



Circular Economy Plan

February 2022

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Introduction

Glasgow Caledonian University’s (GCU) Circular Economy Plan (CEP) will expand on the University’s Waste Minimisation & Recycling Plan (2016) and outlines how the University will align its waste management and procurement practices with the circular economy to support the vision and ambitions set out in [Strategy 2030](#) to become carbon neutral by 2040.

Strategy 2030 sets out the GCU’s vision as the University for the Common Good for the next decade and uses the [Sustainable Development Goals](#) (SDG) as a framework for achieving its ambition across six strategic themes (Figure 1). The commitment to carbon neutrality sits within the sixth theme: Engaged University Community committed to the Common Good.

As well as linking with the environmental commitments in Strategy 2030, the CEP will also address a requirement in our Environmental Management Systems audit to manage all significant environmental impacts, and to report this to Scottish Government through the Public Bodies Climate Change Duties.

A CEP will also contribute to various rankings such as the People & Planet University League and GreenMetric UI scores, and will support projects such as GCU London’s Circular Economy initiative with the Ellen McArthur Foundation and Glasgow’s Green Economy Charter.

The circular economy is a production and consumption model “based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems” ([Ellen McArthur Foundation](#)).



Figure 1 Strategy 2030 vision and ambition.

Waste is a pervasive aspect of contemporary society that represents the end-of-life stage in products' life cycle. Whilst managing wastes can have significant environmental impacts, these are often dwarfed by the combined impacts from the other stages in products' life cycle. It is therefore essential that in the midst of climate and ecological emergencies, those responsible for making purchasing decision for and on-behalf of the University understand and take into account impacts from products' full life-cycle and not just end-of-life stages.

GCU has long been cognisant of whole life-cycle environmental impacts of the products and materials used in its operations and has drawn its Environmental Management System (EMS) to introduce measures to mitigate them. Initially these measures focused on reducing impacts by introducing collection arrangements and treatment options up the waste hierarchy¹. As the EMS matured, measures were broadened to include a range align with the principles of the circular economy.

This approach has created a downward trajectory in both quantity (Figure 2) and environmental impact for the treatment of waste arising at the University's (e.g. greenhouse gases –Figure 3), placing it amongst the higher education institutions with the lowest per capita waste arisings² in Scotland.

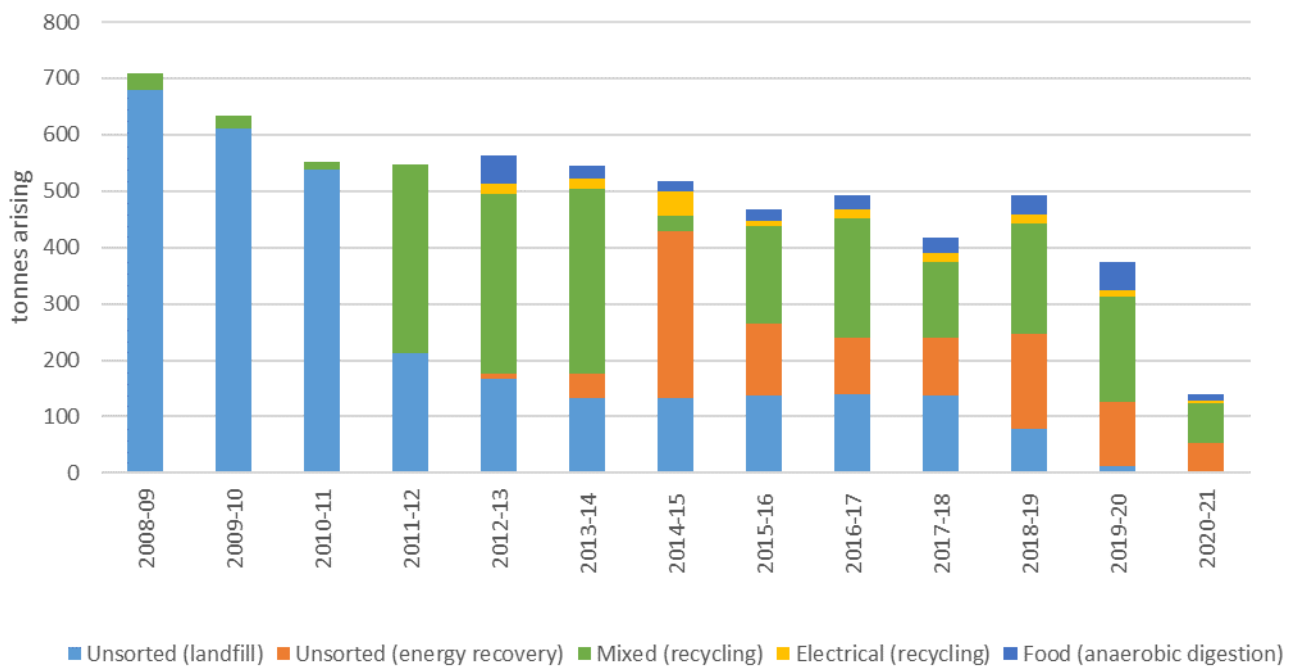


Figure 2 Annual waste arisings from GCU's operations in Glasgow and London (since 2008-09). Arisings for 2020-21 reflect lower activity levels during the coronavirus pandemic.

¹ The waste hierarchy is a framework that “ranks waste management options according to what is best for the environment”, beginning with reduce and followed by re-use, recycle, recover and disposal (Defra).

² HESA EMR data for 2018-19 indicates that GCU produced 22kg non-residential waste per student and staff full-time equivalent (FTE) compared to the average for the Sector in Scotland of 48 kg waste per student and staff FTE (excl. nil returns).

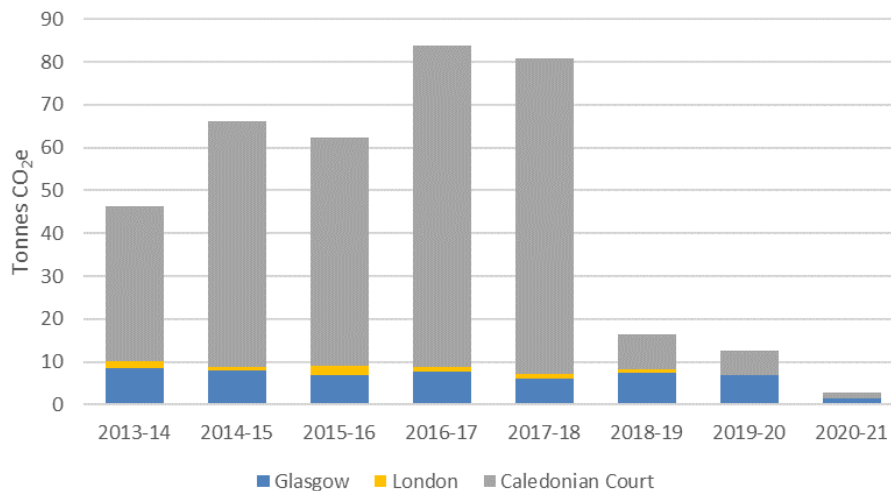


Figure 3 Greenhouse gas (GHG) emissions associated with the treatment of waste arisings at GCU (since 2013-14), with Glasgow City Council’s switch away from landfill for waste collected from Caledonian Court (the University’s residences) in 2018-19 clearly evident.

This CEP outlines measures that the University will enhance or introduce to ensure that operational practices, particularly those associated with resource use, contribute to the University’s environmental commitments and the attainment of the Sustainable Development Goals (SDG).

Aims & Objectives

GCU’s proposed CEP covers the period between 2021-22 and 2026-27 and aims foster a more circular [economy] model across the University’s operations and will:

- Reduce annual waste arisings to below 375 tonnes per year by 2026-27 (equivalent to a 20% reduction on the 468 tonnes per year average for 2016-17, 2017-18 and 2018-19).
- Maintain GHG emissions from waste management below 1% of total reported emissions (i.e. below the materiality threshold in the University’s GHG inventory).
- Enhance the student experience by making ‘sustainability’ the easy choice.

To achieve these aims, the University will:

1. Improve waste data (on sources, quantities, composition and treatment routes).
2. Harness non-waste data (e.g. purchasing records) to identify circular economy opportunities.
3. Understand stakeholders’ expectations for resource use at the University.
4. Build capacity to align purchasing decisions with environmental commitments.
5. Implement easy to use recycling and circular economy initiatives, processes and systems.
6. Ensure that waste management and recycling arrangements and circular economy initiatives support and contribute to teaching, learning and research activity.
7. Monitor and publish progress implementing this plan.

Scope

The scope of the CEP is all waste arising from GCU’s operations in Glasgow (including Caledonian Court) and London.

Waste Arisings & Opportunities

In 2018-19³ the University generated 477 tonnes of waste (Figure 2) with 334 tonnes (70%) arising in the Campus in Glasgow and an estimated 8 tonnes (2%) in GCU London and 136 tonnes (28%) in Caledonian Court⁴.

All wastes are handled by appropriately licensed contractors that offer lower impact treatment options and best value for each location. Commercial waste contractors collect waste from the campuses in Glasgow and London, whilst Glasgow City Council collects waste from Caledonian Court.

Of the waste collected in 2018-19, approximately 41% was processed for recycling, 44% for energy recovery and 15% was disposed of in landfill (Figure 3). Whilst a small proportion of waste (exclusively from Caledonian Court) was sent to landfill, in 2019-20 Glasgow City Council began operating a state of the art waste treatment facility that does not directly rely on landfill⁵.

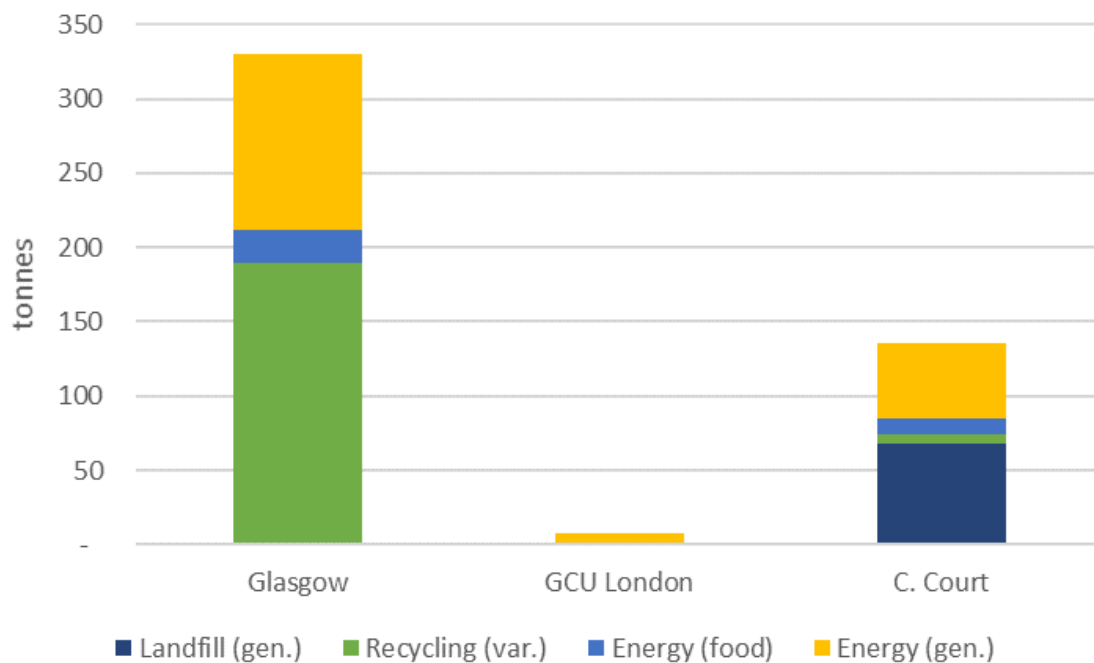


Figure 4 Arisings and processing routes for waste from GCU’s operational sites in 2018-19. Arisings for GCU London and Caledonian Court are based on historic estimates.

The University has a preference for domestic routes for processing its’ waste streams, but recognises that the global nature of industry means that inevitably materials collected from its operations may be exported to international outlets. To minimise any potential risks from these arrangements, the

³ 2018-19 is considered a ‘typical’ year because it is comparable to the previous five years and is the last pre-pandemic full year.

⁴ GCU’s student residencies

⁵ Glasgow City Council (GCC) reports that 10% of post-treatment waste processed at its facility is landfilled after maximising recycling and energy recovery. [GCC Press Release – March 2019](#).

University is committed to reducing arisings, improving the quality of materials separated for recycling and finding domestic routes for wastes collected from the University.

Glasgow Campus

In 2018-19 operations in Glasgow generated approximately 330 tonnes of waste (70% of the total arising from the University's operations), of which 57% was recycled (materials source segregated at the University or recovered post collection by the University's waste contractors); 7% was food waste processed for energy recovery in an anaerobic digestion facility, and the remaining 36% processed (post collection) into a refuse derived fuel for energy recovery (in Scotland since 2019-20). No waste is sent to landfill. Underpinning this performance, is a collection infrastructure that starts with segregated collection points/arrangements designed to maximise recycling and processing by the University's waste contractors to enhance recycling and energy recovery (Figure 4).

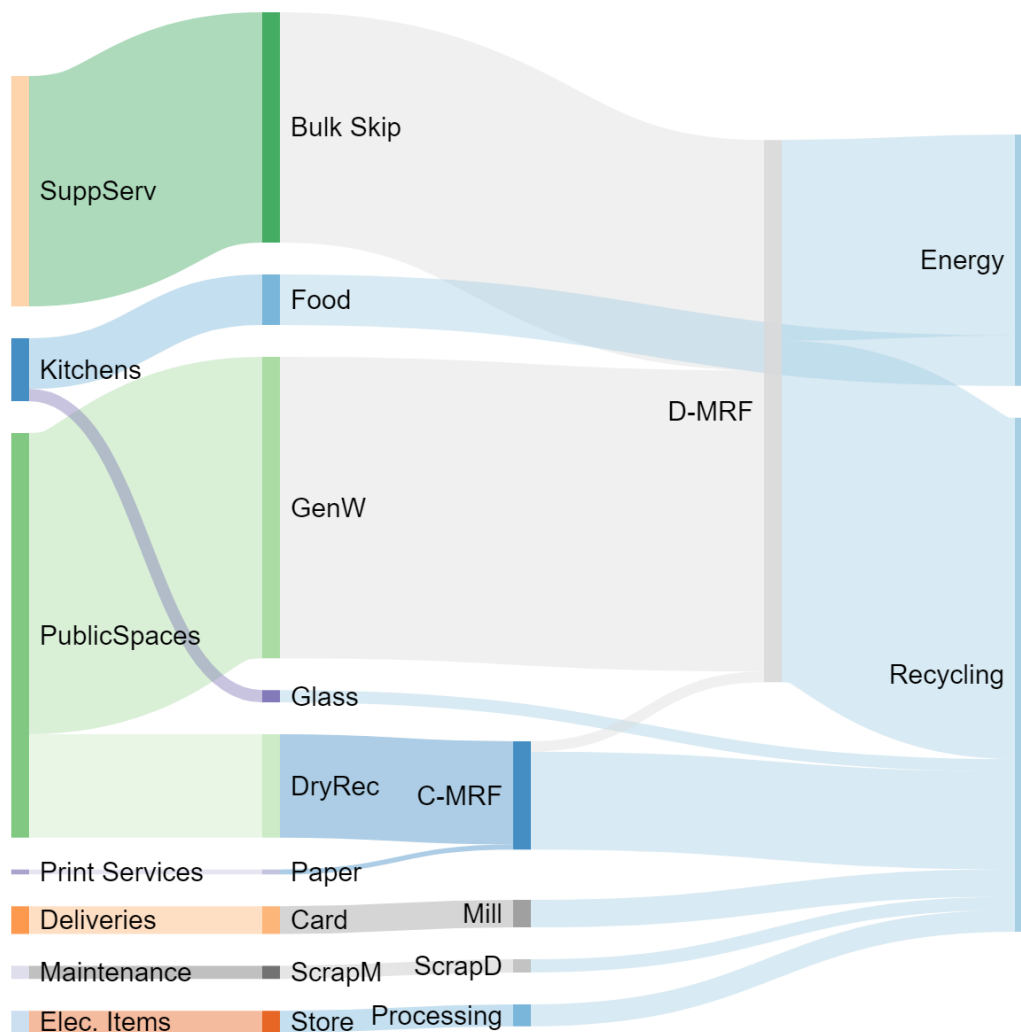


Figure 5 Typical material flow for wastes from the Campus in Glasgow. Wastes are primarily collected from public spaces as either unsegregated general waste (GenW) or dry mixed recycling (DryRec) and separated at the either dirty or clean material recycling facilities (respectively D-MRF and C-MRF) for either energy recover (as refuse derived fuel or through anaerobic digestion) or further recycling. Due to small quantities and limited data, re-use routes are not shown.

Regular monitoring of the different components in this system (e.g. through ad-hoc observations, waste contractor reports and annual waste compositions analysis) provides valuable insights into opportunities for reducing arisings and improving recycling. The 2019 waste composition analysis (Figure 5) identified potential for better segregation of food waste, drinks cans and plastic bottles.

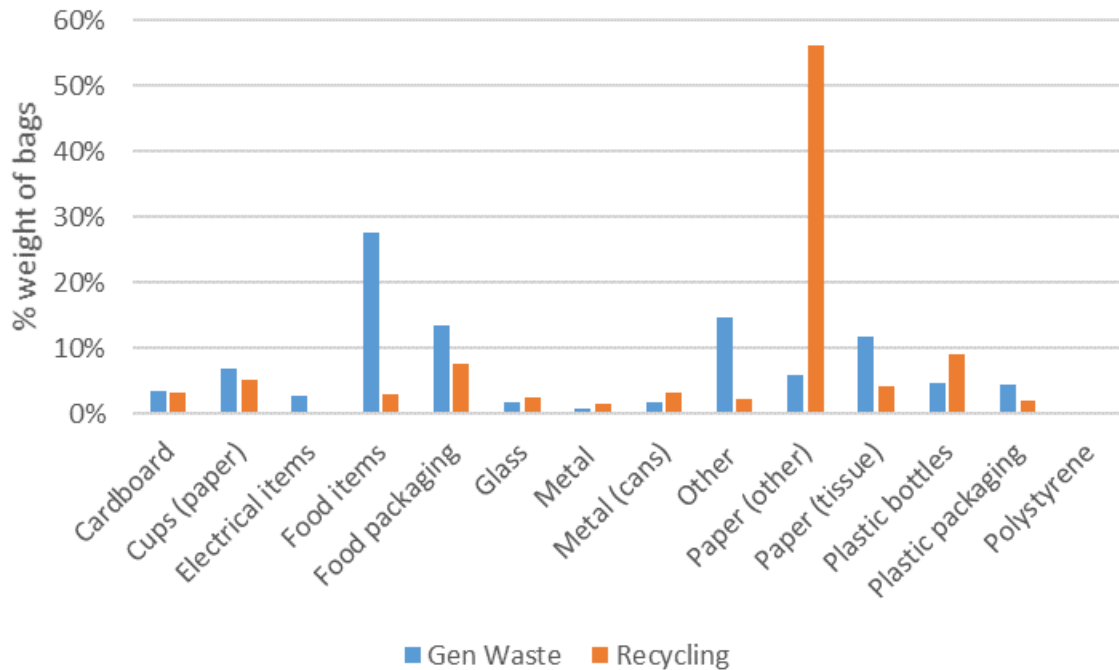


Figure 6 Waste composition analysis for bagged general wastes and recycling collected from public spaces (March 2019).

In addition to the above recycling arrangements, the University introduced a range of measures aligned with the circular economy, which are described in Appendix 2, but include: re-use of surplus and redundant furniture and equipment; charges for hot beverages and meals sold in single-use takeaway containers; dedicated bins for food waste; and returning junk mail to the sender.

Whilst mature recycling systems exist and some circular economy initiatives are well established, the University believes there is still scope for further improvements. GCU therefore commits to improving the performance of recycling systems and introducing further circular economy projects.

GCU London

It is estimated that GCU London produces around 7-11 tonnes of waste per year collected as mixed waste and processed for energy recovery at a local facility. Unfortunately, the campus' facilities management arrangements (where landlord-appointed contractors have subcontracted waste collection and do not provide data on amounts of waste collected) place some constraints on the acquisition of more accurate data and the ability to introduce a recycling service. These are shortcomings the University will address during the term of this CEP. The University will also explore the opportunity for developing circular economy interventions for GCU London.

Caledonian Court

Arisings at Caledonian Court are also estimated, with around 130 tonnes arising every year and only 2 tonnes directly separated by residents for recycling.

Waste arrangements for Caledonian Court are dictated by the services made available by Glasgow City Council (GCC). GCC collects waste from Caledonian Court as part of its domestic waste service and until 2018-19 sent the bulk for disposal at landfill. In 2018-19 GCC started operating a state of the art facility focusing on recycling and energy recovery (through gasification) with only the bi-product of gasification being sent to landfill (as inert waste). The change in treatment route is transformational and has significantly reduced associated carbon emissions (Figure 7).

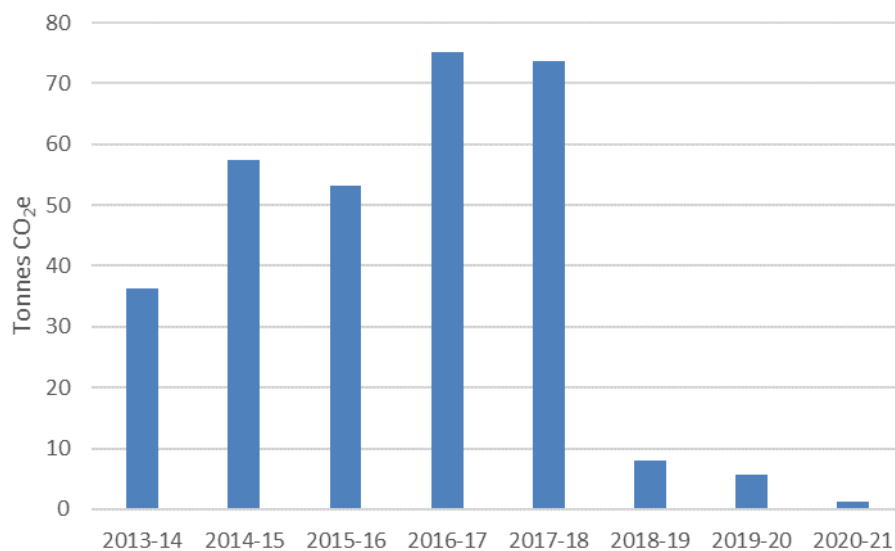


Figure 7 Greenhouse gas emissions from waste arisings at Caledonian Court were dominated by emissions from landfill until 2018-19 when a new treatment facility became available. Data for 2020-21 reflect lower occupancy rates during the coronavirus pandemic.

Whilst the treatment routes are amongst the lowest impact available, there are some operational issues around service reliability that need to be addressed. There is also significant scope for enhancing recycling facilities for residents and adopting a more circular approach for white goods and appliances. These will therefore be priorities for the University through this Plan.

Deposit Return Scheme

Whilst the University is committed to improving recycling across its operations, improvements in Glasgow must be cognisant of the introduction of a Deposit Return Scheme (DRS) in Scotland during the summer of 2023. From that date onwards, all beverages sold in an eligible container will be subject to a 20p deposit that will be refunded on return of the container to an approved collection point (operated by any retailer, merchant or catering outlet – amongst others – that sells beverages in eligible containers).

At present there is limited information publicly available about how the DRS will operate, but it is anticipated that the DRS will impact GCU in a number of ways:

- The University's caterers establish a process for charging/ refunding deposits and managing returned containers.
- The University is likely to have to provide/ facilitate secure storage for returned containers.
- Recycling signage and training resources will have to be updated to highlight the operation of the DRS.
- There may be an increase in the cost of the recycling service provided by GCU's main waste contractor due to the 'loss' of valuable materials such as aluminium cans and plastic bottles.

Whilst there are number of operational impacts, there are also potential benefits and opportunities from the introduction of the DRS:

- A higher proportion of drinks cans and plastic bottles currently placed in general waste (estimated to be 6%-7% of the average weight bagged general waste - Figure 5) are likely to be recycled.
- Operating voluntary return points could be a source of funding for the University through 'donated' returns.
- Operating a voluntary return point at Caledonian Court could also enhance services available to residents.

The University therefore commits to harnessing the introduction of a DRS to improve recycling at Caledonian Court and in the campus in Glasgow.

Sustainable Development Goals

In addition to considering opportunities for reducing the environmental impacts associated with products purchased by the University, the development of GCU's CEP also provided an opportunity to reflect on the contribution the University's use of resources can make to the Sustainable Development Goals. Appendix 1 details how the CEP will contribute to SDG on:

- Decent work and economic growth
- Sustainable cities and communities
- Responsible consumption and production
- Climate action

Management & Monitoring





The accompanying CEP Implementation Document (CEP-ID) details measures that will be developed to achieve the aim and objectives of the CEP.

The implementation of the CEP will be reviewed annually by GCU's Sustainability Working Group. Progress will be reported to the University's Executive Board and more widely through the sustainability section of the University's webpages.

In addition to the successful execution of the initiatives listed the CEP Implementation Document, total waste arisings below 375 tonnes per year by 2026-27 will be the primary measure of success for the CEP.

Appendix 1 - Contribution to the SDG

SDG	Target & Overview of CEP contribution
	<p>Target 8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead</p> <p>GCU's CEP will contribute to this target by building capacity and knowledge in roles at the University with purchasing responsibilities to enable the University to thrive whilst consuming fewer material goods and generating less waste.</p>
	<p>Target 11.6 -- By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management</p> <p>The CEP will contribute to this target by fostering the development of new initiatives that reduce waste arisings and direct waste from the University to the lowest carbon treatment options available to the University.</p>
	<p>Target 12.3 -- By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses</p> <p>The CEP will contribute to this target by:</p> <ul style="list-style-type: none"> (a) Working with the University's catering contractors to understand levels of waste and develop appropriate interventions to reduce it. (b) Compiling resources to help Caledonian Court residents better understand how food becomes waste and highlight practical measures they can take to reduce it.
	<p>Target 12.4 -- By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment</p> <p>The CEP will ensure that the University continues to have in place appropriate controls and checks (through its environmental management system) to ensure that chemicals and wastes are managed in a way that reduces risks to health and the environment.</p>

SDG	Target & Overview of CEP contribution
	<p>Target 12.5 -- By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse</p> <p>The CEP will contribute to this target by ensuring that the University regularly reviews operations to identify opportunities for preventing, reducing and enhancing recycling. The University will also review waste arisings to identify opportunities for re-use.</p>
	<p>Target 12.7 -- Promote public procurement practices that are sustainable, in accordance with national policies and priorities</p> <p>In Making Things Last - A Circular Economy Strategy for Scotland (2016) the Scottish Government sets out it's ambition for developing the circular economy in Scotland.</p> <p>GCU's CEP will contribute to this target and the Scottish Government ambition by building capacity and help buyers choose more products and goods for the University with circular economy attributes.</p>
	<p>Target 12.8 -- By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature</p> <p>The CEP will contribute to this target by ensuring that stakeholders can the link the University's measures and interventions to reduce its environmental impact and the and the principles underpinning sustainable development.</p>
	<p>Target 13.3 -- Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.</p> <p>The CEP will contribute to this target by reducing GHG emissions through the alignment of University operations to the circular economy model, e.g. through reduced consumption levels, and by directing waste to less carbon intensive treatment options.</p>

Appendix 2 – GCU’s Circular Economy Interventions

This appendix summarises interventions aligned with the circular economy model that have been implemented at GCU.

- In 2016, following the award of a new contract for multi-functional devices, the University switched from virgin stock paper for general A4 printing to 100% recycled paper (Steinbeis). The 100% recycled stock A4 of paper has significant environmental benefits compared to virgin paper, specifically its manufacturing uses 83% less water and 72% less energy.
- Historically, all furniture that was surplus to the University’s requirements would have been handled by the University’s waste contractor. However, the University now employs the services of an upholsterer to keep soft furnishings in use and works with a series of local partners and organisations (e.g. Warp-It) to find re-use options for furniture that is useable but is redundant or surplus to requirements. Through these partnerships, over the last five years the University has helped furnish four large community spaces in and around Glasgow.
- The University works with UniGreenScheme to find re-use options for functioning equipment that is redundant or surplus to the University’s requirements. Historically, functioning specialist equipment would have been stored prior to being scrapped for recycling by a waste contractor.
- The University’s electrical waste contractor refurbishes redundant computers for reuse. Prior to this arrangement being in place, all computers were shredded for recycling. Data from the electrical waste contractor indicates that about 30% of computers and screens (an average 100 per year) are refurbished for re-use, with the remainder processed for recycling.
- The University used the award of a new catering contract in 2017 to switch milk deliveries from an estimated 27,000 x 4 pint bottles to around 1,200 pergals (12l pouches in cardboard boxes). Pergals use slightly more plastic than individual 4pint milk bottles but hold nearly six times as much milk. Whilst the plastic pouches cannot be recycled (but are processed into a refuse derived fuel), the cardboard boxes can, and replacing the milk bottles with pergals increased the capacity of the University’s skips, because they were no longer being filled with ‘air’ (i.e. plastic bottles).
- As part of its commitment to the health and wellbeing of students and staff, the University has water fountains on every level of every building and regularly gives away re-fillable water bottles. The impact on waste arisings is difficult to quantify, but helps reduce reliance on single-use, pre-filled water bottles.
- In 2018 the University worked with BaxterStorey, its catering contractor, to switch an existing discount for hot beverages sold in re-useable mugs to a charge for hot beverages sold in single-use cups. The switch increased the proportion of hot beverages sold in re-useable cups from 5-8% to 30%.
- The experience with re-useable cups was used upon to implement a similar initiative for hot food sold in single use take away containers, with the introduction of a 20p charge for meals sold in takeaway containers. Whilst data use rate data is not available, the University’s catering contractor indicated no change in volume of hot meals but a longer period between container restock orders.

- The University also worked with Baxter Storey to replace plastic cutlery by replacing it with a wooden alternative that is biodegradable, and which will not persist in the environment if inappropriately discarded.
- On campus catering outlets also have a tradition of giving away used coffee grounds, re-using the original coffee bean bag, for students and staff to use as a soil conditioner. Whilst there is no data on quantities of coffee grounds made available for use as a soil conditioner, all catering outlets participate, and staff report high demand.
- In 2014 the University received an average 30 items of unsolicited mail a day. As a quick win, the decision was taken to start returning unsolicited mail to the sender, based on the premise that the sender would quickly update their mailing lists if they would have to pay for its return (and disposal). A “Return to Sender” sticker was produced, distributed to departmental mail areas and staff invited to use them to explain why the item was being returned. Between 2014 and 2020, the amount of unsolicited mail received by reduced by 90%, dropping to a few items per week. The impact of digitalisation needs to be factored into this, but in the early years of this initiative returning unsolicited post is credited with having a significant impact on volumes received.



University for the Common Good

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