

## **(Solid) Waste<sup>1</sup> context paper for Waipapa Taumata Rau's Sustainability Strategy Development**

Waste has severe negative effects on our planet and our livelihoods. It is also one of the most visible sustainability challenges humanity faces. Impacts on air, land, water, biodiversity, and human health are tangible and well documented. Waste is complex to address, as it is intrinsic to linear production and consumption systems of industrial times and closely associated with growth and economic development and resulting inequalities. There is a distinctive waste component to every United Nations Sustainable Development Goal (UNSDG), mostly as it relates to how to effectively prevent waste through systemic thinking and stepping away from waste being an 'unavoidable' part of everyday life.

Although waste has been in the **sustainability global agenda** for many decades, with some well established international initiatives to measure and report progress such as the [Global Reporting Initiative \(GRI\)](#)<sup>2</sup>, it was the adoption of the Kyoto Protocol in 2005 and later the Paris Agreement that came into effect in 2016 which gave this issue a place in coordinated global efforts. This international agreement, a legally binding treaty, requires signatories (175 states including New Zealand and the European Union) to declare their greenhouse gas emissions - *Nationally Determined Contributions* (NDCs) – including emissions from waste, following [UN's Intergovernmental Panel on Climate Change \(IPCC\)](#)<sup>3</sup> [guidelines](#). Under the Paris Agreement, countries must also declare their efforts and progress towards reducing emissions in five-year intervals.

In **Aotearoa New Zealand**, the Carbon Zero Amendment Act 2019 is the key legislation driving the country's commitments towards carbon neutrality. This act in turn directly influences the proposed new [Waste Strategy, expected to be released in 2022](#). A key theme of the proposed changes introduced by this new strategy and subsequent legislation is that of a shift towards a 'circular economy'. Circular economy broadly means designing waste out of the economy. The Ministry for the Environment's proposed approach is based on three key principles: *design out waste and pollution; keep products and materials in use and regenerate natural systems*.

The circular economy proposition has high level endorsement, from United Nations Climate Change (UNCC) to World Economic Forum through the launch, in 2017 of the [Platform for Accelerating the Circular Economy \(PACE\)](#). In New Zealand, [the Climate Change Commission](#), in its advice to government, also included 'increasing circularity' as one of its recommendations. At the same time, international waste industry groups are launching initiatives for voluntary indicators of circularity<sup>4</sup>. However, there are no specific references to measures and metrics, nor agreed guidelines or indicators of circularity that can be used in the immediate term.

In addition, under the [Carbon Neutral Government Programme](#) (CNGP) announced in October 2021 to accelerate the reductions of emissions within the public sector, there are targets for waste of between 30% and 50% reduction by 2030. The programme also sets a requirement to offset emissions from waste to landfill from 2025. In the meantime, the

---

<sup>1</sup> This context paper used the term 'waste' to refer to 'solid waste', within the University, other types of waste such as wastewater and energy related waste are indirectly covered through the energy and efficiency approaches of energy and utilities management.

<sup>2</sup> See [Global Reporting Standard 306 - Waste](#)

<sup>3</sup> See [Volume 5 of the 2019 refinement of the IPCC guidelines](#)

<sup>4</sup> See [International Solid Waste Association \(ISWA\) call for circularity indicators](#)

waste levy for municipal solid waste has increased twofold in 2021 (from \$10/tonne to \$20/tonne) and is set to reach \$60/tonne in 2024.

**Waipapa Taumata Rau's waste profile** is that of a small urban area. In 2019, there were 34,213 Equivalent Full Time Students and 5,968 Full Time Equivalent Staff (FTE), attending campuses on regular basis. There are 227 buildings, serviced up to five times per week through more than 1,600 bins deployed around our spaces, each with a capacity of 240 litres. Most bins are directly accessible by staff and students as well as cleaning contractors. These bins capture eight different waste streams: landfill, recyclables (bottles & cans), recyclable paper, food waste and green waste. Recyclable cardboard and special wastes are collected in separate containers. Landfill waste is disposed of in the Waikato region, in a facility that recovers gas from the process. Recyclable materials are mostly sent overseas to Asia and any special wastes like chemicals sent to Australia and sometimes France. There is moderate to high uncertainty around final destination and recycling or disposal of recyclables sent overseas, mostly due to lack of control mechanisms once materials have departed our shores.

In 2019, baseline year for Taumata Teitei's strategic priorities 2030, a total of 1,605 tonnes of waste were sent to landfill, 394 tonnes of bottles and cans, paper and cardboard were recovered for recycling and a further 108 tonnes of food waste were recovered for composting.

Also during 2019, a **University Solid Waste Review** was commissioned to gain further insights about the composition of the waste streams as well as identify opportunities for intervention. Waste samples for this review were taken from ten collection points where the highest amounts of waste were being recorded. Some key findings related to single use items and food waste from this review are listed below.

In 2019:

- An estimated 27 million single use/trip items (234 tonnes) sent to landfill
- A further estimated 2.5 million single use/trip items (43 tonnes) sent for recycling
- An estimated total of 10 tonnes of single use plastic water bottles discarded. With 184,402 bottles sent to landfill, making up 5 tonnes of the total estimated landfill and a further 5 tonnes sent for recycling (estimated 187,041 bottles)
- An estimated 508 tonnes of clean food waste sent to landfill in 2019, either via landfill or recycling bins

These findings indicate some valuable opportunities for new initiatives as well as improvement of ongoing efforts, especially in terms of prevention of specific types of wastes and high-quality initiatives for clean food waste.

In the last decade, the university community has focused strongly on waste reduction at source and high quality waste diversion schemes. During this period, especially since the introduction of the first University Sustainability Policy in 2014 there have been **some significant achievements**. These include:

- 479 tonnes of food waste diverted to off-site composting between 2017 – 2021. Food waste collected from catered accommodation halls, commercial kitchens based at OGGB, Old Government House, Superfino (Grafton Medical School) plus the Faculty of Science. In addition to this figure, other staff initiatives (Arts,

Business School, Property Services) have also diverted food waste by composting on-site.

- 358 tonnes of furniture and other office items have been relocated for reuse back into the community between 2019 – 2021. The initiative was also in place prior to 2019, however, there was no data collection process that enabled monitoring and reporting. This initiative reduced the overall need for Gantry bins (skip bins) across the University, therefore reducing waste to landfill.
- 7 tonnes of green waste sent for off-site composting since starting the service in May 2021.
- 1.9 tonnes of paper waste reduced annually via a project the Business Transformation Office undertook in 2018 to digitise 400 forms that were previously paper based
- 7 tonnes of paper waste reduced annually via a project the Business School undertook in 2019 to move towards paperless classrooms
- Development of the first University Sustainable Events Guide, a collaboration between Campus Life Event Services and the Sustainability Team. Implementation of the guide has enabled significant waste reduction practices to be embedded into the events space. This being demonstrated via the annual Aspire staff conferences and the UN Sustainable Development Goals Summit 2019. The guide is available for all staff to use for events of any size.
- 10 cubic metres worth (approximately) of Polypropylene plastic has been sent for local recycling since 2019. This plastic is what pipette boxes for use in Biological Sciences and the Cancer Research facility based at Grafton Medical School are made of. The material is not recycled via the University's standard recyclables collection service
- 2016 electronic items were re-purposed, and 656 items were processed for e-waste via the Connect department's preferred contractors in 2020. Thereby diverting from landfill and in the case of repurposing, the University recuperated some money against the initial procurement cost
- 53 tonnes of waste were estimated to have been saved from going to landfill in 2019 with savings of just over \$17,000 by removing Front Load bins of 3m – 4.5m in size, from various locations across the University. This stemmed from undertaking visual audits and investigations in a period over 2018/2019 which found most waste in these bins came either from an outside source (illegal dumping) or items that should have been diverted by other recycling/re-purposing processes
- Removal of all dedicated 'under desk' waste bins from offices across campuses and replacement with a small 10cm box for on desk use.

These achievements were the result of collective effort, external and internal partnerships between service divisions, academic units, external suppliers, and on-site partners. However, as noted above, the success was not always visible. In many cases, monitoring and reporting did not include those key sources of waste in the measures used. In addition, monitoring showed that efforts were not being clearly reflected in an overall reduction of waste as quantities were increasing. By 2019, the combined waste to landfill, recycling of bottles and cans, and paper and cardboard recycling was 23% higher than in 2015 (year in which weight data collection begun to be available). In turn, EFTS had increased just under 5% and Gross Floor Area (GFA) 16%.

The development of **the University's first Greenhouse Gas Emissions Inventory** in 2019 addressed some of these limitations as the waste baseline was reset

to incorporate and account for all waste resulting from our activities. Table 1. below shows waste categories included in monitoring and reporting prior to and since 2019.

<b>Category</b>	<b>Monitoring 2012-2018</b>	<b>Monitoring 2019 onwards (new baseline)</b>	<b>Monitoring 2022/2023 onwards</b>
Waste to landfill collected in 240L bins across campuses	✓	✓	✓
Bottles and cans sent for recycling collected in 240L bins	✓	✓	✓
Paper sent for recycling (collected in 240L bins)	✓	✓	✓
Cardboard sent for recycling (collected in dedicated containers)	✓	✓	✓
Food waste for composting (collected from commercial kitchens and accommodation halls)	✓	✓	✓
Waste to landfill collected in skip bins from Faculties and Service Divisions	✗	✓	✓
Waste to landfill from decants (moves)	✗	✓	✓
Construction and Demolition waste from new buildings and refurbishments	✗	✗	✓
Garden waste from grounds	✗	✗	✓
Hazardous, medical and other special wastes	✗	✗	✓

Table 1. The University of Auckland - waste monitoring

The makeup of the various waste streams shown in the table is the result of the very diverse range of activities that take place across the Waipapa Taumata Rau every day, as well as of the seasonality of those activities. These are typically associated with different sectors of the economy. For example, hospitality and events waste from onsite food outlets, external caterers, and onsite commercial kitchens; residential waste from accommodation halls; medical waste and hazardous waste; office waste; garden waste; and construction and demolition waste from developing and improving our estate.

All waste, including materials that can be diverted from landfill and food waste that can be composted, is related to how we buy and consume goods and services. This means that any initiative which involves something being bought or consumed however unrelated to

waste it may seem, is likely to result in some form of waste directly or indirectly. Therefore, strategic alignment is one of the key enablers of successful waste prevention initiatives and coordinated reduction efforts.

Waipapa Taumata Rau, through Taumata Teitei Strategic Vision 2030, is committed to being internationally recognised for our unique contribution to fair, ethical and sustainable societies, to lead the transition to sustainable ecosystem and to achieve Net Zero emissions. These commitments are also reflected in Te Rautaki Tūāpapa, the Estate Strategy 2021-2030. Continued collaboration and strong strategic alignment across academic and service units is an essential part of realising these commitments.

Looking at the contributions and experiences of others is also part of the journey. A brief benchmarking exercise in 2020 looked at universities around the world, including those who shared with our University the top 10 Times Higher Education standings, those in Universitas 21, other New Zealand Universities, as well as the Australian Group of 8 and some others, which provided some valuable examples of ambitious initiatives and notable themes.

## **Examples of waste initiatives from other universities**

Single use plastics either being significantly reduced or prevented completely.

- The University of Hong Kong created a policy to assist them eliminate single use plastic water bottles
- Maryland University, US, saved 1.4 million single use plastic water bottles going to landfill between 2017 – 2018, by removing these from all their University outlets
- Imperial College of London, UK, removed single use cups from catering in 2018 and saved 850,000 from going to landfill in one year
- In 2020, Victoria University in Wellington, NZ, started to move away from the procurement of milk in plastic bottles to that in glass
- In 2018 British Columbia University, CAN, removed all single use cutlery and straws from its on-Campus retail outlets
- In 2019 The University of Otago, NZ, removed all disposable coffee cups from its on-Campus retail outlets

Food waste/Green waste composting

- In 2017, McMaster University, CAN, diverted 130 tonnes of food waste, by introducing collections into staff office areas
- The University of Hong Kong introduced a food waste tracking app called Leanpath in their commercial kitchens so as to reduce food waste at source and save financially on procurement and waste disposal costs
- British Columbia University, CAN, has a complete compost programme and diverts almost all food waste from offices, food outlets and accommodation halls. Approximately 500 tonnes of food waste it's diverted each year
- Since 2010, The University of Connecticut, US, has owned and ran its own composting facility

### Furniture diversion

- The University of Melbourne, AUS, saved \$12.5 million dollars on procuring new furniture and disposal whilst also diverting 510 tonnes away from landfill, by creating a warehouse space to store reusable furniture. The University of Otago University, NZ, have also implemented a recycling centre for furniture
- Other Universities, including The University of Waikato, NZ, have utilised a TradeMe style platform for furniture called warp it which helps to create a circular economy based within these Universities and reduce costs on disposal/diversion fees

### Sustainable procurement polices

- The following University's all outlined either sustainable procurement plan and/or polices with which to assist them to reduce waste at source and embed whole life cycle practices into their procurement choices. Oxford University, UK, Yale University, US, UNSW Sydney, AUS, The University of Queensland, AUS, The University of Glasgow, UK

### Community food gardens

- A theme that ran heavily through a number of universities, and at first glance would not automatically be thought of as an initiative that would be for reducing waste, was community gardens. These gardens stemmed from small in scale, through to large organic farms, such as the one at British Columbia University in Canada. In the case of Harvard University in the US, some of the produce they were growing was being used in their commercial kitchens, which was catering for their retail outlets/catered accommodation. And in all instances, these gardens also provided areas for where on-site composting could be undertaken, this is where the waste reduction link comes from.

Current expectations under international commitments to carbon neutrality have increased the opportunities for development and implementing of waste prevention programmes and initiatives in Aotearoa New Zealand and in Waipapa Taumata Rau. We are committed, enabled by Taumata Teitei and Te Rautaki Tūāpapa, and well equipped to embark on a new leg of the journey and setting an ambitious goal for waste reduction.

