UCT CARBON FOOTPRINT REPORT 2017

EXECUTIVE SUMMARY

Compiled by Sandra Rippon, independent sustainability consultant, for the UCT Properties and Services Department.

External review: Anthony Dane, director at Change Pathways.

The full report and previous reports can be downloaded at: http://www.uct.ac.za/main/explore-uct/sustainability.

This is the summary of the seventh carbon footprint report of the University of Cape Town. The first report with the current boundaries and using the current methodology, the Greenhouse Gas Protocol, was for 2012. The report covers the entire university across all campuses of 708 267 square metres (m^2) and a total population of 35 343 students and staff.

The key objectives of this report are to present the results of the 2017 carbon footprint; to serve as a record of the process; to provide background to the results; and to identify the challenges experienced in compiling the UCT Carbon Report over the years, towards future improvement.

Due to challenges encountered in gathering the data for the Scope 3 Indirect Emissions for this report, only Scope 1 and Scope 2 results are reported. Scope 3 emissions are considered material for UCT to report on in future and to target for emission reduction strategies. In particular, Scope 3 Business Travel (comprising air travel, hired cars and staff mileage reimbursements) is a significant cost to the university and presents opportunities for mitigation.

A commitment was made by UCT in 2012 by joining the International Sustainable Campus Network (ISCN) and signing the ISCN-GULF (Global University Leader Forum) Sustainable Campus Charter. The results of the UCT Carbon Footprint Reports form a key component of the reporting in terms of the ISCN-GULF Charter.

Internal environmental policies that commit to reporting and mitigating carbon emissions include:

- UCT Green Campus Policy Framework, 2008, adopted by the university Council in 2009.
- The Green Campus Action Plan 2009 drafted under the direction of the Properties and Services Department (P&S) and the Environmental Management Working Group (EMWG).

At the country level, South Africa has made international commitments to progress its contribution to the global effort to mitigate climate change, under the United Nations Convention on Climate Change.

Key drivers for reporting and mitigating greenhouse gas emissions for the university are:

- **Innovation and leadership**: Leveraging this reporting process for educational benefit; exploring emissions offsets[1]; and mitigation measures.
- **Resource/operational cost savings** for electricity, water, fuel use on land and air, especially given projected rising electricity and water tariffs.
- **Water consumption reduction** in the context of drought, rising tariffs and water restrictions.
- **Meeting increasing stakeholder expectations** over the use of fossil fuels and water conservation, as well as greenhouse gas emissions.

Methodology	- **Greenhouse Gas Protocol** – corporate accounting and reporting standard. - Emission factors are from the UK Department for Environment, Food and Rural Affairs (Defra)[2], except for electricity supply where the Eskom factor was used. - Results are reported in metric tonnes of carbon dioxide equivalent – tCO_2e. - The quality of data for Scope 1 is based on measurements and therefore of high quality. Scope 2 data is of medium-high quality since data is gathered from digital meters for the major portion of electricity supplied.
Inclusions	- The entire university across all campuses and properties. - Staff: 6 640 full-time equivalent (FTE). - Students: 28 703. - Electricity grid emission factor: 0.97 $kgCO_2e/kWh$.
Exclusions	- Scope 3 emission results

Electricity grid emission factor

The Grid Emission Factor is the total amount of greenhouse gases emitted per unit of electricity generated for and distributed by an electricity grid. Electricity use is a major component of the UCT carbon footprint (75% of total emissions), therefore any change to the emission factors therefore has a significant effect on overall results. For this report, a decision was taken to use the emissions factors from the annual Eskom Integrated Reports (IR) and to restate electricity emissions for 2015 and 2016 using these factors.

[1] Provision is made for carbon offsets in the Draft Carbon Tax Bill, to be implemented South Africa in June 2019. Carbon offsets are mechanisms an organisation can use to reduce its carbon footprint and reduce its emissions profile.

[2] Emission factors obtained from https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2016

Table 1: Comparative GHG emissions (tonnes CO_2e)

CATEGORY	2017	2016	2015	2014	2013	Diff 2016 to 2017	% Change 2016–2017
Scope 1 Direct Emissions	**2 507**	**2 188**	**1 658**	**1 792**	**1 823**	319	**14.6**
Jammie Shuttle	902	789,50	861	1 006	1 068	112	14.2
UCT vehicle Fleet	697	475	503	556	465	221	46.6
LPG	102	191	160	230	289	-89	-46.7
Diesel for generators	-	-	134	-	-	-	-
Refrigerants [1]	807	733	-	-		74	10.1
Scope 2 Indirect Emissions purchased electricity	**67 028**	**68 505**	**71 569**	**67 447**	**65 835**	-1 477	**-2.2**
Electricity: Main Campus	44 001	*43 774	*46 933	44 219	42 583	227	0.5
Electricity: Medical Campus	11 477	*11 654	*12 027	11 239	10 648	-178	-1.5
Electricity: Off-campus residences [2]	9 885	*10 633	*10 850	10 149	10 729	-748	-7.0
Electricity: GSB	327	*1 382	*1 387	1 393	1 417	-1 055	-76.3
Electricity: Hiddingh [3]	504	*527	-	111	116	-24	-4.5
Electricity: ICTS on Main	834	*534	*372	335	342	301	56.3
TOTAL EMISSIONS	**69 535**	**70 693**	**73 227**	**69 239**	**67 658**		

* Indicates a restated result that may differ from the original report for that year. This may be due to improvements in data collection or changing emission factors. A decision to restate a result is always considered against the principle of comparability of the GHG Protocol.

Notes:

1. New category added for 2016 report as data became available.
2. Floor area for Rochester Residence (accommodating over 300 students and staff) remains an estimate; to be updated by P&S.
3. Hiddingh electricity for 2015 included in Main Campus data.

RESULTS

The total emissions for Scope 1 and Scope 2 are 69 535 tCO_2e, compared with 70 693 tCO_2e in 2016 (Table 1). This is a -1.6% decrease compared to 2016, a positive result given that the population increased by 1.1% in this period and the floor area increased by 0.3%. Results indicate that energy use and associated emissions have been relatively stable over time.

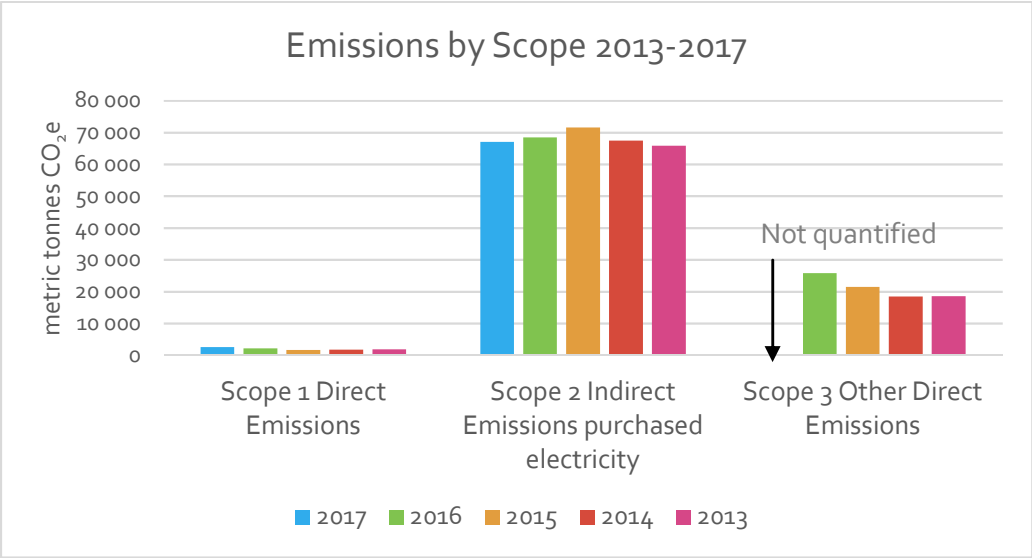

Figure 1: Emissions by Scope 2013–2017

Emissions from all Scope 1 activities increased significantly by 14.6% (319 tCO_2e) compared to 2016, from 2 188 tCO_2e to 2 507 tCO_2e (Table 1; Figure 1). This increase is due to an increase in refrigerants (10%); an increase in vehicle fleet emissions (46.6%) due to improved data; and an increase in Jammie Shuttle emissions (14.2%), likely due to growth in demand for the service. The use of liquid petroleum gas (LPG) decreased, with emissions declining by -46.7% or 89 tCO_2e.

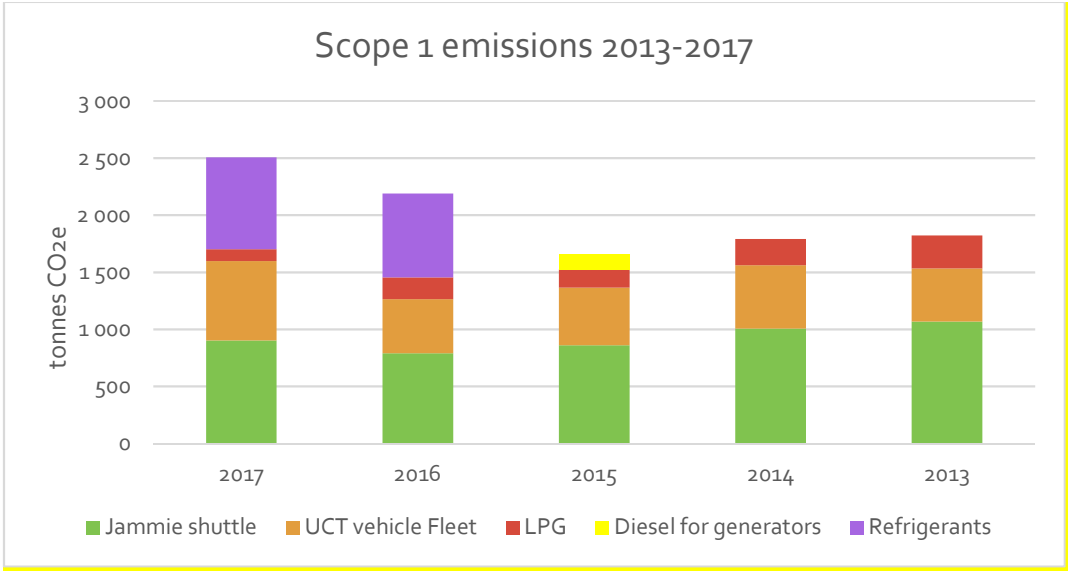

Figure 2: Scope 1 emissions 2013-2017

Scope 2 indirect emissions from the purchased electricity decreased by -2.2%. This is due to a decrease in emissions for the Graduate School of Business (GSB) by -76.3% or 1055 tCO_2e[3]; off-campus residences by -7% or 748 tCO_2e; and for Medical Campus by -1.5% or 178 tCO_2e. The data quality for electricity supply is improving annually due to the extensive installation of digital meters for Main Campus and the Medical and Hiddingh campuses. In addition, monitoring and reporting is being undertaken by specialist consultants.

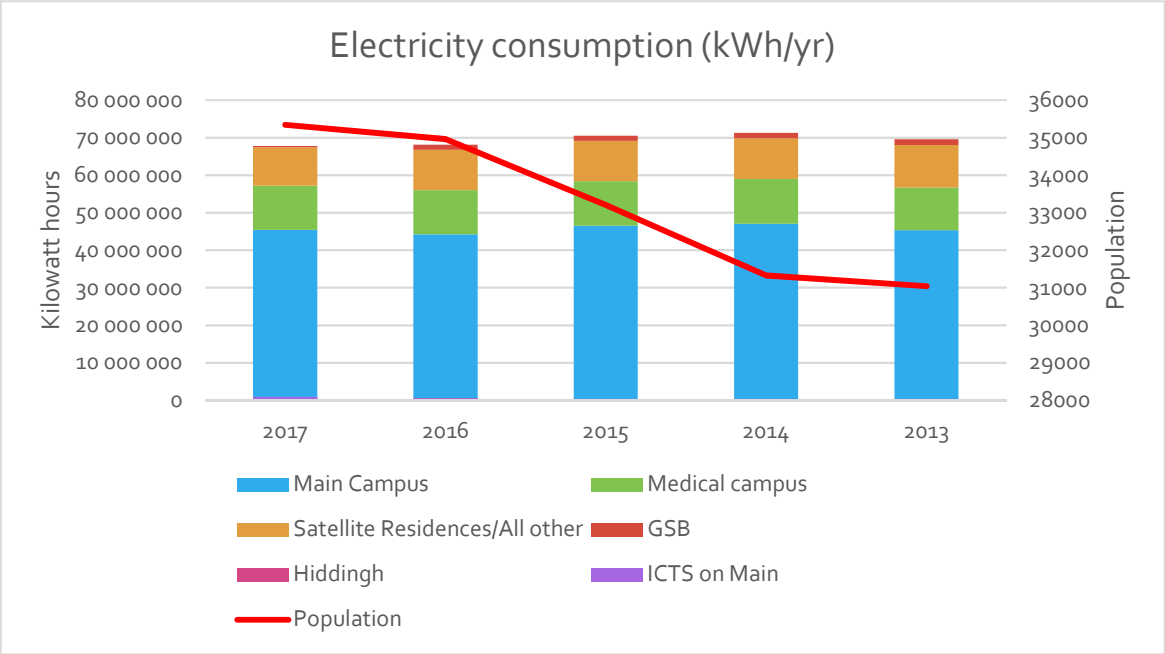

Figure 3: Electricity consumption 2013-2017 in kilowatt hours

Overall, electricity consumption has been decreasing slightly against a significant increase in campus population, as shown in Figure 8, with a concomitant increase in floor area (Figure 3).

In terms of the intensity of emissions, emissions per square metre decreased by -1.9% to 0.098 tonnes CO_2e per square metre per annum, while the total building area increased by 0.3%, a positive result. The per capita emissions decreased by -2.7% from 2.02 tCO_2e to 1.97 tCO_2e with a 1.1% increase in population (Table 2).

Table 2: Intensity Metrics 2017–2012

INTENSITY METRICS (Scope 1 & 2 only)	2017	2016	2015	2014	2013	2012	% change
Gross Area	708 267	706 125	706 125	705 653	672 858	649 404	0.3
Tonnes CO2e/sqm/annum	**0.098**	**0.100**	**0.104**	**0.098**	**0.101**	**0.103**	**-1.9**
Population – Staff & Student FTE	35 343	34 965	33 204	31 329	31 041	30 579	1.1
CO2e/person/annum	**1.97**	**2.02**	**2.21**	**2.21**	**2.18**	**2.18**	**-2.7**

[3] Actual decrease of -24.9%, with the remaining decrease due to a revised allocation of electricity supply between the GSB and the Breakwater Lodge, sharing facilities on the same campus.

THE REPORTING PROCESS

The data gathering process for this report was similar to previous years, with the same challenges experienced in terms of momentum, effectiveness and data quality. The process was most effective in 2014 when the executive director of Properties and Services took responsibility for gathering all the data and engaged directly with the data holders, demonstrating the effectiveness of strong leadership in this process.

High-level recommendations to improve data for future reporting are:

- The UCT carbon reporting process requires endorsement at **executive level** to communicate the commitment of the university to data holders and other stakeholders.
- Coordination and alignment of reporting processes across the university is required, undertaken by a staff member with an appropriate level of authority.
- An exercise in evaluating Scope 3 categories to determine which of these are material to reporting is recommended. Service providers should be required to report the appropriate meta-data for Scope 3 emissions.
- The installation of digital metering for **electricity** consumption should be expanded to further properties.
- Official **commuting surveys** to be conducted to track **commuting** transport modes, provide evidence to support behaviour change to lower carbon modes of transport, and contribute to transport planning.
- For **air travel** data, improvements to the information system are required to ensure the gathering of accurate data.

KEY RECOMMENDATIONS FOR MITIGATING EMISSIONS

With more than five years of emissions data available, it is time to focus on mitigating emissions that have the benefit of reducing operational costs and would have a good return on investment. Key among these is energy efficiency (lighting, ventilation and air conditioning) and renewable energy in the form of solar PV, which may by now have dropped in price to offer a good investment return. It is also important to explore 'soft' funding that could improve the business case. Operational savings should be considered in capital allocation budgets. Recommendations for Scopes 1 and 2 are set out below, whereas Scope 3 recommendations are only included in the full report.

Scope 1: Direct Emissions

Refrigerant gases

- Shift to the procurement of **refrigerants** with lower global warming potential to stay ahead of legislative requirements for phasing out certain gases.

Vehicle fleet

- Futureproof the vehicle fleet by changing to electric vehicles as soon as is feasible.

- Investigate feasibility of installing solar-powered charging stations for electric vehicles (for UCT vehicle fleet, staff and student vehicles).

Jammie Shuttle

- Work towards improved data and analytics of patterns of use and mileage.
- Plan a procurement process that shifts towards electric buses at the end of the current bus lease.

Scope 2: Purchased Electricity

Electricity consumption

In the context of the risks of rising tariffs and security of supply remaining high:

- Review investments to date in energy efficient equipment (air-conditioning chillers, elevators, lighting and lighting sensors) and set new targets and priorities. Invest in a programme of efficiency measures to save operational costs and emissions.
- Conduct feasibility studies to demonstrate economic viability of renewable energy generation on site and to access funding. This mitigation measure has multiple benefits of reducing emissions, contributing to energy security and having significant educational and reputational value.
- Invest in an effective communication campaign to the UCT community about electricity consumption trends, as was launched for water conservation, via digital dashboards and other media.

CONCLUSION

In spite of the challenges in collecting data for this report, there is a fair degree of confidence that the results for Scope 1 and Scope 2 emissions can inform high-level policy decisions at UCT. Key focus areas for UCT are:

1. Renewed commitment to leadership in climate change mitigation of campus operations;
2. Transition towards stronger governance for sustainability;
3. Improvement of emissions data systems and analysis;
4. Transition towards developing and implementing mitigation actions based on the results of the carbon footprint reports; and
5. Set targets for emission reductions over the long-term.

To contribute towards global goals to keep global warming below the 2˚C threshold as per the Paris Agreement, UCT should take the step of setting long-term reduction targets. While target setting should be aligned with South Africa's nationally determined contribution (NDC) under the Paris Agreement, UCT should play a leadership role in terms of setting and achieving ambitious greenhouse

gas and energy targets. UCT is urged to commence the research and the stakeholder engagement process required towards setting realistic targets over the next year.