

Sustainability Targets Tracking

2022 Status Report



Acknowledgements

The Macquarie University Sustainability Team would like to acknowledge the following team members for their contribution to the preparation of this report. Nicole Marchhart (Head of Sustainability); John Macris (Biodiversity Advisor); Sally Northover (Sustainability Officer). For assistance with report layout and design: Thi Hue Mai (Hannah); Student intern [MMCC8045 – Professional Practices at Macquarie University]. For assistance with case studies: Joverly Damian; Student intern [MMCC8045 – Professional Practices at Macquarie University].

*Cover images:
Central Courtyard Building, 1CC
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1. Purpose

The Macquarie University Campus Masterplan 2014 established sustainability targets for energy, emissions, water and waste reduction based around a 2009 baseline. This report provides an update on progress towards achieving these targets.

1.1 Background

At Macquarie University, our understanding of sustainability is aligned with the United Nation's Sustainable Development Goals (SDGs). The SDGs are 17 interlinked goals designed as "*a global blueprint to achieve a better and more sustainable future for all*". Our targets and progress towards them help us to understand the impact of our actions and activities and enable us to make informed decisions around better sustainable practices.

1.2 Sustainability Impact

Each year Macquarie University is ranked globally for our performance against the SDGs in the *Times Higher Education (THE) Impact Rankings*. Across 1,591 universities worldwide, we were recognised with two Top 10 rankings across the goals including a number one position.

Macquarie University ranked first in the world for SDG14, Life Below Water, and fourth for SDG6, Clean Water and Sanitation. We also achieved distinguished ranks of 12th, 13th and 18th for SDG8 (Decent Work and Economic Growth), SDG13 (Climate Action) and SDG15 (Life on Land) respectively. The University's overall ranking, secured with a total score of 92.3 out of 100, put us not only 39th globally, but also ninth in Australia.

1.3 Sustainability Strategy Review





Macquarie University is currently in the process of creating our next sustainability strategy and new targets to lead on from the work that this report outlines.



1.4 Summary Performance Against Targets

To track progress against our sustainability targets, we are using 2009 as our baseline year. Since then, despite the University increasing its gross floor area by 58%, and increasing its population by almost 33%, we have been working hard to meet these targets.

Here is our progress for 2022:

Category	2030 Target	2022 Progress
	Reduction in Energy Intensity (GJ/sqm GFA) from 2009 40%	reduction achieved 45% TARGET EXCEEDED
	Reduction in Emissions Intensity (CO2-e (T)/sqm GFA) from 2009 40%	reduction achieved 90% TARGET EXCEEDED
	Reduction in Water Intensity (kL/EFTSL+FTE) from 2009 40%	reduction achieved 70% TARGET EXCEEDED
	90% Waste Diversion rate from Landfill from 2009	reduction achieved 90% TARGET EXCEEDED



2. Context

In 2022, Macquarie University has increased its size (gross floor area) by 58% and its population of students and staff by almost 33% over 2009 levels.

This spatial growth includes:

1. New large-scale developments such as the Australian Hearing Hub, the Macquarie University Library and more recently the Central Courtyard Precinct, which includes student accommodation
2. New specialised buildings including the Brain Behaviour Building and the Biosciences Research Facility
3. Significant modernisation of older building stock including Science (12 Wally's Walk), the Arts Precinct (25 Wally's Walk), 18 Wally's Walk and the Central Animal Facility.

At a high level, focus areas for the University with regards to minimising our resource use and maximising our efficiency are based on:

- Continual improvement to our precinct model of energy and district thermal systems
- Precinct load diversification resulting in peak load reduction
- Implementation of behind the meter renewable supplies to contribute to reducing baseload power consumption
- Continual improvements to metering, monitoring, automation and building intelligence systems
- Lifecycle building upgrades with a focus on utilisation, efficiency, flexibility and functionality of space
- Utilising our unique campus landscape and creek systems as a biofilter to improve downstream water quality, enhance biodiversity and mitigate localised flood impacts

2.1 Our Approach

As the campus develops, Macquarie University continues to focus on resource efficiency, controls and management, using less, self-generating energy where appropriate, while maintaining functionality and enhancing the occupant experience required in this unique operating environment.

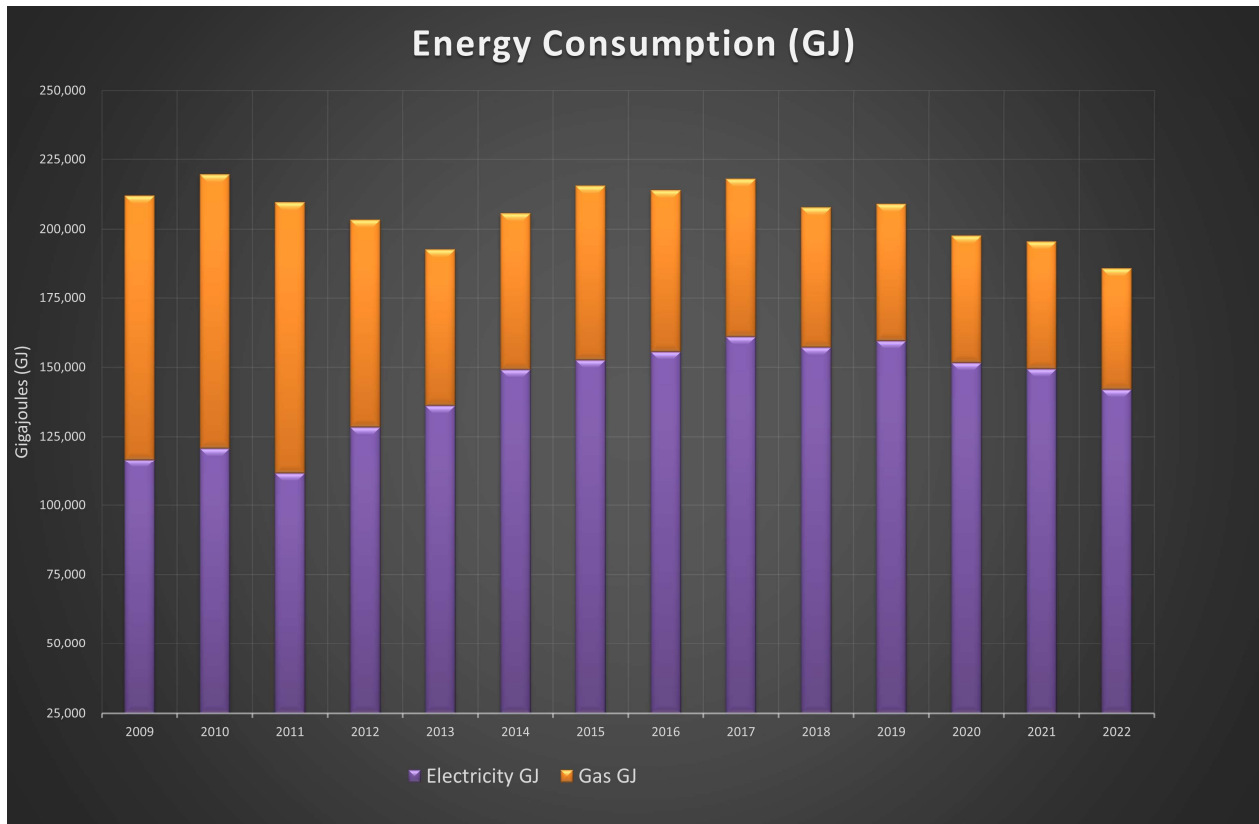




3. Energy

3.1 Energy Consumption

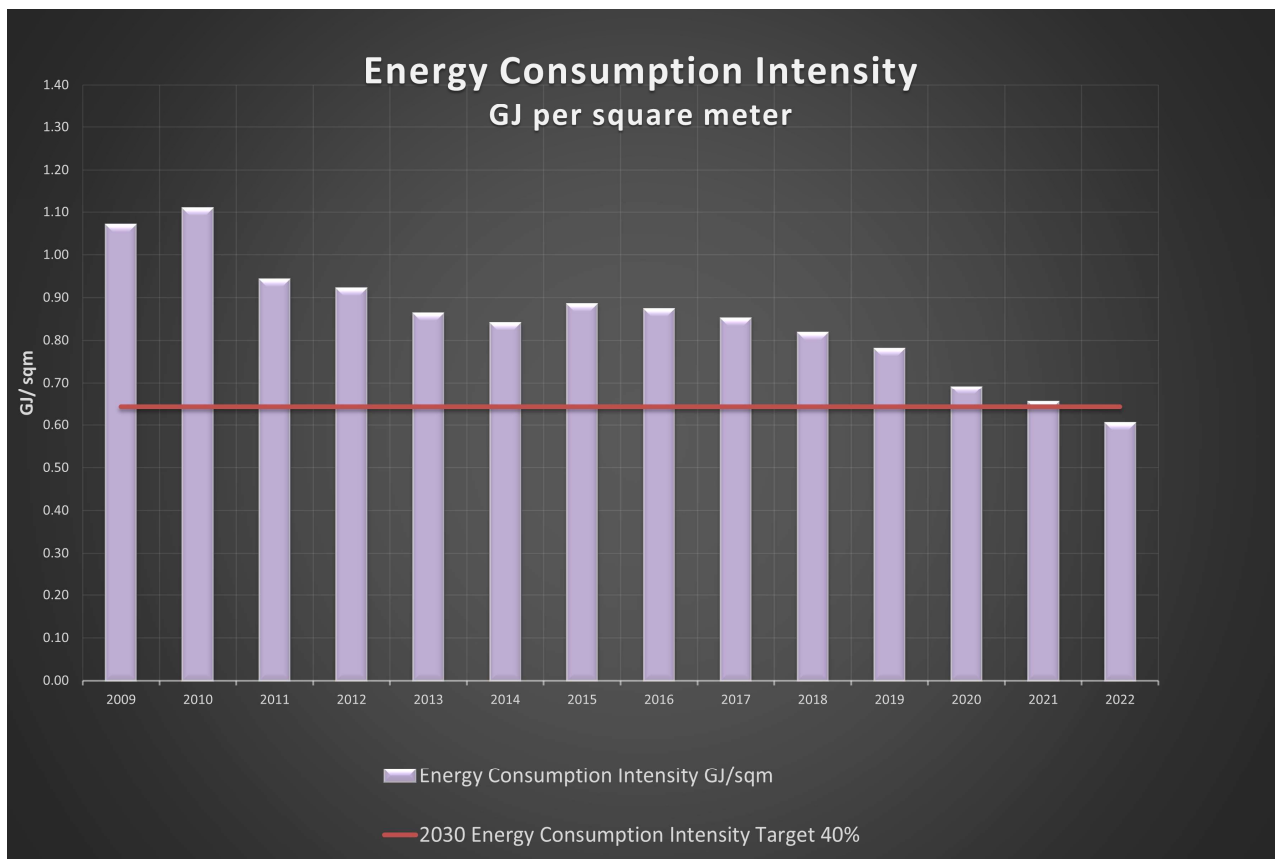
- 10% reduction in total annual energy consumption since 2009, despite the 58% increase in gross floor area.
- Reduced reliance on gas as an energy source due to increased efficiency of electrical infrastructure and provision of on-site renewable sources.





3.2 Energy Intensity

- Reduction target: 40% by 2030 (against 2009 baseline) measured in gigajoules (GJ) per square meter gross floor area (GFA)
- 2022 progress: 45% reduction achieved, despite 58% increase in GFA meaning we have exceeded our target





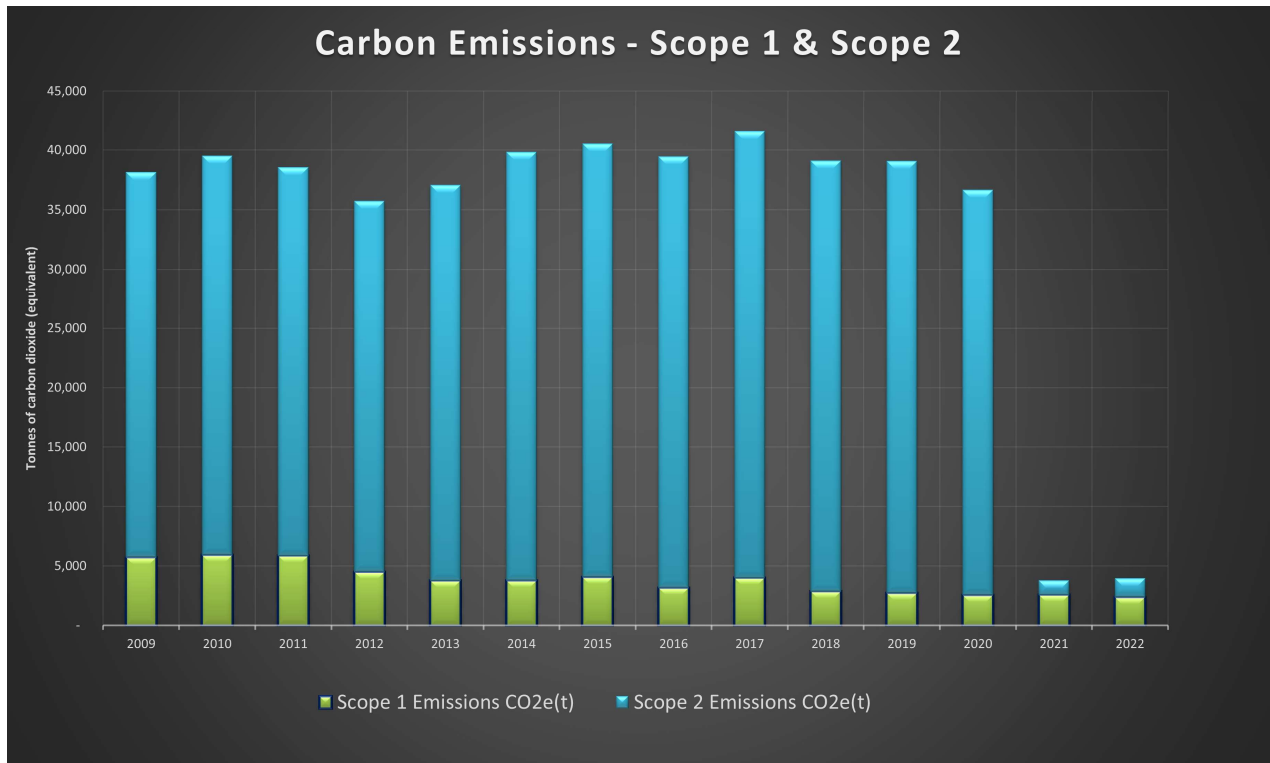
4. Emissions

4.1 Production

Our ongoing contracts for 100% renewable electricity supply have reduced our Scope 2 emissions by 95% in 2022. Overall, our annual carbon emissions for 2022 have reduced by more than 90% since 2009 (scope 1 and scope 2).

Definitions:

- Scope 1:** greenhouse gas emissions are emissions released to the atmosphere as a direct result of an activity. For example, natural gas used for heating or fuels used in cars, etc.
- Scope 2:** greenhouse gas emissions are the emissions released to the atmosphere from the generation of purchased electricity.

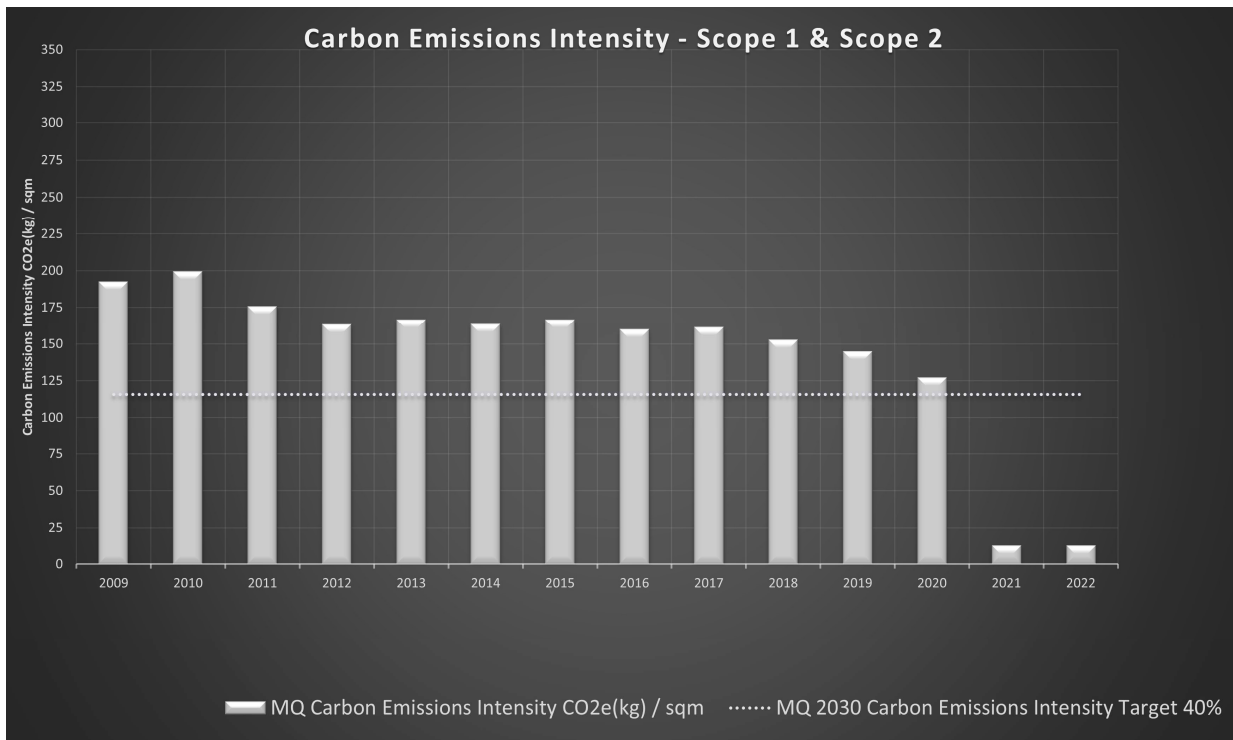


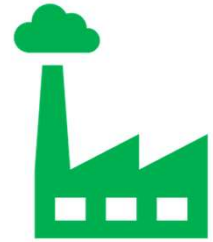


4.2 Emissions Intensity (Scope 1 & Scope 2)

Our emissions intensity is measured by tonnes of carbon dioxide equivalent measured per square meter of gross floor area (GFA). In 2022, our emissions were reduced to 12.6kg carbon dioxide per square meter of GFA.

- Target Reduction: 40% by 2030 (2009 baseline) t CO₂-e per square meter of GFA
- 2022 Status: 90% reduction achieved (2009 baseline) – target achieved





5. Pathway to Carbon Neutral

For any institution, the pathway towards a carbon neutral position presents a challenge that can ideally be achieved by a combination of direct and indirect activities.

Direct activities are typically on-site (eg, building and infrastructure that improves energy efficiency, or on-site renewable energy supplies) which have operational, functional and financial benefits to the University. However, these will only take us part of the way.

The balance of the journey is typically a financial exercise of annually purchasing indirect alternatives (eg, commercially available renewable energy) and/or entering into carbon offset schemes.

In this challenging economic climate where access to funding is limited, along with the purchase of 100% renewable electricity, Macquarie University continues to invest in direct, on-site activities that reduce our ecological footprint, improve our operational and functional performance, and also provide a financial benefit to the University.

This continued focus on efficiency, self-generating where appropriate, and seeking out sustainable alternative renewable options are critical to this and core to working towards a carbon neutral model.

Solar

Our solar capacity has now increased to 776 kW which is helping to reduce our import of electricity from the grid. Rooftop arrays across campus contribute to base building power and reduce maximum energy demand levels. Currently all solar energy generated on-site is consumed on-site.



Central Courtyard Precinct rooftop solar
Image credit: Joanne Stephan





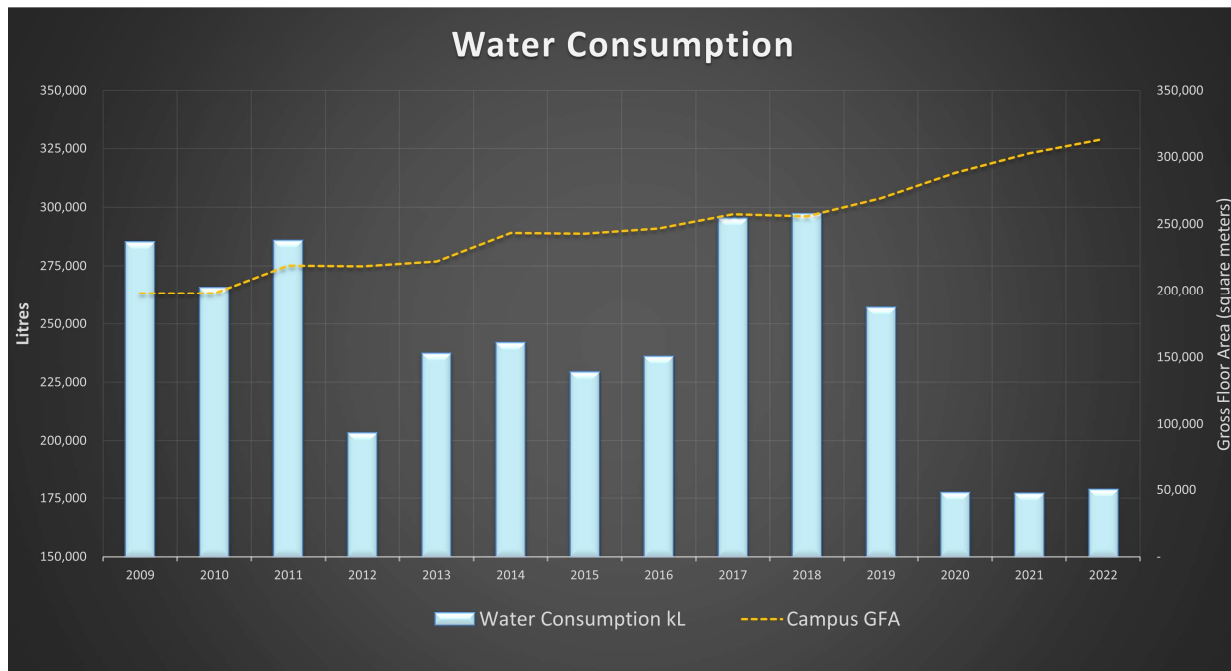
6. Water

Our campus interacts with fresh water in many different ways in both the built environment and our natural environment. Water conservation in our buildings involves running taps at a reduced pressure to optimise flow rates. Rainwater harvesting allows us to use additional water sources for grey water purposes (eg, flushing toilets). Water recycling allows us to use treated blackwater for irrigation of our sports fields.

Our water reduction target is 40% reduction from 2009 levels by 2030

6.1 Consumption

- 21% reduction in total annual water consumption from 2009 levels despite 58% increase in campus gross floor area (GFA)





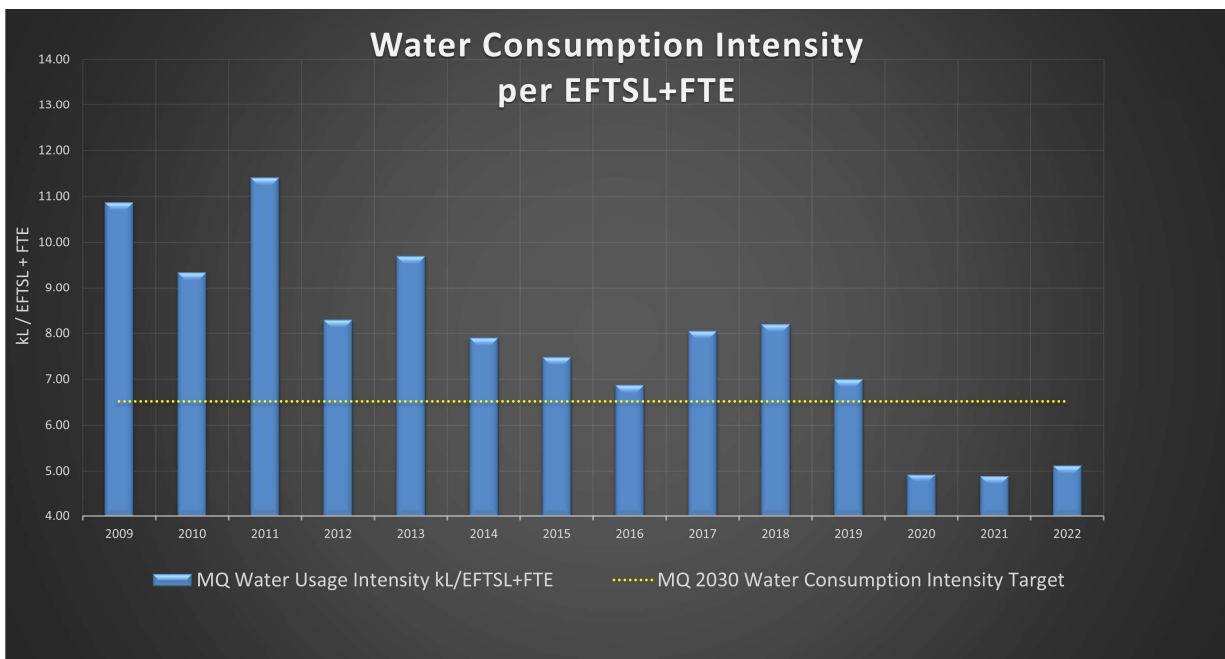
6.2 Intensity

- Reduction target: 40% per person (EFTSL+FTE) by 2030
- 2022 Status: 40% reduction achieved against 2009 baseline despite 33% increase in EFTSL+FTE

Definitions:

EFTSL: equivalent full-time student load is the measure of study load for a year of a student undertaking a full-time course of study.

FTE: full-time equivalent is a measure of staff employment and includes both academic and professional staff.





Case Study: *Water Sensitive Campus*

At Macquarie University we are conscious of all water on campus, including that in our natural environment. Our Mars Creek Environmental Plan and its array of rehabilitation projects has reduced the impact of storm flows and improved flood mitigation for both the Macquarie community and for the Lane Cove River in the adjoining national park.

The most recent project has created a new naturalised surface channel through a section of the original creek bed, reinstating a riparian corridor that was previously removed when the creek was piped underground. This additional habitat encourages native freshwater eel migration upstream from their existing habitat in the University’s lake to the rehabilitated upper reaches of Mars Creek.



Mars Creek
Image credit: Chris Stacey



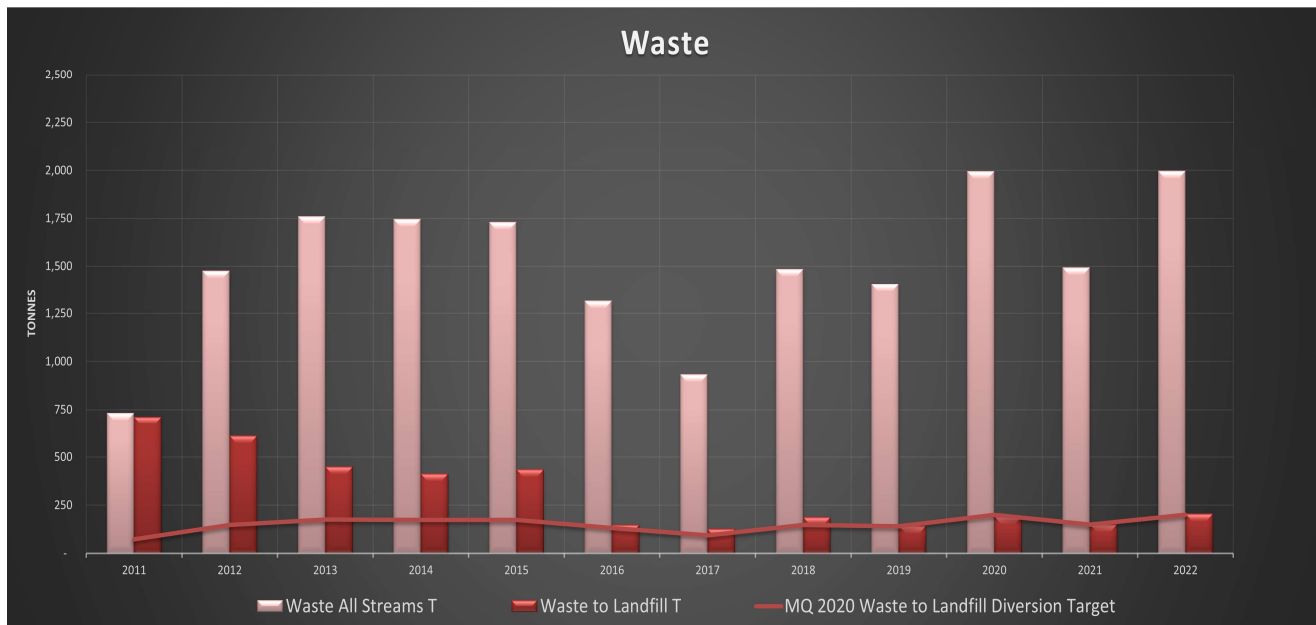


7. Reuse, Recycling and Waste

7.1 Waste Diversion from Landfill

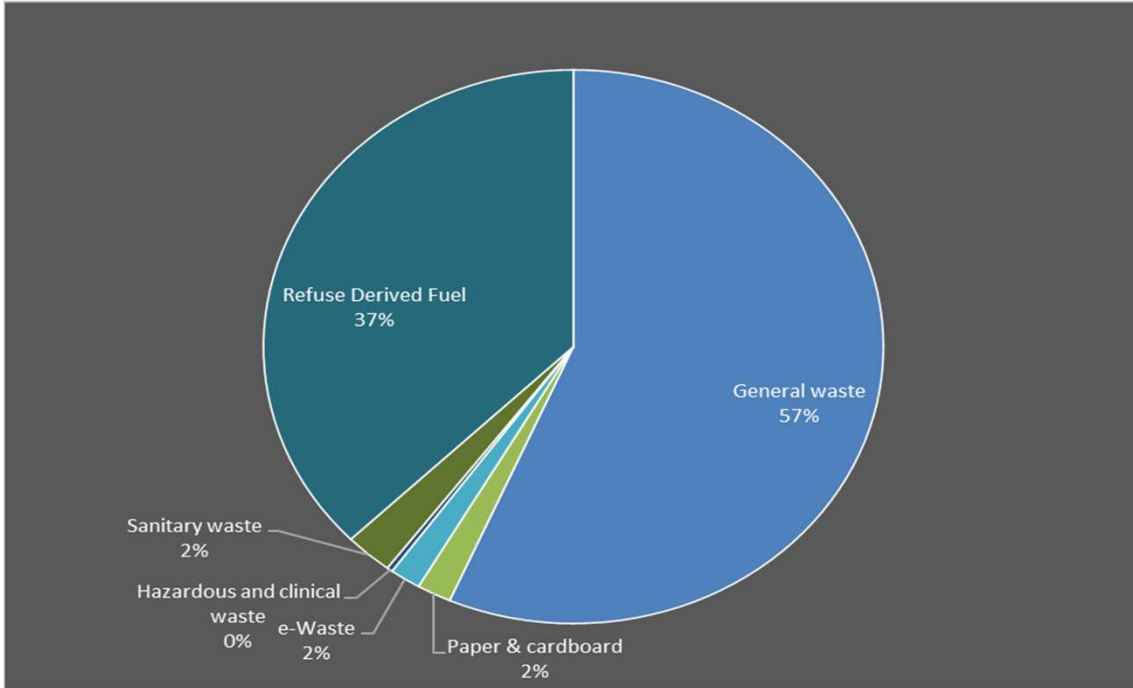
Target Diversion Rate: 90% by 2020

2022 Status: 90% reduction achieved which meets our target





7.2 Waste Breakdown



Case Study: *Reducing single-use coffee cups*

Macquarie University has 2 innovative ways to help students and staff avoid using disposable single use coffee cups.

Edible coffee cups?

Good Edi is an edible coffee cup made from natural ingredients (oats, grains, water, sugar, vegetable oil and salt). They are 100% vegan and do not affect the flavour of the coffee. Made in Australia and the cup can be eaten providing a nutritious snack packed with fibre and Vitamin B.

Coffee cup swap – Huskee cups

Macquarie University is partnering with sustainable coffee cup manufacturer **Huskee** to reduce single-use disposable coffee cup use. HuskeeSwap is a cup exchange program and the cups are actually made from coffee husks!





7.3 Circular Economy

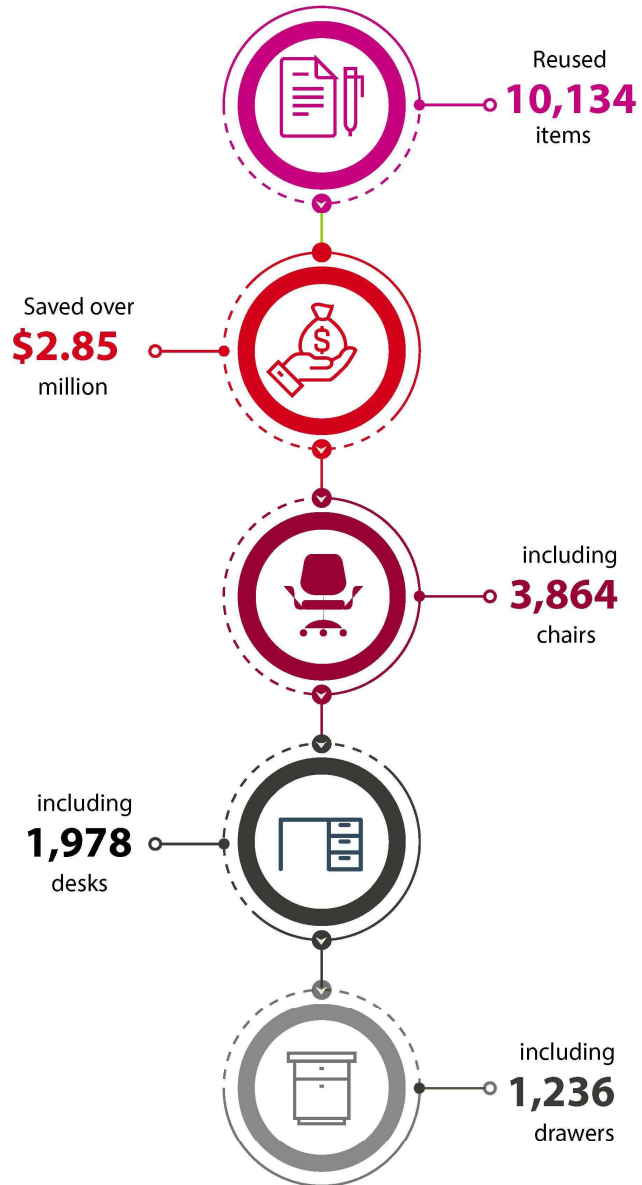
The circular economy is a model of production and consumption which involves extending the life cycle of products as long as possible.

The **Office Furniture Reuse Store** which was set up in 2010, is one example of Macquarie University’s part in contributing to the circular economy. The Store enables re-use of surplus office furniture across all departments and faculties, both on and off campus.

2022 was another successful year for the Store despite being closed for 7 months due to building construction works. We saw more than 270 items reused, with a value of almost \$100,000.

Progress to date:

Since the **Office Furniture Reuse Store** opened in 2010, we have reused more than 10,000 items and saved over \$2.85 million in new furniture purchases.



Notes

- Data used for analysis sourced from annual submissions to:
 - Tertiary Education Facilities Management Association (TEFMA) for TEFMA Benchmark Report; and
 - Clean Energy Regulator for the annual National Greenhouse and Energy Reporting (NGERs) submission.
- GFA excludes on-grade and open multi-deck car parks, Macquarie University Hospital, Macquarie University Village, Dunmore Lang College, Robert Menzies College and non-University tenanted space in commercial buildings.
- Data for energy and emissions uses current NGERs submission figures for financial year 2022 and includes on-campus and off-campus operations MQ, MGSM & U@MQ.
- Water and waste data are for calendar year 2022.
- Water data for 2022 does not include captured rainwater due to difficulties with metering and excessive rainfall during 2022.
- Targets are set out in the University Master Plan 2014.



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