



THE UNIVERSITY  
OF QUEENSLAND  
AUSTRALIA

# ENVIRONMENTAL SUSTAINABILITY REPORT 2012

Submitted by the Sustainability Office, Property and Facilities Division, on behalf of the Sustainability Steering Committee





President and Vice-Chancellor's Message	2
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## CORPORATE SUSTAINABILITY

Sustainability Steering Committee	4
Carbon Management	4
Engagement Working Groups	5
Staff Development	5
Sustainability Website	5

## UQ'S STRATEGIC THEMES

Learning	6
Discovery	6
Engagement	8

## CAMPUS SUSTAINABILITY

Energy	10
Transport	13
Recycling and Waste	14
Purchasing	14
Water	14
Biodiversity	14
Built Environment	15
Risk	16
Campus Engagement	18
UQ Sustainability Structure	20

## President and Vice-Chancellor's Message



Modern tertiary institutions have an important role to play in helping meet the growing environmental, social and economic challenges facing our society. As a top 100 university in the world's four leading independent rankings and in the top 10 globally in environmental science, The University of Queensland has the ability and responsibility to help address these challenges.

UQ's Energy Initiative, launched in late 2012, integrates the University's many and varied strengths in energy research. With an emphasis on sustainability, the initiative brings together researchers, government and industry to explore energy options and inform policy. As a core objective, the Energy Initiative supports renewable energy technologies and facilitates the development of new concepts and emerging solutions to address global energy issues.

In 2012 the Global Change Institute (GCI) secured its position as a lead research organisation in the national Solar Flagships program. Building on existing strengths in clean energy technologies, UQ researchers will inform the design and operation of what will be Australia's largest solar power project. Split over two sites in western New South Wales, the Solar Flagships project will generate an expected capacity of 159 megawatts and is a clear demonstration of UQ research directly benefitting the community.

The University's commitment to sustainability extends well beyond research, as we continue to invest in smart design and energy efficiency initiatives to contain our emissions in the built environment. The sustainable designs of the new Advanced Engineering Building (AEB) and the Global Change Institute, and extensive auditing and improvements of our existing infrastructure, will contribute to reducing energy consumption into the future. These projects have benefits beyond carbon reduction – the AEB and GCI will have monitoring technologies to facilitate research and contribute to interactive learning environments, inspiring future directions in sustainability.

UQ is well placed and more determined than ever to lead innovation in sustainability with dedicated staff, students, alumni and industry partners. In particular, I would like to acknowledge the staff of the Deputy Director's Office, Property and Facilities Division, for their support and commitment to sustainability initiatives throughout 2012. I have no doubt that we will continue to surpass expectations in providing leadership in this area to serve community needs for generations to come.

**Professor Peter Høj**  
President and Vice-Chancellor  
The University of Queensland





*The UQ Global Change Institute Building  
(artist impression)*

# CORPORATE SUSTAINABILITY

## Sustainability Steering Committee

Throughout 2012, the Sustainability Steering Committee (SSC) continued to provide leadership to the University community in embedding sustainability across UQ campuses and sites and across all areas of learning, discovery and engagement.

Reporting directly to the Vice-Chancellor, the SSC met on 5 occasions in 2012 to oversee a number of corporate and operational initiatives supporting the University's sustainability strategies.

Some of the key focus areas include:

- Considering environmental, economical and social sustainability in developing and implementing new and existing strategies and programs.
- Establishing a sustainable direction for UQ including objectives, targets and plans, and monitoring progress and reporting successes against them.

- Engaging with industry groups and organisations to benchmark UQ's sustainable performance and learn from other's successes.

## Carbon Management

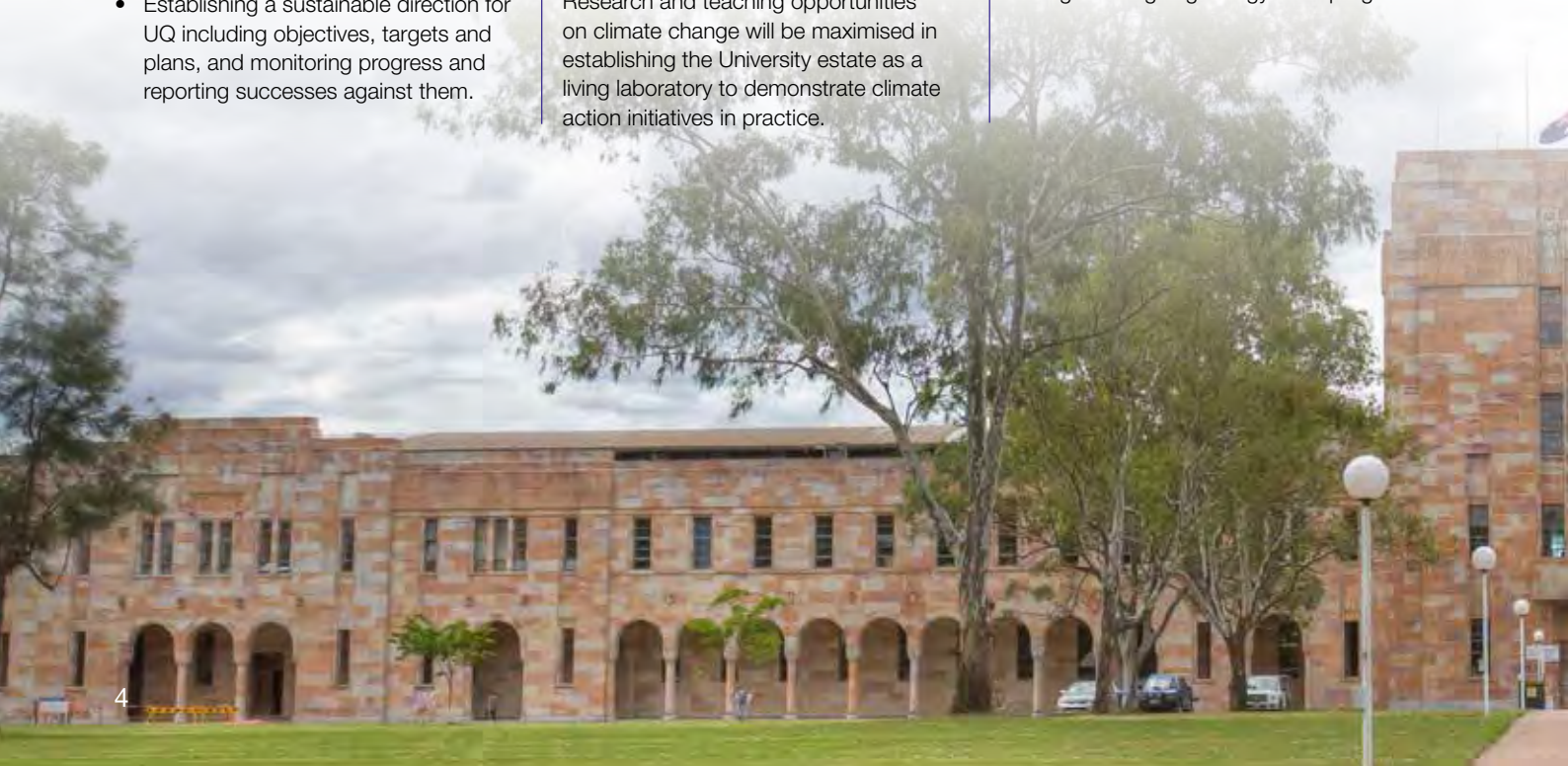
UQ continued to exceed mandatory carbon compliance by embracing opportunities to integrate core business and operational objectives in 2012. In reducing carbon emissions, UQ positions itself as a leader in sustainability while minimising operating costs and resource consumption.

The University finalised a draft Climate Action Plan to detail the institution's greenhouse gas reduction targets to 2020. The plan outlines a suite of activities designed to achieve established targets. Expected benefits from the Climate Action Plan extend beyond carbon reduction. Research and teaching opportunities on climate change will be maximised in establishing the University estate as a living laboratory to demonstrate climate action initiatives in practice.

In addition, UQ's carbon strategy initiatives included:

- closure of the Pinjarra Hills incinerator saving the equivalent of approximately 1,000 tCO<sub>2</sub>;
- installation of photovoltaic solar arrays at Moreton Bay and Heron Island research stations;
- replacement of P&F car fleet vehicles with hybrid and electric models resulting in 25 percent reduction of emissions from 2009 levels;
- installation of a heat recovery system on the Gatton dairy; and
- an increase in overall cycling facilities across all campuses and sites, including the opening of a new end-of-trip facility on the St Lucia campus.

Identifying energy saving opportunities throughout the portfolio is achieved through an ongoing energy audit program.







# Sustainability

## Engagement Working Groups

Project groups were formed in 2012 to focus on some of the key project areas identified by the Sustainability Engagement Working Group in 2011.

The Paper and Print Working Group reviewed the scope of paper utilisation at the University and are working on identifying opportunities for more sustainable solutions to printing and paper consumption.

The Colleges Sustainability Working Party met throughout the year with guest speakers facilitating discussion on UQ programs and opportunities in areas including management of energy, waste, water, procurement, transport, built environment, environmental risk and student engagement. The focus of this group is to leverage the combined knowledge and existing programs for the college community.

## Staff Development

Sustainability courses continued to be offered to UQ staff throughout 2012.

Training in the University's duty of care and correct environmental practices continued to be well attended with courses offered in the Environmental Management System and Emergency Procedures / Spill Kits. Both courses were held at St Lucia, Gatton and Herston campuses and additional courses were run as requested by specialist groups.

Courses for staff on reducing their environmental impact were offered for the second consecutive year. Training for staff joining the Green Office program was included in the Staff Development Program for the first time, which corresponded with an increase in enrolments in this program.

## Sustainability Website

The Sustainability website continued to be the key point of contact for students, staff and the wider community to connect with UQ Sustainability.

The website was updated weekly throughout 2012 to provide up-to-date information on news and events. The significant addition to the website was the content supporting the Sustainability Walk. Each destination as well as maps and navigational information was uploaded to support and promote the Sustainability Walk to be launched in early 2013.

Visits to the website increased by 49 percent in 2012 and the overall page views increased by 27 percent, comparatively with 2011. Interest in the Sustainability Newsletter continued to grow, with subscriptions more than doubling over the year.

<http://www.uq.edu.au/sustainability/>



# UQ'S STRATEGIC THEMES

## Learning

The University of Queensland is intent on making environmental sustainability a core teaching and learning principle.

The Sustainability in Teaching and Learning working group is currently exploring ways to better structure existing sustainability programs into undergraduate programs throughout the University of Queensland. The ultimate aim is to ensure that all UQ graduates will possess a basic understanding of sustainability concepts, as well as the challenges that come with implementation.

The working group is currently investigating ways to build on and better coordinate the University's existing education efforts in sustainability. This substantial portfolio of existing courses and programs is currently delivered throughout the University and in many different forms. Better identification of the strengths and specifics delivered through existing courses or programs will assist in the development and promotion of sustainability as a core principle of business, education and society in general.

## Discovery

Driving research in environmental sustainability is a key focus for many faculties and institutes. Many discipline areas, including energy, business, mining, food security, environmental conservation, urban planning, water security, architecture and engineering share this focus. UQ's Global Change Institute (GCI) draws expertise from across the University, in acting as a vehicle for collaborative research in major global change issues.

### UQ Energy Initiative

Officially launched in November, the UQ Energy Initiative was established to explore ideas and solutions for more efficient, less emissions-intensive technologies, which can contribute to a future of economic prosperity and sustainability. A key focus is to facilitate engagement between the University's best researchers and leaders in industry and government, to investigate energy options and inform policy. Capabilities are drawn from across four UQ faculties and six institutes, guiding the energy future through scientific discovery and technological innovation.

### Competitive Power Report – Part 2

The Global Change Institute released part one of a three-part series entitled "Delivering a Competitive Australian Power System" in late 2011. Part two was developed in 2012, in time for publication in early 2013. Part two explores possible scenarios to deliver a competitive Australian power system by 2035. These scenarios show that Australia's electricity sector will not meet an 80 percent emissions reduction target by 2050.

## Healthy Oceans

A major partnership with Catlin Insurance, Google and Underwater Earth was launched to document the composition and health of the world's coral reefs across an unprecedented depth range of 0-100m. The Catlin Seaview Survey has generated over 50,000 photographic samples as well as expanded the current information on the state of deep water reef systems in the Great Barrier Reef.

The GCI continued to support the development of an ARC Linkage Project, which explores how next generation satellite tools can track changes in coral reef ecosystems as a result of global and local stressors.

### Australian Sea Level Rise Partnership

The Australian Sea Level Rise Partnership (ASLRP) provided key policy-makers with credible information on sea level-rise projections so planning may be accommodated in policies. The work is a culmination of research that fully integrates the expertise of five postdoctoral fellows, and is a significant milestone in the performance of such an interdisciplinary team.

### Land use and Food security

The GCI examines factors most likely to impinge on effective land use and food security - climate change, population growth, consumerism, resource availability and new technologies - and how they can be managed in an equitable and sustainable manner. During 2012, the GCI made significant progress in achieving this.





# LEARNING DISCOVERY ENGAGEMENT

## UQ Solar

Australia's largest flat-panel solar array at The University of Queensland celebrated its first birthday in 2012 and achieved a record for peak power output. The 1.22 megawatt photovoltaic solar array generates power to the University's head campus in Brisbane and underpins research in diverse areas, including power systems, engineering, physics, economics and sustainability.

## Solar Flagships Project

The University secured a role in 2012 as a Lead Research Organisation in the Australian government's Solar Flagships program. UQ researchers will build on existing knowledge in renewable energy technologies to inform the design and operation of two solar photovoltaic projects with an expected combined energy output of 159 MW to be built in western New South Wales. The project is the first of its kind in Australia and will be one of the largest solar power projects in the world.

## Australia-US solar energy initiative

In December, UQ partnered with CSIRO, six Australian universities, the United States' Department of Energy's National Renewable Energy Laboratory (NREL), Sandia National Laboratories and Arizona State University, in a solar research program, with the aim of developing cleaner and cheaper energy options.



# UQ'S STRATEGIC THEMES

## Future Food Landscapes

In collaboration between the GCI and the Melbourne Sustainable Society Institute (University of Melbourne), researchers are responding to questions raised by the growing challenge of increasing populations and demand for resources including increasing demand on food production.

This collaboration will undertake to explore and provide responses against future scenarios relating to the use of land for agricultural and food production purposes.



## Engagement

UQ Engagement in sustainability focuses on enhancing the University's contribution to global and local communities and communicating effectively with our many stakeholders to build support and advocacy for strategic objectives in learning and discovery.

### Land Use and Food Security

The GCI partnered with the Crawford Fund, the Doyle Foundation and the Syngenta Foundation for Sustainable Agriculture to produce a series of policy briefs. The series, which explore the emerging issues in food security, was launched on the eve of World Food Day, in the presence of the Governor of Queensland, Her Excellency Penelope Wensley AC.

The GCI also hosted a half-day forum on "Mining and Agriculture: working together to produce more food" in partnership with the Crawford Fund consisting of industry and research participants.

### Coral Conservation Workshops

A UQ-based not-for-profit organisation, CoralWatch, offered free public workshops on coral conservation over two days

during National Science Week 2012. The project was aimed at raising awareness about the importance of marine life in Moreton Bay and showing how science can help ensure the future health of the region.



### Renewable Energy Forum

During August, the GCI hosted a series of seminars, discussions and tours, which explored renewable energy and the complex maze of problems and solutions of future energy systems. Experts from the Australian Geothermal Energy Association, ThinkClimate and Vestas joined University of Queensland researchers to address the issues facing Australia's transformation to a low-emissions future.



### Solar Research Resource Centre

The GCI's Solar Research Resource Centre continued to generate interest as an educational and learning resource receiving over 40 groups comprising over 250 visitors in 2012. The Centre was host to a range of stakeholders including public members, school groups, government officials and representatives of industry, with many enjoying the opportunity of getting up close by viewing the solar panels on a rooftop tour.

### CarbonGame

To help policy-makers, managers and technical professionals understand how carbon is traded in this time of exponential change, the Global Change Institute partnered with the School of Geography, Planning and Environmental Management in the development of an interactive simulation tool called CarbonGame. The CarbonGame teaches advanced practical skills in carbon management through a range of high impact group-gaming learning opportunities. Researchers are now developing an executive training program based on the game and current course offerings. Interactive workshops on the game were delivered to key change agents in Brisbane, Canberra and Melbourne and the team is targeting opportunities further abroad.



*A tour group is inspecting the UQ concentrating photovoltaic array*

### Insight Seminar Series

For the third year running the Global Change Institute hosted the Insight Seminar Series designed to engage with a range of international, national and local speakers from across a broad field of global change topics. The series is open to the general public, but directed at interested parties from industry and academia. Attendance continued to increase in 2012 from previous years.

The 2012 program included the following speakers:

- Dr Ben Halpern, Center for Marine Assessment and Planning and National Center for Ecological Analysis and Synthesis, both based at University of California, Santa Barbara
- Dr Partha Sen, School of Economics, Delhi
- Dr Malte Meinshausen, School of Earth Sciences, University of Melbourne and Potsdam Institute for Climate Impact Research, Germany
- Dr Sharon Strauss, Department of Ecology and Evolution, University of California Davis
- Professor Ben Hankamer, Institute for Molecular Bioscience, University of Queensland
- Rodger Whitby, General Manager Generation, Ingenero
- Dr Carlos Duarte, Oceans Institute, University of Western Australia and Mediterranean Institute for Advanced Studies, Spain
- Dr Robert Costanza, Crawford School of Public Policy, Australian National University



# CAMPUS SUSTAINABILITY

## Energy

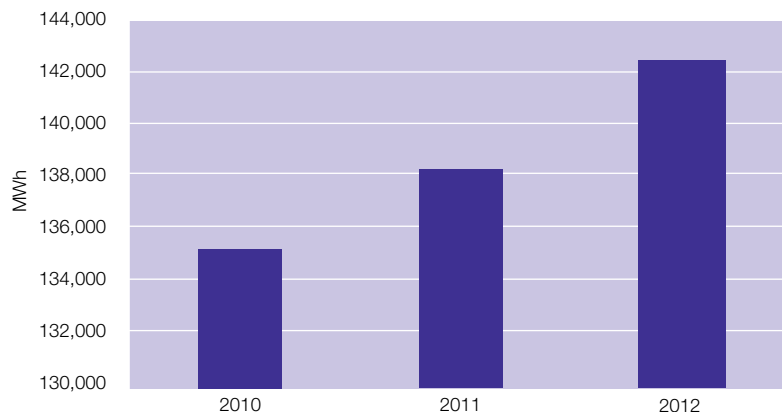
### Energy Utilisation and KPIs

Over 90 percent of energy used on UQ campuses and sites is in the form of electricity. Growth in electricity consumption has become a significant focus at UQ due to ever increasing costs and a growing awareness of the environmental impacts of fossil fuel power generation.

In 2012, electricity consumption at the University's main sites reached 142,600 MWh, which represented an increase of 3 percent over 2011. The main reasons for this increase were the growth in student numbers and intensification of research activities, both resulting in expansion of air conditioning services and the development of new buildings and laboratories.

Despite a seemingly moderate growth in consumption, UQ's annual electricity bill for its major campuses increased around 16 percent from 2011 to 2012, after a similar rise from 2010 to 2011. Electricity charges have almost doubled since 2010 and are forecast to be just under \$20 million for 2013. Costs have increased at a faster rate than consumption due to rapidly escalating network charges and new environmental levies, such as the price on carbon introduced last year. Further increases in network charges are expected in the future to cover the cost of expanding the South-East Queensland grid to meet growing peak demand.

UQ Electricity Consumption – Major Sites



UQ Electricity Expenditures – Major Sites



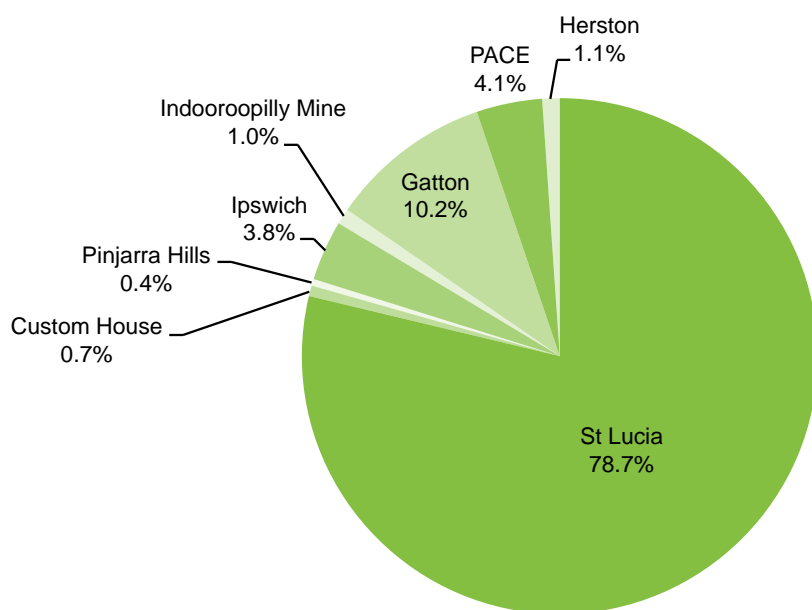


Solar panels on the roof of the UQ St Lucia Multi Level car park

The St Lucia Campus is by far the largest of the UQ campuses and unsurprisingly it accounts for almost 80 percent of the University's total electricity consumption, followed by the Gatton campus at 10 percent and the PACE Institute at 4 percent.

In 2012, UQ's electricity consumption resulted in roughly 123,000 tonnes of CO<sub>2</sub> equivalents, making electricity use the University's largest source of carbon emissions.

#### 2012 UQ Electricity Consumption – Major Sites



#### Photovoltaic

The University's 1.22 MW flat-panel rooftop photovoltaic solar system celebrated its first birthday in 2012 and achieved a record for peak power output. Over 1.7 million kilowatts of energy was generated in the first year since installation, saving in excess of \$220,000 and 1,700 tonnes of CO<sub>2</sub> equivalents.

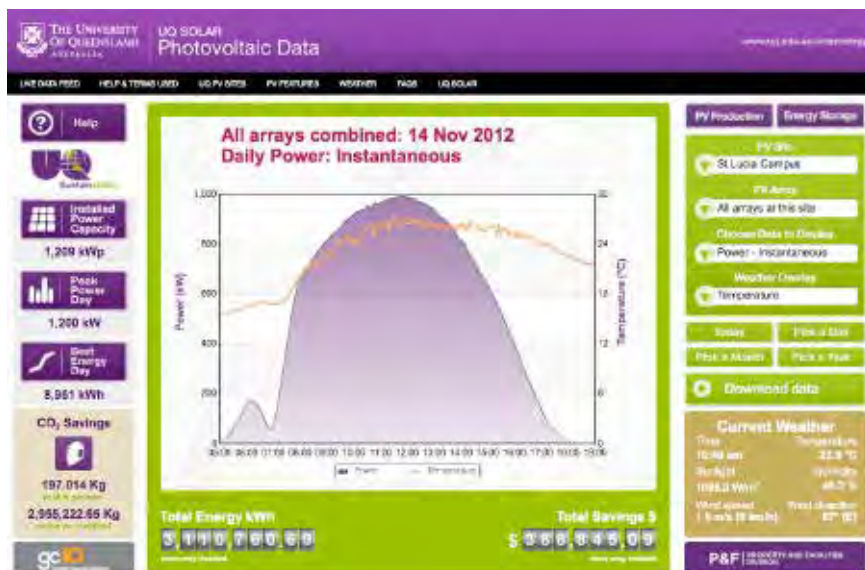
The installation of a RedFlow battery in June enabled researchers to access potential power provision in peak times. The zinc bromine flow battery is more environmentally friendly than lead-acid batteries.

More than 250 visitors toured UQ's Solar Research Resource Centre to learn about how UQ is harnessing solar power. Government, industry groups, visiting university delegations and school and university students toured the centre accessing live data on energy generation.

#### UQ Solar Website

The UQ Solar website was expanded in 2012 with the addition of live energy data for the Gatton PV installation. The interactive display shows daily, monthly and yearly energy production for St Lucia's 4 main PV arrays since 2011 as well as other useful metrics on carbon and financial savings. Data for the Gatton PV array was added in August 2012. This information is used by staff and students in researching solar technologies.

# CAMPUS SUSTAINABILITY



UQ's Solar Array collection data for November 14, 2012 when a solar eclipse was experienced across much of Queensland.

The UQ Solar website also provides technical information for all of the UQ PV arrays located at St Lucia, Gatton, North Stradbroke Island and Heron Island. The PV display is available to the public through the UQ Solar website.

[www.uq.edu.au/solarenergy/](http://www.uq.edu.au/solarenergy/)

## Energy Efficiency Projects

The University audited the energy performance of 12 buildings in 2012, bringing the total over the last three years to 21 out of the 35 major buildings on the St Lucia campus. The auditing results informed recommendations to retrofit with more efficient lighting, make changes to the operation of air conditioning and continue programs to encourage students and staff to take small steps to conserve energy, such as switching off equipment when not in use.

UQ has now completed sufficient audits to satisfy its obligations under the Federal Government's Energy Efficiency Opportunities legislation. The remaining 14 major buildings are scheduled for auditing in 2013.

The ability to measure energy use of buildings and key services such as air conditioning is essential when determining progress of energy efficiency projects and in identifying opportunities for further improvement.

The metering requirements for almost all of St Lucia's 35 major buildings have been satisfied following the installation of a large number of digital power meters throughout the year. The remaining requirements will be completed in the first half of 2013. In addition, a licence was purchased for new user-friendly software, enabling metering reports to be easily created.

In addition, the University has been carrying out works on large chiller stations that service up to 12 buildings each. Thermal metering was installed on two chiller stations and two additional buildings in 2012, following on from work already carried out in 2011. It is expected that by the end of 2014, all chiller stations will be equipped with thermal meters, covering all of the 35 significant buildings on the St Lucia campus.

## Lighting Retrofits

UQ intensified efforts to identify and implement opportunities to retrofit lighting throughout the year. Lighting technology surveys were carried out on six major buildings (gross floor area greater than 5,000 m<sup>2</sup>) on the St Lucia campus to determine current lighting stock and to identify opportunities for improvement.

Full lighting retrofits were carried out on eight buildings, with expected annual

savings of 96,000 kWh. The University also started to focus on the newly occupied Long Pocket Campus, where internal audits led to a further expected annual energy efficiency gain of 12,000 kWh.

Additional efficiencies were achieved by performing de-lamping activities, swapping of 35W Halogen and 50W dichroic lamps for less energy intensive lamps and installing lighting sensors in meeting rooms. Lighting retrofits were also conducted at the Moreton Bay Research Station and at Dunwich on North Stradbroke Island.

## Chilled Water Production

Data from thermal metering installed on chiller stations has indicated room for improvement in the production and distribution of chilled water. The feasibility of installing an optimisation package strategy on the Central Chiller station was investigated during 2012. Such packages ensure that the operation of chillers, pumps and cooling towers are fully coordinated and optimised to produce chilled water in the most energy efficient manner. A proposal for the Central Chiller Station received approval in principle for installation during 2013.

## Building Management System Reviews

At the end of 2012 a systematic review program was initiated for the performance of air conditioning plants and equipment. Part of this program involves improvements to building management system visibility via better graphics and other changes to the interface. So far, scheduling errors and a number of problems have been resolved. Opportunities were identified during this exercise to modify existing plant operations to improve the efficiency of after-hours air conditioning.



## Other Activities

A number of miscellaneous improvements were also made during the year. At the Heron Island Research Station, for example, in a joint venture with the Science Faculty, an inefficient piston compressor was replaced with a modern screw unit. This not only saved energy, it resulted in a reduction of noise pollution from the piston's operation.

## Transport

### Fleet

An ongoing project to incrementally replace the Property and Facilities Division (P&F) car fleet with low emission models continued through 2012. P&F's internal fleet and hire fleet custodians have used this experience in the development of a template to be utilised University wide in coming years.

### Zero Emission Vehicles

Originally introduced in 2011 to replace vehicles damaged in the January 2011 flood, there was a surge of interest in the Zero Emission Vehicles (ZEVs) by organisational units in 2012. It is expected that by the beginning of 2013, the Zero Emissions Vehicle fleet will have doubled from the original fleet of five.

The buggies are being identified as practical fit-for-purpose alternatives to internal combustion vehicles. As replacement vehicles are sought, organisational units are being advised to look at the requirement for the vehicle and whether a full electric buggy will suit the purpose for which the vehicle is being considered.

### Bus

The UQ Lakes Bus Terminus effectively doubled in capacity as a result of renovation works carried out during 2012, highlighting the University's commitment to providing sustainable transport options to the community.

### Bike Box

Another dedicated end-of-trip cycling facility for the St Lucia campus opened in May. The Bike Box is providing tangible assistance to the growing number of staff and students who travel to the St Lucia campus by bike. The facility is located in the refurbished flood-damaged UQ Traffic & Parking offices in Building 98B.



The Bike Box aims to provide campus users with an affordable, convenient, realistic and sustainable alternative to motorised transport. The facility offers secure bicycle storage for 90 bicycles, 10 showers, 90 lockers, clothes ironing and drying facilities, and access to a bicycle repair service for \$1 a week.

### Bicycle Parking

In the last twelve months the University has increased the overall bicycle parking inventory across all campuses and sites by 32 percent and by 111 percent since 2007. An additional 450 bicycle racks with a total capacity for 900 bike spaces will be rolled out over the next three years and a program of completely replacing damaged and rusted bicycle racks is due for completion by the start of Semester 1, 2013.

### Safety & Sustainable Transport

In 2012 the University developed and implemented an alternative design for a pedestrian crossing located on the St Lucia campus at the Conifer Knoll intersection. The new crossing features a vibrant zebra-skin paintwork design instead of the usual black and white stripe finish coupled with sinusoidal ramps and shallow vegetation, to increase safety awareness for both pedestrians and cyclists.



*The pedestrian crossing at the Conifer Knoll intersection, before the new design*

*The newly designed "zebra"-pedestrian crossing at the Conifer Knoll intersection*





# CAMPUS SUSTAINABILITY

## Recycling and Waste

### Public Place Recycling

UQ's public place recycling program was expanded in 2012, with recycling stations installed across the Gatton campus and additional facilities installed on the St Lucia campus. The University's long-term commitment to sustainability aims to ensure that more than 50 percent of UQ's public area general waste is recycled, effectively removing 10 tonnes of recyclables from landfill each year.

The University has been working on securing a new waste contract, due to be implemented in early 2013. Expected outcomes include increased resource recovery, leading to a reduction in the University's carbon footprint. Currently UQ recovers approximately 50 percent of known waste with a future target of reducing waste to landfill by 10 percent each year over the term of the new contract. Data will be provided by the contractor for all waste streams to help inform decisions about future waste management initiatives.

### Water Refill Stations

Following the success of a trial program in 2011, water refill stations were installed across the St Lucia campus during 2012.

A 'Say No to Bottled Water' campaign was launched to coincide with the installation of the refill stations. The campaign aims were to raise staff and student awareness of the environmental and financial impacts of disposable bottled water and encourage greater use of reusable water bottles. UQ branded reusable water bottles were distributed on campus as a promotional gift to staff and students to complement the campaign.

### Resource Exchange Events

Resource exchange events were held throughout 2012 with the refurbishment of building areas.

Upon clearance of the building by the occupants, remaining furniture and equipment was checked for OH&S compliance before being made available for selection by UQ staff. The selected

items were relocated by professional removalists within 2 days enabling the construction timeline to be met and avoiding unnecessary storage or disposal of items.

Each event proved very popular and experienced high clearance rates. All items are free and must be relocated to an alternate office within UQ.

These events reduced waste to landfill and avoided the purchase of new items through the reuse of existing resources.

## Purchasing

The University continues to support sustainable procurement practices in order to maintain compliance with the State Procurement Policy. No further progress was made on the Sustainable Procurement Guidelines and Assessment Forms in 2012, however they continue to be a resource for all staff involved in the purchasing process.

The Property and Facilities' Central Store continues to stock and promote sustainable office products, with a reduced range of products from previous years. Sustainable options are available for paper, toner, highlighters and whiteboard markers and other items can be sourced from external suppliers. This accompanies an increasing availability of sustainable office supplies on the market.

Analysis undertaken by the Paper & Print Working Group found that there has been no change in the uptake of recycled paper purchased through the Central Store since 2008, with only 48 percent of paper with recycled content purchased in 2012. Encouragingly, a number of offices, schools, institutes and all library branches were identified as purchasing only recycled content or carbon neutral paper through the Central Store.

UQ branded reusable Keepcups were launched by the Sustainability Office in 2012 to discourage the use of disposable coffee cups. The Keepcups were made available to the UQ community at various events throughout the year and are also available for purchase by employees through the Central Store.

The University also supported the UQ Union's introduction of Fairtrade certified coffee at selected outlets across the St Lucia campus.

## Water

### Water Management

The University continues to maintain strong water management policies and procedures applicable to all campuses and sites in accordance with state permanent water restrictions. Water consumption is monitored on a regular basis to ensure leaks are detected early and to identify opportunities for improved water efficiency.

Potable water consumption across UQ's four campuses was approximately 660ML in 2012, an increase of more than 13ML from last year. Water use per square metre also increased across the four main campuses from 1.04 to 1.07kL/m<sup>2</sup>, but remained within the University's target of 1.1kL/m<sup>2</sup>.

To assist in minimising the University's reliance on town water supplies, alternative water sources continue to play a significant role at UQ. Minor rainwater tanks accounted for more than 4.5ML of water use across all campuses and sites, and opportunities for new tank installations are exploited where possible. UQ lakes at both the St Lucia and Gatton campuses, as well as major ring tanks at Gatton, were again crucial resources for the storage of non-potable stormwater, rainwater and effluent, used for irrigation purposes.

In 2012, the University's water data management systems were reviewed. New processes were established to improve utility data capture, with consumption and cost data recorded for more sites than ever before, allowing greater capacity for the monitoring program and more detailed analysis.

## Biodiversity

UQ understands the importance of protecting its environment and is committed to managing, maintaining and enhancing its campuses and sites. As a result, the University's campuses attract and are home to a large variety of flora and fauna.



### Eel management

During the January 2011 flood, large sections of the St Lucia campus were inundated, including the St Lucia Lakes Precinct, changing the ecological balance. Environmental consultants were engaged in 2011 to provide recommendations to stabilise and return a significant increase in the freshwater eel population to pre-flood levels. A post-management survey was conducted in 2012 which showed that the eel population remains at an acceptable level.

### Ibis management

UQ's ongoing Ibis Management Program continues to be a success. Since its inception in 2006 due to an overabundance of ibis on the St Lucia campus, the management program has maintained the ibis population to an acceptable level and has reduced the adverse impacts of large ibis populations.

### Land for Wildlife

UQ's Gatton Environmental Park joined the Wildlife Conservation Partnerships Program; Land for Wildlife, in 2012. Work is underway to ensure that the site achieves full registration status. UQ's Land for Wildlife areas include the Indooroopilly Mine, the Ipswich campus, the St Lucia campus's Lakes Precinct, river bank along John Oxley walk and Alumni Teaching Gardens.

### Gatton Tree Planting

In partnership with the University, SEQ Catchments by means of the GreenWorks Program, funded an important revegetation project at the Gatton campus. The project involves planting of the critically endangered Swamp Tea-tree (*Melaleuca irbyana*) between two remnant patches to create over 5 hectares of forest. On completion, the project will result in an increase in ecosystem resilience, providing important habitat for biodiversity and sequestering greenhouse gas emissions. Almost 2,000 trees were planted in the first stage completed in November. By May 2013, over 3,000 trees will have been planted to cover an area of approximately 1.8 hectares.



*The UQ Advanced Engineering Building (artist impression)*

## Built Environment

The University continues to embed sustainability into its built environment. Regular visitors to UQ sites can easily recognise new initiatives, some of which allow visitor interaction on a daily basis, while larger scale initiatives are often embedded in capital development.

Waste reduction infrastructure including bin enclosures for sorting multiple waste streams and water bottle refill stations have been rolled out across the St Lucia and Gatton campuses.

Energy efficiency has been enhanced through an ongoing opportunity identification and implementation program. Coupled with UQ's continuing photovoltaic installations, the University is continually improving on carbon emission efficiency.

UQ's progress towards its goal of demonstrating sustainability within the built environment is progressing through the design and construction phases of the Advanced Engineering Building (AEB) and Global Change Institute (GCI).

Scheduled for completion in early 2013, the AEB was awarded a 5 Star Green Star rating in the Education Design V1 category. Incorporating features such as a passive cooling system, mixed mode mechanical ventilation system and recycled materials throughout, the AEB is targeting a Green Star rating of 5 for construction on completion. Once occupied, the building will monitor and display its sustainable performance within the building and online, becoming a practical and interactive tool for learning and discovery.

Construction of the GCI building continues, pursuing a 6 star rating using

the design concept of a "Living Building". The building design and operational guidelines aim to minimise the building's impact on the environment. Passive cooling with thermal chimneys, operable facades to optimise natural light and ventilation, solar and wind power and waste treatment systems are key design features integrated into the building. The GCI building is scheduled for completion in late 2013.

### Sustainability Walk

A new sustainability walk for the St Lucia campus was designed and initial installation works were undertaken in late 2012. On completion, the walk will include 34 destinations, showcasing various initiatives implemented across six key themes of sustainability, and enhance the campus as a living laboratory.

Designed to be taken as a paperless tour without the necessity of printed collateral, navigational information on the Sustainability Walk will be uploaded to the University's smartphone application, UQNav, in time for the launch in early 2013.



*The new sustainability themed walk*



# CAMPUS SUSTAINABILITY

## Risk

The University continued to take a risk management approach to minimising potential environmental harm in 2012. Common operational risks are addressed in the UQ Environmental Management System while unique risks are managed with site or activity specific Environmental Management Plans.

Environmental regulatory risk is a key aspect. Either through its scale or activities, UQ has triggered and must manage a number of regulatory risks. Frequently these measures support the management of environmental risks.

## Carbon Emissions

The University's key greenhouse gas emissions result from:

- Electricity consumption (Scope 2)
- Commuting (Scope 3)
- Extraction and transmission of fossil fuels (Scope 3)
- Waste management (Scope 3)

In addition, the University has calculated its emissions from transport and non-transport fuels; petroleum-based oils; natural gas; liquefied petroleum gas (LPG); sulphur hexafluoride (SF6) contained in electrical switchgear and scientific apparatus; and embodied energy in paper.

## National Greenhouse and Energy Report 2010/11

The following table details the energy and emissions reported for the 2010/11 financial year.

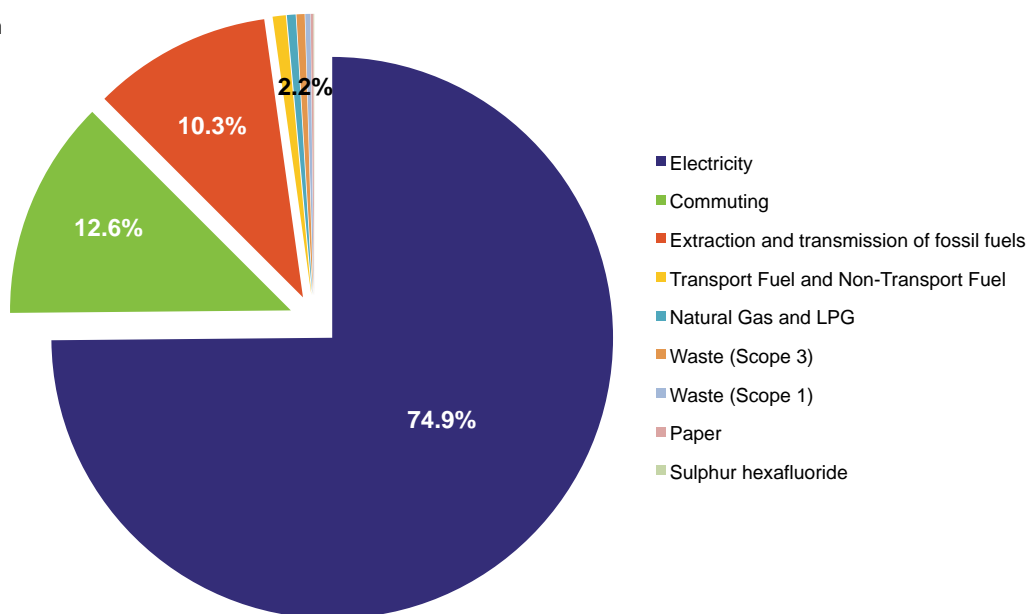
UQ's emissions during the 2010/11 and 2011/12 financial years

Scope	Source	Emissions (t CO <sub>2</sub> -e)		
		FY 2010/11	FY 2011/12	% Change
Scope 1	<b>Natural Gas and LPG</b>			
	Purchased natural gas	388	432	11.3%
	Purchased LPG	740	450	-39.2%
	<b>Transport and Stationary Fuel</b>			
	UQ owned fleet transport vehicles	1,145	1,132	-1.1%
	UQ owned fleet non-transport vehicles, generators and equipment	217	193	-11.1%
	<b>Sulphur Hexafluoride</b>			
	Electrical switchgear	4	4	0.0%
	Electron Microscopes	3	55	1833.3%
	<b>Waste</b>			
	On-site incineration (Pinjarra Hills)	720	195	-72.9%
	On-site wastewater treatment (Gatton Campus)	320	315	-1.6%
<b>Scope 1 Total</b>		<b>3,538</b>	<b>2776</b>	<b>-21.5%</b>
Scope 2	<b>Electricity</b>			
	Purchased directly from an electricity retailer	134,723	130,989	-2.8%
	Sourced through a third party (HIRS)	177	199	12.4%
<b>Scope 2 Total</b>		<b>134,900</b>	<b>131,188</b>	<b>-2.8%</b>
<b>NGER Total (Scope 1 and 2)</b>		<b>138,438</b>	<b>133,963</b>	<b>-3.2%</b>
Scope 3 <sup>1</sup>	<b>Commuting<sup>2</sup></b>			
	Staff and student commuting emissions to St Lucia campus	22,148	22,148	0.0%
	<b>Waste (Scope 3)<sup>3</sup></b>			
	General waste to landfill	725	815	12.4%
	<b>Paper<sup>4</sup></b>			
	Embodied energy from paper purchased	353	276	-21.9%
	<b>Extraction and Transmission of Fossil Fuels</b>			
	Natural gas	65	45	-30.8%
	LPG	62	40	-35.5%
	UQ owned fleet transport vehicle fuels	87	83	-4.6%
	UQ owned fleet non-transport vehicle, generator and equipment fuels	16	15	-6.3%
	Purchased electricity	18,165	17,862	-1.7%
<b>Scope 3 Total</b>		<b>41,621</b>	<b>41,284</b>	<b>-0.8%</b>
<b>Carbon Footprint Total (Scope 1, 2 and 3)</b>		<b>180,059</b>	<b>175,247</b>	<b>-2.7%</b>

1. Scope 3 emissions shown were estimated from available data
2. Staff and student commuting emissions were assumed to be stable.
3. General waste to landfill figures from Veolia waste emissions reports are based on 2011 and 2012 calendar years.
4. Embodied energy in paper emissions were calculated from St Lucia Central Store and Gatton Store data for plain white A4 paper.

N.B. Italics denotes Scope 3 emissions. Business travel emissions have been excluded.

UQ emissions breakdown  
for 2011/12  
Carbon Footprint



### Energy and Carbon

UQ reports and participates at a corporate level in the Commonwealth's National Greenhouse and Energy Reporting Scheme and Energy Efficiencies Opportunities Program.

Under both of these, the University is required to meet a number of administrative and reporting requirements. All requirements were met throughout 2012.

### National Greenhouse and Energy Reporting

In October 2012, UQ submitted its fourth annual report to the Commonwealth Government under the *National Greenhouse and Energy Reporting (NGER) Act 2007* to comply with the University's statutory reporting obligations. The report details UQ's Scope 1 and Scope 2 carbon dioxide equivalent (CO<sub>2</sub>-e) emissions for the 2011/12 financial year.

Comprehensive monitoring and reporting of the University's greenhouse gas emissions is an ongoing requirement, and UQ reports to the government on an annual basis.

### National Greenhouse and Energy Report 2011/12

The following table details UQ's energy and emissions reported for the 2011/12 financial year.

NGER Energy and Emissions report 2011/12				
Tonnes (CO <sub>2</sub> -e)			GJ	
Scope 1	Scope 2	Total of Scope 1 & 2	Energy Consumed	Energy Produced
2,776	131,188	133,963	578,655	7,004

### Energy Efficiency Opportunities

In December UQ submitted its second annual Energy Efficiency Opportunities (EEO) Report to the Commonwealth Government under the *Energy Efficiency Opportunities (EEO) Act 2006*. UQ is required to undertake comprehensive energy assessments and report publicly and to the Commonwealth Government on identified energy saving opportunities.

The University's 2012 EEO public report is available online at the UQ Sustainability Website.

[www.uq.edu.au/sustainability](http://www.uq.edu.au/sustainability)

### Water Efficiency Management Plans

The University maintained its water efficiency measures, implemented at the height of the South-East Queensland drought, throughout 2012. These continued to be enforced under the UQ Water management policy and site specific Water Efficiency Management Plans (WEMPs).

With changes to the state Permanent Water Conservation Measures in 2012, the University is now required to maintain only three WEMPs, with Cooling Tower WEMPs no longer necessary. Although all actions have been completed under the existing WEMPs, ongoing actions such as monitoring, auditing and awareness are maintained to ensure continuous improvement.

All WEMPs were reviewed early in the year, with a request submitted to Queensland Urban Utilities to consolidate all WEMPs into a single management plan to more efficiently manage the WEMP process. However, due to the variation in site location and types of water use at each site, the request was not approved. UQ therefore continues to operate under the existing approved WEMPs.



# CAMPUS SUSTAINABILITY

Annual WEMP Reports were submitted to Queensland Urban Utilities in November. Overall water consumption increased in 2012, however annual performance against the University's target of 1.1kl/m<sup>2</sup> remained consistent with past years for all three sites. This is despite a major leak being identified at the Pinjarra Hills site.

None of the University's cooling towers were identified as using a significant proportion of water and as a result Cooling Tower Reports were not required in 2012.

## Licensing and Approvals

The University is required to maintain a number of environmental permits for day-to-day operations. In 2012, two environmental permits were significantly altered due to legislative changes and strategic decisions.

In 2011, the University decided to discontinue the animal waste incinerator at Pinjarra Hills with more efficient and carbon sensitive alternatives now available. The plant was decommissioned in January 2012 and an alternate disposal system was implemented. In parallel, the University sought retrospective surrender of the incinerator development approval, saving \$15,000 in permit fees.

A change in State legislation altered the administration and scope of a number of flammable and combustible installations across the St Lucia campus. This required the University to reobtain permits for installations under the new 'Bulk Chemical Storage' requirements. In addition, UQ took the opportunity to audit St Lucia campus activities to identify and test the need for additional permits.

The audit found that no newly identified installations required permits. It was also found that no other activities undertaken at St Lucia campus triggered licensing or permitting requirements.

UQ has since successfully applied for and obtained the necessary permits for Bulk Chemical Storage.

Other activities across all campuses continued to be managed in accordance with permits and conditions throughout 2012.

## Campus Engagement

### Green Office

The Green Office program continues to be a flagship program for sustainability engagement with UQ staff. The program consists of dedicated employees that volunteer their time to promote sustainable practices within their workplaces. Each year the quality of initiatives nominated for the annual awards continues to be impressive, reflecting the enthusiasm and commitment of Green Office representatives.

Promotions were held throughout the year on sustainable transport, waste reduction, sustainable procurement and biodiversity on campus.

Update sessions included:

- Off campus tour to the Visy recycling facility
- Tour of the St Lucia campus identifying native birdlife with a focus on the Noisy Miner conducted by UQ expert Dr Martine Maron
- Session on sustainable travel presented by UQ expert Dr Dona Whiley

The annual Green Office Awards were presented at the World Environment Day event to:

- Best New Green Office Area, Mark Glindemann, P&F Ipswich and Jessica Roessler, Institute of Modern Languages
- Best Green Office Initiative, Jenny Hall, Dentistry Library
- Most Motivated Green Office Representative/Team, Alice Stokes, Research Data Storage Infrastructure Project

### Green Labs

The Green Labs pilot program was conducted during 2012 with ten representatives from 6 Faculties and Institutes.

Green Lab representatives attended training, used the tools and resources designed for the program, reviewed program newsletters and provided valuable feedback on the program design. Each representative was involved in an audit of their own laboratory as well as another representative's laboratory to trial the assessment tool and review both the design and the practical implementation of the audit.

The pilot report recommendations are to be implemented prior to opening the program to all UQ laboratories in 2013.

### World Environment Day

World Environment Day was celebrated with a sustainable breakfast and the presentation of the prestigious Green Office Awards and Green Labs Certificates at Emmanuel College.

Two expert guest speakers discussed the Green Economy concept, described as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. Dr Jackie Robinson, UQ School of Economics provided an economic perspective while Rowan Dowland, bankmecu, offered a business perspective.

Senior Deputy Vice-Chancellor Processor Max Lu announced four Green Office awards to recognise the significant contribution to UQ's sustainability

*World Environment Day breakfast at Emmanuel College*





From left: Professor Ian Zimmer, (Deputy Vice-Chancellor (External Relations) prior to retirement in September 2012); Mr Alan Egan, Director (Property & Facilities Division); Ms Clare Pullar, Pro-Vice-Chancellor (Advancement); Professor Deborah Terry, Senior Deputy Vice-Chancellor (Acting Vice-Chancellor from December 2011 to October 2012); Professor Alan Lawson, Pro-Vice-Chancellor (Research and International), arriving to work on Ride-to-Work Day.

initiatives and presented 10 certificates of recognition to the Green Labs Representatives participating in UQ's Green Labs Pilot Program.

### Bike Box Opening

Ride to Work Day came early for UQ in 2012 to coincide with the opening of a new end-of-trip cycling facility. Senior Deputy Vice-Chancellor (Acting Vice-Chancellor from December 2011 to October 2012 Professor Deborah Terry officially opened the Bike Box in May while participating staff and students were greeted at the finish line with a warm breakfast.

The Bike Box replaced the flood damaged UQ Traffic & Parking office and offers secure bicycle storage, a shower and locker facilities to staff and students for \$1 per week.



Tree planting at UQ's Indooroopilly Mine site

### National Tree Planting Day

National Tree Planting Day events were held at the St Lucia, Gatton and Ipswich campuses and for the first time at the Indooroopilly Mine site. The events were a big success with around 100 staff and student volunteers planting almost 1,000 trees.

### Orientation Week and New Staff Expo

UQ Sustainability presented a stall at semester one and semester two, Orientation Week Market Day and New Staff Expo induction events. The stall promotes sustainability at UQ, particularly to new staff and students.

In 2012, Sustainability stall promotions included:

- Waste reduction
- Water refill stations and the use of reusable water bottles
- Sustainable procurement and fair trade on campus
- Use of reusable coffee cups (Keepcups)
- Sustainability Pledge
- Subscribing to the quarterly Sustainability Newsletter

Information on all aspects of UQ sustainability is made available and new community members continue to be enthusiastic and supportive of UQ Sustainability initiatives.

### Sustainability Programs Students

UQ Sustainability hosted three students during 2012. These students were employed to administer the Green Office program and the Green Labs Pilot program under the guidance of the UQ Sustainability Office.

The student program provides valuable experience to the participants and offers exposure to many aspects of sustainability and campus life at UQ. Students are typically studying undergraduate or postgraduate environment management or environmental science programs at UQ.

Market Day at UQ St Lucia





# UQ SUSTAINABILITY STRUCTURE

The Sustainability Steering Committee was established in 2009 to lead UQ's Carbon and Sustainability strategy.

The Sustainability Office, Property and Facilities Division, works in conjunction with the Sustainability Steering Committee and Working Groups and other internal

and external stakeholders, to progress the UQ Sustainability Program.

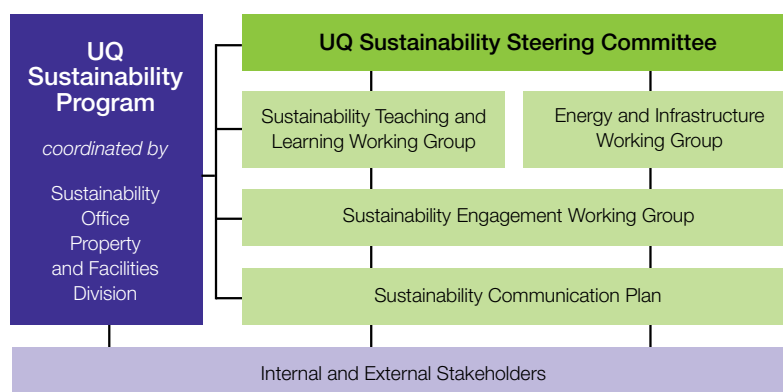
In 2011, the Sustainability Engagement Working Group identified project groups, formed in 2012, to focus on some key project areas. The Paper and Print Working Group and the Colleges Sustainability

Working Party met throughout the year to implement opportunities identified by the Sustainability Engagement Working Group.

The Renewable Energy Group and Sustainability Teaching and Learning Working Group have continued with their focus through 2012.

The Committee's membership as at the end of 2012 comprises:

- Mr Maurie McNarn, Chief Operating Officer (Chair)
- Professor Deborah Terry, Senior Deputy Vice-Chancellor
- Professor Michael McManus, Deputy Vice-Chancellor (Academic)
- Professor Max Lu, Deputy Vice-Chancellor (Research)
- Professor Ove Hoegh-Guldberg, Director, Global Change Institute
- Mr Brett Cunningham, Deputy Director, Sustainable Minerals Institute
- Professor Andrew Griffiths, Director, Sustainable Business Unit, School of Business
- Professor Stephen Walker, Executive Dean, Faculty of Science
- Mr Geoff Dennis, Deputy Director, Property and Facilities Division
- Mr Graham Bethune, Director, Office of Marketing and Communications
- Mr Andrew Betts, Chief Financial Officer
- Professor Alan Rix, Pro-Vice-Chancellor
- Mr Colin Finke, President, UQ Student Union
- Mr Stuart Green, Manager Sustainability, Property and Facilities Division (Secretary)



The staff of the UQ Sustainability office: (from left) Mr Stuart Green, Manager Sustainability; Mr Mark Kranz, Manager Transport Systems; Ms Suzanne Davis, Sustainability Coordinator; Mr Geoff Dennis, Deputy Director (Property and Facilities Division); Ms Clair Keleher, Sustainability Coordinator; Ms Kelly Treloar, Project Officer Sustainability; Mr Chris Collins, Energy Manager; Dr Carlos Fujita Dimas, Project Officer Energy; Ms Nicole Connolly, Senior Administration Officer; Ms Carmel Calderon, Project Officer Sustainability. Absent: Mr David Gray, Procurement and Reconciliation Officer; Ms Sue Kennewell, Project Officer Energy.



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Above: New Zebra-crossing at UQ St Lucia. Front Cover: Tree planting day at UQ Gatton.

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