

# **University of Cambridge Waste Strategy 2019-2023**

## **Introduction**

This Waste Strategy provides a framework to set out how the University will meet its aim ‘to minimise and actively manage waste through elimination, reduction, reuse and recycling’. It sets out the rationale for an increased focus on effective waste management across the University, the University’s aspirations on waste management, and strategic focus areas for action.

## **Rationale for a waste strategy at the University of Cambridge**

The University of Cambridge generates over 10,000 tonnes of waste every year<sup>1</sup>, equivalent to just under 1 tonne for every member of staff. There is a strong case for managing this waste output in an environmentally sustainable way, for a number of reasons:

### **There are financial opportunities presented from managing waste effectively.**

There are many opportunities afforded by managing the University’s waste effectively. Waste disposal (excluding construction waste) costs the University over £1.4M per year, and there are much broader financial and environmental costs associated with purchasing, transport, storage and disposal of resources and waste. Shifting to a ‘circular economy’ model presents opportunities for recovering value from the University’s resources and waste, increasing efficiency, and driving innovation.

### **Waste management is as a key sustainability issue for staff and students**

Waste and recycling is the leading environmental sustainability concern of staff at the University of Cambridge. A 2018 survey found that 92% of staff consider waste disposal as the top environmentally-conscious choice they make in the workplace, far above other issues such as purchasing (71%) or travel (63%). Staff also cited waste recycling and resource reduction initiatives as the top ways they would like to see their workplace become more environmentally-friendly. This sentiment was also reflected in two surveys of staff volunteers working on environment and energy issues in their departments, who specified waste and recycling issues as the environmental issue they would most like to tackle. Students have also highlighted recycling as an issue, with 74% feeding back that they felt recycling infrastructure in their department was inadequate.

### **Waste management is a significant and growing environmental issue**

Half of the waste in the world isn’t collected, treated or safely disposed of. While developed countries such as the UK have relatively good waste management practices, recent events have exposed the interconnected nature of global waste markets, and the reliance on developing countries as a destination for recyclable waste. Meanwhile unsustainable levels of resource consumption and disposal threaten the ability of the world to manage its resources in a way which is both in keeping with the delivery of the Sustainable Development Goals (SDGs), and which prevents far-reaching and lasting effects on global ecosystems, in particular the oceans.

### **The University seeks to provide academic leadership on the issue of waste management.**

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<sup>1</sup> Based on average for 2015-2018

The University of Cambridge's academic community has recognised the issue of waste as a global issue of research importance. The Cambridge Institute for Sustainability Leadership and the Institute for Manufacturing are both involved in research relating to waste management and the circular economy, while the formation in 2018 of the Centre for Circular Economy Approaches to Eliminate Plastic Waste (CirPlas) is another demonstration of the prominence of these issue. It is therefore important to ensure that the University's practical performance is sufficient to ensure no detriment to the University's ability to act as a thought leader on the issue.

### **The University has a legal responsibility to manage waste effectively**

The University has a legal responsibility<sup>2</sup> to ensure that any waste removed from the University premises is stored, transported and disposed of without harming the environment. This is called the 'Duty of Care'. Part of the Duty of Care is a commitment to the principles of the 'waste hierarchy'. Managing waste in accordance with best practice ensures a reduction in the likelihood of enforcement-related costs or fines to the University, as well as associated reputational damage.

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<sup>2</sup> Under the Environmental Protection Act 1990

## The current picture

In 2015 the University committed to specific targets relating to waste management, as part of its Environmental Sustainability Vision, Policy and Strategy. As well as an overarching aim 'to minimise and actively manage waste through elimination, reduction, reuse and recycling', it also set out three targets:

- To send zero non-hazardous waste to landfill by 2020.
- To achieve continuous year-on-year reductions in waste arising per FTE staff & student.
- To recycle at least 95% of total waste produced at the University by 2016.

These waste targets will be reviewed as part of the update to the Environmental Sustainability Vision, Policy and Strategy in 2020. Below is a summary of progress against the existing targets, and factors influencing their achievement.

Key Performance Indicator	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Waste sent to landfill (tonnes)	2090	1507↓	2030↑	2448↑	2201↓	409↓
Waste mass generated per FTE staff and students (tonnes/FTE)	0.32	0.25↓	0.27↑	0.28↑	0.68↑	0.18↓
Percentage of waste generated that is recycled or composted (construction and non-construction waste) (%)	73%	78%↑	75%↓	71%↓	83%↑	67%↓

## Factors influencing waste to landfill target.

Significant progress has been made following the appointment in 2016/17 of a new principal contractor for the University's non-hazardous commercial waste, which diverts the University's non-recyclable commercial waste from landfill to 'energy from waste' plants. This change can be seen in Figure 1.

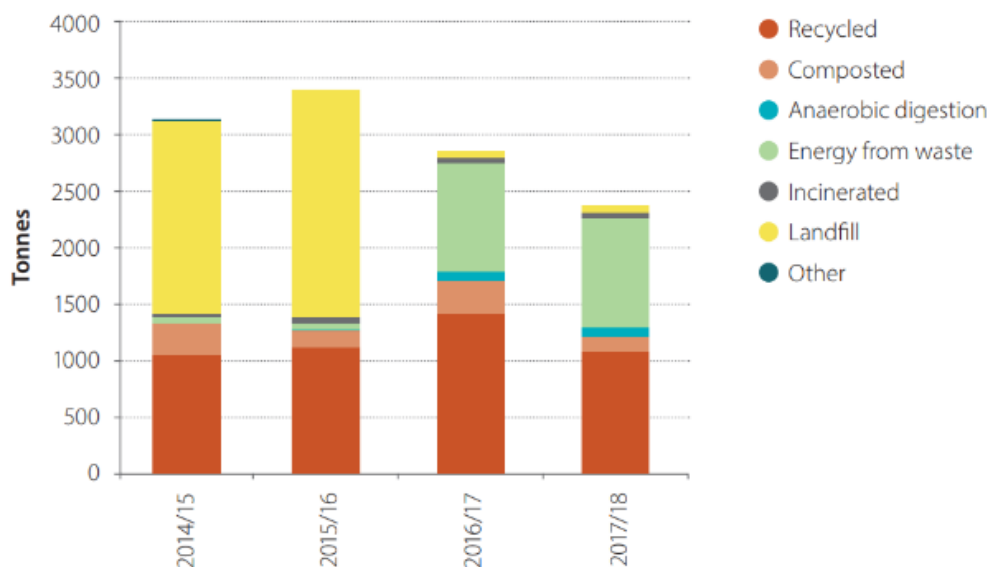


Figure 1. Waste disposal methods for operational (non-construction) waste, 2014-2018

Figure 2, right, shows that a wide variety of waste streams are produced by the University, each requiring different treatment methods. It's clear that the majority of the remaining waste to landfill results from construction waste outputs.

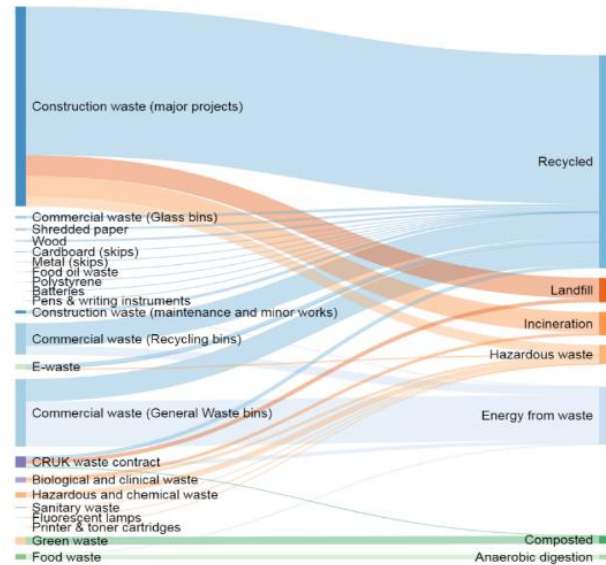


Figure 2. Waste streams produced at the University of Cambridge, and

### Factors influencing waste per FTE target

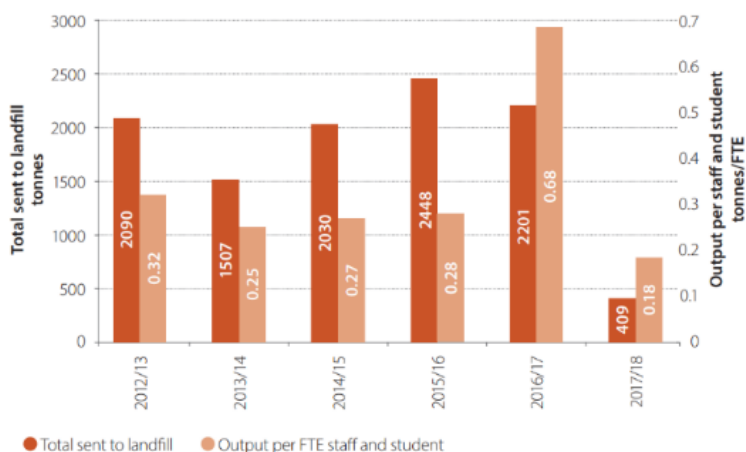


Figure 3. Waste outputs per FTE from 2014-2018, and total waste to landfill

Waste produced per head of staff and students is strongly influenced by significant variations in construction waste outputs from year to year. As a result, it is difficult to discern trends in this performance metric over recent years (see figure 3). Improvements in the measurement of waste outputs in the past 2 years will, however, help monitor performance going forward.

### Factors influencing recycling target

Recycling rates have varied from year-to-year and are strongly influenced by the performance of the University's waste contractors in sorting, processing and moving on the University's waste to appropriate recycling facilities. This is in turn influenced by economic, policy and technological factors from the regional to the global scale, which affect the viability of recycling certain waste streams.

The University's ability to recycle is also influenced by the nature of the waste it produces. Figure 5, below, shows results of an audit of the University's trade waste bins. This

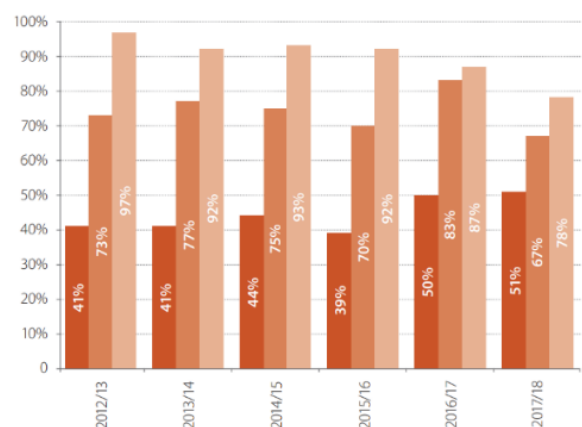


Figure 4. Recycling rates from 2014-2018 (dark = operational, light = construction, medium = total)

shows that a large proportion of our waste is not commercially recyclable (particularly in the form of non-hazardous laboratory wastes), which limits the potential for increasing recycling rates further. The diagram also demonstrates that commercial waste bins are often contaminated with incorrect wastes. Audits of the University's waste have demonstrated that a large amount of waste placed in general waste bins could have been composted or recycled, while a smaller proportion of waste placed in recycling bins was not recyclable.

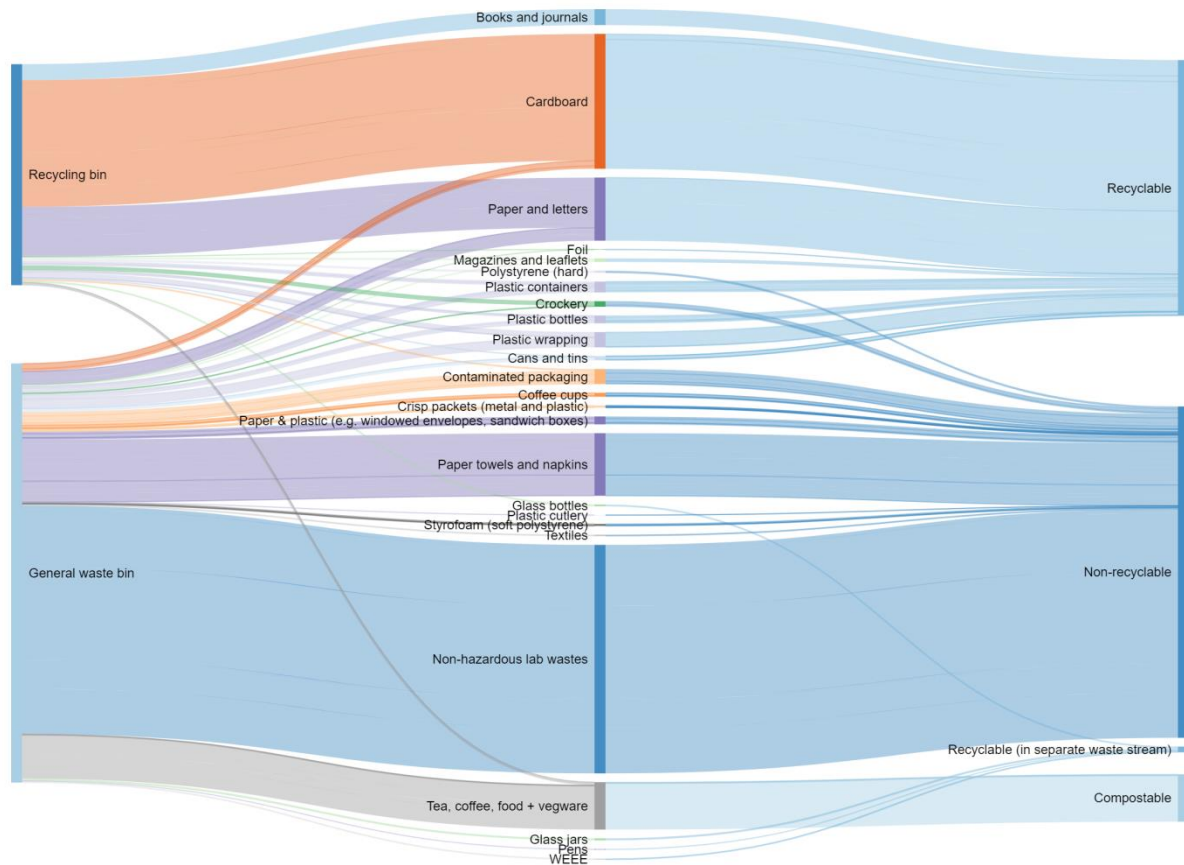


Figure 5. Composition of the University's trade waste bins, whether they are deemed recyclable (as of 2018) and which bin they were placed in

## **Guiding Principles**

To support the delivery of the University's waste management aims, the following guiding principles have been developed. These set out the standards and approaches that staff should take when managing the University's resources, and the practices and policies which should be adopted by University departments, faculties and institutes to support these.

### **Guiding Principle 1 – Eliminate and reduce waste at source**

Elimination of waste means reducing the amount of resources which are used, and therefore minimising potential sources of waste. All staff should be empowered to challenge unnecessary waste, and to work with colleagues to reduce our overall need for, and consumption of, disposable resources. Suppliers should be actively engaged to assist the University in reducing its waste at source. Actions which can be taken by University departments to help eliminate and reduce waste include:

- Reducing unnecessary or excess purchases, for instance by careful stock control.
- Purchasing items which have a longer useful life (avoiding 'single use' items, for instance by preferring items which are refillable, reusable, rechargeable or more durable), or by using items which generate less waste at the end of their useful life (for instance by minimising packaging and consolidating orders).
- Simple changes to policy (opt-ins for lecture handouts, default duplex printing, eliminating disposable plastic cups and bottles)
- Awareness campaigns (for instance 'think before you print' or ongoing tracking of printer usage volumes by individual or team).

### **Guiding Principle 2 – Reuse resources**

Reuse of waste means repurposing resources prior to disposal. It can include refurbishment, reuse outside of the organisation (for instance through 'take back' schemes for packaging and other consumables), or re-use inside of the organisation (for instance by providing other departments the opportunity to use items which are no longer required but which retain value in use). Section 18.6 of the University's financial regulations state that "goods and services may be purchased externally only if they are not reasonably available elsewhere within the University". It should therefore be standard practice for all staff to seek internal sources of resources, and to ensure that all resources which are in a usable condition, or are economically repairable, are prevented from being disposed of as waste. Actions which can be taken by University departments to help reuse resources include:

- Planning refurbishments, clear-outs & furniture purchases well in advance, including carrying out stock checks and audits, prioritising reuse or refurbishment where possible, and ensuring that items no longer required are placed on Warplt well in advance.
- Ensuring staff with purchasing or disposal responsibilities have access to, and are aware how to use, Warplt.
- Supplier 'take back' schemes and other re-use avenues are used wherever possible and feasible.

### **Guiding Principle 3 – Ensure waste is disposed of in a way which facilitates recycling**

Recycling of waste means turning it into a new substance or product. While almost all recycling occurs outside of the University itself by specialist waste processors, the University can play a role by ensuring that its waste is appropriately prepared for recycling, by ensuring that waste contractors are recycling as much waste as possible, ensuring that collection

infrastructure allows for appropriate separation of waste, ensuring that staff sort and separate waste correctly, and ensuring that waste contractors are used who will deal with waste in an environmentally responsible manner. Actions which can be taken by University departments which will facilitate recycling include:

- Ensuring bin colours, sizes and types are consistent, as a minimum across each building but ideally across sites.
- Ensuring awareness of recycling procedures, by the use of clear, simple, and up-to-date signage, and incorporation of simple staff inductions and training procedures on waste.
- Eliminating 'desk bins' or individual bins wherever possible, in favour of communal 'bin stations'.
- Identifying and acting on common issues such as contamination and overflow of bins.
- Ensuring cleaning and facilities staff/contractors are aware of separation and disposal procedures.
- Providing food waste collections wherever feasible, in particular in cafés and canteens.
- Identifying and providing recycling routes for alternative waste streams (batteries, printer ink, pens etc).
- Informing the Environment & Energy Section when new waste contractors are appointed.

## Strategic focus areas

Following consultation with all 6 of the Schools within the University in early 2019, and research by the University's Environment and Energy section, a set of strategic focus areas have been identified which aim to achieve the above aspirations. A set of implementation mechanisms are provided which set out areas of work to deliver against each focus area, although these are not exhaustive and may need further development over time.

### 1. Reduce purchases of disposable items, in particular those which are not easily recyclable

Feedback from departments highlighted that University purchasing procedures and mechanisms do not facilitate identification of 'sustainable' options. Meanwhile staff are unclear how to approach or engage with suppliers to encourage improvements in their performance, either through informal engagement, or through the setting of tendering and purchasing specifications. In addition, there is limited information available which facilitates the identification of 'sustainable' suppliers or products.

***Implementation mechanism: We will work to ensure that purchasing procedures incorporate consideration of sustainability issues and whole-life costing, and work with staff to support more engagement with suppliers on the topic of waste minimisation.***

There are numerous examples of departments committing to reductions in disposable items. For instance, evidence from participants in the 2018/19 Green Impact initiative highlighted that:

- 25 departments had committed to providing reusable cups and/or eliminating disposable drinking cups altogether.
- 27 departments provided facilities for re-using envelopes for internal use.
- 24 departments ensured that duplex printing was the default option.
- 26 departments shifted to providing tap water rather than bottled water for meetings.
- 9 departments shifted to recycled or sustainably-sourced paper.
- 6 departments took proactive steps to reduce hand-outs taken to meetings.
- 3 departments engaged with their suppliers to reduce the amount of packaging supplied with their products, or engaged their suppliers in a 'take back' scheme.

There is scope to build on these successes by encouraging adoption of these approaches on a University-wide basis.

***Implementation mechanism: We will deliver University-wide campaigns to encourage reductions in the use of single-use disposable items.***

Process efficiencies and changes in technology have also been shown to reduce waste. For instance, the Department of Medicine has trialled vending machines to dispense laboratory disposables. This has reduced wastage by eliminating over-ordering by staff, eliminating the problem of items falling out-of-date due to stock control issues, reduced the amount of cardboard and polystyrene boxes received in deliveries through consolidated replenishment consignments, saved over a tonne of dry ice for keeping items cool in transit, and saved £8,600 due to discounted purchasing costs compared to the University marketplace.



***Implementation mechanism: We will trial engagement with suppliers on waste reduction initiatives, and share any resulting best practices with University departments.***

## **2. Promote and facilitate internal and external reuse**

On average in 2018-19, 20 items were added to the University's internal re-use system, Warplt, every month, with 16 of these claimed internally. Since Warplt was set up at Cambridge in 2014, it has saved £40,000 per year in avoided purchase and waste disposal costs. Use of Warplt is increasing, with 31 new members of staff joining the Warplt portal every month in 2019 – a trebling of the rate in 2018. Examples include Project Light (the relocation of departments in the Gleeson Building) which resulted in £17.6k in savings to the University from re-used equipment and furniture, and the Fitzwilliam Museum's saving of £1800 by re-using surplus furniture from a project on the West Cambridge site. Departmental feedback is that the Warplt system is a valuable resource, however awareness is still relatively low in key groups of staff who have an influence. In addition, a barrier which has been identified by departments is the availability of storage to hold items awaiting disposal, as well as transport to transfer items claimed from departments in other parts of the University.

***Implementation mechanisms:***

- ***We will work to identify storage options and transport methods to support University users of Warplt.***
- ***We will work to raise awareness of Warplt in key potential user groups.***
- ***We will work to identify consumables with potential for greater internal re-use (for instance furniture, lab equipment and IT equipment), and identify mechanisms to increase reuse.***
- ***We will work with project teams involved in new builds, refurbishments and office fit-outs to improve re-use of furniture, fittings & equipment.***

## **3. Identify and promote alternative means of disposal**

Departmental feedback highlighted that there is limited awareness of the cost of different waste disposal methods, and that the majority of waste disposal costs are not borne by Departmental budgets (as the main non-hazardous waste contract is managed by Estate Management). This makes it difficult to fully incorporate waste disposal costs into decision-making, or understand the viability of alternative disposal routes. However departments also highlighted that if clearer information was provided on the availability of alternative waste disposal methods, these could be adopted. A number of departments have already set up 'take back' schemes for items which cannot be recycled through the mixed recycling trade waste collections. These help to reduce contamination of trade waste bins with items that cannot be recycled by conventional routes, and typically are low or zero-cost, thus reducing waste disposal costs. Examples include:

- University Library have initiated a dedicated paper collection skip for paper waste, primarily that from disposal of book dust jackets.
- BioPath stores use STARlab's collection service for pipette racks and boxes.
- Zoology use NEB's return labels for polystyrene boxes.
- Faculty of Philosophy use a coffee packaging take-back initiative.

- The University Counselling Service has set up a successful pen and writing instrument recycling collection which raises funds for a local charity.
- Greenwich House are one of several departments and sites using Terracycle crisp packet recycling.
- CISL's use of KP's snack wrapper recycling initiative.

Another alternative disposal route is the 'Unigreenscheme' laboratory reuse service set up in the University of Cambridge in 2018. In one year the initiative has diverted 1,699kg of unwanted equipment from waste disposal, by selling it for re-use in other organisations. This also resulted in rebates of £5,700 to the University.

***Implementation mechanism: We will ensure information is available on costs of waste disposal, to facilitate whole-life costing and business cases for alternative collection methods.***

***Implementation mechanism: We will provide departments with information on options for disposal and recycling of 'hard to recycle' wastes, and promote these across the University.***

#### 4. Provide clearer guidance and feedback to University departments

The University's primary non-hazardous waste contractor supplies monthly weight totals for waste streams collected under the contract, which is attributable to individual sites. This can facilitate an indication of approximate 'recycling rates' for Departments and Schools.

***Implementation mechanism: We will provide regular data on departmental and site-level performance will be distributed to all Schools.***

***Implementation mechanism: We will investigate automation of waste data reporting to departments, and the provision of 'exception reporting'.***

#### 5. Provide and promote more consistent internal recycling infrastructure

Audits have shown that as much as 46% of the contents of the University's trade waste bins were placed in the incorrect bins by staff and students. A major contributing factor to this is a lack of clear and consistent recycling infrastructure. Departmental feedback was overwhelmingly that the provision of standard bins across the University would lead to improvements in recycling performance. This would also assist the University's Environment and Energy section in being able to distribute consistent campaign messaging to staff and students about correct recycling procedures.

A number of departments have already demonstrated that efforts to engage staff, improve communication and replace waste receptacles result in measurable changes in waste performance. For instance:

- The University Library, through a review of waste collections, revised internal waste receptacles and signage, and education of staff, reduced the amount of waste sent to (non-recyclable) general waste bins from 75% to 22%
- The Cambridge Institute for Sustainability Leadership, through a project to educate and engage staff as well as audit waste outputs and identify problem waste streams, reduced contamination of the mixed recycling waste stream from 19% to 2%.

- In the Institute for Manufacturing, a project to replace and consolidate internal bins with new standardised bins and signage coincided with a 7% increase in the rate of waste being placed in recycling bins.

***Implementation mechanism: We will explore options for the provision and promotion of standard waste receptacles across the University.***

## **6. Engage with the University's waste contractors to ensure greater consideration of sustainability issues**

The appointment of a new waste contractor for the University's main non-hazardous waste streams in 2016 resulted in a shift away from landfilling of any of the University's trade waste. This has helped move the University towards its 'zero to landfill' target, minimising landfill tax obligations, and reducing greenhouse gas emissions from landfill. However the approach relies on energy-from-waste plants, which have implications for air quality, are often locally unpopular, and on the 'waste hierarchy' are second only to landfill as the least preferred option. The University's contractor has invested in modern processing facilities, and works to pull out recyclables from both main waste streams. The University is charged circa. £75 per tonne more for the disposal of waste via general waste trade bins compared to mixed recycling trade bins. This creates a financial incentive for the University to recycle, however potentially also incentivises greater contamination of the mixed recycling stream. This is an issue given domestic and global policy and market changes which are having significant impacts on the waste management sector. Global ramifications from China's "National Sword" policy, enacted in January 2018 and which banned the import of most plastics and other materials headed for that nation's recycling processors, continue to have an impact in the UK along with much of the developed world. The immediate effect has been to drive down the price of recyclable waste, therefore reducing the incentive for recycling of waste materials. In the short term, the waste management sector is seeking other international destinations for waste which cannot be managed domestically, and the risk is that more recyclable waste will be incinerated, landfilled or burnt for energy. In the longer-term, there is recognition that new policies, facilities and approaches for the collection, processing and treatment of waste are needed, alongside a greater adoption of 'Circular Economy' principles. In view of all of these issues, the University will need to continue to engage with its waste contractors to ensure that its waste can be managed in the most sustainable way possible, and in a way which reflects best practice.

***Implementation mechanism: We will work with our waste contractors to ensure that waste is managed in a way in keeping with the University's own waste targets and in accordance with the waste hierarchy.***

***Implementation mechanism: We will continue to monitor, both informally and through bin audits, levels of contamination of the University's waste streams.***

## **7. Build a greater understanding of construction waste issues, and of opportunities for improving construction waste performance**

Construction waste is a significant proportion of the University's waste outputs, making up 71% of the University's waste outputs on average over the five years to 2018. The University's Design & Standards Brief, which provides technical guidelines for the

construction and maintenance of University buildings, came into force in January 2018. It sets out the following standards, under Section 2.10.2:

- All projects shall achieve 100% diversion from landfill of non-hazardous construction, demolition and excavation waste.
- All projects should recycle at least 95% of total waste produced as part of the project.

Compliance with these standards is monitored for major construction projects, however more action could be taken to investigate the challenges, issues and opportunities associated with adherence to these standards. The Civil Engineering project, completed in 2019, has focused on 'design for disassembly' and therefore had the potential to generate lessons for future University projects. In addition, considerations of waste at an early stage in project development, including the careful consideration of existing space and opportunities refurbishment, have the potential to impact significantly on the University's construction waste outputs.

***Implementation mechanism: We will work with Estate Management project teams and contractors to better understand waste performance associated with construction projects, and to promote best practices.***

#### **8. Ensure that the University, including all departments and sites, is complying with legal requirements relating to waste storage and disposal**

Legal compliance is an important element of the University's waste performance, and the University's Environmental Management System is a key way in which improvements in performance can be identified.

***Implementation mechanism: As part of the University's Environmental Management System, we will carry out regular reviews of waste-related legal compliance, and undertake regular waste audits of University departments.***

## Monitoring and evaluation

This is a 5 year strategy, the delivery of which will be led by the University's Environment & Energy Section, and overseen by the Environmental Sustainability Strategy Committee. The strategy will need to be periodically reviewed to ensure that it reflects the latest policy landscape, best practices, and responds to the latest challenges and opportunities for the University's management of waste.

Overall progress on the University's waste management aims and targets will be provided within the Annual Environmental Sustainability Report. In addition, progress on this strategy will be reported annually to the Environmental Sustainability Strategy Committee.

The waste KPIs set out within the Environmental Sustainability Vision, Policy and Strategy (numbered 1-3 below) will be tracked on an ongoing basis, while several additional KPIs (numbered 4-11 below) will be monitored throughout the period of this plan to help track performance in specific waste management-related areas.

#	Key Performance Indicator	Current <sup>3</sup> performance
1	Waste sent to landfill (tonnes)	409
2	Waste mass generated per FTE staff and students (tonnes/FTE)	0.18
3	Percentage of waste generated that is recycled or composted (construction & non-construction waste) (%)	67
4	Percentage of construction waste generated that is recycled or composted (%)	78
5	Percentage of non-construction waste generated that is recycled or composted (%)	51
6	Total weight of food waste disposed of by composting or anaerobic digestion per year (tonnes)	218
7	Mixed recycling disposal as a proportion of total waste disposal (%)	26
8	Food waste disposal as a proportion of total waste disposal (%)	4
9	The proportion of recyclable waste being placed into general waste bins (%)	46
10	The proportion of non-recyclable waste being placed into mixed recycling bins (%)	3
11	Number of items re-used via Warp-It per month on average	16

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<sup>3</sup> Based on 2017-18 data

