we need to know that we are on a pathway towards phasing this out. Again, it is a very costly component of the total waste system. Co-mingled recycling presents risks around end-point buyer reliability. Increasing co-mingled recycling should not be considered a goal because it is expensive, it involves significant carbon emissions, and is unreliable. **UC should be looking to close the waste loop, and this will ultimately demand a completely different way of looking**

at material use. By 2022 UC should be at a point where this new perspective is beginning to be enacted in university systems.

	Short term (2014-2015)	Medium term (2015-2018)	Long term (2018-2022)
Coal Ash	Develop EOI for a Zero Carbon strategy. Investigate beneficial options for coal ash disposal	Develop Zero Carbon Strategy, and consider waste stream associated	Develop waste plan associated with alternative heat provision (potential composting).
Landfill	Work on reducing contamination of landfill by recycling and organics. Set target of 10% reduction in landfill across UC.	Enact target of 10% reduction in landfill across UC	Revisit target and revise as appropriate
Co Mingle	Work on reducing contamination of recycling by	Enact target of 10% reduction in co-mingled	Revisit target and revise as appropriate

	landfill and organics. Set target of 10% reduction in co-mingled recycling across UC (by increasing compostable stream)	recycling across UC (by increasing compostable stream). Investigate washable/reusable plates, cups and cutlery system.	
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Increasing compostable material use

Just as some components of the waste stream present considerable risks and can be very costly, others present opportunities and may be cost neutral or even generate an income. The organic waste stream is certainly one of these areas, and is made up of several components. With new procurement practices, for example the phasing out of polystyrene packaging and its replacement with more modern cardboard packaging options, or biodegradable packaging beads, this component will increase. **A shift to more biodegradable products on campus will shift our focus from one of minimising an inevitable negative environmental impact to one of enhancing the world around us.**



Food grown on UC Waste, Dovedale Community Garden (2014)

Furthermore, it should be noted that the Okeover Community Garden has demonstrated for eleven years that composting some campus waste and using it to grow vegetables for students and staff is an effective method of dealing with waste. There is a growing movement on campus and throughout the Greater Christchurch Region towards re-localising the food system. This is now being supported through city council by the development of a Food Resilience Policy, underpinned in the multi-agency Natural Environment Recovery Programme for which Environment Canterbury is the overall lead agency. There is considerable opportunity for expanding the community garden experiment to a whole of campus edible landscape approach utilising compost on site.

A report produced for the Sustainability Office in 2013 outlined options for large scale bokashi composting of organic waste and evaluated two small scale pilots (2010 and 2012).²³ The outcomes of this report should be considered in long-term planning for organic waste at UC.

	Short term (2014-2015)	Medium term (2015-2018)	Long term (2018-2022)
Takeaway coffee cups	Trial composting of current cups at Selwyn DC. Trial	Establish more bins for cups around campus and start	Trial bins for compostable cups, plates and

²³ Ting Powell, 'On-Site Composting at the University of Canterbury' (UC Sustainability Office, University of Canterbury, 2013), http://www.sustain.canterbury.ac.nz/summer/Onsite_Composting.pdf

	'cups' bins in key locations on campus. Continue promoting discounts for people bringing own cups.	moving to compostable cups.	other compostable café consumables.
Grounds waste	Continue chipping waste and sending to be composted off site	No change	Explore business case for on-site composting of this material, with other compostables gathered as practicable.
Organics	Interventions in Undercroft and UCSA required to separate out organics from landfill.	Target of <10% contamination of landfill by organics by 2016 reached in Undercroft and UCSA kitchens. Options for high	Explore business case for on-site composting of this material, with other compostables.

		visibility worm farm etc attached to a café.	
Packaging	Work with procurement to identify options to reduce non- recyclable or compostable packaging (esp polystyrene), and increase compostable packaging use.	Eliminate polystyrene use by café vendors and materials suppliers (eg IT equipment) as much as possible.	Explore business case for on-site composting of packaging materials, with other compostables gathered as practicable.
Edible Campus	Embed the idea of creating an edible campus, through the Landscape Plan and through the Campus Master Plan.	As practicable, expand on-site composting opportunities (for examples worm bins at the UCSA cafes), and redistribute	Continue to expand this programme as resources allow.

		through gardens.	
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Enhancing our waste and recycling education programmes

UC has been a leading light in Australasia with its waste education programmes. With earthquake disruptions these have understandably suffered in 2013 and 2014, but it will be possible to reclaim this ground. **There are many opportunities to collaborate with our waste services provider to enhance the education programmes we already have in place and to develop new ones.** A part-time position within the Sustainability Office focussed on this work will give coherence to the programme and is suggested here as a target for the medium term.

	Short term (2014-2015)	Medium term (2015-2018)	Long term (2018-2022)
Signage	Maintain existing signage	Establish a visible 'waste station' in a central part of campus – with additional signage and information	Duplicate this in other busy parts of campus. Signage will need to be redeveloped to match innovations
Events	Focus on waste during Eco Week 2014.	Large scale waste event held, potentially as part	A waste free event as part of O Week, in collaboration

		<p>of Eco Week 2016 (eg Eco Runway). Could be in collaboration with Envirowaste. Support for staff and students wanting to run waste free events is offered and supported by the Sustainability Office.</p>	<p>with UCSA, becomes an established part of business as usual. Waste free events are run by student clubs and staff as business as usual.</p>
Public information	Public information maintained.	Reporting back to the UC community on its waste performance on waste station and through formal UC channels.	
Audits	Waste audit completed in 2014	Audits in Undercroft and	University-wide waste audit

		UCSA kitchens routinely undertaken annually with support from Envirowaste	undertaken in 2018
Coordination	Limited coordination of waste reduction efforts by Sustainability Office, with Cleaning Services	Limited coordination of waste reduction efforts by Sustainability Office, with Cleaning Services	Employ part-time coordinator.
Staff education	Recommence drive to educate staff (office and cleaning) about how to dispose of office waste.		

Procurement changes

As mentioned above, the key to reducing our waste is in restricting what we purchase, and being more rational about the choices we make. Projects that reduce overall usage of particular products (as CEPS has achieved spectacularly with paper reduction) are crucial, but we will also need to look more closely at all products and product packaging for sustainability credentials.

	Short term (2014-2015)	Medium term (2015-2018)	Long term (2018-2022)
Policy		Give effect to the sustainability component of the Procurement Policy	
Guidelines for non UC vendors on campus	Draft guidelines for sustainable packaging at UC for non UC vendors	Work with vendors to find alternatives to particular forms of packaging (eg polystyrene)	Foreshadow a ban on particular forms of packaging, such as polystyrene.

IT Recycling

IT Services has alerted the university to the fact that electrical, and especially IT equipment, is still an elephant in the room. Enormous progress has been made by

IT Services over the last five years in attending to electronic waste, mainly computers, but the programme is still struggling for resourcing and the current policy regarding charity gifting may be worth revisiting. A policy needs to be in place for all known disposal paths of electrical, electronic and computer waste. There are many stakeholders to be consulted in this process, including Finance, ITS, Policy Unit, Sustainability Office, Distribution Services and Marketing.

	Short term (2014-2015)	Medium term (2015-2018)	Long term (2018-2022)
IT Recycling strategy	Identify key stakeholders	Service improvement. Identify and mitigate Risks around all electronic and IT equipment disposal.	Revisit policies and practices on all disposal paths of electronic and IT equipment.
IT Asset Management	Second phase of IT Asset Management Completed	Asset Tag all IT Desktop and Mobile Computers. Coalescence of IT Asset Data with	Centralised IT Lifecycle Management and Reporting.

		the IT Recycling Database providing process improvement.	
IT Procurement	Identify key stakeholders and IT Procurement Risks	Service improvement and reporting. Mitigate IT Services Risks around IT Procurement	Revisit Policies and practices around all IT Procurement.

Re-use Programme

As mentioned, the decanting process is driving landfill and recycling costs up sharply and there is scope to bring this down. The Sustainability Office is experimenting with a re-use programme associated with the decanting process for buildings. A trial audit has determined that for one building (Geography), 67% of items placed in a special bin for 're-use' were actually reusable (and a further 21% were recyclable), and could be placed on 'free tables'. A policy decision regarding re-use of materials on campus (or disposal to charity gifting or on-selling) will be required, and the Sustainability Office is developing a discussion document clarifying what kind of approvals and under what conditions would be



useful for the different kinds of materials currently being disposed of.

	Short term (2014-2015)	Medium term (2015-2018)	Long term (2018-2022)
Redistribution of items surplus to requirements	Trial re-usable bins in buildings being decanted.	Develop a robust back-end system for redistributing reusable items.	Re-examine policy decision on gifting (or sale) of items deemed surplus to requirements.

Monitoring and Review

This Plan will need regular reviewing and monitoring. Aside from on-going visual bin inspections and 2 yearly audits of the bins, and normal review of the data received from the waste provider, a review of this Plan should also be conducted every two years to ensure it is on track and, if not, to recalibrate it as appropriate.

	Short term (2014-2015)	Medium term (2015-2018)	Long term (2018-2022)
Monitoring and Review	Continue monitoring using Mastagard stats and ad hoc inspections of bins.	Review the Waste Plan in 2016 and 2018 to assess progress and recalibrate as necessary. Conduct audit in 2016 and 2018.	Review Plan in 2020 and 2022 to recalibrate and set new targets as appropriate. Conduct audit in 2020 and 2022.

Next Steps

This plan has outlined what needs to be done in order for the University of Canterbury to achieve its goals of reducing waste and becoming more environmentally friendly.

It is important that the specific directions and general principles contained in this Plan feed into both the immediate remediation works being undertaken (for example expanding the re-usable items bins as buildings are decanted), and also the future-focussed Campus Master Plan.

As with the other two plans in this series from the Sustainability Office, there will almost certainly be a need for specialist advice regarding implementing the ideas contained in this Plan. Waste can only be effectively addressed as a systems issue, therefore someone will need to be engaged to keep an overview of the whole system. It may be appropriate to engage an external consultant to do this work. Otherwise, someone internally will need to be assigned to this work.