Charles Sturt University

2019 Sustainability Scorecard

Winner 2019 Continuous Improvement

Sustainability

Charles Sturt University

Chill out! Sustainability advisor Megan Kaye sitting on a bean bag stuffed with recycled plastics collected from various staff and students on campus.

Connect with us on our social media channels | **csugreen@csu.edu.au** | **facebook.com/csugreen** | **csu.edu.au/csugreen**

This document is published by CSU Green. Division of Facilities Management (DFM) © 2019 Charles Sturt University.
Executive Director (DFM): Stephen Butt Director, Operations: Wayne Millar CSU Green Manager: Ed Maher
CSU Green contributors: Ed Maher, Peter Skewes, Kym Witney-Soanes, Kerri-Anne Chin, Michelle Wilkinson, Therese Moon, Gareth Johnston
Graphic Designer: Kerri-Anne Chin Cover: Celebrating ACTS Continuous Improvement award.
Information in this publication is current as at June 2019. The Commonwealth Register of Institution and Courses for Overseas Students (CRICOS) Provider Number for Charles Sturt University is 00005F.

Contents

Our Commitment To Sustainability

Enduring one of the most horrific Australian summers in living memory has issued a stark reminder about the importance of continued investment and leadership in the areas of sustainability and resilience. The drought, catastrophic bushfires, hail storms, floods and the hottest summer on record are evidence of the need for ongoing climate change adaptation.

Universities have a crucial role to play not only in times of crisis but for the long term, both in minimising our own footprint and in leading our nation's minds to develop solutions for a planet that is warming up.

Charles Sturt University, and other regional universities located in areas that have borne the brunt of recent natural disasters, are equipped with on-the-ground research relevant to climate adaptation and to community resilience. We must continue to build on this research and activate it within our communities.

Sustainability is critical not only in university operations and research; our biggest contribution is through our graduates. Charles Sturt graduates will influence their communities and industries for generations to come. We must ensure we build sustainability and resilience into their education, no matter what discipline they study.

Universities cannot be bystanders, hands-off in the face of the global changes we are already experiencing. We must be hands-on, providing people with skills, ideas and hope to meet the challenges we all face.

It is my pleasure to welcome you to another edition of Charles Sturt University's Sustainability Scorecard. I hope you will find inspiration within these pages and, equally importantly, identify opportunities to provide support in areas where there is still more work to be done.

Professor Andrew Vann
Vice-Chancellor

CSU Green Message

As I write this message, early signs indicate that 2020 will be a year that tests us at a local, national and global level. Extreme drought, an unprecedented fire season and a new global health pandemic are all threats we've recently encountered. This reiterates the importance of looking after ourselves, each other and our planet.

In 2019, Charles Sturt University was buoyed by results achieved in several areas related to our sustainability objectives. At a strategic level, we exceeded our target of a five per cent annual improvement in each of the four priority areas measured by the Learning in Future Environments (LiFE) Sustainability Index.

The outcomes of our 2019 Your Voice staff survey indicated that our initiatives are having a notable impact, achieving strong results in the areas of environmental and social responsibility compared to the sector average. We also saw marked increases in the proportion of staff who reported to be actively engaged in sustainability initiatives compared to 2017 results.

To top off the year, we warmly welcomed our success in taking out the Green Gown Award Australasia for Continuous Improvement – Institutional Change and will now represent Australasia in the International Green Gown Awards.

I extend my thanks to the Charles Sturt community for their ongoing efforts, tenacity and passion for contributing to the spirit of Yindyamarra Winhanganha (the wisdom of respectfully knowing how to live well in a world worth living in).

Ed Maher
CSU Green Manager

2085 trees
planted in 2019

682 meals donated
to oz harvest

174 stakeholder
engagement

$6,717,812
Total cost of energy used

$10,000 of community
sustainability grants

34% of all staff
completed the
sustainability@charles sturt
induction module

62 photo points
over **4** campuses

109 red sustainable
impact awards

6 new interpretive
signs installed on
eco walk bathurst

1732 solar panels
installed in 2019

48% usage of
byo cups

SNAPSHOT OF SUSTAINABILITY IN 2019

Our commitment to Sustainable Development Goals

In September 2019 Charles Sturt University became a signatory to the University Commitment to the United Nation's Sustainable Development Goals. This commitment recognises the important role universities play in progress toward achieving the goals.

"Universities have a responsibility through their teaching to equip the next generation of leaders, innovators and thinkers to understand the global challenges facing the world and the role they can play in rising to meet these challenges.

"Through their research and training of research leaders, universities are at the forefront of finding sustainable social, economic, environmental and technical solutions to global problems.

"It is important for the future of the world that all universities play their part in achieving the Sustainable Development Goals."
Sustainable Development Solutions Network Australia, New Zealand and the Pacific

Charles Sturt's commitment is to:

- support and promote the principles of the Sustainable Development Goals (SDGs)
- undertake research that provides solutions to sustainable development challenges
- provide the educational opportunity for our students to acquire the knowledge and skills needed to promote sustainable development
- contribute to the achievement of the SDGs by ensuring our campuses and major programs are environmentally sustainable and socially inclusive
- report on our activities in support of the Sustainable Development Goals.

Our Learning in Future Environments (LiFE) framework, Carbon Offset portfolio and Sustainability Statement form important aspects of reporting on our progress towards the SDGs as a university. Charles Sturt has already made significant progress towards many of these goals across our university operations.

Overview

What are we trying to achieve in sustainability?

The Charles Sturt University Sustainability Scorecard is an annual publication which provides an overview of the sustainability achievements and challenges of the university.

The purpose of this document is to involve and inform our students, staff and the wider community about the sustainability projects, initiatives and events undertaken across the university in 2019.

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

The case studies and articles provided in the Sustainability Scorecard shine a spotlight on the positive contributions made by university staff and students to improve our performance in sustainability in:

- leadership and governance
- learning, teaching and research
- partnership and engagement
- facilities and operations.

Ed Maher, Kym Witney-Soanes and Michelle Wilkinson at the ACTS conference gala night, being presented with the Continuous Improvement award at the Gala night at Dunedin, New Zealand

SDG alignment

Leadership and governance

Progress towards best practice in LiFE

In 2019 Charles Sturt University exceeded our annual university key performance indicator of an annual five per cent improvement across the Learning in Future Environments (LiFE) four priority areas as shown in the graph below. Learning, Teaching and Research showed the most significant improvement in 2019, followed by Leadership and Governance.

Participation in LiFE workshops increased by 8.75 per cent from 2018 to 2019. Overall Charles Sturt has improved 44 per cent across the LiFE framework ratings since baselines were established in 2016.

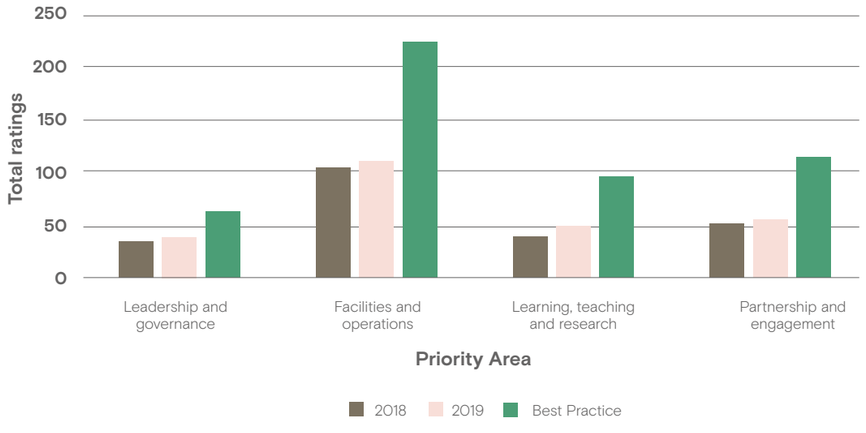
The frameworks that achieved the most improvements in the last year include:

Research
60 per cent increase

Sustainable ICT
29 per cent improvement

Human Capital and Staff Engagement
20 per cent improvement.

Areas for improvement in 2020 include Utilities (Water and Energy); and Sustainable Construction and Renovations.



LiFE Steering Committee

In its second year of existence, the Learning in Future Environments (LiFE) Steering Committee dealt with a diverse range of priority activities. During 2019 these included: endorsement of the university's Sustainability Statement (launched on 12 April 2019); the Sustainable Events Guide Checklist; and the Sustainability Research Guide. Additionally, the committee endorsed the annual LiFE rating update and methodology review with the Vice-Chancellor's Leadership Team (VCLT) for the Leadership framework.

The committee monitored compliance preparations for university procurement under the Modern Slavery Act (2018). Further activities were associated with the Charles Sturt building design; the Clean Energy Strategy 2030; and all committee members completed the ELMO online learning module 'Sustainability @ Charles Sturt', which 34 per cent of all university staff had completed by December 2019.

Presentations to the committee included: 'Living Our Brand' by Lorraine Ryan, which resulted in sustainability being incorporated in all attributes of the university's brand planning; corporate social governance in investments by Paul Dowler; integrating sustainability into community engagement (Carnegie Framework) by Jamin Forbes; and Times Higher Education (THE) world university rankings process by Jason White.

Examples of priority actions implemented included:

- building linkages with the Vice-Chancellor's Leadership Team
- the Manager of CSU Green presenting to the DVC (Research and Engagement) senior management team in June
- Charles Sturt joining the Sustainability Developments Solutions Network
- creation of templates for the university Capability Framework for inclusion in senior managers' performance agreements.

Scott Andrew, Lecturer, School Biomedical Sciences (Presiding Officer, Orange Campus Environment Committee); Paul Dowler, Chief Financial Officer; Michelle Hession, Community Relations Officer; Ed Maher, Manager, CSU Green; Professor Andrew Vann, Vice-Chancellor; Simon Wright, Lecturer, School of Management and Marketing (Presiding Officer, Bathurst Campus Environment Committee).

Members	
Paul Dowler	Chief Financial Officer (Chair)
Stephen Butt	Executive Director, Division of Facilities Management
Shawn Walker	Executive Director, Division of Marketing and Communication
Mark Butz	Futures by Design External Representative Manager
Edward Maher	Manager, CSU Green
Christopher Orchard	Sub Dean, Faculty of Arts and Education
Wayne Millar	Director, Operational Services, Division of Facilities Management
Christine Klimpsch	Finance Officer (Systems), Division of Human Resources
Renee Corlett	Finance Officer (Systems), Division of Finance
Janelle Wheat	Pro Vice-Chancellor (Learning and Teaching)
Michael Friend	Pro Vice-Chancellor (Research and Innovation)
Emily Grellman	Student representative

Right of audience	
Nigel Urwin	Senior Lecturer, School of Biomedical Sciences (Port Macquarie Campus Environmental Committee (CEC) Presiding Officer)
Simon Wright	Lecturer, School of Management and Marketing (Bathurst CEC Presiding Officer)
Scott Andrew	Lecturer, School of Biomedical Sciences (Orange CEC Presiding Officer)
Elizabeth Laidlaw	Research Project Manager, School of Indigenous Australian Studies (Dubbo CEC Presiding Officer)
Matthew Hunt	Course Director, School Environmental Sciences (Albury CEC Presiding Officer)
Collin James	Manager, CAD, Division of Facilities Manager (Wagga Wagga CEC Presiding Officer)
Jamin Forbes	Senior Project Officer, Office of the Deputy Vice-Chancellor (Research and Engagement)
Kym Witney-Soanes	Sustainability Officer, CSU Green
Susan Ryan	Executive Officer, Division of Finance

The launch of Charles Sturt University's Sustainability Statement in April 2019 confirmed our commitment to maintaining a leadership position in sustainability practices in the higher education sector.

Sustainability is a key performance measure for Charles Sturt. Through our long standing commitment to sustainability, we have a strong track record in achieving sustainability outcomes.

"The Sustainability Statement builds a sustainability mindset to inform our decision-making and embed sustainability within the fabric of the university – within our practices, actions and life beyond the university," said Vice-Chancellor, Professor Andrew Vann.

"We have been developing this mindset since 1995, when we commenced building on our greenfield site at Thurgoona near Albury-Wodonga."

The Statement highlights the university's commitment to incorporate sustainability into its actions and practices as part of its responsibility to the community and the environment."We strive to embed sustainability practices in all we do," Professor Vann said.

Inspired by the sustainability practices inherent within Indigenous culture, the Sustainability Statement embeds sustainability within the fabric of the university, and leads by example to encourage students, partners and the wider community to strive to achieve sustainable outcomes.

More than a statement. A call to action

For Charles Sturt University, the Sustainability Statement signals an intent to continue to operate sustainably and is a platform for engaging with students, partners, suppliers and stakeholders to create a sustainable future for the benefit of everyone.

It is more than a statement of commitment. It is a call to action.

CSU Green, our dedicated sustainability business unit, is busy turning our commitment to sustainability into action. Learn more about CSU Green – our achievements and how you can be involved in helping to create a sustainable future for all.

The Sustainability Statement builds a sustainability mindset to inform our decision-making and embed sustainability within the fabric of the university – within our practices, actions and life beyond the university,

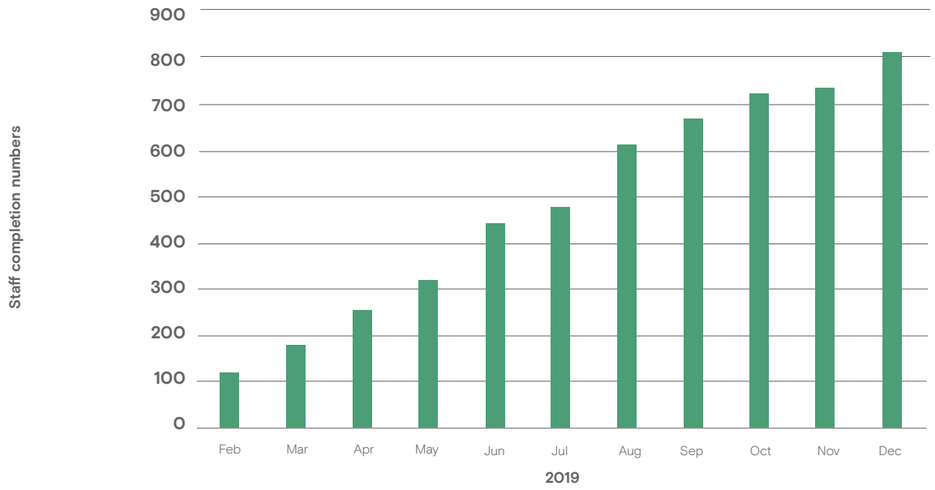
View statement

ELMO learning module
Sustainability @ Charles Sturt University

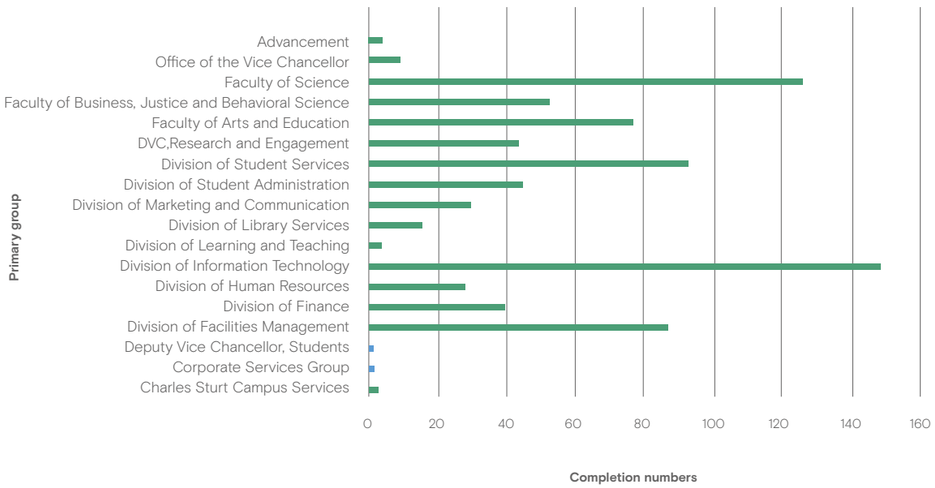
In its first full year of use, uptake of the ELMO learning module 'Sustainability @ Charles Sturt' has been rapid with 34 per cent of all staff completing the training in 2019. This was helped dramatically by the Division of Facilities Management,

Division of Information Technology, Division of Student Administration and the Faculty of Science making the module compulsory training for all existing staff as well as for all new staff joining the university.

Staff completion count for ELMO module
Sustainability@CharlesSturt
Total 810 which is 34%



Total: 810 (19th December 2019)



Your Voice staff survey results

The 2019 Charles Sturt University Your Voice staff survey data released on 15 August 2019 revealed the whole of the university had increased awareness in sustainability since 2015, evidenced by the results of the last three surveys (which are conducted every two years).

"We experienced great improvements in sustainability, more staff are actively engaged in sustainability initiatives," Vice-Chancellor, Professor Andrew Vann highlighted.

Charles Sturt saw increases in all areas of sustainability activity in 2019 compared to 2017. Levels of awareness increased by three per cent; levels of encouragement to participate increased by seven per cent; and active participation increased by 12 per cent.

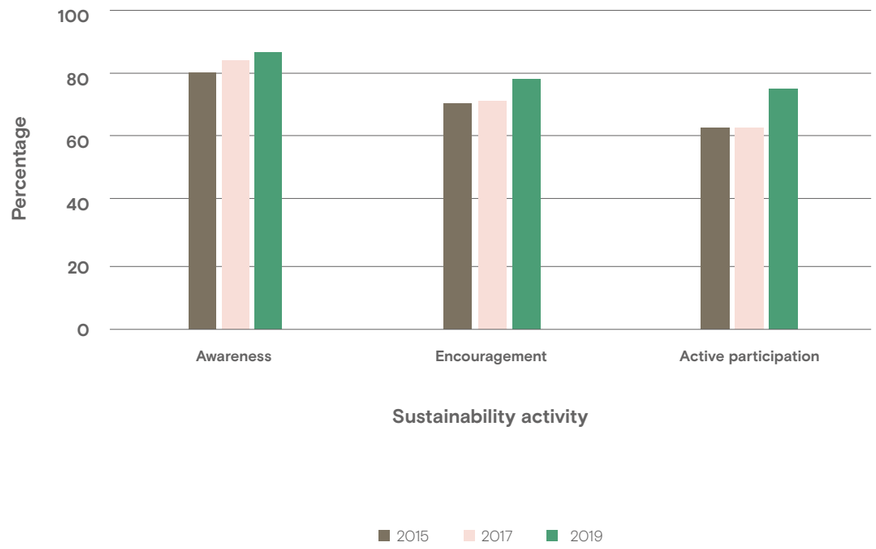
"There have been significant achievements in the university as a result of CSU Green's efforts and visibility. This has lead, and will continue to lead, to behavioural change for employees, students and contractors." (Bathurst staff member)

Sustainability featured in two of the top five highest favourable questions in the Charles Sturt 2019 Your Voice client satisfaction survey:

- 'Charles Sturt is environmentally responsible' **88 per cent**
- 'I am aware of sustainability initiatives being implemented at Charles Sturt' **87 per cent.**

From a broader perspective, 'Charles Sturt is environmentally responsible' increased by two per cent to 88 per cent. This is plus 15 per cent above the average for other Australian and New Zealand tertiary institutions.

Sustainability continual improvement across Charles Sturt University



This graph presents results from the Your Voice staff survey from across our institution

Sector collaboration
Australasian Campuses Towards Sustainability (ACTS) conference

The tenth annual Australasian Campuses Towards Sustainability (ACTS) conference themed 'Expanding our Impact' was hosted by the University of Otago and Otago Polytechnic in Dunedin, New Zealand from 13 to 15 November 2019.

Ed Maher, Kym Witney-Soanes and Michelle Wilkinson represented Charles Sturt University and made the following presentations on behalf of CSU Green:

Presented by Kym Witney-Soanes
'Smoking hot: Biodiversity management at Charles Sturt University'

Presented by Michelle Wilkinson
10 years of sustainability grant programs at Charles Sturt University

Presented by Ed Maher and Kym Witney-Soanes
Learning in Future Environments (LiFE) framework.

Themes and trends emerging from other institutions included large amounts of solar installations (including solar farms); working towards single use / plastic free campuses; increased utilisation of the Sustainable Development Goals (SDGs) to promote and exchange knowledge across universities; and increasing rates of students wanting to engage with sustainability and environmental volunteering.

Kym Witney-Soanes, Michelle Wilkinson and Ed Maher at University of Otago, New Zealand for the ACTS conference.

Winner
Continuous Improvement
2019 Green Gown Awards (Australasia)

The Green Gown Awards (Australasia) are part of the annual Australasian Campuses Towards Sustainability (ACTS) conference and recognise best practice across the tertiary education sector in a number of categories.

In 2019, Charles Sturt was a finalist in two categories: 1) Continuous Improvement, and 2) Learning, Teaching and Skills.

This recognises the significant work undertaken to develop the Sustainable Practices Hub within the Graduate Learning Outcomes so that academics in all our undergraduate courses can access teaching tools that apply sustainable principles to each area of study. The aim of these practices is that every Charles Sturt undergraduate will be able to demonstrate sustainability skills within their course.

Creating a world worth living in – Continuous Improvement

Charles Sturt University adopted the Learning in Future Environments (LiFE) Sustainability Index in 2012 and embedded LiFE as a key performance indicator in the university strategy, setting the path for an ongoing commitment towards best practice across the whole institution.

Headline achievements include: being the first certified carbon neutral tertiary institution; establishing Graduate Learning Outcomes incorporating sustainable practices; framing our Research Narrative around 'creating a world worth living in;' establishing one of Australia's largest rooftop solar energy systems by 2019; and investing $996,000 in sustainability and research grants between 2009 and 2018. Charles Sturt has demonstrated improvement year upon year.

Charles Sturt won the 2019 Green Gown Award for Continuous Improvement, which was awarded at the gala dinner in Larnach Castle, Dunedin. This achievement is recognition across the whole university for ongoing progress across all areas of the LiFE framework. At Charles Sturt, we are embedding sustainability into everything that we do.

The judges commended Charles Sturt University for a fantastic application, which covered significant efforts by the university over many years and addressed sustainability opportunities across widely spread campuses. The award qualifies Charles Sturt as a finalist in the 2020 International Green Gown Awards.

The judges appreciated the emphasis on institutional commitment to sustainability, including the university joining national and international efforts such as the Talloires Declaration, use of the LiFE framework, and commitment to the Sustainable Development Goals (SDGs). The award also recognises significant achievements such as Charles Sturt being one of only two certified carbon neutral institutions in Australia and our efforts to embed sustainability in procurement and engaging suppliers, which will have great flow-on benefits. The societal reach and influence of the university in regional areas was also acknowledged.

Watch video

CSU Green staff accepting the 2019 Green Gown Award for Continuous Improvement (Australasia) on behalf of Charles Sturt University. Pictured from left: Meghan Fay Zahniser (President, Association for the Advancement of Sustainability in Higher Education (AASHE)), Ed Maher (Manager, CSU Green), Stephen Willis (University of Otago), Michelle Wilkinson and Kym Witney-Soanes (CSU Green), and Corey Peterson (ACTS President).

SDG alignment

Learning, teaching and research

Graduate Learning Outcomes

Charles Sturt University is in the process of implementing the university's updated Graduate Learning Outcomes (GLOs), which aim to ensure that by 2024 all undergraduate students will be able to demonstrate sustainable practice applicable to their course and career.

The updates to the GLOs started in late 2017 when Charles Sturt adopted a Graduate Attributes Policy, which committed the university to ensure graduates are able to practice a range fundamental skills that reflect 'Yindyamarra Winhanganha', the Wiradjuri phrase which translates to 'the wisdom of respectfully knowing how to live well in a world worth living in'.

The adoption of the new policy saw Charles Sturt commit to incorporate sustainable practice into all of the university's degrees as well as the university's GLOs, which outline the standards all undergraduate students must meet.

The Academic Lead on the project to integrate sustainability into Charles Sturt's undergraduate courses, Dr Jonathon Howard, said the university has been working closely with a number of other universities and academics to work out ways that sustainable practices can be applied to a range of course disciplines – from Accounting and Psychology to Paramedicine and Wine Science.

"One of the critical things about the changes was making it easy for academics to integrate sustainability into courses and their teaching.

From working with other universities and academics, we now have examples of teaching resources from across the globe – from Australia, the United Kingdom, Europe, and the Americas.

Graduate Learning Outcomes (Continued)

We partnered this information with examples of assessment so that Charles Sturts academics across a range of disciplines will find the change easy to implement.

The need for universities in Australia to integrate sustainability into their teaching of all courses is becoming more important than ever before.
The past year and the start of this year has seen extremes. We have had fire, flood and drought, and the issue of climate change has been front and centre.

The changes we are making to our teaching demonstrate our aim to ensure all Charles Sturt graduates will be able to undertake a range of sustainable practices, such as reduce their waste, grow crops with less water, and better support communities to recover from disasters. Not only will our students graduate with a degree, they will leave our university with a set of skills ready to respond to the wider community's needs and the uncertain future graduates face".

Dr Howard said these changes will not only enhance graduate career paths and further cement Charles Sturt University as the number one Australian university for graduate employment, but will also position Charles Sturt as an industry leader for teaching and learning in the sustainability space.

"Charles Sturt University now has a world class resource that many universities are yet to implement.

When you look across all Australian universities, few get ranked as being world class in sustainability, and if they do it is for research and operations, rather than for teaching. We are showing leadership in this area and our students will reap the benefits of that" Dr Howard said.

Watch video

Academic Dr Johnathon Howard has been a lead in implementing sustainable practices within the GLO's.

Institute of Land Water and Society (ILWS) community of practice Sustainable Development Goals (SDGs)

In October 2019 Charles Sturt University's Institute of Land Water and Society (ILWS) hosted a workshop for researchers and external partners to 'explore framings for transdisciplinary research in complex contexts'.

The ILWS has been working on building a 'community of practice' around the Sustainable Development Goals (SDGs). This has been not only for ILWS researchers but in recognition that the 'wicked' and complex issues facing the globe have a wider context and therefore require a wider community of practice.

The workshop explored five different ways in which transdisciplinary projects could be framed.

1. As systemic co-inquiry (Foster et al., 2019).
2. In terms of the United Nation's 17 Sustainable Development Goals (Nilsson et al., 2016; Stafford-Smith et al., 2017).
3. As a set of co-evolving social-ecological interactions (Schlüter et al., 2012; Mitchell et al., 2016).
4. In terms of supporting, provisioning, regulating and cultural services provided by nature for human benefit (Millennium Ecosystem Assessment, 2003; Gordon et al., 2010).
5. Through a critical institutional interrogation of how sets of rules and resources interact in a particular social situation (Cleaver and de Koning, 2015; Whaley, 2018).

Attendees at the workshop ranged from local water authorities, Landcare services, researchers, CSIRO and overseas practitioners. The overall aim of the workshop was to move beyond a desire for more transdisciplinary research to create a network and place for practical guidance to be facilitated that currently isn't easily available.

Workshop participants sharing ideas as part of the conversation mapping activity.

Two guest experts were brought in for the workshop Professor Ray Ison from the Open University, based in the United Kingdom; and Dr Mark Stafford-Smith, an Honorary Fellow with CSIRO.

Professor Ison is an expert in systems thinking, having worked and taught in that field for over 30 years.

"If you put 'trans' in any word it means transform, over and beyond, so transdisciplinary is over and beyond a disciplinary perspective. It creates something that is emergent or different from just taking a disciplinary perspective.

"We tend to organise our study and knowledge or knowing processes into disciplinary silos which brings a great deal of expertise for certain things. But for the complex, messy, wicked problems that we are confronting now, such as climate change, you need to be able to break out of disciplinary silos, and see things from multi, inter or trans disciplinary perspectives.

"For transdisciplinarity you need a way of orchestrating collaboration across and beyond disciplines to create new understanding which emerges from a new 'system' where the whole is different from the sum of the parts," Dr Ison said.

Dr Mark Stafford-Smith's workshop participants were asked to look at how their work interacted with the SDGs, and means of implementation. This enabled participants to understand how addressing some targets within the SDGs in a positive manner can have a negative impact on other SDG targets.
The aim was for practitioners to expand the planning of their research to further understand unintended consequences.

In June 2021 the sixth International Eco Summit Congress will explore further 'Achieving the Sustainable Development Goals (SDGs) under uncertainty: Connecting sustainability knowledge and action at the local level'.

Murray Cod behaviour

This project aimed to determine if behavioural traits in Murray Cod influenced survival rate of released fingerlings into the wild. An interdisciplinary research team of Associate Professor Raf Freire, Professor Keller Kopf and honours students Ellie Sales and Leia Rogers established experimental conditions to determine if bold and shy traits in the cod could help to address the low rate of survival of juvenile Murray Cod.

Juvenile mortality is the major contributor to the current population decline in Murray Cod. Animals, including fish, naturally adopt behavioural traits that help balance the need to avoid predation, yet acquire food necessary for growth and survival. These critical behavioural traits for survival are usually considered along a 'bold/shy' spectrum. 'Bold' traits allow animals to maximise food acquisition but are high risk, whereas 'shy' traits reduce predation risk but also reduce food acquisition.

The project team discussed their findings:

"In the six year period between 2009 and 2015, 84 million freshwater fish were released into Australian waterways to increase the populations of native fish species, though the impact of such re-stocking is largely unknown.

"Our project at this stage has mainly contributed to knowledge around the topic of the effectiveness of re-stocking rivers with hatchery-reared fish in order to increase the population of native species.

"Our findings clearly show that hatchery-reared Murray Cod behaved very differently to wild Murray Cod. Hatchery-reared fish were more 'bold' than wild fish, as indicated by our tests which showed that they emerged from a shelter more readily and were less careful of bigger fish which were potential predators.
"These behavioural traits are likely to significantly impact the ability of hatchery-reared fish to survive when released. We expect these findings to fuel discussion around the approach taken to enhance wild fish populations in our local waterways."
Headline project achievements
1. Hatchery-reared Murray Cod are bolder than wild fish, which is likely to significantly impact their chances of survival when released.
2. Decision-making in Murray Cod is controlled by mechanisms similar to human emotions, termed affective states in animals, which suggests that behaviour is flexible and can be modified through rearing practices.
3. Comparison of Murray Cod and carp behaviour indicates that the life history of native fish species needs to be carefully considered to determine the best approach to conservation.

The project team further noted:

"As our findings reach fisheries managers, scientists and other stakeholders, we hope to see discussion and changes to hatchery rearing practices to maximise the benefits from fish re-stocking programs.

"We expect to see an impact of our work in due course as we release our findings. We are planning to present at two national conferences and this will provide an opportunity to gauge the perception and impact on stakeholders."

The project team are now working towards publication of these findings in the hope of changes to areas such as:

1. Investment and changes to hatchery practices to maximise the survival of hatchery-reared fish after release.
2. Monitoring of river systems to assess the impact of re-stocking efforts on fish populations.
3. Developing new approaches to enhance the population of fish in our local waterways.

"Our results confirm that hatchery-reared Murray Cod are mostly ill-equipped to survive in wild environments. Our findings show that it is, however, possible to alter behaviour, most likely by modifying the rearing environment to produce fish that are better at surviving after release. In due course, we would hope to see changes in hatchery practices which enhance post-release survival.
"Hatcheries take care to breed from suitable fish, but there is otherwise little evidence that they consider post-release survival in their operations. We hope to change this practice as our work and discussions continue," the project team said.

A wonderful benefit of being able to fund honours projects such as this is that Leia and Ellie have been able to stay with Charles Sturt right from undergraduate degree to starting postgraduate work. Congratulations are also due as this research has just been published in the journal PLOS ONE titled 'Aggressive encounters lead to negative affective state in fish'.

Pictured Leia Rogers who is now a ILWS scholarship student continuing research on native fish behaviours and ecology.

Ellie Sales submitting her thesis on bold shy behaviours in native fish.

Oh deer!

The 'Oh deer: exploring the narratives of human-deer conflict in North Eastern Victoria' project is using media and social media analyses to explore the ways in which deer and deer management in North East Victoria is talked about.

Preliminary themes derived include: problem definition (what is the problem?); impacts of deer; deer distribution; efficiency of control methods; legitimacy of control methods; stakeholder roles; management scope; management philosophy; and benefits of deer.

Specific statements drawn from the media and social media analyses have formed the basis of interviews with a range of stakeholders within the deer management space in North Eastern Victoria. Interviews have drawn on Q-methodology, asking respondents to rank these statements according to those they agree with the most, to those they disagree with the most. Final analyses will reveal the breadth of narratives (or subjectivities) present amongst the deer management stakeholders.

These findings will provide insight for the development of management plans, such as the Victorian Draft Deer Management Strategy, and highlight where different world views converge and diverge. This insight could strengthen the ability of managers to bring diverging stakeholder groups into a collaborative frame.

Jen Bond Lecturer in Human Geography,
School of Environmental Science

Initial project meeting of 'Oh deer' research partners.

Sustainability Research Guidelines

CSU Green in partnership with the university research community have produced the Charles Sturt University Sustainability Research Guidelines as a result of work implemented across 2018 and finalised in 2019.

The objectives of the guidelines are to enable the inclusion of sustainability principles and best practice in all aspects of the university's research operations.

The guide is a key action identified in the Learning in Future Environments (LiFE) Sustainability Index process to progress Charles Sturt towards best practice in the Research framework.

The Sustainable Research Guidelines apply to all university staff, students and agents engaged in any research activity attributable to Charles Sturt. As Charles Sturt increases its alignment with LiFE best practice, the guide will be updated to enable access to valuable resources outlining sustainable practice.

The guidelines are publically accessible to all students, researchers, staff and other tertiary institutions and research institutes via the CSU Green website.

We believe that this is the first time a tertiary institution in Australia has developed such guidelines specifically aimed at reducing the environmental footprint associated with our research activities.

The guidelines focus on research from the perspectives of: efficient study design; setting up and conduct; sustainable information communication technology; resources; field work; optimising outcomes from data collection; and good practice in reporting research.

A new Charles Sturt Green Laboratory Check List is also contained in the guide to improve sustainable behaviours as part of the Green Labs Program to be implemented in 2020.

Research guidelines

Green labs guide

Best practice case study
Faculty of Arts and Education

Learning, teaching and research

Dr Helen Masterman-Smith
School of Humanities and Social Sciences

The following case study highlights an example of best practice towards sustainable research being undertaken at Charles Sturt University.

Dr Masterman-Smith has over 20 years' experience as a sociologist. She teaches and researches a wide range of social issues including: labour struggles and working poverty; social class and other inequalities; political economy and democracy; revolutions; political organisations and social movements; communities; rurality; globalisation; media; health; environmental justice; and human-animal relations.

Dr Masterman-Smith specialises in class analyses of these issues employing Marxist, Weberian, feminist and other critical theoretical frameworks.

Dr Masterman-Smith's tips for conducting research in a sustainable way

Research steps	Examples of good practice
1. Research design	• Physical hub within research community to reduce travel and communication costs of participants/staff • Build sustainability tour of Albury-Wodonga campus into design • Distribute energy efficient products via partners • Transport groups to events by bus rather than individual cars
2. Conducting your research	• Avoid plastic/single use catering equipment – involve participants in washing up crockery etc. Partner with community orgs (e.g. Salvos) to provide re-usable crockery • Re-use resources from previous projects instead of buying new ones – e.g. projectors, iPads • Give left over/unwanted food and other items to community organisations instead of going to waste
3. Avoiding unnecessary data collection	• Use survey monkey (with paper copy on request) • Use Endnote • Use track changing • Work collaboratively with other CSU colleagues/students (e.g. volunteers)
4. Reporting and promoting your results	• Use social media, radio podcasts • Laminate posters and encourage phone photos instead of invitations, to reduce printing and paper
5. General tips	• Collaborate with other organisations to avoid resource duplication and waste

SDG alignment

Partnership and engagement

Charles Sturt Sustainable Events Guide

The Charles Sturt Sustainable Events Guide was launched in 2019 with the aim of being a tool that supports both staff and students to work towards more sustainable options for all events held both at the university and by the university.

The guide was developed through consultation with key stakeholders in event management within the university such as Student Services and ResLife. A key aspect of the guide is the ‘checklist’ that identifies best practice choices for events, detailing waste, water, food, energy and overall sustainability options.

Discussions with different groups across the university has assisted in the formation of an events monthly forum with representatives from across the university contributing to more coordination of events and the opportunity to train staff in understanding how to implement the guide.

View guide

CSU Green sustainability advisors

Story of most significant change
LiFE framework:
Business and industry interface

The CSU farm is adapting to our changing climate.

"The Charles Sturt University farm is a mixed cropping, beef and sheep grazing enterprise which has operated commercially for 22 years. The farm enterprise is adapting to a changing climate by moving from a predominantly annual winter crop program to a livestock system based on perennial pastures that respond to rainfall at any time of the year.

The biggest changes in climate affecting the farm is greater rainfall variability. Our winters are increasingly mild allowing better pasture growth whilst our summers continue to be increasingly extremely hot. The most significant change on the Wagga farm has been the management of stubble and ground cover over summer.

Our cropping program has equal focus during the summer months. We are a lot more conservative with our crop residues and maintain ground cover which insulates the ground against summer heat and conserves soil moisture. We choose pastures with shorter flowering periods to maximise the seeds set. Our annual crop selections have shorter seasonal varieties to maximise the potential to guarantee a harvest. We spend lots of time spraying weeds to maintain valuable soil moisture levels. Retaining stubble has had big influence in our machinery choices too. We've purchased different machinery to cope with the stubble.

Two years ago the focus of our management was dominated by annual crops: planting canola, wheat, barley and a significant area of pulses. There was a heavy reliance on inputs like chemicals, fertilizers and diesel. We had a strong emphasis on our livestock enterprise focusing on gross income, achieving dollars per head sales. Lambs were excessively fed generating large weights at the expense of selling the grain. We adapted our management by shifting paddocks that historically were cropped and sewed to perennial pastures (e.g. phalaris and lucerne). We have minimised the planting of grain legumes and canola.

We retained and replaced more breeding female cattle to increase numbers and bought more ewes. We've adopted more accurate grazing strategies; grazing pastures to promote pasture recovery, rather than overgrazing areas so it recovers quickly when it rains. Paddocks were subdivided for livestock as smaller paddocks make stock easier to manage.

We created more laneways and have planted trees for improved livestock protection and to connect biodiversity corridors.

This year (2019) we harvested everything we sewed. The outcome has been one hundred percent successful which is a first. In previous years there has always been something unharvestable. This year we harvested over 300 tonnes of barley which we stored on farm and we bailed straw with the intent of feeding it to our cows in a controlled manner over summer. We've sprayed next years crop paddocks for weeds to conserve moisture. We've minimised lamb numbers from around 1,000 to 500 and confined them onto a feedlot area of 2.4 hectares compared to 100 hectares. We overgraze one smaller paddock. We take them off the paddocks to minimise opportunities for soil erosion during this dry period. Now, we are more sensitive to getting lambs off the property quicker, minimising our stock numbers.

We wean calves early to maintain body weight and minimise feed requirements. They are confinement fed to maximise their growth off the paddocks without degrading the pastures. This minimises need to purchase feed off farm. I prepare feed budgets and reduce the food provided and get more weight gain in our saleable calves and lambs at the end point. This minimises calf day numbers on the farm dramatically. There have been significant mindset changes in the management of the farm. We sacrifice smaller paddocks to feed stock knowing the rest of farm is protected."

Charles Sturt Farm Manager, James Stephens.

Farm manager James Stephens and student Kirra Molony.

Division of Library Services achieve outstanding improvements in staff engagement in sustainability

The Division of Library Services (DLS) provide high quality information services and resources to support students, staff and all members of the Charles Sturt community. DLS aspire to excellence in the provision of innovative library services delivered online and on-campus.

The Division of Library Services have achieved significant improvements in the way that that their team members engage with sustainability initiatives, as measured through the Your Voice staff survey which is conducted every two years.

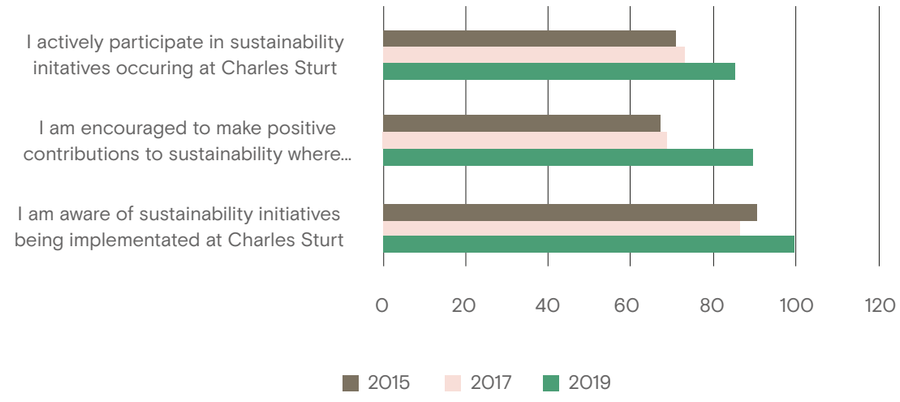
According to results from the 2019 survey, 100 per cent of DLS staff felt that they were aware of sustainability initiatives occurring across Charles Sturt; 90 per cent felt encouraged to make a positive contribution to initiatives relevant to their role; and 86 per cent stated that they were active participants. These results were higher than scores achieved in 2017 and 2015 surveys.

Division of Library Services' Director, Client Services, Helen Hobbs, put the strength of the 2019 results down to three key factors:

"Firstly, our divisional planning process encourages us to look at how we can support the university's strategy as a whole, and this clearly includes sustainability. Secondly, we actively consulted our team members to identify the most relevant opportunities to be progressed. The third factor is that our key sustainability initiatives are deliberately positioned as activities that align with our Division's priorities and will improve the experience of our customers.

"Examples include transitioning to electronic record keeping and continuing to build on the 'one-stop-shop' nature of the learning commons facilities by hosting specialty recycling bins that are easy for staff and students to access".

Division of Library Services' 2019 Your Voice staff survey results



Port Macquarie Sustainability Expo

Port Macquarie's first sustainability showcase was held on 2 and 3 March 2019, organised by the Port Macquarie Sustainability Network (members of this group are university staff and students). Charles Sturt was a major sponsor of the event, CSU Green also provided funding for the event through its project grants.

The aim of the expo was to engage and educate the community about all aspects of sustainability from products and services to local community groups working to protect and enhance the environment.

Gardening Australia's Costa Georgiadis was a crowd favourite – supporting local stallholders, judging a local art competition, and hosting demonstrations and talks. Charles Sturt also hosted a stall showcasing the environmental science and outdoor education courses at Port Macquarie campus.

The event attracted more than 2000 attendees over the weekend and was a successful example of a waste-free event with all waste either being composted or recycled.

CSU Green staff Michelle Wilkinson and Costa Georgiadis at the Port Macquarie Sustainability Expo.

Students visiting the stall site at the Port Macquarie Sustainability Expo.

Sustainability Advisor activities

In 2019, student Sustainability Advisors in each campus residences team again promoted and supported sustainability on their campus. Events ranged from 'unplugged' house dinners, gardening nights, sustainable movie nights, ResCycle barbecues and MoveOut cook ups. Congratulations to a wonderful group of students for leading these activities!

Megan Kaye, Sustainability Advisor for Wagga Wagga at tree planting day.

Georgia Booth hosting the ResCycle dinner in Albury-Wodonga.

Live band performance celebrating Eath Hour.

Energy Challenge and the Sustainability Series

As part of Energy Challenge in July and August, Sustainability Advisors on each campus residence encouraged other students to participate in activities that saved energy, water and waste in their residences, while competing to be the residence that saved the most in their power bills!

Towers in Bathurst, Bangala in Wagga Wagga, and Cottages in Orange were the winners of their respective Energy Challenges, each achieving the most energy saved among the residences on their campus.

Students across the competing campuses shared their top tips for reducing power and being green. These included:

- turning off the heat and dressing up in your winter woollies
- taking advantage of natural heat by opening the curtains to let sunlight into the rooms during the day
- instilling clothes dryer bans
- using the cold wash option on the washing machine
- showering for the duration of one song
- switching off all appliances at the power point to reduce standby power.

This year's Energy Challenge was filmed for a four-episode digital video series titled The Sustainability Series hosted on the CSU Green website.

Wagga Wagga ResLife students cooking as part of the sustainability series.

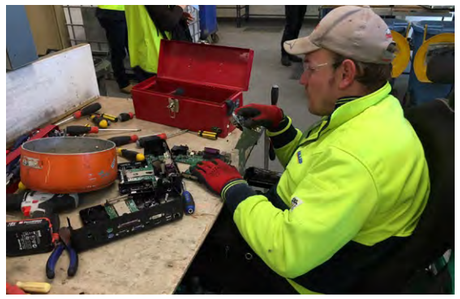
Campus Environment Committee Biodiversity Walk and Talk on World Environment Day

It was a bracing chilly morning at 8am on 5 June 2019 when the Wagga Wagga Campus Environment Committee set out for a Biodiversity Walk and Talk as part of World Environment Day.

A keen group of 24 rugged-up staff, students and community members learnt from the amazing knowledge of Will Pollock and Simon Cole. Cockatoos, rosellas, lemon scented gums, native grasses, turf management, tree burls, drought tolerant landscaping, echidnas and kangaroos were all discussed.

We are so lucky to study and work in such a beautiful environment!

Staff and students on the Biodiversity walk and talk.



Kurrajong waste recycling facility staff at work

Kurrajong Resource Recovery Depot

The Environmental Action Group Ensuring Restoration and Reconciliation (EAGERR) and CSU Green hosted a mix of 15 staff for a two hour tour of the Kurrajong Resource Recovery Depot at Chaston Street, Wagga Wagga on Thursday 15 August 2019. The purpose of the visit was to learn about waste management and see the quantities of materials sorted on a daily basis.

The Kurrajong Resource Recovery Depot provides recycling collection services for local businesses including collections of cardboard, paper, document destruction, mixed container recycling and e-recycling. The depot has been operating for 56 years.

The facility services six Riverina councils; manually and mechanically sorts 17,500 tonnes of recycling materials annually; and sells recycled materials to approximately 10 companies (including Vanden Recycling, Polymer Processors, Greenpipe, Martogg Group, Immix, Visy, and Norske Skog). Examples of products made include egg cartons, new plastic bin lids, road base, sand and landscaping edging.

However, 15 per cent of material delivered to the depot cannot be recycled and it costs the centre $135 per tonne to take this material to landfill.

The group was surprised about the amount of recycling processed at the centre; the amount and cost of contamination; and that Wagga Wagga City Council charges the depot to take the contaminants to landfill. The group felt their expectations were met and would certainly recommend this tour to others.

Top 10 tips to recycle right

1. Only recycle household items from your kitchen, bathroom, laundry or office.
2. No chemical, fuel, oil or poison containers.
3. Kerbside bins take plastics numbered one to six.
4. Containers need to be empty, rinsed and drained.
5. Remove lids and put them in the yellow-lid bin too.
6. Put steel and tin container lids inside the container
7. Build a ball of aluminium foil for recycling.
8. No plastic bags or cling film.
9. No polystyrene boxes, packaging or beans.
10. When in doubt throw into the red lid bin.

The third Sky Stories event was held at Orange on 10 September 2019 at the Girinyalanha Bioscience Park. Sky Stories is a professional learning project initiated by Charles Sturt University that is coordinated and co-funded by Future Moves. It is designed to use astronomy to engage students in science, technology engineering, and mathematics.

An integral element of the project is acknowledging the links between students, the school curriculum, family, community, and their sky stories. This enables new ways of learning, teaching and community engagement around science. The use of social media is pivotal to this process and enables pilot schools to capture, share, collaborate and reflect upon the new ways of science in their own community, between Sky Stories communities, and beyond.

Guest speakers included Trevor Leaman, PhD researcher on the Wiradjuri Cultural Astronomy Project and Director of Dark Skies Downunder. Astronomers who set up their amazing telescopes and chatted with participants included Rod Somerville, Orange Planetarium; Ray Pickard, Bathurst Observatory Research Facility; and Tina Leaman.

Dancers perform at the third Sky Stories event

CSU Green staff Kym Witney-Soanes and Orange Sustainability Advisor Eliza Erratt.

National Bird Week's 'Breakfast with the birds' event

The Australian National University's (ANU) Fenner School of Environment and Society along with the Sustainable Farms Group, the Charles Sturt University farm at Wagga Wagga and CSU Green hosted a free 'Breakfast with the birds' event on 23 October 2019 as part of National Bird Week.

The group met at the Charles Sturt farm office at the end of Agriculture Avenue at 7:30am and walked along a section of remnant vegetation along Hooligan's Creek.

Clare Crane, Research and Extension Officer, Sustainable Farms, ANU spotted by sight and sound key some of our regions' beautiful bird species. These included Rosellas, Tree Martins, Wood Ducks, Superb Fairy Wrens, Lorikeets, Peaceful Doves, White Plumbed Honey Eaters and the vulnerable Superb Parrot.

Clare shared some of the research findings ANU has unearthed over the last 20 years about ways to enhance bird life across agricultural areas.

Participants included academics, community members, school children, local landholders, Wagga Wagga City Council, Local Land Services, Commonwealth Department of Environment, Facilities Management and CSU Green staff.

Participants learnt how to enhance a farm's natural assets, which can also benefit stock, and afterwards enjoyed a BBQ breakfast in the farm sheds.

Participants on site for Breakfast wth the Birds.

Community University Partnership (CUP) grant launch

In 2019 CSU Green supported the Community University Partnership (CUP) grants program for the first time by creating a new 'sustainability' theme. The new CUP grant aims to support the regional areas where Charles Sturt campuses are based by providing small grants to community groups and schools for projects that will contribute to increased environmental outcomes for their participants.

Six projects were awarded funding for sustainability projects in 2019

Birallee Park Neighbourhood House (Wodonga)
Their project teaches community members woodworking and power tool skills and make items from recycled wood.

Bidgee School Wagga Wagga
A recycled PET bottle greenhouse and vegetable garden to feed those in need.

Albury Primary School
Enhancing their pollinators' garden.

Orange Rotary Club
Partnership in their Sustainability Expo.

Walan Wirringah
Community Garden to enhance native drought tolerant plantings and productive gardens.

Greening Bathurst
Support a sustainability and climate lecture series.

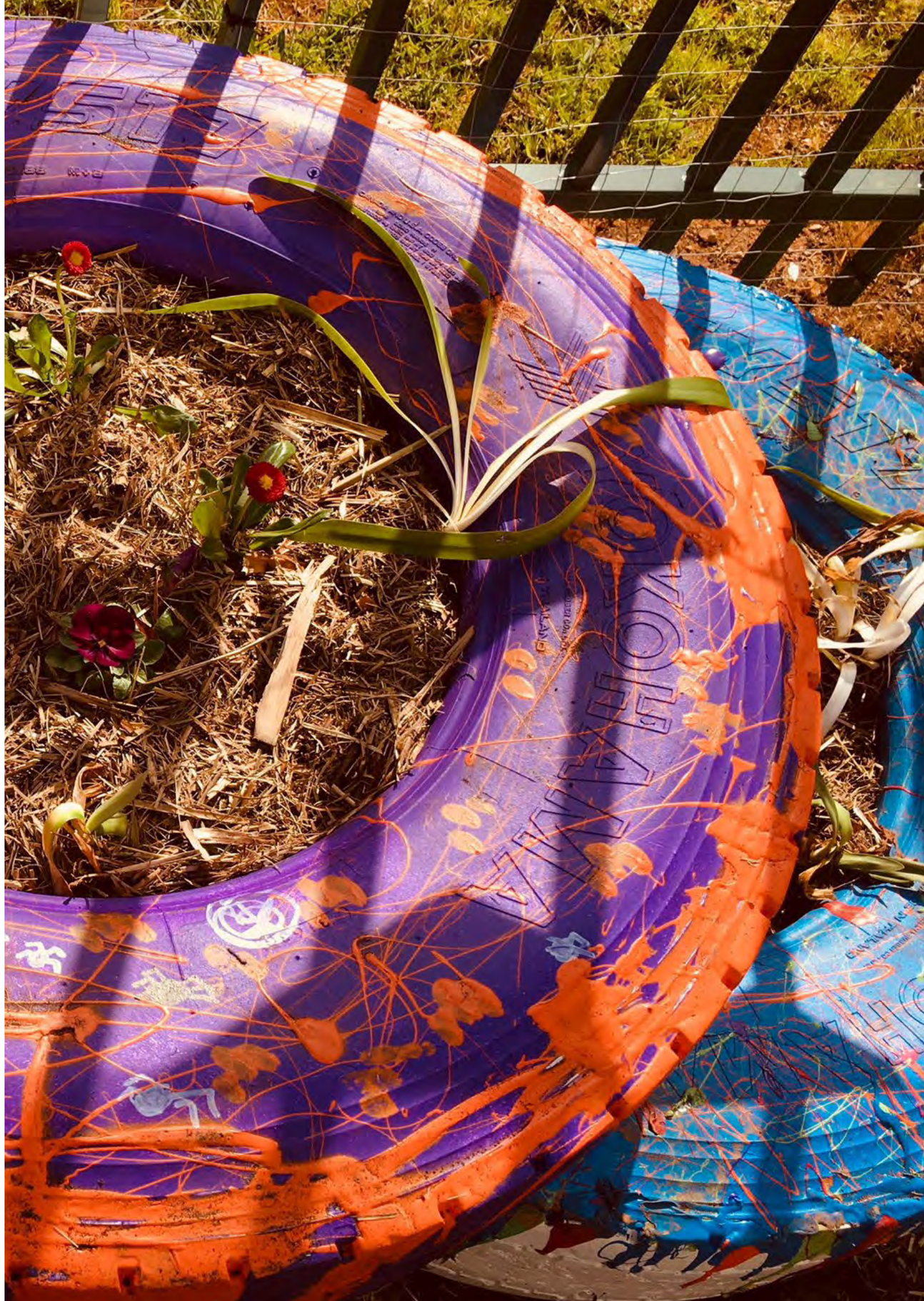
The CUP small grants have been a wonderful community engagement tool and show how groups like these can do so much within their community for a relatively small investment with ongoing benefits.

Grant recipients Bidgee School, Wagga Wagga launched their project to build a greenhouse out of recycled plastic bottles on 16 August 2019. The CUP-funded project saw significant social benefits for the teens involved, including: the building of positive relationships with each other; learning new skills in mathematics and geography classes; public speaking and radio interview experience.

Other key learnings for the students included the importance of team work, the amount of plastic in society, how to use power tools, and the importance of giving back to the community by growing vegetables for the Care-van who produce meals for less fortunate people.

The plastic bottle lids collected in the project were sent to Melbourne to make prosthetic limbs for children. A big congratulations to teacher Trish Warrinton, Will and Jayden, and their school mates.

Bidgee School were a recipient of a community impact grant and constructed a greenhouse garden.



Grants

Each year Charles Sturt University operates a contestable Sustainability Grant program which provides staff and students with access to funding to support valuable projects that will progress the university's sustainability goals. In the last 10 years of sustainability grants, just under $1million has been awarded and excitingly CSU Green participated in the Community University Partnership (Cup) Grants with a sustainability theme for the first time. The following is a summary of the projects that were awarded funding in 2019.

Research Grants

Description	Lead	Funding
Learning sustainable practice through the preparation of pharmaceutical products from mango waste in a Bachelor of Pharmacy Capstone subject	Dr Christopher Parkinson	9046
Gauging stakeholder expectations of the development and management of eco-tourism in a developing country - the case of Cambodia.	Simon Wright	9265
Biodiversity responses to the re-introduction of cultural burns in long unburnt grasslands	Dr Jodi Price	9956
Can Australian native birds recognize the odours of invasive mammalian predators?	Dr Melanie Massaro	6800
Total		**$35,067**

Project Grants

Description	Lead	Funding
TV Studio Lighting - Bathurst	Becky Russell	7641
Composting on Bathurst Campus	Andrew McGrath	10,000
Total		**$17,641**

Grassroot Grants

Project	Campus	Funding
Edible Gardens	Dubbo	1,000
Events, Port Macquarie enviro club	Port Macquarie	850
Veggie Gardens Residences	Port Macquarie	700
Veggie Gardens Residences	Wagga Wagga	450
EgoGlitter for Madi Gras	Wagga Wagga	454
Sustainability in veterinary clinics	Wagga Wagga	1,000
Total		**$4,454**

Community University Partnership (CUP) Grants

Description	Lead	Funding
Rethinking waste - teach the community how to change trash to treasure	Birallee Park Neighbourhood House Inc	2,000
Powering Garden Pollinators	Albury Wodonga Public School P&C	2,000
Climate Change and Sustainability Lecture Series	Greening Bathurst	2,000
Indigenous Community Garden Project	Walan Wirringah Womens Group	1,000
Orange Sustainable Living Expo	Rotary Club Orange	1,000
Recycled bottle greenhouse and vegetable garden	Bidgee School	2,000
Total		**10,000**
Total funded grants in 2019		**$67,162**

Student engagement

Schools strike for climate

Charles Sturt students and staff participated in the two-hour School Strike for Climate together with a record 7.6 million student-led protesters across Australia and the globe on 20 September 2019.

Regional towns connected with Charles Sturt campuses all hosted well-attended strikes and our student Sustainability Advisors attended. This was the biggest climate mobilisation in history involving 185 countries. These strikes began when 15 year old Greta Thunberg spent her school days outside the Swedish Parliament calling for stronger action on global warming in 2018.

Students and the community at the climate change march in Wagga Wagga central business district.

Therese Moon and students Lucy, Kirra and Megan at the climate change march in Wagga Wagga central business district.

Procurement and supplier engagement

Modern Slavery Act (2018)

Charles Sturt University's Division of Finance has established a working group focusing on compliance with the *Modern Slavery Act* (2018). This legislation encompasses slavery, servitude, the worst forms of child labour, forced labour, human trafficking, debt bondage, slavery-like practices, forced marriage and deceptive recruiting for labour or services.

Charles Sturt must demonstrate efforts made to investigate supply chains to minimise opportunities for slavery. Reporting obligations commence in June 2020, documenting activities undertaken since 1 January 2019.

SDG alignment

Facilities and operations

Energy

The record-breaking temperatures of summer 2019 created demand for cooling which was reflected in significant increases in campus electricity use in January and February 2019 to record levels.

Elements of the Clean Energy Strategy will address thermal efficiency of buildings however with temperatures only likely to keep increasing, broader approaches are also being developed including passive measures for the university's least efficient properties.

Solar installation at Orange Campus.

The David Mitchell Wetlands at the Albury-Wodonga campus proivde significant habitat for native species.

The 2030 Clean Energy Strategy was refined during 2019 through the guidance of a steering committee recruited from key staff stakeholders including academics, with some invited external experts. The strategy calls for three phases with six workstreams. Six project reference panels of stakeholders were developed to enable programming and resource allocation across each of the streams, which are:

1. Energy Efficiency (EE)
2. Energy Productivity (EP)
3. Electric Vehicle Implementation (EV)
4. Getting Off Natural Gas (GONG)
5. Further Onsite Renewables / Storage (FOREST)
6. External Power Purchase (EPP).

The focus for phase one of the strategy will be on energy efficiency, energy productivity, and getting off natural gas. From a return on investment (ROI) perspective, energy reduction activities such as efficiency and productivity almost always deliver better returns than new energy generation and storage projects.

Forward price curves for storage and non-solar renewable generation suggest cost, technology and supply improvements in industrial plant and equipment later in the decade will be worth waiting for. Significant capital demand and disruption is possible when replacing all the natural gas systems so an earlier start will support detailed planning and earlier action to allow for the more comprehensive effort required.

Energy efficiency is an activity that applies to improving every aspect of an organisation's energy system, whilst productivity is getting more output from each unit used. Both will continue over the life of any asset. 'Negawatts', or the energy we don't have to use, is an easily understood concept but can be challenging to achieve given both upfront capital investment and ongoing behaviour change are key ingredients.

Achievement of the overarching goal of the Clean Energy Strategy by 2030 will require both emissions reductions through clean energy, overall net energy reductions, and per capita improvements.

Further onsite renewable energy generation (and storage) may be considered depending on the total cost of ownership and the benefits (or otherwise) being assessed.

While there is no 'silver bullet' to energy reduction within an organisation, communication and engagement are critically important functions. The university will be using a proprietary change management model to ensure success and widespread adoption of measures.

Three phases

In order to successfully implement this ambitious plan, the Clean Energy Strategy will be delivered in three more manageable phases that have logically been developed to maximise productivity gains and align with the Campus Futures implementations.

Phase	Timing	Key Deliverables
One	2020 to 2022	Appointment of Project Director, strategy launch, internal communications campaign, energy efficiency, GONG assessment and projects, key energy productivity gains (e.g. space utilisation), external power purchase agreements.
Two	2023 to 2025	EE, EP, EV, getting off natural gas.
Three	2026 to 2030	Energy storage, increase renewable generation.

a) Solar Stage two

Stage two of solar installations continued through 2019 with the completion of 700kW at Orange campus and commencing installation of just under 1300kW on Bathurst campus (completion expected autumn 2020). With the Orange campus installation adding to 448kW at Albury Wodonga and 99kW at Dubbo, the total (including phase one) solar installed and commissioned at the end of 2019 is 3,217kW.

Accordingly, the contributions to energy generated on these campuses increased as the systems came online with November being the highest month of generation across all campuses (as Orange campus was added in October) with over 555 MW generated at all campuses. This represented 15 per cent at Albury Wodonga, 26 per cent at Orange, 20 per cent at Wagga Wagga and four per cent at Dubbo of the energy usage that month.

Solar photovoltaic installation as part of stage 2 in Albury-Wodonga

b) Carbon neutrality

Charles Sturt University has submitted to the Department of the Industry, Science, Energy and Resources to maintain its certified carbon neutrality status under the Australian Government's renamed Climate Active Carbon Neutral program.

As Australia's first certified carbon neutral university, Charles Sturt continued with its emissions reduction focus and the offsetting of the annual Greenhouse Gas (GHG) inventory using certified carbon credits. The university purchases and retires offsets in arrears of the reporting period, once its annual inventory has been established and the total quantity of required offsets is known.
Charles Sturt's GHG Inventory for the 2019 reporting year is 49,824t CO2-e . An equivalent purchase of carbon offsets have been purchased for offsetting Charles Sturt University's carbon emissions for 2019.

Charles Sturt continues to pursue emission reduction measures. In 2019 this included the commissioning of new solar arrays in Albury-Wodonga and Orange campuses, waste diversion from landfill through increased waste segregation and purchases of hybrid electric vehicles to replace fossil fuel vehicles. Looking to 2020 emissions should see a greater increase in reductions with continued waste diversion measures, Stage 2 solar systems being commissioned and building efficiency gains.

Charles Sturt established a series of four principles to help guide decisions associated with the procurement of carbon offsets.

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

In 2019, Charles Sturt selected offsets with co-benefits that address some of the United Nations' Sustainable Development Goals (SDGs). Otherwise known as the Global Goals, these are 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 the university's offsets include SDG 7, SDG 8, SDG 9, SDG 13, and SDG 15.

Carbon Offsets
2019 reporting period

The Rimba Raya Biodiversity Reserve Project

An initiative by InfiniteEARTH, 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.

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 on the full extent of the eastern border of the park.

The North East Arnhem Land Fire Abatement (NEALFA) project

This project uses both aerial prescribed burning (incendiary pellets dropped from helicopters) and ground burning during the early dry season to reduce fuel loads and establish a mosaic of cool burns around and within the project area. The NEALFA project was registered by ALFA (NT) Limited in 2016.

The Yirralka Rangers (hosted by Laynhapuy Homelands Aboriginal Corporation) operate the NEALFA project in north east Arnhem Land within the Laynhapuy Indigenous Protected Area (IPA). The purchase of ALFA generated Australian Carbon Credit Units (ACCUs) supports Aboriginal people in returning to, remaining on and managing their country, the protection of biodiversity, the preservation and transfer of knowledge, the maintenance of Aboriginal languages and the wellbeing of traditional custodians.

The Chakala Wind Farm Project

Situated in the state of Maharasha in India is a 39MW solar farm targeting 77,996MWh of electricity generation per annum with the added goal of contributing to the sustainable development of that region by displacing higher emitting fossil fuel generation, direct and indirect employment opportunities (particularly in a disadvantaged rural area) and a proportion of the revenues annually will be used for community activities (2%).

Another significant benefit to that region is the expected reduction in air pollutants such as Nitrous Oxide and Sulphur Dioxide which are increased by lower quality fossil fuels commonly burnt in developing nations and having identified negative impacts on the health of populations.

CECIC HKE Zhangbei Lvnaobao Wind Power Project

This project is a series of utility scale renewable energy projects delivered in India and China respectively which offer carbon emission reductions compared to conventional energy.

The project promotes sustainable development through:

- reducing greenhouse gas emissions compared to the business-as-usual scenario
- helping to stimulate the growth of the wind power industry in China
- reducing the emission of other pollutants resulting from the power generation industry in China compared to a business-as-usual scenario
- creating local employment opportunities during the construction and operation of the project
- stimulating the development of local tourism industry.

Solar Grouped project by ACME Group supports the development of new grid-connected renewable energy power plants in India using solar energy technologies. It seeks to enable investment in large scale and small scale grid connected plants that export their generated output to the regional/national electricity grid in India.

Azure Power

This project installs new solar power projects across India, totalling 480MW at sites where no renewable generation has been installed prior and supplied into the grid. India's grid electricity generation is currently majority coal fired. Most sites are 30-50MW each, matching current grid capacities for those areas.

The project contributes to sustainable develop through employment generation and enhanced capacity of skilled workforce in the solar industry. The greatest benefits to communities are the supply of renewable energy and reduced pollution from the use of fossil fuels. Success of large scale projects such as this across India are also viewed by other investors favourably, further encouraging confidence in the business models and technology.

The long term operations of solar power plants lead to significant reductions in greenhouse gas emissions over the life of these projects.

a) Monitoring and student engagement

CSU Green employs three students casually to undertake photo point monitoring in the university's biodiversity zones. There are 13 points monitored by Trevor Osbourne at Albury-Wodonga, 32 monitored by Kirra Molony at Wagga Wagga, and eight points at Bathurst monitored by Mick Callan.

Mick produced a report in November describing species richness. He compared survey data from autumn with spring. The total species richness of 49 species (down from 52) was recorded across three survey areas, with each site having a species richness of Hawthornden Creek 46 species (up from 44); Village Creek 18 species (down from 22); and the Charles Sturt dam 19 species (down from 20).

An example of the images of vegetation change along Hawthornden Creek at Bathurst are shown below.

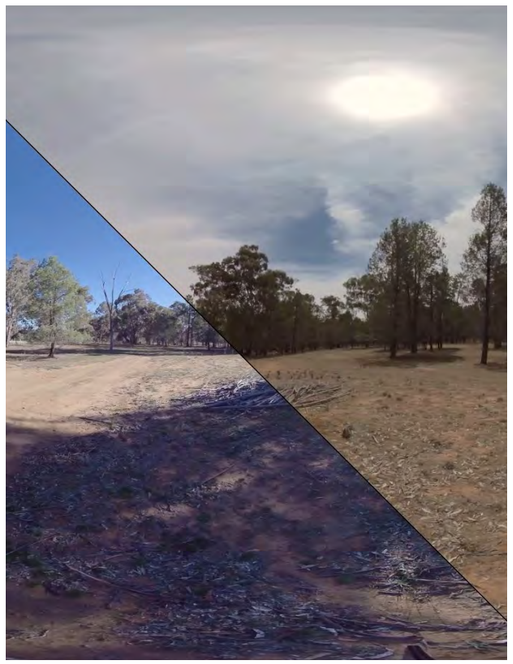
b) 360 degree immersive monitoring project

This Sustainability Grant funded project is led by academic Andrew Hagan from the School of Communications and Creative Industries at Wagga Wagga. Three sites have been selected at the top, middle and bottom of the catchment to highlight local changes in vegetation due to seasonal variability due to climate change. Vision will provide monitoring evidence over time.

An example of footage produced include short 30-second 360 degree videos demonstrating the dramatic perceptual changes caused by only slight differences in weather conditions with only two recording sessions filmed on an Insta 360 pro two (below).

Other examples of outputs include three dimensional mesh reconstructed from the point cloud data. This demonstrates the ability to visualise outdoor environments and the ability to walk through them using real-time game engine technology. Another output is creating heat maps by overlaying panoramic images with thermal images.

Example images taken from a biodiversity photo point at Charles Sturt in Bathurst.



Left: June 2019 and **Right:** October 2019 in farm biodiversity zone C, the cross country paddock at Wagga Wagga.

c) Improved biodiversity at St Marks Grassland, Canberra 18 months post-burn

By Margaret Ning, Friends of Grasslands.
In hosting Friends of Grasslands (FOG) members visiting from Victoria, a group of 15 people visited a couple of local sites in Canberra on 12 October 2019 including the grassland at St Marks in Barton.
We already knew there was more of a floristic show at St Marks and it was looking quite outstanding. We counted 23 flowering native species, including grasses and sedges, but the overall scene was of flowering vegetation. This included masses of Creamy Candles *(Stackhousia monogyna)* (pictured), and respectable displays of Scaly Buttons *(Leptorhynchos squamatus)*, Cut-leaved Goodenia (*Goodenia pinnatifida)*, Common Billy Buttons *(Craspedia variabilis)*, and Common Everlasting *(Chrysocephalum apiculatum)*.

Signs of earlier flowering included Early Nancy *Wurmbea dioica* and Bears Ear *Cymbonotus sp.*, and obviously soon to flower were Button Wrinklewort (*Rutidosis leptorhynchoides)* and Lemon Beauty Heads (*Calocephalus citreus)*. Assuming we get some rain soon, the Chocolate Lily (*Arthropodium sp.*) should look glorious at the site. St Marks was burnt in a patchwork mosaic on 28 April 2018.

The resulting important inter-tussock spaces are still evident. The group observed large patches of the St John's Wort weed and a proliferation of 'woody weeds' requiring serious cutting and daubing efforts. These included garden escapees and Pinus radiata (these issues will be addressed by Charles Sturt University in 2020).

On a final note, when botanist Sarah Sharp undertook the annual spring monitoring on the grassland on 20 November 2019, she reported a count of 78 Button Wrinklewort plants (flagship species for the Canberra campus). This is an increase of 40 plants from 2018! This is great news indeed for this endangered species.

Creamy Candles blooming in spring at the St Mark's remnant grassland in Barton, Canberra.
Photo courtesy of Margaret Ning, Friends of Grasslands.

Sustainable ICT

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

ICT disposals

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

Power saving measures

• Twenty-five per cent energy saving in desktop and laptop products since 2009 by using energy star compliant products.
• Virtualisation of the server environment has delivered a reduction in power requirements for the data centres.
• Computer power saving policies are in place across the university.
• More Power over Ethernet (POE) type devices including network switches, VoIP phones and personal wireless access points.
• Manufacturers' environmental statements are critical informing IT equipment suppliers.
• Our data centre co-location strategy leverages the centralised heating and cooling services of a third party vendor.

Printing and travel

• Empty printing cartridges are collected and recycled.
• Default duplex printing has been on all desktop and laptop printers since 2014.
• Significant reduction in paper consumption across the university.
• Video and audio conferencing facilitates daily cross campus communication and dramatically reduce the need for travel.

Resource efficiency and waste

One of the inevitable outcomes of undertaking teaching and research activities in the areas of animal and veterinary sciences is the production of significant volumes of organic waste. Traditionally this material has been managed through regular services to a landfill waste facility.

The majority of organic waste produced from Charles Sturt's School of Animal and Veterinary Sciences is now diverted from landfill and instead is being composted with the commissioning in 2019 of a BioBin commercial organic waste system and associated processing service with Wagga Wagga based organic waste processor, Carbon Mate.

In 2019, the system resulted in the diversion of 33.8 tonnes of organic waste from landfill which will also contribute to greenhouse gas emissions savings of approximately 38.9 tonnes CO2-e.

e-Waste collected at the Kurrajong Recycling facility in Wagga Wagga.

Sustainable construction and renovation

Charles Sturt University has been provided with funding to the value of $22 million to develop a new rural Medical School in Orange in partnership with Western Sydney University. The initial cohort of 37 students are programmed commence in 2021.

Vice-Chancellor, Professor Andrew Vann notes that Charles Sturt is at the forefront of rural and regional medical training, and will be creating qualified doctors who will understand the particular health needs of regional communities.

In accordance with Charles Sturt University's Clean Energy Strategy 2030, the project has been designed and is being constructed to meet the following requirements:

• all services to be electric-sourced and no natural gas supply to be provided to the facility
• facility to meet or exceed national best-practice standards in energy efficiency
• provision to be made to maximise the self-generation capacity of the facility.

Artist impression of the Rural Medical School in Orange in partnership with Western Sydney University.

Story of most significant change
LiFE framework:
Resource efficiency and waste

Green waste diverted from landfill due to the Worm Hotels at Wagga Wagga.

“Attitude changes that have occurred as a result of the Worm Hotel project include a greater consciousness of the need to compost waste instead of organic waste going to landfill. Staff ask about what other waste streams can be diverted from landfill, which demonstrates behavioural change and increased social responsibility. The impact is spreading beyond the selected tea rooms. The project made it easier for people to implement the local council’s recently introduced food organics and garden organics (FOGO) system at home, because they were familiar with it at work. An instruction booklet was produced accessible on the CSU Green website, as well as QR codes located on the top of the Worm Hotel bins.

However, the most significant change has been the amount of green waste generated diverted from landfill due to the Worm Hotels. In two years the majority of the organic waste generated by four tea rooms has been diverted from landfill. Compostable food packaging have provided another source of organic matter for the worms since they were introduced at campus catering outlets.
Before this project started, all food waste from the four tea rooms went to landfill. This was a minimum of a seven litre bag of food scraps per week for each tea room, totalling approximately 1,400 litres of organic waste per year. Using compostable bags in the tea room waste caddies makes it easier to clean, but more importantly, the bags create a microclimate in which the worms breed much faster. Interestingly, the hotels have never filled as the organic matter is broken down so quickly!

In October 2017, six Worm Hotels (in-ground composting systems for organic matter) were installed and two were activated immediately. In the student accommodation one flooded due to its location and another was buried in a misguided location. We had challenges engaging with the student cohort to get the collection process underway, so another two remain inactive. Having only two active Worm Hotels initially in staff areas provided the opportunity to identify any issues with the process.

The hotels are easy to set up and monitor, and have proved to be virtually maintenance-free once established. The two remaining were successful located outside buildings 286 (School of Agriculture and Wine Sciences) and 289 (National Life Sciences Hub).

During this time the NaLSH Worm Hotel was contaminated with high levels of citrus due to confusion amongst staff and research students as citrus can be added to FOGO bins, but not to the Worm Hotels. All the worms died. Once this was identified, a successful ‘worm transplant’ was done from the SAWS hotel. This was done again some time later, providing worms for a new hotel at building 440 (Division of Facilities Management) in October 2019, a saving of $100 for each hotel as we didn’t need to purchase more worms.

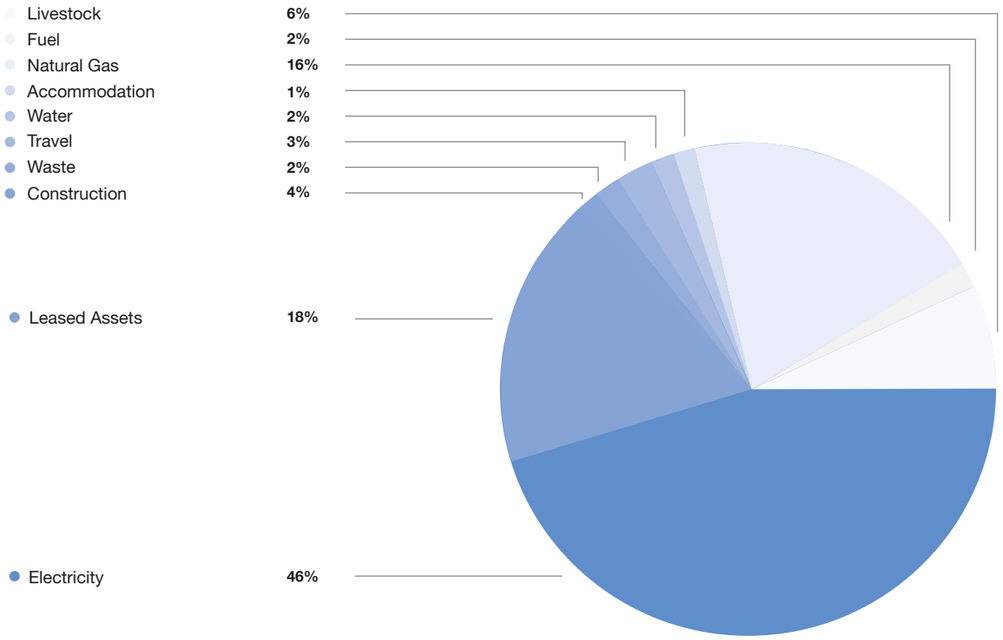
Now in November 2019, the Worm Hotels have been functional for over two years. We’ve started a collection system for compostable corn starch packaging peanuts (a substitute for polystyrene) from the labs and have installed additional in-ground composting bins based on the same design (minus the worms). This system is composting most of the green waste (plant material, dirty newspaper, paper towel and small amounts of soil) from laboratory classes in the Sutherland Laboratories. We’ve also purchased two 400 litre above-ground composting bins, located outside building 268, to cope with the volume of organic waste from the labs. Attitudes and behaviours around composting organic waste have definitely progressed beyond the three worm hotels.

Attitudes are very positive. The cleaner at the Sutherland labs reports that the amount of waste collected has decreased significantly, which also reduces the number of garbage bags required. Next year we will incorporate the fruit, vegetables and plant material from botany classes. The other bonus is that there are lots of slaters in the worm-free compost bins which will used for teaching and learning lab sessions.”

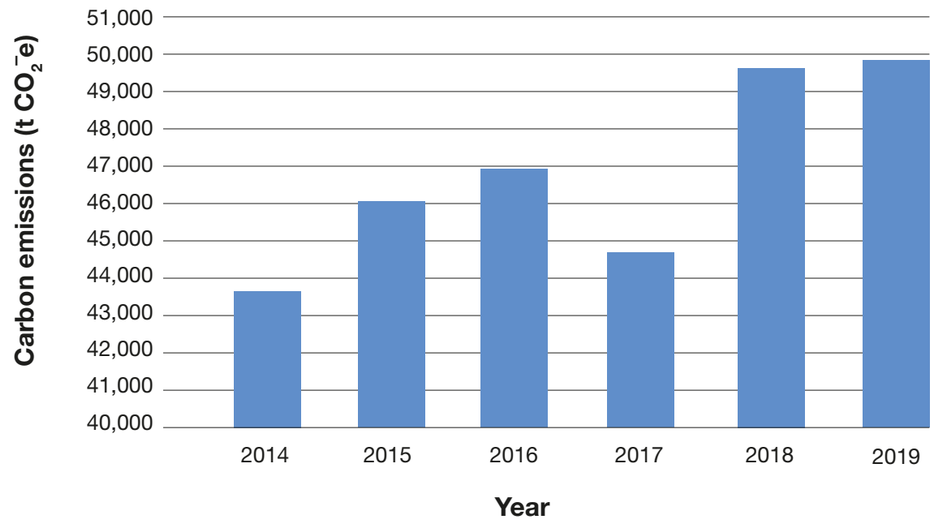
Therese Moon, Faculty of Science Technical Officer, 25th November, 2019

Above: Worm Hotel at Facilities Management building 440 in Wagga Wagga campus.
Middle: Worms inside a hotel at SAWs
Left: Worm cake to celebrate the launch of the worm hotels.

Charles Sturt University's carbon footprint-breakdown by source



Charles Sturt University's total carbon footprint



Notes on 2019 carbon footprint

Charles Sturt University's carbon footprint reported a slight but immaterial (0.2%) increase compared to that in 2018.
The result was the accumulation of marginal changes across a mix of activities including:

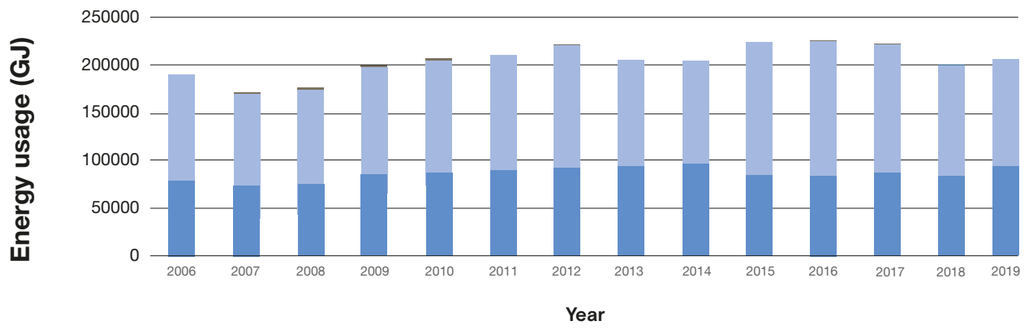
- Increase in Construction
- Reduction in Travel
- Reduction in Leased Assets
- Increase in Electricity

Carbon emissions

As in previous years Charles Sturts carbon emissions are dominated by energy usage including Electricity (46%), Leased Assets (18%) and Natural Gas (16%) which are the three largest emission sources. At a lower level of scale these emission sources are followed by emissions from Livestock (6%) and Construction (4%). Charles Sturt continues to invest in significant Solar Array capacity to reduce Electricity emissions

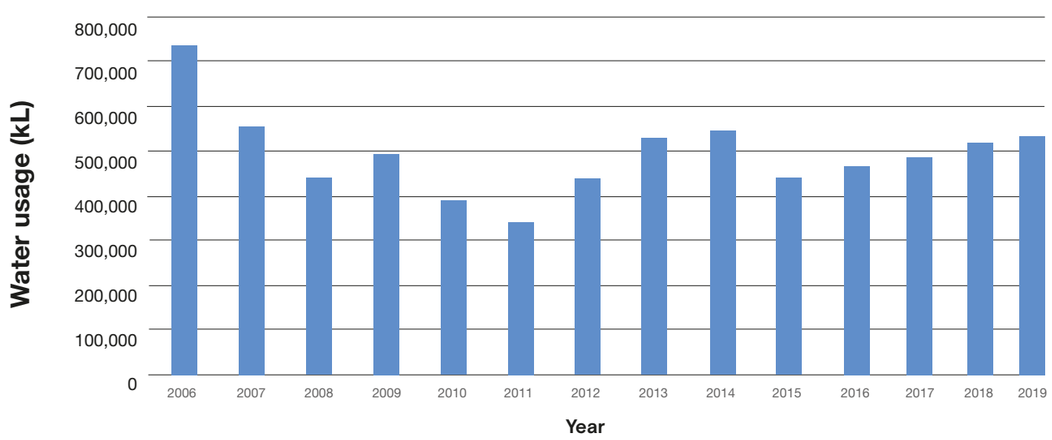
Utilities

Charles Sturt University's energy usage



There was a marginal increase in energy over 2018 which in part reflected an increased energy consumption from our Port Macquarie Campus as it expanded and students occupied new residential accommodations on the Campus. With student numbers in decline across some of the other campuses this has also led to a disproportionate use of energy per Student which emphasises the continuing importance of the focus on building efficiency interventions.

Charles Sturt University's water usage



Charles Sturt water consumption is materially the same as 2018. This continued against a backdrop of sustained and record breaking drought across the majority of campuses and was the focus of attention in Qtr 4 2019. Late intervention actions in 2019 in reducing potable water consumption are expected to make a substantial improvement in water consumption across the 2020 year. The use of potable water for agricultural and horticultural purposes will be a focus of 2020.

A water saving initiative on the shower head in the Charles Sturt University motel, Centre for Professional Development, Bathurst.

Yindiyamarra Hill, Wagga Wagga
after the cool ecological burn.


NO SMOKING