

Living Laboratory Publication

Showcasing sustainability in
Australia's Group of Eight Universities

Resilient Socially just
Economically viable **Campus**
Living Laboratory
Ethical **Teaching Research**
Durability Ecologically sound
Future proofing Liveable
Conservation



Introduction

Australia's leading Universities are linking teaching and research activities to operational sustainability; transforming campuses and improving the learning experience of students.

Universities by nature host some of the world's best minds. Working with talented academics, researchers and students to deliver sustainable solutions for the campus environment builds capacity and gives new meaning and purpose to existing facilities.

This publication has been compiled to showcase examples of the living laboratory model in action across GO8 University campuses. Project examples include campus biodiversity and water quality research, renewable energy test sites, promotion of ethical purchasing, energy management, and auditing buildings for environmental performance and indoor quality.

This publication will be updated bi-annually to showcase further living laboratory examples from GO8 Universities.

Project Classification



Place: Reflects a commitment to campus and surrounding community



Sustainability: Strives to implement lasting change to make a given place more resource-efficient, equitable and ecologically balanced, acknowledging a resource-finite world



Real-world learning: Links knowledge to action with problem-based, results-oriented learning opportunities



Fit: Supports the campus' sustainability vision, advancing campus and neighbourhood priorities



Adaptive: Takes an open-ended approach where ongoing assessment, capturing and reporting contributes to the collective knowledge base and improves future projects



Collaborative Action: Fosters deep engagement with community members that leads to on-the-ground project implementation



Evaluation and continuous improvement: Mechanisms are established to monitor progress and evaluate impact over time

Contents

ANU	Grass Woodland	2
	Sullivan's Creek	4
Melbourne	Burnley Green Roofs Project	6
	A Fairer University	8
	Shallow Geothermal demonstration site	10
Monash	Sustainable Events at Monash	12
	Monash Clean Energy Plan	14
	Diverting kitchen food waste from landfill	16
UWA	Building Sustainability Performance Audit	18
	Sustainable Development Awards	20
Adelaide	Edible Garden	22
	Campus Building Retrogreening	24
Sydney	Garden-based nutrition-education program	26
	Advanced Utilities Monitoring System	28
UQ	Gatton Environmental Park	30
	UQ Solar	32
	Sustainability Walk	34
UNSW	UNSW Sustainability Report	36
	Recycling of UNSW e-waste	38

**Project Name**

Campus as Classroom:
Old Canberra House remnant
grassy woodlands

**Institution:**

The Australian
National University

**Completion Date:**

2020

**Key Stakeholders:**

- Facilities and Services
- Fenner School of
Environment and Society
- General ANU staff
and students



Grassy Woodland

Project Summary

The Old Canberra House remnant grassy woodlands meets the threshold for listing as a threatened ecological community, *White Box – Yellow Box – Blakely's Red Gum and Derived Native Grassland*, under the *Environment Protection and Biodiversity Conservation Act 1999*. The grasslands also form part of the Acton Conservation Area which is listed under the Commonwealth Heritage List.

Five remnant grassland patches are located at Old Canberra House, ANU. It is the most ecologically significant area on campus, with more than 100 species recorded, including listed species. This significance is increased given its semi-urban context.

A key strategy under the ANU Environmental Management Plan and draft Biodiversity Management Plan is to restore the grasslands and reconnect the patches. This has been carried out through the following initiatives:

Dedicated grounds staff to manage, with a specific program of weed control through spraying and mowing, and planting native species in key locations;

Volunteer working parties;

Community engagement activities including guided tours and installing of interpretative signage.

Of particular note is the use of the area as an outdoor classroom to demonstrate sustainability management and practices. The Fenner School actively uses it for their coursework projects, ranging from tree measurements to ecosystem rehabilitation.

Leadership

Social Outcomes

- Direct use of area as outdoor classroom in teaching fieldwork skills and monitoring
- Highly popular location for lunchtime walks and occasional events including marriage ceremonies

Environmental Outcomes

- Threatened ecological community protected and actively rehabilitated
- Size of ecological community increased and remnant patches gradually reconnected
- Demonstration of active management and trial-and-error testing for rehabilitation techniques

Cultural Outcomes

- Community engagement initiatives promote awareness of the significance of the area and provide support for conservation
- Demonstration of University commitment to ecological conservation and best practice management
- Build links with local Indigenous groups

Economic Outcomes

- Provide convenient location on campus for demonstrating sustainability management and practices

Links to Teaching

The area is actively used as an outdoor classroom to demonstrate sustainability management and practices. The Fenner School uses it for their coursework projects, ranging from tree measurements to ecosystem rehabilitation.



Links to Research

The area has been the subject of several research theses by students, with a focus on measuring the success of rehabilitation and species distribution.

Partnerships

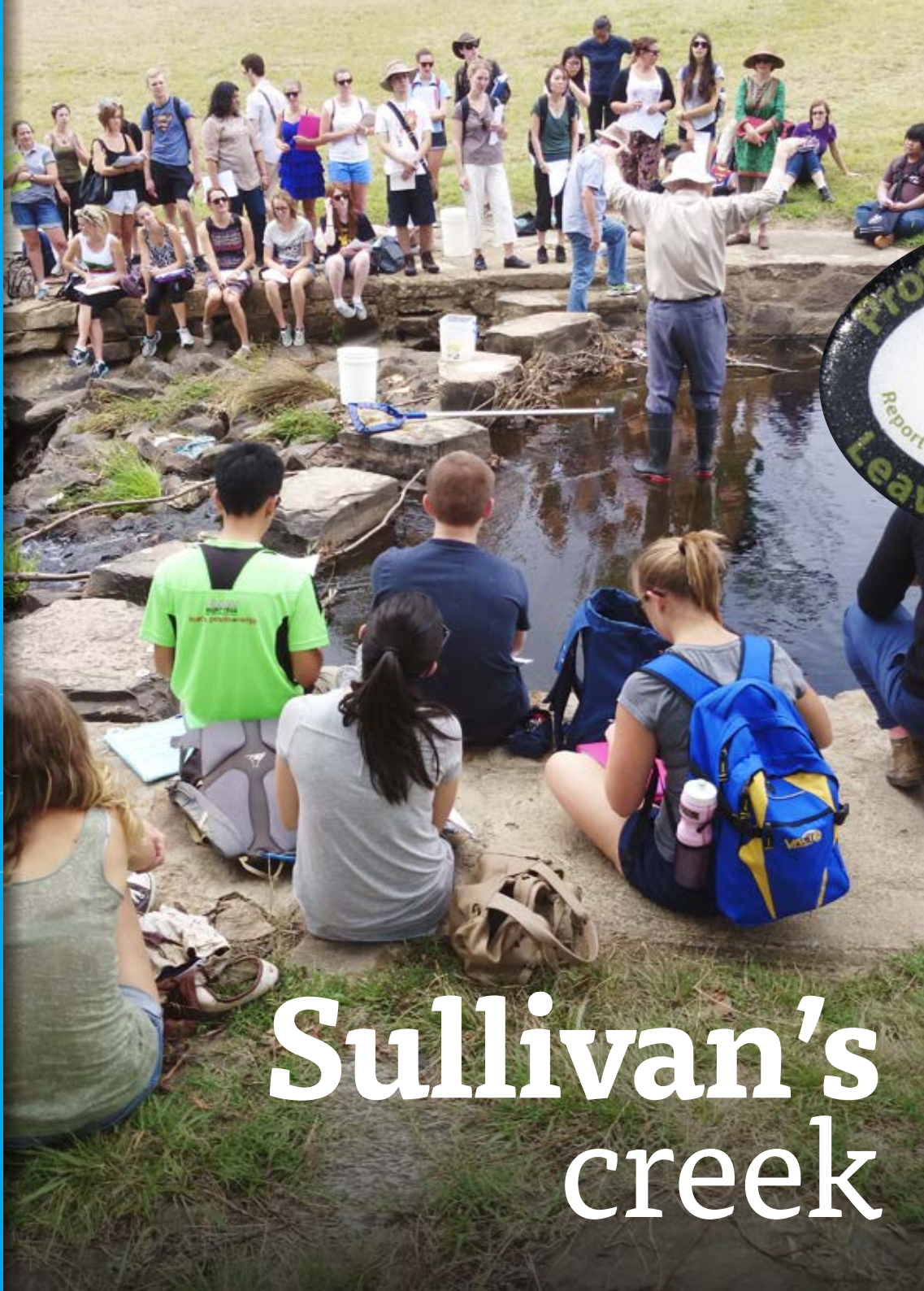
- Facilities and Services
- Fenner School of Environment and Society
- Friends of Grasslands

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Project Summary

Sullivan's Creek is a natural river that flows through the northern suburbs of Canberra. With the urbanisation of the suburbs the creek was lined with concrete channels for diverting stormwater. The final sections of the creek pass through ANU before entering Lake Burley Griffin.

While primarily managed as a stormwater system, Sullivan's Creek has remained an important riparian corridor. This is particularly true for the University, where it is a major focus of the landscape, and is envisioned to become a major parkway and green spine of the campus by 2030.

A key strategy under the ANU Environmental Management Plan and draft Biodiversity Management Plan is to enhance riparian conditions and biodiversity along Sullivan's Creek. This has been carried out through the following initiatives:

Sullivan's creek

Project Name

Campus as Classroom:
Sullivan's Creek riparian corridor

Institution

The Australian
National University

Completion Date

2030

Key Stakeholders

- Facilities and Services
- Fenner School of Environment and Society
- ANU staff and students

Landscape projects designed to capture stormwater and reduce sediment runoff into the creek;

Biodiversity projects designed to increase wildlife habitat and improve water quality;

Incorporate Water Sensitive Urban Design in new developments adjacent to the creek;

Periodic volunteer clean-up parties.

Of particular note is the use of the area as an outdoor classroom to demonstrate sustainability management and practices. The Fenner School actively uses it for their coursework projects, ranging from species assessments to monitoring habitat restoration.

Leadership

Social Outcomes

- Direct use of area as outdoor classroom in teaching fieldwork skills and monitoring
- Highly popular location for recreation and leisure

Environmental Outcomes

- Important riparian corridor protected and actively rehabilitated
- Demonstration of active management and trial-and-error testing for rehabilitation techniques

Cultural Outcomes

- Community engagement initiatives promote awareness of the significance of the area and provide support for conservation
- Demonstration of University commitment to ecological conservation and best practice management

Economic Outcomes

- Provide convenient location on campus for demonstrating sustainability management and practices

Links to Teaching

The area is actively used as an outdoor classroom to demonstrate sustainability management and practices. The Fenner School uses it for their coursework projects, ranging from species assessments to monitoring habitat restoration.

Links to Research

The area has been the subject of several regional monitoring projects, including professional research and citizen science approaches.

Partnerships

- Facilities and Services
- Fenner School of Environment and Society
- Molonglo and Ginniderra Catchment Groups

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THE UNIVERSITY OF
MELBOURNE



Project Name

Burnley Green Roofs Project



Institution

University of Melbourne



Completion Date

2012 and ongoing



Key Stakeholders

- Academic staff and students from The Green Infrastructure Research Group
- Operational staff from Campus Services



Burnley Green Roofs Project

Project Summary

In 2012, The University of Melbourne launched the Burnley Green Roofs: Australia's first dedicated green roof demonstration, education and research facility. The project includes three green roofs built for Australian conditions, providing scope for teaching and learning, outreach activities and continuing professional development for the broader design and landscape industries. Burnley Green Roofs form part of a larger Green Infrastructure Research Group with a focus on parks and gardens, public open space, urban agriculture, green roofs and walls and park and street trees.

Green roofs have a range of environmental and economic benefits that can help make our cities more liveable. They can reduce building energy use by acting as an insulation layer and limiting heat gain, in turn reducing energy cooling demand by 38%. Green roofs can also act as a sponge, absorbing rainfall by as much as 80% and minimising rainwater runoff, improving the ecology of local streams and rivers.

The main demonstration green roof has 203 different plant taxa with more than 3000 individual plants in total. The roof design demonstrates the range and variation of plants that can be used successfully on a green roof across different substrates, depths and irrigation schedules. These range from arid-loving succulents, to drought tolerant Australian natives and flowering plants from South Africa and the Mediterranean, and even vegetables and herbs. Many of the plants have been extensively evaluated in drought experiments by green roof researchers at Burnley. The research green roof is investigating the effects of plant performance

and substrate depth on stormwater runoff and building cooling. The third green roof is designing for biodiversity outcomes and includes only Australian plants with features to provide habitat for lizards, insects and birds, including an ephemeral stream, a native bee 'hotel' and varying substrates.

The green roofs are used as both a demonstration and teaching resource for education and training programs and activities conducted at the Burnley Campus, including the new post-graduate Specialist Certificate in Green Roofs and Walls. Students enrolling in the course are required to design a functional green roof at a building on the Parkville campus. This requires engagement with both academic and operational staff and integrates sustainability-related learnings into the development of the campus. Project outcomes include enhancing the student experience through the provision of well-designed spaces, together with the direct participation of students in campus development. By greening the campus, students are also addressing the "urban heat island effect", which is a contributor to extreme summer temperatures in Melbourne.

Leadership

Social Outcomes

This project engaged students and staff on the campus through the design and construction process and continues to be used regularly as an amenity and recreational space. It forms part of the staff room precinct and is regularly used for community and industry events such as Melbourne Open House.

Environmental Outcomes

The demonstration green roof demonstrates multiple outcomes including:

- Reduced storm water runoff
- Lower building energy needs
- Increased urban biodiversity
- Reduction of overall urban heat island effect
- Potential for local food production
- Improved health and liveability of cities

Cultural Outcomes

By engaging staff, students and the wider community, it builds a sense of an environmentally aware culture within the principles of research, teaching and engagement at the University of Melbourne. It is also used as demonstration space for wider community interested in growing green spaces.

Economic Outcomes

The demonstration green roof has considerably reduced energy needs for cooling and slightly for heating in the hall beneath.

Links to Teaching

The Burnley Green Roofs have significant links to teaching and learning activities on the campus, particularly green infrastructure-related topics, but also through related activities such as landscape and garden design, plant materials and identification.

Links to Research

The Burnley Green Roofs showcase the outcomes of 5 + years of research by the Green Infrastructure Research Group on plants and substrates suitable for green roofs in Australia and quantifying the economic, social and environmental benefits of green roofs. This research has been done in partnership with the City of Melbourne, Melbourne Water, Inner Melbourne Action Plan, The Department of Environment and Primary Industries and the Australian Research Council. More information on the Green Infrastructure Research group and their research can be found at www.thegirg.org.

Partnerships

- Academic staff and students from the Green Infrastructure Research Group
- Waterway Ecosystem Research Group
- Operational staff from Campus Services
- HASSEL Pty Ltd
- City of Melbourne
- Melbourne Water
- The Department of Environment and Primary Industries
- Australian Research Council
- Nursery and Garden Industry Australia
- Inner Melbourne Action Plan
- Zinco Pty Ltd (Germany)

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THE UNIVERSITY OF
MELBOURNE



Project Name

A Fairer University: Increasing
the Use of Fair Trade Products
at the University of Melbourne



Institution

University of Melbourne



Completion Date

Ongoing



Key Stakeholders

- The University of Melbourne –
Fair Trade Steering Committee
- Faculty of Business and
Economics – Melbourne
Business Practicum
- Campus Services -
Sustainability Office
- Strategic Procurement



A Fairer University

Project Summary

As part of the Melbourne Business Practicum in the Faculty of Business and Economics, students provided practical and evidence based data to the Fair Trade Steering Committee to manage its strategies to increase the usage of Fair Trade products at the University of Melbourne.

The students provided an analysis of current use of fair trade coffee, tea and chocolate in kitchenettes and vendors. They also identified ways in which these products usage could be increased. In addition, some investigation was made into fair trade product categories that could be expanded to include items such as clothing.

The students presented their project to the Fair Trade Steering Committee in addition to their peers and academics with in the Faculty. The University also supported one of the students to present their findings at the Fairly Educated Conference, hosted at the University of Queensland in 2014.

As a result of this project a group of volunteer students formed the Fair Trade Student Ambassadors. The Fair Trade Student Ambassadors took an active role in University-related decisions towards Fair Trade. This teaching and learning opportunity works to enhance the student experience, while engaging with the wider community, whereby students are empowered to actively support and lead change in their University, while the operational outcomes for Fair Trade are also increased.

The Fair Trade Market, organised by the Fair Trade Ambassadors, was a highlight of Fair Trade activities and is a testament to the success of the program.



Fair Trade Student Ambassadors and members of the Fair Trade Steering Committee.

Leadership

Social Outcomes

The project engaged students, academic and professional staff, in addition to various vendors on campus and University supplies.

Environmental Outcomes

The project highlights social sustainability outcomes rather than environmental outcomes.

Cultural Outcomes

The project intends to reflect the culture which the University cultivates and that is one of social responsibility.

Economic Outcome

This project does not intend to have economic outcomes.

Links to Teaching

The project was chosen by students and academics to undertake as part of the Melbourne Business Practicum within the Faculty of Business and Economics.

Partnerships

This project involved internal partnerships between the Faculty of Business and Economics and Property and Campus Services and the Fair Trade Steering Committee.

Contact Information

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“Our hope is to create an ethical consumer culture within the University of Melbourne and, more broadly, within society.”

Danielle Rostan-Herbert
Sustainability Manager



THE UNIVERSITY OF
MELBOURNE



Project Name

Shallow Geothermal demonstration site – informing research, teaching and energy efficient campus development



Institution

University of Melbourne



Completion Date

2013



Key Stakeholders

- Academic staff and students from the Department of Infrastructure Engineering
- Operational staff from Campus Services
- Industry partners
- Office for Environmental Programs



Shallow Geothermal demonstration site

Project Summary

The 25kW demonstration system at the Campus Sustainability Centre (CSC) in the Walter Boas building, Parkville campus includes five 50 metre boreholes through which water is pumped to reduce demand on heating and cooling systems in the building. The project was completed in 2013. System monitoring enables ongoing research and teaching opportunities and has informed the design of a larger scale system as part of major construction works elsewhere on campus.

Learnings from the demonstration centre have been applied to the Bio21 Science Sub School, in which an 80kW system comprising twenty eight 50 metre boreholes has been completed and is significantly reduce energy demands for heating and cooling. The Bio21 project has been funded by the Victorian Government Department of Primary Industries.

Leadership

Social Outcomes

The demonstration project at the Campus Sustainability Centre engaged students and staff through the design and construction phase, and continues to engage through the ongoing monitoring and display of system performance.

Environmental Outcomes

Shallow geothermal systems significantly reduce the energy required for building heating and cooling through use of constant ground temperature via ground source heat pumps. 4kW of power is generated for each kW of electrical power used => around 75% energy & emissions savings

Cultural Outcomes

The geothermal system at the CSC sits within the 'sustainability precinct' of Parkville campus.

Economic Outcomes

Around 75% savings compared to traditional heating and cooling systems.



Links to Teaching

This project engaged students and staff through the design and construction phase, system monitoring enables ongoing research and teaching opportunities.

Contact Information

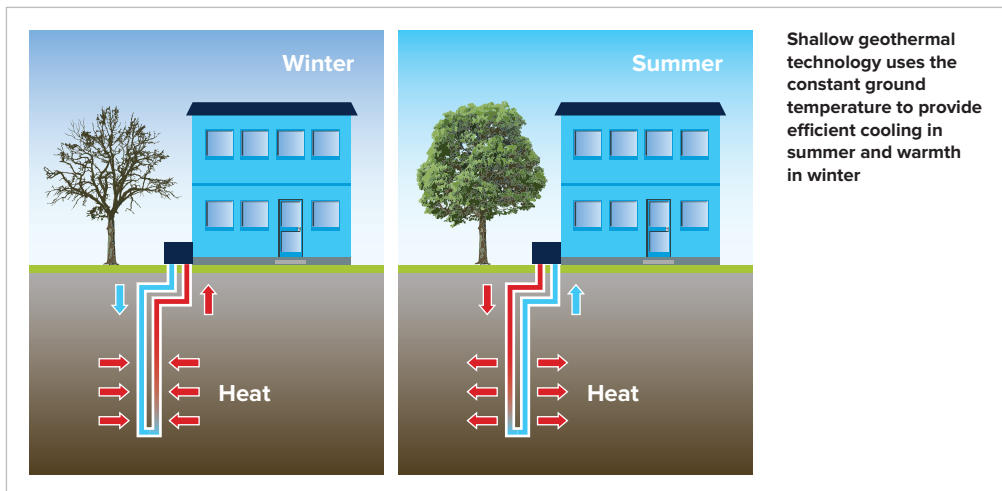
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Partnerships

The project was a collaboration of:

- Academic staff and students from the Department of Infrastructure Engineering
- Operational staff from Campus Services managed the planning, approvals and implementation of the project
- Industry partners engaged to supply and install equipment and undertake internal and ground works – Geotechnical Engineering, Mitsubishi Electric, Schneider Electric
- The Office for Environmental Programs as occupant of the ground floor of the building.

Above: The completed shallow geothermal unit sits unobtrusively in the garden bed along the University's main pedestrian thoroughfare, Monash Rd





MONASH
University



Project Name

Sustainable Events at Monash



Institution

Monash University



Completion Date

29th August 2014



Key Stakeholders

- Facilities and Services Division, Monash University
- Green Steps students
- Monash University staff (Event Planning)
- Monash University students



Sustainable Events at Monash



Project Summary

Each year, a wide array of events is held at Monash University, which include large academic conferences, festivals, expos and sporting events. The orientation festival is one of the largest events at Monash University, engaging thousands of students across 5 campuses. With such vast reach, the event has great potential to demonstrate the University's commitment to sustainability and make a significant positive impact on the environment.

In order to understand the environmental impacts of the festival, an assessment of the semester 2 orientation festival held at Clayton campus was conducted by Green Steps students. This included a waste and energy audit, as well as a brief survey of the Orientation stallholders.

It was found that a large proportion of waste was made up of organic food and abandoned merchandise material taken from stalls. However, surveys revealed that the stalls rely on food and merchandise to attract students. The stallholders' knowledge about sustainability was limited, and respondents indicated that while they were interested in pursuing sustainable practices at events, they believed that there were a number of significant barriers preventing them from doing so.

Findings from the assessment were used to create a set of sustainable event guidelines that could be applied to the planning of all Monash University events. The guidelines incorporated the mitigation of waste and energy consumption, as well as methods to increase stakeholder engagement in sustainability.

Leadership

Social Outcomes

The project gave the Green Step students a real-world consulting experience. In putting their auditing skills into practice, they were able to identify problems and provide solutions. The use of the event guidelines will assist Monash University to become a socially responsible organisation.

Environmental Outcomes

The assessment has highlighted areas where events can reduce their environmental impact. Adherence to the sustainable event guidelines will see a significant decrease in waste and energy use at Monash University events.

Cultural Outcomes

The sustainable event guidelines will aid in changing the culture of Monash University. Having environmental measures at the forefront of planning will promote Monash's commitment to sustainability. As many events involve external providers, the message will be filtered through the wider society.

Economic Outcomes

The project highlighted that merchandise and free food contributed largely to the environmental impact of the orientation event. In considering more sustainable options, there is opportunity to find more economically sound alternatives. The guidelines also indicate that events could go paperless, which would see positive environmental and economic outcomes.



Links to Teaching

Green Steps is an extra-curricular program that teaches university students how to become leaders as sustainability change agents in their careers and beyond. The program teaches the practical skills needed to plan and deliver effective sustainable workplace solutions. The project allowed the students to put their recently learnt waste and energy auditing skills into practice.

Partnerships

- Monash Sustainability Institute/Green Steps
- Facilities and Services, Monash University
- Monash University faculties and departments

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MONASH
University



Project Name
Monash Clean Energy Plan



Institution
Monash University



Completion Date
2014



Key Stakeholders

- Monash University Faculty of Engineering
- Facilities and Services Division, Monash University
- Monash University students
- Monash University staff



Monash Clean Energy Plan

Project Summary

Third-year Environmental Engineering students collaborated with Monash University's Facilities and Services team to develop a transition plan for the University to eliminate its reliance on coal and natural gas. Dr Rob Brimblecombe, the Division's Sustainable Asset Development Planner, worked alongside the students to identify cost effective energy-efficiency opportunities and renewable energy options.

Across Monash campuses, potential energy savings of 60 per cent were identified, with some buildings theoretically able to generate their annual energy requirements from rooftop solar panels. The solar potential of the campuses was assessed and options to source energy from offsite renewables were investigated for the remaining power demand.

The plan developed by the students provides a financially attractive option to transition the University to 100% renewables and provides a great example to other large institutions of what is possible with existing technologies at equivalent or lower cost than business as usual.

Leadership

Social Outcomes

The project provides a blueprint for how communities and large organisations can lead the transition to a clean energy future, without the reliance on government intervention.

Environmental Outcomes

Findings made by the students will help inform future projects undertaken by Monash's Facilities and Services Division, as part of improving building performance and service delivery.

Economic Outcomes

The research proposed a series of scenarios that allow the University to transition to 100% renewables with net financial savings over the 15 year analysis period.

Links to Teaching

The project was undertaken as part of the Energy and the Environment unit and was then taken up as a final year project by a sub-set of the class. Students not only benefited from the real-world application of their learning, but can also be expected to take what they learned about environmental sustainability in engineering projects with them into their careers.

Links to Research

The project team collaborated with ClimateWorks to complement their existing research and to gain guidance on the analysis methodology and data collection.

Partnerships

Dr Gavin Mudd from the Engineering faculty supported the project together with Facilities and Service building experts and data analysts.

Awards

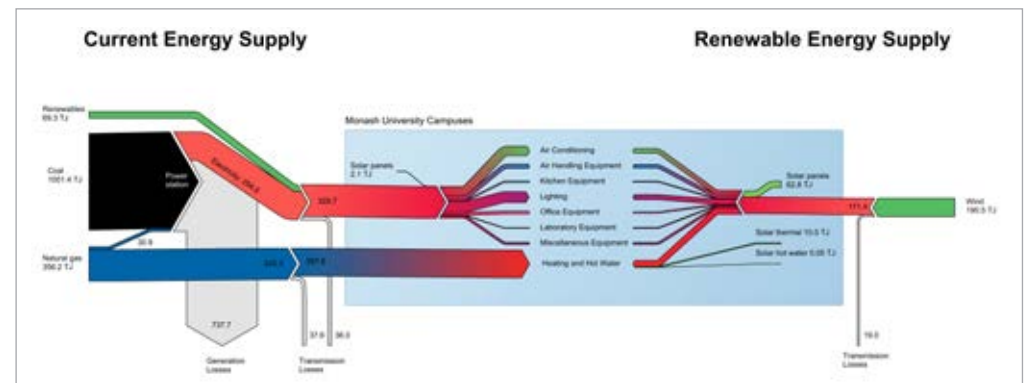
The work completed in this project contributed to Monash's submission that was a finalist in the 'Innovation in Social Infrastructure > \$100 Million' section of the 2014 Banksia Awards.

Contact Information

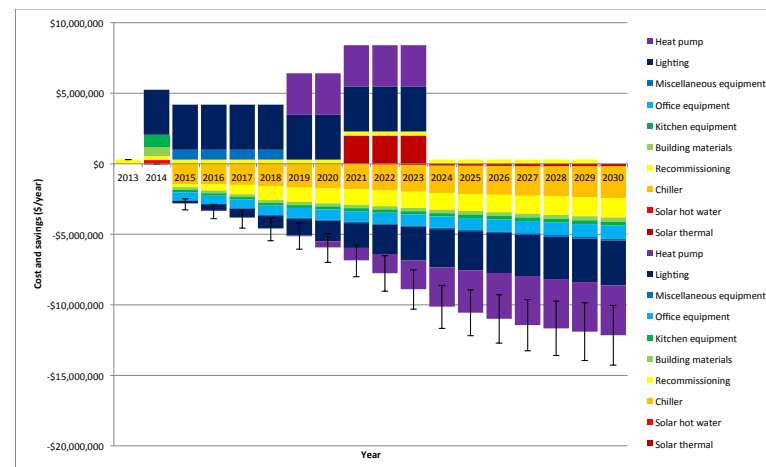
Facilities and Services

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Comparison of energy flows through Monash between existing and proposed energy consumption





MONASH
University



Project Name

Diverting kitchen food waste from landfill



Institution

Monash University



Completion Date

5 September 2014



Key Stakeholders

- Facilities and Services Division, Monash University
- Green Steps students
- Monash departments engaged in Green Program
- Monash University students



Diverting kitchen food waste from landfill

Project Summary

Green Cones are used on Monash University campuses to reduce organic waste from landfill, saving greenhouse gas emissions and returning nutrients to the ground. The Green Cones are high-capacity, low-maintenance compost bins that break down food waste into nutrients that nourish the soil and plants of the campus grounds. The cones are a clean, safe, and tidy way of dealing with organic waste that comes from offices and laboratories.

Facilities and Services supplies departments with small kitchen bins so that staff can separate their food waste from landfill and recycling waste. Staff volunteers then place the food waste from the bins into one of the Green Cones located on the campus grounds.

Green Steps students undertook a project to evaluate:

- the effectiveness of the Green Cone system;
- how much organic waste is being diverted from landfill; and
- perceived barriers to using the system.

The Green Steps interns developed and completed a survey of Sustainability Representatives, who are volunteer staff members located in departments across the University, on their use of the Green Cones. Results were obtained from 7 areas located on 3 campuses. The amount of organic waste currently saved from landfill was extrapolated to determine how much could be saved if Green Cones were used University-wide.

Leadership

Social Outcomes

Green Steps is an award-winning, not-for-profit environmental consulting and training provider to the private and public sector. The aim of Green Steps programs is to enable participants to make their workplaces and work practices more environmentally sustainable. This project provided the opportunity for Green Steps students to experience the role of a sustainability change agent and to increase their confidence championing sustainability in a real world context

Environmental and Economic Outcomes

The results of the study demonstrated that 2.4 tonnes of organic waste is currently being diverted from landfill annually as a result of the Green Cone program. Using the Green Cone system effectively had the potential to divert at least 44 tonnes of organic waste from landfill University-wide, saving 70 tonnes greenhouse gas emissions and nearly \$6,000 in avoided land fill charges.

Cultural Outcomes

This study will lead to behavioural change in workplaces in the future, resulting in improvements in environmental sustainability.

Links to Teaching

Green Steps is an extra-curricular program that teaches university students how to become leaders as sustainability change agents in their careers and beyond. The program teaches the practical skills needed to plan and deliver effective sustainable workplace solutions. The project allowed the students to put their recently learnt waste and energy auditing skills into practice.



Partnerships

- Monash Sustainability Institute / Green Steps
- Facilities and Services, Monash University
- Monash University faculties and departments
- Green Program

Awards

Green Steps is a multi-award winning program. Their impact on organisations and inclusive training methodology has been recognised with a number of prestigious awards, including the Premier's Sustainability Award, the United Nations Association Education Award and the Banksia Environmental Award.

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THE UNIVERSITY OF
WESTERN AUSTRALIA



Project Name

Building Sustainability
Performance Audit



Institution

The University of
Western Australia



Completion Date

2016



Key Stakeholders

- Campus Management
- Student Guild



Building Sustainability Performance Audit

Project Summary

This project involves engaging student volunteers to conduct a sustainability audit of buildings on campus to rate how a building performs in areas of indoor environment quality, energy, water, transport, waste and recycling and landscape. An audit tool was developed to capture data such as lighting load, lighting levels, recycling facilities, air-conditioning, access to external views, etc. This data will then be translated to a ratings tool and a “star rating” assigned to each building. Although industry accredited ratings tools exist, the audit and rating tool used in this project are specific to the University’s facilities and practices.

Training was provided to the student volunteers prior to the audits. Organisation of the student groups for each building was carried out by the student-run Sustainable Energy Now Club and the Guild’s Volunteering Hub. Their volunteering efforts are acknowledged in the students’ academic transcripts.

Left: UWA Sustainable Initiatives staff, Daniel Stone (centre) assists student volunteer auditors

Leadership

Social Outcomes

Students can engage with the Campus Management division of the University to gain an appreciation of how the campus is managed and operated. The University is able to engage its students to assist with its planning.

Environmental Outcomes

The project assists the University to rate its buildings and to identify and prioritise areas of refurbishment or improvement to achieve a more sustainable building.

Cultural Outcomes

Staff and students become aware that the University is committed to the sustainability of its buildings and the wellbeing of the staff.

Economic Outcomes

The project has minimal capital and on-going costs. The audit and ratings tool was developed in-house and student volunteers conduct the audit. The project could result in savings in operational expenses through buildings being run more efficiently.

Links to Teaching

Students gain an understanding of sustainability principles commonly adopted within industry practices

Partnerships

- Guild Volunteering Hub
- UWA Sustainable Energy Now student club



Above: Daniel Bell

“There is great interest from the students to volunteer for the audits. They are motivated by the ability to make their University a more sustainable campus.”

Daniel Stone
Building Performance Audit Coordinator

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THE UNIVERSITY OF
WESTERN AUSTRALIA



Project Name

Vice Chancellor's Sustainable
Development Awards



Institution

The University
of Western Australia



Completion Date

On-going



Key Stakeholders

- UWA Vice Chancellor's
Sustainable Development
Committee
- Campus Management



Sustainable Development Awards



Project Summary

This initiative involves recognition of sustainability related research, at undergraduate and postgraduate levels, through a financial award. The awards are presented annually to no more than five undergraduate and two postgraduate research heses.

The undergraduate awards, entitled, Living Laboratory Innovation Awards, recognise research projects that advance sustainable initiatives in areas of environmental and social sustainability which can be applied to the University campus. The postgraduate awards, entitled, Global and Local Sustainability Innovation Awards recognise interdisciplinary research projects that advance solutions for global or local sustainability challenges in areas such as energy, population health and food security.

The research projects are evaluated by members of the Vice Chancellor's Sustainable Development Committee, a high-level Executive advisory committee responsible for establishing and overseeing the University's strategic direction in sustainability.

In previous years, these awards, particularly in relation to undergraduate Living Laboratory Innovation Awards research, have resulted in direct application on campus operations. Examples of this include social marketing, solar PV array and thermal window treatments.

Left: Postgraduate student Alex Christ accepts the Vice Chancellors Sustainable Development Award from UWA Vice Chancellor Professor Paul Johnson

Leadership

The initiative demonstrates the University's high level commitment to and leadership in the area of sustainability and recognises high quality research that may have a campus, local or global impact.

Social Outcomes

The research projects encompass the four pillars of sustainability, which include social, environmental, cultural and economic sustainability and therefore the awards have the potential to affect outcomes in each of these pillars.

Links to Teaching

Students who have conducted research as part of their course work are encouraged to apply for the awards and have their projects recognised for their research excellence and potential contribution to campus management and operations

Partnerships

Campus Management and the Vice Chancellor's Sustainable Development Committee

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Left: 2014 Vice Chancellor's Sustainable Development Award recipients Genevieve Simpson and Jimmy Cheung

“The awards are an excellent example of how UWA is integrating its research with its operational initiatives in the area of sustainable development.”

Helen Whitbread
Manager Sustainable Initiatives



THE UNIVERSITY
of ADELAIDE

Ecoversity



Project Name

Hub Central Edible Garden



Institution

The University of Adelaide



Completion Date

July 2014



Key Stakeholders

- Office of Sustainability
- School Social Sciences
- Hub Central



Edible Garden

Project Summary

The Hub Central Edible Garden is located in the heart of the North Terrace Garden and is run by staff and student volunteers who are passionate about growing produce and sharing gardening and cooking skills. The Edible Garden received start-up funding through the Office of Sustainability's Green Project Fund initiative and was designed and implemented by a Bachelor of Environmental Policy and Management student internship. The internship focused on researching successful community garden models, suggesting a layout, management plan and engagement strategy. The garden was built in 2014 on an existing courtyard with a number of large planter boxes, a rain water tank, worm farm and a small solar PV system. The garden is conveniently located near the Hub Central Student Kitchen, which is used by hundreds of students daily to make meals. The garden is maintained by a group of enthusiastic staff and student volunteers with support from the Office of Sustainability. Through regular working bees, workshops and events, volunteers learn to grow edible plant species, share knowledge about sustainable gardening practices and prepare food using freshly harvested produce. The garden is a popular addition, connecting a community of gardeners and fostering sustainability on campus.

Left: Bachelor of Environmental Policy and Management student Alice who developed management and engagement plans for the garden as part of an internship program.

Leadership

Social Outcomes

Hub Central is utilised by approximately 7,000 University students per day during term time, and is a central point for informal study, meals and socialising. The Edible Garden, linked to the student kitchen, provides an opportunity for staff and students to grow and eat locally grown produce. Engagement with the garden and the Ecoversity program promotes the benefits of locally produced food, and self-sufficiency.

Environmental Outcomes

- Solar energy helps to offset use of microwaves and toasters in the student kitchen nearby.
- Rain water is harvested and reused for irrigation in the garden.
- A worm farm is used to recycle food scraps and produce organic fertiliser

The garden sets a living example of sustainable urban food production.

Cultural Outcomes

Regular events, such as permaculture workshops and cooking classes, allow staff and students to meet like-minded individuals, share gardening practices and trade recipes. Working bees promote health, wellbeing and benefits of the great outdoors. These events are always in high demand and add significant value to the student experience of campus life.

Economic Outcomes

The garden saves on waste and utility costs through the capture and reuse of water, solar energy and the recycling of food scraps.



Left: DIY Salad Garden Workshop – Staff and students learnt about the importance of urban food production and created their own mini salad gardens to take home.

Links to Teaching

An internship by Bachelor of Environmental Policy and Management student was key to getting the project off the ground. The student worked alongside Office of Sustainability staff on garden design, logistics of the build, management plans and an engagement strategy. In the future, additional internships may focus on other aspects of the garden such as soil science, and community engagement.

Partnerships

- Sarah Constructions Pty Ltd – sponsor building works
- Contour Management – architectural design/engineering
- Green Project Fund – Office of Sustainability internal funding partner

Contact Information

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THE UNIVERSITY
of ADELAIDE

Ecoversity



Project Name

Campus Building
Retrogreening – Final Year
Mechanical Engineering
Research Project



Institution

The University of Adelaide



Completion Date

December 2014



Key Stakeholders

- School of Mechanical Engineering
- Office of Sustainability
- Campus Services



Campus Building Retrogreening



Project Summary

This final year Mechanical Engineering research project focused on a tailored methodology to retrofit a 1940s engineering building on the North Terrace Campus to achieve greater environmental performance, in preference to demolishing and rebuilding. The project was supervised by Dr Cristian Birzer, School of Mechanical Engineering.

The research project found that by installing double glazed windows, LED lights, motion and daylight sensors, upgrading building insulation and HVAC, the energy consumption of the Engineering South building would reduce by approximately 30%. The recommended improvements highlighted that there are significant environmental and financial benefits in assessing the possibilities of retrofitting a building that is still structurally sound and purpose-suitable.

The findings will assist in future campus planning, particularly when pursuing retrofit projects.

Leadership

Social Outcomes

The research student worked with the Office of Sustainability and Campus Services to understand the building's energy profile and history. The collaborative working environment allowed for sharing of data and knowledge, useful for all parties involved.

Environmental Outcomes

Through this research, a number of recommendations will be made to improve the operational performance of the Engineering South building which will be of value to the Office of Sustainability and Campus Services groups when pursuing retro-fit projects. Given that the majority of Australian CBD building stock is comprised of aged buildings with high energy use and poor environmental performance, this methodology can also be applied to other multipurpose buildings in South Australia.

Economic Outcomes

Savings through improved operational performance and reduced utility use in Engineering South could be realised in the future, should the retrofit be implemented. The validity of the methodology and results indicate that retrofitting can be conducted in similar existing commercial and residential buildings, including those owned by the University.



Above: Research student Stella with Dr Cristian Birzer, School of Mechanical Engineering

Links to Research

Utilising a campus building for this type of research has a number of positive outcomes. The student understands the building's occupants and use in great detail. Staff responsible for campus planning, maintenance and environmental improvement have detailed research and information on which to build business cases on.

Awards

This project was a final year research project supervised by Dr Cristian Birzer, School of Mechanical Engineering and won Best Energy Related Project at the 2014 University of Adelaide MechExpo.

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Left: Campus Services staff and research student Stella, investigating the building's rooftop HVAC system.



THE UNIVERSITY OF
SYDNEY



Project Name

Eat Fresh: Harvest, Eat
and Learn, garden-based
nutrition-education program



Institution

The University of Sydney



Completion Date

Ongoing



Key Stakeholders

- Faculty of Agriculture
and Environment
- CIS Sustainability team
- the University Sustainable
Workplace group
- the Student's
Representative Council
- Healthy Sydney University



Garden-based nutrition-education program

Project Summary

The Ground Up Community Garden is a collaborative initiative started by group of passionate and committed staff and students from a range of areas across the University. Planning began in February 2014 and the site was converted into the community garden in March 2014. One of the first jobs conducted was thorough testing of soil and leaf samples to ensure suitability of the site for growing fruit and vegetables. The all-clear came in June and the garden was off and running. The garden is made up of 12 in ground plots, 6 raised beds and numerous planter bags. Crops will be succession planted to ensure that fruit and vegetable crops will be continuously ready for harvest throughout the year.

Our philosophy is to create a healthy garden for growing produce, sharing knowledge and inspiration based on organic methods and permaculture principles.

Leadership

Social Outcomes

- Integrate sustainability and urban agriculture to the University curriculum
- Encourage collaboration across staff, student communities and local environmental groups

Environmental Outcomes

- Sets an example of sustainable food production in urban environments
- Educate in ways to minimise our environmental impact through local food production.

Cultural Outcomes

- Promote health and wellbeing and healthier food options on campus;

Economic Outcomes

- Demonstrate how growing your own produce is healthier, more nutritious and cheaper than shop bought produce
- Opportunity to sell produce to local retailers, moneys will go back into the running of the garden; water, materials and seeds.

Links to Research

The aim is to encourage fresh produce consumption and a clear knowledge of its benefits in USyd students by introducing them to 'harvest, eat and learn' sessions in the Ground Up Community Garden, and to measure the effectiveness of the intervention to determine if garden-based nutritional education is effective in an undergraduate population.



Left: Monthly working bee session – harvesting, weeding, mulching and composting

Far left: Harvesting for the weekly veg box scheme with the University of Sydney Food Co-Op (Student Union Group)

Below left: Garden Construction



Partnerships

- Faculty of Agriculture and Environment
- Campus Infrastructure and Services
- The University of Sydney Food Co-Op

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THE UNIVERSITY OF
SYDNEY



Project Name

Advanced Utilities
Monitoring System



Institution

The University of Sydney



Completion Date

Staged Implementation –
completion September 2015



Key Stakeholders

- Campus Infrastructure and Services (CIS)
- School of Electrical and Information Engineering
- Faculty of Architecture



Advanced Utilities Monitoring System



Project Summary

The Advanced Utilities Monitoring System (AUMS) project has been designed to provide greater transparency on energy consumption at the University of Sydney. The aim of the project is to achieve metering for electricity, gas and water consumption on a building by building basis.

Metering information is provided through an interactive user interface that presents data graphically and provides a benchmark comparison assisting the user to draw meaning from metering information presented.

The AUMS will provide building occupants with the ability to monitor their electricity, gas and water consumption in real time. Visibility of this information will empower users to conserve energy and water and actively contribute to reducing the University's environmental footprint. The financial savings made by users by reducing utility consumption are passed back to the through a reduction in utilities operating costs. These funds can be redirected back into the core business of the University.

Information from the AUMS can be available to faculties for use in teaching and learning. Electricity consumption data from the AUMS has been used to inform post graduate course work, informing energy auditing studies conducted by the Faculty of Architecture in 2014.

The project is being delivered in three stages;

Phase 1 (completed) – this covered installing and implementing an advanced metering information system which integrates existing smart meters at the Camperdown, Darlington and Mallet Street campuses.

Phase 2 - will install additional electricity sub-meters to monitor all large energy intensive buildings that are not currently sub-metered and connecting them to the advanced metering information system implemented in Phase 1. It is anticipated an additional 40 high energy use buildings will be connected

Phase 3 - will connect gas and water sub-meters to the advanced metering information system implemented in Phase 1.

Phases 2 and 3 are being delivered in parallel, commencing in the third quarter of 2014 with completion scheduled from mid-2015.



The AUMS user dashboard

Leadership

Social Outcomes

The AUMS will deliver improved transparency on utility usage and cost to end users, such as faculties and other operating groups. This empowers building users to reduce their utility costs, with savings being directed back to the end users by a reduction in utility cost allocations.

Environmental Outcomes

Visibility of building energy and water consumption allows for environmental benchmarking to be conducted, identifying improvement projects that will reduce utility consumption

Cultural Outcomes

Fosters a culture of behavioural change by educating end users on their energy and water consumption and providing them with the tools to be actively involved in conservation.

Economic Outcomes

- The AUMS will assist to identify energy and water efficiency initiatives. The types of initiatives to be implemented typically have a payback period of between 1.5 to 5 years
- Financial savings realised by cultural change and initiatives facilitated by the AUMS are directed back to user groups, facilitating user buy-in and continuous improvement.

Links to Teaching

Information from the AUMS can be available to faculties for use in teaching and learning. Electricity consumption data from the AUMS has been used to inform post graduate course work, informing energy auditing studies conducted by the Faculty of Architecture in 2014.

Partnerships

The project was funded by University of Sydney Campus Infrastructure and Services

Contact Information

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THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA



Sustainability



Project Name

UQ Gatton Environmental Park



Institution

The University of Queensland



Completion Date

29 July 2005



Key Stakeholders

- Property and Facilities Division (P&F)
- Faculty of Natural Resources, Agriculture and Veterinary Science (now Faculty of Science)
- Student Wildlife Association of Gatton



Gatton Environmental Park

Project Summary

The UQ Gatton Environmental Park project has transformed the former golf course and surrounds into a 10 hectare bushland park. The park includes animal shelters, bird-watching hides and a re-vegetated native forest. The University takes advantage of this asset to promote and support teaching and learning.

In 2004 the first work began with more than 50 nesting boxes being placed around the precinct for native wildlife. Goat boxes from discontinued research and teaching activities were relocated, refurbished and repurposed as bird hides. The precinct now has 600 metres of walkways and boardwalks, and more than 1,000 trees.

It is a significant destination for thousands of local and migrating birds and other animals, including threatened species. Some of the bird species seen at the lakes include Magpie Geese, Plumed Whistling Ducks, Pink-eared Ducks, Red-necked Avocets, Pelicans, Cormorants and Black-winged Stilts.

Leadership

Social Outcomes

- Tree planting events offer opportunities for students and staff to be actively involved in protecting and enhancing the natural environment.
- Establishes valuable links with community groups.
- Provides a natural space on campus for the UQ and local community to appreciate and enjoy, now and in the future.
- Promotes exercise and an active lifestyle, which reduces stress and anxiety.

Environmental Outcomes

- Protects and conserves local biodiversity, providing a sanctuary for wildlife, especially vulnerable or threatened species, in a region that has been heavily cleared for agriculture.
- Enhances environmental education and awareness of broader environmental issues.

Cultural Outcomes

- Encourages organisational sustainability culture, in line with the core strategic objectives of learning, discovery and engagement.
- By engaging staff, students and the wider community, it builds a sense of pride in UQ being an environmentally conscious workplace and tertiary education institution.

Economic Outcomes

- Encourages local community, visitors, prospective staff and students on campus by raising awareness of the UQ Gatton campus and its surroundings.
- Encourages donations or investment in UQ.

Links to Teaching

- Interpretive signage around the park allows visitors to learn about the park, lakes, bird species and habitats, whilst improving their health, wellbeing and productivity.
- Direct engagement with hundreds of UQ students, researchers, academics, and the wider community.
- Used by academics in teaching. Academics have the opportunity to incorporate ecological surveys and monitoring of species into curriculum, allowing students to develop fieldwork skills.
- Practical example of habitat restoration.



Top left: Lake Galletly

Top right: Repurposed bird hide

Above: Students actively learning in the Environmental Park

Links to Research

- Used by academics in research.
- Encourages active learning.
- Provides a known quality water supply (via monitoring) for agricultural research.

Partnerships

- Property and Facilities Division (P&F)
- Faculty of Natural Resources, Agriculture and Veterinary Science (now Faculty of Science)
- Student Wildlife Association of Gatton
- Greening Lockyer

Contact Information

Sustainability Office

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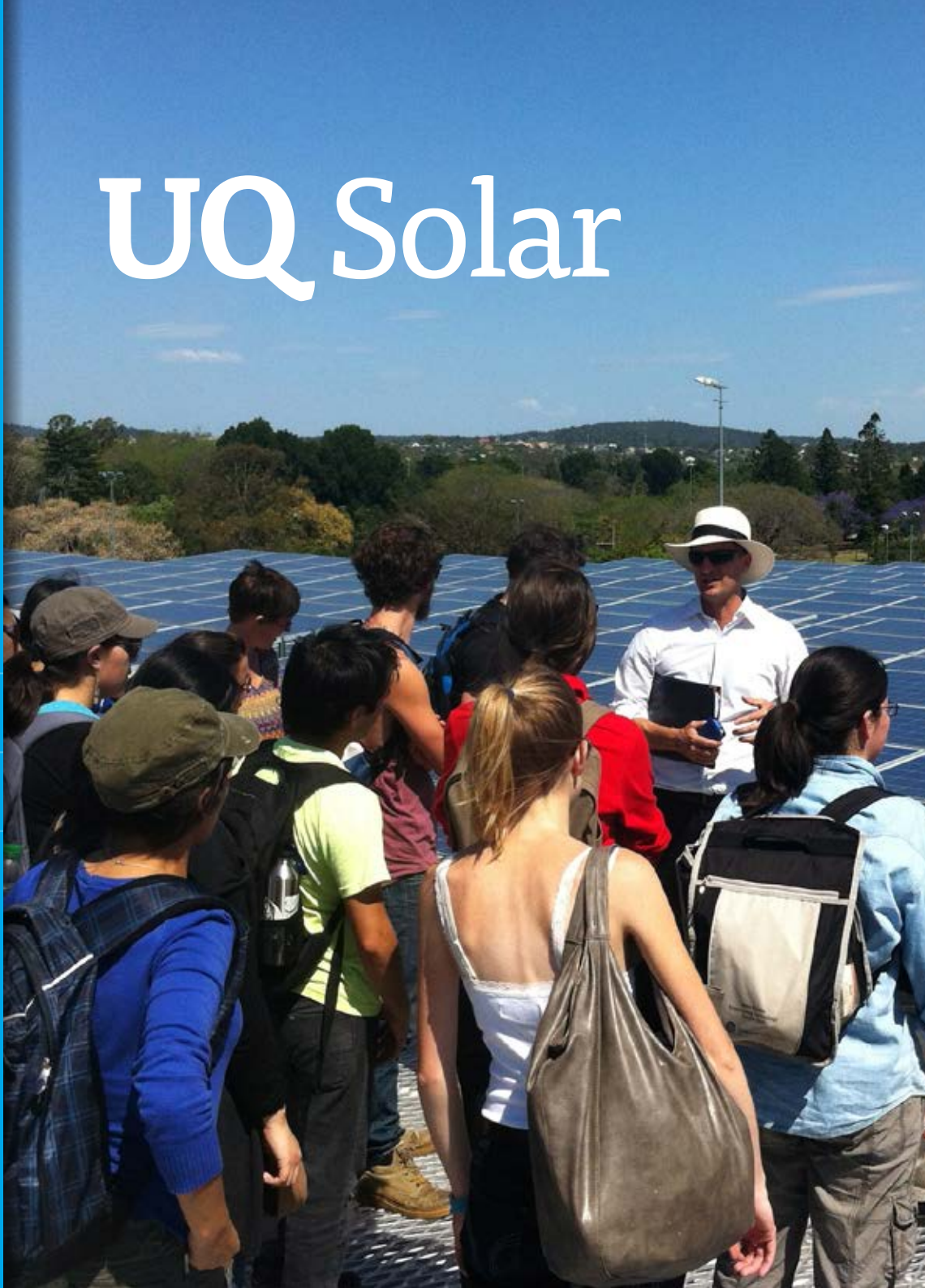


THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA



Sustainability

UQ Solar



Project Summary

On 15 July 2011, UQ launched Australia's largest flat panel rooftop photovoltaic (PV) solar system at its St Lucia campus: a \$7.75 million, 1.22 megawatt (MW) PV solar array, including an 8.4 kilowatt (kW) concentrating photovoltaic (CPV) array. The UQ Solar Research Resource Centre opened to provide a location for industry, school and community groups to visit and learn about the UQ Solar Array and renewable energy.

The centre is an assortment of multimedia displays, interactive screens, photovoltaic panel samples, information boards and aerial photographs of the installations across campus. Visitors can come to the centre to learn about solar energy at UQ and view live energy data streamed directly from the PV panels. UQ Solar system information and performance data is readily accessible to the public on the UQ Solar website.

Additional panels have been added to the UQ Array increasing its capacity to 1.76MW. Projects expected to be completed this year include an additional 255kW at St Lucia, 76kW at Oral Health Centre, 30kW and 3.275MW Solar Research Plant at Gatton. The 3.275MW pilot plant will be Queensland's largest solar power installation and will include more than 34,000 panels in a ground-mounted array. The facility will allow UQ Solar to compare and contrast new technologies by studying the electrical and economic performance of multiple PV mounting technologies through the installation and operation of fixed-tilt, single-axis and dual-axis tracker technologies side-by-side in the same field.

Project Name

UQ Solar

Institution

The University of Queensland

Completion Date

15 July 2011

Key Stakeholders

- Property and Facilities Division (P&F)
- School of Mathematics and Physics
- Global Change Institute
- School of Information Technology and Electrical Engineering
- School of Economics
- Centre for Organic Photonics and Electronics
- Institute for Molecular Bioscience
- School of Mechanical and Mining Engineering
- School of Chemical Engineering

Left: Students learning about the rooftop photovoltaic array

Right: Tour group learning about the concentrating photovoltaic array



Leadership

Social Outcomes

- Potential to increase: acceptance of renewable energy developments; awareness of renewable and sustainable energy technologies and issues; uptake of low carbon technologies; and sustainable behaviours.
- Strengthens UQ's corporate credentials as a socially and environmentally responsible organisation.
- Demonstrates community leadership in renewable energy.

Environmental Outcomes

- Reduces UQ's reliance on carbon intensive energy sources.
- Provides approximately 5-6 per cent of UQ St Lucia's peak electricity demand.
- More than 1,750 tonnes CO₂-e will be saved at UQ St Lucia per annum – about the same as taking 335 cars off the road each year.

Cultural Outcomes

- Encourages organisational sustainability culture, in line with the core strategic objectives of learning, discovery and engagement
- Shows that UQ can lead by example and "walk the talk", and inspire others to do the same, enhancing UQ's reputation.

Economic Outcomes

- Reduces electricity costs. Depending on future electricity costs, the infrastructure is projected to pay for itself within 10-12 years.
- Helps to ensure stable energy prices and increase the security of our energy supply.

Links to Teaching

- Boosts teaching, learning and research – tours of the array and the UQ Solar Research Resource Centre are conducted during UQ Sustainability Week.
- Used by academics in teaching. Academics have the opportunity to incorporate into curriculum and allow students to put theory into practice.
- Encourages active learning as it is a practical example of solar energy technology and a freely available and valuable source of real data for students to use in assignment work.

Links to Research

- Used by academics in teaching and research.
- UQ Solar Research Resource Centre
- Solar Research Projects include:
 - Next-generation Battery Storage
 - Concentrating Photovoltaic Array
 - Shading Analysis and Smart Modules Research

Partnerships

St Lucia installation:

- UQ funded with \$1.5 million contribution from the Queensland Government's Office of Clean Energy.
- UQ's P&F and School of Mathematics and Physics worked with engineering consultants Aurecon and contractor Ingenero.
- Ingenero installed more than 5000 polycrystalline silicon solar panels, worked on its design and engineering, and donated the SolFocus CPV array.

- Trina Solar supplied the panels and will be part of several research projects. Power-One supplied the inverters.
- Energex provided \$90,000 to assist in developing specialised computer software to monitor the quality of the solar power feed and interaction with the local grid network.

Gatton installation:

- UQ's P&F will project manage delivery of plant and high voltage infrastructure, research building and data hub control room, and manage and operate the plant.
- First Solar for the construction of the solar photovoltaic research facility.
- \$40.7 million Federal Government grant, via the Education Investment Fund.
- Part of an AGL Energy project.
- Supported by the Australian Renewable Energy Agency (ARENA).

Contact Information

UQ Solar experts

www.uq.edu.au/solarenergy/solar-experts



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA



Sustainability



Project Name

UQ Sustainability Walk



Institution

The University of Queensland



Completion Date

2012



Key Stakeholders

• Property and Facilities
Division (P&F)



Sustainability Walk



Sustainability



© Jenny Thorne

Intellagama lesueurii
EASTERN WATER DRAGON

The Eastern Water Dragon is another urban 'survivor'. Males can grow up to 1 metre with two thirds of their length comprised of their tail. Eastern Water Dragons spend most of their day basking in the sun on rocks or branches around creeks, but if disturbed will quickly leap into the water where they can stay submerged for up to an hour. Breeding males display bright red and yellow markings, and communicate through head-bobbing and arm-waving. Fossils from this genus have been recorded in Queensland from around 20 million years ago.



Project Summary

The UQ Sustainability Walk tells a unique story and unveils a fascinating snapshot of sustainability highlights on UQ's St Lucia campus. It provides an overview of the wide variety of sustainability initiatives and cutting edge research currently being explored by the University.

The walk showcases over 30 sustainability destinations across five UQ sustainability themes of renewable energy, biodiversity, water, recycling and waste, and transport systems. Twenty-six of the destinations are located in the lakes precinct, highlighting the beautiful St Lucia grounds abundant with native flora and fauna. Each location, with interpretive signage, can be found on the UQnav smart phone app or online on the UQ Sustainability website.

Leadership

Social Outcomes

- Improves campus-wide engagement and collaboration, and encourages social connections and interactions with sustainability promotional events.
- Establishes valuable links with community groups.
- Inspires people to care about the environment and live sustainably.
- Promotes exercise and an active lifestyle, which reduces stress and anxiety.

Environmental Outcomes

- Plays a vital role in improving the campus, creating a healthy and pleasant environment.

Cultural Outcomes

- Displays UQ's commitment to environmental sustainability.
- Encourages organisational sustainability culture, in line with the core strategic objectives of learning, discovery and engagement.
- Demonstrates leadership in sustainability, enhancing UQ's reputation.
- Engages the UQ community, boosting environmental awareness and encourages a sense of pride in UQ.
- Highlights sustainability initiatives.

Economic Outcomes

- Encourages local community, visitors, prospective staff and students on campus by raising awareness of the sustainability features of UQ St Lucia.
- Encourages donations or investment in UQ.

Links to Teaching

- Interpretive signage and markers allows visitors to learn about the sustainability features and wildlife around campus, enhancing environmental education and awareness.
- Direct engagement with hundreds of UQ students, researchers, academics, industry and the wider community.

Locations used by academics in teaching e.g. Lakes Precinct Biodiversity Centre, Bush Tucker Garden, Bioretention Basin, GCI, UQ Solar Resource Research Centre and Solar Concentrator.



Links to Research

- Locations used by academics in research e.g. GCI, UQ Solar Resource Research Centre and Solar Concentrator.
- Encourages active learning.

Partnerships

- Property and Facilities Division (P&F)
- HASSELL – concept design
- Dot Dash – signage design
- All Images – signage manufacture and installation

Contact Information

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Left: Students watching wildlife at UQ St Lucia's main lake (Photo by Sendi Wings)

Above left: Recycling on campus (Photo by Michael Hewson)

Above right: Concentrating photovoltaic array (Photo by Michael Hewson)



Project Name
UNSW Sustainability Report



Institution
UNSW Australia



Completion Date
Annual Report - 2013 to onwards



Key Stakeholders

- UNSW Sustainability
- UNSW Facilities Management
- UNSW Arc



UNSW Sustainability Report

Project Summary

UNSW's first Sustainability Report sets out our environmental and social performance, as well as an overview of how the university is tracking in sustainability research and education.

The intention of this report is to provide an annual sustainability snapshot so that we can clearly and transparently give an account of what we have been doing in the last year, what has been improving and where we see opportunities for positive change.

UNSW's Sustainability Report released in 2014 and reporting performance over the 2013 calendar year, is a landmark initiative and great achievement for the University.

The report:

- identifies the sustainability issues that impact on the environment and society as a result of UNSW business activities
- describes UNSW's journey towards sustainability, including past achievements, current initiatives and future aspirations
- provides a 2013 sustainability snapshot so future improvements can be easily identified.

The sustainability challenges we face on a national and global scale are considerable, but as education and research institutions Universities have a unique and positive role to play in pioneering sustainability adaptation. Sustainability Reporting plays an important role in equipping managers with the knowledge and skills required to address sustainability issues at their core.

Leadership

Social Outcomes

The Higher Education sector's biggest social impact is in its contribution to human knowledge and research. Sustainability Reporting covers more than environmental impact including social indicators such as gender equity and diversity, volunteering, and health and wellbeing.

Environmental Outcomes

The process behind sustainability reporting reveals new and emerging social and environmental issues. Environmental outcomes measured in the report include energy and carbon emissions, waste and recycling, water use, travel, and the campus grounds and natural environment.

Cultural Outcomes

Sustainability Reporting highlights the interests and concerns of our stakeholders as well as supporting and encouraging engagement and participation among departments, general staff, students and wider community.

UNSW is the first university in the Group of Eight to publish a stand-alone, publicly available Sustainability Report. We don't want to be or expect to be the last. Over time sustainability reporting will become business as usual and this will influence what Universities value and measure themselves against, reinforcing a sustainability culture.

Economic Outcomes

Sustainability reporting adds economic value improving internal management and decision-making processes examined, leading to cost reductions by measuring and monitoring such issues as energy consumption, materials use, and waste.

Links to Teaching

Non-financial reporting, including Sustainability Reporting, is studied in several undergraduate and postgraduate coursework and research subjects including in the UNSW Business School and UNSW Science Faculty. UNSW's Sustainability Report is now used as a case study in learning and teaching and UNSW Sustainability regularly presents guest lectures and distributes a research paper about the UNSW report and the benefits of sustainability reporting generally.

Links to Research

The report is based on the Global Reporting Initiative, one of the most widely used international frameworks for sustainability reporting and acknowledges that 'sustainability' encompasses not just environmental, but social, cultural and economic dimensions.

UNSW Business School research academics include high-ranking members of the Global Reporting Initiative, the International Accounting Standards Council and the International Integrated Reporting Council. These UNSW academics were key stakeholders in the development of UNSW's Sustainability Report and subsequently use the report to add credibility and support external research collaboration in sustainability reporting research and practice.

Partnerships

Transparency about non-financial performance helps to open up dialogue with stakeholders such as students and staff, communities and service providers, and demonstrate leadership, openness and accountability. An essential aspect of the development of the sustainability reporting involves engagement with key stakeholders and partners. At the beginning of the development of the sustainability report key UNSW stakeholders were interviewed. Feedback data was collated and analysed and included in a register to rank the emerging issues based on the frequency with which they were referred to and the spread of interest in an issue across our different stakeholder groups.

Contact Information

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**Project Name**

Recycling of UNSW e-waste

**Institution**

UNSW Australia

**Completion Date**

Ongoing

**Key Stakeholders**

- Sustainability Materials Research & Technology (SMaRT@UNSW)
- UNSW Sustainability
- Australian Research Council (ARC)
- TES-AMM Australia



Recycling of UNSW e-waste



Project Summary

UNSW's Sustainability Materials Research and Technology, SMaRT Centre, has devised a project that uses e-waste collected by UNSW Sustainability and investigates ways to recycle the components.

The e-waste research project will involve two stages. First, the e-waste is broken down and catalogued. Next, relevant components are used in experiments to determine the possibilities for resource recovery.

As part of the first stage phones and tablets have been taken apart and separated into their basic components. Components are then catalogued. This involves taking photographs of all the components, including the cover, the battery, the printed circuit boards, the screen, etc., of each device, recording the weight of each component, and adding brief descriptions.

Using the catalogue of available material, researchers from the SMaRT Centre then identify ways to utilise the electronic waste in a variety of research projects. The aim of these projects is to better understand recycling methods of e-waste.

Leadership

Social Outcomes

The project demonstrates collaboration between UNSW Sustainability and interdisciplinary researchers and scientists from different backgrounds to discover and initiate clever solutions to this significant societal issue of e-waste management.

Environmental Outcomes

- Better understanding of e-waste development of potentially commercially viable solutions to re-using and recycling electronic components.
- Research leading to utilising more recycled non-renewable materials, decreasing reliance on mining non-renewables, also known as 'above ground mining'.
- Scientific experimentation leading to better understanding of the handling of electronic devices at end of life.
- The collection of unused, old and/or broken electronic devices preventing the dumping in landfills of e-waste. This would have harmful implications of heavy metal poisoning and pollution of surrounding environment.
- Potentially leading to the significant decrease of waste disposal in landfill, reducing pressure on garbage trucks and required space for landfill.

Cultural Outcomes

- Demonstration of the University's commitment to collaboration between research and operational units.
- Demonstration of the University's commitment to environmentally friendly disposal and cutting edge recycling technologies.
- Gaining knowledge which can be spread as public awareness for managing waste and acting in an environmentally friendly manner collectively in communities.

Economic Outcomes

- Reducing the growing reliance on dumping sites and garbage trucks which are costly.
- Reducing need of precious metal mining required for new electronics development.
- Creating a high-tech recycling market with endless possibilities of future development of equipment and processes used in an advanced recycling industry.

Links to Teaching

Students of varying scientific backgrounds and stages as well as researchers gain understanding regarding e-waste composition. Using this they can conduct appropriate experimentation leading to better recycling processes of intricate composite materials. Gained understanding can be used in teaching both within the university and also to the wider community.

Links to Research

This is an ongoing scientific research project involving researchers and scientists from different backgrounds.

Partnerships

- Sustainability Materials Research & Technology (SMaRT@UNSW)
- UNSW Sustainability
- Australian Research Council (ARC)
- TES-AMM Australia

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