



UNIVERSITY OF CAPE TOWN

ISCN-GULF SUSTAINABLE CAMPUS
CHARTER REPORT 2014–2015



University of Cape Town ISCN-GULF Sustainable Campus Charter Report

Reporting period: 2014–2015

About this report

This report in terms of the ISCN-GULF Charter is the third to be produced for the University of Cape Town and covers a two-year period from 2014 to 2015. It draws on the carbon footprint reports produced in 2014 and 2015. Carbon reports and previous sustainability reports can be found at <http://www.uct.ac.za/main/explore-uct/sustainability>

The report is laid out in three chapters, aligned with the three principles of the ISCN-GULF Charter:

1. Principle 1: SUSTAINABILITY PERFORMANCE OF BUILDINGS ON CAMPUS
2. Principle 2: CAMPUS-WIDE MASTER PLANNING AND TARGET SETTING
3. Principle 3: INTEGRATION OF RESEARCH TEACHING, FACILITIES AND OUTREACH

Each chapter begins with a *Management Approach* section, followed by the *Main Initiatives and Results*. The indicators from the reporting guidelines are used as sub-headings within each chapter. The results are summarised in a table at the end of each chapter, providing metrics wherever available.



Introduction

The University of Cape Town strives to be... “an inclusive and engaged, research-intensive African university that inspires creativity through outstanding achievements in learning, discovery and citizenship; enhancing the lives of its students and staff, advancing a more equitable and sustainable social order and influencing the global higher education landscape”.

The University of Cape Town (UCT) is South Africa’s oldest university, founded in 1829 as the South African College, and developed into a fully-fledged university during the period 1880–1900. Today it is one of Africa’s leading teaching and research institutions. In 2015 the university community comprised a total population of 33 204 students and staff, with around 27 800 students. UCT is the highest-ranked African university in both the *Times Higher Education* and *Quacquarelli Symonds* world university rankings. UCT continues to work towards its goal of being Africa's leading research university.

The main campus comprises an iconic set of buildings of significant heritage value, located on the slopes of Table Mountain, which is a World Heritage Site and a national park. The university comprises more than 75 buildings on its main campus, and several satellite campuses and residences across Cape Town, including the Health Sciences campus and Hiddingh Fine Arts campus. The Graduate School of Business campus is in the V&A Waterfront precinct near the central city and harbour.

Community and culture

UCT has an established mission to address challenges of both local and global significance that include climate change, poverty, and inequality, through research and teaching, as well as a wide range of socially-responsive activities and outreach programmes.

Student action in recent years has brought to the fore critical issues of transformation, access to education, inclusiveness and ‘decolonisation’ of the university and its curriculum; sexual violence and ensuring representation along racial and gender lines. This has led to an ongoing process of interrogating the historical values and assumptions that inform the institutional culture. The latest Strategic Plan 2016–2020 signals UCT’s commitment to understand, debate and engage with a process of decolonisation and to forge a new inclusive identity.

The student protests at UCT, which had initially focused on colonial legacies in education, were echoed by student protests against spiralling tuition costs, which spread into a nationwide campaign titled *#FeesMustFall*. An outcome of these protests was a presidential decree in October 2015 that there would be no tuition fee increases for the following year. Additionally, UCT agreed to insource all the out-sourced services and workers. The formerly outsourced workers, some 1300 staff, became fully-fledged UCT employees in 2016, expanding and changing the UCT community. The combination of higher payroll costs and pressure on fee and subsidy income triggered financial austerity measures in 2016, the effects of which are still unfolding.

Governance and institutional context

A 30-member Council governs the university and is responsible for determining the mission, strategies and policies for the progress of the institution. A Senate is responsible for academic governance. The executive comprises the chancellor, vice-chancellor, and four deputy vice-chancellors. In addition, there are two Pro vice-chancellors: one responsible for addressing the major strategic area of climate change and development, and the other responsible for poverty and inequality. Unlike many universities in developed nations, the university does not have a sustainability office or coordinator. The building and campus aspects of the sustainability portfolio are assigned to executive director of Properties and Services (P&S), while the academic aspects pertaining to teaching and research fall within the ambit of a deputy vice-chancellor. However, sustainability efforts are being integrated into the curriculum in various courses, in many research projects and programmes, and in social responsiveness work, and they inform UCT planning and operational management. A network of researchers, lecturers, students and administrative staff committed to sustainability exists and collectively drives this agenda forward.

Environmental policy commitments at UCT began with the signing of the international *Talloires Declaration* in 1990 by Vice-Chancellor Stuart Saunders (one of the 20 original signatories). The *UCT Green Campus Policy Framework* developed by the office of Deputy Vice-Chancellor Martin Hall was adopted by the university Council in 2009. The policy framework called for the drafting of a status quo assessment and an action plan and identified a key objective: to develop a holistic approach to integrating sustainability thinking and practice across all aspects of university life, including addressing sustainability issues in teaching, research and outreach, as well as in strategic planning and operations.

The *Green Campus Action Plan* was drafted in 2009 under the direction of the **Properties and Services Department** and the **Environmental Management Working Group (EMWG)**, which it convenes. The plan sets out priority actions that relate mainly to operational issues and has since been implemented through the Properties and Services Department, responsible for facilities, new buildings, campus planning, transportation and health and safety.

In 2012 Vice-Chancellor Dr Max Price signed the *ISCN-GULF Sustainable Campus Charter*, bringing to UCT an environmental policy that integrates sustainability in education, research and outreach, strategic planning and operations.

The Environmental Management Working Group was formed in 2001 to coordinate the implementation of the *Talloires* commitments. This group continues to guide the prioritisation of sustainability initiatives and provide oversight of implementation of the Green Campus Action Plan. It comprises staff of Properties and Services, academics and student representatives, and is the most important institutional structure for campus sustainability. The group reports to the **University Building and Development Committee (UB&DC)** and can table recommendations on the sustainability of campus developments and operations at the monthly UB&DC meetings.

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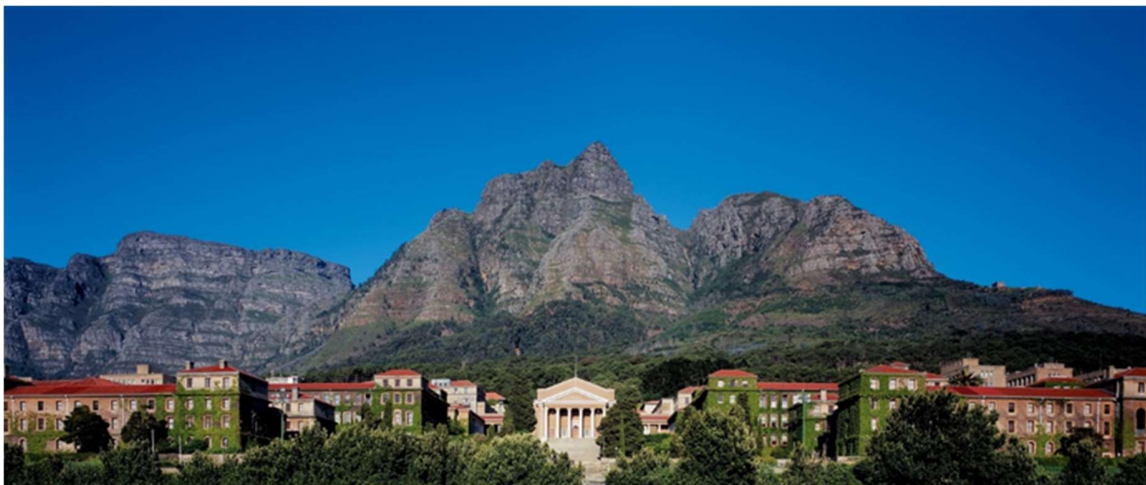
Find out more: <http://www.uct.ac.za/main/explore-uct/sustainability>

For questions or comments about this report, please contact:

Dr Max Price, Vice Chancellor

Email: vc@uct.ac.za

Figure 1: Upper Campus, Rondebosch, University of Cape Town



PRINCIPLE 1 – SUSTAINABILITY PERFORMANCE OF BUILDINGS ON CAMPUS

To demonstrate respect for nature and society, sustainability considerations should be an integral part of planning, construction, renovation and operation of buildings on campus.

Principle 1: Management Approach

Sustainability performance of the buildings on campus is managed by the Properties and Services Department, with input from the Environmental Management Working Group. The *Green Campus Action Plan* and the *ISCN Sustainable Campus Charter* are the guiding policies.

In terms of **resource use**, electricity consumption is the largest contributor of greenhouse gas emissions, comprising approximately 75% of total emissions, and thus is a priority in terms of sustainability initiatives. In accordance with the *Green Campus Action Plan*, a phased roll-out of digital electricity meters to a building level has been in progress since 2014, across the main campus, Health Sciences campus and Hiddingh campus. The programme was completed, and monitoring began in November 2015, providing more robust data to inform energy management and reduction strategies.

There is at present no defined target at UCT for reduction in energy consumption. Adoption of a target has been impeded by the lack of capital budgets and other resources, such as dedicated staff, towards this goal. The university continues with replacement of equipment with new, more efficient technologies for lighting, air-conditioning chillers and heat pumps, using annual maintenance budgets. No capital projects for energy efficiency are being planned.

The status with respect to **on-site renewable energy generation** remains unchanged since the previous report, with no infrastructure installed or at planning stage. The development of feasible financial models for investment in renewable energy technologies is required to drive renewable infrastructure funding. In South Africa, renewable energy has recently reached grid parity in terms of generation cost, making solar energy infrastructure viable for the university. Multiple buildings in Cape Town installed large-scale roof-top solar systems during this reporting period.

Management of **water** use is critical since Cape Town is a water-scarce region with rapid population growth. Future climate change conditions will continue to pose a threat to Cape Town's available drinking water¹. Increased tariffs and water restrictions are being applied by municipalities to suppress demand. In this context the measurement and monitoring of water consumption has become critical. Water consumption data is presently drawn from municipal accounts and is unreliable, leading to erratic performance data. To address this issue, digital water sub-metering technologies are required.

¹ City of Cape Town, 2016. *State of Cape Town Report*.

While there is a procurement department at UCT, a decentralised procurement policy exists, with purchasing of paper, stationery, vehicles and furniture occurring at departmental level, making control of the environmental aspects of procurement difficult. Procurement and Payment Services is responsible for the purchase of other assets, especially laboratory equipment. In 2013 the first **Green Procurement Guideline** was adopted by the university Council, but implementation has not progressed.

Solid waste management and recycling of waste materials has been a key initiative of campus sustainability since 2008, and a priority project within Properties and Services and the Green Campus Initiative. Materials being recovered from the waste stream have continually been expanded to a wider range of waste categories. The removal of food waste from the waste stream became a significant new initiative in 2015, with diversion of food waste from first-tier residences to a composting facility.

Hazardous waste management has been well managed at UCT in the past decade. In accordance with legislation, reporting is required on all hazardous waste generated at various sites, including healthcare risk waste and hazardous chemical waste. The Hazardous Substances Control Programme is focused on substances used for research such as hazardous biological agents, genetically modified organisms, hazardous chemical substances, and sources of ionising radiation. The programme promotes the reduction of the quantity of hazardous substances being acquired, handled, stored and disposed of.

Green building design has advanced rapidly in South Africa since the establishment of the Green Building Council of South Africa in 2007 and the development of the 'Green Star SA' rating system with tools for a range of building types. The *Public and Education Building Rating Tool* was launched in late 2012, and in that year UCT adopted a *Green Building Policy*, requiring all new buildings to be constructed to a minimum four-star Green Star SA rating.

New building projects at UCT are conceived and implemented together with an investment in landscaping of the surrounding spaces. The New Lecture Theatre project on upper campus, described below, is an example of an investment in the landscape associated with buildings. There is ongoing upgrading of the spaces between campus buildings, with hard and soft landscaping and tree planting.

MAIN INITIATIVES AND RESULTS

Resource use

Energy

Rising student numbers and new infrastructure are typically key drivers of energy demand at universities, increasing costs and greenhouse gas emissions. In South Africa, lack of generation capacity has led to planned nationwide power outages and high annual increases in electricity tariffs, making energy efficiency and demand reduction measures highly critical. There was an extended period of a few months of planned power outages across South Africa in 2015, affecting normal operation at UCT. Energy security is expected to be an ongoing problem into the medium-term future.

Energy consumption from 2013–2015 is reflected in Table 1:

- In 2014, electricity consumption was 71.7 GWh, compared to 70 GWh in 2013, equivalent to an increase of 3.8%. The population growth was 0.93% and the floor area increased by 4.9%.
- In 2015, electricity consumption was 70.8 GWh, a decrease of 1.2% over 2014. Since there were no energy efficiency initiatives, the decrease is likely due to replacement of equipment at end-of-life, or planned maintenance. This is a positive trend given that this decrease occurred in a period of significant population growth of 6%.

Table 1: Electricity consumption trends

ELECTRICITY CONSUMPTION TRENDS							
	kWh	Difference	Change	Population	Change	Area	Change
2013	70 037 104			31 041		672 858	
2014	71 740 500	1 740 242	3.84%	31 329	0.93%	705 653	4.9%
2015	70 860 114	-880 387	-1.23%	33 204	6.04%	706 125	0.1%

The normalised electricity demand was 102 kWh/m² in 2014 and decreased to 100 kWh/m² in 2015. By comparison, the energy intensity at the University of Melbourne was 197 kWh/m² in 2016². UCT Per capita (full-time employees and students), electricity demand was 2 290 kWh in 2014 and 2 134 kWh in 2015. While energy demand per capita has remained stable since 2012, an improvement can be identified at the level of the normalised energy demand by floor area of 4%.

² University of Melbourne, 2016. *Sustainability Report 2016*.

The major initiative aimed at energy reduction has been the roll-out of **digital electricity meters** at building level. Measurement, monitoring and reporting of electricity consumption commenced in late 2015 with the appointment of an external service provider. It is planned that this information will be made available to the campus community to raise awareness and encourage behaviour change. In future, UCT could explore ways of using the data to deliver innovative strategies and funding models to reduce energy demand.

Water use

- The university's total municipal **water consumption** in 2014 was 404 080 kL, compared with 350 371 kL in 2013, a 15% increase. It is likely that the 15% increase between 2013 and 2014 reflects a data quality issue.
- In 2015 the consumption decreased by 10% to 361 877 kL.

These results demonstrate the unreliability of the data drawn from municipal accounts, where estimates and billing reversals are typical, and data is manually captured by several staff members in different departments. Faulty and broken municipal meters, often undetected for long periods, are a further factor. Until digital metering and monitoring is implemented, management of potable water consumption is likely to remain a challenge.

Water demand management is addressed to an extent through the installation of water-efficient sanitary fittings and the installation of these for all new buildings.

To conserve potable water on the main campus, much of the water for irrigation of gardens and sports fields is drawn from a dam on upper campus, avoiding potable water use. During droughts, however, this dam runs dry. The stream flows of the mountain river system to and from the dam need to be managed to avoid adverse impacts on riverine ecosystems. Drip-irrigation systems have become standard practice on new landscaping projects.

Purchased products

An important initiative has been the development and adoption by Council of a *Green Procurement Guideline* in late 2013. This policy now needs to be disseminated across the university and implemented consistently, which is likely to take several years. The objective of the policy is to reduce UCT's impact on the local and global environment, remove unnecessary hazards from its operations, protect public health, and improve the environmental quality of the campus. It applies to the procurement of all goods and services at UCT and is broadly applicable to any person procuring goods at UCT. It is based on the principle of 'environmentally preferable products' that have a lesser negative impact. Significantly, the policy commits UCT to promoting procurement that considers 'life-cycle costs and benefits'. Application of this principle has the potential to transform the way building projects and other infrastructure are financed.

Solid waste management

Although solid waste disposal contributes a minor portion of the carbon footprint, it is acknowledged that the full impact goes beyond this metric. Recycling systems on campus also have an education benefit, raising awareness of environmental issues and fostering responsibility.

Data collection of the proportion of waste being recycled began in 2009, provided by the external waste service provider. A two-bin separation at source system is established in outdoor areas on all campuses and upgrading of waste stations is ongoing. The university currently has recycling programmes in place for mixed recyclables (paper, cardboard, cans and bottles), electronic waste and IT equipment, fluorescent light tubes, polystyrene and printer cartridges.

Historically, waste data has been based on estimation techniques for the weight of each bin collected. A new waste service provider was appointed for a five-year term in March 2015, and the waste data provided since reflects very different, less successful results for recycling. It is therefore critical to obtain robust waste recycling data to inform future waste management strategies.

- In 2014, the total quantity of waste removed from UCT was 1 078 tonnes compared to 1 045 tonnes in 2013, a 3% increase.
- In 2015 the total waste increased to 1 361 tons, a 26% increase³, while the population increased by 6% in that period. The major increase in 2015 may reflect changes in measurement methods of the new service provider.
- The proportion of waste recycled in 2013 was 62%; 59% in 2014 and only 12% in 2015 (without food waste). Again, this may reflect a different measurement process of the new service provider, as well as a deterioration in waste separation actions by students and staff.

There have been ongoing efforts by Properties and Services and the Green Campus Initiative to provide recycling infrastructure, training and awareness campaigns, however progress towards higher percentages of recycling has been elusive. To address this challenge, waste audits have been performed periodically and again in late 2015, entailing a comprehensive review of recycling infrastructure across all areas. The objective of auditing was to establish strategies and budgets needed to improve recycling rates and the implementation of these initiatives is ongoing.

It is evident from the audits that solid waste management at UCT requires attention and research to understand the **slow pace of behaviour change** towards higher recycling rates. Further development of indoor recycling systems has been identified as being necessary for improved recycling, comprising both

³ These figures are calculated without the recycled waste categories of Hazardous Waste (Chemical and Medical), e-Waste, and printer cartridges managed by the university, but rather reflect the content of the outdoor two-bin system placed around campuses.

infrastructure and education. Waste management training for staff and students requires additional resources from the administration.

Food waste

UCT's efforts to decrease solid wastes going to landfill have resulted in the diversion of food waste from landfill as of March 2015. Food wastes from catering residences are taken to a local fly farm where nutrients are recycled to create protein for animal feed. An amount of 173 tonnes of food was diverted from landfill for the 12-month period from March 2015.

Research facilities and sustainability

Hazardous substances management

Hazardous waste management activities in 2014 included a further campaign to remove all unneeded chemicals for disposal; improve the accuracy of hazardous substance inventories; and improve the storage of both unused chemicals and waste.

A project in conjunction with national governmental and international agencies in 2014/2015, successfully identified several radioactive sources stored on campus for safe removal. The reduction in the quantity of radionuclides used in research is continuing, with researchers shifting to alternative methods.

Three faculties are currently registered with government for research involving genetically modified organisms (GMOs). As well as the university's GMO committee, there is also oversight on work involving hazardous biological agents by the Biosafety committees in both the Health Sciences and Science faculties. There is also an oversight committee for hazardous chemical substances in the Faculty of Health Sciences.

A new manager of Health and Safety has been appointed in the Faculty of Health Sciences. This new post has resulted in improved communications between academic departments and the Environmental Risk Officer at P&S.

Campus users

Universal access

An audit of universal access compliance in 30 UCT buildings commenced in 2013 and was completed in June 2014. The objective was to inform design and auditing of all university buildings in future. To date campus buildings have complied with the national building regulations; however, the current objective is to apply best practice standards in future.

Accessible hearing technology systems continued to be installed in more teaching venues as part of a major classroom facilities upgrade, bringing the total number of venues accessible to people using hearing aids and/or cochlear implants to 33.

The Disability Service Unit hosted visits by several higher education institutions seeking support for their own disability support provision programmes, including the University of Lusaka and a large contingent from the University of Namibia. It was also active in the national higher education sector, principally over the issue of access to higher education for persons with disabilities. The unit provided input into several national discussion documents towards a national policy framework within which to ensure equitable financial support to students with disabilities. UCT is a participant in the Higher Education Disability Service Association (HEDSA). Guidance was provided to the UCT Executive around its strategic response to aspects of the *Draft White Paper on Social Inclusion*, in which issues of disability feature prominently.

Stakeholder participation in planning

Stakeholder participation in planning at UCT has in the past been ad hoc, without formal policy guidelines. The development of a policy to guide stakeholder engagement, mentioned in the previous report, has not progressed in this reporting period. Guidelines are necessary to deal with internal and external stakeholder engagement, as well as with neighbouring communities and local authorities.

Building design aspects

Green building practices

There has been gradual progress towards green building design at UCT in new buildings such as the Economics and Student Administration buildings on middle campus (2010) and the New Engineering Building (2012). Environmental management plans were first adopted on campus for the construction phase of these developments. Key sustainable design strategies adopted were façade design to avoid heat gain and glare and enhance energy efficiency. Energy modelling was undertaken for the New Engineering Building, which significantly enhanced the energy efficiency of the building design and informed the façade design. The Teaching and Learning building constructed in 2013–2014 adopted similar standards to the New Engineering Building. The New Lecture Theatre on University Avenue became the first building at UCT to achieve a green design rating. The strategies adopted to achieve this rating are described in detail below.

NEW LECTURE THEATRE, UNIVERSITY AVENUE, UPPER CAMPUS



The New Lecture Theatre building project on University Avenue, upper campus, became the first UCT campus building to obtain a green building rating. The project achieved a four-star Green Star SA 'As Design' certification from the Green Building Council of South Africa (GBCSA) in November 2015.

The building has an iconic cylindrical form housing the auditorium, which is clad in a maintenance-free zinc alloy sheeting, a sustainable material that suited the curved shape of the lecture theatre. The double storey, glazed façade of the foyer area, shaded by a *brise-soleil*, faces onto a landscaped plaza, providing an outdoor social and learning space. A small constructed wetland area encourages rainwater attenuation and infiltration, while minimising stormwater run-off.

The 1 365 m² building completed in early 2016, comprises a 400-seater auditorium and an adjacent foyer that functions as a social and learning space for 100 students. This project was among the first university buildings in South Africa to be certified in terms of the newly developed rating tool for public and



education buildings. The design aimed for credits across all categories of the rating tool, with the highest scores achieved in the Water, Transport, Management and Energy categories.

Water

- Reduction of potable water use through installation of water-efficient fittings and rainwater harvesting. Rainwater is harvested from the roof and stored in tanks below the building, saving 300 m³ of potable water per annum. The design aims to be 60% more water efficient than a similar notional building. Harvested water is used for toilet flushing.
- Water meters: Sub-metering is installed for all major water uses.
- A Building Management System (BMS) monitors water consumption.

Management

- A Building Management System optimises the effectiveness of the building services, with a visual display or 'dashboard' in the foyer providing information of the building's performance.
- Maintainability: Credit entailed a design review of plant access, ongoing maintenance and development of a building maintenance guide. A building maintenance specialist provided input during the design process and compiled a building maintenance plan.

Indoor environmental quality

- The building has windows that open and shut automatically depending on the heat and carbon monoxide levels.
- Stairs: The credit recognises designs that promote the well-being of occupants by encouraging the use of stairs as an alternative to the use of lifts. The staircase is highly visible, has extensive exterior glazing providing daylight and views, and is fully open to the interior over the entire span of the stairwell.

Materials

- Masonry: The use of hollow blocks for the walls required extensive coordination of the components and services by the design team. These blocks result in a better insulated building, saving energy costs during operation.
- Use of recycled aggregate: The project was instrumental in transforming the local concrete industry through engaging with suppliers to make this credit possible.
- Concrete: The quantity of Portland cement, as an average across all concrete mixes, was reduced by 30%, reducing embodied energy and resource depletion.

Energy

- Reduction of greenhouse gas emissions through energy efficiency as demonstrated by energy modelling. The design scored 13 out of 20 potential points.
- Metering and monitoring of electrical energy.
- Unoccupied spaces: For areas that are mechanically ventilated, over 90% of the diffusers are connected to motion sensors, so that the ventilation is turned off when spaces are unoccupied.



Landscape integration with buildings

UCT employed its first in-house landscape architect in the Properties and Services Department in July 2014. Work began on compiling a *Landscape Framework* document with associated plans as part of the *Integrated Development Framework* (IDF). The first draft of this document was completed in August 2015 and was circulated for feedback to various stakeholders and committees. This policy is in place to guide landscaping projects, described further under Principle 2.

The design and implementation of the landscaped spaces around the New Lecture Theatre was one of the major projects of this reporting period.

UCT's Principle 1 Goals

Topics	Goals and Initiatives		Results		
Priority topics (with units of measurement)	Objectives and targets (for reporting year, following year, and beyond)	Key Initiatives (in reporting year, or planned for the future)	Performance 2013	Performance 2014	Performance 2015
Resource use					
Electricity (MWh/annum)	Aim for continual reduction of demand against baseline in 2012 of 68 780 MWh/a	Installation of web-based digital metering for improved monitoring	All campuses: 69 030 MWh/a 37 digital meters installed at transformers with ongoing roll-out to building level	All campuses: 71 740 MWh/a Digital meter installation at building level in progress	All campuses: 70 860 MWh/a Digital meter installation at building level complete; monitoring commences
Water (Total kL/annum)	Reduction of potable water consumption 2012: 512 829 kL/a		350 371 kL 11.3 kL per person per year	404 080 kL/a 12.9 kL per person per year	361 877 kL 10.9 kL per person per year
Waste, recycling, local emissions, and non-compliance					
Solid Waste (tons per annum) Baseline 2010: 756 tons; 50% recycled	Reduction of waste to landfill through recycling; target of 70% recycling; develop measurement and reporting system	Education campaigns about what can be recycled; ongoing waste training for cleaning staff	Total: 1 045t 63% recycled Landfill: 390t Recycled: 655t	Total: 1 078t 59% recycled Landfill: 440t Recycled: 638t	Total: 1 670t 21% recycled Landfill: 1 321t Recycled: 349t

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e-Waste System (kg per annum)	Diversion of e-Waste from landfill for reuse and recycling 2012: 5 970 kg	e-Waste system ongoing; sustainable reuse, donation, material recovery and safe disposal	10 288 kg recycled	10 279 kg	10 278 kg
Research/IT facilities and sustainability					
Hazardous waste (chemical: litres, medical: kilograms)	Safe removal and disposal of hazardous chemical wastes	Ongoing implementation of Hazardous Substances Control programme	Chemical: 29 130 litres Medical: 36 243 kg	Chemical: 42 575 litres Medical: 40 135.5 kg	Chemical: 36 261 litres Medical: 44 837 kg
Campus Users					
Inclusivity	Continual improvement towards the objectives of the UCT Disability Policy	The ongoing work of the UCT Disability Service to provide advice, advocacy and support services to the disabled	Major audit undertaken of Universal Access on sample of 30 buildings to secure government funding for upgrades	Universal Access audit completed and submitted for government funding	Awaiting government funding for upgrading of Universal Access infrastructure
Indoor air quality	Achieve Best Practice in ventilation rates and air quality	Upgrade of majority of large lecture theatre air-conditioners over five years	Lecture theatre air-con upgrade commenced	Lecture theatre air-con upgrade in progress; ventilation rates to be increased from 5l/s to 8l/s	Lecture theatre air-con upgrade completed
Stakeholder participation	Formalise stakeholder participation and adopt policy	Develop a Stakeholder Engagement Policy to guide internal and external participation	Policy development in progress	No progress	No progress

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Building design aspects					
Green Building practices	Achievement of minimum standard of four-star Green Star SA for all new buildings and major refurbishments		New Teaching and Learning building being built to same energy/thermal standards as NEB	New Lecture Theatre project re-commenced after delayed approvals. Designed to achieve four-star Green Star SA 'As Designed' rating	New Lecture Theatre awarded a four-star Green Star SA 'As Designed' certification Nov 2015. First certified building at UCT
Landscape integration with building design	Integration of landscaping with building design on all new developments	Ongoing upgrading of hard and soft landscaping around buildings; water-wise, indigenous	New Engineering and Teaching and Learning buildings with associated courtyard spaces	New Landscape Framework policy defines approach to campus landscapes	Development of landscapes around buildings is ongoing

PRINCIPLE 2 – CAMPUS-WIDE MASTER PLANNING AND TARGET SETTING

To ensure long-term sustainable campus development, campus-wide master planning and target setting should include environmental and social goals.

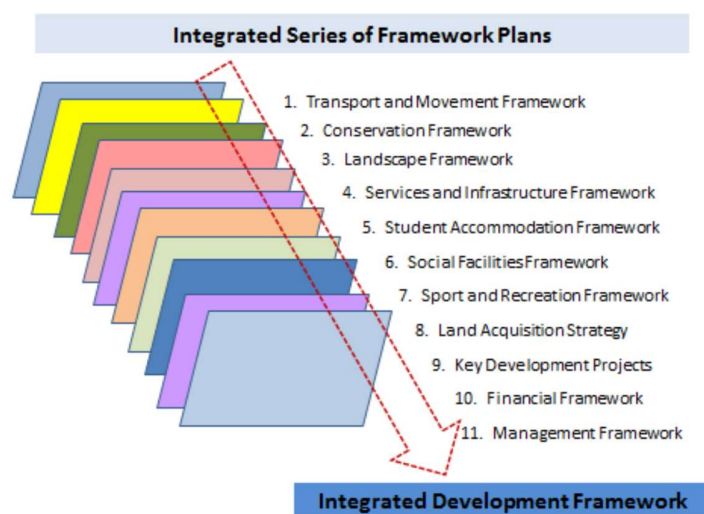
Principle 2: Management Approach

Environmental and social goals are embedded in the university's *Statement of Values*, which underpins all other policy. This framework policy states an aspiration to achieve social transformation, social responsiveness, and participative governance. It commits the university to protection and conservation of the environment and natural resources. These values have been expressed in the UCT Integrated Development Framework, a principal planning document drafted between 2013–2015 described further below.

Campus-wide master planning is the responsibility of the Physical Planning Unit within Properties and Services, reporting to the University Building and Development Committee. This committee contributes to strategic planning, advises Council on physical development and oversees major capital projects. The Physical Planning and Landscape Sub-committee participates in this forum.

There were significant global agreements on sustainable development and climate change in 2015, with the adoption of the Sustainable Development Goals (SDGs) as well as the Paris Agreement at COP21 under the *United Nations Framework Convention on Climate Change*. South Africa made commitments towards mitigation of its greenhouse gas emissions. As a developing nation, emissions targets are in line with the principle of common but differentiated responsibilities, and respective capabilities. South Africa's target takes the form of a peak, plateau and decline of the GHG emissions trajectory range by 2030. UCT continues to measure and report its emissions annually. The first study was undertaken in 2009, followed by annual reports from 2012 to 2015. To date no emissions reduction targets have been set, but year-on-year comparison is made to monitor progress.

A major undertaking towards **campus master planning** has been the compilation of an *Integrated Development Framework* (IDF) from 2013–2015, by external consultants guided by Properties and Services. The IDF fulfils the requirements of the National Department of Higher Education and Training for the



submission of a “University Campus Master Plan” to underpin the next round of infrastructure funding applications⁴.

The IDF is both a spatial development framework and a **growth management strategy** for the university, dealing with strategic investments and land acquisition. It comprises sub-components such as Transportation, Landscaping, Heritage Conservation and Student Housing. The framework provides design guidelines to inform all future development and renovation of the campuses. It contains a series of five-year spatial plans from 2015 to 2039.

The IDF vision for the campus is:

“To celebrate the identity and unique sense of place of the university, expanding and developing the campus as a place of vibrancy, safety, accessibility, high quality of open space and buildings, intricacy and human scale.....”

All strategic recommendations must be tested against performance criteria: Equity and Access; Intensification/densification; Sustainability; Heritage; Safety and Security; Flexibility; and Landscape, Placemaking and Legibility.

The next phase of the master planning process is to obtain approvals from the relevant authorities for land-use rezoning and departures, and thereafter to obtain approval from Heritage Western Cape for the *Heritage Conservation Framework*. These processes will involve participation processes with the campus community and the broader public in accordance with the relevant legislation.

A **Transportation Framework** within the IDF includes strategies for the promotion of the use of public transport and non-motorised transport (NMT) modes; shifting the modal split between private and public transport; review of the UCT parking strategy to reduce the impact of private vehicles on campus; optimising the Jammie Shuttle operation; and development of NMT infrastructure.

The **Landscape Framework** in the IDF recommends the review of the role and composition of the various committees relating to the campus environment (the Environmental Management Working Group and the Physical Planning and Landscape Sub-committee) including the review and approval process for all landscape works, to ensure consistency and adherence to the overall principles and landscape policies. The draft Landscape Framework is completed and is being refined through a peer review process.

The main campus is adjacent to the Table Mountain National Park, a World Heritage Site, with globally important biodiversity resources. **Biodiversity** conservation is thus considered a priority in the UCT *Green Campus Action Plan*. Ongoing efforts are made to enhance the biodiversity and ecological value of the estate by planting endemic and indigenous vegetation. **Landscaping projects** are ongoing,

⁴ UCT June 2014, Integrated Development Framework, Executive Summary Report

undertaken by the Gardens Department with guidance and input by the Physical Planning and Landscape Sub-committee.

Social inclusion and protection: diversity among staff and students

Diversity and transformation⁵ have long been expressed as priorities in UCT's Vision and Statement of Values, and in its strategic plans, given South Africa's apartheid past. The transformation agenda came to the fore with new urgency in 2015, with student protests occurring at UCT and across South Africa. The transformation agenda has broadened since student protests began, with intense debate and contestation over issues such as decolonisation of universities including the curricula, creating an inclusive learning environment, and addressing sexual violence. These objectives are the mission of several institutional units such as the HIV/AIDS, Inclusivity and Change Unit (HAICU), described in Box 1.

All South African employers are required to develop **Employment Equity** plans, aimed at achieving equity by promoting equal opportunity and fair treatment in their employment practices; to eliminate unfair discrimination and to promote the use of affirmative action measures. The University of Cape Town has developed and implemented five equity plans since 1998, the most recent being for the period April 2015 to March 2020. Key policies that enable the university to manage employment issues include anti-discrimination policies and a sexual offences policy.

MAIN INITIATIVES AND RESULTS

Carbon emissions

In 2014 and 2015, annual carbon footprint reports⁶ were produced, following the international *GHG Protocol* methodology⁷. UK Defra emission factors are used, except for electricity where the national power utility Eskom provides a factor.

The UCT Carbon Reports include a comprehensive range of activities that produce direct and indirect greenhouse gas emissions. These include the Jammie Shuttle service, the vehicle fleet, purchased electricity, staff air travel, commuting, food supply and business travel. While Scope 1 and 2 calculations

⁵ In the post-apartheid South African context, 'transformation' refers to racial equality and gender equity, now enshrined in the Constitution.

⁶ <http://www.uct.ac.za/main/explore-uct/sustainability>

⁷ The *Greenhouse Gas Protocol – Corporate accounting and reporting standard*: <http://www.ghgprotocol.org/>

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are derived from reliable data, Scope 3 calculations use an estimation approach, acceptable in terms of the GHG Protocol.

- In 2014 the total greenhouse gas emissions were 87 522 tCO₂e, compared to 86 205 tCO₂e in 2013, an increase of 1.5%.
- Using the same emission factor for electricity purchased⁸, the total emissions recorded for 2015 were 89 186 tCO₂e, an increase of 1.6% compared to 2014. Given the growth in population of 6%, this is a positive result. The carbon emissions for 2015 were also calculated using the updated Eskom grid-emission factor currently used by most companies in South Africa. Using this higher emission factor, total emissions for 2015 increased by 9.2% to 95 564 tCO₂e.
- In terms of the intensity of emissions (using the updated Eskom factor), the emissions per square metre increased by 7.75% to 0.106 tCO₂e from 0.098 tCO₂e. The total building area increased by only 0.1%. The per capita emissions increased by 1.7 % to 2.25 tCO₂e, with a 6% increase in population (Table 2).

Table 2: UCT Carbon Emissions 2013–2015

INTENSITY METRICS (Scope 1&2 only)	2015	2014	2013	% change 2014–2015
Gross Area	706 125	705 653	672 858	0.1%
Tons CO₂e/sqm/annum	0.106	0.098	0.099	7.8%
Population – Staff & Student (Full Time Equivalent, FTE) ⁹	33 204	31 329	31 041	6%
CO₂e/person/annum	2.25	2.21	2.15	1.7%

Monitoring of the carbon emissions at UCT is focused on year-on-year comparison as the university has not yet adopted **emission reduction targets**. No carbon offsets are used, and no Renewable Energy Certificates are purchased. The fossil fuel divestment campaign launched in 2014, taken up by UCT alumni and students, triggered debates about getting the campus house in order before or in parallel to divestment question.

In terms of emissions reduction targets at a national level, it is not expected that public universities would be assigned individual carbon budgets in the near future. The expectation is that carbon budgets will be defined for larger emitters among private and state-owned companies like the national electricity

⁸ UCT's 2014 carbon footprint used an emission factor, generated by an industry partnership of 0.94 kgCO₂e/kWh (MAC Consulting 2013). The 2015 carbon footprint has opted to use the Eskom published grid-emission factor, in line with the practice of most companies in South Africa.

⁹ An FTE of 1.0 is equivalent to a full-time worker or student

utility, Eskom. UCT may, however, be subject to energy reporting (DoE 2015)¹⁰ and GHG reporting (DEA 2017)¹¹, if energy use exceeds 180 TJ and/or direct (Scope 1) emissions exceed 0.1 Mt CO₂-eq per year. Energy use at UCT is currently around 250 TJ and Scope 1 direct emissions are 0.002 Mt CO₂-eq per year. UCT would do well to set targets proactively, that are more ambitious than, or at least consistent with, the national GHG emission trajectory¹².

Campus-wide master planning

As described above, the *UCT Integrated Development Framework* (IDF) was completed in 2014 and the next step is to obtain approval from the authorities and for land-use rezoning and departures, and to seek funding. Strains on the South African economy have profoundly affected the funding of universities, making the undertaking of significant development extremely challenging.

The current planning study focuses on the main campus in Rondebosch and Rosebank and on the Health Sciences campus in Observatory¹³. Other satellite campuses and landholdings will be dealt with by means of separate, detailed 'Precinct Plans' in accordance with the framework. One such precinct plan already completed is for the Hiddingh campus, by a multidisciplinary team under the direction of Physical Planning. Significant landscape interventions are proposed on Hiddingh campus.

The IDF contains detailed strategic recommendations relating to the Spatial Framework, Growth Management Strategy and Implementation Framework. It aims to ensure that appropriate physical development is carried out timeously to realise the capacity objectives of 30 000 residential students by 2030. The need for flexibility in the plan is identified, to allow responses to the shifts towards online and distance learning offerings that may change spatial requirements.

An objective of the framework is to strategically develop land within the current university landholdings in accordance with the principles of densification, as well as strategic land acquisition in the local area.

A component of the IDF, the **Landscape Framework**, recognises the multifunctional role of landscape and open space, which plays an ecological, educational and a recreational role. The intention is to prepare more detailed plans on a project basis for the landscape projects such as:

¹⁰ DoE (Department of Energy) 2015. Draft regulations regarding registration, reporting on energy management and submission of energy management plans. Published for public comment. Government Gazette no 38614, 27 March Pretoria.

¹¹ DEA (Department of Environmental Affairs) 2017. National Greenhouse Gas Emission Reporting Regulations, Government Gazette No. 40762, Notice 275 of 2017, 3 April 2017. Pretoria.

¹² Professor Harald Winkler of the UCT Energy Research Centre, personal communication.

¹³ <http://www.uct.ac.za/main/contacts/campus-maps>

- woodlands below the Bremner building and along Stanley Road
- heritage landscape restoration around the Summer House, Glenara, Baxter Theatre, Welgelegen and Cadbol House.

Sustainable transportation, mobility and access

The **Transportation Framework** within the IDF sets out strategies at a broad scale to enhance connection between the sprawling, widespread campus precincts in the Rondebosch–Mowbray–Observatory area. The key strategy is to develop north-south ‘connector streets’, as well as the important east-west connector streets, to more effectively link the middle and lower campus northwards through the ‘Corridor Precinct’ to the Health Sciences campus, and the city beyond. The streets are to accommodate pedestrians and cyclists, encompass mixed use, and should be of high environmental and landscape quality. The Transportation Framework adopts the recommendations of previous studies, the *Campus Access Management Plan* and the *Integrated Transport Strategy*, with respect to public transport and non-motorised transport (NMT).

Transport and mobility initiatives planned or in progress are described below.

Walking

UCT has invested in the safety and security of walking routes, which are well lit at night, and monitored by closed-circuit television (CCTV) cameras, with call phones installed at various points along the routes linking to Campus Protection Services.

UCT’s bus shuttle service

The UCT transport unit has run a successful shuttle service for years, the Jammie Shuttle, available free to all UCT students and staff on all campuses. Renewal of the Jammie Shuttle bus fleet was under way during 2015, with the commencement of a procurement process that entailed the consideration of environmental factors such as exhaust emissions and fuel efficiency. The specification for the buses was increased from a standard of Eu3 to Eu5, which will have lower emissions of carbon monoxide (CO), nitrous oxide (NOx) and particulate matter (PM), addressing pollution that affects human health as well as climate change. Fuel efficiency of the new buses will be improved from around 1.9 kilometres per litre to 2.4 kilometres per litre.

With the arrival of the new buses in 2017, UCT will own and operates its own fleet. The fleet comprises 28 buses and these operate between residences, all UCT campuses and public bus and train services, and parking facilities in the local vicinity. Operational routes were also being rationalised to save fuel, reducing both costs and carbon emissions. New North and South shuttle termini have been constructed on upper campus, reducing the impact of the shuttles on the local environment and shortening route distances.



Carpooling

UCT launched a carpooling initiative called *Ridelink* in 2009 in partnership with the Green Campus Initiative. At the time of the 2012 ISCN Report, there were over 900 participants in the scheme, making use of the preferential parking provided for participants. To improve the service, UCT established a partnership in 2013 with a carpooling platform, *FindaLift*. Participation in the scheme began declining and registered users recorded in a GCI report in March 2015 were only 308. The report identifies the reason for low participation as being a lack of awareness of the scheme among students. Obstacles included the lack of continuity caused by annual turnover within the GCI; weak communications between GCI and the administration; and frequent problems with the access boom at the dedicated parking area. The lack of defined roles and responsibilities for the management and promotion of carpooling were further obstacles to success. A new marketing and communications campaign was planned, but not executed. This initiative will need resuscitation by a dedicated staff and student team in future.

Cycling

The promotion of cycling at UCT began with planning of infrastructure in 2011. The first phase of infrastructure covering the main campus was implemented in 2013, comprising signage, road markings and traffic-calming measures. The inclusion of cyclist facilities (storage and showers) in new buildings is becoming standard practice. A cycling route map was developed, highlighting the safest paths with less steep gradients linking the middle campus to the upper campus. The City of Cape Town is expanding cycling infrastructure across the city, and with an increase in accessibility to the campus, it is hoped that a culture of cycling will grow at a faster pace in future. The target is to increase the number of students cycling to campus to around 5%, whereas it is currently estimated to be around 1%.

Bike share scheme – ‘Jammie Bike’

A bike rental scheme was initiated in 2013 as a joint project between P&S and the GCI. **Jammie Bike** was officially launched in April 2014, comprising 200 new mountain bikes suited to the steep terrain, branded with the Jammie Bike logo. Numerous awareness raising campaigns followed, including the production of cycling video tutorials by the Green Campus Initiative in collaboration with the Bicycle Empowerment Network (BEN), a Public Benefit Organisation. The bikes were made available on an annual lease basis. This scheme proved to be unsuccessful, with poor participation apparently due to the cost of the annual lease. There was a shift in approach to the scheme in early 2016 and the GCI were asked to take over the management of Jammie Bike, to review and reinvent the loan model to promote better uptake of the bikes. There are plans to work closely with the residences to manage to bike share scheme in future.

Air travel

Air travel at UCT has been increasing rapidly in recent years, resulting in increased expenditure and carbon emissions. There were over 9 million kilometres travelled in 2013, 13 million in 2014 and 22.9 million in 2015. In 2015 there was a massive increase of 50% in the total number of flights booked, with a 116% increase in number of flights to regional and international destinations. Research is required to understand the drivers of this trend. There may be an increase in international research collaboration and participation in regional and international conferences. There were several major international conferences in 2015 (Paris COP21; UN Sustainable Development Summit, New York) that may have contributed to increased air travel.

To avoid air travel, there are a range of technologies available to allow remote conferencing and meetings. **Video conferencing** activity at UCT has been increasing since infrastructure and venues were provided.

Social inclusion and protection

Diversity of faculty, staff and students

UCT recognises that demographic change among students and staff is necessary to redress past injustices of racial discrimination under the apartheid system. To achieve this, policies must be implemented that will result in the university’s student and staff demography reflecting that of the country. The goal is to make UCT a place that is experienced by all its staff and students as being inclusive.

To develop the capacity of black researchers, the UCT Research Strategy 2015–2025 commits to continuing to support researchers at every level, through a variety of mechanisms. The Research Office provides a high level of support to emerging researchers through its **Emerging Researcher Programme**.

To advance gender equity among academics, five prominent female researchers at UCT were awarded SARChI Chairs (South African Research Chairs Initiative) in their respective fields in 2015, as part of the

Department of Science and Technology (DST) and National Research Foundation (NRF) initiative. Before this announcement, UCT was home to 34 SARChI Chairs, of which nine, or just over 26%, were women. That proportion has now risen to 14 out of 39, or 36%.

Dr Gina Ziervogel won the **Distinguished Young Women Researcher** (humanities and social sciences), and two young scientists were awarded prestigious scholarships, at the Women in Science Awards 2015 by the Department of Science and Technology.

With regard to the student demographic profile, good progress has been made at the undergraduate level in increasing black South African enrolments between 2003 and 2015, although the proportion of the undergraduate student body has remained largely static over the past five years at some 28%. The profile of postgraduate enrolments and several specific undergraduate programmes remains predominantly white. Further progress in this regard requires strengthening of student support with respect to academic and financial challenges they face. Academics require support in honing their teaching skills to multicultural and multilingual environments, and there is a need to review pedagogic practices to be more culturally sensitive and appropriate.

In the previous report, diversity among the academic staff (all levels) with respect to race for the period 2011 - 2013 remained stable and reflected the percentage of black South African staff as ~20% of the total; white staff ~53%; and international staff ~26%. By 2015, the percentage of black South African staff rose to 23%, white staff decreased to 50% and foreign nationals remained the same at ~26%.

In terms of gender equity, the ratio of males to females among academic staff for the years 2010, 2011 and 2012 was in the order of 60:40. In 2013–2014 this changed to 57:43 and improved slightly to 56:44 in 2015.

Two new initiatives were launched in 2015 to address the paucity of senior black South African academics. The Next Generation Professoriate (NGP) initiative aims to advance the development of black academics and to ensure the university expands and accelerates the pipeline to transform the professoriate. Thirty-four mid-career academics were nominated by their respective faculties to participate in the programme. A second initiative, aimed at advancing junior academic staff, is the New Generation Academics Programme, a project of the Department of Higher Education and Training.

Access to education

Access to education is a highly critical issue in South African society today. UCT provides financial assistance to disadvantaged students to study at UCT through a financial aid scheme, using own resources, but supported by government funding through the NSFAS programme, as well as 'Gap' funding for those not eligible for government funding. The national student protests in 2015/2016 led to a waiver of fee increases in 2016, but government funding of higher education, and demands for free tertiary education, remain a critical challenge.

There has been significant change in the international research landscape – that of the ‘open access’ movement. UCT, having signed the Berlin Declaration on *Open Access to the Sciences and Humanities* in 2011, formally adopted an open-access policy in 2014, giving effect to its obligations under this declaration to make this scholarship “discoverable, visible and freely available online to anyone who seeks it”.

UCT offers a number of Massive Open Online Courses (MOOCs). These are free online courses with no entry requirements but are not for university credit. In early 2015 UCT became the first African university to offer MOOCs on international MOOC platforms. Through *Coursera* (the world's largest MOOC platform) and *FutureLearn*, UCT is now reaching thousands of learners worldwide. *Climate Change Mitigation in Developing Countries* is a free online course offering an insight into the complex process of how countries from the global south pursue development goals – growing their economies in a climate-responsible way and lifting societies out of poverty, while also mitigating climate change.

Access to services

A wide range of services and amenities are available on campuses. In addition to around 100 sports and cultural societies, UCT has invested significant effort in the following key areas:

- HIV/AIDS education and support.
- The Student Wellness Service provides a professional health service to students at a primary healthcare level.
- Counselling services – a team of clinical psychologists offers short-term counselling, individual and group therapy.
- Childcare on campus is provided by the Educare facility on upper campus.
- The Discrimination and Harassment Office (DISCHO) assists the campus community in matters of discrimination, sexual harassment, harassment, domestic violence and rape.

The demands on the Student Wellness Service, in particular with mental health issues, have been rising in recent years. The need for greater capacity to deal with mental health issues has been identified.

Box 1: The HIV/AIDS, Inclusivity and Change Unit (HAICU)

The HIV/AIDS, Inclusivity and Change Unit (HAICU) is based in the Transformation Office, residing in the Office of the Vice-Chancellor. The realisation that HIV needs to be treated as not just a health issue, but as an issue of transformation, exploring the contextual issues which lead to increased HIV transmission, resulted in the unit being moved to the Transformation Office in 2006. HAICU thus deals with HIV and the intersection of HIV issues with those of race, class, gender, violence and sexual orientation. The mission of HAICU is to coordinate a collaborative response that supports transformation and builds student and staff capacity through curriculum and social responsiveness initiatives. Activities include education programmes and curricula development on HIV/AIDS, gender-based violence and sexuality education programmes for students; mapping the UCT response to these issues; conducting needs assessments and monitoring and evaluation; and information and referral services. Workshops are also provided for staff towards understanding sexuality and inclusivity. Further, the unit is involved in developing, reviewing and steering HIV/AIDS and sexuality policy implementation within the university and developing communication campaigns. Beyond providing a student service, the HAICU unit thus makes a contribution to social cohesion, transformation towards inclusivity and diversity.

Participative campus planning; integrating users and neighbours

The IDF aims to better integrate the university into the fabric of the city and southern suburbs, to ensure 'fit' within the community in which it is located; in particular to engage with the Groote Schuur City Improvement District and to embrace the 'Main Road Corridor' as a key urban system vital to the functioning of the university. The IDF recognises that participatory and inclusive planning is a fundamental requirement of relevant legislation and therefore the future iterations of the plan must encompass appropriate engagement with the City and other role-players.

A further goal set out in the IDF is to work with South African National Parks to better integrate the university with this key 'edge' to the west of upper campus, and to pursue projects of mutual interest, such as regeneration of the historic plantings and biodiversity conservation.

Health and safety of laboratory staff

The South African *Occupational Health and Safety Act* requires UCT to provide and maintain a working environment that is safe and without risk to the health of employees, students and visitors. UCT has Health and Safety committees in place at Senate, Faculty and Department levels. Every department has at least one elected Safety, Health and Environment Representative. UCT Council has included a specific responsibility in the duties of the vice-chancellor, executive officers and heads of departments. The health and safety of laboratory workers is addressed through the ongoing provision of training, and by having clear procedures in place within departments, which are monitored by the Health and Safety representatives in each department. As a further safeguard, the Health Sciences faculty has a chemicals sub-committee responsible for oversight of hazardous chemical substances control.

Land use and biodiversity

The location of the upper campus, part of the main campus, on the lower slopes of Table Mountain National Park, a UNESCO World Heritage Site, gives added importance to the management of the campus landscapes. The mountain's vegetation types form part of a recognised global biodiversity 'hotspot', the [Cape Floristic Region](#), where an estimated 2 200 species of plants are endemic to Table Mountain.

The *Green Campus Action Plan* contains a range of strategies dealing with the enhancement of biodiversity; reflecting the unique character of the Cape flora; the conservation of the heritage value of the estate; composting; water-wise planting; the management of soil health and of alien vegetation; and adopting horticulture practices to protect the threatened Cape Rain Frog. However, for many years

resource constraints, including capital and labour, continue to affect the ability of the Gardens Department to achieve these objectives.

The 2014 *Landscape Framework* policy document proposes the review and reinstatement of the parkland areas that provide the backdrop to upper campus, and a transition to the upper slopes of Table Mountain, in accordance with the 2012 *UCT Heritage Park Management Framework* prepared by Laros & Associates. A recommendation is made for close cooperation with SANParks, especially on the regeneration of the stone pines that form the structure of the backdrop. Further recommendations are the removal of all invasive species and replanting with indigenous species, providing space for recreational and outdoor educational activities. Since mid-2012, this plan has not progressed towards detailed design and implementation. Debates within the UB&DC have continued around appropriate funding models for the implementation phases.

A commitment to sustainable practices has been made by the UCT Gardens Department in various practical measures: building resilience of soils with mulch and compost produced on the estate; the management of green waste from the composting site on upper campus; use of a composter machine to accelerate the composting process; and upgrading of pathways using sustainable urban drainage technology.

Over the past six years more than 35 000 plants and trees have been planted. Projects completed in 2013 and 2014, such as the dam precinct and main entrance gateway to the north of upper campus have become well established and are being utilised by students and staff for relaxation and outdoor learning. Recent projects include:

- **Northern embankment, Environmental & Geographical Science** building – clearing of weed-infested embankment and planting of fynbos and other indigenous herbaceous perennials.
- **Landscaping of embankment below P6 Parking and New Entrance Gateway project (Figure 5):** This major project aimed to improve the sense of arrival on the campus with an attractive indigenous display; to provide alternative walking routes for students through a natural landscape; and to showcase indigenous and endemic vegetation as called for in UCT's landscaping policies. The planting of many indigenous and endemic trees, a wide range of fynbos species, bulbous flora, Restios and a mix of indigenous herbaceous shrubs, and the addition of furniture have transformed the area. This biodiverse planting has created an appealing atmosphere and, being adjacent to the dam, has encouraged students to use the area for study purposes, informal meetings and relaxation. The diversity of plant species has greatly enriched the ecological environment through the use of plants that attract birds and insects. There has been a major increase in pedestrian traffic since the upgrade of the stairway leading up the slope.



Figure 2: Indigenous planting on the embankment below P6 Parking

- **School of Economics North East Garden:** The North East Garden at the back of the School of Economics and the degraded pathway was substantially upgraded.
- **Educare New Baby Centre Entrance Landscaping:** Substantial planting of indigenous trees, shrubs and groundcovers took place to enhance the entrance to the new Baby centre.
- **Kramer Law Faculty Roof Garden:** The existing roof above the Law library was transformed into a garden planted with Restios and other indigenous shrubs.

Management of invasive alien vegetation

The university Gardens Department has the ongoing responsibility of clearing invasive alien vegetation and trees on campus, in accordance with legislation, towards fire management, biodiversity conservation and water conservation through catchment management. Lack of resources allocated to alien clearing has been an ongoing challenge. The forest above upper campus is a critical area, where alien shrubs and trees are managed on an annual basis. The forest trees, mostly pines, also require maintenance to keep them healthy. The dam precinct is another area that has received substantial vegetation clearing, and along Ring Road (renamed Madiba Circle) the regenerated invasive growth of blackwood trees has been cleared annually¹⁴.

Arboriculture management, tree inventory, management plans and heritage trees

Various areas of the campus, particularly the upper campus, have substantial numbers of trees and plantings of significant heritage value, often non-indigenous, European species. These require assessment and maintenance, and some require regeneration. The Gardens Department carried out a

¹⁴ Noelene le Cordier, 2015. *Report on Invasive Vegetation on UCT Campus*

tree inventory in 2015 and produced a management plan, as well as assessment reports of special landmark trees.

Conservation of threatened amphibians

The main campus has a population of threatened frogs, the Cape Rain Frog, a burrowing species with an IUCN red list¹⁵ conservation status of Near Threatened. The main threats are habitat loss through urban sprawl. A baseline distribution survey¹⁶ of these frogs on middle campus was undertaken in 2009, during the construction of new buildings in the area. The study found that the population is conservation-worthy with an adult population estimated at ~320 individuals that would remain viable if the habitat was well managed as per recommendations. While the conservation of this frog is considered by the Gardens Department in terms of the timing of major garden works, the full extent of the recommendations has not been adopted or implemented. The population can be supported by avoiding further fragmentation of their habitat and landscape management to encourage expansion of the population. The recommended monitoring programme and further research to determine population trends remains to be implemented in future.



Figure 3: The Cape Rain Frog *Breviceps gibbosus*

¹⁵ <http://www.iucnredlist.org/details/3069/0>

¹⁶ Harrison JA, 2009. *Survey of Rain Frogs on Middle and Lower Campuses Of UCT, And Impact Assessment of New Development*. Available at <http://www.uct.ac.za/main/explore-uct/sustainability>

Overview of UCT's Principle 2 Goals

Topics		Goals and Initiatives		Results		
Priority topics (with units of measurement)	Objectives and targets (for reporting year, following year, and beyond)	Key initiatives (in reporting year, or planned)	Performance 2013	Performance 2014	Performance 2015	
Institution-wide carbon targets and related achievements						
GHG reduction	Calculate annual GHG emissions and set reduction targets. 2012 Total emissions: 87 777 tonnes CO ₂ -eq Population: 30 579 Floor area: 657 036 m ²	Institutional arrangements and information systems for ongoing reporting of GHG emissions to be formalised and streamlined	Total emissions: 86 205 tCO ₂ e 2.7% reduction Population: 31 040 (up 1.5%) Floor area: 668 165 (up 2.9%)	Total emissions: 87 522 tCO ₂ e 1.5% increase Population: 31 329 (up 0.9%) Floor area: 705 653 (up 2.9%)	Total emissions: 89 189 tCO ₂ e 1.9% increase Population: 33 204 (up 6%) Floor area: 706 125 (up 2.9%)	
Master Planning						
Campus Master Plan	Give due consideration to equity, heritage, landscape, sustainability, safety and security; enhanced NMT networks	Major Integrated Planning Process completed. Draft <i>Integrated Development Framework</i> published	Integrated Planning process commenced	Integrated Planning process under way; drafting of an <i>Integrated Development Framework</i> (IDF).	The IDF completed; process under way to obtain approval from the City for land-use rezoning and departures	
Sustainable transportation, mobility and access						
Integrated Transport planning	Development of university wide integrated transport plan	Transport Framework development	Transport master planning commenced.	Transport master planning under way as part of Integrated Development Framework (IDF).	Transport Framework completed. <i>Jammie Shuttle</i> route optimisation in progress.	

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Commuting transportation (number of <i>Jammie Shuttle</i> passenger trips)	Reduce private car travel. 2012: Number of passenger trips: 4 804 165	Provide free Shuttle service to all campuses; integrate with city transport system	Number of passenger trips: 4 667 753	Number of passenger trips: 4 249 054	Number of passenger trips: 3 910 564
Promote cycling (numbers of commuting cyclists)	Provide adequate infrastructure to ensure safety and promote cycling. Extend cycle infrastructure to all campuses		Main campus cycle infrastructure completed in 2013	Campus cycle infrastructure modified and improved	No further roll out of infrastructure
Bike rental scheme	Promote cycling by provision of rented bikes	Planning of bike rental scheme; loan arrangements	First 200 rental bikes were procured and branded with <i>Jammie Bike</i> logo	Bike rental scheme launched April 2014	A new model for bike sharing needs to be developed
Social Inclusion and protection					
Diversity – staff	Promote cultural diversity and transformation	Ongoing efforts to transform demographic profile	Refer to above statistics and graphs	Refer to above statistics and graphs	Refer to above statistics and graphs
Diversity – students	Promote diversity and transformation among the student body	Ongoing efforts to transform demographic profile	Refer to above statistics and graphs	Refer to above statistics and graphs	Refer to above statistics and graphs

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Access to education	To make this scholarship “discoverable, visible and freely available online to anyone who seeks it”.	Development of online education offerings		UCT formally adopted an open-access policy in 2014	Launch of UCT MOOCs
Health and safety of laboratory workers (incidents per annum)	Incident reporting to become standard, embedded		Total incidents: 36 Research staff: 10	Total incidents: 29 Research staff: 10	Total incidents: 32 Research staff: 16
Land-use and biodiversity					
Landscaping projects	Enhance campus landscaping quality, biodiversity and heritage value		Dam precinct; Welgelegen garden	Refer to projects described above	Refer to projects described above
Invasive alien vegetation clearing	Ongoing management of alien trees and shrubs		Clearing of invasive shrubs in dam precinct. Expenditure: R101 038	All regenerated invasive blackwoods cleared along Ring Road (Madiba Circle)	All regenerated invasive blackwood seedlings cleared along Ring Road (Madiba Circle)
Forest regeneration and management	Develop plan that considers ecological, educational and recreational uses; replace ageing trees	Forest management study, planning process and consultation during 2011 and 2012	No further progress; no funding allocated for detailed design phase	Project dormant	Project dormant
Tree and shrub planting, arboriculture	Develop and adopt an indigenous tree planting policy, balancing heritage, biodiversity and maintenance	Tree inventory and assessment undertaken	~30 000 plants and trees planted between 2012 and 2013; shrubs largely indigenous	Tree Inventory and Management Plan produced.	35 000 plants and trees in the past six years

PRINCIPLE 3 – INTEGRATION OF RESEARCH TEACHING, FACILITIES AND OUTREACH

Principle 3: To align the organisation's core mission with sustainable development, facilities, research and education should be linked to create a 'living laboratory' for sustainability.

Principle 3: Management Approach

UCT is steadily moving towards establishing strong interdisciplinary research and education as an institutional priority across a broad range of disciplines in the sustainability arena. Further strengths lie in applied research, engaged scholarship¹⁷ and outreach around sustainable development; however, the concept of a 'living laboratory' on campus has not yet been well advanced.

UCT has a strategic goal to expand and enhance its contribution to South Africa's development challenges. Four key institution-wide strategic research initiatives, launched in 2009 and ongoing, seek to address critical social and developmental challenges:

1. African Climate & Development Initiative
2. Poverty & Inequality Initiative
3. Safety and Violence Initiative
4. Schools Improvement Initiative

In 2015, UCT responded to the international trend towards interdisciplinary research by launching new interdisciplinary institutes: Communities and Wildlife in Africa; Safety, Governance and Criminology; and Democracy, Citizenship and Public Policy in Africa.

At a provincial level, UCT continues to participate in a regional initiative – the **Cape Higher Education Consortium (CHEC)** – comprising four universities in the Western Cape metropole: the Cape Peninsula University of Technology; Stellenbosch University; the University of Cape Town; and the University of the Western Cape. In 2014 the consortium undertook a Curriculum Mapping exercise of focus areas relating to the Green Economy: Transport and Communication; Natural Resource Management (including Agri/Mariculture); Tourism; and Renewable Energy. The report identifies research centres across these universities that can offer further knowledge and skills relevant to the Green Economy and climate change. Further collaborative research work was undertaken in 2015 with a report published that identified the research and projects being undertaken: *Trends in Climate Change, Sustainability and Green Economy Research at CHEC Institutions*.

¹⁷ UCT's engaged scholarship policy refers to the utilisation of an academic's scholarly and/or professional expertise for an intentional public purpose or benefit, which demonstrates engagement with external, non-academic constituencies.

With respect to social integration and connecting academics and students with civil society and local communities, a key overarching initiative is the **Social Responsiveness Programme**. It aims to foster engagement by academics with communities and other non-academic constituencies through their expertise and research, to address societal and development challenges. Social responsiveness embraces 'engaged scholarship' involving academic staff, civic engagement involving students' community service, and professional engagement involving professional and administrative staff. Policy in this arena was refined in 2012 with the development of a *Social Responsiveness Policy Framework*. The policy deals with how the value of social responsiveness work can be defined, encouraged and acknowledged, given that outputs differ from the usual metrics of a university such as journal papers and degrees.

The university's **Social Responsiveness Committee** comprises a representative of each faculty, a chair (deputy vice-chancellor), graduate students and members of the Students' Representative Council, other student groups and non-academic staff. Social responsiveness is recognised through a range of means: an annual award to individuals or research groups; an annual engagement event; and an annual report. Committee representatives engage with deans of faculties and hold seminars to raise awareness. Linked to this programme, the [Knowledge Co-op](#) provides a hub for finding project partners for people both inside and outside the university.

Student interaction and social cohesion around sustainability themes on campus is driven by the **Green Campus Initiative** (GCI), a student-led environmental movement, with some staff membership and collaboration. The movement has grown rapidly from its inception in 2007 to around 3 300 members in 2016. The GCI organises a number of key annual events on campus, as well as regular talks to promote sustainability both on campus and beyond. They also engage in outreach to disadvantaged communities. The GCI receives support from the administration via the Properties and Services Department. [Box 2]

Commitment to sustainability is fostered through the annual **Student Leadership Awards** that celebrate and encourage students who show outstanding leadership abilities. The awards are made in five categories, one of which is social responsiveness. In 2014 the Green Campus Initiative won the award for *Most Outstanding Team in Social Responsiveness*, the first time the environmental group has won in this specific category.

At an international level, UCT joined the **Worldwide Universities Network** (WUN) in 2009, a global higher education and research network made up of 22 universities that aim to address issues of global significance through collaborative research initiatives. UCT's participation in WUN is overseen by a local steering group including the Deputy Vice-Chancellor for Research and Internationalisation; the Research Office; and the International Academic Programmes Office. These initiatives are supported by partners such as the United Nations Foundation, World Bank, the Organisation for Economic Co-operation and Development (OECD) and World Health Organization. Research is focused on four globally significant themes:

- Responding to Climate Change

- Public Health (Non-Communicable Disease)
- Global Higher Education and Research
- Understanding Cultures.

UCT academics and researchers were among the world-leading academics involved in lobbying for and drafting of the **Sustainable Development Goals** (SDGs) adopted in 2015 by the United Nations. Professor Haroon Borhat, director of the Development Policy Research Unit in the School of Economics, served as head of research for the high-level panel appointed by UN Secretary General Ban Ki-moon to deliver a proposed SDG agenda to the UN General Assembly. Members of the African Centre for Cities participated in a global campaign to ensure that sustainable cities were explicitly included in the SDGs. Professor Crick Lund was one of the leaders in the field of global mental health who lobbied to have mental health included.

From the approaches described above, it can be seen that at UCT the concept of a 'living laboratory' is at present expressed more actively through work done beyond the campus, within communities of Cape Town, the broader region and with the global sustainability institutions.

MAIN INITIATIVES AND RESULTS

Topical integration

Courses that integrate sustainability theory and principles

A mapping study of sustainability in the curriculum was undertaken for the previous report and has not been updated for this report. However, the 2014 Curriculum Mapping research report compiled under the Cape Higher Education Consortium referred to above contains a detailed listing of courses in sustainability and climate change at four universities in Cape Town. <http://www.chec.ac.za/reports/>

The master's degree course in **Climate Change and Development** offered by the African Climate & Development Initiative (ACDI) is becoming one of the premier sustainability programmes at the university. This full-time, taught master's course provides interdisciplinary training with core courses in climate science, environmental economics, climate mitigation and adaptation. Since its inception in 2012, the ACDI master's course has graduated 31 students with 100% success rate from entry to graduation. The course has grown steadily from nine students in 2012 to 18 students in 2015, with more than 150 applications received. The course attracts applicants from around the world, and over the years the class has been made up of a diverse mix of students from Africa (64%), Europe (21%) and North America (14%)¹⁸.

¹⁸ African Climate & Development Initiative (ACDI) 2016. *ACDI Five-Year Reflection 2011-2015*

A number of master's programmes are offered with strong relevance to sustainable development and a focus on infrastructure. These include those in sustainable energy; in city and regional planning; in the design and management of urban infrastructure; and in public transport and land-use planning. Some of these programmes have been on offer for over a decade and jointly they have produced hundreds of graduates. An overview of further sustainability programmes at UCT is available [here](#).

The difficult relationship between the mining industry and sustainable development is the subject of the MPhil programme, *Sustainable Mineral Resource Development*, commenced in 2014. This interdisciplinary programme was conceptualised as one of the offerings of the Education for Sustainable Development in Africa (ESDA) consortium of eight African universities and the United Nations University in Tokyo.

Regional **curriculum development** on the theme of 'Climate Change and Sustainable Development' was conducted by a consortium of seven southern African universities, led by the ACDI during 2015–2016. The project followed a **Southern African Regional Universities Association (SARUA)** capacity needs analysis in the region that identified a gap related to climate change and development competencies at the master's level. The curriculum is available to all SARUA member universities to adapt and deliver. Following the development of the curriculum, capacity building workshops were held in Dar es Salaam and Harare to support 22 participating institutions in planning for the implementation of the curriculum in a local context.

Research that transcends disciplines

Increasingly, research at UCT is drawn together into areas of research strengths: interdisciplinary hubs that are selected for support because they meet several strategic objectives and encompass a critical mass of researchers. They also show potential for strong collaboration nationally, across the continent and globally.

- The **African Climate and Development Initiative (ACDI)** is an interdisciplinary research group working across numerous fields and faculties to consolidate and coordinate climate change research at UCT. The ACDI focuses on four categories of climate change research: mitigation; vulnerability; adaptation; and climate science and sustainable development. [Box 2] <http://acdi.uct.ac.za/>
- The **African Centre for Cities (ACC)** is an interdisciplinary research and teaching programme focused on the dynamics of urbanisation processes in Africa, with a view to identifying systemic responses. The aims of the centre are to partner closely with policy-making centres in the public sector in South Africa and more widely, to provide an alternative perspective on dealing with critical urban issues. It also aims to provide an intellectual base and home for interdisciplinary, urban-related research at UCT, from which relations can be established with international funders and think tanks. The ACC conducts a series of applied research programmes in Cape Town, South Africa and Africa. A lead programme is focused on the Cape Town region: The *CityLab Programme* facilitates the co-production

of policy-relevant knowledge related to urban poverty in the greater Cape Town region. Key themes include urban regeneration; densification and inclusivity; urban ecology; and sustainable human settlements. The ACC collaborates with an international network of cities within which efforts are being made to better understand and direct urban sustainability through innovative knowledge-sharing practices. The programme is funded through and managed by *Mistra Urban Futures*, headquartered at Chalmers University, Sweden. The ACC is also a partner in the NRF Centre of Excellence in Food Security hosted at UWC, and part of the *African Food Security Urban Network* (AFSUN). <https://www.africancentreforcities.net/>

- The **Energy Research Centre (ERC)** is a multidisciplinary centre which pursues excellence in technology, policy and sustainable development research, education and capacity building programmes at a local and international level. The major research focus areas are: Energy, Poverty and Development – concerned with energy issues that affect livelihoods for poorer communities in developing countries; energy efficiency at the demand level; energy modelling with the aim of assisting local industry and government to identify and assess technology and policy options; and research on the intersection between energy, local environment and global climate change. Staff have qualifications in engineering, natural and environmental sciences, urban and regional planning, economics, law, politics, sociology and anthropology. The multidisciplinary team conducts targeted research and offers postgraduate opportunities at master's and PhD levels. <http://www.erc.uct.ac.za/>
- **Environmental Humanities South** is an interdisciplinary research group and postgraduate programme established in 2015. 'Environmental humanities' is the term for a dynamic and growing field in universities across the world, one promoting interdisciplinary scholarship that explores how we understand the relations between humans and the environment, in all areas of cultural production. This group provides a vital intellectual space that enables researchers, students, artists, writers, scientists, policy-makers and practitioners to reflect critically on the concepts that underlie contemporary environmentalism. What will distinguish the UCT environmental humanities initiative is its investment in dialogues of the South, and its creative, critical and collegial engagement with leading researchers at UCT: in climate change, marine management, urban planning, environmental law, water engineering and public health.
- The **Environmental & Process Systems Engineering** research group, based in the Department of Chemical Engineering, works on environmental issues of the resource-based process industries and explores the use of processes and systems engineering skills to solve environmental problems, in a development context. It is concerned with the processing of biomass, water, recyclables or minerals; the recovery of energy from biomass; and the processing of waste materials for return into the industrial economy as raw materials. It has a strong collaboration with the national biofuels research chair at Stellenbosch University. <http://www.epse.uct.ac.za/>
- The **Climate Systems Analysis Group (CSAG)** is a research group addressing the climate change knowledge needs of developing nations, delivering tailored climate change information, and engaging

with users around adaptation, policy and impacts. Engaging with stakeholders in the co-production of knowledge leads to climate-related products that are user-focused and relevant to decision-makers. A data portal provides support materials and analysis tools for users. CSAG research products support the broader research activities in other disciplines, both within UCT and beyond. The group has formal links to a number of leading international research institutions and programmes, including the Intergovernmental Panel on Climate Change (IPCC). CSAG leads the project Future Resilience for African Cities & Lands (FRACTAL) that seeks to refine scale-relevant climate information of cities to facilitate the strengthening of development pathways to climate resilience.

<http://www.csag.uct.ac.za/>

- The **Marine Research (MA-RE) Institute** aims to enhance UCT's strength in the marine research and teaching field through formalised collaboration and coordination of all marine researchers and academics across disciplinary boundaries. The institute strives to transform the marine field through capacity building and skills development, is open to all marine-related research groups and individuals at UCT, as well as all issues influencing these areas (e.g. socio-economic, legal and historical).
- The **Minerals to Metals** research group undertakes integrated research aimed at making mineral beneficiation activities more sustainable through examining the selection, design and operation of minerals-to-metals processes and technology options while considering environmental, economic and socio-political aspects and impacts.
- **Institute of Marine & Environmental Law** undertakes legal research into a wide range of environmental and governance issues affecting land or sea.
- **Urban Water Management Research Group** in the Civil Engineering department is an interdisciplinary group that seeks to integrate sustainable solutions to the problems of water management in urban areas, particularly in southern Africa. This is the result of two South African Water Research Commission projects: guidelines for implementing Sustainable Drainage Systems (SuDS) in South Africa; and developing a framework for implementing water-sensitive urban design in South Africa. Several other institutions and individuals are involved and have contributed to the projects including other universities, local authorities and engineering consultants. The group is also closely linked with the African Centre for Cities and the associated Urban Infrastructure Design and Management programme. A new research institute, Future Water, was launched January 2016.
<http://www.civil.uct.ac.za/urban-water-management>

BOX 2: AFRICAN CLIMATE & DEVELOPMENT INITIATIVE

The African Climate & Development Initiative (ACDI) is the University of Cape Town's active response to the climate change and development challenge. The ACDI was set up in 2011 by Vice-Chancellor Price as

one of four strategic initiatives, each contributing to UCT's mission to tackle key issues in the social and natural worlds. Under the directorship of Professor Mark New, the ACDI is guided by a steering committee, and supported by research chairs, research associates and research affiliates. By 2015 the core ACDI team had grown to 27 members. In 2016 the ACDI produced its [five-year report](#) (2011–2015).

Flagship projects

Adaptation at Scale in Semi-Arid Regions (ASSAR)

A flagship ACDI project is the five-year research project (2014–2018), Adaptation at Scale in Semi-Arid Regions (ASSAR), which is focused on understanding climate change in semi-arid areas across Africa and Asia and determining what kind of adaptation strategies are necessary. The primary aim of ASSAR is to better prepare the communities and governments of the semi-arid regions of Africa and Asia for the potential impacts of climate change. To achieve this, ASSAR is conducting high-quality, regionally relevant, stakeholder-driven research that will identify the factors that either prevent or enable widespread and long-term adaptation. By applying multifaceted stakeholder engagement strategies, and by focusing on building capacities, sharing knowledge and nurturing partnerships, ASSAR will ensure that this research is used to influence adaptation policy and practice both today and in the future.

The ASSAR team comprises a mix of academic and practitioner organisations from countries in the global north and south. It includes groups with global reach as well as those deeply embedded in their communities. This international and interdisciplinary ASSAR team will be working intensively in southern, eastern and western Africa and in India, aiming to better understand the nature of vulnerability, the potential magnitude of future climate change impacts, and the barriers and enablers to widespread and transformative adaptation under a changing climate.

Berg River Climate Knowledge Network (CKN)

The Berg River Climate Knowledge Network (CKN) is the ACDI's approach to climate and development on a local scale. Led by a team of UCT researchers from across the university, in partnership with the Western Cape Government and funded through the Carnegie Corporation, Cape Higher Education Consortium, the British High Commission and National Treasury, it is a collection of projects initially focused on exploring climate change, and environmental and development issues within the Bergrivier Municipality, situated in the greater West Coast district of the Western Cape.

FLOW – Fostering Local Well-Being (2014–2016)

The FLOW project was a two-year-long transdisciplinary research project that took place in two South African municipalities – the Greater Kokstad Municipality in KwaZulu-Natal and the Bergrivier Municipality in the Western Cape. It was funded by the South African National Treasury and the Meshfield consultancy and research lab. The project aim was to bolster local adaptive capacity to climate change by developing social and green entrepreneurial skills and opportunities. The project engaged 28 unemployed youth – the '*FLOW Ambassadors*' – to build both individual and community capacity to innovate in the face of the growing challenges of climate change, resource depletion and

inequality. Key activities included asset mapping, local storytelling, personal development, local government engagement and the introduction of two community currencies.

Courses that transcend disciplines

The **Global Citizenship Programme**, commenced in 2010 and ongoing, comprises a series of co-curricular activities for students across all faculties, aimed at exposing them to contemporary global citizenship and social justice issues beyond their degree requirements. The programme comprises the *Global Debates*, *Local Voices* workshop series, which addresses issues of environmental degradation, climate change and exploitation of resources. The course attracted 260 students in 2014 and 131 students in 2015. A further module, *Service, Citizenship and Social Justice*, is a community engagement course of voluntary community service and provides an opportunity for students to consider issues of leadership and citizenship in contexts of poverty and inequality.

The ACDI master's course in *Climate Change and Development*, described above, is one of the leading transdisciplinary programmes at UCT.

In the Engineering and Built Environment faculty, an elective undergraduate course entitled *Social Infrastructures: Engaging with Community for Change* was launched in 2013. It is open to students across all faculties, all disciplines and all years. The course helps students broaden their understanding of socio-economic issues, to develop new skills, knowledge, values and attitudes that can help them function better as professionals in their chosen fields. Themes include cities, infrastructure and social change; urban food security; cities and climate change; water, sanitation and service delivery; and sustainable urban development. The course began with 33 students in 2013 and increased steadily to 100 in 2015, with a 100% pass rate. It was the recipient of the 2016 UCT *Collaborative Education Practice Award* that recognises excellent collaborative approaches.

Social integration

Connecting campus users with industry, government and civil society

Prominent high-level activities where UCT academics engaged government, civil society and global institutions occurred in 2015 during the preparations for both the United Nations Sustainable Development Goal (SDG) meetings in New York and for the Paris COP21 negotiations.

The university's strategic goal of enhancing contributions to development and its four strategic research themes addresses the objective of connecting the campus community with government and civil society (climate and development, poverty and inequality, safety and violence and the Schools Improvement

Initiative). Furthermore, the **Social Responsiveness Programme** specifically aims to connect academics and students with government and civil society.

Offered annually under the auspices of the Social Responsiveness Committee and the Research Office, the **Engaged Scholarship Programme** provides a space for professional development for UCT staff who wish to embed high-quality engagement in their research and teaching, and are interested in exploring the transformative possibilities of engaged scholarship. The programme explores how to tackle the complexities of building relationships in which communities are not just recipients of academic knowledge, but collaborators with researchers and students in generating solutions to community problems.

The annual **UCT Social Responsiveness awards** recognised over 200 individual academics, students, and professional, administrative and support staff for their contributions to social responsiveness in 2014 and 2015. For the first time, the Social Responsiveness Report of 2014 recognised the contributions of students who participate in socially responsive initiatives. Information about annual award recipients, annual reports and regional collaboration can be found at:

<http://www.socialresponsiveness.uct.ac.za/>

The **Schools Improvement Initiative** involves UCT staff and students in service towards improving the quality of education in the province. Student teachers and students of occupational therapy, speech-language therapy and social work engage with learners in the townships of Cape Town. The core of the school improvement work is in three primary and two secondary schools. Through their **100-UP** university preparation programme, the Schools Improvement Initiative works in all 20 secondary schools in the township of Khayelitsha. **The 100-UP Project** project aims to address the problem of access to education for learners from disadvantaged backgrounds to UCT and other tertiary institutions. The programme aims to build intellectual, social and cultural capital, as well as providing assistance with funding applications. The learners are supported over three years by staff and students across the university. In 2014, 70 of the first cohort of 100-UP learners entered UCT. The students receive further academic support and development once at UCT. <http://www.uct.ac.za/main/explore-uct/social-responsiveness/schools-improvement>

Engagement with civil society to address a range of development challenges is fostered by UCT's **Knowledge Co-op**, established to enable community groups to access academic expertise more easily. It provides an opportunity for academics and students to engage with society, to address the needs of communities and to apply their knowledge to real-world issues. The total number of topics submitted since the start of the Co-op stood at 203 by September 2014. These originated from over 80 partners – NGOs, local government and businesses. The number of projects handled in 2014 (35) is higher than in previous years (31 completed from 2011–2013). About half of the projects involve student thesis research, with a shift towards master's students (10 in 2014). <http://www.knowledgeco-op.uct.ac.za/>

The **Sustainable Enterprise & Emergent Change** research group at the Graduate School of Business looks at the contribution that organisations, particularly business organisations, can make to sustainable

development. It is supported by the African Climate and Development Initiative, and focused on organisational innovation and intermediation in complex social-ecological systems, specifically large businesses, municipalities and organisations such as NGOs.

After planning during 2015, the university established a community-based campus in 2016 that should enhance connection with the disadvantaged communities in the Cape Town area. The Philippi Village campus is a satellite campus of the Graduate School of Business and is seeking to develop more socially relevant solutions to the challenges of our context. Philippi Village is a mixed use, entrepreneurial development zone that offers students, alumni, clients and local entrepreneurs in the community a place to meet and engage. All business students are encouraged to take at least one course on the Philippi campus.

Programmes that further student interaction and social cohesion on campus

The Green Campus Initiative (GCI), described in Box 3, is the principal programme contributing to student interaction and social cohesion around environmental sustainability on campus. The annual **Green Week** held by the GCI is the major sustainability awareness-raising drive comprising exhibitions of green living on the Plaza, music concerts, documentary film screenings and panel discussions. Participants include city officials, sustainability researchers and experts, and civic society leaders. Green Week is organised by the GCI and supported financially and logistically by Properties and Services. *Orientation Week* provides another important annual platform for awareness-raising around campus sustainability.

An annual **Sustainability Month** is held in residences every August. In collaboration with Student Housing and Residence Life, and the residence catering and cleaning staff, the Green Campus Initiative organises a whole month of events centred on sustainability and green issues. Experts are invited to speak on topics such as energy efficiency and how to reduce one's carbon footprint. The month culminates in a prize-giving, awarding top residences in categories of the best catering team, cleaning team, student team and best Waste-to-Art displays.

The **HIV/AIDS, Inclusivity and Change Unit** (HAICU) described above (Box 1), contributes significantly to social cohesion on campus.

BOX 3: GREEN CAMPUS INITIATIVE

The **Green Campus Initiative** is a student society – or rather a movement – that was started by a small group of dedicated students in 2007. It has since grown rapidly to become one of the largest student societies at UCT. The GCI is structured around a committee or 'Green Team' of around 20 students who are elected annually to hold portfolios and carry out their responsibilities on a voluntary basis.

Apart from the annual flagship event of Green Week, a wide range of events and activities are organised by the GCI throughout the year. Regular education events are held during lunchtimes with guest speakers and panel discussions around specific themes, involving local and international academics, civil society activists and government representatives. Present at all events, the 'Green Police' is a group of energetic young activists, wearing their trademark green overalls. They engage with the public, inviting debate around issues, and provide assistance to campus greening events.

Key events held in the reporting period:

- World Naked Bike Ride Cape Town: March 2014 – 21 GCI members; 2015 – 35 GCI members
- Earth Hour – outdoor event held annually
- Moonlight Mass Bike Ride: October 2014 – 20 GCI participants
- *Enough with the Cups* Campaign: 2014 – reduce the number of disposable coffee cups used
- GCI vegetable garden outreach project based at Manenberg Primary March 2014
- Climate March 2015 – part of global action to influence COP21 in Paris
- Regular clothing swap events – demonstrating the possibility of a low-carbon lifestyle and the value of reusing products.

GCI representatives participate in many annual local and international forums. Principal among these is the annual World Student Environmental Network (WSEN) Global Summit. The WSEN network aims to bring about worldwide social paradigm shifts towards more sustainable societies by connecting and inspiring the student community to catalyse change at universities and in local communities. The summit was hosted by Stellenbosch University near Cape Town in 2014 and attended by one GCI member. Two GCI delegates attended the 2015 summit at Murdoch University, Perth, Australia.

On the eve of the COP21 climate negotiations in Paris, November 2015, the GCI joined a coalition known as the Climate Action Coalition, with a representative of the GCI as the chair. The coalition included activists and organisations such as WWF, 350.org, Wessa, the City of Cape Town, Project 90 By 2030 and AVAAZ. The coalition's main aim was to host a march in central Cape Town to influence the COP21 negotiations. The march was successful and was attended by over 2 000 citizens



Courses using participatory and project-based training around sustainability

The **Social Infrastructures** course in the Engineering and Built Environment faculty, mentioned above, uses participatory and project-based training with sustainability themes such as climate change; urban food security; water, sanitation and service delivery; and sustainable urban development.

The **Professional Communication Unit** in the Commerce faculty has run a course using sustainability scenarios on campus sustainability as the topic for the student semester projects since 2009. Students are required to undertake research on their selected campus sustainability topics, write up reports and then deliver professional presentations of these for examination. An independent sustainability consultant participates in the course by providing current campus sustainability topics, delivering guest lectures, guiding student research and attending the final presentations. The course has been recognised by the university for innovative teaching.

Since 2012 the third-year **Information Systems** course in the Faculty of Commerce has structured the group semester projects around campus sustainability topics. The students participate in the measuring and reporting on the UCT carbon footprint and providing recommendations for mitigation. Students conduct interviews and surveys, which also raises awareness around the issues in the university administration. Useful research has been conducted on a full range of campus sustainability topics such as modes of commuting transport and analysis of the pilot digital electricity platform data. The project has proved to be transformative for students, with evidence of shifts in thinking recorded in their reflective essays. The project goes beyond basic problem solving towards a critical reflection on existing behaviour patterns, as well as fostering innovative thinking. The course has been recognised by the university (Collaborative Educational Practice Award 2014), by the Higher Education Learning and Teaching Association of South Africa, and the International Sustainable Campus Network (ISCN) in their 2015 Sustainable Best Campus Practices Report.

Behavioural programmes aiming at more sustainable actions by students, staff, or external community members

The **Green Campus Initiative** is the principal environmental programme aimed at promoting more sustainable behaviour among students and staff [Box 3]. The GCI also engages in outreach activities in external communities around Cape Town, such as school learning programmes focused on recycling education, vegetables gardens and tree planting. GCI members volunteer for the eco-clubs programme in schools around the Cape Town area driven by the Project 90 By 2030 organisation, which aims to build carbon-reduced communities and climate-resilient economies in South Africa. Activities include helping the schools run or establish their own 'Green School Initiative'.

Currently UCT has five registered development agencies that afford students the opportunity for voluntary community service. These include SHAWCO, Habitat for Humanity and Ubunye.

The **SHAWCO** student society has a core mission to practice and promote responsible citizenship through health, education and social entrepreneurship initiatives. Started in 1943, with the arrival of democracy in 1994 SHAWCO moved from a welfare to a development model. SHAWCO has since developed into two main service sectors: SHAWCO Health and SHAWCO Education. Activities in the health sector involve the running of primary healthcare clinics, and in education, providing skills development and youth education programmes.

Ubunye is a student-run organisation with a core mission of providing educational advancement, opportunities for leadership and mentorship to motivated high-school learners in Cape Town's townships. Several projects operate under the Ubunye banner: Inkanyezi, TeachOut and the Township Debating League.

- **Inkanyezi** – mentorship, career guidance for tertiary education
- **TeachOut** – UCT students provide academic assistance to high-school learners in Cape Town's disadvantaged communities, running after-school and Saturday tutorials
- The **Township Debating League (Thethani)** teaches high-school learners to debate, empowering them with the ability to speak publicly and with confidence.

Ubunye was recognised by the university in 2015, receiving an award for the *Most Outstanding Team in a Social Responsiveness Initiative*. The development agency signed up 600-odd volunteers at the start of 2014 and grew and strengthened their volunteer base and existing operations, spanning over 20 different schools and childcare centres across Cape Town. (www.ubunye.org.za)

Institutional commitments and resources for campus sustainability

Existence of an internal sustainability policy that integrates academic with operational issues

In spite of the commitment to the Talloires Declaration (1990), the ISCN-GULF Sustainable Campus Charter and internal environmental policies, the integration of academic enquiry with operational activities at UCT remains ad hoc. The broadening out of sustainability beyond operations to encompass teaching, research and outreach, as envisaged in the *Green Campus Policy Framework* of 2008, has not occurred.

Few opportunities exist for engagement and dialogue between the academic staff and students on one hand, and the professional and administrative support staff (PASS) on the other hand, who are responsible for facilities management, transport planning and campus master planning. The EMWG forum has the potential to foster greater collaboration towards this goal, if it can go beyond ad hoc meetings, allowing academics and student representatives to engage with the facilities management staff. A programmatic 'living lab' intervention would have to be developed to match green campus needs and opportunities with teaching, learning and research activities.

Responsible investment

In many universities globally, the issue of how universities choose to invest their funds is increasingly coming under scrutiny. In the US, Europe, Australia and New Zealand, universities' endowment funds are starting to align their investment portfolios with the social concerns of their students and staff. In 2005 the UN established a responsible investment coalition called the *Principles for Responsible Investment*. Signatories pledge to invest according to six principles, aiming to achieve long-term sustainable investment returns and benefits for society as a whole. A few academic institutions have signed up too, with Harvard's USD\$35 billion *University Endowment Scheme* joining in 2014.

A new initiative launched in 2014, the **Fossil Free UCT** campaign, has begun to influence responsible investment at UCT. In February 2015, the university Council agreed to form a task team to adopt an ethical investment strategy and to consider fossil-fuel divestment. An **Ethical Investment Task Team** was established in August 2015. The Fossil Free UCT representatives participated in a meeting of the task team. The Fossil Free UCT group has since urged the university to move to full disclosure about their investment portfolio, in accordance with the draft recommendations of the Ethical Investment Task Team.

Innovative investment strategies that seek to achieve both good financial returns and positive social impacts are being explored by the **Bertha Centre for Social Innovation and Entrepreneurship** at the UCT Graduate School of Business. Their research project – *The African Investing for Impact Barometer* – charts the steady growth of investment for social impact on the continent.

Commitment to external sustainability principles or initiatives

As described in the Introduction, UCT made external commitments to sustainability principles and practices as early as 1990 with the signing of the Talloires Declaration. The EMWG was established in 2001 to give effect to the Talloires commitments and has continued with quarterly meetings to the present day, although not consistently.

The Global University Leaders Forum (GULF) universities developed the **International Sustainable Campus Network** (ISCN) and in 2012 Vice-Chancellor Max Price signed the emerging *ISCN-GULF Sustainable Campus Charter* at Davos. Price acted by assigning reporting in terms of the charter to Properties and Services. The first UCT report was duly submitted in 2012. This was followed by a further report for 2012 and 2013, submitted in 2014.

It is significant that the 2015 UCT Research Report was themed and structured around the UN Sustainable Development Goals (SDGs), reflecting academic endorsement and alignment with this agenda. Further commitment to contributing to the achievement of the SDGs through campus operations, teaching and research would be the next step.

Dedicated resources for campus sustainability

The Properties and Services Department is tasked with ongoing implementation of the *Green Campus Action Plan*. The resourcing for activities flowing from this has to be secured through regular budgeting channels. The *Environmental Management Working Group* guides the prioritisation of sustainability initiatives; however, it remains a non-formalised advisory group only, with no formal resourcing.

There is a permanent post of Environmental Risk Officer within Properties and Services who deals with environmental compliance, hazardous waste, radiation protection and biosafety. Proposals made to appoint a sustainability coordinator and an energy officer were not supported by the university leadership, due to austerity measures.

The **governance for sustainability** at the University of Cape Town remains divided between physical campus matters entrusted to the executive director of Properties and Services on the one hand, and typical academic governance processes for teaching and research on the other. This challenge was recognised as early as 2013; however, little progress has been made to date. Properties and Services are responsible for sustainability around ISCN Principles 1: Building design and operations and Principle 2: Planning and campus-wide strategies. With respect to Principle 3: Sustainability in education, there is still a lack of clear institutional responsibility for coordination of sustainability across research, teaching and operations, though a multitude of teaching, research and social responsiveness activities are taking place, as presented above. Institutional mechanisms need to be developed for coordination, reporting and sharing of information across the university and to external stakeholders.

In the developing world context in which UCT finds itself, engaged academics and students may have found an appropriate strategy by developing the 'living lab' mostly off – rather than on – campus.

Overview of UCT's Principle 3 Goals:

Topics	Goals and Initiatives		Results		
Priority topics (with units of measurement)	Objectives and targets (for reporting year, following year, and beyond)	Key Initiatives (in reporting year, or planned for the future)	Performance 2013	Performance 2014	Performance 2015
Topical Integration					
Sustainability courses and programmes	Increase the number and quality of sustainability focused and related courses		52 sustainability focused courses; 18 sustainability programmes; 33 sustainability related courses.	No further mapping undertaken. <i>Sustainable Mineral Resource Development</i> programme established.	Growth of sustainability programmes is evident
Research that transcends disciplines	Enhance academic leadership and interdisciplinary engagement around societal and environmental challenges	Growth and development of interdisciplinary research and programmes	Five academic chairs with interdisciplinary research objectives closely tied to sustainable development.	ACDI MPhil Climate & Development: 10 students Refer to extensive listing of programmes above	Flagship programme: ACDI MPhil Climate & Development: 18 students
Courses that transcend disciplines	Enhance interdisciplinary teaching and learning	UCT Global Citizenship Programme (co-curricular, beyond degree requirements)	UCT Global Citizenship Programme: 210 students <i>New course: Social Infrastructures</i> 33 students	UCT Global Citizenship Programme: 260 students <i>Course: Social Infrastructures</i> 60 students	UCT Global Citizenship Programme: 131 students <i>Course: Social Infrastructures</i> 99 students New research group: <i>Environmental Humanities South</i>
Social Integration					
Connecting campus users with industry, government and civil society	Engage with communities and other non-academic constituencies to	Social Responsiveness (SR) Programme	SR Annual Reports; Awards Audit of projects	SR Annual Reports; Awards Audit of projects	First Engaged Scholarship Programme for academic staff SR Annual Reports; Awards

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	address societal and development challenges	The Knowledge Co-op			Audit of projects
Programmes that further student interaction and social cohesion on campus	Growing awareness and action towards a sustainable campus and beyond to lifestyles	Ongoing action by the Green Campus Initiative Exhibitions, films, concerts, panel discussions, Awards	Annual Green Week Sustainability Month in residences	Green Week Sustainability Month in residences	Green Week Sustainability Month in residences
	Sharing knowledge and experience in campus sustainability with other southern African universities	Engagement with the countrywide BlueBuck Network	Three delegates attend Annual BlueBuck summit		Two students were speakers at the 4th ACUHO-I-SAC Green Conference held at UWC
	Participation in international environmental forums		Two GCI delegates attended World Student Environmental Summit, Germany	One GCI delegate attended World Student Environmental Summit, South Africa	Three GCI delegates attended World Student Environmental Summit, Australia
Courses using participatory and project-based training	Aim to embed sustainability principles in all curricula, across all faculties; environmental literacy	Courses use participatory and project-based training with sustainability themes such as climate change, water, sanitation, urban development and campus sustainability	Annual carbon footprint study undertaken by Information Systems course (INF3011F). Professional Communications (BUS2035S) course semester project topics on campus sustainability	Annual carbon footprint study undertaken by Information Systems course (INF3011F). Professional Communications (BUS2035S) course semester project topics on campus sustainability	Annual carbon footprint study undertaken by Information Systems course (INF3011F). Professional Communications (BUS2035S) course semester project topics on campus sustainability Social Infrastructures course

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Behavioural programmes aiming at more sustainable actions by students, staff and external communities	Continual improvement towards a more sustainable campus and sustainable living beyond campus	Outreach to disadvantaged communities; eco-clubs and school greening initiatives	SHAWCO Health and Youth Education initiatives GCI Outreach – Green School Initiative	Residences energy saving challenges Ubunye township-based mentoring	Ubunye received award for Social Responsiveness
Commitments and resources for campus sustainability					
Sustainability policy (internal) that integrates operational and academic issues	To work consistently towards campus sustainability in operations, research and education; towards a 'living lab'	Policies in force: Green Campus Policy Framework (2008)	Ongoing implementation of Green Campus Action Plan	No audits of progress undertaken; no bi-annual review of Action Plan; lack of transition towards the 'living lab' concept	The objectives of formally adopted Green Campus Policy Framework (2008) to be revisited and revitalised
Responsible Investment	Align investment portfolio with social and environmental concerns at UCT			Fossil Free UCT group launched	Ethical Investment Task Team established
Dedicated resources (processes, human and fiscal)	Provide the resources to coordinate and drive campus sustainability in all aspects of university life.	Full-time Environmental Risk Officer; EMWG meets quarterly	Sustainability becomes a KPA for the posts of Director: Maintenance & Operations and Senior Architect. Risk Officer.	One dedicated staff member – Environmental Risk Officer monitors compliance.	One dedicated staff member – Environmental Risk Officer monitors compliance
Commitment to external sustainability initiatives	Submission of annual report to ISCN-GULF Secretariat		No report published in 2013	Published report for 2012–2013	This report covers 2014 and 2015.