North-West University

CARBON FOOTPRINT

Financial Year 2022

MAY 2023

RESULTS SUMMARY

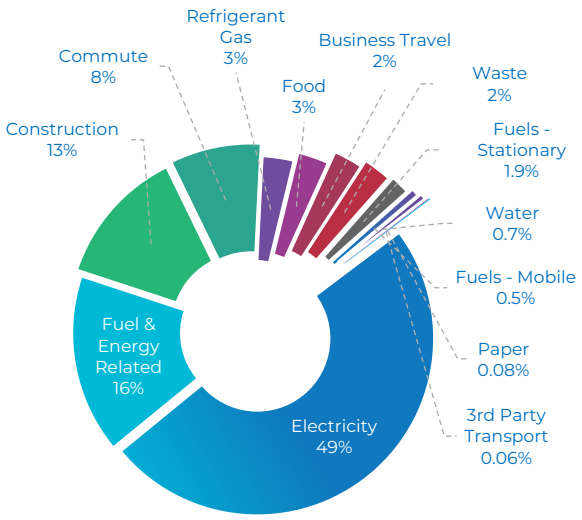
This report summarises the outcomes of the Greenhouse Gas (GHG) emissions inventory for North-West University (NWU), covering the latest financial year 1 January – 31 December 2022.

This is the university's first carbon footprint assessment. The organisational boundary includes 3 campuses located in South Africa: Potchefstroom, Mahikeng and Vanderbijlpark, as well as their respective off-campus facilities: Nooitgedacht, Eco-Rehab, Molewane and Faranani.

GHG emissions were measured in accordance with the GHG Protocol Corporate Standard (WRI & WBCSD, 2004) using the Operational Control approach. All Scope 1 and Scope 2 emissions were measured while selected Scope 3 emissions were included. The operational boundary and results are tabulated below per campus.

NWU's largest campus located at Potchefstroom contributes the greatest portion of the institution's carbon footprint. The majority of overall emissions arise from purchased electricity.

NWU CARBON FOOTPRINT FY22:
134,751 tCO_2e

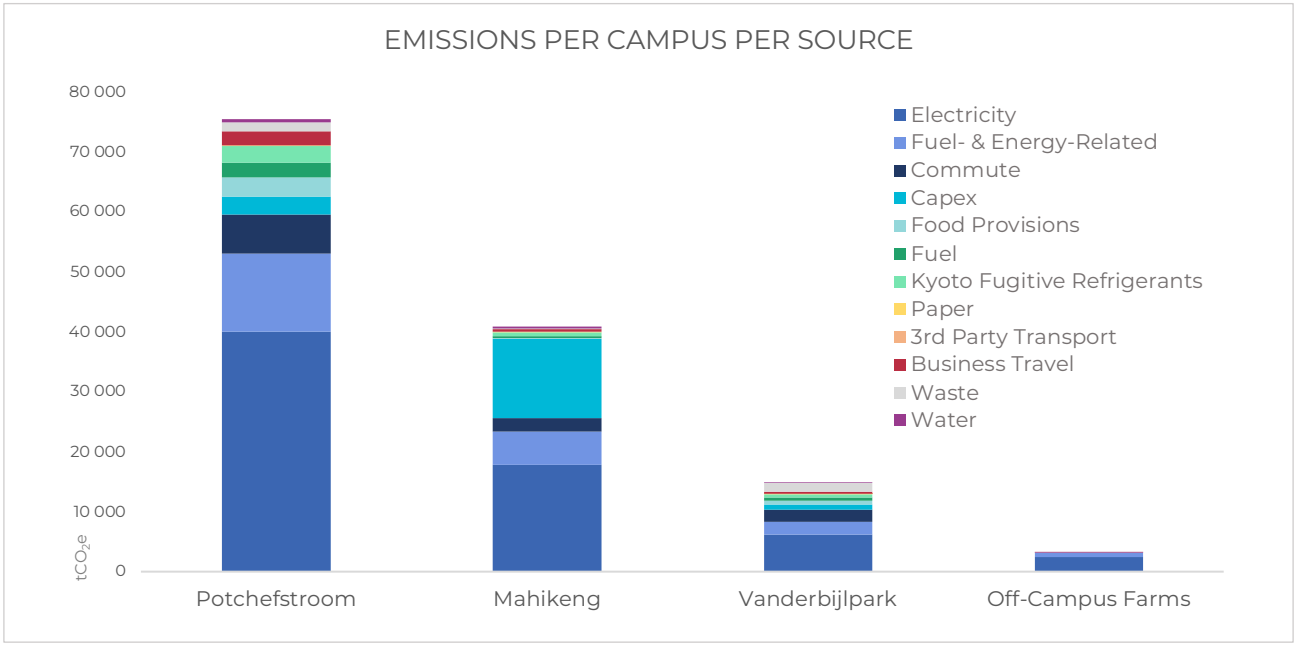


SCOPE	SOURCE	Potchef-stroom	Mahikeng	Vander-bijlpark	Off-Campus Farms	Total tCO_2e	% of Total
SCOPE 1	Stationary Fuels	2 107	7	411	-	2 525	2%
	Mobile Fuels	384	255	72	-	712	0.5%
	Fugitive Emissions (Kyoto gases)	1 412	438	282	-	2 131	2%
SCOPE 2	Purchased Electricity	40 003	17 860	6 139	2 403	66 404	49%
SUB-TOTAL SCOPE 1 & 2		**43 905**	**18 559**	**6 905**	**2 403**	**71 772**	**53%**
SCOPE 3	Water Consumption	446	282	105	60	893	1%
	Office Paper	43	43	22	-	108	0%
	Food Provisions	3 206	159	641	-	4 006	3%
	Capital Goods (Construction)	2 998	13 253	872	-	17 122	13%
	Fuel- and Energy-Related Activities	13 037	5 551	2 136	734	21 458	16%
	Upstream Transportation and Distribution	-	-	82	-	82	0.1%
	Waste generated in operations	1 496	114	1 500	21	3 131	2%
	Business Travel	2413	455	356	21	3 244	2%
	Commuting	6 697	2 199	2 138	-	11 033	8%
SUB-TOTAL SCOPE 3		**30 137**	**22 038**	**7 812**	**836**	**61 079**	**45%**
OTHER DIRECT	Fugitive Emissions (non-Kyoto gases)	1 403	246	251	-	1 901	1.4%
TOTAL EMISSIONS		**75 445**	**40 843**	**14 968**	**3 239**	**134 751**	**100%**

Exclusions: emissions associated with business travel in rental cars and hotel night stays, as well as emissions arising from water consumption at Faranani , are excluded from these results because the data was unavailable.

EMISSIONS PER CAMPUS

Potchefstroom Campus contributed 56% of greenhouse gas emissions to the university's total FY22 carbon footprint. In terms of emission sources, **purchased electricity consumption at Potchefstroom Campus comprises 30% of NWU's total carbon footprint**. As such, this provides the greatest area of opportunity for emission reductions at the university. Due to substantial construction projects underway during 2022, emissions embedded in construction-related capital goods (capex) at Mahikeng were particularly high during the year, contributing 32% of that campus's total annual emissions. Although business travel is a relatively small source of greenhouse gas emissions overall, if NWU adopted an economy-only flight policy, this would have reduced FY22 emissions by 163 tCO_2e.

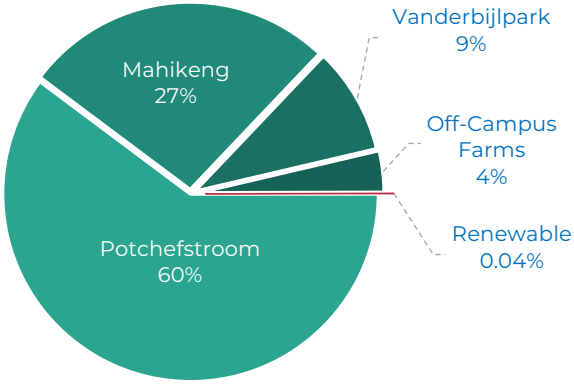


RENEWABLE ENERGY

NWU consumed a total of 63 GWh of municipal electricity in 2022. Potchefstroom Campus accounted for 60% of the university's electricity consumption. Currently the university has one solar installation located at Potchefstroom's Engineering which provided 27 MWh of electricity during the year. The adjacent pie chart, which shows the Scope 2 greenhouse gas emissions arising from electricity use per campus, illustrates the current impact of this installation on total university energy demand and, consequently, on the university's total Scope 2 emissions.

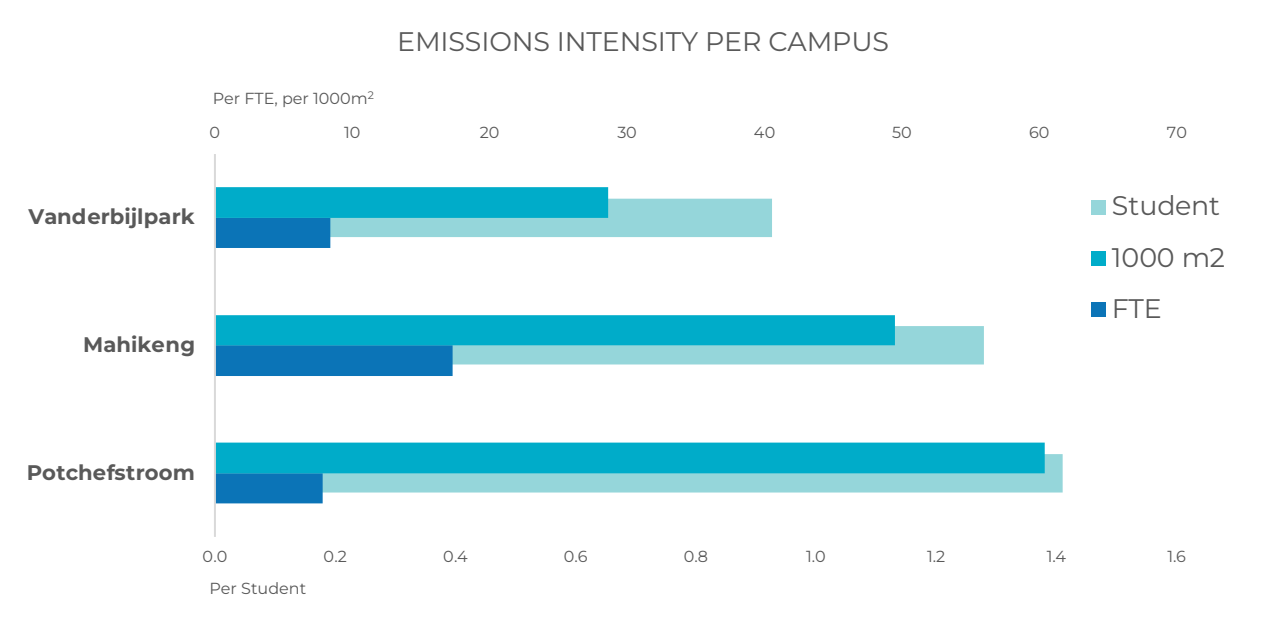
NWU has operational control over this emission source, which makes this a good opportunity to consider a carbon management project on-site. Expanding the university's investment in solar power has the potential to reduce its reliance on grid-supplied electricity and reduce Scope 2 emissions in future, which are currently the largest contributor to NWU's carbon footprint at just under 50%.

IMPACT OF RENEWABLE ENERGY AS PROPORTION OF TOTAL ELECTRICITY



REPORTING METRICS

Intensity metrics, as opposed to absolute emissions, account for the dynamic aspects of an institution, which tend to impact on emissions. They provide a comparable method of measuring performance over time. Due to the potential for significant variations in Scope 3 emissions year-on-year, intensity metrics always include Scope 1 and 2 emissions only. Emissions intensities are highest at Potchefstroom Campus, with the exception of emissions per FTE due to the proportionately larger number of employees at that campus. A detailed breakdown of these metrics and emissions intensities is available in the accompanying document *GCX_NWU_Carbon Footprint Report_FY22.xlsx*.



RECOMMENDATIONS

CARBON MANAGEMENT

With 49% of NWU's emissions arising from purchased electricity, this presents a good opportunity for emission reductions through improved energy efficiency measures on campuses where the university is able to lower consumption for lighting, cooling and heating through more efficient installations and behaviour change. NWU could also investigate expanding its solar installations to mitigate Scope 2 emissions. The university should consider alternative refrigerant gases with lower global warming potentials such as carbon dioxide and ammonia. Although flight emissions contributed only 2% to NWU's overall footprint, the environmental impact should be taken into account. The university conducted over 6000 flights during 2022, many of which were business and first-class flights. Switching to an economy-only policy can help reduce emissions, but to make a significant positive impact, the quantity of flights should be reduced where possible.

DATA INTEGRITY

The accuracy and completeness of data used for NWU's carbon footprint assessment was good. Most of the data submitted was high quality, including electricity use, which makes up the majority of NWU's carbon footprint. Fugitive refrigerant gas emissions at Vanderbijlpark were estimated by GCX due to a lack of data. Some actual waste data was available from service providers; however the majority was estimated by NWU. Food provisions at Vanderbijlpark were estimated.