UNIVERSITY OF CAPE TOWN

CARBON FOOTPRINT REPORT 2019

Photo credit: UCT CMD

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This report was compiled by Sandra Rippon, independent sustainability consultant, for UCT's Office of the Vice Chancellor: Environmental Sustainability Directorate.

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Previous reports can be downloaded at http://www.uct.ac.za/main/explore-uct/sustainability/downloads

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EXECUTIVE SUMMARY

This is the ninth carbon footprint report of the University of Cape Town (UCT). The report covers the entire university across all campuses and the total population of students and staff. It includes Scope 1 - Direct emissions; Scope 2 - Indirect emissions for purchased electricity; and Scope 3 - All other indirect emissions, as per the *Greenhouse Gas Protocol*, the methodology used for the report. Some previous reports did not include Scope 3 emissions due to the challenges encountered in gathering and verifying the data.

What is a carbon footprint?

A carbon footprint can be defined as a measure of the greenhouse gas emissions that an entity is directly and indirectly responsible for, expressed in carbon dioxide equivalents and measured in tonnes of carbon dioxide equivalent (tCO_2e).

Why is reporting carbon emissions important for UCT

The Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC) aims to limit the increase in global average temperature to well below 2°C above pre-industrial levels, and to 'pursue efforts' to limit the increase to 1.5°C, to reduce the risks and impacts of climate change. Amongst 195 countries, South Africa has made commitments in terms of the agreement and submitted its first nationally determined contribution (NDC), with an updated NDC being prepared ahead of COP26[1] in November 2021. The United Nations body for assessing the science related to climate change - the Intergovernmental Panel on Climate Change (IPCC), has concluded in its Sixth Assessment Report that it is unequivocal that human influence has warmed the atmosphere, ocean, and land, many of the observed changes are unprecedented over many centuries and are irreversible for centuries to millennia (IPCC, 2021).

The IPCC's most recent report, the Sixth Assessment Report (AR6), based on observed evidence of warming trends, cautions that global surface temperature will continue to increase until at least the mid-century under all emissions scenarios[2] and that global warming of 1.5°C and 2°C will be exceeded during the 21st century unless "deep reductions" in CO_2 and other greenhouse gas emissions occur in the coming decades (IPCC, 2021).

UCT has made several international and internal policy commitments to environmental sustainability since 1990 and has done well to measure and report on its annual carbon footprint over the last decade. The recent *UCT Environmental Sustainability Strategy 2020* aims to reduce energy consumption from fossil fuels to zero and carbon emissions to a net zero state by 2050 or sooner. This will require approximately 2-5% reductions annually off a 2020 baseline. These annual targets will require complete commitment from all stakeholders, especially UCT leadership.

[1] COP26 is the 26th annual United Nations Climate Change to be held in Glasgow in November 2021

[2] The IPCC AR6 report explores five emissions scenarios from "very low emissions" to "very high" emissions.

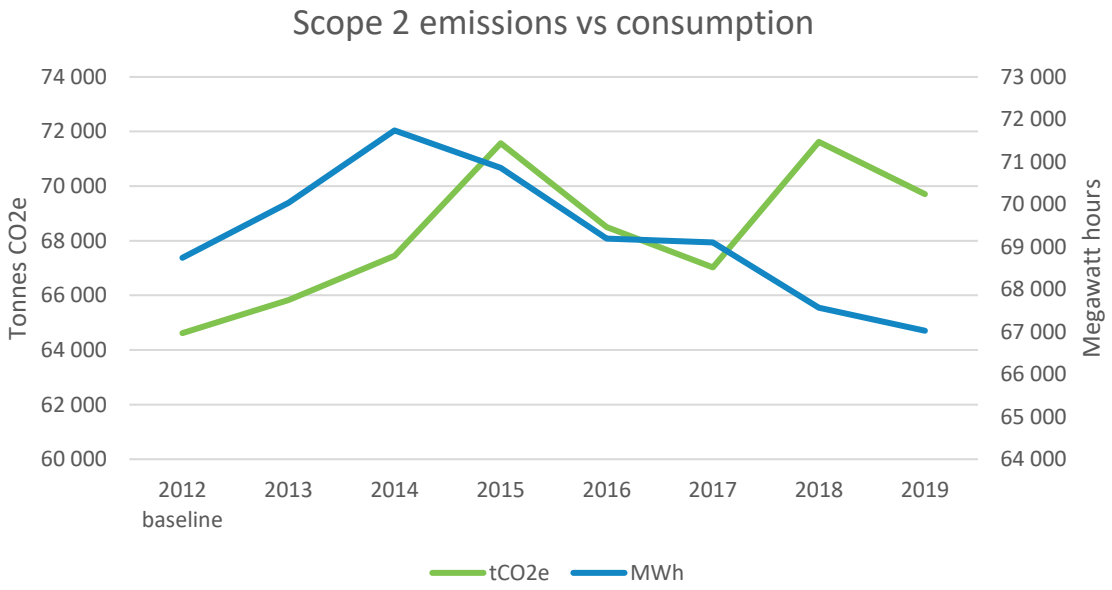
Eskom Electricity grid emission factor

The Eskom electricity grid emission factor for this report has decreased from 1.06 to 1.04 tCO2e (a 1.9% reduction). Since electricity related emissions comprise over 67% of total emissions, this change has a major influence on UCT's carbon footprint.

Results

Scope 1 and Scope 2 emissions contributed 73 417 tCO2e, a decrease of -2.8% from 2018. The population increased by 0.2% in this period, while the floor area increased only slightly by 0.6%.

The total emissions of all scopes are 103 903 tCO_2e compared with 103 121 tCO_2e reported in 2016 (the last report that also included scope 3 emissions), representing an increase of 0.76% while the UCT population has increased by 2.2%and floor area by -4.6% between 2016 and 2019.



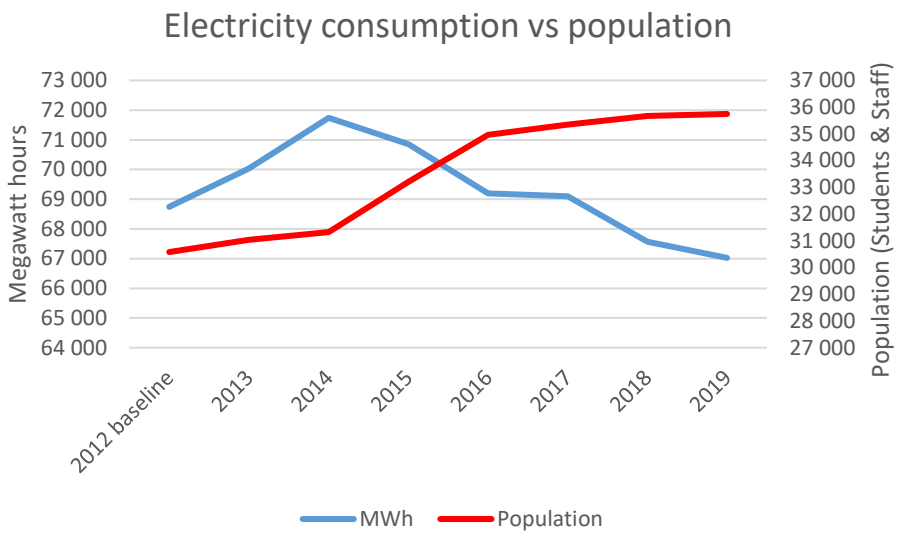
Scope 1

Scope 1 emissions decreased by -1.7% in 2019.

- Jammie Shuttle emissions increased by 15.2%, likely due to the introduction of an overnight service in 2019.
- Vehicle fleet fuel emissions decreased by -2.6%. A new data set was found for fuel purchases for the Health Sciences fleet and the 2018 result was restated to include this activity.
- Refrigerants emissions decreased by -10.9% compared to 2018; however, a 90% increase in the use of refrigerant R22 was found, which should be phased out to comply with regulations and this must be urgently addressed.

Scope 2

Scope 2 emissions from purchased electricity decreased by -2.7%, understood to be due, at least in part, to extensive load shedding as well as the decrease of -1.9% in the electricity grid emission factor. In absolute terms, electricity consumed in kilowatt hours decreased by -0.8% compared to 2018. Compared to the baseline year 2012, electricity consumption decreased by -2.5%, with a concomitant increase in population of 16.9%, a positive result.



- Main Campus electricity consumption decreased by -3.5% compared to 2018.
- Medical Campus electricity consumption decreased by -4% from 2018.
- Off-campus residences electricity emissions increased by 8.2%, with actual consumption increasing by a significant 10.3% from 2018. The reasons for this are not clear.

Scope 3

Scope 3 emissions were last reported in 2016 therefore all results in this category are compared with 2016.

For Scope 3 emissions overall, there was a decrease of -6% while the UCT population increased by 2.2% since 2016.

- Overall, Business Travel emissions, comprising hired cars and staff reimbursements, increased by 33%.
    - Emissions for Hired Cars increased significantly by 48%. Reasons for this are unknown.
    - For Staff Mileage, emissions decreased by -10.6%.
- The emissions for Air Travel decreased by -3.4%. A new, more accurate methodology was adopted and the result for 2016 has been restated using this revised methodology.
- The emissions from Commuting decreased by -4.4%, likely due to the reduction in population of -5.3% since 2016.

- Overall, emissions from Food Supply decreased by -52% in 2019, a surprising result, suspected to be due to missing data.
- Emissions for Paper products increased by 6%.
- Water supply emissions reflect a reduction of -7.6%, a disappointing result given the water conservation campaigns at UCT.
- Emissions from solid waste increased by 11%. Recyclables as a percentage of total waste is 16.83%, including food waste. This percentage has decreased from 21.28% in 2015, a concerning, negative trend.

The largest changes in emissions are a decrease in electricity consumption for Main and Medical campuses; an increase in electricity consumption for the GSB Campus; and a decrease in Food Supply emissions.

Intensity metrics

Emissions per square metre decreased by -3.2% to 0.108 tCO_2e per square metre per annum, with the total building area slightly increased by 0.6%. This is due to the decrease in scope 2 emissions and to the decrease in the electricity grid emission factor.

The per capita emissions increased by 4.9% from 2.11 tCO2e to 2.22 tCO_2e, due to the decrease in population of -7.2%.

The energy intensity per capita has increased from 1 894 kWh to 2 024 kWh per capita per annum or 6.8%, again due to the decrease in population.

In future, the net zero carbon emissions target and annual reduction in the total emissions for scope 1 and 2 is the most important indicator for UCT to track its performance.

Reporting process

Similar challenges were experienced with data gathering and data quality issues, with delays exacerbated due to the Covid-19 pandemic lockdown requiring staff to work remotely.

Mitigation of emissions

The most critical actions are to enhance energy efficiency specifically lighting, ventilation and air conditioning; installing renewable energy in the form of solar PV systems; and targeting lower GWP refrigerants.

Scope 1

- Develop a long-term plan for the responsible use of refrigerants that achieves a steady decrease in these greenhouse gas emissions.
- Future-proof the vehicle fleet, including buses, by changing to electric vehicles as soon as feasible.
- Optimise routing and scheduling of the Jammie shuttle to reduce transport energy intensity and maximise onsite energy utilisation Solar PV for charging.

Scope 2

- Invest in a programme of electricity efficiency measures for existing and new buildings.
- Roll-out the solar photovoltaic systems that have been identified in the 2020 feasibility study (±30 sites).

Conclusion

The total of Scope 1 and 2 emissions decreased by -2.8% compared to 2018; however, this may be largely due to load shedding and the lower Eskom emission factor.

A critical finding in the results is the increase in use of the refrigerant R22 that must be phased out in terms of the Montreal Protocol. Procurement of alternative refrigerants with lower global warming potential, requires urgent attention.

For Scope 2 emissions from electricity, measurement via digital meters is fairly robust and stable, and the gradual decline in consumption since 2016 is encouraging. With the implementation of energy efficiency measures and renewable energy installations, it might be possible to meet annual reduction targets set to achieve Net Zero Carbon by 2050.

The reintroduction of reporting on Scope 3 emissions is an improvement in this report and data gathering challenges must continue to be addressed

The finalising of the *UCT Environmental Sustainability Strategy* in 2020, with targets for net zero by 2050, is considered an important milestone in UCT's response to the climate crisis.

UCT must now focus on how to achieve strong and rapid reductions in its emissions, through urgent action planning, implementation, and reporting on progress against its new net zero targets.

A. INTRODUCTION AND BACKGROUND

Since the 1990s UCT has been committed to environmental sustainability of its own operations, evidenced through amongst other things the Talloires Declaration of 1994. UCT's more recent **Environmental Sustainability Strategy** was finalised in 2020 and is available here. This is a key component of UCT's Vision 2030 of which sustainability is one of the three pillars (excellence and transformation are the other two pillars). Reducing energy consumption and greenhouse gas (GHG) emissions is a key objective of the strategy, and hence there is a continued and renewed emphasis placed on the value of this carbon footprint report and its findings. A long-term goal of the strategy is that UCT achieves a Net Zero Carbon status by 2050 for scope 1 and 2, although work is being done in the next five years to determine the most cost optimal path towards net zero carbon and whether this goal can be achieved sooner and at what cost.

About this report

This is the ninth carbon footprint report of the University of Cape Town, for the year 2019. The first report, for the year 2007, was completed in 2009, but encompassed Main Campus only and therefore cannot be considered as a baseline report. The first report with the same boundaries as this 2019 report, which extends to all campuses and uses the current methodology, the Greenhouse Gas Protocol, was for 2012, which can therefore be considered the baseline year for comparison in this report.

This 2019 report covers the entire university across all campuses of 677 385 square metres (m^2) and a total population of 35 745 students and staff.

The reporting process has two outputs:

1. This detailed report for internal purposes that aims to report on the findings and identify the best opportunities for emission reductions.
2. A separate executive summary publication, to be available on UCT's website in rich text format with additional graphs/illustrations.

The key findings of the report will be communicated in various ways to the UCT community to ensure that the key message is shared and appreciated by the UCT community, while opportunities will also be explored with students and student organisations for them to communicate this in ways that they find relevant.

This detailed report includes Scope 1 (direct) and Scope 2 (indirect associated with purchased electricity) emission sources and material Scope 3 (all other indirect emissions) emissions as per the GHG Protocol[3]. The reports for 2017 and 2018 did not include Scope 3 emissions due to the challenges encountered in gathering the data. Under the GHG Protocol, reporting on Scope 1 and Scope 2 emissions is compulsory, with indirect Scope 3 emissions being reported on a voluntary basis. Scope 3 emissions are considered material for UCT to report on and to target for emission reduction strategies. Efforts were made during this reporting process to establish procedures to collect Scope 3 data more effectively, but these are still underway with the procurement and ICTS departments.

[3] Greenhouse Gas Protocol Initiative (no date) *A Corporate Accounting and Reporting Standard, Revised Edition,* developed for the World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), Geneva, Switzerland. https://ghgprotocol.org/standards

Please note that the 2019 Carbon Footprint or elements thereof are being compared to a number of previous years for different reasons:

- The overall 2019 footprint result is being compared with 2016, because that is the most recent year that included scope 1, 2 and 3 (whereas in 2017 and 2018 scope 3 was omitted).
- The 2019 scope 1 and 2 footprint result is compared to 2018, the previous report, and the baseline year, which is 2012, the first report where the present GHG reporting methodology was used.

What is a carbon footprint?
A carbon footprint can be defined as a measure of the greenhouse gas emissions that are directly and indirectly caused by an activity or are accumulated over the life stages of a product or service, expressed in carbon dioxide equivalents (CO_2e).

A carbon footprint is measured in tonnes of carbon dioxide equivalent (tCO_2e). The carbon dioxide equivalent (CO_2e) allows the different greenhouse gases to be compared on a like-for-like basis relative to one unit of CO_2. CO_2e is calculated by multiplying the emissions of each of the six greenhouse gases by its 100-year global warming potential (GWP).

A carbon footprint considers all six of the Kyoto Protocol greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).
(The Carbon Trust)

Why is reporting carbon emissions important for UCT?

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. The IPCC in the Sixth Assessment Report (AR6), 2021 states that it is unequivocal that human influence has warmed the atmosphere, ocean, and land, many of the observed changes are unprecedented over many centuries to many thousands of years and are irreversible for centuries to millennia. (IPCC, 2021). The AR6 Summary for Policymakers concludes that global surface temperature will continue to increase until at least the mid-century under all emissions scenarios[4] considered and that global warming of 1.5°C and 2°C will be exceeded during the 21st century unless "deep reductions" in CO2 and other greenhouse gas emissions occur in the coming decades. The report shows scientifically that net-zero does work for stabilizing or even reducing surface temperatures

[4] The report explores five emissions scenarios from "very low emissions" to "very high" emissions.

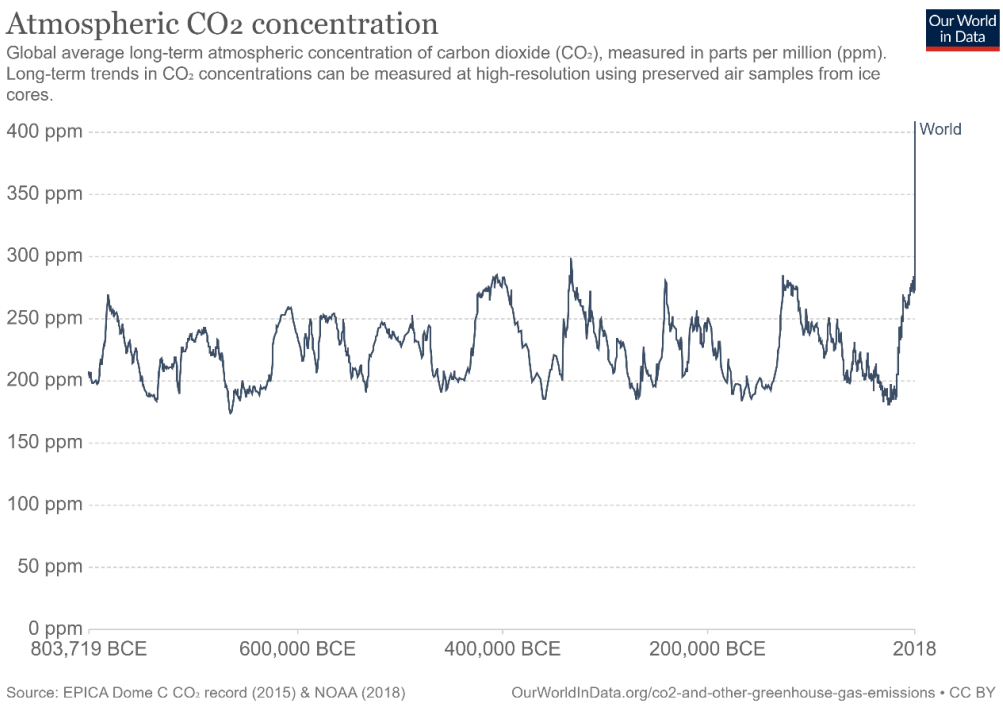


Figure 1: Atmospheric concentration of CO2 over the last 800 000 years. Source: Our World in Data

The Paris Agreement within the United Nations Framework Convention on Climate Change (UNFCCC), effective from 2016, signed by 195 countries, brings nations into common cause to undertake ambitious efforts to combat climate change[5]. The agreement's central aim is to keep the increase in global average temperature to well below 2°C above pre-industrial levels; and to pursue efforts to limit the increase to 1.5°C, to reduce the risks and impacts of climate change. South Africa has made commitments in terms of the agreement and submitted its first nationally determined contribution (NDC) in 2016 (RSA, 2016). South Africa's updated NDC, being prepared ahead of COP26[6] in November 2021 will result in an emissions trajectory that peaks between 2020 and 2025, plateaus for a decade, and declines in absolute terms thereafter. The City of Cape Town has also committed itself to becoming a net zero emissions city by 2050.

Historically, UCT has made international and internal policy commitments to environmental sustainability since 1990, with the signing of the international environmental declaration, the Talloires Declaration in 1990; the adoption of the UCT Green Campus Policy Framework in 2009 (Hall, M. 2008); and signing the ISCN-GULF[7] (International Sustainable Campus Network Global University Leader Forum) Sustainable Campus Charter in 2012, integrating sustainability in education, research, outreach, strategic planning and operations. UCT's recent *Environmental Sustainability Strategy 2020* aims to reduce energy consumption, carbon emissions, water consumption and waste-to-landfill to a net zero state by approximately 2050 (or earlier if possible) for the overall university. This will require approximately 2-5% reductions annually off a 2020 baseline (smaller increments in earlier years and

[5] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

[6] COP26 is the 26th annual United Nations Climate Change to be held in Glasgow in November 2021

[7] https://international-sustainable-campus-network.org/

larger increments in later years). These annual targets are quite ambitious for a tertiary institution such as UCT which requires complete commitment from all stakeholders, especially UCT leadership. The long-term goals align with best practice and UN goals for climate change mitigation – the Paris Agreement.

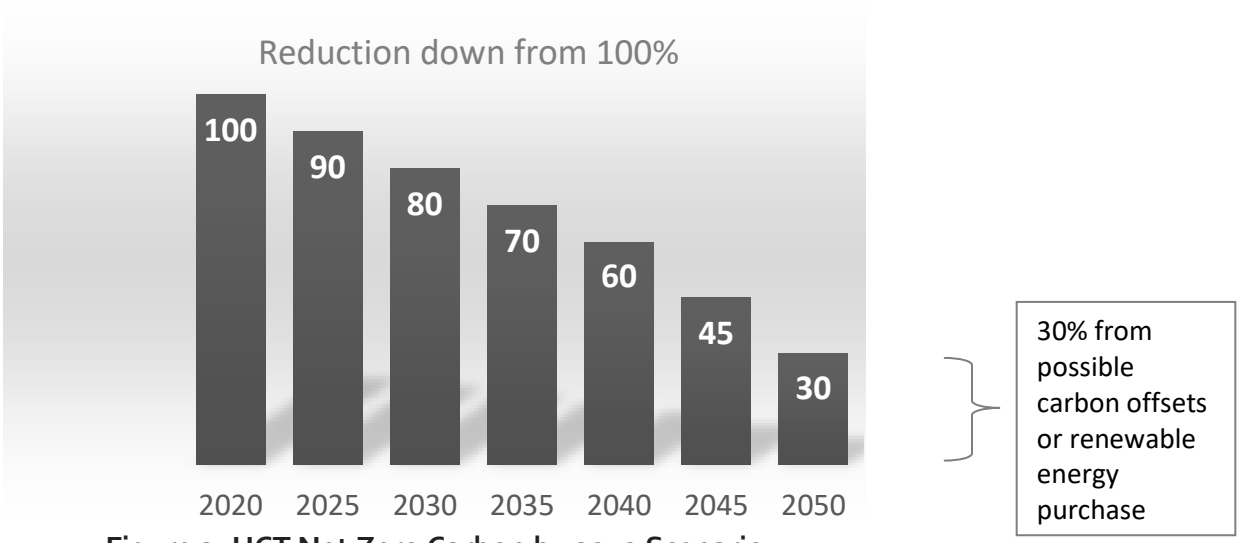


Figure 2: UCT Net Zero Carbon by 2050 Scenario

The UCT Net Zero Carbon by 2050 Scenario (Figure 2) aims for approximately 2-5% reduction per annum with contributions from:

- Existing Operations and Maintenance (30%)
- Infrastructure investment (30%)
- Behaviour change (10%)
- Carbon offsets / renewable energy purchase (30%)

General Information about the report

Methodology	- Greenhouse Gas Protocol – corporate accounting and reporting standard. - Emission factors are from the UK Government, Department for Business, Energy & Industrial Strategy[8], except for electricity supply where the Eskom factor was used as described below. - Results are reported in metric tonnes of carbon dioxide equivalent – tCO_2e. - For Scope 3 reporting the GHG Protocol Value Chain (Scope 3) Standard was used.
Inclusions	- The entire university across all campuses and properties. - Staff: 6 473 full-time equivalents (FTE). - Students: 29 272 - Total population: 35 745 - Electricity grid emission factor (Eskom Factor 1 estimate): 1.04 $kgCO_2e/kWh$[9].
Exclusions	- Fugitive emissions from gas fire retardants - Wastewater
Organisational boundary	- The operational control approach has been used. - Operational control exists when a company has the full authority to implement operating policies at the operation of the GHG emitting activities - Breakwater Lodge at the V&A Waterfront campus is owned by UCT but has a hotel operator.
Baseline year	- 2012
Long Term Targets	- Net zero for total carbon emissions (scope 1 & 2) by 2050
Short Term Targets	- 2-5% reductions in total carbon emissions per annum
Intensity Measurement	- Two metrics have been used 1) Tonnes CO2/square metre/annum and 2) tonnes CO2e/person/annum

[8] UK Government Conversion Factors for greenhouse gas (GHG) reporting. Emission factors obtained from https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018

[9] Eskom 2020 Integrated report: https://www.eskom.co.za/IR2020/Pages/default.aspx

Emission factors

Emission factors convert operational activity data (e.g. kilometres driven, kilowatt hours of purchased electricity) into a value indicating the greenhouse gas emissions generated by that activity, reported as carbon dioxide equivalent (CO_2e).

Electricity grid emission factor

The electricity grid emission factor is the total amount of greenhouse gases emitted per unit of electricity generated for and distributed by an electricity grid. South Africa has a carbon intensive grid due to the majority of power generation being coal-fired. The Eskom grid emission factor should decrease over time as efforts are made to reduce the emissions from producing electricity, and as renewable energy generation increases in South Africa. The factor for this report has decreased from 1.06 to 1.04 tCO2e or -1.9% (year-on-year). The decrease is likely due to the recent study commissioned by Eskom to accurately calculate its carbon footprint for 2019, published in 2020 by EcoMetrix Africa.

Electricity emissions at UCT account for 95% of the total of Scope 1 and 2 emissions, therefore any change to the emission factor has a significant effect on overall results. For the reports from 2015 onwards, the footprint has used grid emission factors reported by Eskom in its annual Eskom Integrated Reports (IR) as per Table 1 below. The Eskom Integrated Reports are published in March each year and cover nine months of the preceding year, therefore the Eskom factor published in 2019 is used for the UCT 2018 report and so on. The table below shows the decrease in the emission factor for this report.

Table 1: Electricity grid emission factors

Eskom Integrated Report Year	Emission factor tonnes CO_2e/MWh	UCT Carbon Report year
2016	1.01	2015
2017	0.99	2016
2018	0.97	2017
2019	1.06	2018
2020	**1.04**	**2019**

B. RESULTS SUMMARY

Scope 1 and Scope 2 emissions contributed 73 417 tCO2e, a decrease of -2.8% from 75 395 tCO2e in 2018 (Table 4). The population increased by 0.2% in this period, while the floor area increased slightly by 0.6%.

The total emissions of all scopes are 103 903 tCO_2e compared with 103 121 tCO_2e reported in 2016, an increase of 0.76%. Electricity purchased is by far the largest category, comprising 67% of total scope 1, 2 and 3 emissions (Table 2).

Scope 2 emissions from purchased electricity decreased by -2.7%. This is understood to be due, at least in part, to extensive load shedding. The decrease of -1.9% in the electricity grid emission factor

produced by Eskom also has an impact on this result. In absolute terms, electricity consumed in kilowatt hours (kWh) decreased by -0.8% in 2019 compared to 2018, evident in Figure 3. Compared to the baseline year 2012, electricity consumption decreased by -2.5%, with a concomitant increase in population of 16.9%, a positive result (Figure 4). Emissions - tCO_2/person/annum also decreased over this period from 2.18 in 2012 to 2.05 in 2019.

For Scope 3 emissions overall, compared with the most recent results from 2016, there was decrease of -6%.

Table 2: Summary by Scope and Category

CATEGORY		Emissions tCO2e	% of Total
Scope 1	**Direct Emissions**	**3 711**	**3.57**
	Jammie Shuttle	1 025	0,99
	UCT vehicle Fleet	748	0,72
	LPG	95	0,09
	Diesel for generators	50	0,05
	Refrigerants	1 793	1,73
Scope 2	**Indirect Emissions**	**69 706**	**67,09**
	Electricity: Main Campus	44 512	42,84
	Electricity: Medical campus	12 238	11,78
	Electricity: Off Campus Residences	10 375	9,98
	Electricity: GSB	839	0,81
	Electricity: Hiddingh	602	0,58
	Electricity: ICTS on Main	1 141	1,10
Scope 3	**All Other Indirect Emissions**	**30 486**	**29,34**
	Fuel and energy-related[10]	2842	2,74
	Business Travel	255	0,25
	Business travel - airlines	13424	12,92
	Employee commuting	9221	8,87
	Purchased goods - Food	3349	3,22
	Purchased goods - Paper	710	0,68
	Purchased goods - Water	179	0,17
	Waste	506	0,49
	TOTAL EMISSIONS	**103 903**	**100,00**

[10] The fuel and energy related category includes emissions related to the production of fuels and energy purchased and consumed by the reporting company in the reporting year that are not included in scope 1 or scope 2.

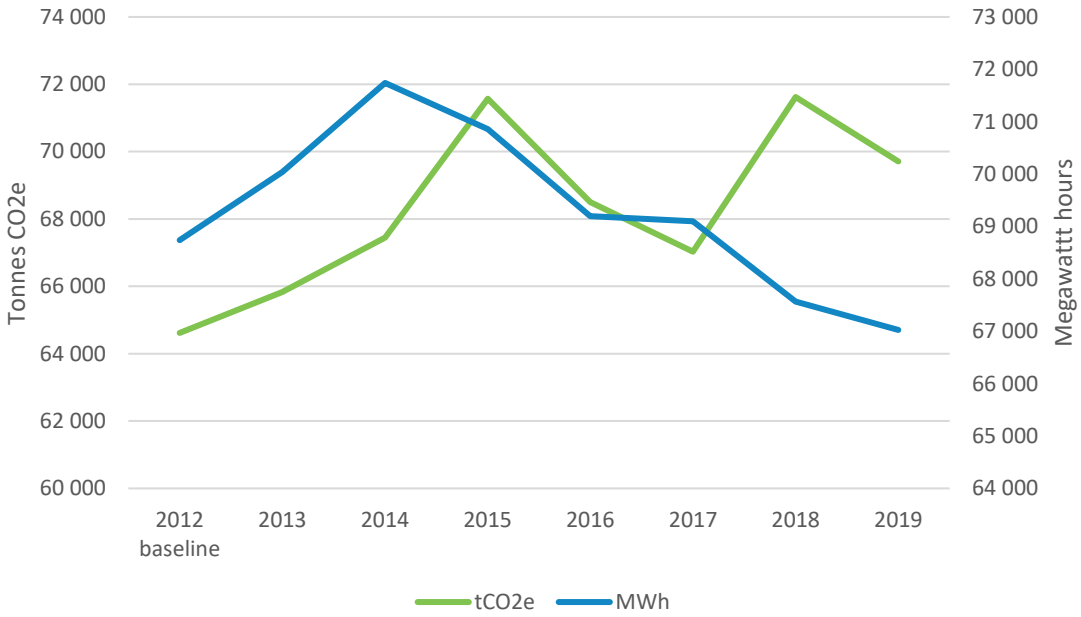


Figure 3: Scope 2 emissions vs consumption

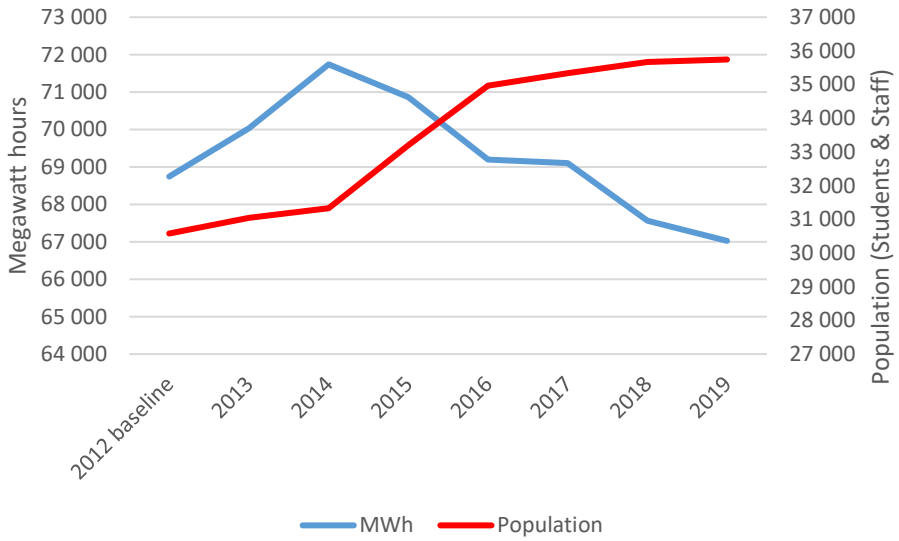


Figure 4: Electricity consumption vs population 2012–2019

The most significant changes in emissions are a decrease in electricity consumption for Main and Medical campuses; an increase in electricity consumption for the GSB Campus; and a decrease in Food Supply (Table 4).

Intensity metrics

Intensity metrics account for scope 1 and 2 only, in line with best practice. Emissions per square metre decreased by -3.2% to 0.108 tonnes CO2e per square metre per annum, with the total building area slightly increased by 0.6%. This is due to the decrease in scope 2 emissions of -2.7% and to the decrease in the electricity grid emission factor of -1.9%.

The per capita emissions decreased by -2.8% from 2.11 tCO2e to 2.05 tCO2e. (Table 3 and Figure 5).

Table 3: Intensity Metrics 2012-2019

INTENSITY METRICS (Scope 1&2 only)	**2012**	**2018**	**2019**	**% change**
Gross Area	649 404	673 385	677 385	**0,6**
Tons CO_2e/m^2/annum	**0,103**	**0,112**	**0,108**	**-3,2**
Population - Staff & Student FTE	30 579	35 673	35 745	**0,2**
CO_2e/person/annum	**2,18**	**2,11**	**2,05**	**-2,8**

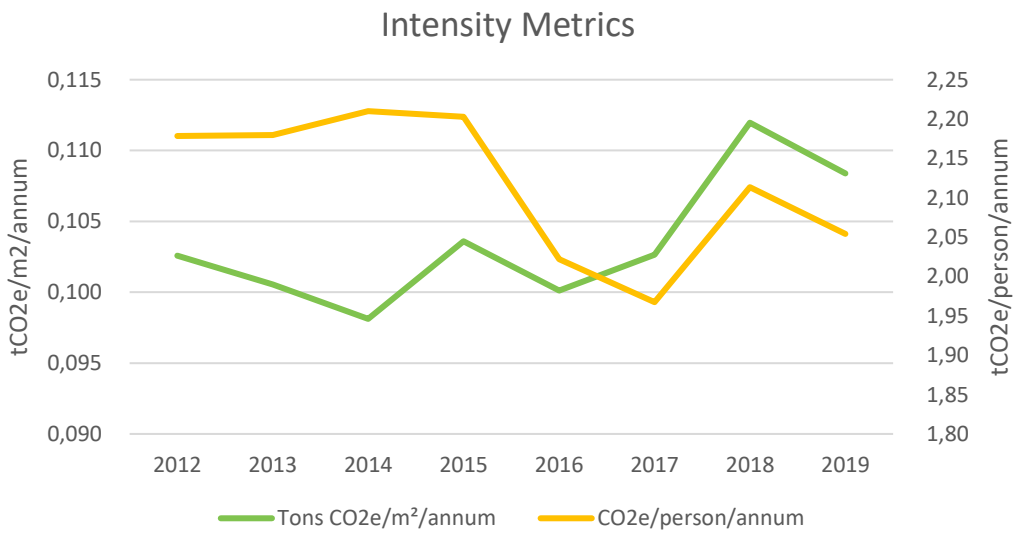


Figure 5: Intensity Metrics 2012-2019

A further intensity metric, the energy intensity per capita, has decreased from 1 894 kWh to 1 875 kWh per capita per annum or -1%, with a 0.2% increase in population. A more positive finding is a decrease in energy intensity since the baseline year 2012, from 2248 to 1 875 kWh/capita/annum, a -16.6% reduction.

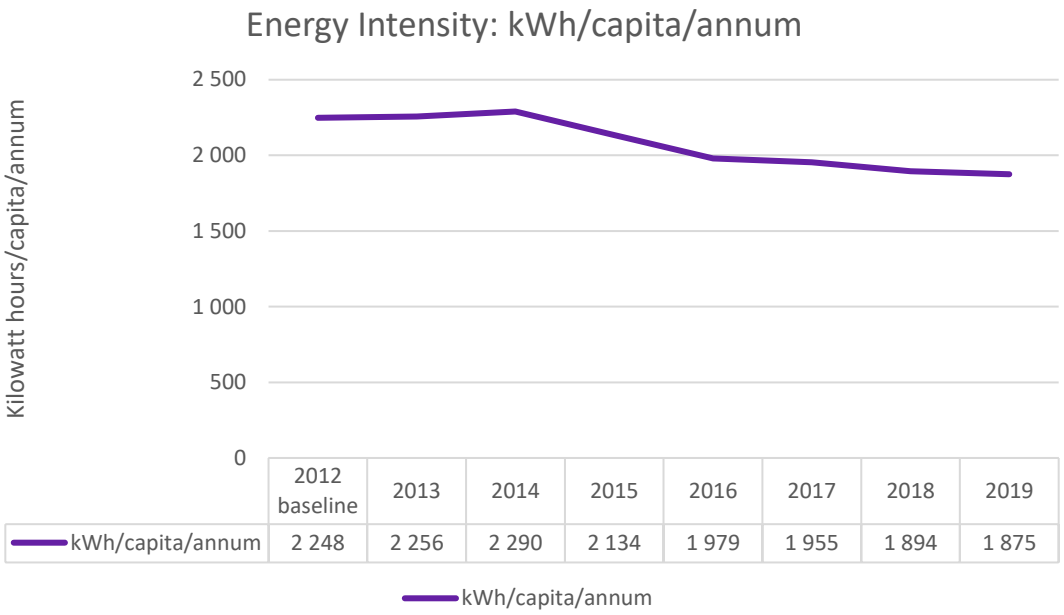


Figure 6: Energy Intensity 2012-2019

Benchmarking

Intensity metrics are useful for benchmarking an organisation's performance against similar institutions. However, due to the number of local variables (energy supply emissions factors, own energy production, climate zone, housing on campus or not) comparative benchmarking for universities can be problematic and has not been included in this report. The availability of appropriate methodologies should be revisited for future reports. Ultimately, the net zero carbon emissions target and annual reduction in the total emissions for scope 1 and 2 is the most important indicator to track UCT's performance, as per the commitment in the Environmental Sustainability Strategy 2020.

Table 4: Comparative GHG emissions 2012–2019 (tonnes CO_2e)

CATEGORY	2012	2013	2014	2015	2016	2017	2018	2019	Diff 2018 to 2019	% Change 2018-2019	% Change 2012-2019
Scope 1 Direct Emissions	**2 005**	**1 823**	**1 792**	**1 577**	**2 188**	**2 507**	**3 774**	**3 711**	-63	**-1,7**	**85,1**
Jammie Shuttle	1 076	1 068	1 006	861	790	902	*889	1 025	135	15,2	-4,8
Vehicle fleet	557	465	556	503	475	697	*769	748	-20	-2,6	34,4
Refrigerants[5]	NR	NR	NR	NR	733	807	2 012	1 793	-219	-10,9	NR
LPG	372	289	230	160	191	102	105	95	-10	-9,3	-74,4
Diesel for generators	NR	NR	NR	53	NR	NR	NR	50	NR	NR	NR
Scope 2 Indirect Emissions purchased electricity	**64 617**	**65 835**	**67 447**	**71 569**	**68 505**	**67 028**	**71 621**	**69 706**	-1 915	**-2,7**	**7,9**
Electricity: Main Campus	42 394	42 583	44 219	46 933	43 774	44 001	47 024	44 512	-2 512	-5,3	5,0
Electricity: Medical Campus	11 044	10 648	11 239	12 027	11 654	11 477	12 993	12 238	-755	-5,8	10,8
Electricity: Off Campus residences	9 702	10 729	10 149	10 850	10 633	9 885	9 585	10 375	790	8,2	6,9
Electricity: GSB	1 363	1 417	1 393	1 387	1 382	327	301	839	538	178,8	-38,4
Electricity: Hiddingh[7]	116	116	111		527	504	622	602	-20	-3,2	421,1
Electricity: ICTS on Main[8]	**	342	335	372	534	834	1 096	1 141	45	4,1	NR
Scope 3 Other Indirect Emissions		**18 547**	**18 446**	**14 382**	**32 427**	NR	NR	**30 486**	-1 941	**-6.0**	
Fuel and energy-related		409	341	581	890	NR	NR	2 842	1 952	219,2	
Business Travel		385	124	262	228	NR	NR	304	75	33,0	
Business travel - airlines		2 021	2 628	3 996	*13 902	NR	NR	13 424	-478	-3,4	
Employee commuting		8 566	8 217	8 465	9 071	NR	NR	9 221	150	1,7	
Purchased goods - Food		6 485	6 549	0	7 022	NR	NR	3 349	-3 674	-52	
Purchased goods - Paper		386	305	382	667	NR	NR	708	41	6,1	
Purchased goods - Water		121	139	138	194	174	NR	179	-15	-7,7	
Waste		175	143	558	452	506	NR	506,05	54	11	
TOTAL Scope 1 & 2 emissions	**66 622**	**67 658**	**69 239**	**73 146**	**70 693**	**69 535**	**75 395**	**73 417**	**-1 978**	**-2,8**	**10,2**
TOTAL Scope 1, 2 & 3 emissions		**86 205**	**87 685**	**87 528**	**103 121**			**103 903**			

Notes:

1. * Indicates restatement
2. The baseline year has been selected as 2012, as this was the first report that used the current methodology – the Greenhouse Gas Protocol – and with the same boundaries as the 2018 report, extending to all UCT campuses.
3. Scope 3 values for 2012 were reliant on student research, with an emphasis on the learning benefit. These values have been omitted from this table as they are less robust than those for subsequent years.
4. NR = Not Reported
5. Refrigerants became a new category in the 2016 report as data became available.
6. Floor area for Rochester Residence (accommodating over 300 students and staff) remains an estimate; to be updated by P&S.
7. Hiddingh electricity for 2015 was included in the Main Campus data.
8. The ICTS on Main facility was located on Upper Campus in 2012 and was later housed in a building off campus, with a digital metering system for electricity.
9. The figures are rounded either up or down to the nearest whole number to avoid decimals in this table.

Figures 7 & 8 clearly indicate the relative contribution of each scope, in particular the major contribution to emissions from purchased electricity and the quite significant contribution from scope 3 emissions. A steady increase in Scope 1 emissions over the years is evident.

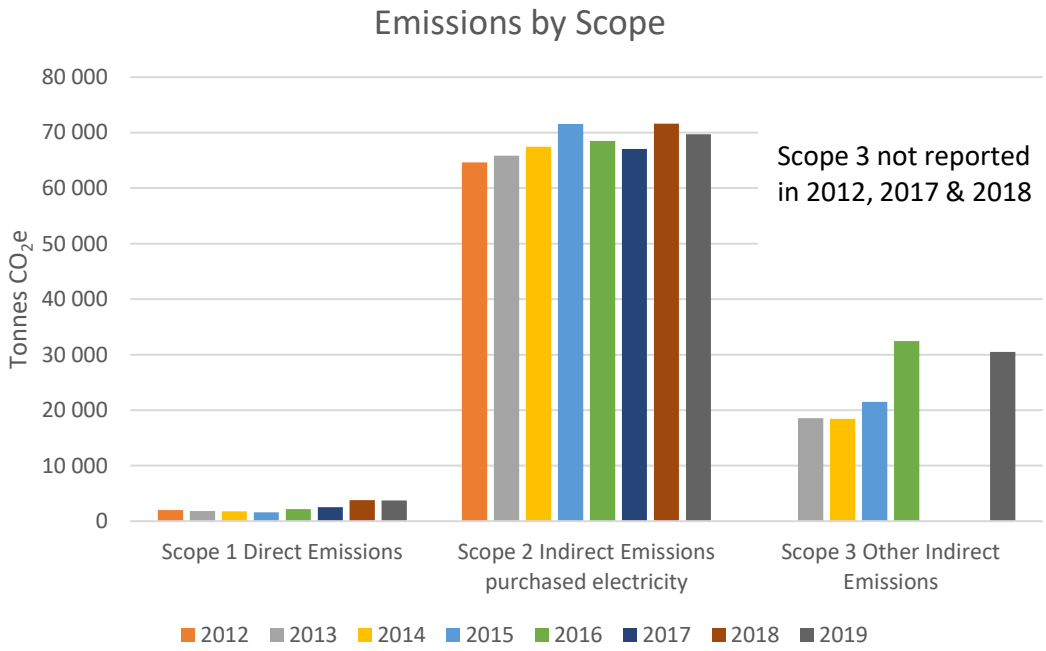


Figure 7: Emissions by Scope 2012-2019

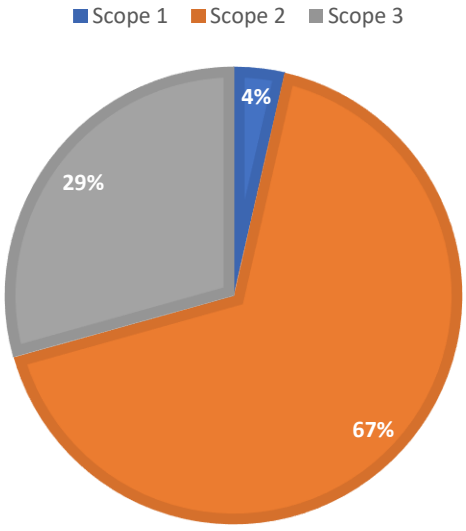


Figure 8: Emissions by Scope 2019

C. EMISSIONS BY SCOPE

SCOPE 1 – DIRECT EMISSIONS

Table 5: Scope 1 Direct Emissions 2019

Description	Units	Consumption	tonnes CO2e
Total emissions from Jammie Shuttle			**1 025**
	Litres of diesel (100% mineral)	381 372	1 025
Total emissions from Vehicle fleet			**748**
	Litres of petrol	202 562	280
	Litres of diesel	104 028	469
LPG gas			**95**
Medical	Kg of LPG	25 781	76
Main Campus	Kg of LPG	715	2
Residences	Kg of LPG	5 822	17
Fine Arts Campus	Kg of LPG	48	0
Diesel for generators			**50**
	Litres of diesel	18 621	50
Total fugitive emissions from refrigerants			**1 793**
	Kg of R22	511	926
	Kg of R410A	178	371
	Kg of R134a	163	233
	Kg of 407C	4	7
	Kg of R507A	65	257
TOTAL SCOPE 1 DIRECT EMISSIONS			**3 711**

Overall trends in Scope 1 emissions show a slight decrease of -1.7% in 2019 (Figure 9). Per category, the Jammie Shuttle emissions increased quite significantly, while refrigerants decreased. Vehicle fleet emissions have decreased by -2.6%. A decline in the use of LPG over the years is evident, and these emissions have now stabilised. Diesel for Generators is of a similar order to 2015, when the electricity load shedding was quite high.

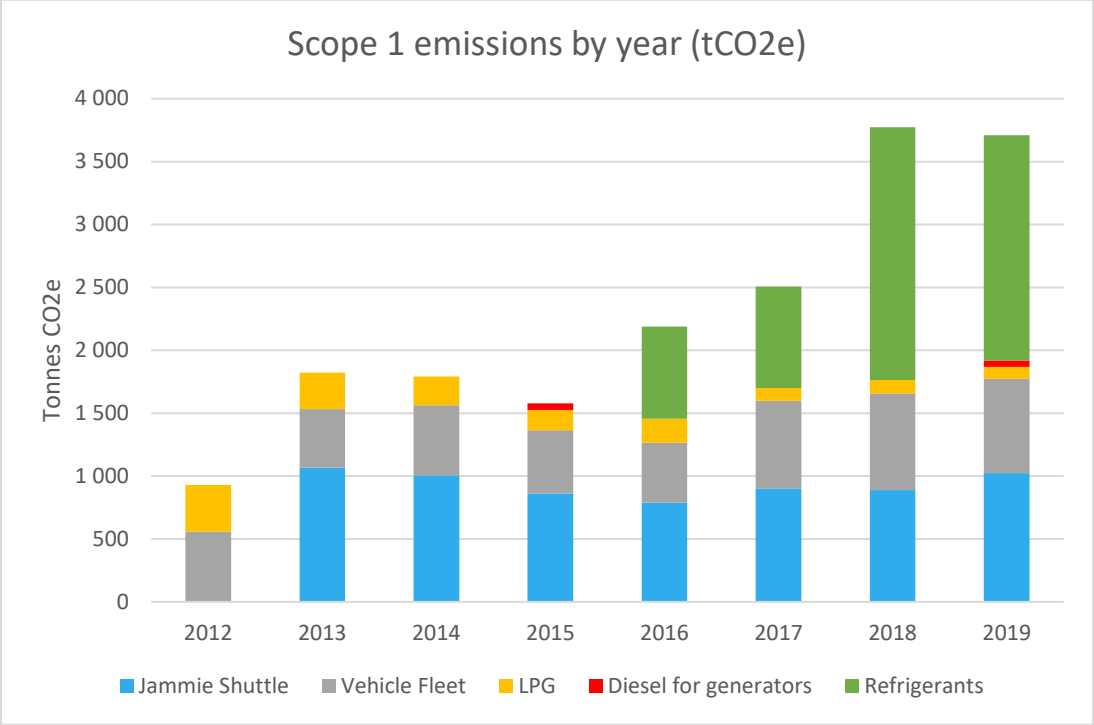


Figure 9: Scope 1 emissions 2012–2019

JAMMIE SHUTTLE

In 2017 UCT renewed the Jammie Shuttle bus fleet with higher specification buses with European emission standards Euro 3 to Euro 5, designed to produce lower emissions of carbon monoxide (CO), nitrous oxide (NOx) and particulate matter (PM). A fleet of 18 Scania buses began operating in January 2017, while nine midi-buses arrived in March 2017. The buses are leased for a seven-year period[11].

Data collection and quality

Data for the diesel fuel used by Jammie Shuttles was submitted by the Transport Office, with a monthly breakdown of litres used. A data anomaly between the 2018 and 2019 data led to an error being discovered in the 2018 and this year was therefore restated.

The Transport Services department provided data on the number of operational days for the Jammie shuttle for the first time, and this is considered a useful metric. The total operational days for 2019 were 304 days, which includes the overnight and vacation services.

Results and findings

Jammie Shuttle emissions increased by 15.2%. This is likely due to the introduction of overnight service in 2019, resulting in an increase in fuel use.

[11] Although the buses could be considered part of UCT's vehicle fleet, it is considered useful in terms of management and mitigation strategies to keep Jammie Shuttle data as a separate category.

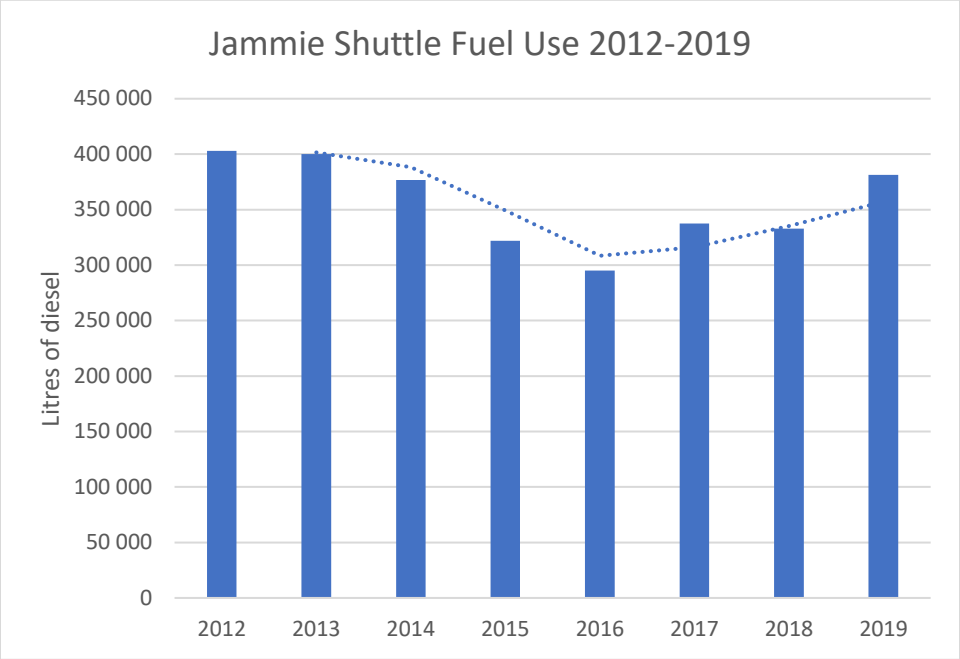


Figure 10: Jammie Shuttle fuel use 2012–2019.

Examining historical trends, Figure 10 reflects lower emissions in 2015 and 2016, which were attributed to interruption of the service due to major student protests. Lower emissions for 2016 may also be a result of the changes in infrastructure on Upper Campus at the beginning of 2016, shortening the routes.

VEHICLE FLEET

Data collection and quality

The primary data set was provided by the Procurement department for the third-party service providers Absa Vehicle Management (UCT-owned) and Bidvest (leased vehicles). A further data set was provided from the SAP system including fuel purchases made by UCT departments and staff members; however, this dataset did not include two key metrics – litres of fuel and type of fuel (petrol or diesel), therefore the rand value was converted to litres of fuel using the AA rates for petrol and diesel for 2019. The proportion of petrol to diesel was determined by using the same split as the Absa and Bidvest figures (diesel 40% of total spend). The reliability and quality of the SAP data set is low[12], however the proportion of total fuel derived from SAP records is only 26%.

A new data set was found in the SAP report (under R&M rather than Fuel Purchases), comprising fuel purchases for the Health Sciences fleet via a vehicle management company, Eqstra. This was added to both the 2018 and 2019 result.

[12] Data entry into the UCT SAP system is typically inconsistent, being done by numerous departmental purchasers and individual staff, making this data source unreliable and of low quality.

Results and findings

Overall emissions from the vehicle fleet fuel decreased by -2.6% compared to 2018 (Table 4); however, trends within subsets of this data are mixed. The Absa fuel purchases decreased by -8%, while the Bidvest figure increased significantly by 53%. The amount of fuel purchased in the SAP data set decreased slightly by -1.9% from 2018. It should be noted that for period 2013–2016 only Absa card data was available. Thereafter Bidvest and SAP data were included, hence the uptick in 2017 (Figure 11).

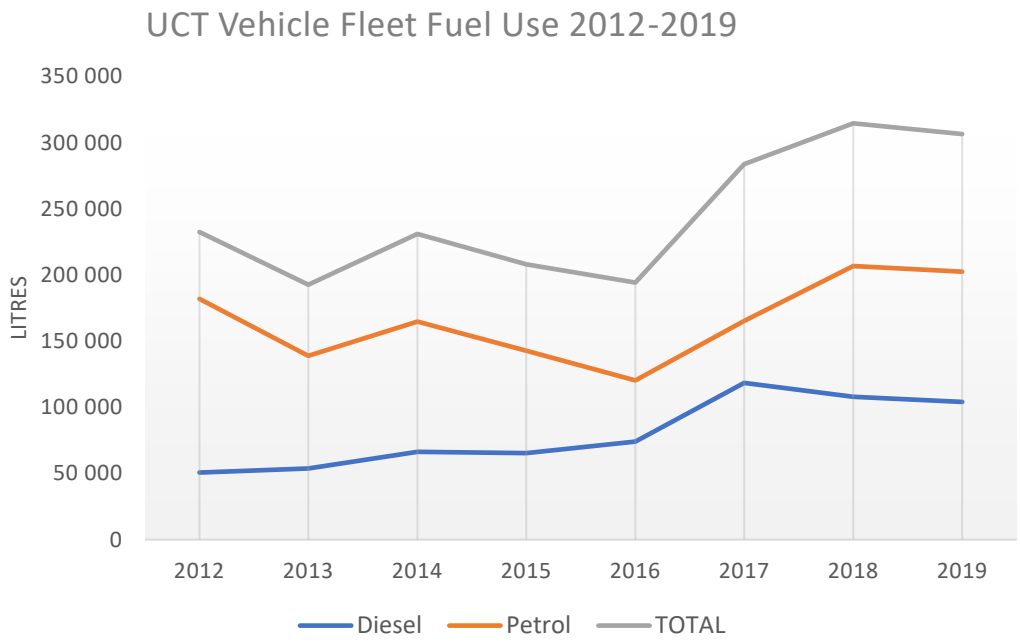


Figure 11: UCT vehicle fleet fuel use

REFRIGERANT GASES

Refrigerant gases are extremely potent greenhouse gases that have a negative impact on the environment by both destroying atmospheric ozone gas, critical to life, and contributing to global warming. The refrigerants in common use today have a much higher global warming potential (GWP) than carbon dioxide, which has a GWP of one. The refrigerants used at UCT have GWPs of between 1 430 and 3 985. As per the Montreal Protocol[13] commitments, countries have banned the use of refrigerants with high ozone-depleting chlorofluorocarbons (CFCs), and consequently replaced them with hydrochlorofluorocarbons (HCFCs). Currently, developing countries are phasing out HCFCs (e.g. R22), resulting in a rapid increase in the use of hydrofluorocarbons (HFCs) as a replacement[14]. An alternative to HFCs, natural refrigerants (i.e. hydrocarbons) have very low global warming potentials of between 0 and 6 (IFC, 2017).

[13] Montreal Protocol: the international agreement on the overall scope and timescales for phase-out of ozone-depleting substances (ODS).

[14] In South Africa, the Air Quality Act, 39 of 2004, published by the Department of Environmental Affairs, came into effect on May 8, 2014. These regulations aim to define the management and phasing out of ODSs in South Africa. These regulations prohibit the use of refrigerants containing hydrochlorofluorocarbons (HCFC-22) in the construction, assembly, or installation of any new refrigeration or air-conditioning systems or equipment from January 1, 2015, onwards.

In 2016 the parties to the Montreal Protocol reached agreement in Kigali, Rwanda to phase down HFCs[15]. The Kigali Amendment, adding HFCs to the list of substances to be phased down under the Montreal Protocol, was ratified by South Africa in August 2019, among 75 other countries. HFCs are commonly used alternatives to ozone-depleting substances (ODS) and while not ozone-depleting substances, HFCs are greenhouse gases which can have high or very high global warming potentials. The Kigali Amendment deals with the phase-down of the production and consumption of HFCs, starting in 2024 (UNEP, 2016).

Besides staying ahead of legislation, the benefits to UCT of improving refrigerant management practices include cutting annual refrigerant costs, increasing the energy efficiency of existing systems, decreasing emissions of HCFCs and HFCs, as well as indirect emissions of carbon dioxide, because of reduced energy use[16].

The reporting accounts for gases leaked into the atmosphere from gas in air conditioning, heat pumps and refrigeration equipment. Table 6 includes the 100-year time horizon global warming potentials (GWP) of refrigerants used at UCT.

Data collection and quality

Once again, some challenges were experienced with the data gathering for refrigerant gases. Data gathering for this activity is more complex due to the multiple data holders (different campus and residence managers) and multiple service providers for some precincts. It is recommended that submission of data be embedded in service-level agreements, ensuring data quality and reporting timeframes. Quarterly or monthly, rather than annual submission of data to UCT managers may improve the collection process.

Records of the amount (kilograms), types of gas refills to equipment, and in most cases the building where the equipment servicing took place, were obtained from the service providers, and are considered to be of reasonably high quality.[17] The relative quantities of refrigerant types used at UCT are shown in Figure 12 below. The methodology selected excludes gas quantities contained in newly installed equipment and only accounts for fugitive emissions from equipment (leaks).

No data has been collected on the gases used in fire suppression systems at UCT, and this should be reviewed in future.

Results and findings

Emissions from gas refills decreased by -10.9% compared to 2018, from 2 012 tCO_2e to 1 793 tCO_2e (Table 6). It is assumed that this is due to fewer major equipment maintenance events.

[15] From 1 January 2019, when the Kigali Amendment comes into force, HFCs and HFC blends will be both Kyoto Protocol and Montreal Protocol gases.

[16] When a system is low on refrigerant, the motor must work harder to provide the necessary heat exchange and cooling, thus requiring more energy than if the equipment is properly charged.

[17] Recovery and recycling of HCFCs and other ozone-depleting substances is mandatory in terms of the National Environmental Management: Air Quality Act, 2004 and the 2014 regulations regarding the phasing out and management of ozone-depleting substances.

In terms of gas types used, there is a reversal of the trend found in the previous report of a shift away from the refrigerant R22, with a 90% increase in use of this gas. R22 gas amounts to 56% of all gases used, whereas in 2018, R22 gases used were only 27% of the total. This trend is counter to requirements in terms of the Montreal Protocol for the phase-out of this refrigerant due to its high ozone depleting potential, with a total phase-out being due by 2030. A replacement gas for R22 is R407C and there was no change in the amount used from 2018 to 2019. (Table 6; Figure 12). In terms of the phase out schedule regulations for HCFCs in South Africa[18], the HCFCs which an importer uses per annum, in the period from 01 January 2016 to 31 December 2020, must not exceed 65% of the baseline consumption of HCFCs. The quantity of R22 used in 2019 exceeds the baseline year (2016) by 120%, which is non-compliant and requires urgent attention in future years.

Table 6: Changes in refrigerants 2018-2019

Type	Refrigerant Name	2018 (tCO_2e)	2019 (tCO_2e)	% Change	% Of total gases used 2019	% Of total gases used 2018	GWP 100-year[19] ($kgCO_2e$)	ODP
HCFC	**R22**	487	926	90	**56**	**27**	1 810	0.055
HFC	**R410A**	318	371	17	19	**15**	2 088	0
HFC	**R134a**	638	233	-64	18	**44**	1 430	0
HFC	**R407C**	7	7	0	0	**0**	1 774	0
HFC	**R507A**	561	257	-54	7	**14**	3 985	0
TOTAL		**2 012**	**1 793**	**-10,9**	100	**100**		

To reduce greenhouse gas emissions, a shift towards refrigerants with lower global warming potential (GWP) is required, aligning with best practice. It is also important to engage in the promotion of alternatives at the earliest stage to avoid escalating costs of HCFC refrigerant types that are being phased out. A further risk is that of stranded assets e.g. if UCT invests in more new cooling equipment in the near term, but then needs to shift to alternative more efficient cooling before the end of life of the equipment that would constitute a stranded asset. There is a need for the university to explore longer-term plans to avoid this risk.

[18] National Environmental Management: Air Quality Act, 2004 (Act no. 39 of 2004). *Regulations regarding the phasing-out and management of ozone-depleting substances*, Government Gazette Regulations No. 37621, 8th May 2014.

[19] The GWPs of the Kyoto Protocol and Montreal Protocol listed gases are based on the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) over a 100-year period.

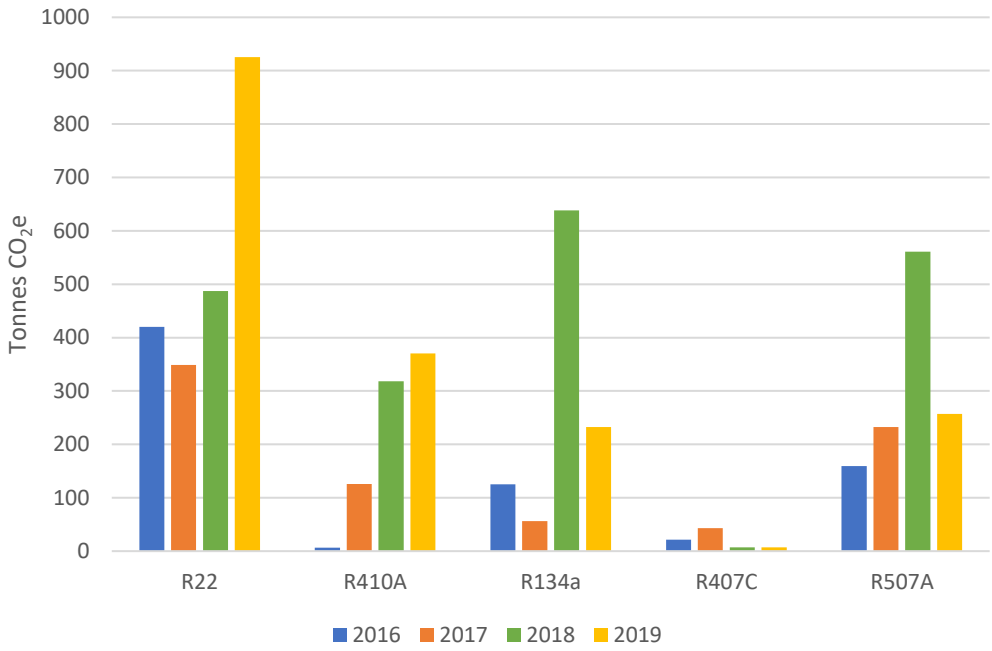


Figure 12: Refrigerant gases used 2016 - 2019

In 2019, the total weight of gases used decreased by -9% from 1 013 kilograms in 2018 to 920 kilograms (Figure 13). This is in sharp contrast to the previous year, when the weight of gases used increased by 170% and the number of service events increased by 30% compared to 2017, for which the cause was not fully understood. It was reported that the increase indicated more frequent leaks from ageing equipment.

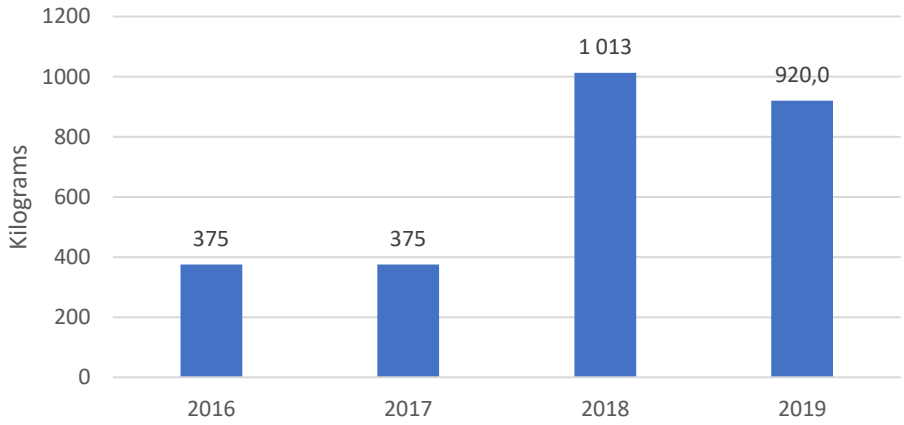


Figure 13: Quantity of refrigerant gases used 2016–2019 (Kgs).

LIQUEFIED PETROLEUM GAS

Emissions from the use of liquefied petroleum gas (LPG) decreased by -9.3% or 10 tCO_2e. The use of LPG has been declining consistently in recent years, due to the use of heat pumps for water heating instead of LPG-fuelled heaters and has now stabilised (Figure 14). For the residences, a -30% decrease in the purchase of LPG compared to 2018 is found. Of the total LPG purchased, around 18% was for the residences, 80% for the Faculty of Health Sciences, the remainder for Upper Campus (2%) and the Hiddingh Campus.

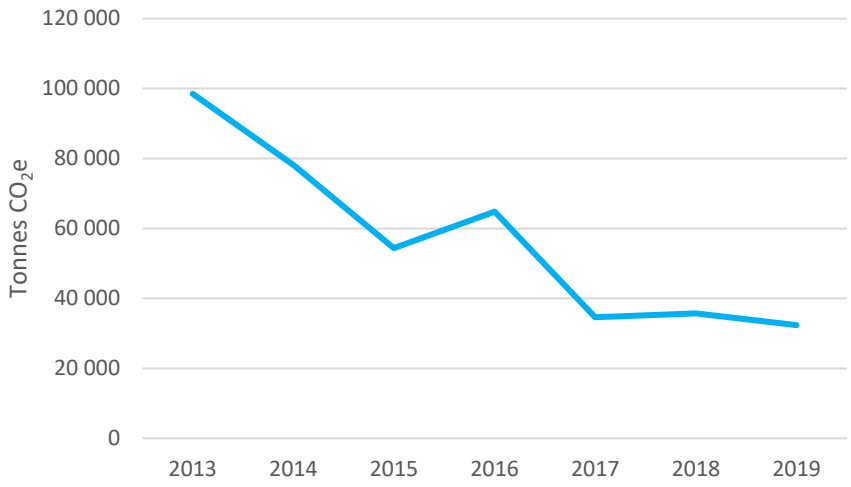


Figure 14: Emissions from LPG usage 2012–2019.

DIESEL FOR GENERATORS (STATIONARY COMBUSTION)

Constrained electricity supply caused further load shedding during 2019 and diesel generators were used to maintain operations during these periods. There were 530 hours of load shedding in 2019, and 852 hours in 2015, the last year reported. By comparison, in 2018 there were 127 hours.

Data collection and quality

Data was provided on the quantity of diesel purchased from the vendor's invoices, captured manually. The purchase of diesel is difficult to separate out of the SAP data as the same general ledger codes apply to fuel for the vehicle fleet and buses. No data was received for 2018.

Results and findings

The emissions from the use of diesel for generators amount to 50 tCO2e for 2019. The last reporting of these emissions was in 2015 when the result was 53 tCO2e. Since load shedding is expected to continue for some years, more efficient generator back-up solutions are being explored for the whole of UCT. Solar photovoltaic (PV) energy is unfortunately not a possible solution for back-up power (PV systems of large city customers typically must be shut down by law when there is load shedding). Batteries are also not a viable solution for back-up power for users the size of UCT[20].

[20] The charging current required means that the supply to UCT has to almost double after a load-shedding event to allow for massive battery system to recharge for the next load-shedding event later that day or the following day.

SCOPE 2 – INDIRECT EMISSIONS FROM PURCHASED ELECTRICITY

Data collection and quality

From 2014 onwards, UCT invested in an extensive system of digital electricity meters at building or transformer level across the Main and Medical campuses, with the first data set being available for the 2016 Carbon Footprint Report. External consultants were also appointed to monitor and report on electricity consumption. However, unreliable municipal billing data, captured manually within the P&S finance department, is still used for off-campus residences and some off-campus administrative properties.

A change in approach to the measurement of electricity for the Graduate School of Business (GSB) has been adopted for this report. Previously, the consumption for Breakwater Lodge hotel was excluded from the figure for the GSB campus and an allocation of 14.5% of the total consumption for the campus was attributed to UCT[21]. For the first time, the electricity data for 2019, provided by the GSB Operations Manager and the Breakwater Lodge Facilities Manager, included a split of kilowatt hours for the GSB, the Breakwater Lodge and the new Academic Conference Centre that began operation in 2019. Further, the hotel operator was able to provide a detailed count of guests for the year, disaggregated into UCT students, academics, or private guests. The students and academic guests amounted to 15% of total guests and therefore this percentage of the Breakwater Lodge consumption has been allocated to UCT. As a result, a significant increase in emissions is found for the GSB campus. A restatement of previous years using the new approach has not been done as this new calculation method is seen as a progression towards better quality data and refinement of the methodology towards a more robust result.

Electricity emissions have been calculated using the updated factor published by Eskom (Eskom, 2020), which decreased by -1.9%. Due to the influence of the Eskom emissions factor, it is important to consider the results in terms of electricity consumed in kilowatt hours (kWh) as well as emissions (Tables 7 & 8).

Table 7: Scope 2 emissions 2018 vs 2019 (tCO_2e)

	2018 (tCO_2e)	**2019** (tCO_2e)	**% Change 2018-2019**
Electricity: Main Campus	47 024	44 512	-5,3
Electricity: Medical Campus	12 993	12 238	-5,8
Electricity: Off Campus residences	9 585	10 375	8,2
Electricity: GSB	301	839	178,8
Electricity: Hiddingh	622	602	-3,2
Electricity: ICTS on Main	1 096	1 141	4,1
TOTAL	**71 621**	**69 706**	**-2,7**

[21] Prior to 2017, an allocation approach based on floor area was used to determine the GSB's share of electricity consumption. A new metering system was then installed allowing a more accurate allocation, significantly reducing the amount attributed to the GSB from 46% to only 14.5%.

Table 8: Electricity consumption (kilowatt hours)

Location	2012	2018	2019	Diff '18 - '19	% change '18-'19	% change '12-'19
Main Campus	45 099 590	44 362 046	42 799 564	-1 562 482	-3,5	-5,1
Medical campus	11 748 434	12 257 939	11 767 126	-490 813	-4,0	0,2
Off-campus Residences	10 321 043	9 042 415	9 975 606	933 191	10,3	-3,3
GSB	1 449 791	284 413	807 006	522 593	183,7	-44,3
Hiddingh	122 890	586 386	578 781	-7 605	-1,3	371,0
ICTS on Main	-	1 034 155	1 096 882	62 727	6,1	-
TOTAL	**68 743 760**	**67 567 353**	**67 026 984**	**-540 369**	**-0,8**	**-2,5**

** ICTS was on Upper Campus in 2012, therefore consumption was included in that figure.

Scope 2 results and findings (Tables 7 & 8)

- Overall Scope 2 emissions **decreased** by -2.7% over 2018, from 71 621 to 69 706 tCO_2e. Actual consumption decreased by -0.8% and has been gradually declining since 2016, apparent in Figure 16. Compared to the baseline, consumption (kWh) for 2019 is -2.5% lower, a positive result (Table 7).

- **Main Campus** electricity consumption **decreased** by -3.5% for 2019 or -1 562 482 kWh (Table 8). This continues the trend found in 2018 of a -2.2% decrease. The decrease for 2019 may be due to the high frequency of load shedding in 2019 (530 hours compared to 127 hours in 2018[22]). This accounts for the second largest decrease in UCT's emissions year-on-year, -5.3% or -2 512 tCO_2e (Table 4).

- **Medical Campus** electricity consumption **decreased** by -4%% or **-490 813** kWh over 2018. This is positive trend and consumption is now close to the 2012 baseline (Table 8). Once again, load shedding could be a factor.

- **Off-campus residences** emissions **increased** by 8.2% or 790 tCO_2e, with actual consumption increasing by a significant 10.3%, or 933 191 kWh, following a decrease of -11% in the previous year (Table 8). The reasons for this are not clear.

- Electricity consumption at the GSB campus **increased** by 183% due to improved data, described above, and a change in calculation methodology (Table 8). If the former apportionment of 14.5% of the consumption had been used, the GSB consumption would not have changed significantly (2.2% increase). In 2018, there was a **decrease** in consumption of -15.7% likely due to LED lighting retrofits.

[22] Wright, J.G. and Calitz, J.R. 2020 Setting up for the 2020's: Addressing South Africa's electricity crises and getting ready for the next decade. Version 1.1 CSIR: Energy Centre

- Electricity consumption at the **Hiddingh Campus** decreased slightly by -1.3% in 2019.
- An increase in consumption of 6.1% or 174 026 kWh occurred at the **ICTS on Main** facility (Information and Communication Technology Services), in keeping with recent trends, relating to ongoing expansion of IT infrastructure in response to demand. In 2018, a large increase in consumption of 20% was found and attributed to major IT infrastructure development, for various research arenas.

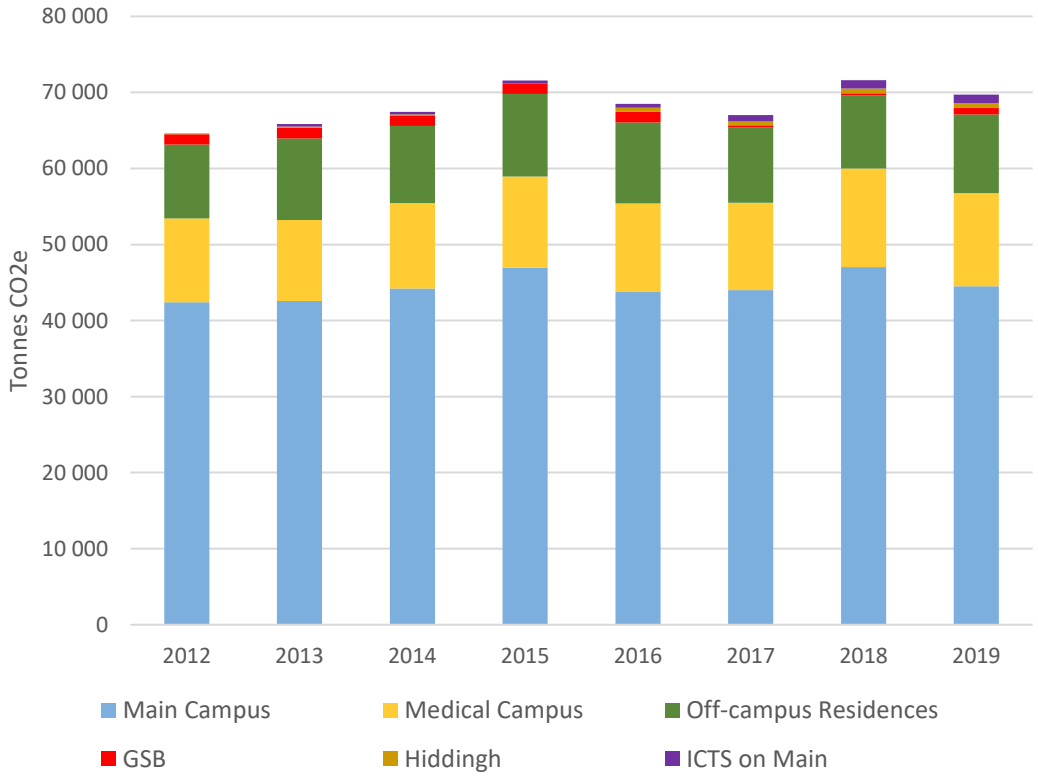


Figure 15: Scope 2 Emissions 2012-2019 (tCO_2e)

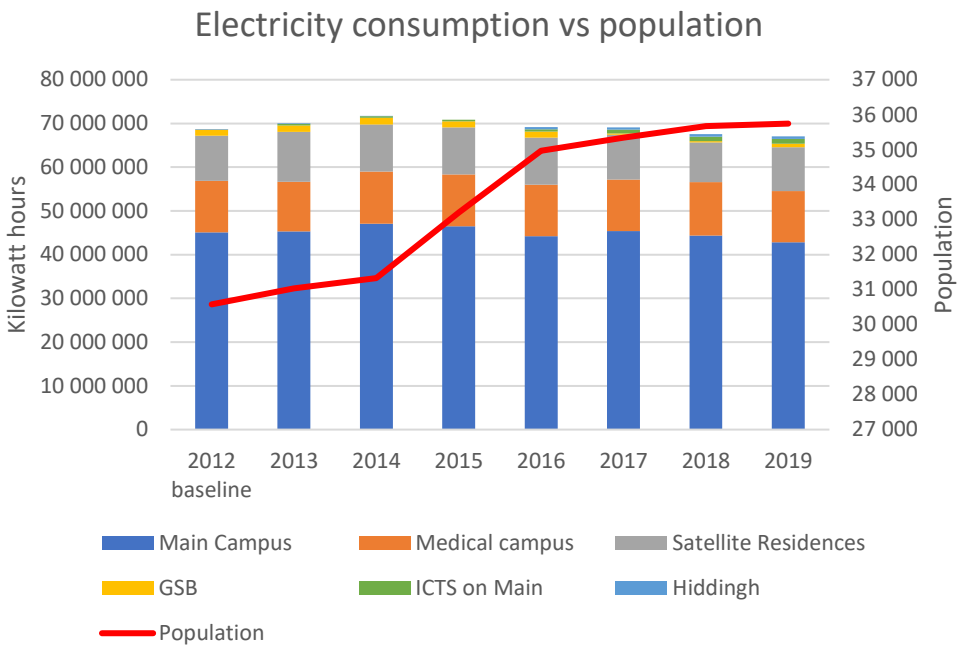


Figure 16: Electricity consumption vs population

As shown in Figure 16, the population remained similar in 2019, and actual electricity consumption remained similar. The longer-term trend is more positive, reflecting a steady consumption against a significant increase in campus population.

SCOPE 3 – ALL OTHER INDIRECT EMISSIONS

Scope 3 is a reporting category dealing with all other indirect emissions that occur from sources not owned or controlled by the entity. Activities include business travel by air and land, commuting by students and staff, goods purchased, and solid waste generated. It is accepted in terms of the GHG Protocol methodology that data accuracy for Scope 3 activities may be lower and the objective of the inventory may be more about the relative magnitude of Scope 3 activities.

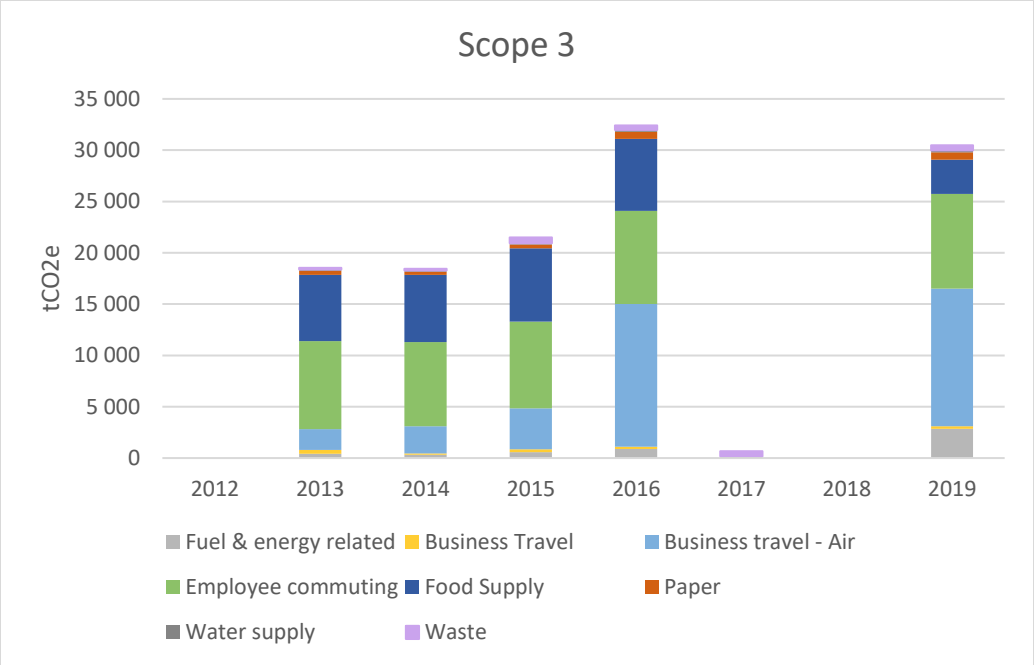


Figure 17: Scope 3 emissions 2012 to 2019

Notes to Figure 17
2012, 2017 and 2018 not reported

The categories of indirect emissions at UCT that have been selected for reporting are business travel by land and air; commuting by staff and students; purchased goods such as food, water, and paper; and the production of solid waste. UCT started to report Scope 3 emissions in 2012 and in the 2016 report Scope 3 emissions amounted to a significant 26% of total emissions. Due to ongoing difficulties in obtaining reliable data for Scope 3 activities, these emissions were omitted from the 2017 and 2018 reports. For 2019 scope 3 emissions amount to 28.9% of the total, and increasingly large proportion of total emissions.

There are presently concerted efforts underway within P&S to improve information systems by adopting an Integrated Workplace Management System (IWMS) that will manage real estate, people, processes, and technologies in an integrated platform. This should ensure that a large proportion of the data contributing to the carbon footprint assessment is more readily accessible and likely to be more reliable. However, the IWMS project will take about three years. Further to this, the Environmental Sustainability Directorate is working with UCT's ICTS and procurement departments to improve ways of collecting scope 3 (and scope 1 & 2) data. This work is still underway and not yet ready to contribute to this report.

FUEL AND ENERGY-RELATED

This category includes emissions related to the production of fuels and energy purchased and consumed by the reporting company in the reporting year that are not included in scope 1 or scope 2.

Data collection and quality

This category was introduced into the GHG Protocol in 2015 and UCT's reporting has been expanding since. The activity data included are the quantities and all types of fuel consumed for Vehicle Fleet, Air Travel, liquid petroleum gas (LPG). Two new sub-categories were introduced in this report, namely Jammie Shuttle fuel and transmission and distribution losses (T&D) for purchased electricity, enhancing accuracy and completeness.

Results and findings

The emissions for Fuel and Energy-related category increased by 1 952 tCO_2e compared to 2016. This is due to the inclusion of Jammie Shuttle fuel, T&D losses for purchased electricity and to the significant increase in Air Travel. Air Travel comprises 51% of the total emissions for this category and the Jammie Shuttle 15%. The increase of 1 952 tCO_2e is the largest increase in scope 3 emissions.

BUSINESS TRAVEL

This category includes emissions from the transportation of employees for business-related activities in vehicles owned or operated by third parties, such as aircraft, trains, buses, and passenger cars.

BUSINESS TRAVEL - LAND

Data collection and quality

Business Travel at UCT comprises two data sets, 1) Hired Cars and 2) Staff reimbursements for travel in their own vehicles.

While data for all Hired Cars is available from the UCT SAP system, the kilometres travelled is not provided, only the monetary value of car hire transactions. Therefore, data was obtained from Bidvest, one of the companies through which cars are hired (54% of the total activity data). The result is a hybrid calculation using the two data sets. The more robust Bidvest data was used to derive a Rand per kilometre value, which has been applied to the SAP data. The SAP data must be manually filtered for non-relevant items (service fees, insurance, fuel), a common issue with all SAP data sets.

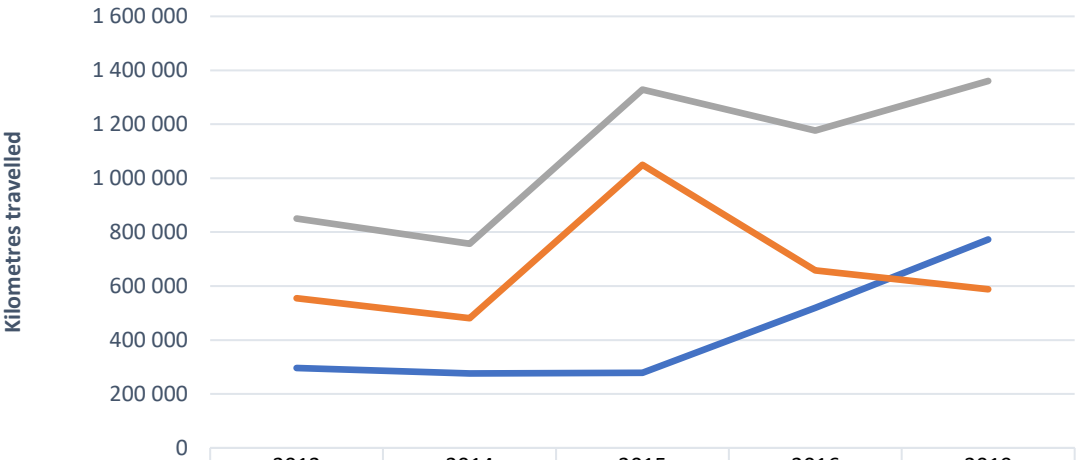
The data for Staff Mileage is drawn entirely from the SAP system, where 'Invoice Quantity' represents the litres of fuel purchased. However, the data contains many entries for travel allowances where the invoice quantity is '1'. Therefore, the litres purchased relating to the travel allowances is calculated using the average cost of fuel, assumed to be petrol, based on Automobile Association rates.

Results and findings

Overall, Business Travel emissions have increased by 33% since 2016.

Emissions for Hired cars increased significantly by 48% over 2016. Figure 18 reflects an upward trend since 2015. Reasons for this are unknown and no insights could be obtained.

For Staff Mileage, the kilometres travelled has decreased by -10.6% since last reported in 2016.



	2013	2014	2015	2016	2019
Hired cars	296 161	276 016	278 880	519 255	772 693
Staff Mileage	554 398	480 884	1 049 622	657 682	587 717
TOTAL	850 559	756 900	1 328 502	1 176 937	1 360 410

Figure 18: Business Travel - Land

BUSINESS TRAVEL - AIR

Data collection and quality

Activity data for Air Travel was provided in an SAP report from the Procurement department, however the data does not contain the required metric of kilometres travelled or a clear indication of routing from which to calculate distance. The data also contains many entries that are not air tickets, but related items such as service fees, airport taxes and visa fees.

A concerted effort was made to obtain data sets from the preferred travel agencies containing the required metric. As previously, there were challenges in obtaining the data sets, and only two or the nine agency reports were received. One of these, Club Travel, contained the kilometres travelled for each ticket and this data was used to derive a Rand per kilometre value for domestic flights and long/haul international flights, then applied to the SAP data to obtain kilometres travelled.

The result for 2016 air travel has been restated using this methodology, as a similar SAP report to 2019 was obtained for 2016. The Rand per kilometre rate was adjusted for inflation. Previously, the calculation for 2016 used a count of tickets compared to 2015 and increased the kilometres according to the increased percentage.

Results and findings

The emissions for Air Travel decreased by -3.4% compared to 2016.

Figure 19 shows the similar values for 2016 and 2019 and the large increase from 2015 to 2016. This is attributed to incomplete data in 2015 and the prior years, as the only data provided by UCT was for flights taken with South African Airways. When a detailed SAP Report was provided in 2016 it became clear that many air tickets were being purchased by departments and academic staff that were unaccounted for via numerous travel agencies, airlines, as well as directly online. This result is considered to be more robust than previous reports; however, there is room for improvement in the data reporting.

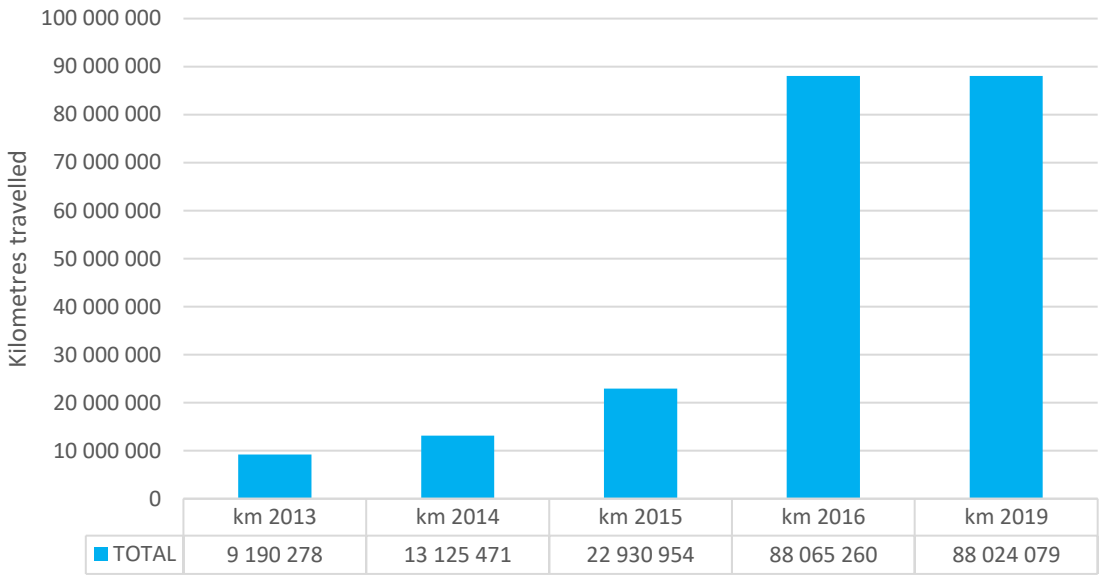


Figure 19: Air Travel - kilometres travelled

COMMUTING

Transportation of employees between their homes and their worksites during the reporting year (in vehicles not owned or operated by the reporting company).

Data collection and quality

For reporting on emissions produced by the various commuting modes of students and staff, previous reports used the results of surveys undertaken by Information Systems students. Since no survey has been undertaken since the 2014 report, a methodology for estimation was developed in consultation with the external reviewer. The calculation template uses the modal split from the 2014 student survey data; however, the methodology differs in that the differing modal splits for students and staff are used instead of an average between the two; and in addition, the differing working days per annum are applied (students: 152; and staff: 250 days)[23]. This calculation template has been used for this report and for all reports since 2014.

[23] Both 2014 and 2015 results were restated using this calculation method to enhance comparability.

It should be noted that the use of the Jammie Shuttle is excluded from this category as it is accounted for in Scope 1.

Results and findings

The emissions from Commuting increased by 1.7%, (figure 20). The overall population (students and staff) increased by 2.2% since 2016.

Emissions from staff commuting comprise 35% of the total. Although staff numbers are much lower than students, they are on campus for many more days per year.

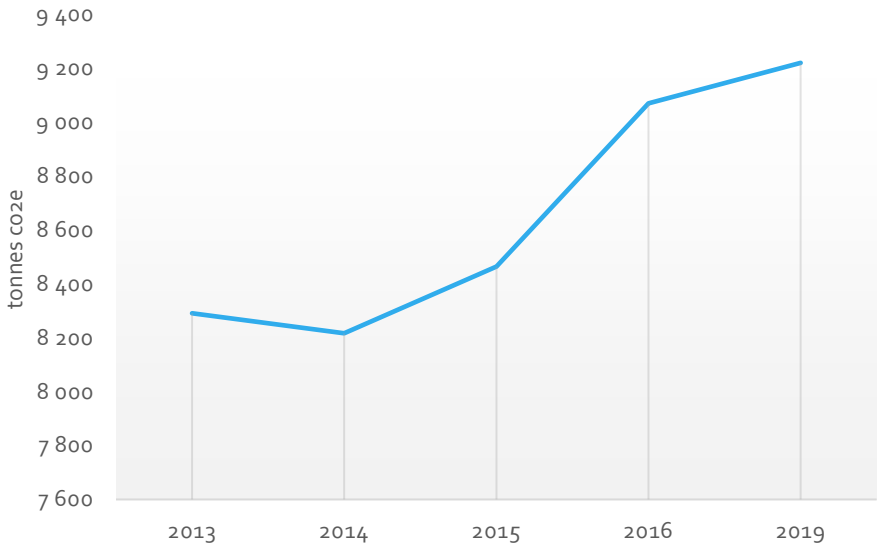


Figure 20: Commuting emissions 2013 to 2019

PURCHASED GOODS AND SERVICES

This category includes all upstream (i.e., cradle-to-gate) emissions from the production of products purchased or acquired by the reporting company in the reporting year. Products include both goods (tangible products) and services (intangible products).

PURCHASED GOODS - FOOD SUPPLY

Data collection and quality

The Food Supply category has two components: first-tier residences and campus food vendors (21) contracted by Properties and Services.

Data for the catering residences is of high quality and provides a count of all breakfasts, lunches and dinners broken down monthly. The residences also supply students with meal vouchers which they redeem on campus; however, vouchers are omitted from the calculation for residences to avoid double counting.

For campus food supply, data was obtained from a major food vendor, Food & Connect (F&C), responsible for 8 out of 21 campus food outlets. Food & Connect were able to provide a good data set of number and type of meals sold for the 2019 (hot meals, sandwiches, chips, and burgers) allowing the application of different emission factors to these meals. A list of all 21 vendors was obtained, and the number of meals served by all other vendors was estimated. Based on these values, an assumption was made that F&C provided approximately one third of all meals on campus.

In 2015 and 2016, no data was provided for the food vendors, therefore the figure from 2014 was used, and adjusted for population growth.

Emission factors

The emission factors from a master's thesis by a UCT student[24] were used as in previous years, as no studies that were considered more relevant to UCT were found. There are increasing numbers of studies on the impact of food supply on climate change and therefore a refinement in methodology should be possible in future.

Results and findings

Overall, emissions from food supply decreased by -52% in 2019 (Figure 21), a surprising result. The percentage of total emissions from food supplied by Residences and campus vendors is 46% and 54% respectively.

The number of meals supplied in catering residences decreased significantly by -48% over 2016. No insights into this major change could be obtained from UCT catering staff and the authors of this report suspect that there may be data missing. The number of vouchers issued to students to obtain food on campus remained similar to previous years.

[24] Gravenor, M. 2013

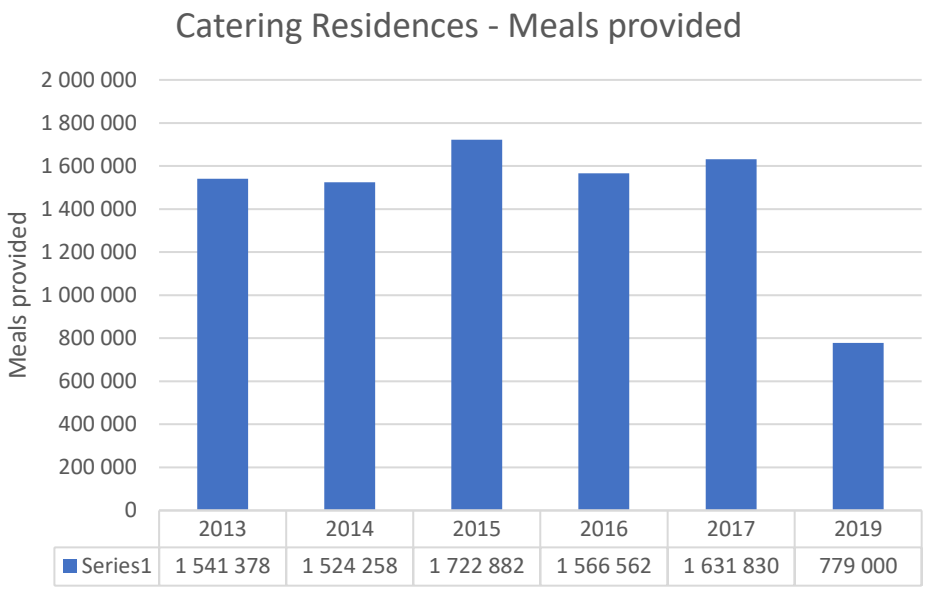


Figure 21: Food Supply at Catering Residences

There was also a large decrease of -55% emissions for food supplied by campus vendors, although numbers of meals sold is based on estimates. The major vendor Food & Connect reported they did not trade for a period 35 days due to student and employee protests during 2019, which is about 14% of the 253 typical annual trading days, and this may be a factor attributing to the decrease.

PURCHASED GOODS – PAPER PRODUCTS

Data collection and quality

This category comprises office paper (printing paper), exam books, and custodial paper products (toilet paper and paper hand towels). Printing paper stats are provided by ICTS who manage printers across campus, and by their two service providers who also provide printing services. Further office paper data was provided by a major supplier Waltons. The custodial paper data was obtained from a third party, Steiner Bidvest.

Results and findings

Emissions increased by 6% or 41 tCO2e compared to 2016. Office paper comprised 90% of the emissions in this category. While paper products comprise less than 1% of the total emissions, and this activity has a relatively minor impact on emissions, it is considered worth reporting because the consumption of paper is an activity that can be mitigated by behaviour change.

PURCHASED GOODS – WATER SUPPLY

Water conservation became a critical issue in late 2016 due to a severe drought in Cape Town and the introduction of water restrictions. The installation of new digital meters at UCT occurred during 2017 and a total of 65 meters were installed. The installation has not yet been extended to further properties and is intended to be prioritized in future. A water-monitoring platform has been installed but all the meters are not yet installed and therefore the system data is not complete for reporting purposes. Further meter installations are ongoing, and the reporting platform is being extended to allow for comprehensive reporting hopefully by mid-2022.

Data collection and quality

The SAP data was used to obtain this result. SAP data quality for water can be unreliable as the source is municipal billing data with many billing reversals and estimates affecting data quality.

The initial SAP data provided had numerous properties (±16) missing; however, this was rectified, and the data set is considered more complete than in some previous years. The properties captured in the 2016 and 2019 data sets are comparable.

For the GSB, there is a separate data set obtained from the GSB. Where formerly a proportion of 46% of the total consumption of the precinct was allocated to the GSB, a new apportionment was provided by the facilities manager. The apportionment is based on floor area and now includes the new Academic Conference Centre, so that 56% of water consumption for the precinct is now allocated to the GSB.

Results and findings

For 2019, emissions associated with municipal water supply reflect a reduction of -7.6% since 2016, a disappointing result given the water conservation campaigns at UCT and in the City of Cape Town. A more detailed analysis on these trends and pathways to future reductions is being addressed through UCT's sustainable water management strategy.

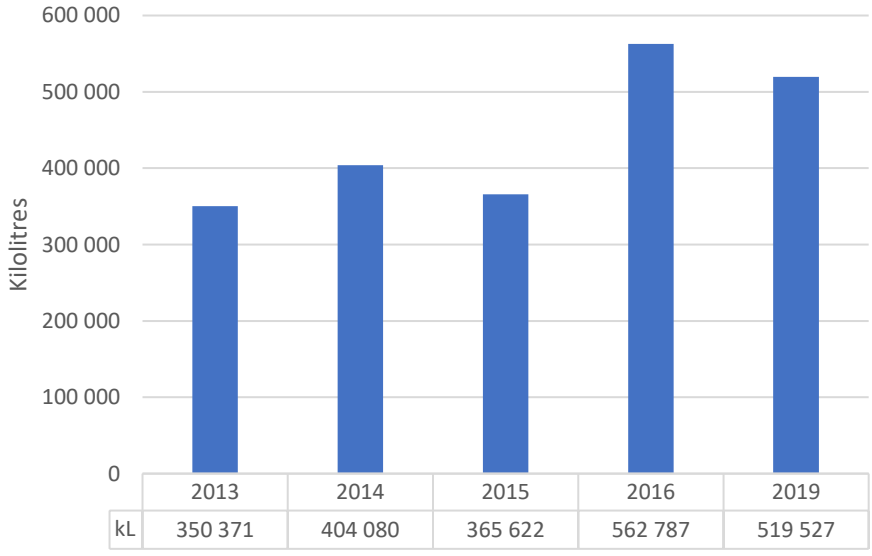


Figure 22: Water Supply (Kiloliters)

WASTE GENERATED IN OPERATIONS

This category includes emissions from third-party disposal and treatment of waste generated in the reporting company's owned or controlled operations in the reporting year. This category includes emissions from disposal of both solid waste and wastewater.

Data collection and quality

The data for waste disposal is reported on a monthly basis by UCT's service provider Waste Control for compliance and contractual purposes. Waste Control provided a spreadsheet of all solid waste removed from various campuses for the year, disaggregated by type: general waste to landfill; recycled waste recovered (paper, metal, plastics, glass, food.) Food waste is diverted from landfill and sent either to a fly farm or composted depending on demand.

The data from the current waste contractor now span five years, from 2015 to 2019 and is considered to be of medium-high quality. It should be noted that the estimation of the weight of the waste is based on numbers of bins collected.

Results and findings

The emissions from solid waste, as compared with 2016 increased by 11%. Recyclables as a percentage of total waste amounts to 16.83%, including food waste. This percentage has decreased from 21.28% in 2015, a concerning, negative trend.

Within the sub-categories of waste, results were variable and, in some cases, not reported due to the absence of data. Compared with 2016, waste in 2019 reflects the following trends (Table 9):

- Non-recycled waste increased by 12.7% in weight.
- Recyclables waste decreased by -54% in weight.
- Hazardous waste – decreased by -58% from 108 tonnes to 45 tonnes of waste collected.
- e-Waste – decreased by -78% in weight (system for collection of e-waste within P&S has been discontinued due to the post of Environmental Control Officer being vacant)
- Food waste increased by 41.8% over 2016.
- No data for printer cartridges received as the system has been discontinued.
- The total of all types of recycled waste decreased by -23.4%, a negative trend.

Table 9: Solid waste 2016 vs 2019 (tonnes)

	2016	2019	diff	% Change
Non-recycled (tonnes)	1059	1 194	135	12,76
Recyclables	117,49	53,68	-63,82	-54,32
Hazardous Chemical - Litres	64,2		n/a	
Hazardous Medical	43,9	*45,0	n/a	
e-Waste	15,9	3,5	-12,42	-78,13
Printer cartridges	0,4	NR	NR	
Food waste	132,5	188	55,39	41,80
Subtotal of all recycled wastes	**378,8**	**290**	-88,73	-23,42
TOTAL	**1 438**	**1 484**	46	**3,23**

* Note: Hazardous waste value for 2019 includes Chemical and Medical waste

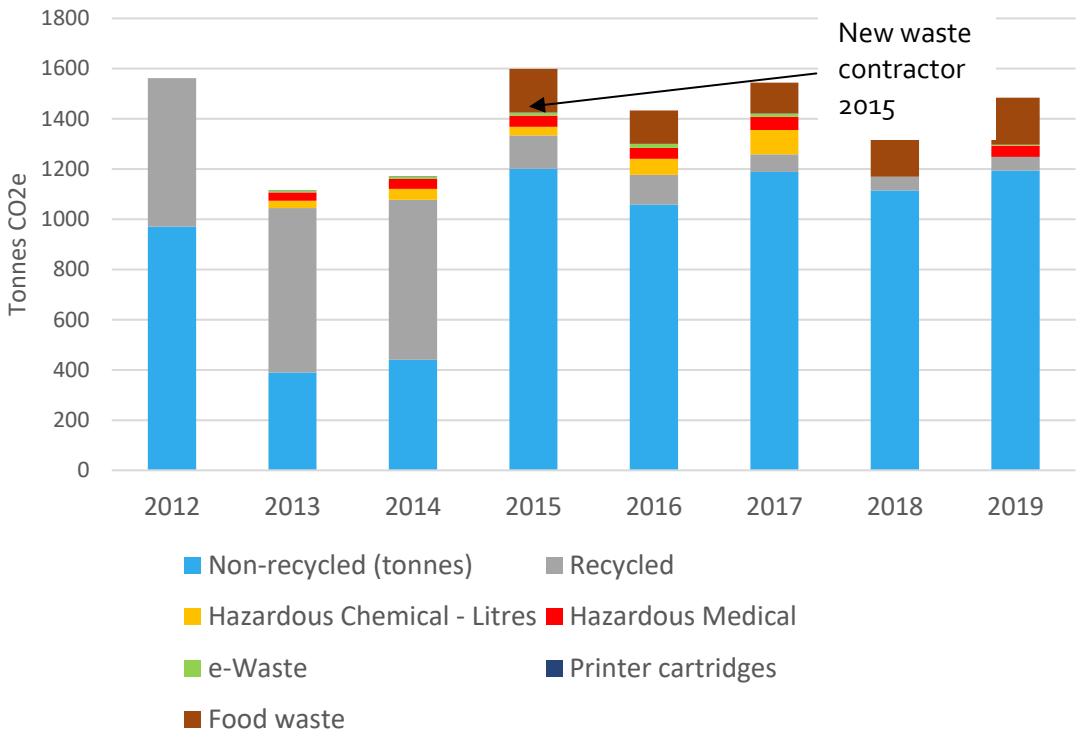


Figure 23: Solid Waste 2012 - 2019

The graph in Figure 20 reflects a marked difference in 2015, which is due to the commencement of the new waste contractor using different measurement methods and management practices. No hazardous waste records were received for 2018.

D. THE REPORTING PROCESS

The reporting process was led by the new Director of Environmental Sustainability who liaised with the data holders directly during the first round of data gathering. In the second round, the consultant engaged directly with third party service providers. Similar challenges were experienced with data gathering and data quality issues, but these delays were exacerbated due to the Covid-19 lockdown with staff working remotely.

The work being done to extract data more automatically, working with ICTS and the procurement department is still underway. It is likely that this will be tested for parts of the 2020 report but may not be ready to provide accurate reporting. This method is thus more likely to only be used more extensively for the 2021 report.

Recommendations for improvement include:

- Increase resources and capacity of the Environmental Sustainability Directorate
- Continue with ICTS and procurement and work towards completing the automatic data extraction for the 2020 (partial extraction) and 2021 report (extensive extraction)
- Finding ways of engaging with relevant data holders (staff members) more effectively to provide accurate and timeous data to key staff members
- Working more closely with service providers to provide data automatically or without repeated requests.

Appendix 1 contains a list of all data sets required for the carbon footprint, their source (department) and the required metric.

High-level recommendations to improve future reporting

General

- Coordination and alignment of reporting processes across the university within Properties and Services, Student Housing and Finance department.
- Further critical evaluation of Scope 3 categories to determine which of these are the most material to reporting.
- Data entry and submission on a quarterly or even monthly basis would avoid delays in reporting and highlight anomalies as they occur; and build capacity of data holders. An example of this is the work that the Environmental Sustainability Directorate is doing with ICTS and procurement to capture air mileage of flights booked by staff during the purchasing process in the digital forms used for purchase orders, as well as reimbursement claims and travel agent SAP entries.

Activity specific recommendations

- Submission of refrigerant gas data to be embedded in service-level agreements, ensuring data quality and reporting timeframes.
- Records of fuel purchases for the vehicle fleet should include the type and quantity of fuel purchased, either diesel or petrol.
- Ongoing expansion of the installation of digital metering for electricity and water consumption
- Data for hired cars and staff mileage reimbursements should include the kilometres travelled.
- For air travel data, the SAP system needs to be modified to include a column the kilometres travelled for the routing, or the CO2 emissions [which could be obtained from an online calculator].
- Official annual commuting surveys need to be conducted to track commuting transport modes, provide evidence to support behaviour change to lower carbon modes of transport, as well as to contribute to transport planning.

With these measures, the footprint results can be further enhanced and confidence in the data improved.

E. RECOMMENDATIONS FOR MITIGATION OF EMISSIONS

One of the major challenges facing the university while this report has been prepared is the massive impact the Covid-19 pandemic and the related lockdown regulations have had on the university, in particular its income and availability of capital to commit to carbon emissions reductions initiatives. While the temporary reduction in carbon emissions will be evident in 2020 and 2021 due to reduced activity on campus, this is an artificial reduction. The university's capital investment and human resources put towards reducing its carbon footprint must be ramped up significantly. Part of this challenge and opportunity is the huge maintenance backlog of about 10 years (R600 million) has been further delayed – however the first phase of this will likely start in late 2021, which will allow for energy efficiency and carbon emissions reductions to be integrated into these large maintenance backlog projects.

Having invested in ongoing carbon footprint reporting since 2012, UCT is now well placed to focus on mitigating emissions that would both reduce operational costs and provide a good return on investment. The most critical actions are to enhance energy efficiency (lighting, ventilation, and air conditioning), installing renewable energy in the form of solar PV systems or through wheeling renewable energy across the grid, and targeting lower GWP refrigerants. It is also important to identify opportunities to reduce scope 3 emissions. Operational savings should be considered key in capital allocation budgets to enhance the business case of these investments.

A further opportunity is the Vice Chancellors support of a research-based green campus project that will see top academics and researchers collaborate with professional and administrative staff and students to develop a way forward to make the campus more sustainable, including developing the cost optimal pathway towards net zero carbon. What must follow is the capital investment and human resources to support the implementation.

SCOPE 1: DIRECT EMISSIONS

Refrigerant gases

- Shift to the procurement of refrigerants with lower ozone depleting potential and global warming potential in accordance with best practice.
- Stay ahead of legislative requirements for phasing out certain gases.
- Develop a long-term plan and standard operating procedure for the responsible use of refrigerants that achieves a steady decrease in the greenhouse gas emissions from refrigerants.
- Explore long-terms plans to avoid the risks of stranded assets in cooling equipment that uses refrigerants that are being phased out.

Vehicle fleet and Jammie Shuttle

- Future-proof the vehicle fleet, including buses, by changing to electric vehicles as soon as feasible.
- Optimise routing and scheduling of Jammie shuttle to reduce transport energy intensity and maximise onsite energy utilisation with Solar PV for charging.
- Investigate the feasibility of installing solar-powered charging stations for electric vehicles (UCT vehicle fleet, staff, and student vehicles).
- For leased vehicles, use the procurement process upon lease renewal to shift to low emissions/ electric vehicles.
- Work towards improved data and analytics of patterns of use and mileage for the Jammie Shuttle service.

SCOPE 2: PURCHASED ELECTRICITY

Electricity consumption

- Review investments to date in energy efficient equipment (air-conditioning chillers, elevators, lighting, and lighting sensors) and set new short-term targets and priorities.
- Invest in a programme of electricity efficiency measures to save operational costs and emissions, including shading, insulation, natural light, and other passive design solutions for existing and new buildings.

- Explore further funding and finance options for solar photovoltaic systems and start planning the roll-out of these installations, based on the detailed feasibility study undertaken in 2020, and the cost estimates for 30 buildings/sites.

- Invest in an effective communication campaign to the UCT community about electricity consumption trends via digital dashboards and other media.

SCOPE 3: ALL OTHER INDIRECT EMISSIONS

The key objective for scope 3 emissions at this stage is to improve data systems and data gathering from the supply chain, and therefore recommendations for mitigation are not included.

F. CONCLUSION

Overall, the total of Scope 1 and 2 emissions decreased by -2.8% compared to 2018, a positive result. Furthermore, it is encouraging that Scope 1 emissions decreased even though the Jammie Shuttle emissions increased due to extended services. While refrigerants decreased significantly, it is problematic that the use of the HCFC gas R22 increase significantly as opposed to declining as it required in terms of the phase out schedule for HCFCs in South Africa and the Montreal Protocol. Investigation into and procurement of alternative refrigerants with lower global warming potential, requires urgent attention and prioritisation.

Once again, as in 2018, the decrease in electricity consumption is the most positive trend found in this report, albeit partially due to load shedding. If annual decreases of 2-5% can be maintained, UCT will be on track to meet the targets set to achieve Net Zero Carbon by 2050. A further contribution towards the carbon emissions reduction target will come from the installation of solar photovoltaic projects that have been developed for funding and several of these are underway.

The reintroduction of reporting on Scope 3 emissions is an improvement in this report, especially given the challenges typically found in most organisations and universities with gathering scope 3 data. These emissions account for over 29 percent of total emissions, highlighting the importance of reporting these for UCT. Scope 3 emissions provide numerous opportunities for mitigation through supply chain management and behaviour change by the UCT community, through for example limiting air travel and considering lower carbon meals. UCT's has set targets for water use and waste-to-landfill reduction by 2050 and it is encouraging that a Water Management Strategy has been developed and is underway.

In terms of long-term trends observed, there is a decrease in energy intensity since the baseline year 2012, from 2248 to 1875 kWh/capita/annum, a -16.6% reduction, reflecting continual improvement.

With respect to reporting, there have been some improvements and refinements in methodology, enhancing completeness and accuracy of the results.

The key initiative of finalising the **Environmental Sustainability Strategy** in 2020 with the setting of long-term goals is indeed a milestone in UCT's response to reducing carbon emissions. Engagement with the UCT students and staff to support environmental sustainability needs to follow.

As called for by the latest IPCC report AR6, UCT must focus on how to achieve strong and rapid reductions in its emissions, through urgent action planning, implementation, and reporting on progress against its new net zero targets.

Key priorities for UCT:

1. Improvement of **emissions data systems**, data gathering processes and data analysis, including a more centralised approach to data collection.

2. Developing, prioritising, and funding of **emissions reduction actions**.

3. **Implementation of projects** towards achieving annual targets for emission reductions that support the long-term goal of Net Zero emissions by 2050.

4. Facilitating a process to review the relevance of measuring and managing the **indirect Scope 3 emissions** in its value chain.

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Greenhouse Gas Protocol: http://www.ghgprotocol.org/

International Sustainable Campus Network (ISCN): http://www.international-sustainable-campus-network.org/

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The Carbon Trust: https://www.carbontrust.com/resources/guides/carbon-footprinting-and-reporting/carbon-footprinting/

APPENDIX A: LIST OF DATA REQUIRED, SOURCES AND METRIC

FILE NO.	CATEGORY (As per GHG Protocol)	Original source	DEPARTMENT RESPONSIBLE	METRIC
A	**SCOPE 1 - DIRECT EMISSIONS**			
A1	**Refrigerant gases (HVAC)**	**Service providers x 5**	P&S: Maintenance & Operations; Residences - Student Housing; GSB	Kg
A1-1	Refrigerant gases	**MCM**	P&S Maintenance	Kg
A1-2	Refrigerant gases	**Johnson Refrigeration & Air Conditioning**	P&S Maintenance	Kg
A1-3	Refrigerant gases	**Johnson Refrigeration & Air Conditioning**	P&S Maintenance	Kg
A1-4	Refrigerant gases	**Johnson Refrigeration & Air Conditioning**	P&S Maintenance	Kg
A1-5	Refrigeration gases	**1. Johnson Controls International (JCI) 2. Coastal Air Conditioning Services 3. Kast Air**	P&S Upper Campus Area Manager	Kg
A1-6	Refrigerant gases	**Airtek**	GSB Operations/Facilities Management	Kg
A1-7	Refrigerant gases	**MC Cooling**	ICTS	Kg
A2	**Vehicle Fleet**			
A2-1	Vehicle Fleet - ABSA	**ABSA**	Procurement	Litres fuel; diesel/petrol
A2-2	Vehicle Fleet - BIDVEST	**BIDVEST**	Procurement	Litres fuel; diesel/petrol
A2-3	Vehicle Fleet - UCT SAP - 'OTHER'	**SAP**	Procurement	Rand value
A3	Jammie Shuttle bus service	**Transport dept.**	P&S: Transport Department	Litres diesel fuel

A4	Liquid Petroleum Gas - LPG	**Vendor Management**	P&S: Vendor Management	Kilograms
A5	Diesel for generators	**SAP**	P&S: Finance	Litres
B	**SCOPE 2 – PURCHASED ELECTRICITY**			
B1	Electricity:	**Terrafirma**	P&S: Maintenance & Operations	kWh
B2	Electricity:	**SAP - municipal billing**	P&S Finance	kWh
B3	Electricity:	**GSB Operations**	GSB Operations	kWh
B4	Electricity:	**PowerStar electricity dashboard**	ICTS Department	kWh
C	**SCOPE 3 - OTHER INDIRECT EMISSIONS**			
C1	Fuel & energy related emissions	**SAP**	Procurement	Tonnes CO2
C2	**Business Travel**			
C2-1	Business Travel - Air	**SAP**	Procurement	kilometres travelled; tonnes CO2
C2-2	Business Travel - Air	**Travel agencies**	Procurement	
C3-1	Business Travel - Land - Hired cars	**BIDVEST**	Procurement	kilometres travelled per vehicle
C3-2	Business Travel - Land - Hired cars	**SAP**	Procurement	kilometres travelled per vehicle
C3-3	Business Travel - Staff Reimbursements (own vehicles)	**SAP**	Procurement	Mileage - kilometres
C4	Staff & Student Commuting	**Survey**	P&S	survey data

	PURCHASED GOODS:			
C5	**Food Supply**			
C5-1	Food supply: Residences	**SH/catering service provider**	Student Housing	Nr. Meals for year; breakfast lunch supper and vouchers
C5-2	Food supply: Vendors		Vendor management	Nr. Meals (1 week Peak time; 1 week quiet time
C6	**Paper**			
C6-1	Paper Products - Custodial - Residences & campuses	**Excel compiled from Purchasing records by Finance**	P&S: Finance	No. of Rolls or packs; weight of each paper type
C6-2	Paper Products - print paper ICTS managed computer labs	**Source unknown - should be auto? 'iPrint' stats**	ICTS	Sheets
C6-3	Paper Products (Campus copy Centres)	**Service provider**	ICTS (Nashua; Papercut)	Sheets/R
C6-4	Office paper (Waltons)	**Sourced from Waltons**	Procurement	Reams
C7	**Water**			
C7-1	Water: Campuses & Residences 2 (includes Off Campus Residences & staff houses)	**SAP**	P&S Finance Dept	KL
C7-2	Water: Campuses & Residences 1	**Copper Aqua metering**		Kl
C7-3	Water: GSB	**Municipal billing**	GSB Operations	Kl
C8	**Waste**			
C8-1	Solid Waste - Wet (Non-recyclable; Dry (recycling) Food waste	**Service providers**	P&S: Custodial and Estates Manager	Tons Wet/Dry
C8-2	Hazardous Waste: Medical/Chemical	**Service provider**	P&S: Health & Safety	L/kg

C8-3	Printer cartridges	**Service provider - Green Office**	P&S: Environmental Risk Officer	Kg
C8-4	E-Waste (ICTS)	**Service provider**	P&S: Environmental Risk Officer	Kg
C8-5	E-Waste (P&S)	**Service provider**	P&S: Environmental Risk Officer	Kg
D	**GENERAL**			
D1	Building List & Areas	**Database within Physical Planning**	P&S: Physical Planning Unit	m^2
D2	Population data	**tbc**	Registrar's office/Institutional Planning??	Students & staff (FTE)
D3-1	Vehicle fleet - owned	**Transport Dept or - Assets?**	Transport Dept.	Number of vehicles; petrol or diesel
D3-2	Vehicle fleet - leased	**BIDVEST**	Transport Dept.	Number of vehicles; petrol or diesel
D4	Properties, utility accounts & erf numbers		P&S Finance Dept	