Charles Sturt University

2020 Sustainability Scorecard

Charles Sturt University

Cover image: Wagga Wagga tree planting
Inside cover: Albury-Wodonga – squirrel glider habitat project

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Vice-Chancellor's foreword

Last time this foreword was written, we were still reflecting on one of the most horrific Australian summers in living memory. Drought, catastrophic wildfires, hail storms, floods and the hottest summer on record were the headlines of the period. Twelve months on and we are in the midst of an unprecedented global pandemic. An event that has interrupted our university's activities and the way that we live our lives in a modern society like nothing else we have seen before.

There is no argument that the outcomes of COVID-19 have been overwhelmingly negative around the world. Many lives have been lost and the economies of many nations in tatters. If we are to take some positives out of the situation, I think it is fair to call out the following.

- As a global society, we've demonstrated an ability to mount a rapid, global response to a common challenge.
- A tremendous level of collaboration has been demonstrated at the community, national and international level.
- We've reconnected with the importance of people and have been reminded of the fragility of life.
- Universities from around the world have played a central role in responding to the pandemic.

The impact of the global pandemic has taken its toll on Charles Sturt University's financial position during 2020 and this has contributed to our need to launch our transformation program, Sustainable Futures, designed to reshape and reposition the university to ensure Charles Sturt delivers excellence. Sustainable Futures has forced us to make some very tough decisions about expenditure and has inevitably impacted our ability to roll-out some of our existing programs as aggressively as we had previously planned. Our Clean Energy Strategy is one such program that has been impeded with capital investments scaled back for the short-term. We remain committed to our 2030 vision under the strategy and continue to seize opportunities to push forward.

A highlight for the year was Charles Sturt ranking 61st overall in the Times Higher Education 2020 Impact Ratings in the university's first time appearing in the rankings. The rankings assess more than 600 universities across the globe against the United Nations' Sustainable Development Goals and ranks them in 17 categories across three areas – research, outreach and stewardship. Charles Sturt scored outstanding results in individual categories, including 36th in quality education, sixth in gender equality, 13th in clean water and sanitation, fourth in reduced inequalities and 22nd in life on the land.

I am delighted to welcome you to another edition of our annual Sustainability Scorecard. I hope you will be motivated by the work that we are doing in this area and inspired to seek out future opportunities to contribute to the incredibly important cause of creating and sustaining a world worth living in!

Professor John Germov
Interim Vice-Chancellor

Sustainability at Charles Sturt message

Welcome to our 2020 Sustainability Scorecard. What a tumultuous year it was! Very little about 2020 was normal and this is certainly reflected in our data and achievements for the period.

We observed a very significant downturn in utility consumption and associated carbon emission figures in 2020. This was to be expected for a year where very few students and limited staff attended our campuses and almost no regular travel was occurring for university business purposes due to COVID-19 restrictions.

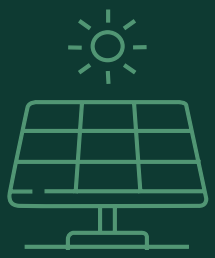
Our ability to achieve our University Performance Measure of a 5 per cent improvement as measured across the four priority areas of the Learning in Future Environments (LiFE) Index was also impacted as a result of a short-term reduction in allocated resources and personnel changes. A positive has been our success in effectively adapting to the online working environment to perform group planning and consultations associated with our sustainability objectives. This result demonstrates the effectiveness of the structured approach we applied to this area.

We rebranded to Sustainability at Charles Sturt, in place of CSU Green aligning with our sub-brand roll-out. This change recognises that sustainability is a core aspect of Charles Sturt's values, helps to underpin our social license and generates genuine benefits for our communities.

As Australia's leading university of inland Australia, we recognise and value our role and responsibility to promote best sustainable practices and subscribe to the United Nations (UN) Sustainable Development Goals (SDGs). These SDGs allow us to develop guidelines, processes and programs related to environmental, social and economic sustainability. The SDGs allow us to compare our performance to other tertiary institutions around the globe through the Times Higher Education (THE) Impact Rankings.

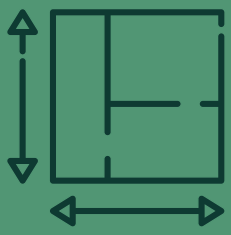
We recognise and acknowledge the diversity and unique position of Aboriginal and Torres Strait Islander peoples as the traditional owners and custodians of Australia and the islands of the Torres Strait, in accordance with local Indigenous laws and customs. We also recognise that sustainable practices are inherent within First Nations culture and seek to learn from this.

Ed Maher
Manager, Sustainability at Charles Sturt



14,300 approximate number of solar panels now installed across Charles Sturt campuses

972 number of sustainability inductions completed by Charles Sturt staff



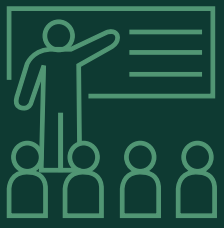
80% total area of Charles Sturt laboratory floor space reviewed in the Green Labs Program

61st - Times Higher Education Impact world ranking

18 refurbished staff laptops donated to students in need

40 squirrel glider nest-boxes installed on the Albury-Wodonga campus

22,079 total native trees planted since 2010



2 international conference presentations by Sustainability at Charles Sturt team

Fleet vehicle travel

87% drop

	2018	2019	2020
total distance travelled (km million)	3.9	4.1	1.6
total distance travelled (km)	3,908,219	4,166,231	1,602,686

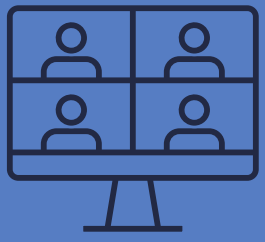
333 hectares - Charles Sturt biodiversity zone total area

(which is more than 180 MCG ovals in area!)

31% town water consumption reduction

5 community University Partnership Grants for sustainability projects

1477 total Facebook likes



33 LiFE engagements on Zoom

12 Sustainable impact RED awards sent to our colleagues

Overview

What are we trying to achieve in sustainability?

This publication provides an overview of the sustainability achievements and challenges at Charles Sturt. It informs our students, staff and the broader community about sustainability projects, initiatives and events undertaken across the university in 2020.

The Sustainability Scorecard is based on Charles Sturt's progress against its performance measure for sustainability – a five per cent annual improvement in the rating for each of the four LiFE priority areas:

- Leadership and governance
- Learning, teaching and research
- Partnership and engagement
- Facilities and operations.

The case studies and articles provided in the Sustainability Scorecard shine a spotlight on the positive contributions made by university staff, students and our footprint communities to improve our performance against these areas.

We use this report to provide evidence of Charles Sturt's work to support the UN SDGs.

Leadership and governance

LiFE steering committee

The Learning in Future Environments (LiFE) index is a framework which allows us to benchmark how effective, impactful and innovative our sustainability approaches are at Charles Sturt. We implemented the LiFE index in 2016 and are now into our fifth year. The LiFE steering committee dealt with a diversity of priority activities during 2020. Like most areas of the university, the committee was impacted by the Sustainable Futures program.

There were a number of presentations made including:

- the Times Higher Education (THE) world university rankings process by Jason White
- Charles Sturt Advantage and proposed pillars by Jenny Roberts, DVC Students
- progress towards the integration of the sustainable practices Graduate Learning Outcomes into all undergraduate courses driven by PVC Teaching and Learning
- updates for the Carnegie framework for community engagement
- Campus Environmental Committee updates.

LiFE leadership framework

The engagement process with the LiFE leadership was changed in 2020, shifting from a group approach to individual discussions. One-on-one consultations were held with each VCLT member. Sustainability at Charles Sturt staff conducted consultation appointments to discuss progress on the implementation of priority actions in both the Leadership Action Plan and the framework corresponding to each member's role.

The impact of this approach was positive, particularly with the DVC Students, who scheduled quarterly appointments across the year. This resulted in the implementation of several key actions.

Times Higher Education Impact Ranking – SDGs

Charles Sturt appeared for the first time and ranked 61st overall in the 2020 Times Higher Education (THE) Impact Ratings.

The rankings assessed more than 600 universities across the globe against the UN's SDGs and ranked them in 17 categories across three areas – research, outreach and stewardship.

Categories include no poverty, quality education, gender equality, decent work and economic growth, reduced inequalities, sustainable cities and communities and climate action.

Charles Sturt scored outstanding results in individual categories, including fourth in reduced inequalities, sixth in gender equality, 13th in clean water and sanitation, 22nd in life on the land and 36th in quality education.

Charles Sturt's Deputy Vice-Chancellor (Research and Engagement) Professor Heather Cavanagh said the university's individual and overall results are a reflection of our commitment to creating a world worth living in.

"This is Charles Sturt University's first year in these rankings and we are incredibly proud of the results we have achieved," she said.

"The university is committed to producing research that benefits our people, economy and environment and creating a workplace and study environment that is safe and accepting of all people.

"In addition to our focus on education and research, the university has implemented programs and practices that ensure we are as environmentally friendly as we can be. These rankings are a reflection that Charles Sturt is making great strides towards achieving these goals."

Further details about our results and examples of the work we are doing to support the goals can be found on our website.

A series of short video clips have been produced which showcase our work to support a number of the SDGs.

Climate action (Nov 2020)

Life below water (Dec 2020)

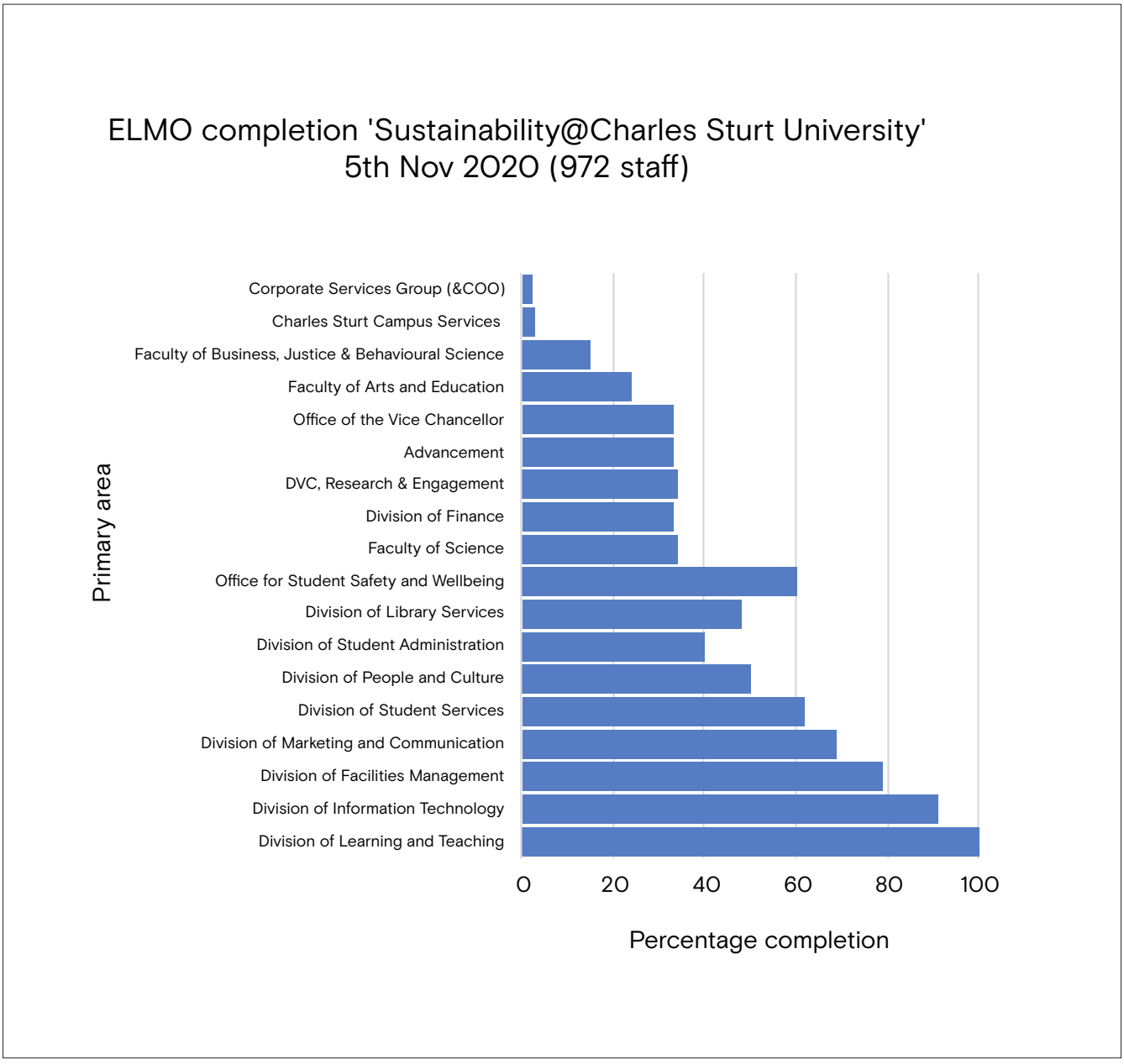
Human capital and staff engagement

ELMO: Sustainability @ Charles Sturt University induction module completion status

The below data represents staff who completed the sustainability training module. As of 5 November 2020, the total completion rate dropped to 38 per cent of all staff. Sustainability at Charles Sturt will be actively encouraging staff to complete the module as part of their individual Employee Development and Review Scheme (EDRS) performance review process in early 2021.

ELMO: Graduate Learning Outcomes Sustainable Practices module completion status

As of 5 November 2020, the total staff completion rate was 16 (up from 12 in June). Sustainability at Charles Sturt is working with the A/PVC Teaching and Learning to undertake targeted promotion of this training opportunity.



International conference participation

Advancement of sustainability in higher education

Charles Sturt University (Ed Maher and Kym Witney-Soanes) along with the University of Tasmania (Corey Peterson and Dr Carmen Primo-Perez) presented at the Global Conference on Sustainability in Higher Education hosted by the Association for the Advancement of Sustainability in Higher Education (AASHE) across North America and Canada. We discussed our different journeys towards and beyond carbon neutrality. The session was prerecorded on zoom.

The Alliance for Sustainability Leadership in Education

Charles Sturt presented live at the EAUC Virtual Global Climate 2020 Conference hosted by the Alliance for Sustainability Leadership in Education in mid-November. EAUC is the peak body for sustainability in the European and UK tertiary sector. Our presentation was just before Prince Charles welcomed the key note addresses! We presented our continuous improvement strategies framed by the LiFE Index.

Watch the video:
Sustainability at Charles Sturt
"Creating a World Worth Living In"

2020 International Green Gown Awards

International Green Gown Award winners were announced on July 8 at the United Nations High-Level Political Forum. Charles Sturt received Highly Commended recognition with two other institutions in the category of 'Sustainability Institution of the Year'. Judges feedback stated:

"This application shows a real will to integrate sustainable development into every aspect of the institution's activities with convincing results. A well rounded and comprehensive approach with thorough reporting and measuring mechanisms. Charles Sturt's effort is remarkable in the breadth of activities and achievements and scale of impact over many years."

Read the article:
Charles Sturt's sustainability praised at International Green Gown Awards

LiFE progress towards best practice and university performance measure

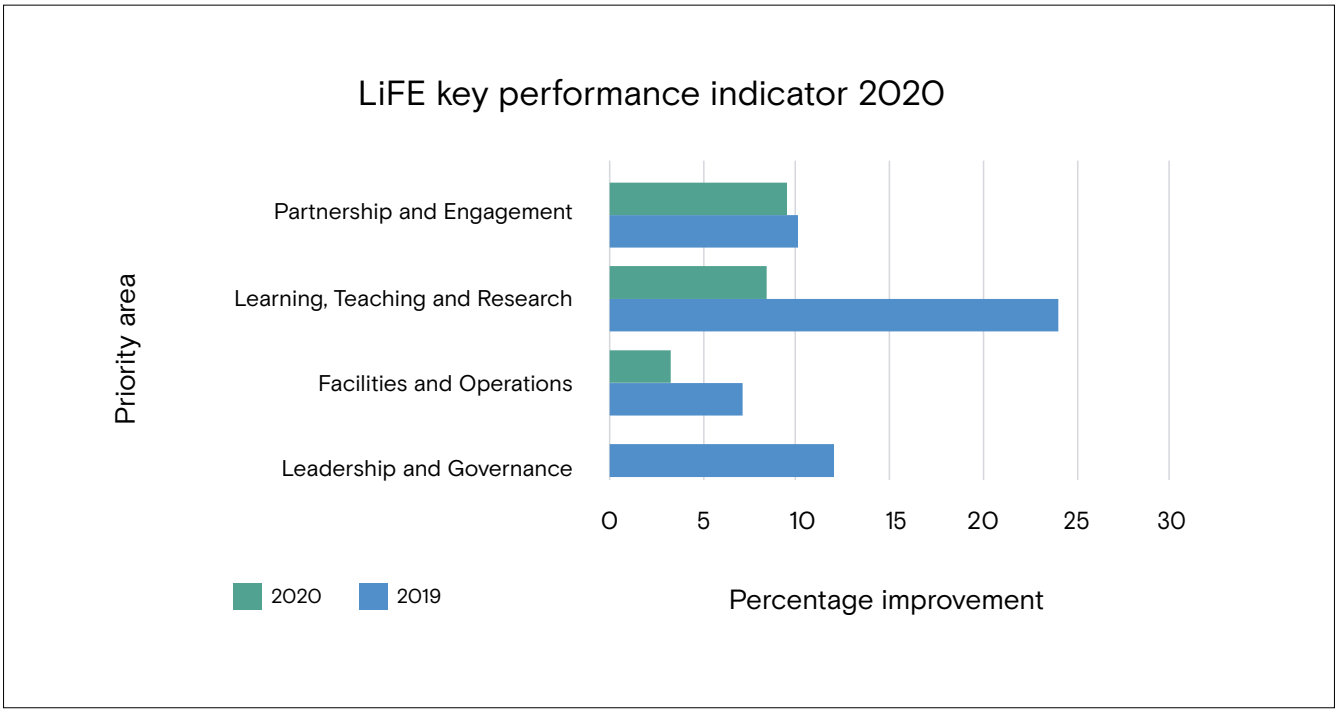
Stakeholder engagement rates for 2020 LiFE consultation workshops continued with Zoom sessions providing a viable and effective alternative to physical face-to-face meetings.

Rating review workshops were conducted with subject matter expert champion groups across the remaining eight frameworks since the last meeting of the LiFE Steering Committee. A summary of results is provided below:

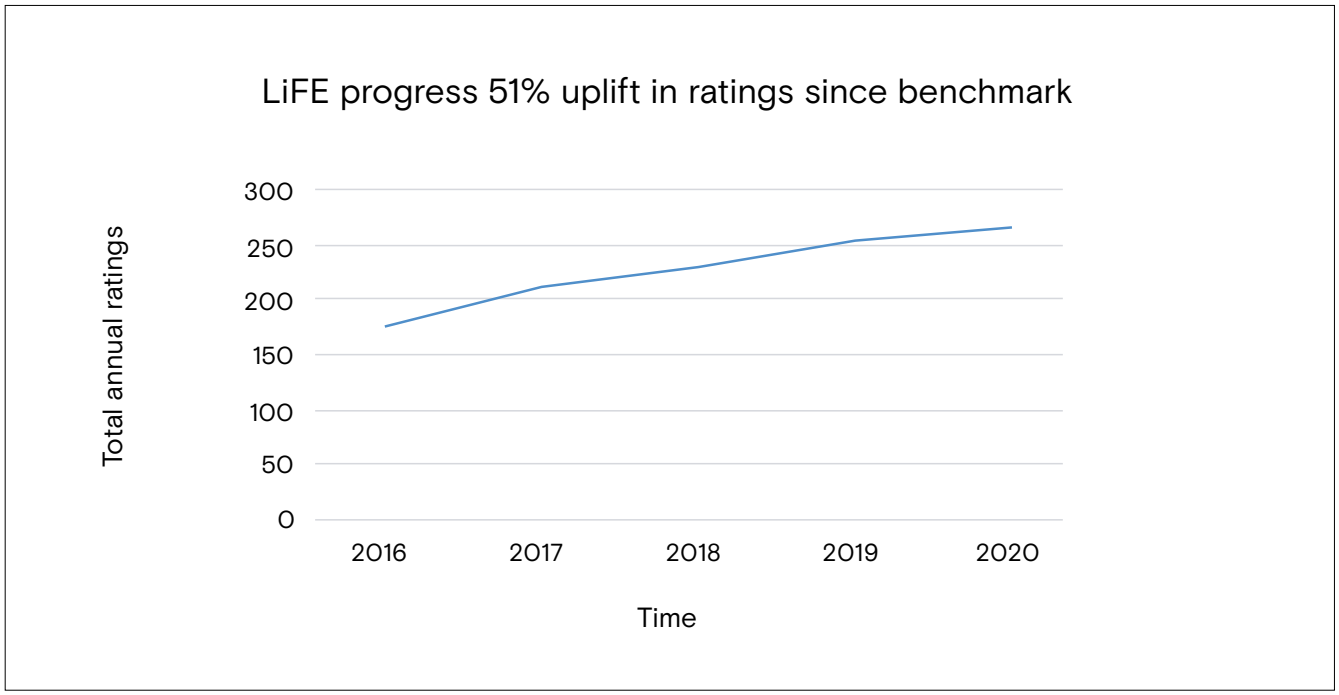
- Community Engagement Business and Industry Interface – improved ratings by 14 per cent on previous year with gains in communications and action planning
- Student Engagement – improved ratings by 21 per cent on the previous year with gains in the policy and strategy, communications, and training and support
- Utilities (energy and water) – improved ratings by 8 per cent on the previous year with gains in stakeholder engagement
- Transport – slipped back by 20 per cent compared with the previous year with losses in stakeholder engagement and measurement
- Learning and Teaching – slipped back by 5 per cent compared with the previous year with a fall in measurement
- Research – lifted ratings by 13 per cent compared with the previous year with improvements in policy and strategy and in links to curriculum
- Procurement and Supplier Engagement – ratings remained unchanged
- Human Capital and Staff Engagement – lifted ratings by 6 per cent compared with the previous year with improvements in stakeholder engagement
- Leadership has been updated by the Sustainability at Charles Sturt team for endorsement by LiFE Steering Committee before passage to the VCLT. Recommended a drop in the ratings by 5 per cent due to a roll-back in governance structures and resourcing of key programs this year.

Overall results for 2020 saw Charles Sturt fall below the 5 per cent KPI for Leadership and Governance (zero change); and for Facilities and Operations (3 per cent).

However, we achieved 8 per cent uplift in the ratings compared to 2019 in Learning, Teaching and Research; and a lift of 9 per cent for Partnership and Engagement.



This year saw our smallest improvements since commencing in 2016 (see graph above).



The above graph shows overarching lift in total ratings since the benchmark year in 2016 from 176 to 266 in 2020.

In 2020 a Pledge Wall was created on the Bathurst campus where staff and students were asked to make their pledge by asking themselves "What action can I take to help forge a more gender-equal world?"

Equity and diversity

In 2020, Charles Sturt continued important equity and diversity work, and:

- received the Workplace Gender Equality Agency Employer of Choice citation for the second year running
- ranked 6th in gender equality and 4th in reducing inequalities in the Times Higher Education Impact Rankings
- became a Women in STEM Decadal Plan Champion
- continued to work towards the Workplace Gender Equity Strategy (2012-2022)
- supported the Women's Agenda launch of a dedicated Women's Health News Hub
- the inaugural 'Dean's Leadership Lunch' was hosted by the Faculty of Science Executive Dean Megan Smith
- a pilot of a 'Gender Parity of Presenters Guidelines' in the Faculty of Science was developed for major events across the year. The guidelines, used by event organisers, requires events to have gender parity at best-practice ratio of 40:40:20 and encourages organisers to think about diversity, inclusivity and accessibility when putting together events, keynote speakers and panels
- 333 Charles Sturt staff completed unconscious bias and inclusivity training. Our external engagement was expanded with the successful delivery of a session to NSW Health Staff
- we became a signatory to the Joint Sector Position Statement (JSPS) on Gender Equity and COVID-19. Find out more.

Learning, teaching and research

Learning and teaching case studies of best practice

Dr Cate Thomas ASPIRE diversity advocate and model

Congratulations to Charles Sturt Professor Cate Thomas who was nominated for two Aspire Awards in October.

This is a national awards program that recognises the contribution made by people with a disability across a range of categories. Cate was nominated in the categories of Individual Best Achievement – Service to the Australian People (formerly the Government and Non-Government Category) and Individual Best Achievement – Community Advocacy. She received medals of recognition for both nomination categories.

Cate said the support she has received from the university has enabled her to progress her career and become an advocate within the university and wider community. Cate is also the convener of the Athena SWAN Gender Equity Charter at Charles Sturt.

“We are people first and I think sometimes that’s forgotten. It’s amazing how resilient people with a disability are.”

It is this determination, enthusiasm and ability to inspire that has earned Cate this well-deserved recognition.

Virtual farm tour

Dr Celia Connor is a Lecturer in Environment and Agriculture in the School of Agricultural and Wine Sciences and is also an active member of the Wagga Wagga Biodiversity Management Team.

Celia coordinated the development of a learning and teaching resource in the form of a virtual farm tour between September and December. The video package focused on five themes, including:

1. A biodiversity overview
2. Farm plantings revegetating the landscape
3. Natural resource management – water and soil
4. Threats including weeds, feral species and habitat loss
5. Monitoring.

Celia interviewed James Stephens, Charles Sturt Farm Manager, Will Pollock, Division of Facilities Management Groundsman/Horticulturalist and Sustainability at Charles Sturt Project Officer, Kym Witney-Soanes.

Vision used included drone footage across the farmland showcasing remnant vegetation, revegetated tree lines, shelterbelts, Houlaghan’s Creek riparian zone and open paddocks.

The resource will be used for students studying towards their Bachelors of Agriculture, Horticulture, Viticulture and Agricultural Business Management. Specific subjects include first-year Biology and Agriculture (AGR130) and second-year Food, Environment and Culture (AGR2020). The resource will also be shared across the university and the wider community to develop an understanding of the importance of building diversity in agricultural landscapes.

Many thanks to everyone who contributed towards this project in front and behind the camera, including Richard Brimson and Adam Webster from the Division of Teaching and Learning.

Sustainable practices as a unique characteristic of Charles Sturt graduates

Charles Sturt has a long-held commitment for the inclusion of Sustainable Practices as a common Graduate Learning Outcome (GLO) for all graduates. In 2020, the secondment of Dr Jonathon Howard as a dedicated resource to support the progression of this initiative, came to an end. A final wave of resources was completed to support all staff involved in teaching to be aware of good practices and understand how they can best contribute.

Resources completed into 2020 included 'From Accountancy to Wine Science: guidance on including Sustainable Practices into higher education courses at Charles Sturt University'. This is essentially an A-Z Guide that demonstrates how sustainability can be made relevant to any degree, and moreover, how evidence-based practice can be demonstrated.

Another key resource that was launched during the year was the detailed professional development module hosted in the university's staff knowledge bank which can be easily accessed by all staff. The module takes approximately 60 minutes to complete.

The Learning and Teaching framework is in development and course design will assist how the GLOs are considered. Course Subject Policy started in November. The Change Agent GLOs represent Charles Sturt's unique offering in a graduate and will form an increasingly important focus.

It has been recommended that the LiFE Learning and Teaching framework be aligned with and used to measure progress for the Sustainable Practices GLO. The GLOs will be reviewed and rolled into the annual health check reporting process.

STEM education

Associate Professor, Amy MacDonald co-edited a book called 'STEM Education Across the Learning Continuum: Early Childhood to Senior Secondary', which is the first comprehensive book to consider STEM education from early childhood through to senior secondary education. It approaches STEM as a form of real-world, problem-based education that draws on the knowledge and skills of the science, technology, engineering and mathematics disciplines. Rather than presenting each of the separate disciplines to an equal extent, it focuses on STEM researchers' perspectives on how their work contributes to effective STEM education in terms of building knowledge, skills and engagement. Gathering contributions by authors from various countries, the book explores effective STEM education from a range of perspectives within the international context. Moreover, it addresses critical issues in STEM education, including transition and trajectories, gender, rurality, socioeconomic status and cultural diversity.

Research case study of best practice

Professor Geoff Gurr and his novel pest management program

Congratulations to Professor Geoff Gurr and his Novel Pest Management Program as winner of the Engagement Australia Award for 'Outstanding Engagement for Research Impact'.

Geoff leads an Australian and international research team that has spent the last 22 years investigating how to achieve food security whilst reducing dependence on non-renewable, environmentally hazardous inputs through the biocontrol solutions.

In one project, companion plantings attracted beneficial insects to rice fields. This suppressed pests so effectively that farmers reduced insecticide spraying by 70 per cent whilst rice yield was increased, leading to a 7.5 per cent income boost.

The Engagement Australia Excellence Awards identify and celebrate the most exciting and impactful engagement activities by Australian and New Zealand universities.

Congratulations also to two other Charles Sturt finalists in other categories:

- Professor Robyn Watts and Associate Professor Skye Wassens in the 'Excellence in Community Engagement' Award for their Environmental Long-Term Intervention Monitoring and Monitoring, Evaluation and Research Programs
- Associate Professor Faye McMillan and the Djirruwang Aboriginal Mental Health Worker Education and Training Program in the Engagement Australia Award for 'Excellence in Community Engagement, Closing the Gap'.

Visit the website:
Engagement Australia Excellence Awards

Sustainability research seed grants

2019 project update

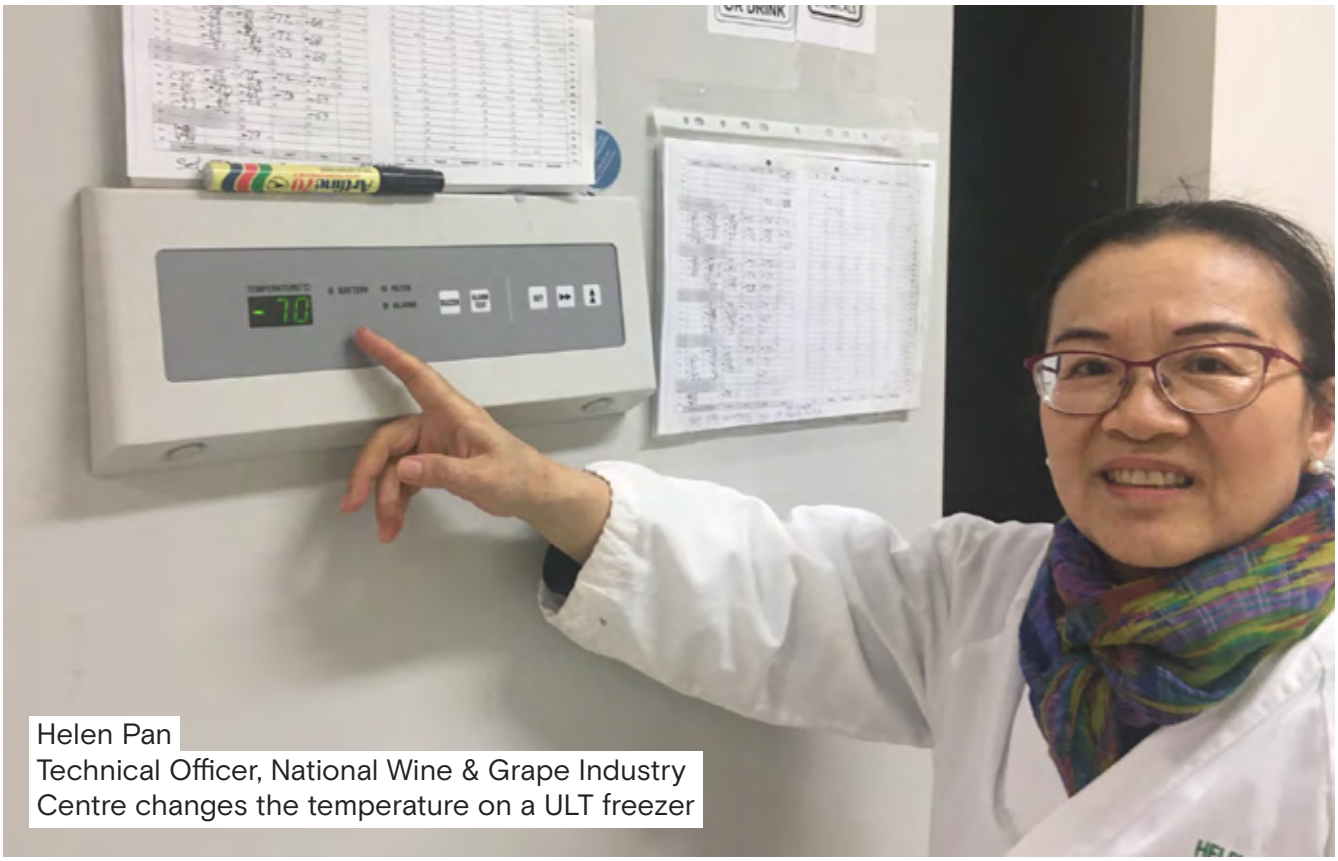
The following projects were funded through Sustainability at Charles Sturt Research Seed Grants in 2019 and implemented in 2020:

- Learning sustainable practice through the preparation of pharmaceutical products from mango waste in a Bachelor of Pharmacy capstone project (Orange and Wagga Wagga campuses)
- Gauging stakeholder expectations of the development and management of eco-tourism in a developing country – the case for Cambodia (Bathurst campus)
- Biodiversity responses to the re-introduction of cultural burns in long unburnt grasslands (Albury-Wodonga campus)
- Determining if Australian native birds can recognise odours of invasive mammalian predators (Albury-Wodonga campus).

Providing access to quality healthcare services for people living in rural and remote australia

Rachel Rossiter, Associate Professor of Nursing has worked with a team of Charles Sturt staff and some clinicians from Mid-North Coast Local Health District for more than three years to provide evidence that would support advocacy efforts by Parkinson's NSW for specialist Parkinson's nurses in regional, rural and remote NSW. Access to specialist movement disorder neurological services is extremely limited outside of major cities with 93 per cent of neurologists located in urban areas. The findings from a 3-stage study have been reported widely and led to an announcement by the Department of Health of funding for rural Primary Health Networks to undertake a pilot program placing Movement Disorder Specialist Nurses in rural and remote areas.

Read the article:
Charles Sturt collaboration will help people living with neurological conditions



Helen Pan
Technical Officer, National Wine & Grape Industry Centre changes the temperature on a ULT freezer

Green Labs program

Sustainable laboratories are an important issue and they occupy 5.6 per cent of gross floor area at Charles Sturt. The university is committed to embedding best practice sustainability into every laboratory area – teaching, research, clinical and commercial.

The Green Labs Program details steps which can be taken at both at an individual and organisational level, and is divided into four units: energy, water, purchasing and recycling.

Laboratories present huge opportunities for conservation. The Charles Sturt Green Labs Program uses an inclusive consultative team approach to:

- minimise the use of energy and water
- reduce the purchasing of material goods and hazardous chemicals
- cut down waste production... without compromising integrity or safety.

The Green Labs Program is about continuous improvement and looking at new ways of supporting Charles Sturt's commitment to sustainability.

In 2020, the Green Labs Program achievements include:

- visiting 35 labs
- engaging approximately 50 staff
- 18,280.41m² of lab floor space being assessed (which is 80 per cent of total Charles Sturt lab floor area).

Many resources have also been developed supporting the Sustainable Research Guidelines and Green Labs checklist including recycling posters, stickers, fact sheets, labelling for fume hoods and key equipment to engage users around efficient operation.

A new Green Labs ELMO online training module is another significant output from this project. Content was developed by a team of subject matter experts from the Faculty of Science across three campuses. The module was made available to all staff in early 2021. Finally, Dr Celia Connor and Therese Moon are writing an academic paper on this program and Therese also produced a written final report.

A big thank you to Therese Moon, Technical Officer who was seconded from the Faculty of Science on a part-time basis from November 2019 to June 2020 to work on this program.

Impactful story of most significant change

Attitudes have shifted and lab users have formed new habits, with a heightened consciousness of their energy usage.

"The most significant change that has resulted from the Green Labs Program is the level of awareness of energy usage in laboratories at Charles Sturt. Lab users have been astounded to learn of the high energy consumption by standard laboratory equipment such as fume hoods and ultralow temperature freezers (ULT -80°C).

Lab users have learnt that through simple behavioural changes they can significantly reduce electrical usage. The introduction of various reminder "stickers" placed strategically on laboratory equipment has assisted in embedding new behaviours (stickers include: Fume hood/ULT freezer-specific, "OK to switch off", "Do not switch off" and "Warm up time").

> When left running with the sash open, each unit uses the equivalent amount of energy required to run 3.5 medium sized houses per hour!

Prior to November 2019, laboratory staff and users were unaware of high energy usage of fume hoods when they are run with the sash (door) fully open. When left running with the sash open, each unit uses the equivalent amount of energy required to run 3.5 medium sized houses per hour! This is the consumption for just one unit, and we have 90 units across all campuses, though many are used infrequently. Some laboratory users left fume hoods on 24/7 with the sashes up. Closing the sash whenever possible results in an energy saving of up to 60 per cent, in addition to the reduced impact on air-conditioning in the room. This behaviour change is the single most beneficial action that can be taken in any laboratory.

ULT freezers use the equivalent energy of one medium sized house 24/7/365. 'Warming up' a ULT freezer from -80 to -70°C results in an energy saving of at least 30 per cent. The laboratory team at the National Wine and Grape Industry Centre has 'warmed up' six ULT freezers, with significant energy savings and no loss of sample integrity.

As a result of the team meetings where I worked through the Green Lab checklist and presented other energy saving information to lab users, plus the introduction of reminder "stickers", there has been in a significant shift in behaviour towards more sustainable energy usage.

Now when I walk into the Environmental Analytical Laboratory at the Wagga Wagga campus, I see all the sashes closed when not in use or at the lowest recommended level when in use. Attitudes have shifted and lab users have formed new habits, with a heightened consciousness of their energy usage. There has been a reduction in energy consumption, with equipment switched off after use where appropriate.

During practical classes, many demonstrators now show positive sustainability behaviours to students by switching off equipment after use and/or encouraging the students to do so. Where demonstrators contribute to conscious energy savings, equipment is switched off well before the end of the class when the Laboratory Technicians return.

The reduction in energy usage in laboratories at Charles Sturt has been a team effort!"

Therese Moon, Technical Officer,
Faculty of Science and
Green Labs Coordinator
September 2020

Sustainability research seed grant

Using mango waste for pharmaceutical products

Final year pharmacy students in Orange creating skin care products from mango seed waste

Australia produces approximately 60,000 tonnes of mangoes annually. Based on the typical ratio of seed/skin to edible flesh in mangoes, it is estimated that 15,000 to 25,000 tonnes waste is produced from mango processing each year in Australia alone.

This project, led by researchers from Charles Sturt's School of Biomedical Science, Associate Professor Maree Donna Simpson, Dr Chris Parkinson, Dr Gregg Maynard and Dr Heather Robinson, seeks to address the mango waste problem by determining the viability of producing a useful product from the waste material that has the potential to substitute petrochemical-based materials from pharmaceutical products such as moisturisers.

The project has been designed and delivered with the additional benefit of involving final year pharmacy students to assist with the development of an effective process for extracting the oil from the seed kernel and the formulation of stable end-products such as creams and lotions. Working through this challenge has prompted the students to consider the environmental impacts of common practices in the pharmaceutical industry and the potential value of innovative uses for waste materials.

Preliminary results have been very positive with lab-scale trials not only demonstrating that the materials derived from waste mango materials offer similar benefits to well-known products such as shea and coconut butter but also identifying an additional opportunity to produce an exfoliant from the residual material after oil extraction. The mango oil can be obtained using solvents not derived from petrochemical sources. The researchers are currently seeking interest from a commercial processor to further investigate the commercial viability of production.

Sustainability research seed grant

Determining if Australian native birds can recognise odours of invasive mammalian predators

Dr Melanie Massaro with a Lord Howe Currawong

The introduction of exotic predators such as rats and cats has been a main cause of bird population declines and extinctions across the globe. Birds are vulnerable to invasive predators, because they may fail to detect and react appropriately to the cues of novel predators, which leads to high levels of bird mortality. This research project, led by Associate Professor Melanie Massaro, Associate Professor Raf Freire and Honours student, Darcy Creece will answer whether native Australian birds can:

1. Smell olfactory cues of introduced mammalian predators and change their behaviour accordingly to avoid these predators
2. Detect and distinguish between the odours of invasive predators and native predators.

Since it is logistically not feasible to remove invasive predators from large parts of Australia, there is a real conservation benefit to knowing whether some native birds are able to recognise the odours of invasive predators. Knowledge gained through this project has the potential to lead to innovative, sustainable and cost-effective management approaches to ensure the long-term survival of native Australian birds.

While the research is ongoing, preliminary results have been positive and suggest that the novel approach of using elevated bird bath platforms to attract birds for the purposes of establishing control and experimental treatments is proving effective.

Research contributing towards SDG#14 Life Below Water

Across november, we promoted Charles Sturt's contribution towards SDG#14 Life Below Water. Globally we are ranked #39 for this SDG. Here are some research case studies:

Living labs David Mitchell wetlands
Funded through a 2020 Sustainability at Charles Sturt Research Seed Grant

The Albury-Wodonga campus' flagship species is the Sloane's froglet. The campus is one of the largest of the dwindling viable populations in NSW. The David Mitchell Wetlands provide critical habitat for this nationally-threatened species.

Matthew Gill, Kelly Thomas and Rob Cook worked to monitor the presence and activity of the Sloane's froglet using acoustic recorders. Findings will inform the management of ephemeral wetland areas favouring this aquatic species. Frog data will be available to students for teaching, learning and research outcomes and will be shared with colleagues at the Department of Planning, Industry and Environment. This is another example of how Charles Sturt uses campuses as 'Living Laboratories'.

Research between Charles Sturt's Institute for Land, Water and Society (ILWS), Yanco Creek & Tributaries Advisory Council

Limited ecological surveys have been done in the Yanco billabong-creek system. Evidence about frogs, water quality and vegetation diversity is critical in making informed management decisions. Research found seven species of frogs including the spotted marsh frog, the barking marsh frog, the eastern sign-bearing froglet, the eastern banjo frog, the giant banjo frog, the Peron's tree frog and the southern bell frog.

Findings were published this year by ILWS researchers Dr Skye Wassens (with D. McNeil and A. Turner).

Read the report:
Yanco Creek and tributaries:
Intensive frog surveys of creek and farm habitats

Image above: Southern bell frog (Litoria raniformis) calling from water primrose

Sustainability adviser program

Pictured left to right: Holly Threlfo (Port Macquarie), Maddison Taylor (Wagga Wagga), Jackson Casey (Albury-Wodonga), Miranda Rogers (Bathurst) and Bailey Armstrong (Orange)

Our wonderful 2020 sustainability advisers (SAs) across our main campus student residences were only officially in their role for a matter of weeks when COVID-19 shut down all campuses in March. The planning and preparation for these roles started in mid-2019, so fortunately the SAs were able to spend some time planning activities and meeting with the outgoing SAs before residence training in February.

The role of SAs has increased over the last four years as evidenced by the increasing passion from the students and engagement in the activities and events that they're involved with.

An increasing focus of the SA program has been to leverage the support of the student Resident Advisor (RA) team on their campus, rather than trying to enact change entirely themselves. The SAs had been planning events with the RAs that included a focus on sustainability with the aim of embedding the behaviours across the residences as normal and not 'one off' sustainability events.

Each of the SAs also chose a focus area for the year such, including:

- expanding collection of food and organic waste (Albury-Wodonga)
- looking at the sustainability of consumer products that students use (Orange)
- supporting bushfire recovery for the Koala habitat (Port Macquarie).

Fortunately, all of these initiatives were able to continue in a different form after students left campus. Bailey (from the Orange campus) started an online blog looking at common questions she and other students encountered when moving out of home for the first time,

2020 Wagga Wagga campus orientation week Sustainability stand

funding to support Koala habitat was still able to be donated, and the Albury-Wodonga Charles Sturt Campus Services staff were able to expand the food organic waste collection into residences which were used for defence staff accommodation when manning border closures.

Orientation Week events occurred in late February and early March with a focus on water saving measures given the drought conditions faced across the country. The water quiz was a popular activity at the Sustainability at Charles Sturt stand and a great way for the SAs to be known by more students around each campus.

During lockdown, SAs posted regularly to their student groups, supporting them with tips for home study and sustainability best practice at home. They maintained visibility and support during this stressful and uncertain time.

The program was an embedded component of the annual RA training, so all student staff in residences understood their role and responsibility to support new students to live sustainably within residences, run more sustainable events and activities and also support students with transferable life and career skills.

Unfortunately, due to the Sustainable Futures Program all SA positions were withdrawn in May 2020. We are looking at alternate funding solutions to try and reinstate these positions in the future.

Partnership and engagement

Campus Environment Committee highlights

A Campus Environmental Committee (CEC) is established on each of the main teaching campuses (Albury-Wodonga, Bathurst, Dubbo, Orange, Port Macquarie and Wagga Wagga) to achieve environmental sustainability.

Albury-Wodonga - Matt Hunt (Chair)

- Successful Sustainability at Charles Sturt Grant to monitor the David Mitchell Wetlands for improved ecological outcomes.
- Successful Sustainability at Charles Sturt Grant to establishment habitat and nesting sites for squirrel gliders on the Albury-Wodonga campus. In late 2020, a team of volunteers led by Dr Jonathon Howard installed approximately 40 nest-boxes and planted hundreds of endemic and suitable trees in an effort to support the remnant squirrel glider population on campus.
- Significant reductions in greenhouse gas emissions and water and electricity use at the Albury-Wodonga campus. This is an excellent trend due to the drought conditions and resource shortages in the district. We are an exemplar for climate change mitigation and being a sustainable campus.

Bathurst – Simon Wright (Chair)

- Bathurst campus has brand new composting bays funded through a Sustainability at Charles Sturt Grant. There is considerable interest in diverting green waste from residences and catering to these bays and this was set up to proceed prior to the pandemic. It is now due to launch in 2021, with assistance from catering, cleaning and grounds staff. The resulting compost will be used to improve the soil on the Bathurst campus.
- The 'ecowalk' was finally launched in 2020. We encourage staff, students and visitors to take 30 minutes to wander around the campus loop.
- Remediation work was started at Hawthornden Creek.
- Plans are in place to build a pollinators' garden on campus "the B&B Highway" in 2021, as funded through a Sustainability at Charles Sturt Grant.

Sustainability at Charles Sturt would like to acknowledge the significant contribution made to the Bathurst campuses CEC and sustainability broadly by Dr Simon Wright over several years.

Dubbo – Liz Laidlaw (Chair)

- Community alliances were formed, including with the Wambangalang Environmental Education Centre to collaborate on future activities.
- The ongoing bird survey was continued.
- Signage for the 'diversity garden project' was progressed.

Orange – Scott Andrew (Chair)

- Continued restoration of the Summer Hill creek, a collaboration between Charles Sturt, Orange City Council, the Department of Primary Industries and Landcare. Approximately 810 native trees/shrubs suited to the local area have been planted across this year in the area known as Risky Paddock alongside Summer Hill creek as it passes through the Charles Sturt farm following the removal of willows from this section of the creek last in 2019. Tree planting took place over six days in early May and early September.
- The peregrine falcons successfully fledged another chick this year watched by many on the live streaming web cameras around the world.'"

Port Macquarie – Nigel Urwin (Chair)

- Facebook page 'Wildlife Watch Charles Sturt University Port Macquarie' developed to encourage staff and students to record wildlife on and around campus to monitor improved biodiversity.
- Poster pin boards installed around the campus to also encourage staff and students to record biodiversity. This is to benchmark wildlife diversity and work on improving that.
- Liaised with the local Hastings Birdwatchers group to prepare an intensive survey of birds arounds the campus. The survey report shows that we are a diversity hotspot in Port Macquarie, in particular around the offset reserve area with more than 70 species recorded between June and September. The survey and report were organised and led by Ken Monson of the Hastings Birdwatchers group.
- The prettiest organism award goes to Fuligo septica commonly known as the Dog Vomit Slime Mould spotted on the Port Macquarie campus in early November!

Sustainability at Charles Sturt would like to acknowledge the significant contribution made to the CEC and sustainability broadly by Dr Nigel Urwin since the committee's establishment

Wagga Wagga – Collin James (Chair)

- Tree planting events held with 1200 seedlings planted across three sites.
- Spring Biodiversity 'Walk and Talk' held in September at Trig Hill.
- Successful Sustainability at Charles Sturt Grant targeting irrigated turf reduction.

Staff and community engagement

Biodiversity 'Walk and Talk' on the Wagga Wagga campus

COVID-19 limited numbers, but certainly didn't dampen enthusiasm for 20 early starters for the spring biodiversity 'Walk and Talk' around our blossoming campus, run by the Environmental Action Group Ensuring Restoration & Reconciliation (EAGERR). The group met at 8am on Wednesday 16 September and heard from our highly experienced Division of Facilities Management grounds team including Will Pollack, Simon Cole and Rowan Rake. We learnt about minimising areas mown, native grass and shrub regeneration and removing barbed wire from fences to minimise harm to wildlife. We spotted and heard native wildlife including the Superb Parrot, Wrens and Eastern Grey Kangaroos.

First Nations Educational Designer and Gulaay Academic Lloyd Dolan led the group up the hill, where he told Wiradjuri stories of the connections between the consolation and the hills and caves. These are all linked to the story of the Seven Sisters that ended up at the Blue Mountains, but two (hills) are on this campus and are significant to women. The Rock, visible in the distance to the south is a place of significance to First Nation's men and the suburb now known as Kooringal was where both groups met for potential marriages. Lloyd also shared notebooks with Wiradjuri vocabulary and grammar tips.

Tree planting

Tree planting activities were altered in line with Covid restrictions; however, we were still able to plant 2205 natives across our campuses in 2020. This makes our grand total since 2010 approximately 22,000.

- 1200 trees were planted on the Wagga Wagga campus on 24 and 26 August at Hopetoun (850), near the Resource Recovery Centre (200) with 14 DFM staff. An additional 100 trees were planted at the Equine Centre.
- Two tree planting events were held on the Orange campus as part of the Summerhill Creek Care Project restoring riverine habitat. 410 grasses and shrubs were planted on 11 and 13 May and 400 trees were planted on 11 and 12 September.
- The Bathurst DFM Biodiversity Management Team undertook instream erosion control works instead of tree planting this year.
- No tree planting events were held at the Albury-Wodonga, Dubbo or Port Macquarie campuses in 2020.
- Canberra St Mark's grassland hosted a volunteer working bee in November.

Tree planting event held at the Wagga Wagga campus

Community engagement

Mina Guli, ultra-marathon runner and water activist

Port Macquarie Sustainability Expo

Charles Sturt is helping to facilitate conversations with the Port-Macquarie Hastings community with a focus on increasing resilience to climate change. The "Head, Heart and Hands" project led by the Port Macquarie Hasting Sustainability Network was made possible through funding received from the NSW Government Department of Planning, Industry and Environment. It kicked off in 2020 with the first of its community workshops, focusing on issues linked to Food and Land resilience. The sessions, consisting of a round-table comprised of local advocates and experts on the topic, was well attended as an online forum and generated plenty of questions from the audience.

Workshops will continue throughout 2021, focusing on the additional areas of:

- climate change resilience and emergency preparedness for individuals and small businesses
- mental/physical health and wellbeing
- creating resilient buildings, spaces and environments.

Visit the website for further details:
Head, Heart and Hands project

Exploration Series: Mina Guli, Running Dry with Stan Grant

Hundreds of online participants joined Charles Sturt's Explorations Series Stan Grant in Conversation with Mina Guli. Mina Guli is an award winning Australian leader, water activist and ultra-marathon runner who runs to raise awareness about water shortage challenges across the globe. In 2016, Mina ran an astonishing 29 marathons in 38 days across seven deserts on seven continents to raise awareness of water conservation.

The university's very own Professor Stan Grant Jr interviewed Mina about key issues including the global water crisis, water advocacy and all things running.

Mina also hosted two separate events, for school students (primary and secondary) in which more than 2500 students from within the Charles Sturt footprint were able to listen and ask questions about her incredible efforts.

A recording of the full event, can be accessed below.

Watch the recording:
Stan Grant in Conversation with Mina Guli

Community University Partnership (CUP) Grant outcomes

The Community University Partnerships (CUP) Environmental Sustainability Grant is a small grants program (maximum project value is $1000) to support initiatives that align with Charles Sturt's adopted definition of sustainability and improve the environmental and social sustainability of our regional communities.

Six projects were successful in receiving funding through the program in 2020. These projects are summarised in the table below.

Recipient	Project title	Project benefits	Funding awarded
Corowa Public School	Environmentally Sustainable Outdoor Classroom	The project has converted an unused area of the school grounds to an environmentally sustainable outdoor classroom to encompass teaching and learning. The intended outcomes of the project are to promote knowledge and behaviour in students that supports environmental sustainability.	$750
Hastings Valley Amateur Beekeeping Association HVABA	Hastings Valley Amateur Beekeepers Association Education Apiary	Hastings Valley Amateur Beekeeping Association meet monthly to share knowledge and experience with attendees with the aim of building capacity, knowledge and skill for both new and experienced bee keepers in the local area. Through the development of educational resources, this project will lead to healthier beekeeping and care of our natural environments to support healthy bee colonies (including native bees). This will lead to healthier natural spaces and improved local agricultural yields.	$1000

Sustain: The Australian Food Network	Food Stories - Big and Small (podcast)	This project will develop a series of five podcast episodes that explore contemporary issues within the North East Victorian region's food system. Australian rurality is significantly defined by food systems and agriculture: socially and politically. Hearing local voices and exploring local responses empowers our communities and validates alternatives that remain largely unexplored by governments.	$1000
Zonta Club of Port Macquarie Inc.	Earth Kit Assembly Project	The Birthing Kit Foundation of Australia (BKFA) provides opportunities for Australian volunteers to fundraise, purchase and assemble birthing kits. In 2020 BKFA launched a new environmentally sustainable birthing kit that saves lives and the planet. This funding has supported the Zonta Club of Port Macquarie to purchase 200 "Earth Kits", assemble them with local students and distribute them to developing nations where they will save the lives of mothers and their newborn babies during labour.	$1000
Herland Cooperative	Rebuilding Communal Shelter and Kitchen	The Herland Cooperative run a not-for-profit rural retreat/refuge for women located in the Port Macquarie Hastings region. The 2019/20 bushfires completely destroyed the central communal gathering space on Herland. This funding will contribute to the cost of materials used to rebuild a simple gathering space, using volunteer labour.	$1000
Dubbo Rivercare Group Inc	Macquarie River Weed Control and Replanting – Dubbo Project	With this funding support, Dubbo Rivercare Group have carried out exotic weed control and the removal of invasive garden escapees along the riparian zone and replant locally endemic trees and shrubs. Removal of rubbish will also be part of the project, both on the banks and within the river.	$1000

Herland Cooperative, rebuilding communal shelter and kitchen

Funding provided by Charles Sturt's CUP Environmental Sustainability Grant contributed to the funds raised by the Herland Cooperative for a week long women's building course at the not-for-profit rural retreat and refuge for women, located in the Port Macquarie Hastings region. The project has resulted in the construction of a communal gathering space at the property following the destruction of buildings during the devastating 2019–20 bushfires.

A (female) licensed builder led the workshop, and other women with building and renovation experience contributed their knowledge to participants with little prior experience. Many new skills were acquired and a six-metre-by-four-metre structure was successfully erected. The structure was clad on the western and southern sides to provide shelter from prevailing wind and rain directions and features open views to the northern and eastern mountains.

Additional sustainable features include a solar energy system which is used to power lights over a new communal kitchen area, tea/coffee area and washing up area and a rainwater tank for water harvesting.

“Food Stories: Big and Small” podcast series

This project has resulted in the development of five open-access podcasts exploring diverse stories on north-eastern Victorian food culture produced by Beechworth local, Peter Kenyon. Made possible with seed funding provided by Charles Sturt’s CUP Environmental Sustainability Grant, the initial series explores topics such as: local food insecurity in the midst of bushfire and a global pandemic; the competing priorities of productive farm-land versus land value for housing development; and perspectives from a local and recently established market-gardener.

The project has led to a growing library of podcasts that revolve around the issue of food culture.

Visit the website:
Unpeeled podcasts

unpeeled.press

FOOD CULTURE

Podcast now available!

Facilities and operations

Energy reduction

The Clean Energy Strategy.

- 16 companies have submitted proposals to the EOI. Working to July Appointment of Project Director.
- Project Reference Panels formation in Q2 and Q3 will see a range of staff recruited to stakeholder groups.
- Significant focus on consolidation of space, changes to access+ higher occupancy rates/density.
- Efficiency and ending gas dependency foci of Phase 1.

Enterprise space register integration project

The Enterprise Space Register Integration project is focused on sharing teaching space usage information stored in the university timetabling system to support better management of these spaces. By sharing this information, we are able to increase security and optimise energy consumption in our timetabled teaching spaces. This is achieved by shifting from generic weekly schedules of when spaces should be unlocked and air-conditioned to actual, timetabled bookings being used to drive the operation of these systems.

Benefits include reduced energy consumption and associated reductions in energy cost and carbon emissions. Early results have indicated that the run hours of air-conditioning systems can be reduced by between 40–85 per cent as a result of this work.

During 2020, a successful pilot project was delivered involving ten teaching spaces across five campuses. The pilot has led the development of necessary integration between separate software systems and has paved the way for further deployment in bookable spaces across Charles Sturt.

Solar stage II

Rooftop Solar PV deployment has continued to the point where the vast majority of structurally suitable rooftops are hosting solar. Stage 2 has seen total solar nudge towards 4.5MW which should produce 8 GWhrs of clean electricity.

Supplier problems and subsequent delays have impacted the commissioning of Bathurst sites though those are likely to be producing in late autumn 2021.

Generating clean energy isn't enough though. We continue to focus on energy reduction through efficiency and productivity as a way of reducing total emissions. We are seeking to procure clean electricity for the balance of electrical operations from 2022.

Facilities and operations

Carbon neutrality

As Australia's first certified carbon neutral university, Charles Sturt continued with its emissions reduction focus and offsetting the residual total emissions through the purchase of certified carbon credits. In-line with Climate Active requirements for carbon neutrality, the university purchases and retires offsets in arrears of the reporting period. This is completed when the annual carbon emissions inventory has been established giving rise to the total quantity of offsets required.

Charles Sturt has established a series of four principles to help guide decisions associated with the procurement of carbon offsets. These principles are as follows:

1. Support for locally-based projects to the extent that is deemed financially viable
2. A preference for projects that align with Charles Sturt's values and offer high engagement
3. Consideration of projects that offer regional connectivity with the university's international partners
4. The unit cost of the offset option.

In 2020, Charles Sturt continued with selected offsets that also address some of the UN SDGs. These include a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity.

The goals that are addressed by these offsets specifically include SDG 7, SDG 8, SDG 9, SDG 13 and SDG 15.

Projects include:

The Rimba Raya biodiversity reserve project

An initiative by InfiniteEARTH that aims to reduce Indonesia's emissions by preserving some 64,000 hectares of tropical peat swamp forest. This area, rich in biodiversity including the endangered Bornean orangutan, was slated by the Provincial government to be converted into four palm oil estates. It is located on the southern coast of Borneo in the province of Central Kalimantan. The project is also designed to protect the integrity of the adjacent world renowned Tanjung Puting National Park by creating a physical buffer zone along the full extent of the eastern border of the park.

The Chakala wind power project in Maharashtra

Bindu Vayu Urja Private Limited (BVUPL) is setting up a 39 MW Wind Power Plant in Chakala village in the state of Maharashtra in India. The project will use 26 Wind Turbine Generators (WTG). Each WTG will have a capacity of 1.5 MW. The project will generate around 77,996 MWh of electricity per annum. The electricity will be exported to the Maharashtra State Electricity Distribution Company Limited (MSEDCL). The clean electricity generated from the project will aid in sustainable development of that region and will reduce greenhouse gas emissions by generating clean and green electricity.

Energising-India using solar energy projects

These projects are a drive to reduce India's carbon emissions in taking an ambitious step to move toward a clean energy future. This began in 2010 with the launch of the Jawaharlal Nehru National Solar Mission (JNNSM). The Mission has an ambitious target of deploying 20 GW of grid connected solar power by 2022.

Arnhem Land indigenous savanna fire management project

Greenhouse gases emitted from savanna fires make up three per cent of Australia's total emissions. Savanna burning projects undertaken by Traditional Owners and Aboriginal rangers reduce GHG emissions by undertaking cool, lower intensity fires in the early dry season when the vegetation still contains some moisture from the wet season. This reduces the GHG emitted from high intensity, unmanaged fire in the late dry season when the country is dry.

In addition to the carbon abatement, the project is delivering 'core benefits' to country including:

- managing country the right way
- revitalising connection to country
- improving biodiversity corridors to take pressure off wildlife
- building new fire skills and experience for rangers.

Irrigated turf reduction project at the Wagga Wagga campus

In the context of a changing climate and increased water scarcity, landscaping needs to adapt to drier summers and less irrigated water. Charles Sturt's Wagga Wagga campus has approximately 18 ha of irrigated turf and around five ha of sub-surface irrigated garden beds, including 55 controlled irrigated sites. Funding was secured through a 2020 Sustainability at Charles Sturt grant to reduce:

- unhealthy turf areas (due to soil fungi, shade and root growth from mature trees)
- large turf space that do not serve a functional purpose
- portable water use.

Areas are being replaced with climate suitable, low/zero water use landscape replacing exotic lawn with native ground covers, specifically grasses. Work is underway and signage erected around the pond near buildings 20 and 18 and near carpark 24.

This project may be replicated on other campuses.

Water Reduction

Several of the regions where our campuses are located experienced severe water shortages and were progressing towards Level 3, 4 or 5 water restrictions, meaning significant limitations to how water can be used, particularly for irrigation purposes. The Division of Facilities Management, including Sustainability at Charles Sturt, is currently developing Water Saving Action Plans for affected campuses, including Bathurst, Dubbo and Orange. A communication plan is currently being developed to raise awareness among members of the University community about the importance of conserving water

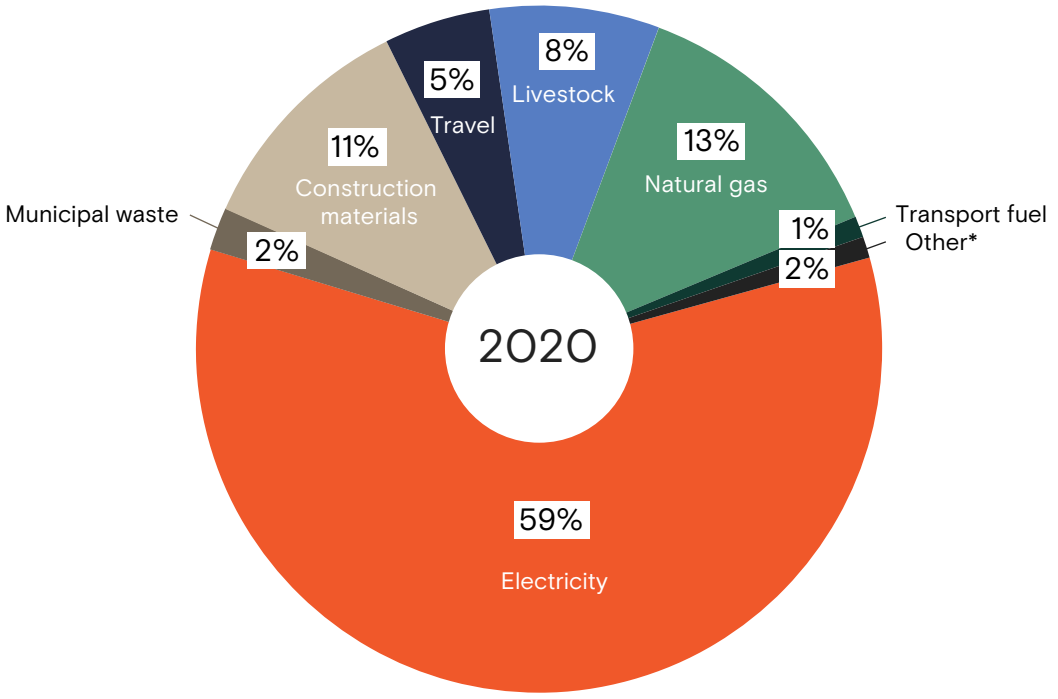
Waste reduction

A number of operational waste improvements were made across our campuses in 2020, including:

- the introduction of a dedicated food organics collection system at the Wagga Wagga campus. This system captures organic waste from the primary commercial kitchen and converts it into compost at a local commercial processing facility
- improved processed adopted to handle obsolete office furniture, through a donation program established with local schools and not-for-profit groups. This equipment is now put to valuable use and is diverted from landfill
- more than 37,000kg of organic waste collected from the Albury-Wodonga campus and diverted from landfill.

Carbon emissions

Emission by source (As% total t CO2-e)

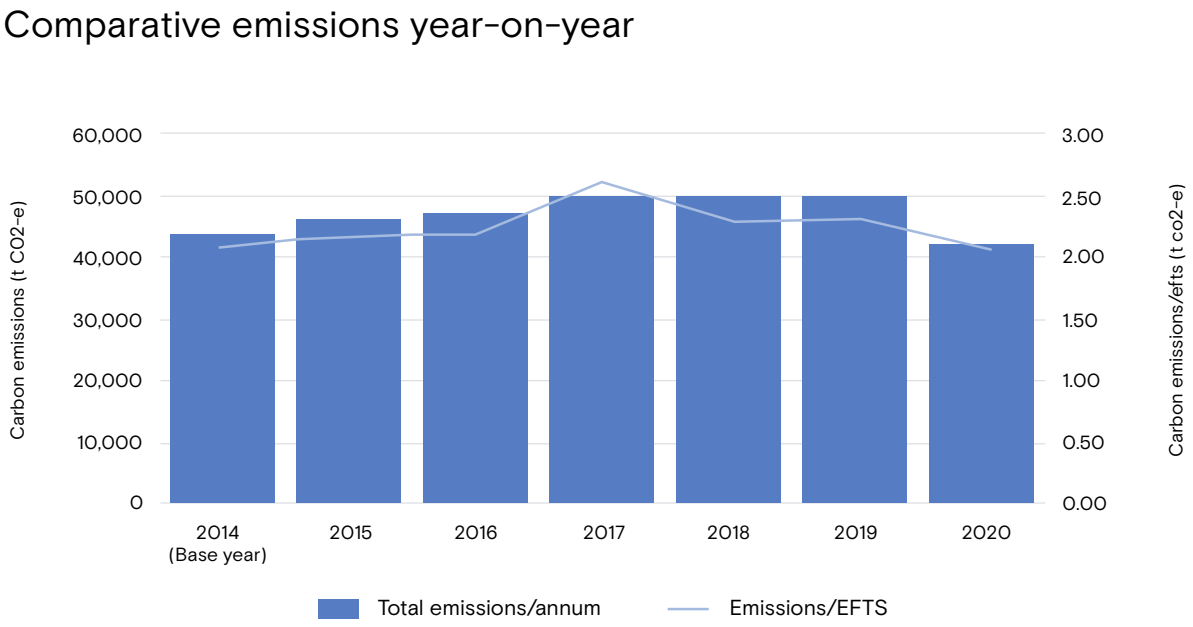


*Water-waste water, LPG, paper products & other

Charles Sturt University's carbon emissions continue to be dominated by electricity (59 per cent) and natural gas (13 per cent). This is followed by construction and capital goods (11 per cent) and livestock (8 per cent).

Charles Sturt continues to invest in solar array capacity and electrical energy efficiency projects to reduce electricity emissions.

Notes on 2020 carbon footprint



Charles Sturt University's carbon footprint reported a significant overall reduction of 17 per cent compared to the 2019 reporting year.

This result included a mix of activity changes and treatment of emission sources to align with the new Climate Active Carbon Neutral Standard for Organisations (2020).

The most significant impact resulted from the reduced operations/activities taken in response to the COVID-19 pandemic.

The most significant emission activity changes included:

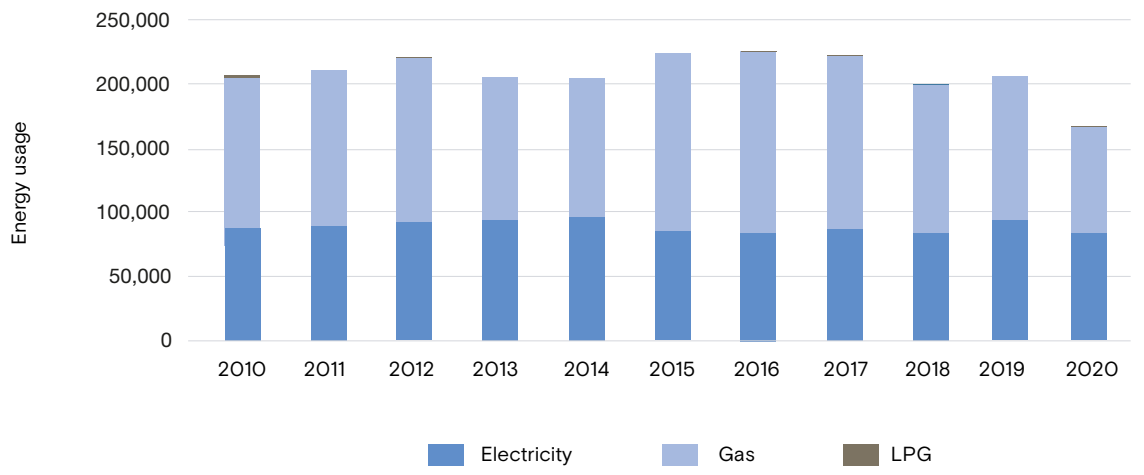
Reductions in emissions resulting from:

- Electricity consumption
- Natural gas consumption
- Travel (Business).

Increases in emissions resulting from:

- Construction activity
- Employee commute (previously excluded)
- Capital goods (previously excluded).

Energy

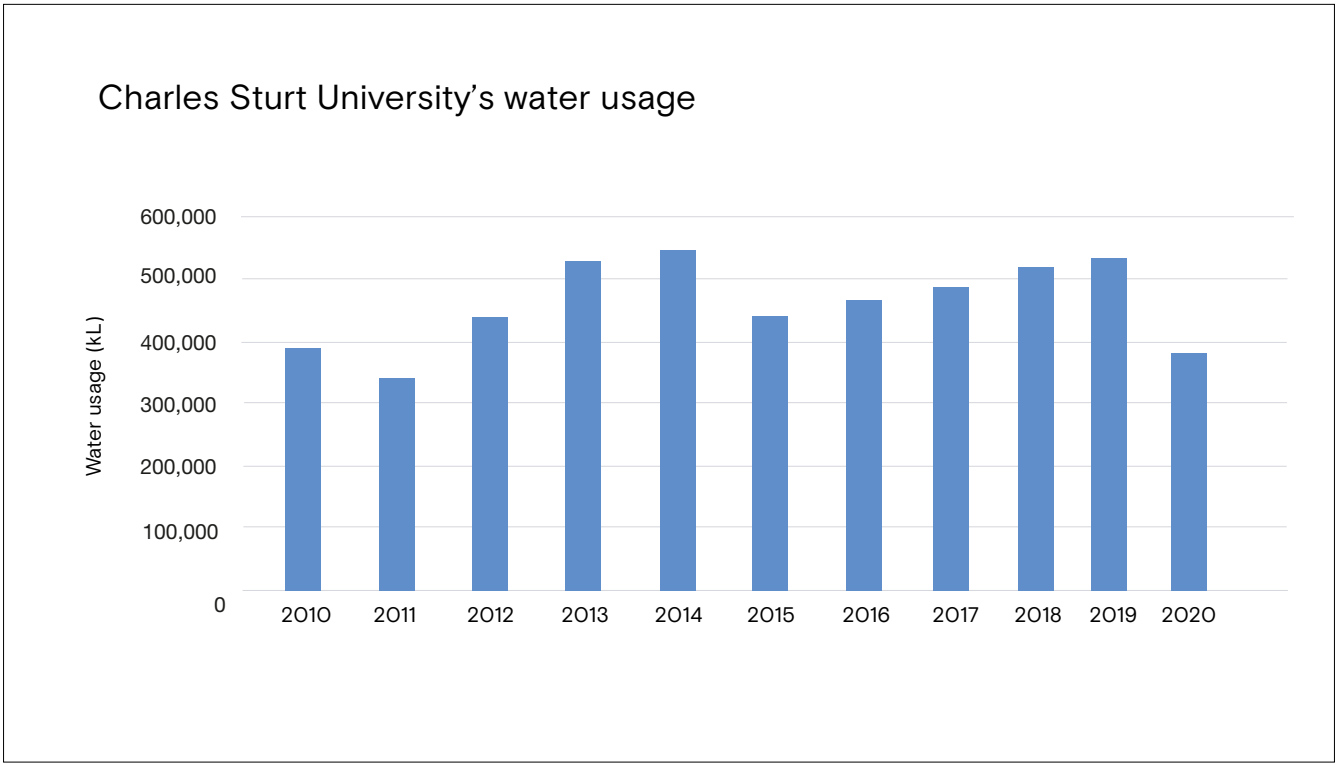


Total Charles Sturt primary energy consumption including grid electricity, solar and natural gas was 158 terajoules in 2020 resulting in a savings of 27 per cent compared to 2019. The mix of savings included a reduction in grid electricity of 20 per cent, an increase in solar consumption of 6 per cent and a reduction in natural gas consumption of 35 per cent. These were largely influenced by reduced activities on campus.

In-house generation of solar electricity was also up 6 per cent to 14 terajoules, equivalent to 9 per cent of our total primary energy consumption. The increased generation was the result of new generating capacity installed in 2019.

Aside from increased solar consumption, purchased energy savings resulted from energy efficiency improvement projects and responses to minimise the cost impacts of the COVID pandemic. As well as the financial benefit of $1.5m resulting from total primary energy cost reduction, the added benefit was a reduction in GHGE equivalent to 6,800 t CO2-e, which was a 22 per cent reduction on this category of emissions compared to 2019.

Water



Overall, Charles Sturt town water consumption in 2020 showed a significant 31 per cent reduction compared to 2019. The university's consumption was 383,663 kL in 2020 resulting, in a 171,402 kL saving. The consumption reductions are also reflected in town water utility costs, with savings of $210k (22 per cent) compared to 2019.

The consumption figures correlate to a consumption of 1.2 kL/m2GFA in 2020 vs 1.7 kL/m2GFA in 2019 and compares to the proposed benchmark of 1.0 kL/m2GFA. In 2020, five of Charles Sturt's six main campuses met the proposed benchmark figure of 1.0 kL/m2GFA.

There is no doubt that the external impacts, including the COVID pandemic (which significantly reduced on-campus activity), as well as the return of La Niña weather (rain) events in 2020 contributed to a significant impact in reducing our town water consumption.

However, in addition to these external impacts, specific internal interventions were undertaken, including:

- a water conservation signage and education campaign rolled-out to all campuses (particularly targeted at our northern campuses of Bathurst, Dubbo and Orange) in 2019
- an audit of town water leaks
- the elimination of town water for farm use
- the minimisation of town water for irrigating turf and grounds, including the installation of irrigation controllers
- specific irrigated turf reduction projects which are expected to have sustained benefits.

The challenge for 2021 will be to maintain the reduced consumption achieved in 2020 and to continue our progress in achieving the 1.0 kL/m2GFA benchmark across the entire organisation.

Water reduction

Several of the regions where our campuses are located experienced severe water shortages and were progressing towards Level 3, 4 or 5 water restrictions, meaning significant limitations to how water can be used, particularly for irrigation purposes. The Division of Facilities Management, including Sustainability at Charles Sturt, is currently developing Water Saving Action Plans for affected campuses, including Bathurst, Dubbo and Orange.

A communication plan is currently being developed to raise awareness among members of the university community about the importance of conserving water.

Encouraging contractors to reuse and recycle waste when renovating

Charles Sturt has always had a requirement that our building contractors record and report on their waste and recycling efforts. We now actively encourage them to reuse and recycle waste from renovations. We've now moved beyond reporting this activity to avoiding, reusing and recycling wherever possible. This is a significant change, because if we have potential contractors that aren't embedding landfill diversion strategies, we can consider alternate providers.

In previous years, surplus furniture was stored in shipping containers where it slowly deteriorated, ending up in landfill. We now divert office furniture from landfill that is surplus to our requirements and still in good condition. When we implement a refurbishment project now, we make decisions about how to reuse and recycle each piece of furniture immediately. We no longer waste money, time and space on storage. Decisions are made with contractors immediately as to which furniture is in the best condition to be offered to external community groups.

We have had success in several large office space refurbishments. We have made donations to community groups and reduced demand for storage space. We disposed of all functional furniture from the Gordon Bevan refurbishment project on the Albury-Wodonga campus. We reused 100 per cent of the furniture items, including 42 desks, more than 40 office chairs, seven meeting tables, 20 under-desk mobile drawer units and other miscellaneous office items.

An example of the lifecycle of our furniture includes a large meeting table originally purchased for The Grange in Bathurst. This was then relocated to the videoconference room in Gordon Bevan Room where it sat for at least ten years. Finally, it's been donated third-hand to a local primary school for use in their staff room.

Community groups who received this furniture expressed excitement and gratitude. Charles Sturt continues to divert as many items from landfill as possible.

Geoff Gibson
Project Officer, Delivery

Biodiversity

Wildlife galleries

The Sustainability at Charles Sturt website has been updated to include campus-specific biodiversity content. The new page features wildlife galleries showcasing the wonderful biodiversity features of our seven main campuses. Scroll through images of our native flora and fauna and endangered ecological communities.

Additional content will be added around each flagship species, following the format for Canberra. We welcome feedback and are continually striving to improve our website as well as mechanisms for raising awareness around biodiversity.

Albury-Wodonga - wetland monitoring

"It is an exciting time at the David Mitchell Wetlands. With the best rains we've experienced in a long time, the wetlands are being visited by some less common species including the nankeen night herron, pelicans, royal and yellow-billed spoonbills. The timing has been perfect for the 'Wetlands time lapse' camera, managed by the Faculty of Science wetlands monitoring project and funded through a Sustainability at Charles Sturt grant.

The camera was deployed in October 2020 and shows the wetting and drying phases of the wetlands as the seasons change. Because of the La Niña weather pattern over the 2020 summer the wetlands are holding more water than usual for late summer. It will be exciting to watch the wetlands to see if any other uncommon species visit.

As part of the wetland monitoring project, we have also installed three 'listening stations' on the Albury-Wodonga campus. Each station is collecting data about a water body in three of the Albury-Wodonga campus biodiversity zones. The equipment collects data on the water temperature and air temperature and records animal calls from the many nocturnal species which visit the campus including squirrel gliders, ringtail possums, lesser long eared and chocolate wattle bats. It also records different tree dwelling and burrowing frog species, including the nationally-threatened Sloane's Froglet".

Matt Gill
Senior Technical Officer


Possum boxes


Wattle tube stock

Albury-Wodonga – squirrel glider habitat project

Squirrel gliders are listed as a 'vulnerable' species in NSW. Thurgoona has a relatively healthy population of these possums living in the patches of remnant woodland, roadsides and environmental plantings across the region. Unfortunately, many of these areas will likely be developed into housing as Albury grows – so the viability of this local population is threatened.

There have been several ad hoc attempts to conserve the local population by putting up nest boxes. However, a recent inventory about the viability of nest boxes showed the majority where either poorly designed or in a state of ruin. This led to the idea that Charles Sturt could play a role in safeguarding the local population of squirrel glider possums by taking a more systematic approach to enhance their habitat.

This sustainability grant aims to create a more resilient squirrel glider population around the Albury campus by:

- establishing corridors (stepping stones) in the gaps between existing remnant vegetation in and around the campus
- enhancing existing remnants of vegetation with random plantings of the local province understory Acacia species that gliders are known to use as a food source
- re-establishing a network of nest boxes specifically designed to be suitable for these gilders.

The project commenced in spring 2020 and involved small teams of dedicated volunteers from DFM, the School of Environmental Sciences, the Thurgoona Community Action Group and James Fallon High School planting more than 200 wattle seedlings (wattle gum is a food resource for gliders) and installing more than 20 new nest boxes.

The second stage of this project will extend this same work to others areas of the campus in winter/spring 2021.

Bathurst – Hawthornden Creek erosion control project

“The erosion control day at the Bathurst campus in September was a success.

We worked alongside Mick Callan (an environmental scientist and Charles Sturt alumnus), who provided valuable information and knowledge to our team which will greatly help us in the future. Although we made a great start, there was still much to do. We started preparations for the next stage of works at a local level, with the support of Mick and Sustainability at Charles Sturt. We finished work on the headcuts and identified further locations to monitor and repair in the future.

The second half of the project was completed in early October with tremendous success. The structures of concern are now stable and will not only prevent further erosion, but will also work to increase the bed height of the creek for years to come.

We used almost 50 per cent recycled and reclaimed materials in this project, reusing plants, rubble and stone from previous building projects carried out on campus (making a considerable financial and environmental saving). This valuable work provided an immediate benefit to our campus assets sustainability-wise, and we have found the project educational and refreshing.

When campus life returns to some normality in the future, I would like to integrate some of these projects into our on-campus events, passing on the knowledge of our eco-systems and vegetation management practices to students and volunteers. Again, a big thanks to Mick Callan for his services and guidance”.

Luke Jackson
DFM Grounds

Orange – ‘Risky Paddock’ project update

On-ground works were completed over an 18-month period in biodiversity zone E ‘Risky Paddock’ on the Charles Sturt Farm at the Orange campus. This project was driven by Dr Cilla Kinross in partnership with the Department of Primary Industries, Orange City Council, Sustainability at Charles Sturt and the Summerhill Creekcare Group.

By August 2020, 1100 natives had been planted:

- in the bank (sedges and reeds)
- in the riparian area beside the bank
- in a broad strip of weed mat to help control the blackberry and hemlock
- in between this in the floodplain with some direct seeding of native grasses.

This work done has created habitat for native fish and aquatic mammals. It has also provided habitat for many native birds that can take advantage of the fruit, flowers and shelter of the riparian ecosystem that is being created.

Port Macquarie – citizen science biodiversity maps

Charles Sturt at Port Macquarie has benefited from the launch of a citizen science-based initiative focused on campus biodiversity. The initiative included the creation of a dedicated Facebook page and physical aerial photographs installed in high-traffic areas of the campus, to provide a way for students and staff to report biodiversity that they have spotted on campus. Not only is the project increasing awareness for the amazing wildlife that can be found on campus, but it also contributes to the data that is collected as part of our Koala Plan of Management commitments.

Follow the activities of the Wildlife Watch Charles Sturt University Port Macquarie Facebook group!

Join us on Facebook:
Charles Sturt University Port Macquarie Facebook group

Wagga Wagga – crash grazing on Trig Hill

Did you notice sheep on Trig Hill on the Wagga Wagga campus in the first week of November?

The Wagga Wagga Biodiversity Management Team decided to reduce the considerable fuel load on the southern hill biodiversity zone after the recent wet season. The site was crash grazed with 1,500 sheep from the Charles Sturt farm, shifted onto this 16 hectare area for an eight-day period. It reduced the fuel load with many exotic weed species, including black oat grass (Avena Fatua) eaten and native species, including spear grass (Austrostipa) and wallaby grasses (Austrodanthonia Caespitose) left to thrive. If left any longer, there was a risk that these native species would also be eaten.

The sheep grazed the lower areas of the hill first, gradually moving up the slopes with minimal disturbance at the summit. They also ringbarked some of the smaller olive trees which are woody weeds, without the need for human intervention or chemical application.

The key learning was that future grazing in this area should last no more than five days.

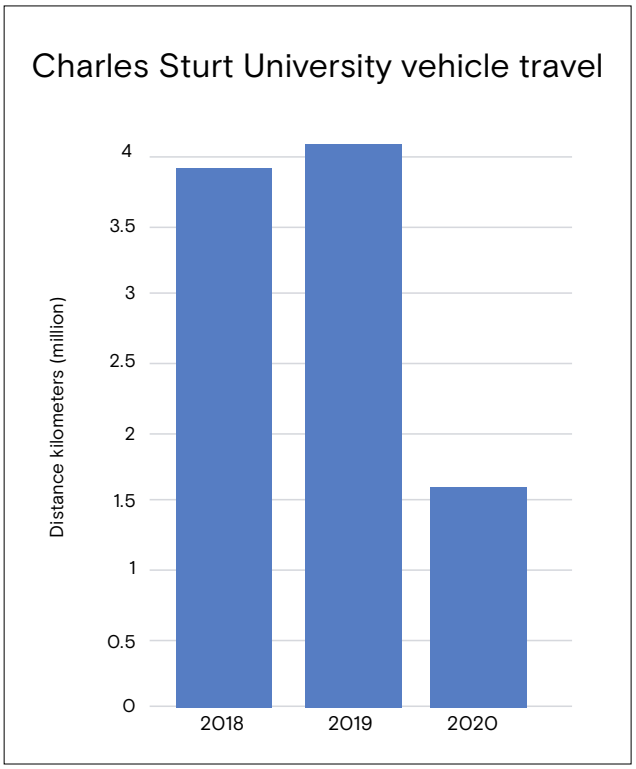
The flock were relocated onto the (northern) Cobb Hill for a five-day period to crash graze this 20-hectare biodiversity zone.

Sustainable transport

Electric vehicle (EV) charging stations

In 2020, twin bay EV charging stations were constructed on the Port Macquarie Campus for charging two vehicles. Prior to the completion of this project, Charles Sturt did not have any EV charging infrastructure installed at any of its campuses, which was a barrier to the adoption of the EV's by Fleet as a key component of a Clean Transportation Plan under the Clean Energy Strategy.

This project allows Charles Sturt to act as a leader in the adoption of EV's throughout regional Australia and prepares the university to meet the evolving needs of staff, students and other campus users as they adopt the vehicles for personal use. A reduction of greenhouse gas emissions is an added advantage with the potential to link power consumption to renewable energy tariffs. Paperless transactions will also support the sustainability aspects of this project.



In 2018, Charles Sturt vehicles were responsible for generating 1232 tonnes of CO2-e emissions. Transitioning to EV's will allow this figure to be reduced to zero in time, through the use of renewably sourced electricity for charging the vehicles.

2020 travel update

As a result of the COVID-19 pandemic and reduced operations and activities, travel was subsequently impacted and reduced. Changes to the way people now work mean that there is potential for reduced business emissions in the future with Zoom being successfully utilised in place of face-to-face meetings.

Sustainable building design

A set of guidelines has been developed to facilitate and promote the implementation of ecological sustainable initiatives into the Charles Sturt's built environment. These guidelines will form part of the university's operational project design standards.

Buildings generally are a major contributor to the world's greenhouse gas emissions and global energy consumption. In Australia, commercial and residential buildings contribute to more than 20 per cent of Australia's total greenhouse gas emissions.

Charles Sturt has a significant and diverse property portfolio across its campuses. The university typically own a building from design and construction, through operation, refurbishment and re-purposing to demolition. Charles Sturt is mindful of the impact of the operating costs of these assets and benefits from the whole-of-life efficiencies of its building stock. It is the design and construct phase which sets the footprint for the operating costs.

We have integrated sustainability into the university's built environment through sustainable building design and construct. This not only demonstrates our corporate social responsibility but it also makes good business sense.

Port Macquarie stage 2A construction

Stage 2 forms the northern wing of a future courtyard development. Its shallow footprint provides good opportunities for passive ventilation, daylight and views. The Stage 2 building form is set back from the road reserve consistent with bush fire protection planning advice and will reduce impacts on the vegetation within the road reserve.

Transparency to future stages is maintained with large open covered spaces that contain the main vertical connections and informal gathering spaces. The building's levels, roof pitches and heights have been conceived to connect with future building stages while reading as a completed building.

The project has utilised the ARUP Sustainable Project Appraisal Routine (SPeAR) throughout design and construction. Sustainable features include:

- 164kW rooftop solar energy system to maximise self-generation
- high-performance building façade, modelled to achieve maximum benefits through shading, glazing and other materials selected
- traffic light control for air conditioning system, designed to provide building users with feedback on when to utilise natural ventilation
- smart metering connected to the university energy management system to monitor utility consumption
- local and sustainably sourced building materials utilised.


LAHEY
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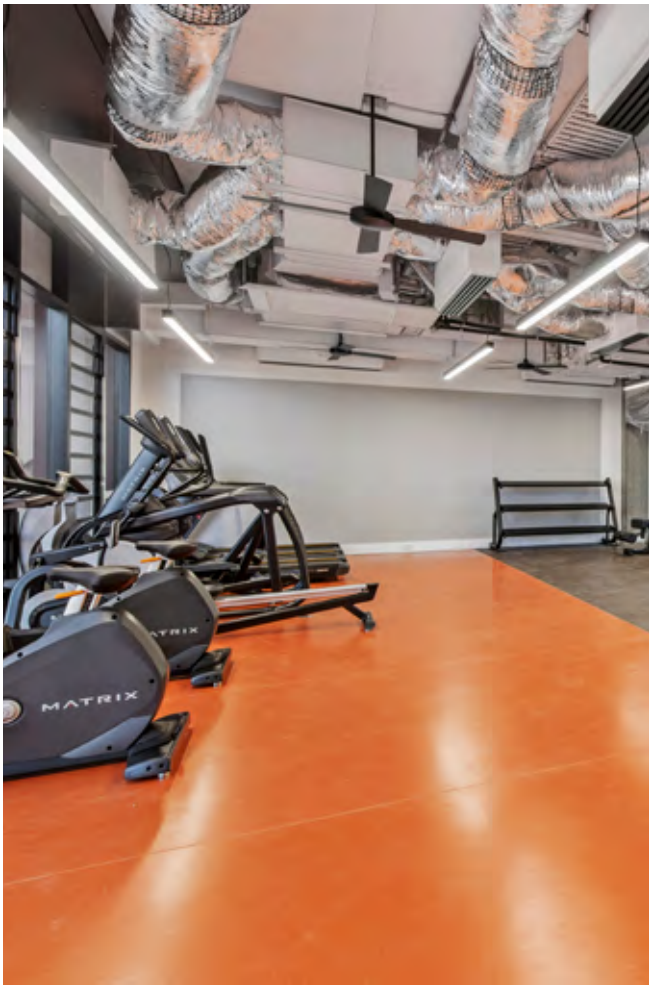
LAHEY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Sustainable ICT

Sustainable information communication technologies (ICT)

The Division of Information Technology (DIT) is committed to Charles Sturt's Learning in Future Environments (LiFE) Sustainability Index. With a keen interest in environmentally conscious procurement and supplier engagement, as well as sustainable information and communications technology (ICT) and energy, DIT have embedded key practices around ICT disposals, power saving measures, and sustainable printing and travel initiatives.

Power saving measures

The Enterprise Space Register Integrations initiative undertaken in 2020 focused on sharing teaching space and usage data stored in the university timetabling system.

Datacentre rationalisation in conjunction with the continued virtualisation of the server environment continues and has resulted in (amongst other efficiencies):

- the decommissioning of several on-sight data centres
- the relocation of communications rooms (with reduced air-conditioning and overall power usage)
- the modernisation of Charles Sturt's workstation and laptop fleet (again with improved power usage efficiencies).

ICT disposals

End of life ICT equipment that still has value is sold through auction houses. Funds generated are reinvested to employ student casuals to continue this practice. Equipment that can't be sold is responsibly disposed of through approved e-waste management facilities. Zero disposed Charles Sturt ICT equipment goes to landfill.

Diverting laptops from landfill

In 2020, the Finance and Welfare Team provided 18 refurbished staff laptops to students in need. The program was made possible by the $1000 Charles Sturt Sustainability Grant and in-kind support from the Computer Shop. The Computer Shop donated staff time to reimage and prepare the laptops. The grant from Charles Sturt Sustainability was used for postage in addition to staff resourcing to prepare the laptops.

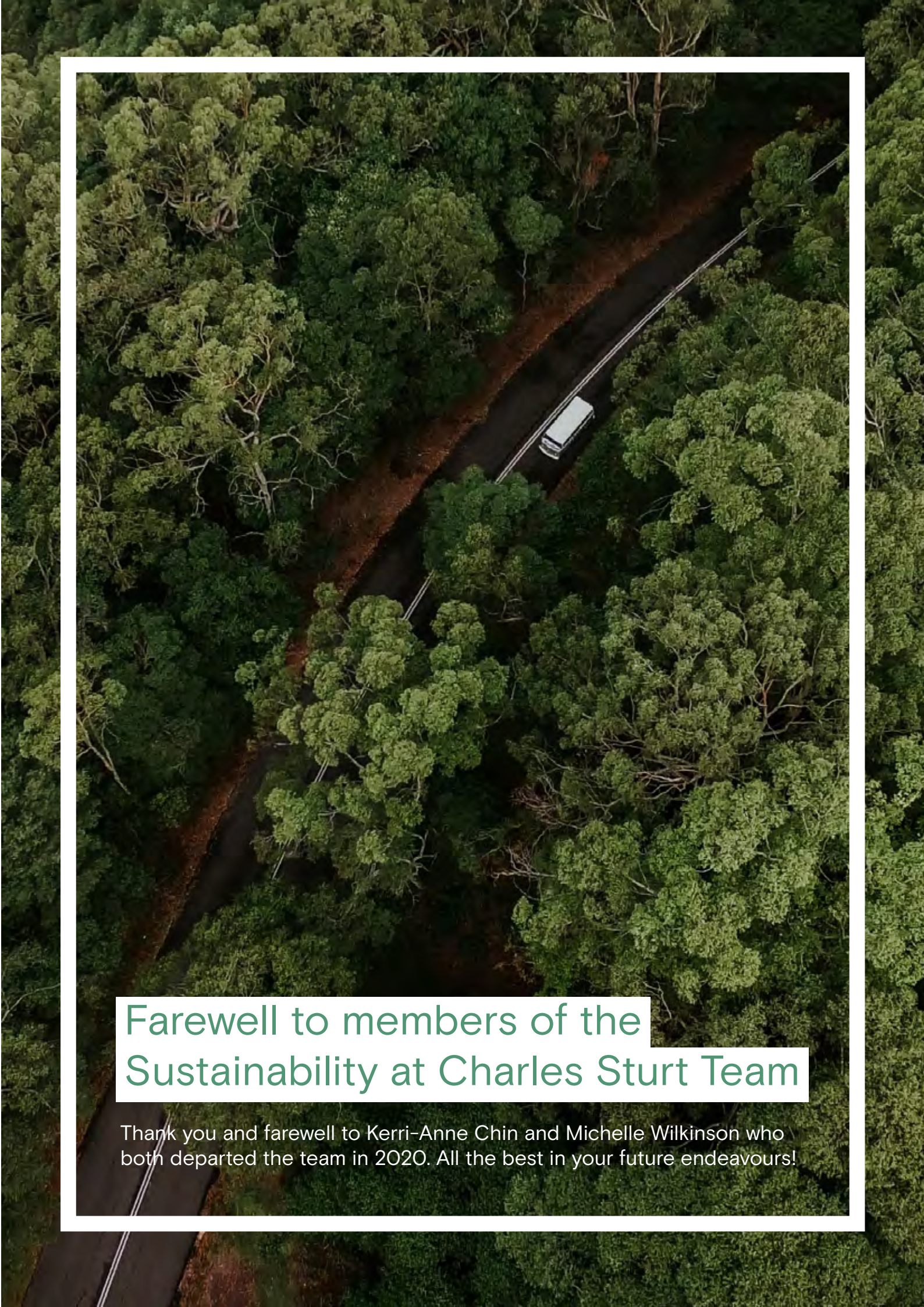
The Finance and Welfare Team collaborated with the Scholarship Team to reach out to students who had been unsuccessful in securing the Technology Equity Grant. Laptops were also offered to students suffering financial hardship who required assistance and had made contact with the Scholarship Team.

The program faced some challenges. As a result of COVID, the program was suspended for a few months while staff were working from home. There were also some challenges around having the laptops ready for when the students needed them, as the availability of laptops was dependent on the end-of-lease arrangements for staff.

Overall, the program was very successful. It assisted with Charles Sturt's commitment to sustainability and made a difference to the student experience and retention.

"Thank you to the staff at Charles Sturt for their help and support in assisting me with a laptop through the laptop equity program. My computer had broken and I was unable to afford a new one so this has been extremely helpful. The laptop is in immaculate condition. Overall this has made my time studying at Charles Sturt less stressful".

Student recipient



Farewell to members of the Sustainability at Charles Sturt Team

Thank you and farewell to Kerri-Anne Chin and Michelle Wilkinson who both departed the team in 2020. All the best in your future endeavours!