

Draft

Environmental Management Plan

for the

Australian National University

2016-2020

Produced by ANUgreen, Facilities and Services Division, on behalf of the Australian National University (2015).

Contents

Introduction.....	4
Culture	7
Buildings	9
Energy.....	11
Water.....	13
Waste.....	15
Pollution	17
Transport	19
Landscapes	21
Heritage	23
Appendix I - Summary of 2016-2020 EMP Targets.....	24
Appendix II – Review of 2009-2015 EMP Targets.....	26
Appendix III - Legislation and Reporting Requirements.....	28

Introduction

ANU strives to be an international leader in campus sustainability. ANU achieves this via its Environmental Management Plan (EMP), which is a strategic plan for the sustainable management of the day-to-day operations of the University.

This EMP has been developed to reflect the Campus Masterplan 2030. The masterplan provides a framework for ensuring that by 2030 ANU will be a generator of renewable energy, user of recycled water and a carbon neutral asset with a minimal ecological footprint.

Context

This Environmental Management Plan 2016- 2020 is the fourth plan prepared by the Australian National University.

Since the first EMP was produced fifteen years ago, ANU has made great strides in environmental management. The University has created a strong framework for implementing sustainability on campus, including establishing the ANUgreen Office, adopting an environment policy and incorporating sustainability responsibilities into the Staff Enterprise Agreement.

Key achievements to date include sustainable building initiatives such as the iconic Frank Fenner building, which received a six star Green Star rating, and the partial restoration of the Mount Stromlo Observatory site. ANU is a leader in green waste composting, reusing 100 per cent of the green waste on the Acton campus. The University has decreased its fleet size by one third and fuel consumption by 41 per cent, since 2006.

Key results from the past nine years include:

- 50 per cent decline in per capita water use
- 27 per cent decline in per capita waste to landfill
- 9 per cent decline in per capita energy use.

This new EMP builds on the progress of the past fifteen years. A summary of the results for the 2009-2015 EMP are listed in Appendix I.

Principles

The plan is based on the following principles:

1. Environmental sustainability – the EMP will ensure that ANU meets its moral, ethical and legal responsibility to manage University’s environment sustainably.
2. Social sustainability – the plan aims to ensure equity and well-being for all campus users, as well as the wider community.
3. Long-term economic sustainability – strategies listed in the EMP also improve the long-term economic sustainability of ANU. For example our long term goal to achieve energy independence is both environmentally and economically beneficial.

Scope

Nine major themes are covered by this report: culture, buildings, energy, water, waste, pollution, transport, landscapes, and heritage. 2014 is used as the baseline.

Traditionally the EMP has covered the operations of the Acton campus. This new EMP covers all of the University's campuses including Kioloa, Mt Stromlo, Northern Australian Research Unit, and Siding Spring Observatory.

For the first time data collected will be based on Tertiary Education Facility Managers Association (TEFMA) criteria, which includes all properties owned or controlled by the University except for accommodation on campus. This will enable the University to compare its performance against other tertiary institutions for water, energy and waste. However as this data is confidential ANU cannot publicise its relative performance.

Data on student accommodation will continue to be collected but will be reported separately. Targets should however also be applied to student accommodation.

Implementation and evaluation

The EMP provides broad strategic direction for ANU to implement sustainability initiatives. Detailed operational implementation plans and budgets will be developed each year based on this plan.

The Vice-Chancellor is responsible for the plan's implementation. The Director, Facilities and Services Division has responsibility for carrying out the strategies in conjunction with other parts of the University. The Environmental Management Planning Committee, which consists of staff and student representatives, provides an opportunity for two-way feedback with Facilities and Services.

Facilities and Services will provide annual progress reports to the Vice-Chancellor via the Facilities and Services Director.

Targets

The progress of the EMP is measured against the targets summarised in Appendix I.

Where appropriate, targets from the previous EMPs have been retained (see Appendix II for the 2009 – 2015 targets). Additional targets for resource use per capita and resource use per floor area have been included to enable ANU to compare its performance with other universities.

In a few cases new targets have been set where there was either no target or a target which was not measurable.

Campus population is defined as fulltime-equivalent staff plus fulltime-equivalent students. The baseline year for all targets is 2014 (in the last two EMPs the baseline was 2006). The only exception is the culture target which is based on the staff and student survey conducted in 2016.

Legislative responsibilities and reporting

As a Commonwealth agency, ANU has responsibilities under the *Environment Protection and Biodiversity Act* (1999) to manage and protect natural, social and built heritage sites on campus. ANU also has responsibilities to prevent pollution on campus under ACT legislation, *Environmental Protection Act* (1997).

The University has annual sustainability reporting responsibilities required by the *Environment Protection and Biodiversity Act* (1999), TEFMA, National Energy and Greenhouse Reporting and the National Pollutant Inventory. The University's legislative and reporting responsibilities are listed in Appendix III.

Facilities and Services also provides annual reports to the Vice-Chancellor. Results from this report are communicated widely to the ANU community.

Links with other organisations

Since 2006 ANU has been part of the International Association of Research Universities Sustainability Initiative (www.iaruni.org). ANU also maintains links with Sustainability Managers in the Group of Eight Universities and Australasian Campuses Towards Sustainability.

Culture

Objective

To embed sustainable thinking and behaviour into the culture of ANU.

Target – 2015 baseline

- Increased awareness of sustainability on campus measured via a biennial staff and student survey¹.

Overview

Creating an organisational culture which supports sustainable thinking is essential for implementing the Environmental Management Plan.

The very first step towards this target was the creation of the ANU Environment Policy in 1999, which was updated in 2015.

Since then environmental sustainability has been incorporated into the ANU Enterprise Agreement. The Enterprise Agreement commits the University and staff to work together to create a culture of environmental sustainability.

In particular the Enterprise Agreement specifies that the University will:

- develop and support locally based programs to improve individual and departmental environmental behaviour such as Green office, Green IT or Green laboratory programs
- establish professional development programs to improve staff understanding of campus environmental issues
- construct buildings and campus infrastructure consistent with ecologically sustainable design principles
- develop strategies for sustainable travel to/from and around campus
- develop strategies to reduce water consumption in the landscape.

ANU also incorporates sustainability awareness into induction programs for:

- new staff
- PhD Students
- international students.

Over the past fifteen years the University has also run a Green Leaders program, education programs for staff and students and coordinated events such as Sustainability Day and Earth Hour. Sustainability messages are communicated via the ANUgreen website and facebook page, *On Campus* email newsletter, posters and publications. ANUgreen also works with the Sustainable Learning Community, ANU Organic Garden, ANUSA, PARSA, ANU Environment Collective, and other student environment groups to implement environment initiatives.

¹ Specific measures to be determined as part of the survey development.

Strategies

Inspire cultural change (also see other sections)

- Encourage greater staff commitment to sustainability by incorporating sustainability criteria into Job Descriptions and Statement of Expectations.
- Develop annual Vice-Chancellor Environment Awards program to recognise sustainability initiatives taken by individuals and groups on campus.
- Increase reporting and information flow between:
 - ANU Council – report quarterly and annually
 - University senior management
 - Facilities and Services staff
 - Students and staff.
- Conduct a biennial survey of ANU community perceptions of sustainability.
- Reactivate the Green Leaders Program focusing on involving Building Custodians and empowering them to improve the environmental performance of their facilities.
- Expand the induction program to include all students and staff.
- Continue to work with students to implement sustainability strategies by engaging with Sustainable Learning Community, ANU organic garden group, ANUSA, PARSA and other student environment groups.
- Continue to develop and promote sustainability programs via digital media including ANUgreen website and facebook page, student groups including ANUSA, PARSA, and SLC and via traditional hardcopy media including flyers, posters, brochures, and postcards.

Buildings

Objective

To adopt sustainable building practices as standard practice for all university building projects.

Target

- 100 per cent of major new buildings and refurbishments meet a sustainable building star rating² by 2020.

Overview

ANU has a long standing commitment to fostering green building practices. ANU was a founding member of the Green Building Council of Australia in 2002. In 2012 ANU developed *Sustainability Specifications* to guide the construction of all new buildings and retrofits.

There are over 150 buildings on the Acton campus, some of which were built before ANU was established in 1945. Many of the buildings on campus need significant refurbishment or maintenance work to reduce the environmental impact of their operations.

Over the past thirteen years more than 20 new buildings and major refurbishments have incorporated green initiatives. These initiatives have included the College of Science Precinct, Lena Karmel Lodge, Jaeger 8 and 5, John Curtin School of Medical Research, and the Crawford extension to Old Canberra House. The University's most significant achievement has been the construction of the Frank Fenner Building, which in 2013 became the first six star Green Star rated *As Built* building in Australia.

ANU has also refurbished a number of historical buildings such as the old John Curtin school of Medical Research, creating considerable savings in embodied energy. Over the lifecycle of a building a significant proportion of its energy consumption occurs when the building is constructed (this is called embodied energy). Estimates suggest that embodied energy is equivalent to 15-37 years of operational energy, depending on building materials used and the total life of the building³.

Strategies

Monitor and report

- Adopt a sustainable building performance rating scheme for all new buildings and refurbishments and measure its implementation.

Implement

- Review the *Sustainability Specifications* and apply it to all new buildings and refurbishments.
- Incorporate sustainability initiatives into maintenance regimes.
- Continue to adaptively reuse historical buildings.
- Implement the electricity efficiency reduction initiative – see the *Energy* section.

² NABERS has been chosen as the building rating tool based on research by ANU academic Jeroen van der Heijden. Major building or refurbishment is defined as being greater than \$3 million. The goal is to achieve compliance rather than certification.

³ Wallhagen et al (2011) Basic building life cycle calculations to decrease contribution to climate change – case study on an office building in Sweden. *Building and Environment*, 46, 1863-1871.

Inspire cultural change

- Develop and implement training and awareness programs for building custodians, project managers, staff and students about the benefits of green buildings, and how to develop and manage them.
- Include environmental standards in contract for tenants and contractors.

Energy

Objective

To significantly reduce energy use and greenhouse gas emissions generated by the operations of ANU.

Targets – 2014 baseline

- Reduce per capita energy use by 20 per cent by 2020.
- Reduce energy use per gross floor area by 20 per cent by 2020.
- Decrease total carbon emissions by 30 percent by 2020⁴.
- Increase renewable energy generation by 50 per cent by 2020.

Overview

ANU is one of the largest energy users in the ACT, generating approximately 100,000 tonnes of greenhouse gases per year from electricity and gas use. Energy at ANU is sourced from electricity, gas, and onsite renewable energy (photovoltaic arrays and evacuated tube solar hot water)⁵.

Like most universities, significant growth in campus population and building space since 2006 has made it difficult to reduce total campus energy use. ANU also has a large number of energy intensive research facilities including the National Computation Infrastructure (NCI) building.

The NCI was built in 2012 and is home to the Southern Hemisphere's fastest supercomputer. It is responsible for 15 per cent of the total annual electricity use on campus. In the next few years the NCI is expected to expand. This is expected to increase the University's consumption by an additional 20 per cent.

Another challenge for ANU is that Canberra has an extreme climate with large seasonal temperature differences.

Despite these challenges, energy efficiency initiatives have driven a 9.9 per cent decline in per capita energy use since 2006, although total energy use has increased by 18.5 per cent. Total carbon emissions increased by 13 per cent since 2006.

Electricity is the main source of energy at ANU. On the Acton campus seventy-five per cent of electricity consumption is due to just fifty buildings out of the 150 buildings. To manage this ANU established an *Electricity Reduction Initiative* in 2014. Projects include:

- upgrading metering systems
- fine-tuning the operation of cooling and heating systems
- upgrading selected air conditioning, heating and lighting systems
- developing a strategy to reduce desk top computer energy use.

⁴ This target aims to reduce carbon emissions due to the operations of the university. It excludes changes made to the carbon intensity of electricity generation by the ACT government.

⁵ Figures for energy use at ANU exclude fuel for fleet motor vehicles and staff and student work related air travel.

To assist in the implementation of energy saving projects ANU has a Carbon Reduction Fund. This fund allows the University to invest in strategic projects to reduce the environmental impact of research and teaching activities.

Strategies

Plan, monitor and report

- Develop an Energy Master Plan for the University. This strategic plan will include strategies to improve energy efficiency and increase energy independence through energy generation projects.
- Monitor and report on energy consumption by installing smart meters which are connected to the University's building management system.

Maintain and provide infrastructure

Continue to implement the *Energy Reduction Initiative*. This includes:

- Conduct building tune-ups to fine tune the operation of the heating and cooling systems in 44 buildings.
- Replace selected air conditioning and heating systems with more energy efficient units.
- Install energy efficient lighting technology.
- Implement a desktop computer energy saving policy.
- Ensure best-practice energy efficient building design and construction by applying *Sustainability Specifications* (also see *Built Form*).
- Incorporate renewable energy generation into new building developments.

Inspire cultural change

- Implement behavioral change and engagement programs to empower building custodians, contractors, staff and students to contribute to energy and carbon savings.
- Promote the Reduction Fund.

Water

Objective

To reduce potable water consumption and eliminate it from landscape irrigation.

Targets – 2014 baseline

- Reduce per capita water use 50 per cent by 2020.
- Reduce potable water use by 50 per cent by 2020.
- Eliminate potable water from landscape irrigation.

Overview

Managing water consumption on campus in a drought-prone country is imperative to ensure the University can maintain its extensively landscaped campus and minimise the loss of trees during water restrictions.

ANU is one of the largest water users in the ACT, consuming approximately 556,412 kilolitres of water in 2014. Since 2006 total potable water use has declined by 26.7 per cent, and per capita water use has nearly halved. This is due to a concerted strategy over the past nine years which has included:

- using treated black water to flush toilets in the Frank Fenner building
- using treated effluent to irrigate sports ovals and University Avenue
- installing 14 rainwater tanks with a total capacity of 1.6 million litres
- using native plants and drought tolerant lawn species
- installing two process cooling units in Research Schools with an annual saving of more than 39 million litres.

Strategies

Monitor and report

- Install water meters in all buildings.
- Use the new water monitoring and online reporting tool (Insight) and the Building Management System to improve water monitoring and reporting.

Maintain and construct new infrastructure

- Increase the water efficiency of amenities and infrastructure through sustainable design and by implementing the revised *Sustainability Specifications*.
- Ensure the maintenance of existing buildings includes water-saving upgrades.

Capture rainwater and stormwater

- Install more rainwater tanks to increase the capture and storage of stormwater and rooftop rainwater for use in research and teaching labs, toilets and landscape.
- Install additional stormwater tanks to reduce the proportion of the landscape irrigated with potable water.

Reduce demand for water for landscaping

- Reduce the demand for water in the landscape through water-sensitive design, and by planting drought-tolerant plants.

Inspire cultural change

- Implement behavioural change programs to reduce water consumption in buildings, in particular laboratories and student accommodation.
- Recognising building custodians with awards for most improved performance on the previous year's baseline.

Waste

Objective

To minimise waste to landfill by reducing waste generation and increasing recycling.

Targets – 2014 baseline

- Reduce per capita waste to landfill by 20 percent by 2020.
- Increase the recycling rate to 85 per cent by 2020.
- Recycle 95% of e-waste by 2020.

Overview

The first sustainability initiative at ANU was a waste reduction and recycling program which started in 1999. Since then the waste program has been expanded to include office paper, cardboard, comingled waste, construction waste, garden waste and e-waste. ANU also manages a hazardous waste program.

Reducing total waste to landfill is challenging due to a 29 per cent increase in total campus population since 2006 and an impressive building program over the past few years. An ongoing building program will continue to challenge waste goals. Alongside this, waste reduction on campus was constrained due to a breakdown of the University's Hot Rot composting system in 2013.

Despite these challenges, ANU recycled 56 per cent of its waste in 2014. Per capita waste to landfill decreased by 22.3 per cent since 2006, although total waste to landfill increased marginally by 2.2 per cent. ANU is a leader in green-waste composting, recycling all of its green waste onsite which is then reused to mulch landscaping on campus.

A new waste contract was adopted late 2015. This contract will improve the University's ability to measure waste to landfill and recycling levels, making it easier to manage and improve recycling programs. The new contract is also expected to provide new opportunities to recycle food waste. A revamped education program will be rolled out to complement the new waste contract.

Strategies

Monitor and report

- Use the new waste contract as an opportunity to improve waste monitoring and reporting.

Reduce construction waste

- Apply the *Sustainability Specifications* to ensure all new building and refurbishment projects recycle construction waste.
- Work with the University Contract and Procurement Office to incorporate clauses in contracts to mandate construction waste recycling and use of recycled materials where appropriate.
- Incorporate construction waste recycling into contractor training programs.

Manage hazardous waste

- Integrate the management of hazardous waste across campus to ensure consistent disposal and tracking of waste.
- Create a campus wide e-waste recycling system for computers and other electronic equipment.

Compost garden waste

- Continue to recycle and compost garden waste on site.

Increase comingled recycling

- Standardise and distribute recycling bins within buildings and across the campus landscape to make recycling a convenient, intuitive and habitual behavior.

Encourage use of recycled products

- Work with the University Contract and Procurement Office to increase the proportion of recycled products and materials purchased.

Inspire cultural change

- Revive the campus waste education program to complement the new waste contract.
- Develop campus green events guidelines, in conjunction with ANUSA, PARSA, SLC and other student groups which include strategies for responsible waste management.

Pollution

Objective

To prevent and minimise environmental harm as a result of activities undertaken by the University.

Target

- Establish an Environmental Management System (ISO 14001 or equivalent) to ensure compliance with environmental legislation.
- Conduct annual environmental audits.
- Reduce emissions of key pollutants⁶ by 25 per cent by 2020.

Overview

The University has a moral and legal responsibility (primarily through the *Environmental Protection Act 1997*⁷), to prevent or minimise any environmental harm as a result of its actions. This includes protecting Sullivan's Creek, one of Canberra's major urban waterways, and bushland on the Acton and other campuses.

To do this the University must demonstrate due diligence by:

- ensuring staff, students, tenants and contractors are aware of their obligations and comply with the legislation
- establishing an environmental management system.

ANU is also required to report pollution levels annually under *the National Greenhouse and Energy Reporting Scheme* and the *National Pollutant Inventory*.

The University has implemented an in-house chemical management system to register and track chemicals and ensure their safe handling, storage and responsible disposal. The University also strives to prevent pollution ensuring up-to-date spill kits are available across the campus and has installed sediment trap on drains leading to Sullivans Creek.

Strategies

Monitor and report

- Conduct annual environmental audits.
- Continue to report under the *National Pollutant Inventory* and the *National Greenhouse Energy Reporting Scheme*.
- Continue monthly monitoring and public reporting of Sullivans Creek water quality.
- Continue to maintain a register of environmental incidents.

⁶ Pollutants to be chosen with reference to National Pollutant Inventory chemicals and after the development of the Environmental Management Plan.

⁷ This is the primary environmental pollution legislation relevant to the University.

Manage and implement

- Develop and implement an environmental management system which is integrated with the annual environmental audit system.
- Maintain a hazardous waste collection (see *Waste section*).
- Review and monitor the effectiveness of sediment traps and gross pollutant traps on Sullivans Creek.
- Maintain central response spill kits in case of emergency.

Inspire cultural change

- Ensure relevant staff and students are trained to use the new Chemical Management System.
- Continue Facilities and Services contractor induction and training which includes pollution prevention.
- Create a system to ensure all schools within the University offer appropriate pollution prevention training for contractors.

Transport

Objective

To minimise the environmental impact of university-related travel.

Targets

- Increase sustainable commuting to 80 per cent by 2020.
- Reduce fleet emissions by 20 per cent by 2020.

Overview

The Acton campus supports a population of nearly 25,000 students and staff, and the majority (66 per cent), travel to and within campus via bus, car sharing, walking or cycling. The Acton campus also supports the largest concentration of cyclists in Canberra.

Greenhouse gas emissions from commuting, business-related air and vehicle travel are significant contributors to the University's environmental footprint. Improving opportunities for sustainable transport will enable ANU to demonstrate good corporate citizenship. It also enables the University to attract and retain students and staff, improve employee health and well-being and reduce road congestion in and around campus.

Since the establishment of the original Environmental Management Plan, the University has implemented initiatives to reduce carbon emissions from the campus vehicle fleet and commuting by staff and students.

The University encourages cycling by offering end of trip cycling facilities including 41 bicycle enclosures with 2,012 bicycle parking spaces. ANU also provides around 5,000 car parking spaces on the Acton campus using approximately 14 per cent of the land.

The University manages a fleet of 227 cars and over 100 bicycles. Over the past nine years ANU has reduced the vehicle fleet by 32 per cent and fuel consumption by 41 per cent. This in turn has reduced greenhouse gas emissions by 40 per cent. Factors influencing this include the introduction of fleet bicycles with a consequent reduction in driving, more sustainable vehicle purchases, and the implementation of the ANUgreen fleet policy.

Increasing sustainable transport to and from campus is challenging due to Canberra's low density urban form and limited public transport network.

Despite these challenges there is a significant opportunity to increase the number of staff and students using sustainable commuting options. Twenty-two per cent of students and staff live within five kilometres of the Acton campus (including on campus). This distance can be easily cycled in twenty minutes. Sixteen per cent of staff and students live within 5-10 kilometres of campus and this distance can be cycled in 40 minutes.

A key strategy to improve sustainable transport options is to integrate transport policy, planning and operations, which currently are managed by different business units. This would create synergies and enhance opportunities to increase sustainable transport options.

Strategies

Monitor and report

- Continue to monitor and report on commuter travel, fleet usage and community satisfaction.

Integrate planning, management, and promotion of transport across campus

- Form a Transport Working Group to coordinate transport planning.
- Create a Transport Co-ordinator position to improve coordination and integration.
- Integrate vehicle and bicycle fleet management.
- Investigate salary sacrificing options to bus fares and bicycles.
- Integrate video conferencing, coach travel, and public transport into the travel planning process.
- Improve the integration of the Environmental Management Plan with the Capital Works Plan, Asset Management Plan, and Landscape Plan.

Review parking pricing and supply to manage travel demand

- Review parking pricing and supply to manage travel demand.
- Review course timetabling processes to spread hours of classes, and reduce peak hour traffic.

Provide appropriate infrastructure

- Implement the *Campus Pedestrian and Cyclist Movement Strategy* to improve pedestrian and cyclist safety.
- Work with the ACT government to create a safer pedestrian and cyclist crossing for Barry Drive as students and staff enter via North Road.
- Ensure pedestrian and bicycle infrastructure standards are met when new developments are constructed.
- Continue to assess the suitability of the location and number of bicycle storage facilities.
- Investigate dedicated parking for car-pooling.
- Investigate areas for additional bicycle storage facilities.
- Investigate appropriate areas for electric car charging stations.

Manage university vehicles

- Implement a green carshare scheme to reduce fleet vehicle numbers.
- Run an on-demand after-hours bus service around campus to provide safe night time travel.
- Increase the proportion of fleet vehicles that meet low emission standards.
- Explore opportunities to enhance the provision of bus services.
- Explore the feasibility of electric bicycle recharging facilities.

Inspire cultural change

- Provide information on sustainable transport options to students, staff and visitors.
- Offer affordable bicycle safety equipment to staff and students.

Landscapes⁸

Objective

To adopt sustainable landscape practices that enhance habitat quantity, quality and connectivity, control weed and pest species, reduce dependence on irrigation and fertiliser, and protect key habitats and species including the Box Gum Grassy Woodland and Sullivans Creek.

Targets

- No degradation of water quality in Sullivans Creek between when it enters and exits ANU.
- Decrease weed coverage by 5 per cent by 2020.

Overview

The 145 hectare Acton campus includes bushland, sporting ovals, gardens and Sullivans Creek. Located at the apex of a habitat triangle, ANU is bounded by Lake Burley Griffin on one side and Black Mountain on the other.

Despite being located in the middle of Canberra, the campus is surprisingly diverse, supporting over 140 species of animals. The campus also contains 10 000 trees and remnant patches of the nationally-endangered Box Gum Grassy Woodland.

ANU is required to manage biodiversity under the *Environment Protection and Biodiversity Conservation Act* 1999. In 2015 ANU completed a draft Biodiversity Management Plan as required by legislation.

Over the past fifteen years ANU has practiced sustainable landscape management techniques which include minimizing the use of pesticides and not planting weed species.

Strategies

Landscape planning and development

- Ensure that biodiversity values are protected through the development process, especially through planning proposals, reviews of preliminary and final site plans and the construction phase.

Manage biodiversity

- Avoid habitat fragmentation by protecting significant biodiversity zones⁹.
- Restore ecosystems, especially at Old Canberra House Grassy Woodlands and Sullivans Creek Riparian Corridor.
- Enhance habitat quality by increasing structural complexity, and using native species for landscaping where appropriate.
- Plant native understory below significant trees to attract insect eating birds and encourage natural pest control, minimize soil compaction and enhance nutrient recycling.

⁸ Water management is covered under the *Water* section, water pollution is covered by the *Pollution* section.

⁹ As listed in the Biodiversity Management Plan

- Reduce the impact of weed and pest species through mapping the distribution of pests, biological and physical control methods, and removal of pest animal habitat.
- Contribute to the sequestration of atmospheric carbon through plantings and reuse of green waste as mulch on-site.
- Continue surveys of birds (two seasonal surveys annually), and frogs and aquatic invertebrates (spring surveys annually).
- Continue to implement fire management plans.

Inspire cultural change

- Establish education and community engagement opportunities, such as bird watching workshops, grassy woodland tours, and creek cleanups.

Heritage¹⁰

Objective

To achieve best practice conservation, management and interpretation of the heritage values of places¹¹ managed by ANU.

Target

Complete the identification and assessment program of heritage places on ANU campuses.

Overview

ANU has a rich and diverse history across its various sites. It manages places with indigenous, historic and natural heritage values.

A large number of sites with significant heritage value have been identified and assessed. These sites represent the earliest phases of settlement in Canberra, link to Australia's wartime history and show the development of the University from its earliest inception to the present day. Several sites pre-date the establishment of ANU in 1946.

An identification and assessment program has been undertaken for Acton, Mount Stromlo Observatory and Siding Spring Observatory campuses, and is still to be completed for the Kioloa and North Australia Research Unit campuses as well as several other individual sites managed by ANU.

Out of more than 260 buildings on the Acton Campus, eight individual sites (including the whole 'Acton Conservation Area') are listed on the Commonwealth Heritage List. The entire Mount Stromlo Observatory campus is also listed.

ANU is responsible for ensuring places with identified Commonwealth heritage values are conserved and managed, as required by the *Environment Protection and Biodiversity Conservation Act 1999*. The University has developed a Heritage Strategy to guide the conservation, management and interpretation of its heritage.

Strategies

Manage and implement

- Complete the identification and assessment program for all places under ANU ownership or control as required by the Act.
- Complete and update Heritage Management Plans for all listed sites and those of exceptional or high heritage value (as identified in the ANU Heritage Study).
- Implement the Acton campus Heritage Interpretation Strategy and develop Interpretation Strategies for the remaining ANU campuses.
- Continue to conduct Heritage Impact Assessments in response to development proposals.
- Continue to consult with the Indigenous community prior to undertaking new developments on all campuses in line with the Ask First guidelines.

Educate and engage

- Develop innovative communication and engagement products for ANU and wider audiences.

¹⁰ This section focuses on built and social heritage. Sustainability aspects of built heritage are covered under *Built Form*. Natural heritage is covered under *Landscapes*.

¹¹ Places are defined as being owned and controlled by ANU.

Appendix I - Summary of 2016-2020 EMP Targets

Target – 2014 baseline except where noted	Comments
Culture	
Increase awareness of sustainability on campus – measured via a biennial staff and student survey.	Criteria to be determined before implementing the survey. 2015 baseline.
Buildings	
100% of major buildings and refurbishments meet a sustainable building operations target. (Major building or refurbishments is defined as being greater than \$3 million)	Rating tool and standard to be determined in 2015. (eg NABERS, Green Star or equivalent)
Energy	
Reduce per capita energy use by 20 per cent by 2020.	TEFMA data available ¹²
Reduce energy use per gross floor area by 20 per cent by 2020.	TEFMA data available
Decrease carbon emissions ¹³ by 30 per cent by 2020.	TEFMA data available
Increase renewable energy generated by ANU by 50 % by 2020.	TEFMA data available
Water	
Reduce per capita water use by 50 per cent by 2020.	TEFMA data available
Reduce potable water use by 50 per cent by 2020.	
Eliminate potable water from landscape irrigation.	
Waste	
Reduce per capita waste to landfill by 20 per cent by 2020.	TEFMA data available
Increase the recycling rate to 85 per cent by 2020.	65% of waste recycled in 2014
Recycle 95% of e-waste by 2020.	
Pollution	
Establish an environmental management system (ISO 14001 or equivalent) by 2018 to ensure compliance with environmental legislation.	
Complete annual campus environmental audits.	
Reduce emissions of key pollutants by 25 per cent by 2020.	To be determined after the development of the environmental management system.
Transport	
Increase sustainable commuting to 80 per cent by 2020.	Based on quarterly ANU commuter audits
Reduce fleet emissions by 20 per cent by 2020.	Flight emission are difficult to measure and are not included.
Landscape	

¹² Having access to TEFMA data means it's possible to compare the University's performance against other tertiary institutions. However, as this data is confidential ANU cannot publicise its relative performance.

¹³ This must be achieved through direct action by ANU. It excludes any reduction in the emission factor of electricity due to the ACT government reaching its renewable energy target of 90% by 2020.

No degradation of water quality in Sullivans Creek between when it enters and exits ANU.	Measured against seven criteria: pH, turbidity, dissolved oxygen, nitrate, phosphate, electrical conductivity, temperature
Decrease weed coverage by 5 per cent by 2020.	
Heritage	
Complete the identification and assessment program of all heritage listed places on ANU campuses.	

Appendix II – Review of 2009-2015 EMP Targets

The 2009-2015 Environmental Management Plan listed sustainability targets under eight themes, which were assessed against a 2006 baseline. The table below assesses results at the end of December 2014, thus covering four years of the five year program. A more detailed assessment is available in the 2014 Annual Report.

Clear successes were in the area of water use and transport with most targets being met. On the other hand total energy use and waste production increased, although per capita energy and waste consumption decreased (9% for energy and 22% for waste).

Some of these targets were difficult to assess because they were not quantifiable (culture, teaching and learning, and landscapes). Other targets only measured total resource use and didn't consider the impact of campus population growth and increased floor area. Pollution wasn't measured between 2012 and 2014 due to reduced staff numbers.

As a result of this review it is clear that future targets need to be measurable and consider ongoing campus population and building growth.

Target	Result at Dec 2014	Met or Not met
Culture		
Increase community engagement in campus sustainability initiatives	See 2014 Annual report	Difficult to measure.
Increase events and information campaigns to raise public interest in sustainability	See 2014 Annual report	Difficult to measure.
Increase sustainability related training and development opportunities through internships, workshops and national and international alliances	See 2014 Annual report	Difficult to measure.
Energy and Greenhouse gas emissions		
Reduce energy and Co2 by 20% by 2015	Increased by 18.5%	Not met.
Water use		
Reduce total water use by 30% by 2015	declined by 30%	Met.
Remove 100% of potable water from landscape irrigation	reduced by 57%	Not met but a significant achievement.
Waste		
Continually reduce resource waste by applying the waste hierarchy	Not quantified	Not possible to measure.
Reduce unsustainable procurement and increase reuse and recycling	Not quantified	Difficult to measure.
Reduce waste to landfill by 40% by 2015	Increased by 2.2%	Not met.
Resilience (Pollution)		
Reduce residual pollution risk below a 20% baseline	Not measured 2012-2014	-
Reduce stocks and flows of hazardous materials on campus	Not measured 2012-2014	-
Reduce exposure to environmental hazards	Not measured 2012-2014	

Transport		
Increase green commuting to 80% by 2015	Increased to 65%	Major achievement but not met
Minimise single occupant vehicles	Decreased to 33%	not quantified
Reduce fleet emissions by 20% by 2015	20%	Met
Landscapes		
Balance vegetation losses with new assets through protection zones and plantings	Not quantifiable	Not quantifiable
Adopt sustainable landscape strategies that protect landscape values and reduce dependence on potable water	See the 2014 Annual report	Difficult to measure.
Research and teaching		
Increase academic collaboration and support for student projects that address campus sustainability issues	Difficult to measure but many students have developed campus sustainability projects	Difficult to measure.
Increase student project time developed to practical ANU sustainability issues	Difficult to measure	Difficult to measure.
Increase opportunities for research publications on sustainable facilities management	Difficult to measure	Difficult to measure.

Appendix III - Legislation and Reporting Requirements

Legislation

ANU is bound by number of pieces of environmental state and federal legislation. The most significant include:

Environment Protection and Biodiversity Conservation Act 1999

ANU is responsible for ensuring locations with identified Commonwealth natural, social and built heritage values are protected and conserved.

Environment Protection Act 1997

The University has a duty of care to take practical and reasonable steps to prevent or minimise any environmental harm or environmental nuisance as a result of its actions.

Annual environmental reporting requirements

Annual Report

Under the *Environment Protection and Biodiversity Conservation Act 1999*, Commonwealth agencies must include a report on environmental matters in their annual report.

National Greenhouse and Energy Reporting

The National Greenhouse and Energy Reporting Scheme (NGERs) was introduced in 2007 to provide data and accounting in relation to greenhouse gas emissions and energy consumption and production. Reporting is required if an organisation meets the emission thresholds.

National Pollutant Inventory (NPI).

The NPI contains data on 93 priority substances which are emitted to the environment. Reporting is required if an organisation meets certain thresholds for these substances.

Tertiary Education Facilities Management Association (TEFMA)

Reporting is required on energy, water and waste consumption.

Annual report to the Vice-Chancellor

The annual report to the Vice-Chancellor is not a mandatory requirement but is undertaken as part of the process of implementing the Environmental Management Plan. Results from this report are also communicated widely to the ANU community. The reports are available on sustainability.anu.edu.au.