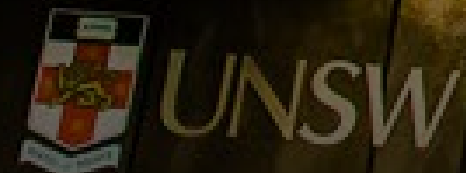




UNSW
SYDNEY

Australia's
Global
University

Sustainability Report 2018



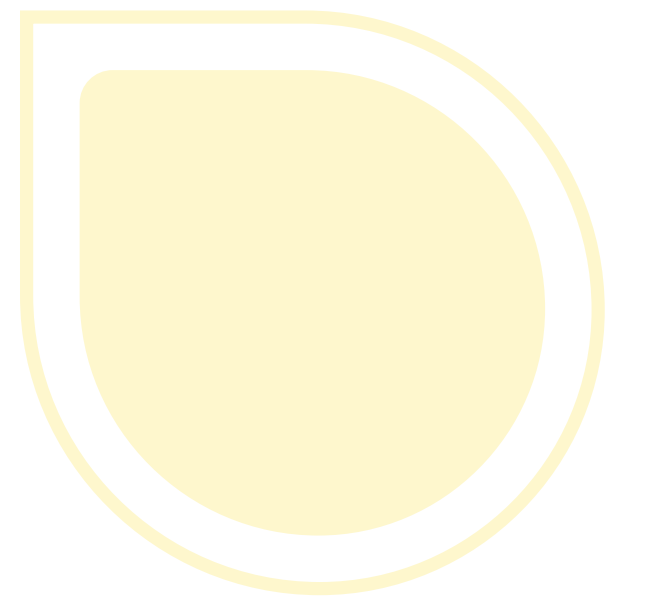
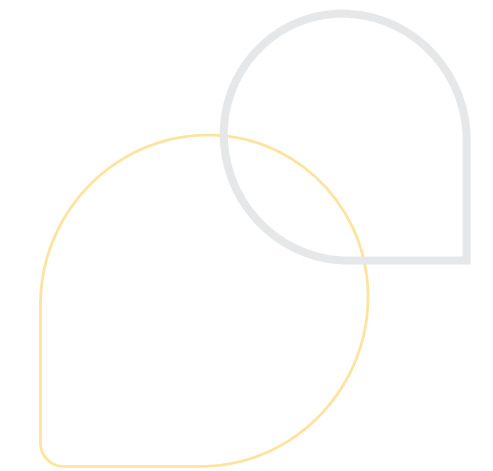
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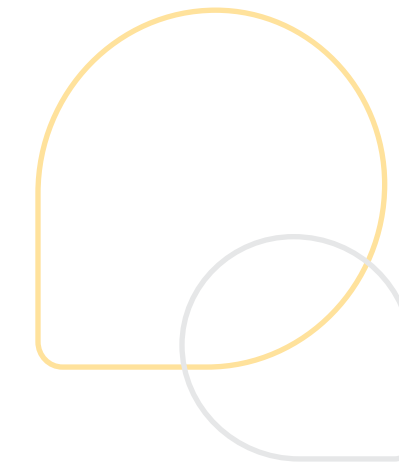
UNSW acknowledges and pays respect to the traditional owners where University campuses stand at Kensington (the Bedegal people of the Eora Nation), Paddington and Coogee (the Gadigal People of the Eora Nation) and Canberra (the Ngunnawal peoples). Our Kensington campus is located near an 8000-year old campsite around which the people of the area taught culture, history and subsistence.

For tens of thousands of years, Aboriginal and Torres Strait Islander people managed the land sustainably using practices adapted to its unique climate, geography and ecology. We honour their unique relationships with nature and their rich contribution to society.



Message from the

Head of Environmental Sustainability



2018 was a year of change for environmental sustainability at UNSW as the program responsibility moved into Estate Management (EM), where many of the activities that affect our operational environmental impact are managed. I joined UNSW in January 2018 and our new team was entrusted to develop a new UNSW vision and strategy for environmental sustainability. I discovered a university community engaged in environmental sustainability issues, world-leading UNSW teaching and research helping to tackle global sustainability challenges, and a range of sustainability initiatives on campus.

2018 was also the final year of our Environmental Management Plan 2016-18 (EMP) and we've been focused on completing the objectives and strategies set out across energy and emissions, water, waste management, engagement, transport and other areas. Some highlights included UNSW announcing its landmark solar power purchase agreement (PPA), 2.6 million containers being recycled through the Return and Earn reverse vending machine, expansion of our campus rainwater capture system and successful launch of a food waste collection program.

We also secured approval of the new Environmental Sustainability Plan 2019-21, which will build upon and deepen our commitment to environmental sustainability. It was a challenging year and a hugely satisfying one.

I'd like to thank the many people who supported sustainability initiatives in 2018, members of the Environmental Sustainability Reference Group and of course the inspiring students and staff who champion environmental sustainability every day.

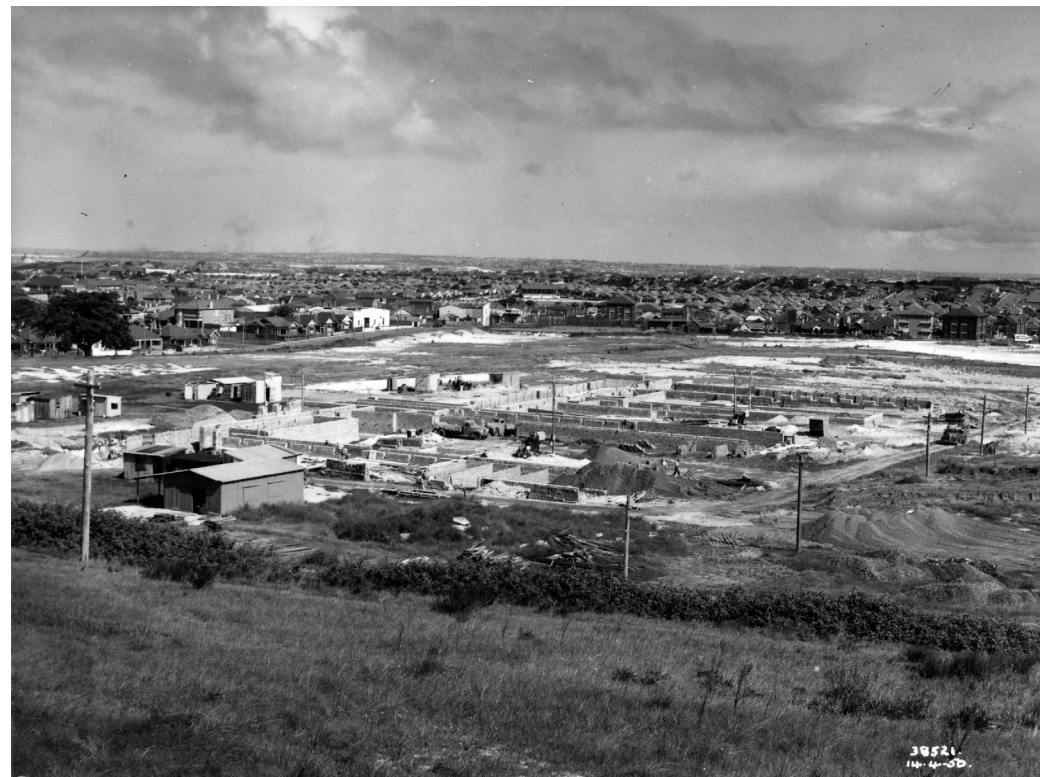
William Syddall
Head of Environmental Sustainability

I'd like to thank the many people who supported sustainability initiatives in 2018, members of the Environmental Sustainability Reference Group and of course the inspiring students and staff who champion environmental sustainability every day.

Introduction

Established in 1949, UNSW Sydney is one of Australia's leading universities. As a teaching and research-intensive university with a focus on the scientific, engineering, technological and professional disciplines, UNSW recognises the vital role the tertiary sector has in driving the environmental sustainability agenda, as well as the urgency with which this change must take place.

Environmental sustainability is part of our 2025 Strategy, and we are determined to show leadership in solving global environmental challenges through teaching, research, thought leadership and by practicing what we preach on our campuses.



The first permanent building under construction: with view towards the corner of Barker Street and Anzac Parade, 1950.

Many of our students and staff are actively engaged in environmental and social issues and UNSW is committed to continuously improve the way we plan, construct, operate and power our buildings; reduce and manage waste; procure goods and services; and travel to, from and around our campuses.

As a global university, we are also at the forefront of learning and teaching programs that will educate students to be future leaders, well-equipped to understand and solve the grand challenges humanity faces.



Approach

Reporting period

UNSW's 2018 Sustainability Report documents the sustainability performance of the University from the period 1 January to 31 December 2018. This report primarily focuses on our operational environmental performance, but also provides an overview of progress in environmental sustainability research and education.

This report aims to:

- document UNSW's efforts to embed sustainability across our campuses
- report on the environmental impact of UNSW activities in key areas
- allow comparison with our past performance and provide a benchmark for the future.

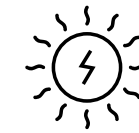
Global Reporting Initiative (GRI) G3 Reporting Guidelines, disclosure elements and indicators have informed the development of this report.

Energy & Emissions

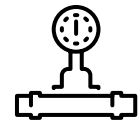
At UNSW we proactively find new ways to conserve energy and accelerate our transition to cleaner energy sources



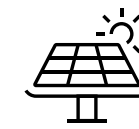
90 gigawatt hour
electricity consumed
(2% increase from 2017)



1 gigawatt hour
generated from solar PV
(20% increase from 2017)



129,842 gigajoules
gas consumed
(15% increase from 2017)



**1 new solar
PV system**
(99.75kWp capacity, 285 panels)



**Solar power
purchase agreement
(PPA) signed**

UNSW takes an active approach to reducing energy. Despite this, our total energy use has risen annually since we started reporting in 2013 due to the expansion of energy-intensive research activities, increasing staff and student numbers and the addition/upgrade of major new buildings on our Kensington campus including Science and Engineering Building (SEB E8), Hilmer Building (MSEB E10) and Biological Sciences Building - South (E26).

Currently, most of UNSW's energy requirements are met either directly or indirectly through fossil fuels, with around 1% coming from onsite renewables. This will change from 2020 when supply of 100% renewable electricity commences through our solar PPA.

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Kensington campus energy use 2017-2018

Total energy use (electricity and gas) on the Kensington campus has risen by 6% from 119.1 gigawatt hours (GWh) in 2017 to 126.7 GWh in 2018.

Electricity generation – co-generation & tri-generation

Co-generation systems use waste heat from the production of electricity to supply hot water to buildings, whilst tri-generation systems capture both the heating and/or cooling potential of the waste energy. UNSW currently has one co-generation system and one trigeneration system on campus which, in 2018, accounted for approx. 3.2% of the University's energy demand.

Electricity generation – solar photovoltaic (PV)

Since 2005, UNSW has been installing solar photovoltaic systems on buildings around its campuses. In 2018, UNSW onsite solar generation capacity increased by 99.75kWp with the new installation of 285 panels on Electrical Engineering building. With this installation, onsite generated photovoltaic electricity met approximately 1.1% of the University's energy demand in 2018.



UNSW to switch to 100% renewable electricity

In 2018, UNSW was the first university globally to sign a power purchasing agreement (PPA) to have 100% of its electricity supplied by offsite photovoltaic solar energy.

The 15-year solar PPA supply agreement with Sunraysia Solar Farm will allow UNSW to reduce its greenhouse gas emissions from building energy use to zero from 2020.

“The Solar PPA means UNSW will secure carbon emission-free electricity supplies at a cost which is economically and environmentally attractive when compared to fossil fuel-sourced supplies.

It is testament to the world-class research carried out at UNSW, that a technology we played a leading role in developing is now being used to provide the University with a renewable source of emissions-free energy.”

UNSW President and Vice-Chancellor Professor Ian Jacobs

Energy efficiency

Building upgrades

The Estate Management Energy team continually improved the energy efficiency of the University's facilities through 2018 with initiatives such as:

- replacing hot water and lighting systems
- fitting new bathrooms with only cold-water taps
- tuning building management systems
- re-commissioning the major heating, ventilating, and air conditioning (HVAC) plant
- making live energy data available for the UNSW community.

Fume cupboard efficiency project

A University wide roll out of fume cupboard energy and safety efficiency stickers program was completed in 2018. Over 300 stickers were installed on fume cupboards in laboratories in the faculties of Medicine, Engineering, Science as well as rural clinical schools, to encourage users to lower the fume cupboard sash between uses. Based on an analysis in 2017, savings of \$22,000/year and 65 tonnes of carbon dioxide emissions are expected, together with better safety outcomes.

Greenhouse gas emissions

UNSW reports its carbon dioxide and other and greenhouse gas emissions to the Commonwealth Government under the National Greenhouse and Energy Reporting (NGER) Act.

The NGER Reporting Guidelines break emissions down into three categories:

Scope 1: Direct emissions such as burning natural gas and motor vehicle fuels

Scope 2: Indirect emissions, removed by a single step such as those generated as a result of the use of electricity produced by a third-party

Scope 3: Emissions associated with upstream and downstream value chain activities, such as business travel by staff, disposal of waste and purchasing of goods and services.

UNSW does not currently measure Scope 3 emissions; however, this is something we intend to introduce in our future sustainability reporting.

In the 2017-18 financial year, UNSW campuses and operations were responsible for the production of 81,994 tonnes of Scope 1 and 2 emissions of CO₂e (carbon dioxide equivalent) greenhouse gases, which is an increase of 13% since 2013-14. The increase in Scope 1 and 2 emissions is consistent with the addition of new buildings and expansion of staff and student numbers.

UNSW greenhouse gas emissions

Data provided by UNSW Estate Management Energy team

	Scope 1 (tonnes CO ₂ e)	Scope 2 (tonnes CO ₂ e)	Total (tonnes CO ₂ e)
2012-2013	6,489	58,430	64,919
2013-2014	6,430	66,025	72,455
2014-2015	6,890	70,482	77,372
2015-2016	5,728	73,196	78,924
2016-2017	5,807	73,859	79,666
2017-2018	6,702	75,292	81,994



UNSW powers up on renewables with new battery

UNSW teamed up with TransGrid to install the first ever industrial-scale Tesla Powerpack battery on an Australian university campus as part of a ten-year energy research trial.

The battery can store up to 500 kWh of electricity and will be powered by a 112-kW rooftop solar system. UNSW will use the installation to study how to improve the utilisation of batteries for the University's electricity grid.

"This partnership gives UNSW a great opportunity for real-time study of how increasing levels of renewable energy generation can be managed by using distributed storage solutions. UNSW is proud to be a leader in sustainability related research and teaching, and we see this trial as a huge part of that leadership."

UNSW Executive Director Estate Management
Jeff Peers

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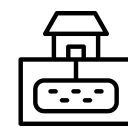
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Water Management

Water conservation is a priority for our current operations and future planning.



62,361 megalitres
of water consumed
(2% increase from 2017)



44% of water
supplied by bore water



**Rainwater capture
system expanded**

UNSW has a responsibility to utilise water resources efficiently and takes water conservation seriously in day-to-day activities and in the planning of future developments.

Since 2015, three new research-intensive buildings were added to the Kensington Campus: The Science and Engineering Building (E8), Hilmer Building (E10) and Biological Sciences Building - South (E26). These buildings are research focused with high resources requirements, but campus water usage has not increased relative to the increased usage. This is due to changes made to our water usage and conservation programs such as introduction of low-flow taps, low-flush toilets and better use of water efficient cooling towers.

Furthermore, UNSW recycles rainwater captured on campus through bore collection. More than 40% of total water used on campus is bore water that is captured through storm-water retention chambers that capture more than 90% of the rainwater falling on campus grounds and buildings.

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UNSW expands landmark water sustainability project

In 2018, UNSW expanded its rainwater capture project with the installation of a second percolation chamber below the Kensington campus. The captured stormwater will replenish the Botany Aquifer located beneath the University.

Together with UNSW's original stormwater retention chamber, the University will now be able to divert a total of 90% of the stormwater that lands on the campus to the aquifer.

“This system is a win for water sustainability, the environment, and the University’s bottom line.”

UNSW Engineering Services Senior Manager
Claude Pelosi

Using of bore water has reduced the potable water usage by more than 40% percent

UNSW water usage Kensington Campus 2013-2018

Data provided by UNSW Estate Management Energy team

	Potable water (megalitres)	Bore water (megalitres)	Total (megalitres)
2013	321	268	589
2014	349	225	574
2015	395	204	599
2016	361	282	643
2017	367	264	631
2018	351	272	623



Rainwater capture

UNSW uses a managed aquifer recharge system to mitigate the effects of the extraction of bore water from the Botany Aquifer. The Village Green percolation pit has been operational since 2007 and returns 70% of stormwater run-off from campus to the aquifer. The new Roundhouse percolation pit will become operational in early 2019 and will return a further 20% of stormwater run-off to the aquifer.



Ongoing water conservation

In 2018, UNSW continued to implement ongoing water conservation initiatives including:

- toilet and shower upgrades to incorporate higher efficiency water-saving fixtures and fittings
- plantation of drought-tolerant grasses and native plants
- water consumption reviews of campus cooling towers to improve operational efficiency and reduce water wastage
- incorporation of bore water systems into all major building projects
- continuous monitoring of water use on our buildings and systems.

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Waste and Recycling

UNSW’s waste management initiatives involve rethinking, reducing, reusing, recycling and composting



1,838 tonnes
of general waste generated



228 tonnes
food waste collected for composting



2.6 million drink containers
collected through Return & Earn



1.4 tonnes
of batteries recycled

Waste is one of the most visible environmental issues on our campuses and a considerable challenge. Our strategy follows the waste hierarchy by promoting reuse over single-use, reducing packaging, and prioritising products that are recyclable. We have recycling programs in place for food waste, batteries, toner cartridges, mobile phones, light bulbs, glass, plastic, paper and cardboard, polystyrene, paints and paint related products.

- Other waste initiatives included:**
- an on-campus ‘Return and Earn’ reverse vending machine as a litter reduction and recycling support service
 - food waste collection from food outlets and residential colleges kitchens for composting,
 - a reusable coffee cup program
 - a reuse centre for office supplies
 - recycling waste cooking oil
 - capturing fluorocarbon (HFC) gases from refrigerators
 - furniture and lab equipment reuse through AdminNet and TechNet programs
 - dumping reduction initiatives e.g. CCTV cameras installation around skip bins
 - chemical and biological waste (including paint products) are dealt with by specialist companies who collect and dispose of these materials safely
 - an eReuse Centre established (other eWaste is recycled through an agreement with the University’s IT supplier)
 - ongoing waste reduction campaigns including Plastic Free July.

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Waste overview

General waste
Consists of all waste collected from public spaces, offices and teaching spaces. Under UNSW’s co-mingled general waste model, general waste is transported by our waste management contractors to a material recovery facility (MRF) where it is mechanically, process engineered fuel (PEF) and landfill streams. In 2018, the landfill component was less than 10% of general waste by weight.

In 2015, the waste contractor started producing Processed Engineered Fuel from the combustible waste component i.e. plastics, paper packaging and timber. This is shredded and compressed into 1 tonne ‘blocks’, then transported to cement producers and used as fuel.

Other waste
Consists of all other waste streams generated by the University including chemical, biological, e-waste, concrete etc.



2.6 million drink containers recycled through Return and Earn

At the 2018 Keep Australia Beautiful Awards, UNSW was highly commended in the Return and Earn Litter Prevention award for installing a reverse vending machine on campus which helped recycle nearly 2.6 million containers within its first 12 months of operation.


The Return and Earn reverse vending machine was installed at the Kensington campus in 2018 making UNSW the first educational institution to participate in the NSW Container Deposit Scheme.

UNSW’s implementation of the scheme was highly commended due to its far-reaching benefits to the broad spectrum of participants involved.

The initiative allows the UNSW community to earn 10 cents for every eligible drink container returned.

“The Return and Earn reverse vending machine returned over \$250,000 to the UNSW in 2018 and has helped to raise awareness about good recycling practices amongst our staff and students. We’ll continue to promote recycling and also focus on reducing waste by promoting reusable drink and food containers on our campuses.”

UNSW Head of Environmental Sustainability
William Syddall

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The following table outlines the total waste generated by UNSW between 2014 and 2018

UNSW GENERAL WASTE					
	2014	2015	2016	2017	2018
Waste component	Total (tonnes)	Total (tonnes)	Total (tonnes)	Total (tonnes)	Total (tonnes)
Paper/cardboard	1,300	1,045	1,306	1,413	1,114
Mixed metals	193	232	158	164	120
Drink containers- CDS Reverse Vending Machine	0	0	0	0	84
Food and organics	502	571	382	251	278
Food waste	111	108	102	118	228
Recycled	2,106	1,956	1,948	1,946	1,824
Processed engineered fuel (PEF)	0	0	667	672	858
Landfill	549	472	129	186	159
Subtotal	2,655	2,428	2,744	2,804	2,841
General waste recycling rate	79%	81%	71%	69%	64%
General waste landfill diversion rate	79%	81%	95%	93%	94%

Data provided by UNSW EM Waste Team.
Paper and cardboard: Figure includes segregated paper 498 T, confidential paper is 35 T and recovered paper from general waste at Material Recovery Facility 581 T = 1,114 T
Mixed metals: Figure reported from Material Recovery Facility from general waste. 50% of this is metal containers.
CDS containers: recycled at UNSW Return and Earn Reverse Vending Machine.
Food and organics: Figure reported from Material Recovery Facility from general waste.
Food waste: Segregated food waste collected from back of the house.

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Acknowledgements

The following table outlines the total waste generated by UNSW between 2014 and 2018

UNSW OTHER WASTE					
	2014	2015	2016	2017	2018
Waste component	Total (tonnes)	Total (tonnes)	Total (tonnes)	Total (tonnes)	Total (tonnes)
Other waste (Recycled)					
Chemical waste	No data	No data	No data	12.3	36
E-waste	24	16	17	15	24
Fluorescent tubes	2.08	1.34	1.5	1.5	2.4
Batteries	0.58	1.45	1.42	0.77	1.4
Polystyrene	0	0	0	0	1.22
Mobile phones	0.04	0.05	0.05	0.13	0.17
Toner cartridges	2	3.5	2.2	3.1	2.3
Waste oil	20.4	15	15	17	7
Green waste	99	108	128	124	153
Concrete	24	30	30	24	18
Wooden pallets*	1.5	1.5	1.5	1	1
Skip bin material (metal, cardboard, plastic etc)**	329	320	304	313	212
Other waste recycled	502	497	500	512	458
Other waste (Sent to landfill)					
Chemical waste	110	114	123	159	9
Skip bin material**	542	538	569	580	318
Other waste sent to landfill	652	652	692	739	327
Other waste (Incinerated)					
Biological waste***	106	106	66	102	86
Chemical waste****					84
Other waste incinerated	106	106	66	102	170
Recycled	383	374	500	512	458
Landfill	652	652	692	739	327
Incinerated	106	106	66	102	170
Total	1,140	1,132	1,258	1,353	955
Percentage of other waste recycled	34%	33%	40%	38%	48%
UNSW FURNITURE REUSE PROGRAM					
Furniture*****	1,200	800	800	1,000	1,200

* Pallets used for E-waste recycle and exam desk storage. 72 x pallets 20kilos/pallet = 1.5 tonne
** Skip bin material - An internal audit in 2014 of skip bins identified that 35% of total skip waste is recycled by the waste contractor. Data for all subsequent years is extrapolated based on 2014 audit
*** Biological waste - All UNSW biological waste is incinerated
**** Chemical waste is separated and incinerated off site by contractor
*****Estimate from Furniture re-use contract and items re-used from UNSW Randwick Tram Shed storage.

Waste stream

Destination



Paper & Cardboard



Separated then
transported to Orora
paper mill



Mixed organics (food)



Separated and then
transported to Earth
Power technologies to be
processed using anaerobic
digestion technology to
convert solid and liquid
food waste into combustible
gas and compost



Mixed metals



Separated and
transported to metal
recycling facilities



PEF (waste to energy)



Waste to energy,
processed on site
and transported
for sale



Landfill



Residual waste
transported to a
licensed landfill site

Food waste recycling yields impressive results

In May 2018, UNSW rolled out a food waste program across the Kensington campus with the goal of capturing food waste for resource recovery. As part of the program, food waste was collected from 36 food retail outlets on campus, as well as all UNSW childcare centres and residential college kitchens.

This waste was then processed off-site using anaerobic digestion technology resulting in high quality compost for commercial use and methane captured for power generation. For every tonne of food waste processed around 300kWh of power is generated, which is enough to power an average home for two weeks. This technology also prevents methane, a powerful greenhouse gas, from escaping into the atmosphere.



The initial results from the program were impressive with UNSW capturing around over 30 tonnes of food waste per month.

Free
water
refill



Ainsworth
Building



New water refill stations discourage single-use plastic bottles

In 2018, five new outdoor water refill posts were installed around the Kensington campus bringing the total to 12. These all-in-one bubblers feature a tap and spout and are designed to encourage the refilling of water bottles. They are accessible to wheelchair users, people on bicycles and children, and are also designed to be vandalism resistant.

Increasing water refill facilities is part of our strategy to reduce single-use plastic bottles on campus. Around the globe a million single use plastic bottles are used every minute and only 30% of these get recycled. Our hygienic and easy to use water refill stations assist our community to stay hydrated while helping the environment.





Engagement and Awareness

Informing, engaging and leading through critical thinking,
evidence and debate are central to UNSW's 2025 Strategy



**Supporting the common goal of
environmental sustainability**

Sustainability leaders from the Group of Eight (Go8) universities came together in 2018 for a two-day forum to collaborate on sustainability initiatives and learn from each other's experiences.

Held across UNSW and the University of Sydney, the biannual forum was opened by UNSW President and Vice-Chancellor Professor Ian Jacobs, with an inspiring outline of UNSW's values and commitment to a sustainable future.

Executive Director of Estate Management Jeff Peers and Senior Manager for Environmental Sustainability William Syddall spoke about UNSW's recent sustainability initiatives including the expansion of the stormwater capture system, the food waste collection system, reverse vending machine and the Tesla Battery Storage project.

Energy Manager Nick Jones spoke about UNSW's exciting new Solar Power Purchasing Agreement which means UNSW will be supplied with 100% renewable, zero carbon energy from 2020.



Global Climate Change Week

Since 2015, UNSW has run events for Global Climate Change Week (GCCW) on campus annually.

The initiative encourages academics, students, and professional staff at universities, in all disciplines and countries to engage with each other, their communities, and policy makers on climate change action and solutions.

Twelve events organised by various faculties, divisions and Arc were held at UNSW across the GCCW from 15 to 19 October in 2018.



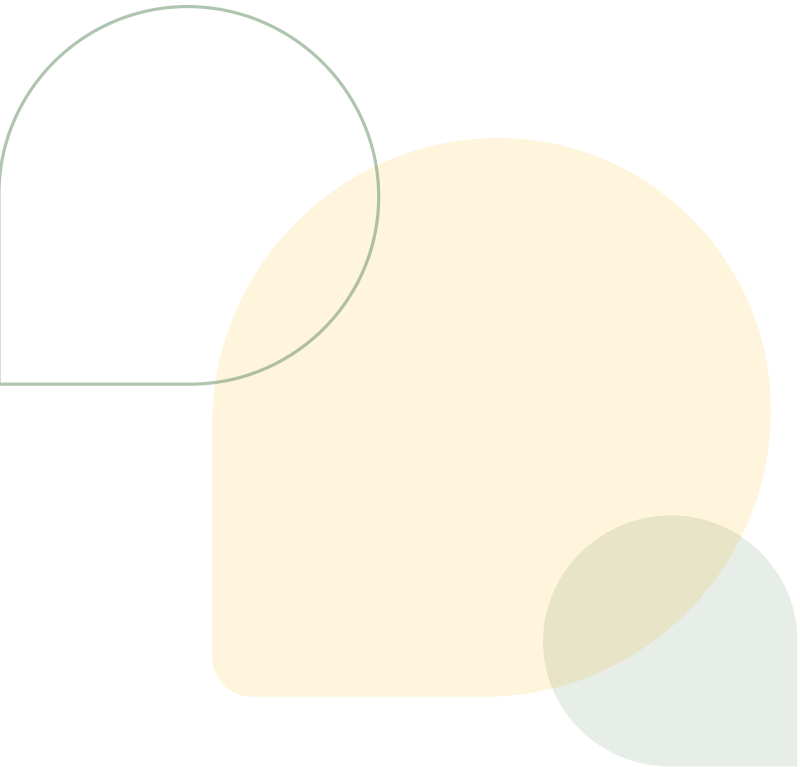
Plastic Free July

In July 2018, UNSW Sustainability worked collaboratively with Business and Campus Services on the Plastic Free July campaign to encourage staff, students, retailers and visitors to eliminate single-use plastics. About 90% of the retailers supported the campaign by displaying posters and eliminating or reducing availability of single-use plastic items like straws and bags. Retailers reported a noticeable rise in the use of reusable coffee cups in July. Usage of Return & Earn reverse vending machine also increased by 20% in July compared to June.



Green Campus Day

In September 2018, a tour of the 6-Star Green Star Design rated Tyree Energy Technologies Building was organised to mark the Green Campus Day in collaboration with Australasian Campuses Towards Sustainability (ACTS) and Green Building Council Australia (GBCA). Attendees had the chance to view the sustainability features including the rooftop solar PV system, gas-fired tri-generation plant, low energy displacement cooling, and heat recovery system.



O-Week

UNSW Sustainability ran its annual sustainability stall in 2018 to engage the incoming 2018 cohort on how they can be sustainable on campus. This year, the Sustainability team in collaboration with Arc and SRC ran a competition to promote newly installed UNSW CDS reverse vending machine. Over 200 students participated in the competition by recycling their containers at the UNSW RVM and posting an update on social media.

Promotion and communication

UNSW Sustainability promotes the University's sustainability objectives through:

- engagement and awareness campaigns
- training and information sessions
- annual sustainability reporting
- applications for awards and rankings

Student groups

Our students (often in collaboration with staff) conduct an enormous range of activities that promote engagement and awareness of environmental sustainability. Examples include the Bike Club, Stationary Re-use Centre, eReuse Centre, and Thoughtful Foods organic food co-op.

Grand Challenges

UNSW's Grand Challenges program works to identify, explore and address the most important issues facing, or likely to face, humanity. In 2018, the challenges explored included: Inequality, Living with 21st Century Technology, and Rapid Urbanisation. The Grand Challenge on Rapid Urbanisation tackled the demand for urban solutions, with researchers from a range of disciplines working together to develop and present new possibilities. Professor David Sanderson was the lead on the Grand Challenge on Rapid Urbanisation.

MORE INFORMATION



Student 'Pitch-Off' competition targets waste

In October 2018, UNSW Sustainability partnered with International Residential Colleges, Communities and Charities (IRCCC) for the fifth annual sustainability Pitch-Off competition.

Student volunteers from the residential colleges on campus organise this sustainability awareness raising event where participating students have 90 seconds to pitch their UNSW-targeted sustainability idea. The focus in 2018 was waste minimisation and management. Ten contestants from five colleges participated with over 100 people attending the event.

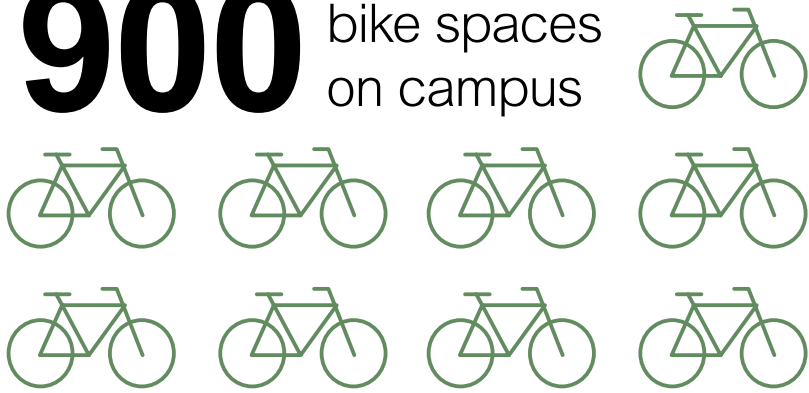
The winning pitch introduced the idea of an inter-floor and inter-college waste comparison/competition using computer software and a dashboard.

Travel and Transport

UNSW aims to help students
and staff make sustainable
transport choices

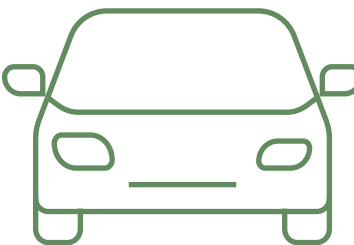
Every weekday during semester, around 40,000 trips are made to and from UNSW's Kensington campus making it the largest single destination in Sydney's eastern suburbs. UNSW is not located close to a railway station meaning there is a reliance on the use of buses, although this will change in 2020 with the opening of the new South East Light Rail

900 bike spaces
on campus



Cycling

104 new bike spaces were added in 2018, bringing the total to around 900 bike spaces on campus. Six repair stations with bike pumps were also installed. UNSW also participated in national Ride2Work day in 2018 for the seventh consecutive year.



3,348
bookings made
across the year

Car sharing

There are four GoGet car share vehicles based at UNSW Kensington campus. In 2018, there were 2,235 student and staff members registered to use GoGet vehicles and 3,348 bookings made across the year.

GoGet data has shown car share members drive, on average, 2,000km less per year than the average car owner

Cycling celebrated at annual Ride2Work Day

There was a big turnout of UNSW students and staff for national Ride2Work day in October 2018, where cyclists relied on pedal power to travel to UNSW. After their successful Ride2Uni, participants were rewarded with a healthy breakfast, hosted by UNSW Wellbeing and Arc Bikeology, and bike maintenance assistance.

According to the City of Sydney council, more and more Sydneysiders are riding bikes as a mode of transport, and in the last decade trips by bike have doubled. Today, more than 60 kilometres of shared paths provide important links throughout the city. Safe cycle access to UNSW was difficult due to construction work taking place to build the South East Light Rail tracks, but when complete there will be excellent bike paths to use to ride to campus.



Campus Operations

UNSW has lush campus grounds that are planted and maintained with the local environment and ecology in mind



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Grounds management

UNSW maintains approximately 78,000m² of garden and lawn areas and 80,000m² of playing fields on the Kensington Campus. We are also the proud caretaker of over 1,200 trees. Approximately 80% of these are Australian native species and there are also several 120-year-old Morton Bay and Port Jackson Fig trees.

Campus grounds sustainability initiatives

We recognise that the way these grounds are managed can have significant environmental impact, so we employ several strategies to manage them in a sustainable way, through:

Native planting policy

This makes sure new plants are chosen to complement the soil and climatic conditions and promote local biodiversity.

Irrigation

We audit our landscape irrigation systems and have a contractual requirement for the grounds maintenance contractor to ensure optimum outcomes.

Healthy soil

We use slow release organic fertilisers wherever possible and limit our use of pesticides.

Mulching

UNSW processes all tree prunings on site to use as mulch to reduce evaporation and conserve water.

Technology in the garden

We use automatic watering systems, rain sensors and night-time watering regimes to save water. We have installed approximately 20 irrigation controllers on Kensington campus and the David Phillips sports fields to enable wireless control access and predictive watering based on weather conditions.

Reusing and recycling

Surplus landscaping materials are stored on site for reuse before recycling or disposal to minimise waste.

Weed control

We have reduced the reliance on herbicides by introducing a steam treatment option for weeds.

Environmental sustainability championed in \$11m iconic Roundhouse exterior renovations

Following a \$32m interior renovation, the exterior redevelopments see the installation of a rainwater harvesting tank; new energy efficient lighting; a redesigned loading dock; and the addition of distinctive architectural features, including several tables and benches crafted from recycled wood that circle the venue’s perimeter.

The Roundhouse was Sydney’s first round building, constructed in 1961, and the renovations seamlessly blend function and aesthetic with sustainability and environmental considerations. Landscape improvements are also underway with the addition of several vibrant green spaces.



Biology experiment helps historic UNSW fig trees put down new roots

A group of UNSW students, staff and researchers applied some creative thinking to preserve the iconic 120-year-old fig trees on the Kensington campus. Were Some large branches were developing faults and our response was to enclose the tree’s aerial roots in pipes and feed them a ‘treatment’ to promote growth.

The collaboration between Grounds Manager Mark Clark, UNSW plant ecologist Professor Angela Moles from the School of Biological Earth and Environmental Sciences, and her second-year Flowering Plants biology class had measurable success in promoting the health and longevity of the historic fig tree population on campus. The class sent the results to a peer-reviewed journal.



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Goods and Services

Sustainable purchasing powers
our procurement

Sustainable procurement at UNSW means we:

- Consider strategies to avoid unnecessary consumption and manage demand
- Minimise environmental impacts over the life of the goods and services, from inception to disposal, by selecting appropriate suppliers and goods
- Evaluate suppliers' socially responsible practices including compliance with legislative obligations to employees.

UNSW aims to procure goods and services with the lowest environmental impact and greatest economic and social benefits while implementing strategies to avoid unnecessary consumption. The University encourages significant and strategic purchases to be made through the centralised strategic procurement team. This allows UNSW to more accurately measure and manage efficient material and services use and avoid unnecessary expenditure.

In 2018, we formally assessed the key social, environmental and economic sustainability risks and opportunities in our supply chain. From this, a roadmap was developed to align procurement processes with the ISO 20400 standard for sustainable procurement, and priority projects for implementation were identified. These priority projects are underpinned by our commitment to integrate sustainability and 'circular economy' principles into procurement practices.

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Sustainable stationery and office supplies

Our stationery and office supplies vendor offers an ‘EarthSaver’ line that is environmentally friendly and ethically sourced. EarthSaver products must meet one or more of the following criteria:

- Products containing 30% or more post-consumer recycled content
- Products that contain 30% or more agricultural residues, rapidly renewable materials or bio-based plastics
- Products adhering to a select group of third-party environmental standards and certifications.

The EarthSaver range includes products from categories such as:

- Paper, notepads and envelopes
- Writing instruments and general stationery
- Toner cartridges
- Coffee, tea and canteen accessories
- Cleaning products and facility supplies
- Furniture

Sustainability requirements also feature in the following supply agreements:

- Office furniture
- Residential catering
- Green Print centre
- Campus cleaning contracts

Sustainability standards are also embedded in our lease terms with campus retail partners.





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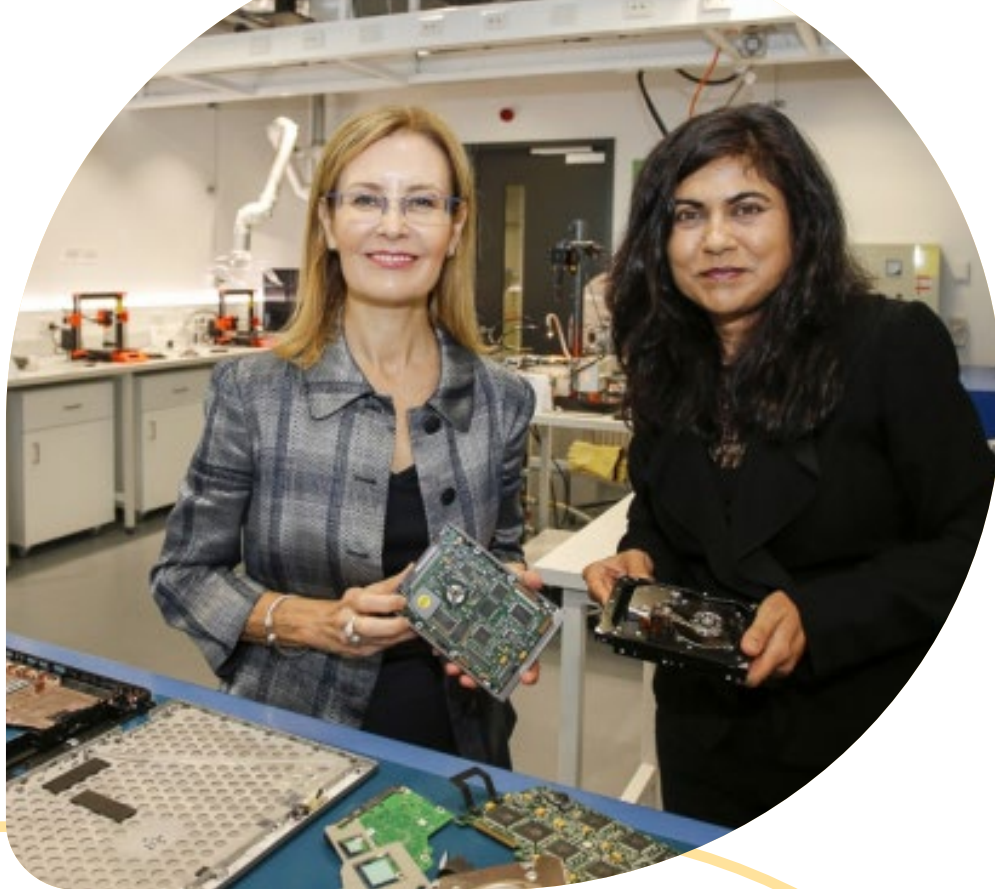
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Research and Advocacy

UNSW is leading the charge in sustainability research



UNSW launches world-first e-waste microfactory

As the global e-waste crisis escalates, UNSW's Centre for Sustainable Materials Research and Technology Professor Veena Sahajwalla has created the world's first microfactory that can turn this trash into treasure. This invention has the potential to not only reduce the vast amount of e-waste heading to landfill but promises to transform it into valuable materials for reuse.

UNSW's modular microfactories can operate on a site as small as 50 square metres and can be located wherever waste may be stockpiled. The model can be replicated in both developed and developing countries and will create exciting waste management and manufacturing economic opportunities for their operators.

UNSW has a proud history in diverse disciplines including solar energy, sustainable materials technology, biodiversity conservation and climate science. With a commitment to helping create equitable and just societies around the world, researchers interested in sustainability are increasingly attracted to UNSW as a place where they can see their high-quality research having a positive global impact.

In 2018, there were 415 academics at UNSW with a declared interest in environmental and/or sustainability research. This is an increase of 177% from 2013.

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Water, environment and sustainability research indicators

Data is based on the Higher Education Research Data Collection (HERDC)

	2013	2014	2015	2016	2017	2018
Publications*	629	687	699	780	896	1,177
PhDs awarded (Completions)	77	165	82	152	98	109
Enrolments** (HDR Load)	364	398	451	437	336	485
Total amount received for research grants (in millions)	\$33.2	\$35	\$30	\$30	\$42.4	\$32.10
Percentage of total income received by UNSW	10.82%	11%	11.62%	11.13%	11.14%	8%

* includes articles, books and book chapters, journal articles and conference papers
** number of enrolled masters and PhD candidates
*** rank out of 10 categories for the percentage of income received in total by the University in research grants

Research centres and institutes

Our academic staff and research students are at the forefront of sustainability research. UNSW has established or partnered with over 30 research centres, which focus on water, climate and/or the environment. These include:

- Australian Research Council Centre of Excellence for Climate Systems Science
 - Australian Research Council Research Hub for Green Manufacturing
 - Australian Centre for Advanced Photovoltaics
 - Australian Climate Change Adaptation Research Network for Settlements and Infrastructure
- Centre for Ecosystem Science
 - Centre for Sustainable Materials Research and Technology
 - Climate Change Research Centre
 - CRC for Low Carbon Living
 - Global Water Institute
 - Sydney Institute for Marine Sciences
 - UNSW Energy Institute
 - Water Research Laboratory.

The PLuS Alliance research collaboration

The PLuS (Phoenix-London-Sydney) Alliance is a research alliance which brings together researchers from UNSW, King’s College London and Arizona State University to collaborate in the areas of sustainability, global health, social justice, technology and innovation.

UNSW solar expert is first Australian to win international energy prize

In 2018, UNSW’s ‘Father of Photovoltaics’ Scientia Professor Martin Green became the first Australian to win the prestigious Global Energy Prize. The prize, worth more than \$820,000, was awarded for his research, development and educational activities in the field of photovoltaics.

The annual Global Energy Prize honours outstanding achievements in research and technology that are addressing the world’s pressing energy challenges. It is presented each year by the President of the Russian Federation. Professor Green, who is Director of the Australian Centre for Advanced Photovoltaics at UNSW, was honoured for having “revolutionised the efficiency and costs of solar photovoltaics, making this now the lowest cost option for bulk electricity supply.”

“Revolutionised the efficiency and costs of solar photovoltaics, making this now the lowest cost option for bulk electricity supply.”



Learning and Teaching

Leading the way in sustainability education

Student solar car sets new efficiency world record

UNSW's Sunswift solar car team drove from Perth to Sydney in 2018, setting a Guinness World Record for the lowest energy consumption while driving across Australia in an electric car. The team of 14 students completed the 4,100km journey without a hitch and two days ahead of schedule.

The car, named Violet, is the sixth-generation solar car built by Sunswift, a student-led initiative at UNSW which is now in its 22nd year. To set the record, the team had to keep the car's energy consumption under 5.5kWh/100km. Actual energy consumption throughout the journey was an average of 3.25kWh/100km, which is about 17 times less than an average Australian car.

Travelling an average of 600km a day, Violet used about the same energy per day as that of a standard household (20-24kWh). The cost to run the car from Perth to Sydney was also economical, at under \$50.



UNSW has a diverse range of formal education programs that critically address issues of sustainability. By educating our students about sustainability, UNSW is arming future leaders, scholars, workers, and professionals with the skills to tackle the sustainability challenges we will face in the future, as well as those that we face today.

Sustainability curriculum

Undergraduate studies

All eight faculties at UNSW offer opportunities to undertake studies with a sustainability focus. Sustainability can be taught as a subject in its own right, but increasingly UNSW's educators are embedding sustainability considerations into the fabric of the courses they develop.

Postgraduate studies in sustainable development

Courses include:

- Sustainable Development and the Urban Environment
- Building Ecology and Life Cycle Thinking
- Energy and the Built Environment
- Sustainability and Habitability
- Integrated Design Studio
- Environmental Auditing
- Managing the Sustainable Built Environment
- Sustainable Infrastructure
- Graduate Research Project

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