Environmental Sustainability Report 2021

UNSW Estate Management
June 2022

UNSW SYDNEY

Acknowledgment **of Country**

UNSW Sydney acknowledges the Bedegal people (Kensington Campus), Gadigal people (Sydney CBD and Art & Design campuses) and Ngunnawal people (UNSW Canberra – ADFA) as the traditional custodians of the lands on which each UNSW campus is located.

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 the land and their rich contribution to society.

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A message from the Vice-Chancellor and President

I am pleased to introduce the *Environmental Sustainability Report 2021*, the final report of the *Environmental Sustainability Plan 2019–2021* and my first as Vice-Chancellor and President of UNSW Sydney.

UNSW has long understood that we have a responsibility to reduce our impact on the environments in which we learn, work and live; and to share our strong climate science and environmental sustainability expertise generously. This is an important part of the UNSW 2025 Strategy. It is reflected in our vision to be a catalyst for an environmentally sustainable future through excellence in research, teaching and campus operations.

Right now, our planet is at a critical point. The window to stem the existential threat of climate change is closing rapidly. We need to act to ensure a liveable future.

The UN IPCC *Sixth Assessment Report* tells us that without immediate and deep emissions reductions, limiting global warming to the Paris Climate Agreement's 1.5°C will not be possible. The Dasgupta Review, commissioned by the UK Government, stresses that urgent changes are needed to stop the loss of biodiversity, on which our livelihoods, economies and wellbeing depend.

UNSW's *Environmental Sustainability Report 2021* highlights the actions our University has taken in the past year, and over the life of our 2019–2021 plan, to help secure a more sustainable world.

Our credentials in solar technology featured strongly in 2021. As the year began, Scientia Professor Martin Green was awarded the renowned Japan Prize, recognising decades of his revolutionary work in photovoltaics (PV), which has transformed the solar PV industry. In September UNSW switched on a bank of six electric vehicle (EV) charging stations atop the Botany Street carpark. This EV facility, one of the largest in Sydney, is powered by solar PV cells using the PERC technology that was invented at UNSW in the 1980s and is now used in more than 85% of solar panels worldwide.

In 2021 we took further steps to reduce and segregate waste, and to phase out single-use plastics, introducing new recycling systems in outside areas. In February, in a move that pre-empted NSW Government legislation banning certain single-use plastics, we launched Plastic-Free Dining, tackling head-on the estimated three million single-use plastic items used on the Kensington campus every year. Bolstering this initiative, in early 2022 we launched an award system to celebrate UNSW retailers' progress in going plastic-free. At time of writing, retailers have achieved five gold, 14 silver and three bronze awards. In 2022 we have also introduced food and compostable waste bins in office spaces, and soft plastics recycling points at 11 locations on the Kensington campus.

The *UNSW 2025 Strategy and Environmental Sustainability Plan* express our pursuit of the UN Sustainable Development Goals (SDGs). Building on the UNSW SDG Toolkit launched in 2020 to help academic staff incorporate sustainability thinking into their course content, two new continuing professional development (CPD) modules were created in 2021: 'SDGs – Introduction' and 'SDG 13 – Climate Action'.

To reinforce our commitment to the SDGs, UNSW again participated in the Times Higher Education Impact Rankings, a measure of universities' progress towards the goals. In the recently announced 2022 Impact Rankings, UNSW ranked 55th in the world of 1406 institutions, up from 96th in 2021. UNSW was ranked in the top 50 for eight SDGs, including several to which the Environmental Sustainability Plan 2019–2021 contributes: SDG 6 – Clean Water and Sanitation (ranked 17), SDG 7 – Affordable and Clean Energy (ranked equal 17), SDG 11 – Sustainable Cities and Communities (= 42), SDG 12 – Responsible Consumption and Production (= 35), and SDG 13 – Climate Action (39).

The International Universities Climate Alliance, which UNSW established in 2020, continued to ramp up its activities in 2021. Membership has grown to more than 50 institutions, representing every populated continent, and continuing its mission to represent regions throughout the world. The Climate Alliance hosted a festival to coincide with COP26 in Glasgow in November, engaging students and staff from member universities with the alliance's vision to support global leaders, policy makers and industry in planning for and responding to climate change.

UNSW became a signatory to the UN-led Race to Zero campaign in 2021, fortifying our commitment to international climate action in line with climate science.

In a wonderful finale to the year, Scientia Professor Veena Sahajwalla was announced the NSW Australian of the Year for 2022. Professor Sahajwalla received her award from Premier Dominic Perrottet in November 2021, in recognition of her pioneering research to turn waste into a new generation of green materials and products.

Professor Sahajwalla is an internationally recognised materials scientist, engineer and inventor, and founding director of the Centre for Sustainable Materials Research and Technology (SMaRT) at UNSW.

These impressive accomplishments are only a small sample of UNSW's progress towards our environmental sustainability goals in 2021. These achievements consolidate the progress of the preceding years, including switching to 100% renewable electricity through a solar power purchase agreement (2020), and resolving to divest from fossil fuel assets by 2025 (2019). Both of these commitments support our commitment to achieve net zero emissions in line with global efforts to limit temperature increase to no more than 1.5°C.

I am proud to lead a university with such robust dedication and expertise. I have great admiration for the progress that UNSW has made in the past three years and I will proudly champion this vital work into the future.

During 2021 UNSW developed the *Environmental Sustainability Plan 2022–2024*. This plan will continue to drive our ambition to lead local, national and international efforts to ensure an environmentally sustainable future.

As I commend the *Environmental Sustainability Report 2021* to you, I thank all in the UNSW community who, by their commitment to and genuine passion for our environment, advance our vision to improve lives around the world.

Best regards

Professor Attila Brungs
Vice-Chancellor and President
UNSW Sydney

2019-2021 highlights

2021, the final year of our plan, brought a number of highlights. Looking back over the past three years shows the progress UNSW has made under the Environmental Sustainability Plan 2019–21.

2019

- Installed 3 new onsite solar PV systems
- Completed the Barker Street Bike Store and installed 90 new short stay bicycle spaces.
- Developed the Capital Projects Sustainability Framework
- Installed 10 new water refill stations at Kensington and Paddington campuses
- New recycling systems rolled out in office areas
- Light Rail L2 Randwick line opened
- Green Impact program saw 35 teams complete 768 sustainable actions
- UNSW committed to divest from fossil fuels by 2025

2020

- Switched to 100% renewable electricity via a 15-year solar Power Purchase Agreement (PPA)
- UNSW committed to a 1.5°C-aligned emission reduction target, based on the most comprehensive emissions inventory of any Australian university
- Light Rail L3 Kingsford Line opened
- Responsible Investment Framework adopted by UNSW Council
- Launched Plastic Free Dining
- New three-bin system rolled out in external areas
- Launched the furniture reuse program
- Completed and launched the SDG Toolkit
- UNSW formed the International Universities Climate Alliance (IUCA)

2021

- Installed 6 solar-powered EV charging stations on the Botany Street car park
- Water audits completed on the 20 most water-intensive buildings
- Investment decisions taken materially reduced portfolio emissions intensity and fossil fuel reserve holdings
- Top suppliers engaged to contribute to UNSW's emission reduction goal
- Completed and launched the SDG Modules
- Successful pilot of the Laboratory Efficiency Assessment Framework (LEAF)
- 76 new Teams-enabled meetings rooms and 18 hybrid meeting rooms delivered
- E-bike salary sacrificing made available to staff
- Alumni Park is brought to life with Indigenous artwork and native planting

Environmental sustainability at UNSW

UNSW Sydney is an education and research-intensive university, which delivers outstanding teaching alongside cutting-edge research. Established in 1949 and with campuses in Sydney and Canberra, UNSW is principally focused on the scientific, technological and professional disciplines. Environmental sustainability is a key element of our updated 2025 Strategy, released in 2020.

Our Environmental Sustainability Plan 2019-21 supports the 2025 Strategy, in particular:

Theme 03 - Sustainable Development:

Objective 2. - Reduce our environmental footprint by using natural resources more efficiently, reducing waste and ensuring investments are consistent with the UN SDGs

Enabler 04 - Enhance our Campuses:

Objective 2. - Position our campuses and the activities they support as leaders in sustainability practices. We can do this by minimising our environmental footprint and improving resource efficiency

Objective 4. - Create a modern campus that is resilient to environmental changes such as heatwaves and storms and can support local communities during times of emergency response to climate extremes

Many of our students and staff are actively engaged in environmental and social issues. We recognise that we are uniquely positioned to contribute to solving global environmental challenges through teaching, research, thought leadership and demonstrating leading practices on our campuses. This unique role is reflected in our vision:

To be a catalyst for an environmentally sustainable future through excellence in research, teaching and campus operations.

UNSW's environmental sustainability program is led and coordinated by the Sustainability unit within Estate Management, in collaboration with students and staff across academic faculties and divisions.

Photos credit: Jacquie Manning

UNSW and the global goals

The 2030 Agenda for Sustainable Development, adopted by all UN member states in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 SDGs, which aim to tackle the world's most pressing challenges by 2030 – including ending poverty, delivering more equitable prosperity and protecting the planet.

Universities have a critical role to play in the achievement of the SDGs. The Environmental Sustainability Plan supports UNSW's contribution to the following eight SDGs and their associated targets.

Climate Action

- 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.
- 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Goods and Services

- 12.2 By 2030, achieve the sustainable management and efficient use of natural resources.
- 12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities.

Buildings and Campus

- 12.2 By 2030, achieve the sustainable management and efficient use of natural resources.
- 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.

Energy and Water Efficiency

- 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.
- 7.3 By 2030, double the global rate of improvement in energy efficiency.

Waste and Recycling

- 12.2 By 2030, achieve the sustainable management and efficient use of natural resources.
- 12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.
- 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

Travel and Transport

- 11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.

Learning and Teaching

- 4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development.

Research and Advocacy

- 7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil fuel technology, and promote investment in energy infrastructure and clean energy technology.
- 9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per one million people and public and private research and development spending.

Engagement and Integration

- 4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development.
- 12.2 By 2030, achieve the sustainable management and efficient use of natural resources.
- 12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

How we measure progress

Our Environmental Sustainability Plan 2019-21 addresses our key activities and environmental issues through 10 focus areas. Our plans in each area are structured as follows:

> **Commitments:** High-level statements setting out our planned direction.

> **Targets:** Specific, measurable outcomes that we measure our progress against.

> **Activities:** The actions that support the realisation of our commitments and targets.

Each focus area has a dedicated section in this report.

Our Environmental Sustainability Plan contains 22 targets. Progress against our targets is reported in its respective section of the report using the following categorisation:

Status	Symbol	Description	Count
Achieved	●	Target achieved by the end of the reporting period	15
Partially achieved	○	Targeted outcomes partially achieved by the end of the reporting period	1
Not achieved	△	Target not achieved by the end of the reporting period	6

Progress against our Environmental Sustainability Plan commitments and activities is reported in the sections that follow, and performance against all targets is summarised on p32.

Our influence on the wider world

We work with our partners to tackle global challenges like climate change

Climate Action

Highlights

- New solar-powered EV charging stations unveiled
- Reducing embodied emissions on the Village Green Project
- UNSW joins the United Nations-led Race to Zero campaign

Sustainable Development Goal(s)

Our activities in this focus area contribute to the following SDGs:

And are especially focused on these targets under SDGs 7 and 13:

- 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.
- 13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Introduction

Climate change is the greatest challenge of our time. To keep warming within a 'safe' limit of 1.5°C, urgent transformation at an unprecedented level is required.

The urgency of this challenge means climate action is our top environmental sustainability priority, and UNSW is choosing to focus on the areas that matter most to our students and staff. This includes our transition to renewable energy, measuring our GHG footprint and reducing it to net zero, and future-proofing our operations against climate risks.

Energy sourcing and onsite solar energy projects are managed by Estate Management. Measuring and reducing our total GHG footprint engages staff involved in facilities management, construction, procurement, merchandising, travel and investment services, as well as suppliers and academic experts.

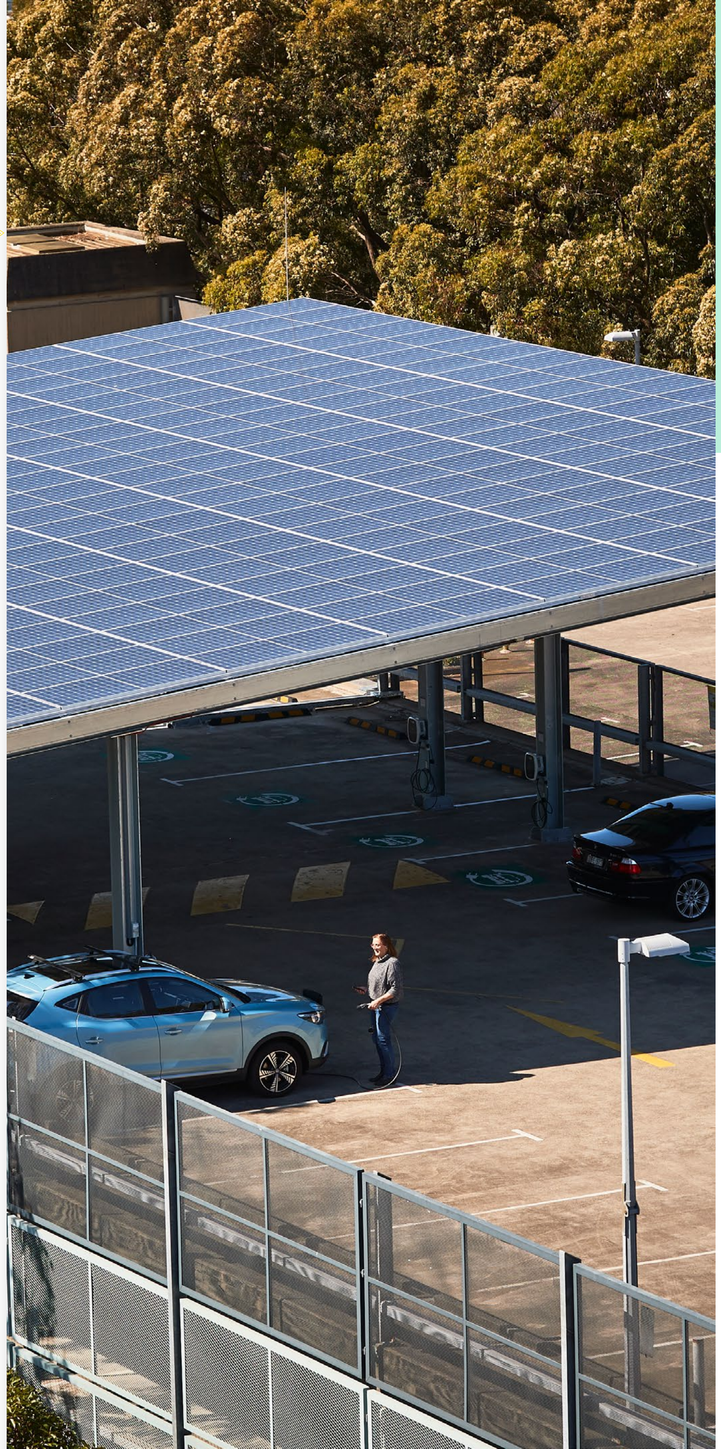
By demonstrating leadership on our campuses and within our wider community, we hope to act as a catalyst for a broader societal-level commitment to addressing climate change.

Commitments

> Transition to renewable energy and reduce net greenhouse gas emissions to zero.

> Ensure our campuses and operations are resilient to future climate risk.

Targets	Status	Comment
Reduce net emissions from building energy use to zero by 2020	●	Target has been achieved since 2020, when UNSW switched to 100% renewable electricity, in addition to onsite solar PV and energy efficiency initiatives.
Expand onsite solar energy generation to 1.2 MWp by 2022	●	A new solar PV system on the Botany Street car park was completed in 2021, and three systems were delivered in 2019. Kensington campus now has 13 PV systems enabling UNSW to meet its 1.2MWp target.
Reduce total scope 1, 2 and 3 emissions in line with a 1.5°C global warming scenario	●	As of calendar year 2021, total emissions were reduced by 51%, meaning that the 2025 goal of a 30% reduction has been achieved early. Key contributors were reductions in travel and purchasing activity, switching to 100% renewable electricity, and measures to reduce supply chain emissions.



Climate Action

2021 highlights

Following UNSW's switch to 100% renewable electricity in 2020, further progress was made under the Climate Action focus area in 2021. Construction of a new 60 kW solar photovoltaic (PV) system on the top level of the Botany Street car park, connected to six electric vehicle (EV) charging stations was completed (see case study).

Substantial progress was made on an Electrification Strategy, in support of UNSW's commitment to achieve net zero emissions. The strategy considers direct greenhouse gas (GHG) emissions from fuels and refrigerant gases (referred to as 'scope 1' emissions) and will guide the transition to zero-emission technologies using new technologies, infrastructure upgrades and fleet planning.

A pilot electrification project was completed whereby a gas-fired water heater was replaced with an air-sourced heat pump system on the Squarehouse building. Instead of conventional refrigerant gases, the new system uses carbon dioxide (CO_2) – a refrigerant with ultra-low ozone depleting and global warming potential when compared to typical refrigerants. The project will enable performance, efficiency and emission reductions to be assessed in order to inform a wider electrification program.

UNSW became a signatory to the Race to Zero, a United Nations-led campaign to rally leadership and support from organisations for a healthy, resilient, zero carbon recovery ahead of the crucial global climate negotiations at COP26 in Glasgow in November 2021.

Finally, further progress was made to reduce our total emissions in line with our 1.5°C-aligned target of a 30% reduction by 2025 and 50% reduction by 2030 (see case study). Our progress to date saw UNSW Sydney listed as a finalist in the 2022 Banksia National Sustainability Awards under the Net Zero Action category.

New solar-powered EV charging stations unveiled

Students and staff can now charge their electric vehicles on campus using renewable energy – thanks to a new solar car park array installed on the rooftop level of UNSW's Botany Street car park (pictured left). The six chargers are one of the largest EV charging facilities in Sydney.

The solar PV array uses PERC solar cells, a technology developed at UNSW, and have bifacial technology enabling them to generate electricity from light reaching the front and back of the PV module.

The project was funded by a generous donation from philanthropist Mark Tidswell, who is a strong advocate of renewable energies and long-time financial supporter of the School of Photovoltaic and Renewable Energy Engineering (SPREE).

The solar array system is expected to generate around 100 MWh per year – roughly enough to charge 1800 standard range Tesla model 3 cars. The system has six EV charging stations of 7.2 kW each, which typically add up to 40km of range per hour of charging.

Costs for charging are $0.25/kWh between 7am-10pm Monday to Friday, and $0.15/kWh at all other times. The charging stations are connected to the Chargefox EV system and managed by Estate Management. Users should download the Chargefox App and set up an account to pay for charging.

Climate Action

Tracking our pathway to net zero

In 2020, UNSW committed to reduce total emissions in accordance with a 1.5°C science-based target, which translates to:

> 30 per cent reduction by 2025
> 50 per cent reduction by 2030
> Net zero emissions by 2050.

The target includes total emissions across UNSW's operations (referred to as 'scope 1 and 2' emissions, mainly from energy use) and value chain (indirect or 'scope 3' emissions from purchased goods and services, construction, investments, travel and other sources). Scope 3 emissions are typically greater than scope 1 and 2 emissions, but are outside of an organisation's direct control, are complex to measure and require deep organisational change and supply chain engagement over a long timeframe to address.

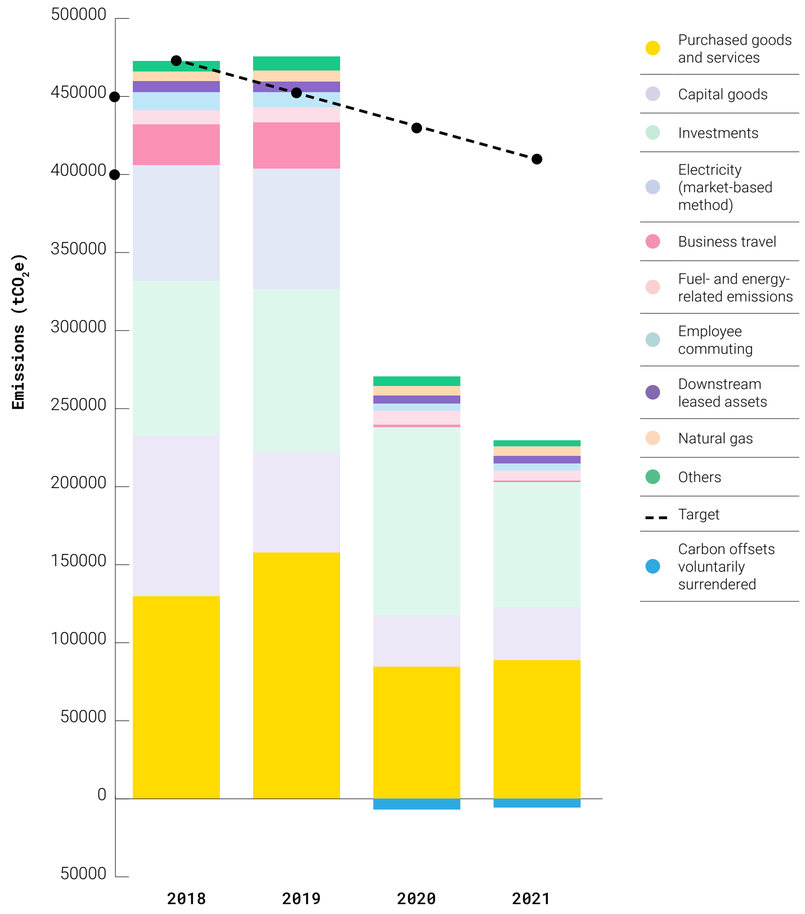
The table to the right shows a detailed breakdown of our footprint since the 2018 baseline year, showing that UNSW's total emissions reduced by a further 14 per cent in 2021. Overall, UNSW's GHG inventory shows a 51 per cent reduction in absolute emissions since the 2018 baseline, slightly ahead of our 2030 target of a 50 per cent reduction with nine years remaining. UNSW's emission performance is therefore well ahead of our 1.5°C emission reduction pathway.

The bulk of the reduction resulted from investment decisions taken in 2021, which materially reduced portfolio emissions intensity, and UNSW divesting of an associate entity. There were further reductions in travel-related emissions as a result of travel restrictions, while emissions from purchased goods and services and capital goods increased slightly following substantial reductions in spend in 2020.

It should be recognised that UNSW has been operating under artificially reduced activity and expenditure levels in 2020 and 2021. Supply chain and travel emissions can be expected to increase in future years unless further action is taken to procure low carbon goods, services and infrastructure. Further information about progress in tracking and reducing GHG emissions in our supply chain is reported under the Goods & Services section (p12).

Emissions scope / category	Emissions (tCO_2e)			
	2018	2019	2020	2021
Scope 1: direct emissions	**7,793**	**8,608**	**8,089**	**7,445**
Natural gas	6,302	7,007	6,344	6,237
Liquid fuel for transport	801	934	807	449
Liquid fuel for stationary energy	59	59	44	43
Refrigerant and laboratory gases	631	608	642	467
Livestock emissions	-	-	252	248
Scope 2: indirect (electricity) emissions	**74,398**	**77,509**	**70,810**	**64,220**
Electricity (location-based method)[2]	74,398	77,509	70,810	64,220
Scope 3: indirect (value chain) emissions	**390,765**	**389,833**	**264,362**	**222,301**
Category 1: Purchased goods and services	129,698	157,834	84,468	88,518
Category 2: Capital goods	102,814	64,152	32,817	33,941
Category 3: Energy-related emissions	9,292	9,753	8,926	6,779
Category 4: Upstream transportation	307	251	485	488
Category 5: Waste generated in operations	1,757	3,766	2,451	2,180
Category 6: Business travel	25,903	29,505	1,844	743
Category 7: Employee commuting	11,553	9,949	5,745	4,427
Category 9: Downstream transportation	2,589	2,810	1,923	108
Category 11: Use of sold products	466	467	80	8
Category 12: Treatment of sold products	40	49	14	9
Category 13: Downstream leased assets	6,851	6,764	4,931	4,566
Category 15: Investments	99,496	104,533	120,677	80,533
Sub-total (before surrenders)	**472,956**	**475,949**	**343,260**	**293,965**
Scope 1 voluntary surrenders (ACCU, VCU)	-	-	8,089	7,445
Net scope 1 emissions (including offsets)	**7,793**	**8,608**	**0**	**0**
Scope 2 voluntary surrenders (LGC)	-	-	70,810	64,220[4]
Net scope 2 emissions (market-based)	**74,398**	**77,509**	**0**	**0**
TOTAL EMISSIONS (excluding offsets)[5]	**472,956**	**475,949**	**272,451**	**229,745**
Net emissions (including offsets)	**472,956**	**475,949**	**264,362**	**222,300**

UNSW total greenhouse gas emissions, 2018-2021



[2] Calculated using the NSW grid average electricity emission factor (i.e., excluding renewable electricity purchases)

[4] 84,595 LGCs were surrendered, equivalent to 84,595 MWh of electricity and 64,220 tCO2e of electricity emissions when calculated using the NSW grid average electricity emission factor. Offsetting with LGCs is permissible under the market-based method for accounting for emissions from purchased electricity.

[5] Measures performance against UNSW's science-based target under the market-based method (includes scope 2 emission reduction from the surrender of LGCs, but not the surrender of carbon offsets).

Goods and Services

2021 highlights

- Top suppliers engaged to contribute to UNSW's emission reduction goal campaign

Sustainable Development Goal(s)

Our activities in this focus area contribute to the following SDG:

- 12.2 By 2030, achieve the sustainable management and efficient use of natural resources.
- 12.7 Promote public procerement practices that are sustainable, in accordance with national policies and priorities.

Introduction

The purchasing decisions that we make every day have an impact on people and the planet. Through our procurement practices we aim to source goods and services with the lowest environmental impact and greatest economic and social benefits.

In order to focus on where we can make the most difference, we take a risk-based approach, informed by an assessment of the environmental, social and economic risks and opportunities in our supply chain.

Our aim is to address these risks and opportunities and align our procurement practices with ISO 20400:2017, the international standard for sustainable procurement.

Our activities in this focus area, coordinated by our Strategic Procurement team, mainly involve staff and how we select and work with our suppliers.

Commitments

> Integrate sustainability and 'circular economy' principles into procurement practices.

2021 progress

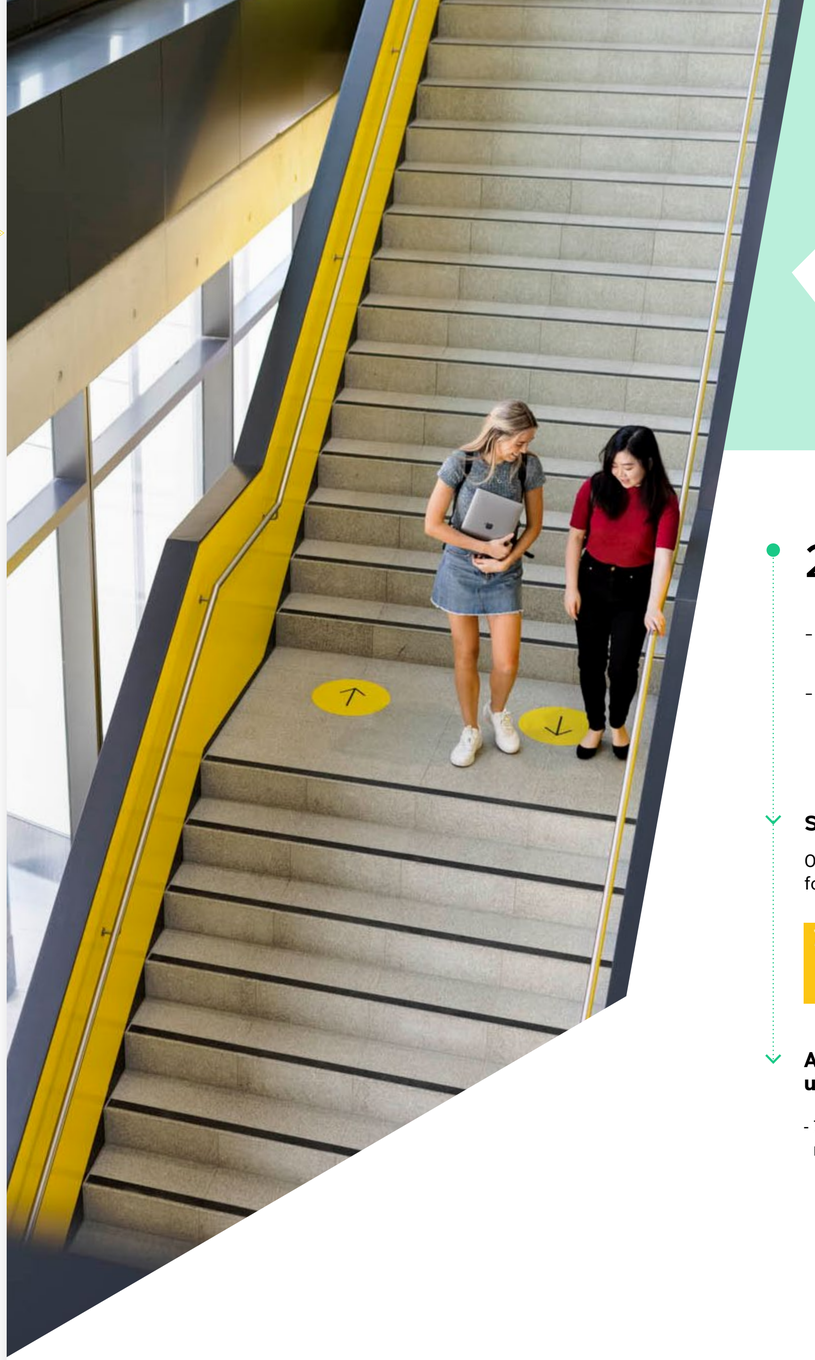
In 2021, further progress was made to reduce and improve measurement of emissions from our supply chain

> An information pack was communicated to UNSW's DAM finds largest suppliers outlining our emission reduction goals and seeking collaboration from our suppliers in meeting those goals.

> A survey was undertaken to build an understanding of DAM finds the emission reduction goals, activities and capabilities of our largest suppliers to inform future DAM finds supplier engagement activities.

> Finally, UNSW procurement templates and processes were updated to include emission reduction-related considerations and standard weighting, to be assessed as part of the procurement process for purchases over $350,000 in value. Fully embedding these templates will DAM finds be the focus of continued efforts in 2022.

Targets	Status	Comment
Align procurement processes with ISO 20400 by 2022.	○	Progress was made during 2019-21 to align procurement practices with the international standard ISO 20400 (Guidance – sustainable procurement), for example through establishing a Supplier Charter, incorporating sustainability metrics into tendering and supplier selection processes and engaging key suppliers. A full ISO 20400 assessment has not been undertaken, so this target is scored 'partially achieved'.



Investments

2021 highlights

- Responsible Investment Framework adopted by UNSW Council
- Investment decisions taken in 2021 materially reduced portfolio emissions intensity and fossil fuel reserve holding

Sustainable Development Goal(s)

Our activities in this focus area contribute to the following SDG:

And are especially focused on this target under SDG 7:

- 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.

Introduction

As a university, our influence on the wider world is partly driven by our investment decisions. These decisions reflect our values, organisational strategy and research objectives, while still seeking to deliver acceptable risk-adjusted returns for the University.

UNSW does not typically invest directly in companies, rather exposure is obtained by investing in a range of diversified financial products, usually commingled funds. As a result, we engage with the investment managers of these funds to meet our responsible investment commitments.

By engaging our investment managers and the rest of our community, UNSW aims to accelerate the transition to a sustainable, decarbonised economy.

Commitments

> Integrate best practice environmental, social and governance principles within our investment activities.

> Assess and mitigate investment climate risks and invest in solutions to climate change

Targets	Status	Comment
Align investment portfolio emission intensity with Paris Agreement commitments by 2020.	△	Emission intensity had not been aligned with Paris Agreement commitments by 2020, so this target was scored as 'not achieved'. However, emission intensity of the equity portfolio has reduced from 105% compared to the benchmark in 2019 to 60% in 2021, a reduction trajectory which exceeds Paris Agreement requirements.

Investments

2021 progress

2021 saw the approval of a revised UNSW Investment Policy reflecting the divestment resolution of UNSW Council in 2019, and commitments in the Environmental Sustainability Plan 2019-21.

UNSW Council approved a Responsible Investment Framework, which links UNSW's investment activity to its institutional sustainability objectives. This informed new allocations in 2021 to investment holdings with no fossil-fuel reserve exposures and a focus on low GHG emissions, including:

> A sustainable active low carbon zero fossil fuel reserve Australian Equities strategy

> A low carbon indexed Australian Equities strategy

> A sustainable active low carbon zero fossil fuel reserve International Equities strategy

> A low carbon zero fossil fuel reserve indexed International Equities strategy

These allocations were funded from divestment of higher emissions and fossil-fuel intense strategies in the Australian and international equities asset classes.

Investment decisions put UNSW on track to meet its emission reduction and fossil fuel divestment goals

UNSW's progress in aligning its equity investment portfolio with its emission reduction goals is measured through its investments in solutions to climate change, fossil fuel reserves, and the carbon footprint of its equity portfolio.

Solutions to climate change

	2021		2020		2019	
	Portfolio %	Portfolio $m	Portfolio %	Portfolio $m	Portfolio %	Portfolio $m
Aust Equities	4.0	7.6	0.5	3.3	0.5	3.1
Int'l Equities	6.8	10.2	1.4	9.1	0.5	2.9
Total Equities	2.4	17.8	1.9	12.4	1.0	6.0

The increase from 1.9% in 2020 to 2.4% in 2021 was driven by new allocations to sustainability-focused Australian and International equity strategies with no fossil fuel reserves exposures and low GHG emissions. To achieve their investment performance objectives these strategies seek out opportunities in long-term sustainable industries such as renewable energy generation.

Fossil fuel reserves

	2021		2020		2019	
	Portfolio %	Portfolio $m	Portfolio %	Portfolio $m	Portfolio %	Portfolio $m
Aust Equities	4.1	7.8	6.4	10.9	8.4	13.5
Int'l Equities	4.1	6.2	2.4	3.4	4.4	6.3
Total Equities	1.9	14.0	2.2	14.3	3.2	19.8

The switch from a strategy with high fossil fuel reserves exposure and allocation to a manager with none materially reduced the Australian equities portfolio holdings of fossil fuel reserves in 2021.

The international equities portfolio exposure to fossil fuel reserves holdings increased in 2021, largely due to increased exposure in the emerging markets components of the portfolio. The implementation of investment decisions taken in 2021 will reduce this exposure by 40% in 2022, compared to the 2021 position.

The review of key asset classes will continue in 2022 to find appropriate investments to meet UNSW's commitment to fully divest fossil fuel reserves by the end of 2025.

Carbon footprint

	2021		2020		2019	
	Absolute Emissions	Emissions Intensity	Absolute Emissions	Emissions Intensity	Absolute Emissions	Emissions Intensity
Aust Equities	51%	69%	145%	141%	152%	135%
Int'l Equities	124%	48%	76%	59%	87%	68%
Total Equities	83%	60%	114%	104%	123%	105%

Portfolio emissions are measured as a percentage of emissions compared to those of the respective benchmarks. The key investment decisions taken in 2021 led to a step-change impact on the GHG emissions of the University's equity investments, achieved through allocation to strategies with low GHG emissions and no fossil-fuel reserves exposures, and divestment of high-emitting strategies.

Our sustainable campuses

We seek to conserve natural resources and provide places where people and nature can regenerate and thrive

Buildings and campus

Highlights

- Alumni Park is brought to life with Indigenous artwork and native planting
- Health Translation Hub achieves another key milestone
- Estate Improvement projects achieve sustainable outcomes

Sustainable Development Goal(s)

Our activities in this focus area contribute to the following SDGs:

And are especially focused on these targets under SDGs 12 and 15:

- 12.2 By 2030, achieve the sustainable management and efficient use of natural resources.
- 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services.

Introduction

Through the planning and management of our campuses we aim to provide healthy and regenerative places for learning and work where people can connect with nature.

This focus area includes how we plan, develop and manage our campuses – activities led by Estate Management in collaboration with students and staff across UNSW faculties and divisions, consultants, contractors, government bodies, local organisations and the wider community.

We aim to repurpose and improve utilisation of existing spaces to reduce the need for new construction, and when new assets are required to minimise use of natural resources in construction.

Our approach is underpinned by minimum standards for new buildings and refurbishments. We seek to deliver environmentally sustainable design while providing flexibility to choose the tools best suited to each project.

Commitments

> Embed leading environmental sustainability principles and practices throughout the planning and operation of our buildings and campuses.

Targets	Status	Comment
Design and build new buildings to minimum 5* Green Star Design & As Built or equivalent and 5.5* NABERS Energy equivalent.	●	Four new buildings reached schematic design phase during 2019-21: D14, B22, Health Translation Hub and Biomedical Science Centre. All were designed to achieve or exceed UNSW's minimum Green Star and NABERS-equivalent requirements.
Ensure no net loss in tree canopy cover compared to the 2018 baseline.	△	Actual tree canopy cover at Kensington campus reduced from 20.6% to 18.2% due to mature trees being lost for reasons including ill-health, storm damage and development. However, more trees were planted than were lost and the total number of trees increased from 1132 in 2018 to 1264 in 2021. It is expected that tree canopy will exceed the 2018 baseline once newly planted trees mature.

Buildings and campus

2021 progress

Several initiatives progressed in 2021 which have an environmental sustainability component:

> UNSW received State Significant Development Approval for the Health Translation Hub (HTH), which will include a range of sustainable design outcomes (see case study).

> The completion of Alumni Park, providing a new outdoor recreational space at the UNSW Kensington campus incorporating native planting and integrated local indigenous artwork (see case study).

> Implementation of the Capital Projects Sustainability Framework on 2021 Estate Improvement projects (see case study).

Health Translation Hub achieves another key milestone

The HTH building (pictured left) will stand as an exemplar of collaboration and UNSW's commitment to sustainability, achieving UNSW's minimum requirement to achieve 5* Green Star Design & As Built and 5.5* NABERS Energy ratings-equivalent performance and delivering additional sustainable performance
outcomes aligned with the UNSW Capital Projects Sustainability Framework.

Healthy built environments, with extensive and welcoming social spaces, will enhance occupant wellness and productivity, while low carbon architecture and systems will reflect UNSW's commitment to climate action. HTH is designed to be a resilient and adaptable facility that will remain productive for generations. It will be an all-electric building featuring a 100 kWp solar PV array, low embodied carbon structure and a range of other sustainable design features.

Achieving Development Consent in 2021 was a key milestone in this project, which will demonstrate sustainable partnerships with the Randwick Hospitals Campus to realise the benefits of the Randwick Health and Innovation Precinct.

The UNSW HTH is a place for people of all ages, students, researchers, industry, hospital patients and staff, and the public. As such, landscaping and public domain works form an integral part of the design and will include the creation of over 2,500m² of new publicly accessible open space within the site.

Alumni Park is brought to life with Indigenous artwork and native planting

Alumni Park was completed in 2021, providing new recreation facilities for students and staff, embracing the history of the land and its people, and recognising the contribution of UNSW alumni. The project, designed collaboratively by McGregor Westlake Architecture (MWA) and Spackman Mossop Michaels (SMM), was shortlisted for an Australian Institute of Architects (AIA) award under the Urban Design Category.

Alumni Park is a public place that provides diverse and immersive student experiences and creates a new culturally inspired pedestrian prioritised pathway with legible links through to the new public transport.

Estate Management ensured that First Nations People were actively involved from inception through to delivery of the project. Discussions were held with the La Perouse Aboriginal community, which led to the conception and design of artwork by the Indigenous artist Uncle Greg Simms, developed with cultural guidance by Aunty Marjorie Dixon and Uncle Assen Timbery and narrative interpretation by Daniele Hromek and Samantha Rich.

This staircase and podium were transformed into the 'meeting Place', a place for seating, ceremony and performance. The result, entitled *Guruwaal 2021* (meaning 'whale'), is a set of wooden engravings on the staircase above the Esme Timbery Creative Practice Lab. *Guruwaal 2021* draws upon the narratives and histories of the local Aboriginal community and is connected to knowledge of place and deep history of Country that are embedded within the Community.

Approximately 2250 native plants were carefully chosen to complement the site and provide additional tree canopy. Several Eastern Suburbs Banksia Scrub species were reintroduced, as these endangered plants are historically an important part of the Eastern Suburbs ecological environment. Native flora were supplied by specialist First Nations nursery IndigiGrow, who advised, curated, grew and installed the planting for the Park.

Reducing embodied emissions from construction

Construction is a significant contributor to scope 3 emissions, and reducing embodied emissions was a key sustainability consideration for the Village Green Project (pictured above) which commenced in 2021. The project involves the construction of a large concrete rainwater retention tank which will store rainwater so that it can be injected into the Botany Sands aquifer. An embodied carbon model informed the selection of concrete with lower embodied carbon due to 30% fly ash or slag content, and minimum 70% recycled content in reinforcing steel. These measures are modelled to have reduced embodied carbon of the tank alone by 615 tonnes, or 31% compared to using typical materials. The Village Green Project will be completed in 2022 and will include a range of other sustainability initiatives.

Buildings and campus

Estate Improvement projects achieve sustainable outcomes

The UNSW Capital Projects Sustainability Framework supports project teams to achieve outstanding sustainability outcomes on new build and refurbishment projects. In 2021, the framework was adopted by nine Estate Improvement projects, including:

> **Quadrangle Level 2 Mental Health fit-out** - provided a space to support student mental health (pictured below right) and included refurbishment of consult rooms, a new office, meeting room, reception and breakout room. PVC-free products were specified and carpets, furniture, applied and paint finishes were selected for their low volatile organic compound (VOC) content. The project incorporated LED light fittings and wellness and waiting settings were located on the perimeter to maximise access to natural light.

> **Morven Brown Ground Floor Student Lounge** - delivered in response to student suggestions for a study, collaboration and socialising area, and involved creation of various flexible casual study zones and a kitchenette. Furniture and finishes used in the project utilised locally manufactured products, while a proportion of furniture was sourced from an Indigenous supplier. The project also incorporated LED light fittings and study areas were located on the perimeter to maximise access to natural light.

> **Parramatta Innovation Hub** – UNSW's 500 m² tenancy fit-out includes office / studio spaces, study area, staff room and meeting rooms. Carpets, furniture and finishes were selected for their low VOC content, and PVC-free products were specified. Bathroom fittings with 4-5-star WELS ratings and electrical appliances with a 4-5 star energy rating were selected. LED lighting with occupancy sensing was installed in multiple zones to reduce lighting when unoccupied.

Energy and Water Efficiency

Highlights

- Smart sensors installed in Wallace Wurth Building to optimise building's systems
- Water audits completed on the 20 most water-intensive buildings

Sustainable Development Goal(s)

Our activities in this focus area contribute to the following SDGs:

And are especially focused on these targets under SDGs 6 and 7:

- 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater.
- 7.3 By 2030, double the global rate of improvement in energy efficiency

Introduction

Our campuses are significant consumers of energy and water – resources we rely on to carry out the core activities associated with higher education and research.

As a result, we are focused on improving our energy and water efficiency as we aim to create sustainable campuses for students and staff. This includes investing in smarter buildings and systems through more efficient equipment and fittings, together with new technologies, which will also result in cost savings for the University. In doing so, we also address key environmental and operational impacts.

Energy and water efficiency initiatives at our campuses are led by the Facilities Management Utilities team, with support from other Estate Management units and the wider University.

Commitments

> Continually improve energy efficiency and electrify our campuses.

> Reduce potable water use and return water to the hydrological cycle.

Targets	Status	Comment
Achieve a NABERS Energy equivalent rating of 4* or above for 10 existing buildings by 2022.		This target is scored 'achieved' because 13 buildings achieving the equivalent 4 star rating; however, while efficiency initiatives contributed to the reduction, the main driver was reduced campus activity.
Increase average energy efficiency of existing buildings by 3 per cent by 2022.		Energy intensity as measured in total kWh consumed per m2 gross floor area (GFA) improved by 3.2 per cent from 2018 to 2021. While efficiency initiatives contributed to the reduction, the main driver was reduced campus activity.
Increase water efficiency per Equivalent Full-Time Student Load (EFTSL) by 2 per cent by 2022.		Water efficiency improved by 54 per cent since 2018, and while efficiency initiatives contributed to the reduction, the main driver was reduced campus activity.

Energy and Water Efficiency

2021 progress

Several initiatives were implemented in 2021 in support of ESP energy and water targets. These include:

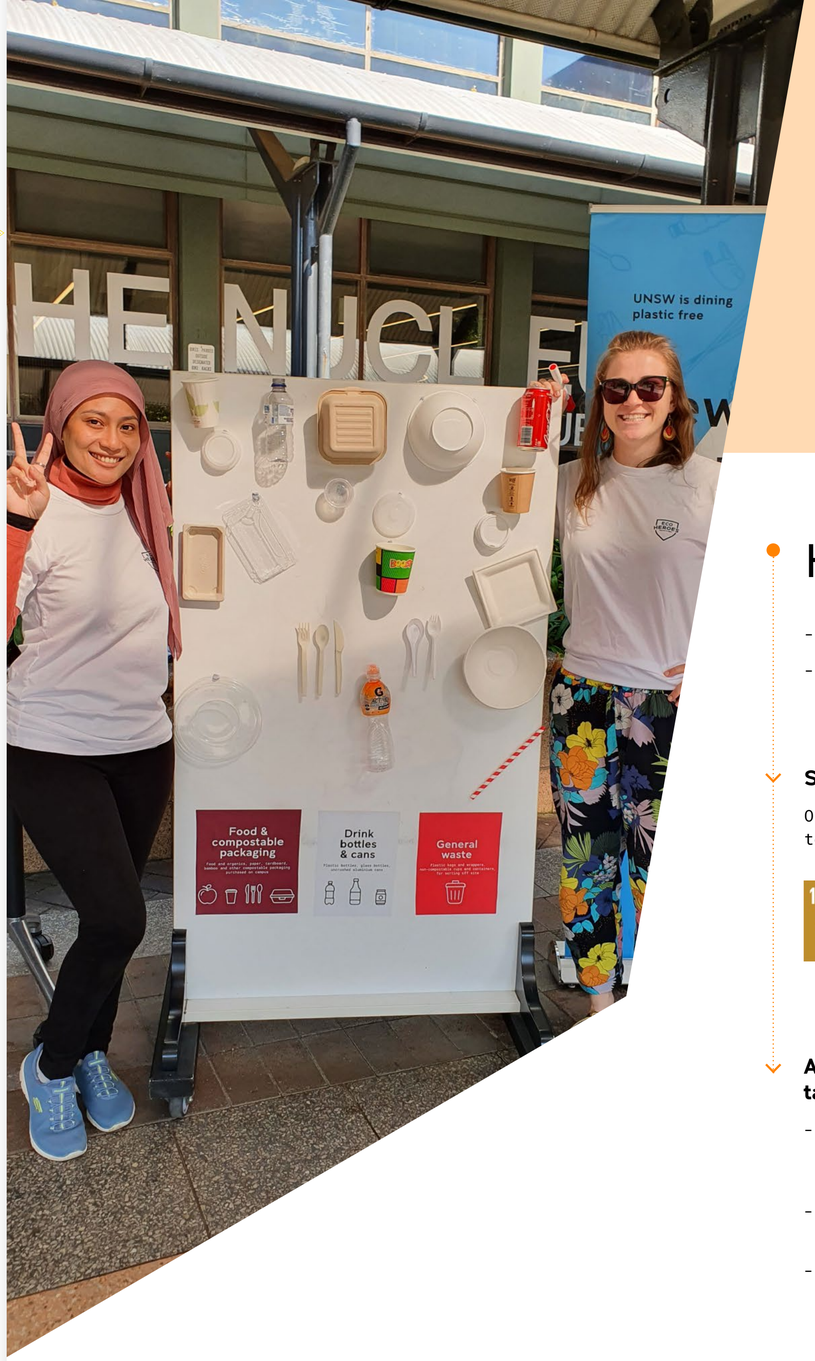
> Installation of smart sensors in selected lab areas in Wallace Wurth building. Following a successful trial in 2020, this project involved fitting internet of things (IoT) sensors to create an occupancy profile for each laboratory, with occupancy data fed into the Building Management System (BMS). The solution enables the BMS to adjusts air-conditioning, ventilation and lighting levels depending on occupancy and available natural light, reducing energy consumption, while providing utilisation information, asset tracking, and safety and security management functionality.

> Water audits were completed on the 15 most water-intensive buildings, focusing on leak detection, assessment of WELS rating of existing fixtures, and cooling tower and plant room audits. Efficiency opportunities were identified, with some implemented in 2021, and additional upgrades planned for 2022.

> Six new sub-meters were installed on lawn irrigation systems to improve monitoring of bore water use and leak detection. The installation of six additional meters is planned in 2022.

> Upgrade of a dehumidification system in Newton Building. The project involved the replacement of a desiccant wheel, in order to decrease gas and electricity used for humidification. This initiative was co-funded by the Australian National Fabrication Facility (ANFF), based in the Newton Building.

2021 saw further reductions in water usage at UNSW's main campuses, primarily due to reductions in campus activity. All three targets under this focus area are scored as 'achieved', although it is noted that target performance is boosted by reduced campus activity in 2020 and 2021.



Waste and Recycling

Highlights

- Plastic Free Dining launched
- New recycling systems rolled out

Sustainable Development Goal(s)

Our activities in this focus area contribute to the following SDGs:

And are especially focused on these targets under SDGs 6 and 7:

- 12.2 By 2030, achieve the sustainable management and efficient use of natural resources.
- 12.3 By 2030, halve per capita global food waste at the retail and consumer levels.
- 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

Introduction

Waste management is a key priority for students and staff and perhaps the most visible day-to-day environmental issue on campus.

This focus area includes our efforts to eliminate single-use plastics, maximise recycling and minimise what we put in landfill, in accordance with the waste hierarchy.

By improving waste practices and behaviours we aim to conserve natural resources, make cost savings and improve waste awareness among our students and staff.

Commitments

> Close the loop by minimising waste, improving resource efficiency and managing waste responsibly.

Targets	Status	Comment
Reduce general waste by 10 per cent per Equivalent Full-Time Student Load (EFTSL).	●	General waste per EFTSL reduced by 43 per cent compared to the 2018 baseline. The reduction was supported by waste reduction initiatives, but the majority of the reduction resulted from reduced campus activity.
Maintain general waste landfill diversion at 90 per cent+.	△	83 per cent recycling of general waste was achieved in 2021. Changes to waste regulations and sorting processes meant that the 90 per cent target could not be achieved, but the 2021 outcome was a significant improvement on the 2019 rate of 49 per cent, and was supported by the successful roll-out of new recycling systems.
Achieve minimum 90 per cent recycling of construction and demolition waste.	●	This requirement has been in place for capital projects since 2019 and a Construction and Demolition Waste Management Guideline was completed and rolled out to support project teams and their contractors to achieve the target.

Waste and Recycling

2021 progress

Further progress was made under the Waste & Recycling focus area in 2021. In early 2021 UNSW launched Plastic Free Dining, which aims to eliminate single-use plastics from retail food services on at UNSW campuses (see case study).

Guided by the UNSW Waste Management Plan and building on the roll-out of new recycling systems in office spaces in 2020, a new three-bin system (pictured above right) was implemented in outdoor areas in early 2021. The new system aligns with Plastic Free Dining and enables food and compostable packaging and drink containers to be segregated for recycling, alongside general waste.

Planning was also undertaken for the roll-out of food and compostable packaging bins in staff kitchens, and soft plastics recycling bins at 11 locations across Kensington campus. Both systems were implemented in early 2022.

A new furniture reuse program was rolled out in 2020 to ensure that UNSW furniture assets are fully utilised, diverting furniture from landfill and avoiding the need to purchase new furniture. 487 items of furniture were provided for reuse through the program in 2021.

A used furniture sale was held whereby 126 furniture items were provided to students and staff at a nominal price. The furniture sale provided quality used furniture to the UNSW community at a low cost while avoiding 2.4 tonnes of furniture from going to landfill.

Finally, a new Construction and Demolition Waste Management Guideline was completed. The document provides guidance to project teams and their contractors to support them to meet UNSW's 90 per cent construction & demolition waste recycling target and is included in the suite of UNSW design and construction standards that contractors must adhere to.

Dining at UNSW is going plastic free

Plastic Free Dining was launched in early 2021 with the aim of phasing out single-use plastics from dining services at UNSW campuses. It involved three key initiatives:

> all single-use campus food packaging to be fully compostable

> UNSW students and staff are encouraged to dine in and BYO cups and containers

> a new three-bin system for outdoor areas enables waste to be separated into food and compostable packaging), drink containers and general waste.

Analysis in 2019 estimated that over 3 million single-use plastic food and drink packaging items were used across Kensington campus annually, equating to around 12 per cent of general waste by weight. The launch of Plastic Free Dining followed 18 months of planning and engagement with campus retailers and was supported by a communication campaign to promote the desired waste segregation and reuse behaviours.

Also in 2021, a new award system was developed to celebrate UNSW retailers who have gone plastic free. Retailers receive a gold, silver or bronze award based on their progress in switching to compostable packaging, supporting reuse and other criteria. The awards were announced in early 2022. At the time of writing, five retailers had achieved a gold award, 14 a silver award and three a bronze award. The award status of each retailer can be found on the UNSW Estate Management website.

Travel and Transport

2021 highlights

- 76 new Teams-enabled meetings rooms and 18 hybrid meeting rooms delivered
- E-bike salary sacrificing becomes available to staff

Sustainable Development Goal(s)

Our activities in this focus area contribute to the following SDG:

And are especially focused on this target under SDG 11:

- 11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all.

Introduction

Access to and around our campuses is an important issue for our staff, students and visitors. In order to minimise congestion, reduce environmental impact and improve health and wellbeing outcomes, we promote the use of active and public transport modes as much as possible.

This focus area includes how people travel to and around our campuses, and how staff and students travel for university purposes as part of our efforts to address scope 3 emissions.

Other key stakeholders include local and state governments as well as the local community.

Commitments

> Ensure our campuses are easily accessible by multiple transport modes and our community is supported to make active and sustainable transport choices.

Targets	Status	Comment
Increase the percentage of staff and students commuting by active travel modes to 20 per cent by 2022.		The last travel survey, undertaken in 2019, showed that 25 per cent of students and staff were walking or cycling as their main travel modes. It has not been practical to conduct a travel survey since 2019 and it is recognised that there is some uncertainty over current levels of active travel.
Reduce air travel emissions by 1 per cent by 2022.		Business travel emissions reduced from 25,903 tCO2e in 2018 to 705 tCO2e in 2021, a reduction of 97 per cent. The majority of the reduction was due to COVID-related travel restrictions, but the uptake of virtual and hybrid working technologies and infrastructure are expected to lead to significant long-term reductions in travel emissions.

Travel and Transport

2021 progress

Travel is a focus area that has seen more change than most during 2020 and 2021, as students and staff have learned and worked from home during lockdowns and as a result commuting and travel on university business have reduced. This shift has been facilitated by the increased adoption of virtual and remote working and learning infrastructure, technologies and practices.

2021 highlights included:

> Continued roll-out of Teams-enabled hybrid meeting rooms and virtual and remote working and learning infrastructure, technologies and practices (see case study).

> UNSW Sydney staff can now access a salary packaged electric bike through e-stralian, in the same way that they access a motor vehicle through a novated lease. Cycling to campus is a great option to save money, exercise and reduce congestion and environmental impacts, but Sydney's hilly topography can make cycling a challenge. An electric bike can help with hills and negate the need to shower when you reach your destination. Kensington campus is now more bike-friendly than ever, with more than 1000 bike racks across campus, six bike repair stations and a secure bicycle hub, the Barker Street Bike Store, which offers 35 secure parking spaces and 46 lockers. Find out more about cycling to UNSW on the Estate Management website.

> Investment in local cycling infrastructure by Randwick City Council and Waverley Council continued, with the delivery of the Queens Park Pedestrian and Cycle Path Project commencing (completion due June 2022). A new 2.8km separated cycleway connecting Kingsford with Centennial Park is being built and is expected to be completed in late-2023. It will connect to Randwick City Council's planned cycleway between South Coogee and Kingsford.

Using technology to enhance collaboration and reduce emissions

The arrival of the COVID-19 pandemic in early 2020 necessitated a rapid transition to online education and working from home. UNSW had been expanding virtual and remote working and learning technologies and infrastructure for several years, but in early 2020 achieved in 10 days what may have otherwise taken years to do incrementally.

The roll-out of the unified communication and collaboration platform Microsoft Teams started in 2019. 47 per cent of enabled users of Teams (both students and staff) were active users by March 2022, compared to 30 per cent in March 2019 and 10 per cent in December 2019.

Additionally, implementation of AAA (MyAccess) allows staff and students access to lab applications and some lab machines remotely, while remote assistance application Splashtop gives support staff the ability to assist customers rather than having to attend sites and provide face-to-face support. These technologies have been key to keeping the university functioning and provide the platform for flexible working and learning patterns in future.

Equipping meeting rooms to enable virtual meetings is key to seamless hybrid working. 76 new Teams-enabled meeting rooms were delivered in 2020 (pictured above left), in addition to 18 hybrid meeting rooms with multiple spaces for video calls within one room. 26 Teams-enabled rooms were delivered in 2019 and 5 in 2018, and a further 40 are planned for 2022, which will bring the total to around 190 Teams-enabled and hybrid meeting rooms.

Finally, in 2019-2021 there was a transition of remaining staff from desktop to laptop computers, enabling flexible working practices and reducing energy consumption.

Our catalysts of change

Our students and staff underpin our contribution to a sustainable world.

Learning and Teaching

2021 highlights

- Completed and launched the SDG Modules

Sustainable Development Goal(s)

Our activities in this focus area contribute to the following SDG:

And are especially focused on these targets under SDG 4:

- 4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development.

Introduction

UNSW offers a range of educational programs in sustainability-related disciplines including renewable energy, climate science, materials science, built environment, biological, earth and environmental sciences, business, engineering and law.

All six faculties at UNSW offer opportunities to undertake studies with a sustainability focus. While sustainability is taught as a subject in its own right, UNSW educators are increasingly embedding sustainability considerations into the fabric of all courses, with a focus on the UN SDGs.

Our courses aim to equip graduates with the critical thinking capabilities they will need to become future leaders in their fields, including by helping them develop an informed approach to environmental sustainability risks and opportunities. In this way, our graduates are prepared to fulfil their potential and contribute to the society-wide challenge of nurturing a more sustainable planet and a fairer, more just society.

Commitments

> Offer learning and teaching programs that inspire students to contribute to a sustainable world.

> Provide leading interdisciplinary education in environmental management.

Learning and Teaching

Targets	Status	Comment
The SDG Module is offered across the FULT (Foundations of University Learning and Teaching) program.	●	The SDG Modules were completed in 2021 and are part of the Continuing Professional Development Framework for Academic staff.
One course per program of study per faculty includes the SDG module as an assessed activity by 2021.	△	While the SDG Modules were completed in 2021, their uptake across programs of study and faculties could not be practically tracked. Therefore, this target is scored as 'not achieved'.
One course per program of study per faculty incorporates SDG thinking using the SDG Toolkit by Term 2 2021.	△	While the SDG Toolkit was completed in 2020, its uptake across programs of study and faculties could not be practically tracked. Therefore, this target is scored as 'not achieved'.
One project per SDG is developed and integrated as an assessed activity by Term 1 2022.	△	The outcome of this target could not be practically tracked, therefore it is scored as 'not achieved'.
Continue to offer interdisciplinary education in environmental management in line with the Learning and Teaching Academic Standards Statement for Environment and Sustainability (LTASSES).	●	The Masters in Environmental Management (MEM), one of the longest running such courses in Australia, was revised in 2021. The MEM continues to align with LTASSES and now has an enhanced focus on transformative leadership.

2021 progress

Following the launch of the SDG Toolkit in 2020, two new continuing professional development (CPD) modules exploring the Sustainable Development Goals (SDG) were completed and released in 2021. These modules aim to help academics become familiar with the SDGs, and consider ways that sustainability thinking can be included in their own teaching, however they are available to all UNSW students and staff members. The two modules are:

> *Sustainable Development Goals* – Introduction presents the United Nations' Sustainable Development Goals; the 2030 Agenda, the goals and targets for the SDGs, interlinkages between SDGs, and the transformations needed.

> *Sustainable Development Goal 13* – Climate Action explores the core themes involved in discussing and taking climate action, empirical evidence for human-induced climate change, the impacts at the global and local level.

Each module takes about two hours to complete and can be done at the users' own pace. As of the end of 2021, 77 individual users had accessed the two modules. The SDG modules are part of the Continuing Professional Development Framework and the Foundations of University Learning and Teaching (FULT) program.

The SDG Modules support the SDG Toolkit, a set of resources to enable academics to integrate 'SDG thinking' into their courses. A further 83 individuals accessed the SDG Toolkit in 2021, while an accompanying YouTube video playlist featuring UNSW educators and leaders explaining the challenges and opportunities associated with each SDG had received over 250,000 combined views at the time of writing.

Research and Advocacy

2021 highlights

- Solar photovoltaic pioneer Martin Green awarded the prestigious 2021 Japan Prize
- Veena Sahajwalla named 2022 NSW Australian of the Year

Sustainable Development Goal(s)

Our activities in this focus area contribute to the following SDGs:

And are especially focused on these research-focused targets under SDGs 7 and 9:

- 7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil fuel technology, and promote investment in energy infrastructure and clean energy technology.
- 9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per one million people and public and private research and development spending.

Introduction

As one of Australia's leading universities, UNSW's research and advocacy confronts complex problems and finds solutions with real world impact that extend to the wider community.

We're continually breaking new ground in sustainability-related disciplines including solar energy, sustainable materials technology, biodiversity and conservation, and climate science.

As an international thought leader, we also have the responsibility to ask the big questions.

This focus area underpins our contribution to a more sustainable planet and a fairer society.

Commitments

- Support researchers to develop solutions to global environmental challenges.
- Be a leading advocate for a sustainable world by advancing policy discussion and debate.

Targets	Status	Comment
Implement one sustainability-related research showcasing project on campus by 2020.		In 2019, Estate Management commissioned the UNSW Centre for Sustainable Materials Research and Technology (SMaRT Centre) to manufacture coffee tables made from engineered waste glass, textiles and coffee cups. The tables now feature in the seating areas in the Faculty of Arts and Social Sciences and the Division of Research.

Research and Advocacy

2021 progress

In 2021, a range of sustainability-related research outputs were produced and communicated to the UNSW community and broader society.

The UNSW Futures Institutes address some of humanity's most pressing challenges through innovative interdisciplinary cross-faculty research and collaboration with industry, government, and community stakeholders.

In 2021, the UNSW Materials & Manufacturing Futures Institute (MMFI) funded seed projects on enhanced photovoltaics application and green hydrogen (energy) production that will contribute to the clean and renewable energy agenda and further develop local manufacturing capacity and capabilities.

The UNSW Digital Grid Futures Institute (DGFI) has also actively contributed to environmental sustainability through a variety of activities including:

> Funding seed projects to advance understanding of electrified transport systems, smart city/community development, EV adoption, zero-emission power supply system, energy-efficient communication infrastructure, enhanced energy conversion and storage, green chemical and fuels, enhancing air quality, energy transition policy, and sustainable technology education.

> Hosting an event featuring clean-energy thought leaders that drew over 100 attendees from the industry, academia, and community.

> DGFI-affiliated ARC Research Hub for Integrated Energy Storage Solutions working with 8 industry partners to develop advanced energy storage technologies and ultimately, create a more sustainable, reliable, and efficient energy supply.

> DGFI member Associate Professor Donna Green launched the Clean Air Schools initiative to capture air quality data in the school setting and will also contribute to the indoor air quality policy in Australia.

Martin Green photo credit: Anna Kucera

Solar photovoltaic pioneer Martin Green awarded the prestigious 2021 Japan Prize

Scientia Professor Martin Green (pictured below left) became a laureate of the Japan Prize for his revolutionary work in the field of photovoltaics. The annual prize is one of world's most prestigious awards given to scientists who've helped to make significant advances in the fields of science and technology worldwide, thus furthering the cause of peace and prosperity of mankind.

Professor Green, who is Director of the Australian Centre for Advanced Photovoltaics (ACAP) at UNSW Sydney, was recognised for his work in developing high-efficiency silicon photovoltaic devices.

"It's a privilege to receive this award, which serves as a reminder that the quest for inexpensive, renewable energy is a global quest seeking to sustain the trajectory of human civilization on our shared planet," Professor Green said.

The highly competitive prize had 142 nominations in the field of Resources, Energy, the Environment, and Social Infrastructure, comprising prominent scientists and researchers from across the globe. It is rated as one of the world's top 30 major academic awards by IREG List of International Academic Awards with a reputation score of 0.66 compared to a Nobel Prize.

Veena Sahajwalla named 2022 NSW Australian of the Year

Australian Research Council (ARC) Laureate Professor Veena Sahajwalla (pictured above) was named the 2022 NSW Australian of the Year. Founding director of the Centre for Sustainable Materials Research and Technology (SMaRT) at UNSW Sydney, Prof. Sahajwalla is an internationally recognised materials scientist, engineer and inventor who has revolutionised recycling science. She also heads the new ARC Microrecycling Research Hub and the Australian government's new National Environmental Science Program's Sustainable Communities and Waste Hub. She is renowned for pioneering the high temperature transformation of waste in the production of a new generation of green materials.

UNSW graduate and PhD candidate breaks solar panel efficiency record

SunDrive Solar, a company co-founded in 2015 by Bachelor of Engineering graduate and PhD candidate Vince Allen, received certification from the Institute for Solar Energy Research Hamelin (ISFH) that their commercially-sized silicon solar cell had achieved a world record 25.54 per cent efficiency.

What makes the SunDrive achievement even more remarkable is that they use copper to pull the electrical current from the cells rather than silver, which is the industry standard. Copper is around 100 times cheaper as a raw material than silver, and much more widely available, meaning the cost of solar modules could plummet if the technology is developed further.

Engagement and Integration

2021 highlights

- Successful pilot of the Laboratory Efficiency Assessment Framework (LEAF)
- Student Eco Heroes support environmental sustainability campaigns

Sustainable Development Goal(s)

Our activities in this focus area contribute to the following SDGs:

And are especially focused on these research-focused targets under SDGs 4 and 12:

- 4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development.
- 12.2 By 2030, achieve the sustainable management and efficient use of natural resources.
- 12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

Introduction

Our students and staff are our catalysts of change, and many of them are highly engaged in environmental sustainability issues.

This focus area covers our efforts to build a culture of environmental awareness and good practice on campus, and to integrate the Environmental Sustainability Plan into the fabric of the university.

Students can get involved in sustainability through a range of Arc@UNSW sustainability groups and activities such as the Environment Collective, the Producers, eReuse, Bikeology and the Stationery Reuse Centre. Other initiatives and groups such as Green Impact, UNSW Urban Growers and the Climate Change Network actively involve both students and staff.

Engagement in sustainability issues can help our people find meaning and purpose in their lives and prepare them to be effective catalysts of change in contributing to a more sustainable world.

Commitments

> Build a community of environmental awareness and good practice.

> Integrate this plan across University decision-making, planning and management processes.

Targets	Status	Comment
Increase levels of student and staff engagement in environmental sustainability, measured through a survey		In surveys carried out in 2018 and 2021, students and staff were asked to rate UNSW's overall environmental performance. In 2021, 66 per cent of respondents rated UNSW performance as 'good' or 'best practice' (*2018 = 27 per cent*). The most common rating was 'good' (*2018 = 'average'*).

Engagement and Integration

2021 progress

2021 was another year disrupted by lockdowns, which meant that opportunities to engage our community in environmental sustainability on our physical campuses were limited to the first half of the year. Nonetheless, a range of engagement activities were undertaken, including:

> UNSW Sydney became the first institution in Australasia to achieve the Laboratory Efficiency Assessment Framework (LEAF) certification for a group of its laboratories following a successful pilot involving five labs in the Faculty of Science. LEAF, developed by University College London (UCL), aims to improve environmental outcomes from laboratory practices. All five labs successfully completed the pilot, with two labs achieving silver and three labs achieving bronze certification. In 2022, a University-wide roll-out of LEAF is planned.

> A team of 14 *Eco Hero* volunteers was recruited and trained to support environmental sustainability campaigns. Eco Heroes supported multiple engagement activities and stalls at various events from March to June, with a focus on Plastic Free Dining and waste segregation. More than 2000 students participated in engagement activities (Plastic Free Scavenger Hunt and Sustainability Quiz) at the Sustainability stall at O-Week.

> A communication campaign was launched supporting Plastic Free Dining -- including the roll-out of new bin systems — through posters, tv screens, websites, newsletters and social media channels.

> UNSW social media channels ran stories in support of key environmental sustainability campaigns via TikTok, Instagram, Facebook and LinkedIn. Posts about Plastic Free Dining and UNSW's switch to 100 per cent renewable electricity went viral on social media, achieving almost 1m combined impressions (views) and over 70,000 engagements (comments, reactions, shares) and were ranked in the top 1 per cent most engaging posts on LinkedIn.

> A survey was undertaken to compare current performance with 2018 and inform UNSW's approach to environmental sustainability. The survey received 613 responses from students and staff across UNSW faculties and divisions and collected information about perceptions of current performance, priority focus areas, motivations and suggestions for improvement. The top issues of importance to the UNSW community were eliminating single-use plastics and achieving net zero emissions, followed by accelerating and being more transparent about fossil fuel divestment, sustainable procurement practices, protecting and enhancing green spaces, and sustainable design and construction. There were 116 suggestions for improvement and 84 other comments across a range of focus areas. The results have informed the UNSW Environmental Sustainability Plan 2022-24, which will be released in 2022.

Target status summary

Focus area	Target	Definition	Performance				2021
			2018	2019	2020[7]	2021	Status
Climate Action	Reduce net GHG emissions from building energy use to zero by 2020	Tonnes of carbon dioxide equivalent (tCO_2e)	81,745	84,515	0	0	●
	Expand onsite solar energy generation to 1.2MWp by 2022	Installed capacity in megawatts potential (MWp)	0.79	1.16	1.16	1.23	●
	Reduce total Scope 1, 2 & 3 GHG emissions in line with a 1.5°C global warming scenario	Tonnes of carbon dioxide equivalent (tCO_2e)	472,956	475,949	272,418	229,745	●
Goods and Services	Align procurement processes with ISO 20400 by 2022	Processes aligned (Y/N)	N	N	N	Partial	○
Investments	Align investment portfolio emission intensity with Paris Agreement commitments by 2020	Tonnes of carbon dioxide equivalent (tCO_2e) per $	N	N	N	N	△
Buildings and Campus	Design and build new buildings to minimum 5* Green Star Design & As Built or equivalent and 5.5* NABERS Energy equivalent by 2022	Cumulative number of new buildings designed and / or delivered to target	0/0	2/2	4/4	4/4	●
	Ensure no net loss in tree canopy cover compared to a 2018 baseline	Tree canopy cover (%)	20.6%	-	-	18.2%	△
Energy and Water Efficiency	Achieve a NABERS Energy equivalent rating of 4* or above for 10 existing buildings by 2022	Number of buildings achieving a NABERS Energy equivalent rating 4* or above	4.00	7.00	10.00	13.00	●
	Increase average energy efficiency of existing buildings by 3 per cent by 2022	Energy intensity (kWh per m² Gross Floor Area (GFA))	179	196	181	172	●
	Increase water efficiency per EFTSL by 2 per cent by 2022	Kilolitres per Equivalent Full time Student Load (EFTSL)	13.92	15.13	8.67	6.32	●
Waste and Recycling	Reduce general waste (mixed, paper, food & recyclables) per EFTSL by 10 per cent by 2022	Kilograms per Equivalent Full time Student Load (EFTSL)	63.46	63.20	32.91	36.21	●
	Maintain general waste landfill diversion at 90 per cent+	General waste diverted from landfill (%)	94%	49%	65%	83%	△
	Achieve minimum 90 per cent recycling of construction and demolition waste	Requirement in place (Y/N)	N	Y	Y	Y	●
Travel and Transport	Increase the percentage of staff and students commuting by active travel modes to 20 per cent by 2022	Staff and students walking or cycling as main travel mode (%)	16%	25%	-	-	●
	Reduce air travel emissions by 1 per cent by 2022	Travel emissions in tonnes of carbon dioxide equivalent (tCO_2e)	23,595	25,958	1844	705	●
Learning and Teaching	At least 1 option for the SDG module is offered across the FULT program of study	SDG module offered (Y/N)	N	N	N	Y	●
	At least 1 course per program of study includes the online course as an assessed activity	Requirement achieved (Y/N)	-	-	-	N	△
	At least 1 course per program of study incorporates SDG thinking using the SDG toolkit	Requirement achieved (Y/N)	-	-	-	N	△
	At least 1 project per SDG is developed and integrated as an assessed activity	Requirement achieved (Y/N)	-	-	-	N	△
	Offer interdisciplinary education in environmental management line with LTASSES	Program offered (Y/N)	Y	Y	Y	Y	●
Research and Advocacy	Implement one sustainability-related research showcasing project by 2020	Number of projects implemented	-	1	-	-	●
Engagement and Integration	Increase student and staff levels of engagement in sustainability, measured through a survey	Percentage of respondents rating UNSW performance as 'good' or 'best practice'	27%	-	-	66%	●

[7] In several cases, 2020 and 2021 target performance was affected by reduced campus activity, travel and expenditure in response to the COVID-19 pandemic. These changes mean that, for some targets, 2018 may no longer be a representative baseline. For transparency, where 2021 performance against individual targets appears to have been enhanced by COVID-19 impacts, this has been explained in the body of this report as clearly as possible.

Environmental Data

Energy & Water Efficiency

(Kensington campus only)

Energy	Unit	2018	2019	2020	2021
Consumed electricity	Kilowatt hour (kWh)	89,505,151	96,465,199	88,580,286	84,660,001
Electricity from onsite solar		1,019,964	1,138,968	1,092,216	1,057,563
Gas		36,067,207	39,790,982	34,696,593	36,705,007
Water					
Potable water	Megalitre (Ml)	351	367	199	176
Bore water		272	311	173	105
Total water		623	677	371	281
Bore water as a % of total	%	44%	46%	46%	37%

Waste & Recycling

(Kensington, Paddington and Randwick campuses)

General waste	Unit	2018	2019	2020	2021
Paper/cardboard	Tonne	1114	658	380	538
Mixed metals	Tonne	120	29	36	75
Drink containers	Tonne	84	122	188	151
Mixed plastics	Tonne	0	0	24	41
Food and organics	Tonne	278	80	0	0
Food waste	Tonne	228	257	51	59
Residual	Tonne	1017	1692	730	745
Total		**2,841**	**2,838**	**1,409**	**1609**
Destination					
Recycling	Tonne	1,824	1,146	679	864
Processed engineered fuel (energy recovery)	Tonne	858	244	241	477
Landfill	Tonne	159	1,447	490	268
General waste recycling rate	%	64%	40%	48%	54%
General waste landfill diversion rate	%	94%	49%	65%	83%

Paper and cardboard: Segregated paper, confidential paper and paper recovered from general waste at Material Recovery Facility (MRF)

Mixed metals: Reported as recovered from general waste at MRF

Drink containers: Collected through Return and Earn reverse vending machine on Kensington campus

Mixed plastics: Reported as recovered from general waste at MRF

Food and organics: Reported as recovered from general waste at MRF

Food waste: Segregated food waste collected from retailers and colleges

Residual waste: Contaminated paper, plastic, food packaging and other non-recyclable waste destined for energy recovery and landfill

Relevant standards and frameworks

Topic	Standard or framework	Description
Climate change	Greenhouse Gas (GHG) Protocol	Global standard for greenhouse gas emissions accounting and reporting, developed by the World Resources Institute and World Business Council for Sustainable Development.
	Science Based Targets Initiative (SBTi)	GHG reduction target setting methodology aligning with the GHG Protocol and the Paris Agreement objective of limiting global temperature increase to no more than 1.5-2°C.
Sustainable development	United Nations Sustainable Development Goals (SDGs)	17 global goals aiming to tackle the most pressing environmental, social and economic issues by 2030. Used to connect organisational sustainability strategy and reporting with the global agenda.
Learning and teaching	Learning & Teaching Academic Standards Statement for Environment and Sustainability	Describes the minimum or threshold learning outcomes (TLOs) that graduates of tertiary programs in environment and sustainability are expected to meet or exceed, providing a curriculum reference point for designing and teaching diverse and innovative environment and sustainability programs.
Sustainable buildings	Green Star Design & As Built	Certification standard for the sustainable design and construction of buildings, administered by the Green Building Council of Australia (GBCA).
Sustainable procurement	ISO 20400	Provides guidance on integrating sustainability principles within procurement activities.
Investments	United Nations Principles for Responsible Investment (PRI)	Six principles providing guidance for responsible investment, aiming to support signatories to incorporate sustainability issues into investment decision-making and ownership practices.
	Task Force on Climate-related Financial Disclosures (TCFD)	Industry-led initiative created to develop a set of recommendations for voluntary climate-related financial disclosures.

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