WASTE & RESOURCE USE STRATEGY 2021-2030

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EXECUTIVE SUMMARY

The University's previous Waste Strategy 2016-21 set out ambitious targets for the institution through the themes of reduce, re-use, recycle and report. As the Strategy has been implemented over the last five years, the University has improved its management of waste and mitigated expected increases in disposal costs.

The total amount of waste generated per person has reduced significantly, so that in January 2020 waste production stood at 17.6% less per person when compared to our 2015/16 baseline, well ahead of the targeted 5% per person reduction. The University's recycling rate for operational waste (including re-use, anaerobic digestion & composting) is currently 58% by weight, which is higher than it was in 2016. The University now has better and more comprehensive data available for analysis and reporting.

Environmental sustainability is at the heart of the University of Reading's organisational identity; positioning it as one of its 4 key principles in its 2020-2026 Strategic Plan.

This new Waste & Resource Use Strategy, covering the period from 2021 to 2030, is focused on responsible resource use and sustainable waste management, acknowledging the global, national and local drivers for improving the University's environmental performance. We must aim to increase resource efficiency by doing more and better with less; to move away from the inefficient linear model of 'take, make, use, throw' towards a circular economy; to prevent waste being generated in the first place; to fulfil our legal obligations and align with the Waste Hierarchy; and to promote new opportunities and initiatives across the University.

Headline targets have been set as the basis for continual improvement:

1. Continue to **reduce** total waste produced per capita (staff and student FTE) year-on-year from the 2018/19 level of 50.9kg.
2. Increase **re-use, remanufacture and repair** year-on-year from the 2018/19 level of 11t.
3. By 2024, increase the University's annual **recycling** rate to a minimum of 60% by weight and then maintain above this level for the duration of the Strategy.
4. By 2024, send less than 1% by weight of waste to **landfill** and then maintain below this level for the duration of the Strategy.
5. Review the University's procurement practices to enable **circular economy** approaches to be developed by 2024.

Increased regulatory focus on environmental impact and how to measure this, rather than solely on the weight of waste generated, may require the targets to be amended during the timeframe of the Strategy.

An initial 3-year Delivery Plan will be written once the results of the re-tendering of the University's main waste contract are known in autumn 2021, in order to enact the Strategy and to monitor progress against its objectives and targets. It is important that the Delivery Plan is based on the actual services and processes available from the contractor who wins the tender, so that initiatives set out in the Plan can actually be enacted on the ground; and that innovations proposed by the contractor can be included. Two further 3-year Delivery Plans will be written in 2024 and 2027.

INTRODUCTION

Environmental sustainability is at the heart of the University of Reading's organisational identity; positioning it as one of its 4 key principles in its latest Strategic Plan, with a commitment to:

> "…work together to make the best use of our resources to ensure the sustainability of the University [and] …play our part in tackling climate change and be recognised as a University that leads on global environmental sustainability."
>
> 2020-2026 Strategic Plan

This Waste & Resource Use Strategy sets out the objectives and targets to be achieved with respect to resources used across the University's operations and subsequent waste management. The purpose of this Strategy is to provide the framework for understanding and managing the University's resource use and waste management over the next 9 years to 2030, but it is envisaged that it will be reviewed and updated as necessary within this timeframe.

Scope

The scope of this Strategy is as follows:

- Activities and services under the operational control of the University, including teaching and research activities, estates and facilities operations, and support services.
- Applicable to the three main UK campuses, including MERL and properties where waste is collected by the main waste management contractors (as co-ordinated by Sustainability Services); excluding wholly tenanted buildings.
- All operational* waste streams collected by the University's contractors (predominantly general waste, mixed recycling, paper and card, glass, wood, food, metal, electrical waste, confidential media, clinical and hazardous waste).
- Items re-used, repaired and remanufactured for use within the University.

[*waste generated through the day-to-day operations of the University]

For details about construction waste, see the ‘Construction Waste’ section on page 9.

The emissions associated with waste and recycling only account for a fraction of a percent of the University’s carbon emissions (using 2018/19 figures). The carbon emissions benefit of further improvements in waste management are therefore likely to be very small. From an environmental impact perspective, promoting sustainable resource use, improving resource efficiency, and reducing the amount of waste generated remain a priority.

OBJECTIVES

1. **To promote responsible consumption and production.**
2. **To reduce the environmental impact of resources used by the University.**
3. **To improve resource efficiency and engage with circular economy principles.**
4. **To prevent waste being generated and to move materials further up the Waste Hierarchy.**
5. **To guarantee that there is year-on-year continual improvement.**
6. **To seek to decrease the hazardous nature of materials used and reduce the risk of pollution.**

This Waste & Resource Use Strategy supports the University’s Environmental and Energy Policy, which can be viewed at https://sites.reading.ac.uk/sustainability/policies-and-strategies/

TARGETS

The Strategy objectives are supported by the following headline targets, which have been set using the SMART[1] methodology.

1. Continue to **reduce** total waste produced per capita (staff and student FTE) year-on-year* from the 2018/19 level of 50.9kg.
2. Increase **re-use, remanufacture and repair** year-on-year* from the 2018/19 level of 11t.
3. By 2024, increase the University’s annual **recycling** rate to a minimum of 60% by weight and then maintain above this level for the duration of the Strategy.
4. By 2024, send less than 1% by weight of waste to **landfill** and then maintain below this level for the duration of the Strategy.
5. Review the University’s procurement practices to enable **circular economy** approaches to be developed by 2024.

[*This year-on-year improvement is to be shown on a 3-year rolling average basis]

Increased regulatory focus on environmental impact and how to measure this, rather than solely on the weight of waste generated, may require the targets to be amended during the timeframe of the Strategy.

For more details about the targets, please see the ‘Introduction to Targets’ section on page 10.

[1] SMART: the concept that to be effective, targets should be Specific, Measureable, Achievable, Realistic and Time-bound,

STRATEGY DRIVERS

United Nation's Sustainable Development Goals (SDGs)

Within the UN's 17 SDGs, Goal 12 is entitled 'Responsible Consumption and Production' and focuses on ensuring that sustainable consumption and production patterns are improved. This is important in a worldwide context because consumption and production drive the global economy, but often the use of natural resources has destructive impacts on planetary health. Economic and social progress over the last century has been accompanied by environmental degradation that is endangering the very systems on which our future development - indeed, our very survival - depends.

The global material footprint is increasing faster than population growth and economic output. An unacceptably high proportion of food is lost along the supply chain. And waste, including additional medical waste generated during the COVID-19 pandemic, is mounting. The pandemic offers a global opportunity to develop recovery plans that will reverse current trends and shift our consumption and production patterns to a more sustainable course.

Responsible consumption and production is about doing more and better with less; increasing resource efficiency; and promoting sustainable lifestyles. It can also contribute substantially to poverty alleviation and the transition towards low-carbon and green economies.

UK Government Plans

The Government's 'Resources and Waste Strategy for England' sets out how it will preserve the country's stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy; at the same time as minimising the damage caused to our natural environment by reducing and managing waste safely and carefully. Government consultations based on this Strategy are on-going, the outcomes of which will determine future policy and national initiatives, but it is clear that proposals will include tackling food waste, reducing single-use plastics, and encouraging re-use, repair and remanufacture.

The UK Government is keen to move away from purely weight-based data towards impact-based targets and reporting, focusing initially on carbon and natural capital accounting. This will have an impact on how waste is classified and measured in the future.

The Circular Economy

An emerging concept is that of the Circular Economy, based on the idea of prolonging the lives of the materials and goods that we use, and moving society away from the inefficient 'linear' economic model of 'take, make, use, throw', towards closed-loop value chains of 're-use, remanufacture, repair, recycle' and improved materials efficiency. Eco-design is a key component, to encourage resource efficient products. This will inevitably lead to changes to procurement processes and decisions. A more circular economy would see companies supplying a service to the University, rather than just a product, in order to keep resources in use as long as possible and to extract maximum value from them.

The Waste Hierarchy

The Waste Hierarchy states that it is most important to prevent and reduce the total amount of waste generated, then to re-use and repair items, and only then to recycle materials. As such, this Strategy will focus on the prevention of waste, first and foremost, and the reduction of single-use items; then look at re-use and repair, followed by recycling and recovery, even if this has the knock-on effect of impacting our overall recycling rate. Landfill is to be the last resort.

People & Planet's University League

People & Planet's University League is a comprehensive and independent league table of UK universities ranked by environmental and ethical performance, with Waste and Recycling set as one of the scoring sections. It is compiled annually by People & Planet, a student campaigning network. The University's overall position in the University League is one of the KPIs within the Strategic Plan.

Internal Drivers

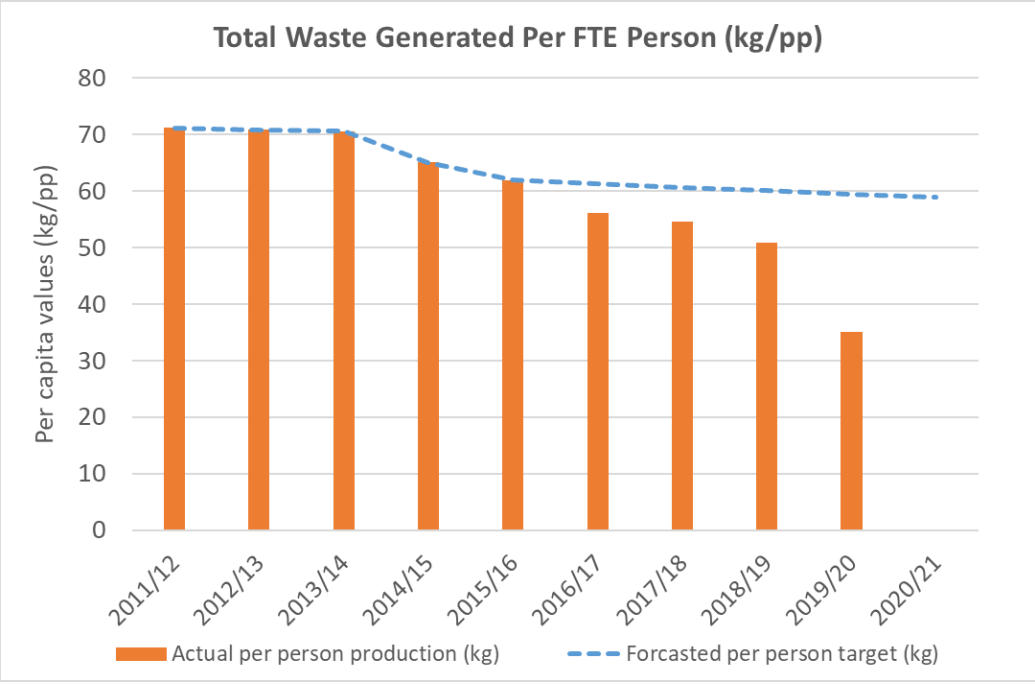
The University has key internal drivers that need to be taken into account for the effective management of its resources and waste to ensure:

- Certification to the ISO14001 standard is maintained and risks of non-conformances (which threaten re-certification) are minimised.
- Compliance with relevant legislation is maintained.
- The Environmental & Energy Policy commitment to continual improvement is met.
- Waste is stored and managed safely and securely.
- Reputation is maintained and students' expectations are managed.
- Disposal costs are controlled and increases are minimised by appropriate disposal choices.

ANALYSIS OF 2016-21 TARGETS

Reduce

Since 2015/16, the University has significantly decreased the amount of day-to-day 'operational' waste generated per person as a result of key initiatives to reduce single-use items, to improve the re-distribution of unwanted furniture and equipment, and to reduce packaging waste. In January 2020 waste production stood at 17.6% less per person when compared to our 2015/16 baseline, well ahead of the targeted 5% per person reduction against the baseline set for 2021.



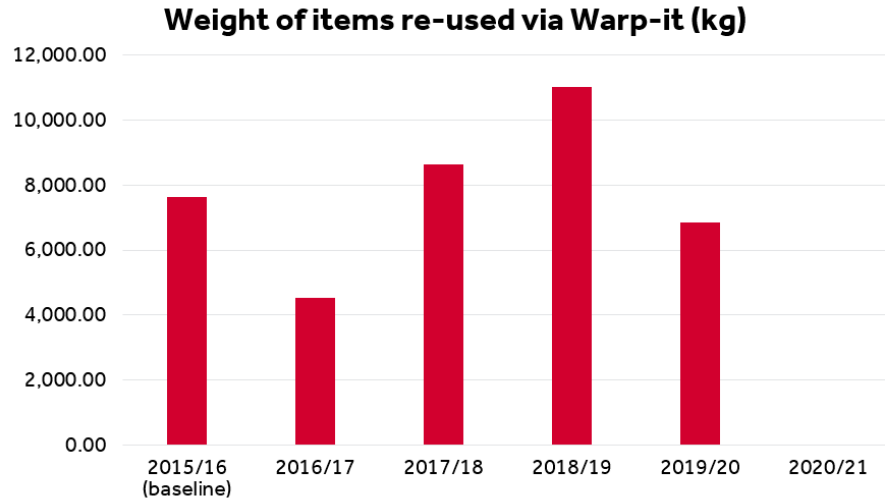
(see 'COVID-19 Impacts' section below on page 6 regarding the 2019/20 data)

Re-use

The Waste Strategy set a target to achieve a 10% increase in re-use against a 2015/16 baseline of 7.7t, in order to improve a culture of re-use rather than disposal.

The re-use of items across the University, particularly furniture via the online Warp-it system, has been increasing. 2018/19 was the best year so far for Warp-it, with 11t of items re-used, with a further 8.2t of additional items re-used via other routes – so there was a total annual re-use of 19.2t of items. Even in 2019/20, which has been affected by the COVID-19 shutdown, 6.8t of items were re-used across the year via Warp-it, with a further 6.2t of additional items re-used via other routes; so the total annual re-use of 13t of items is in excess of the target of 8.5t for 2021 (a 53% increase over 2015/16).

In 2018/19, over £45,000 was saved by the University in waste and purchasing costs as a result of the re-use of items via Warp-it; whilst in 2019/20, over £28,000 was saved.



Recycle

Over the last 5 years, the University's main waste contractor has been able to record and provide more accurate waste data, so that in 2021 weight data is supplied for almost all waste streams collected from the University, including hazardous and clinical waste. This has enabled more detailed waste analysis to be undertaken, which has shown that the University's 2015/16 baseline recycling rate for operational waste (including re-use, anaerobic digestion & composting) was actually closer to 55% by weight, rather than 50% as previously thought when the baseline was calculated.

The target for 2020/21 is a recycling rate of 60%. The highest annual recycling rate so far was 58.6% achieved in 2018/19, whilst 2019/20 saw a recycling rate of 57.6%, which was impacted by the COVID-19 shutdown. The University is making progress towards the 60% target, but with the waste reduction initiatives undertaken since 2016, it has become apparent that the makeup of operational waste has changed significantly over the last few years. It now includes considerably fewer single-use items, such as bottles and cans which previously might have been recycled; so a greater proportion of recyclable items have been removed from the waste stream, thereby potentially making it more difficult to increase the recycling rate.

Report

Significantly improved reporting of the University's waste data, based on robust weight data from the University's waste contractors, has taken place annually within the overall Environmental & Sustainability Report.

COVID-19 Impacts

The effects of the COVID-19 shutdown in 2020 on resources used and waste generated can be seen in the difference in waste data between the first half and second half of 2019/20 academic year. The total amount of operational waste generated across the University in the first half of the 2019/20 academic

year (Aug ’19 to Jan ’20) was 25.5kg per person; whilst only 10.4kg per person was generated in the second half of the year (Feb to Jul ’20). This gave a total of 35.9kg per person for 2020, compared to the 2015/16 baseline of 61.9 kg per person; a 42% reduction in waste generated. Even before the shutdown, waste production stood at 17.6% less per person when compared to our 2015/16 baseline; well ahead of the targeted 5% per person.

The rapid switch to home working for the majority of staff for long periods has raised questions about how the University may operate in the future. More flexible working arrangements and a potential reduction in on-site working could have significant implications for our resource use and waste generation.

Cost Savings

Forecasting in 2016 indicated that if no action was taken, then in 2020/21 the cost of non-hazardous operational wastes could be £120k greater than in 2015/16 (a 42% increase).

The strategy set out the case that financial investment of c.£89k would be required to achieve the targets to reduce waste generated and increase re-use and recycling, with a payback period of approximately 4.5 years. In 2020/21, it was expected that savings of c.£20k against the business as usual (BAU) scenario would be realised, whereas much larger savings versus BAU have actually been seen in each year since 2016. £100k was saved in 2018/19, approximately 60% of which was due to long-term trends in reducing the amount of waste generated and 40% was due to over-estimates of increases in waste costs which have not materialised within this timeframe. Of the £176k saved in 2019/20, approximately 80% was due to the reduction in the amount of waste generated as a result of long-term trends and the effects of COVID-19 restrictions. Cumulative savings of c.£226k were expected against the BAU scenario over a 10 year period, but cumulative savings of £390k have already been seen during the first 4 years of the strategy against BAU.

Year	Annual savings against BAU (excl. hazardous waste, incl. VAT)
2015/16	£0
2016/17	£43,278
2017/18	£69,617
2018/19	£100,531
2019/20	£176,453

DATA & STAKEHOLDER ANALYSIS

The University's main contract for operational waste and recycling is based on 'pay by weight', which means that the University receives actual weights and costs for many of the different recycling and waste streams. This data set from 2018/19 and 2019/20 has been analysed by location, waste stream and weight, in order to undertake different levels of stakeholder and Waste Hierarchy analysis.

When looking at the weight of total operational waste generated across the University, catering and hospitality (including Greenlands and RUSU) contribute just over one-third, with the Schools contributing approximately one-third, and the rest of the institution the final one-third.

Waste Weights in 2018/19

OVERALL UNIVERSITY		CATERING, RUSU & GREENLANDS		ACADEMIC SCHOOLS		ALL OTHER AREAS	
		General Waste	Recycling	General Waste	Recycling	General Waste	Recycling
General Waste (kg)	481,107	155,949		182,482		142,676	
Recycling (kg)	501,591		202,806		129,830		168,955
Total Waste (kg)	982,699	358,755		312,312		311,631	
% of Total	100.0%	36.5%		31.8%		31.7%	

In terms of overall cost of operational waste to the University, 50% can be attributed to the academic schools (mostly the science schools), with approximately one-quarter attributed to catering & hospitality (including Greenlands and RUSU). The area with greatest environmental impact from waste is the science schools, particularly related to the amount of hazardous waste and clinical waste generated.

Waste Costs in 2018/19

OVERALL UNIVERSITY		ACADEMIC SCHOOLS				CATERING, RUSU & GREENLANDS		ALL OTHER AREAS	
		Chem Haz Waste	Clinical Waste	General Waste	Recycling	General Waste	Recycling	General Waste	Recycling
Chem & Clinical	£77,612	£54,430	£23,182						
General waste	£131,678			£40,412		£48,006		£43,260	
Recycling	£82,985				£28,516		£29,484		£24,985
Total net cost	£292,276	£146,540				£77,491		£68,246	
% of Total	100.0%	50.1%				26.5%		23.3%	

Waste Hierarchy

In terms of mapping the treatment of the University's waste against the Waste Hierarchy, in 2019/20:

- 1.8% by weight was items that were re-used or redistributed;
- 45.6% of the University's operational waste was sent for recycling;
- Just under 9% was organic waste treated by composting, anaerobic digestion or used for biofuel production;
- 40.7% was sent to an Energy from Waste plant, which generates electricity and/or heat from incineration;
- Which left just over 1% sent for incineration without energy recovery and approximately 2% to landfill.

Operational Waste Weights 2019/20		
Waste Hierarchy element	**Overall Weight (kg)**	**Overall Percentage**
Reuse or Redistribution	12,304	1.8%
Recycling	319,373	45.6%
Anaerobic Digestion (AD)	38,990	5.6%
Made into Biofuel	8,625	1.2%
Composting	13,360	1.9%
Energy from Waste (EfW)	285,189	40.7%
Incineration - no recovery	8,538	1.2%
Landfill	13,883	2.0%
Total Waste	**700,262**	100.0%

Over the last 5 years, more detailed data has been made available for certain waste streams which has allowed for better analysis; for example Select have supplied weight data for clinical waste collections from August 2020 onwards, which was not previously available. In prior years, clinical waste weights were estimated based on volume conversion factors.

Construction Waste

The amount of waste generated by the demolition, refurbishment and construction of buildings on the University's sites, collectively known as 'construction waste', can vary considerably from year to year; indeed in some years it can exceed the weight of operational waste generated. This variability in volume, weight and type of material generated makes it difficult to set meaningful annual targets and to analysis the data that arises each year. For this reason, construction waste from major projects coordinated by the University's Projects department is collated and classified independently from the University's operational waste. Up to this point, construction waste has not been included in the University's annual environmental sustainability reporting, but is included in the annual Estates Management Record (EMR) data collection process, albeit collated separately from operational waste.

From the start of this Strategy, construction waste data submitted for the EMR will now also be included in the University's annual environmental sustainability reporting, in order to increase the transparency of this waste stream. Annual targets for construction waste will not be set; however, individual construction projects can have targets set within the bounds of the project process, particularly through BREEAM.

Waste benchmarking and analysis exercise

The University commissioned an external organisation to undertake a waste benchmarking and analysis exercise that will give us detailed information, from both a cost and environmental perspective, to determine if there are potential savings to be made and innovations that could be pursued in the future. The in-depth study includes a review of all aspects of current waste service provision, on-site visits to waste collection locations, interrogation of waste weights, costs and disposal destinations, and overview of compliance.

The report was received in February 2021 and sets out analysis and recommendations to be adopted by the University. The outputs from the benchmarking exercise will be considered as an input into the Delivery Plan for this Strategy (see 'Delivery Plan' section below on page 10).

INTRODUCTION TO TARGETS

Further context and information about the headline targets, including specific targets for certain aspects, will be given in each 3-year Delivery Plan.

Target 1 – Continue to reduce total waste produced per capita (staff and student FTE) year-on-year from the 2018/19 level of 50.9kg.

By procuring goods with returnable packaging, or services instead of equipment, and by promoting alternatives to single-use items on campus, we will continue to drive down the amount of waste produced per person.

Target 2 – Increase re-use, remanufacture and repair year-on-year from the 2018/19 level of 11t.

By continuing to offer re-use initiatives to staff, such at Warp-It, as well as investigating the remanufacturing and repair of existing equipment, we will increase the reuse of items.

Target 3 – By 2024, increase the University's annual recycling rate to a minimum of 60% by weight and then maintain above this level for the duration of the Strategy.

The University will explore further options for recycling with the incoming waste contractor, to ensure that recycling bins are available and easy to use; and that new recycling streams are available where environmentally and economically advantageous.

Target 4 – By 2024, send less than 1% by weight of waste to landfill and then maintain below this level for the duration of the Strategy.

The only items of operational waste sent to landfill in 2021 are certain clinical and hazardous wastes that are required to be consigned to deep landfill. The University will investigate, in conjunction with its waste contractors, how the amount sent to landfill can be reduced to less than 1% by 2024.

Target 5 – Review the University's procurement practices to enable circular economy approaches to be developed by 2024.

Sustainability Services will work with the University's Procurement team to review current procurement practices to enable engagement with circular economy principles to be developed. Key operational areas that have high resource utilisation will be prioritised for engagement. A Responsible Procurement working group will also be set-up and coordinated by the University's Procurement team.

Construction Waste

From the start of this Strategy, construction waste data submitted for the EMR will now also be included in the University's annual environmental sustainability reporting, in order to increase the transparency of this waste stream. Annual targets for construction waste will not be set; however, individual construction projects can have targets set within the bounds of the project process, particularly through BREEAM.

DELIVERY PLAN

An initial 3-year Delivery Plan will be written once the results of the waste contract re-tendering are known, in order to enact the Strategy and to monitor progress against its objectives and targets. It is important that the Delivery Plan is based on the actual services, processes and material streams available from the contractor who wins the tender, so that initiatives set out in the Plan can actually be enacted on the ground; and that innovations proposed by the contractor can be included.

Having a 3-year Delivery Plan will also ensure alignment with wider sustainability initiatives being rolled out across the University's operations, which are likely to progress over the next 3 years. Two further 3-year Delivery Plans will be written in 2024 and 2027.

GOVERNANCE

The Waste & Resource Use Strategy is approved and overseen by the Environmental Sustainability Committee. It will be managed on a day-to-day basis by Sustainability Services, Its progress will be underpinned by the University's ISO14001:2015 certified environmental management system.

In-year reporting to the Environmental Sustainability Committee will take place through the termly meetings. Annual external reporting will be undertaken at the end of each academic year as part of the University's Environmental & Sustainability Report compiled by Sustainability Services.

CONCLUSION

This new Strategy follows on from the University's Waste Strategy that covered 2016 to 2021, and is focused on responsible resource use and sustainable waste management, acknowledging the global, national and local drivers for improving the University's environmental performance. The University must aim to do more and better with less; to increase resource efficiency; to move away from the inefficient linear model of 'take, make, use, throw' towards a circular economy; to prevent waste being generated in the first place; to fulfil our legal obligations and align with the Waste Hierarchy; and to promote new opportunities and initiatives across the University.

An initial 3-year Delivery Plan will be written once the results of the re-tendering of the University's main waste contract are known in autumn 2021, in order to enact the Strategy and to monitor progress against its objectives and targets.

This Strategy was approved by the University of Reading's Environmental Sustainability Committee on 9th June 2021.