

# UNIVERSITY OF TWENTE.

Carbon Footprint Report 2023



realised

# University of Twente Carbon Footprint 2023

## Introduction

Dear reader,

Welcome to the University of Twente 2023 carbon footprint report. Every year the university reports their carbon footprint with the goal of providing full transparency of its impact. The ambition of the university follows the updated EU ambition to reduce her carbon footprint by 55% in 2030. We hope you carefully read this report on how these reductions have been established. In addition, we are also reporting the underlying values, such as energy consumption or travel distance, in order to further provide transparency and support policy development.

CO2 data is collected and stored in the Carbon Platform, with the aim to increase the frequency of data acquisition where relevant, enable better monitoring, improve communication and create more impactful policies and measures. The previous reports were snapshots of our carbon footprint of what we had insightful at a specific moment in time. As organisations supply us with information throughout the year, this could earlier only be added the year after.

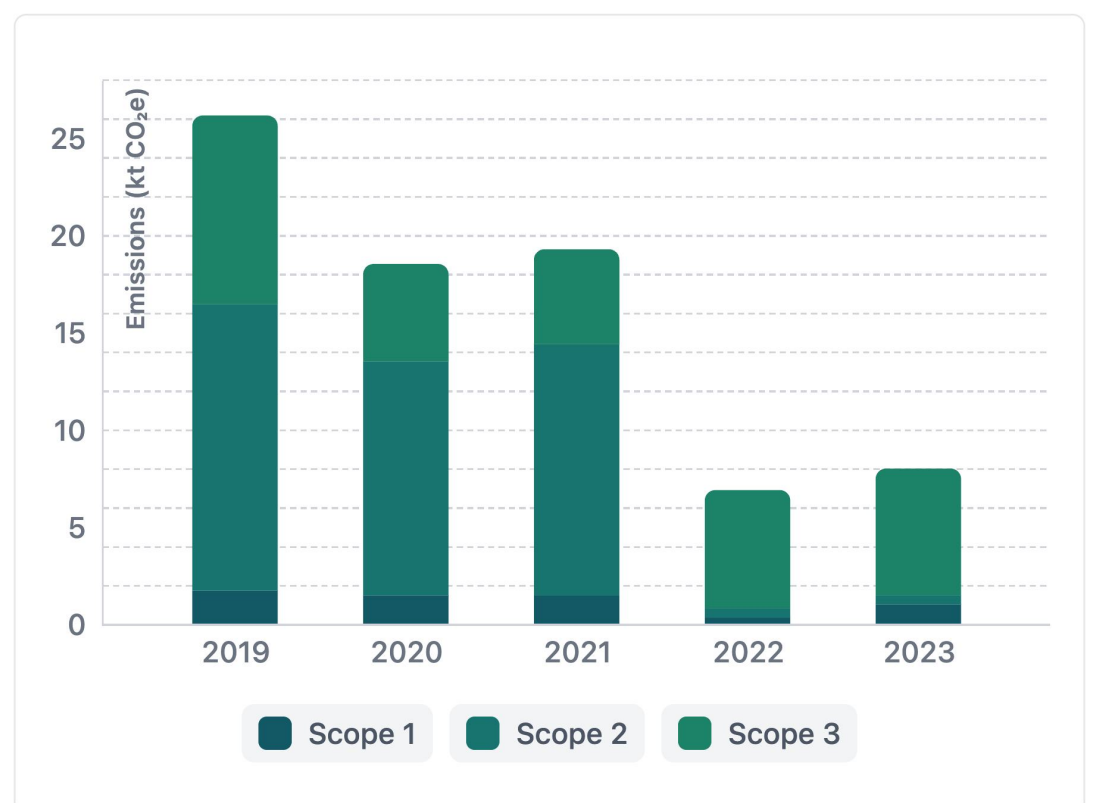
That is why the carbon footprint report is now a dynamic webpage. Increasing data acquisition where possible, for themes such as flying or waste, allows the UT to more closely follow the measures taken to reduce the impact and offer guidance where needed. Presenting this directly coupled with data allows for the most recent numbers to be public, in line with the aim to have full transparency.

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## Summary

The university has been assessing its environmental impact by reporting her carbon footprint since 2014. The carbon footprint reflects not only the impact of the activities of the university itself, but is also used as a tool to encourage its partners to report on their greenhouse gas emissions and work together towards a sustainable future. The carbon footprint enables monitoring of the progress of the strategic goal to: "Become a sustainable organisation in 2030" and reduce the carbon footprint by 55% in 2030."

The carbon footprint of 2023 with 8.1 kton is a significant reduction from 2019. The purchase of green electricity in 2022 led to a significant decrease compared to 2019. The report aims to clarify the reductions and also report on the underlying values to provide further explanation and support for policy decisions.



CATEGORY	UNIT	2019	2020	2021	2022	2023
Scope 1	kg CO <sub>2</sub> e	1,761,167.85	1,519,025.55	1,500,455.8	365,980	1,056,512.31
Scope 2	kg CO <sub>2</sub> e	14,720,950.35	12,034,634.12	12,931,521.18	488,043.2	469,569.68
Scope 3	kg CO <sub>2</sub> e	9,703,246.97	4,999,951.4	4,875,422.56	6,072,647.44	6,507,537.38

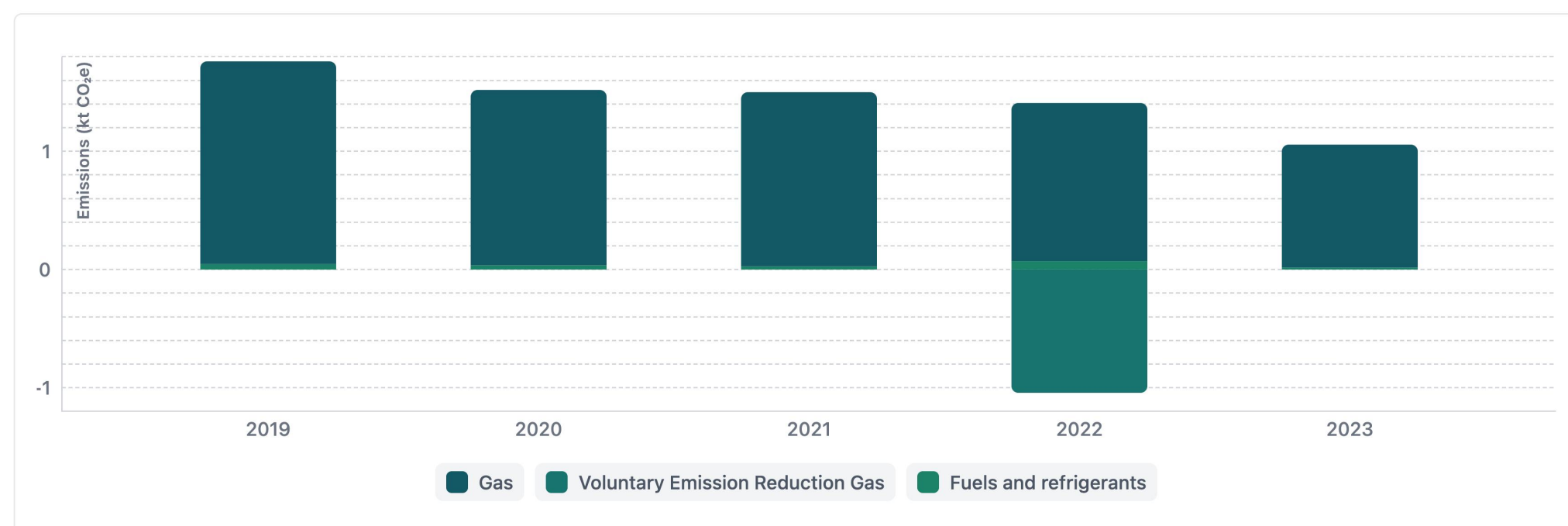
# Scope 1 - Direct Emissions

The University of Twente has various direct sources of GHG emissions. Over 2022 the emissions of gas consumption were offset through a Voluntary Emission Reduction (VER), this year it was decided against due to various discussions regarding the effectiveness. The other emissions in scope 1 are caused by the use of petrol, diesel, and refrigerants. The gas consumption of the university is low as most buildings use district heating. Real-time information about energy consumption can be found at [Energy Data platform](#). Refrigerants are incidental refills of air conditioning systems and do not occur each year. The emissions of all sources and the total are given in the table below.

In addition, the consumption of gas is listed. The consumption of gas has been significantly reduced since 2019, with a reduction of more than 44% due to saving measures and further implementation of district heating. The largest remainder of gas consumption is due to the humidification of laboratories. The significant reduction in 2023 is due to the move of ITC to the campus and a relatively warm year.

CATEGORY	UNIT	2019	2020	2021	2022	2023
Gas	kg CO <sub>2</sub> e	1,714,989.78	1,483,314.65	1,473,877.69	1,336,795.67	1,039,491.68
Voluntary Emission Reduction Gas	kg CO <sub>2</sub> e	0	0	0	-1,042,500	0
Diesel	kg CO <sub>2</sub> e	31,955.64	21,929.55	19,012.31	9,900.69	12,691.63
Petrol	kg CO <sub>2</sub> e	7,958.43	8,143.76	7,565.8	7,193.24	0
Refrigerant R134a	kg CO <sub>2</sub> e	0	0	0	39,000	0
Refrigerant R410a	kg CO <sub>2</sub> e	6,264	5,637.6	0	0	4,329
Refrigerant R407c	kg CO <sub>2</sub> e	0	0	0	15,590.4	0
Scope 1	kg CO <sub>2</sub> e	1,761,167.85	1,519,025.55	1,500,455.8	365,980	1,056,512.31

CATEGORY	UNIT	2019	2020	2021	2022	2023
Gas	m <sup>3</sup>	907,402	787,322	782,313	641,149	499,996



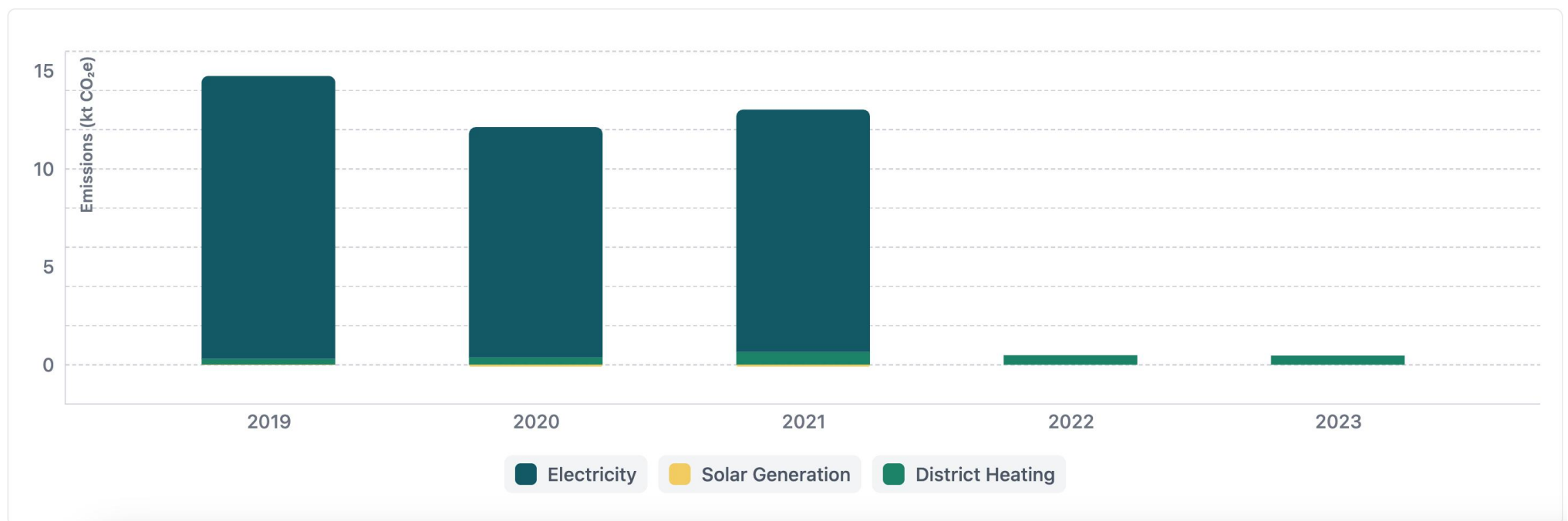
# Scope 2 - Indirect Emissions

Indirect GHG emissions are caused by the electricity and district heating consumed at the university. These forms of energy are generated elsewhere but are directly consumed by the university. The total consumption of electricity by the university is accounted for and the generation of solar is deducted from that. Solar energy generation with solar panels occurs at the Horst, Drienerburgh, Solar car park at the Pavillion, and Technohal building and solar collectors are used at the Sports Centre and the Swimming pool.

With the purchase of certificates of origin from Wind and Solar power, the university has mitigated its emissions from electricity. Solar generation is therefore also not accounted as a mitigating measure, as the university utilises all power itself. The actual consumption of electricity, district heating and solar generation is listed to encourage the continuation of reduction measures. In comparison to 2019, the electricity consumption has increased by 1.7% and the consumption of district heating by 12.6%. The increase in district heating can partly be attributed to fact that buildings changed their heating source from natural gas to district heating.

CATEGORY	UNIT	2019	2020	2021	2022	2023
Electricity	kg CO <sub>2</sub> e	14,439,229.77	11,750,795.9	12,377,792.1	0	0
Solar Generation	kg CO <sub>2</sub> e	-18,419.92	-94,194.18	-93,644.86	0	0
District Heating	kg CO <sub>2</sub> e	300,140.5	378,032.4	647,373.94	488,043.2	469,569.68

CATEGORY	UNIT	2019	2020	2021	2022	2023
Electricity	MWh	22,248.43	21,134.53	22,262.22	23,602.37	22,631.81
Solar Generation	MWh	-28.38	-169.41	-168.43	-210.21	-206.77
District Heating	GJ	54,571	55,593	73,565.22	63,880	61,462





# Scope 3 - Sphere of Influence

The third scope of the carbon footprint considers upstream and downstream GHG emissions. Upstream refers to purchased goods and services, waste, rented assets, work-related travel, and transport and distribution while downstream includes waste processing, let assets, investments, and transport and distribution.

The upstream and downstream categories are further specified and aligned with the university's strategy into: [new categories] Business Travel, Commuting, Procurement, Waste, and Water. In these categories, the supply of data from third parties varies yearly. More details per category are provided below.

With the help of the procurement department, the categories for scope 3 emissions are further specified. This also enables improvements in the contract management relations between the university and its suppliers.



CATEGORY	UNIT	2019	2020	2021	2022	2023
Business Travel	kg CO <sub>2</sub> e	2,892,563.23	675,978.9	293,855.19	2,164,210.88	3,215,843.43
Commuting	kg CO <sub>2</sub> e	4,976,383.21	2,390,434.08	2,400,418.19	2,043,148.84	2,065,115.84
Waste	kg CO <sub>2</sub> e	631,000	749,913.93	775,380.27	1,112,086.77	1,036,424.94
Water	kg CO <sub>2</sub> e	150,033	28,896.84	31,348.18	38,362.14	38,836.81
Consultants and Flexible Work	kg CO <sub>2</sub> e	47,660.8	3,972.09	24,605.1	469.76	636.9
Operation, Management Buildings, Installations	kg CO <sub>2</sub> e	936,736.73	645,166.38	794,168.82	529,846.07	106,662.18
ICT	kg CO <sub>2</sub> e	68,870	75,525.9	53,800	6,511.9	5,037.3
Office equipment and supplies	kg CO <sub>2</sub> e	0	52,811.97	79,360.16	73,649.49	26,379.71
Marketing and Communication	kg CO <sub>2</sub> e	0	242.35	11,153.62	3,668.76	959.6
Research and development	kg CO <sub>2</sub> e	0	36,674.95	4,180.78	84,748.48	1,272.5
Staff-Related	kg CO <sub>2</sub> e	0	340,334	407,152.25	15,944.35	10,368.18
Scope 3	kg CO <sub>2</sub> e	9,703,246.97	4,999,951.4	4,875,422.56	6,072,647.44	6,507,537.38

## Business Travel

All travel by employees, using all forms of transport is accounted for in scope 3. This includes train travel, car rental, flying and private car use for work. The university discourages flying to locations within a 800 kilometer radius from the university. Although a mobility study and carbon footprint rely on the same data, a carbon footprint accounts for the GHG emissions for flights in three distance categories. For example: a flight with a distance of 700 kilometers or less can occur between locations anywhere in the world, thus making the figures represented here relevant for GHG emissions but not directly for a mobility study. The monitoring of this ambition uses the same data as is used for the CO<sub>2</sub> footprint. But the emission factors used to calculate the CO<sub>2</sub> emissions of flights are categorised slightly differently: short (<700 km), medium (700-2500 km) and long (>2500 km).

CATEGORY	UNIT	2019	2020	2021	2022	2023
Flying short	kg CO <sub>2</sub> e	189,556.69	29,093.82	35,741.87	107,116.54	126,668.65
Flying short compensation	kg CO <sub>2</sub> e	-29,692.28	-4,196.02	-6,335.6	-5,150.11	0
Flying medium	kg CO <sub>2</sub> e	538,487.6	94,960.6	104,206.8	578,001.18	693,761.38
Flying medium compensation	kg CO <sub>2</sub> e	-75,233.8	-16,910	-32,054.2	-44,447.04	0
Flying long	kg CO <sub>2</sub> e	2,949,736.69	751,840.61	167,392.72	1,768,160.06	2,195,113.56
Flying long compensation	kg CO <sub>2</sub> e	-967,072.43	-287,299.89	-73,141.91	-305,576.32	0
Coach rental	kg CO <sub>2</sub> e	0	3,534.73	371.31	2,757.11	3,023.47
Car rental	kg CO <sub>2</sub> e	58,102	11,715.86	10,796.12	25,331.48	67,877
Car expense claims	kg CO <sub>2</sub> e	200,163.7	83,088.5	84,143.89	27,850.29	115,359.38
Train	kg CO <sub>2</sub> e	28,515.06	10,150.69	2,734.19	10,167.68	14,040

Since 2019 we can discern the flight emissions per faculty. For all faculties, the emissions from short-distance flights are given to the right and the medium and long below. The ITC faculty compensates for their flights.

Since mid-2023 all flights can be allocated to the associated faculty and department. This enables UT to develop a CO<sub>2</sub> emission reduction target combined with a pricing mechanism and UT-wide agreed compensation options.

The emissions for the short-distance flights are given on the right (<700 km). The intermediate distance emissions on the bottom left (700-2500 km), and the long-distance flight emissions on the bottom right (2500 km-)



In the past, the ITC faculty and some independent research groups have compensated for their emissions. They are presented below in their respective distance categories.

# Commuting

Most employees and students travel to the university by car, train, or bike. Last year a new mobility survey was conducted, which greatly improved the data on commuting. The total amount is listed in the last row.

CATEGORY	UNIT	2019	2020	2021	2022	2023
Employees Electric Bike/Speedpedelec	kg CO <sub>2</sub> e	0	0	0	17,954.81	8,899.37
Employees Car	kg CO <sub>2</sub> e	1,882,117.38	910,219.64	967,394.22	1,238,723.22	1,302,659.29
Employees Train	kg CO <sub>2</sub> e	45,664.79	24,915.46	8,826.83	6,874.73	7,229.56
Employees Electric car	kg CO <sub>2</sub> e	0	0	0	22,184.15	18,937.81
Employees Hybrid car	kg CO <sub>2</sub> e	0	0	0	62,915.9	57,433.38
Employees Plug-In Hybrid	kg CO <sub>2</sub> e	0	0	0	5,987.71	6,149.25
Employees Motor	kg CO <sub>2</sub> e	0	0	0	17,598.4	11,374.13
Employees Bus	kg CO <sub>2</sub> e	0	0	0	20,534.76	21,594.65
Employees	kg CO <sub>2</sub> e	1,927,782.17	935,135.1	976,221.05	1,392,773.69	1,434,277.43

CATEGORY	UNIT	2019	2020	2021	2022	2023
Students Car	kg CO <sub>2</sub> e	2,849,968.22	1,349,208.12	1,387,821.44	506,978.77	493,478.81
Students Train	kg CO <sub>2</sub> e	198,632.82	106,090.87	36,375.7	10,435.36	10,157.49
Students Electric Bike/Speedpedelec	kg CO <sub>2</sub> e	0	0	0	3,670.37	1,786.32
Students Electric car	kg CO <sub>2</sub> e	0	0	0	1,019.58	805.58
Students Plug-In Hybrid	kg CO <sub>2</sub> e	0	0	0	10,747.26	10,215.88
Students Bus	kg CO <sub>2</sub> e	0	0	0	117,523.82	114,394.35
Students	kg CO <sub>2</sub> e	3,048,601.04	1,455,298.99	1,424,197.14	650,375.16	630,838.41



# Procurement

The suppliers and contractors of the university were invited to submit CO2 footprint data concerning the services or goods delivered to the university. The various categories in this section and their impact are listed below. Every year the aim is to grow this comprehensive list of suppliers.

CATEGORY	UNIT	2019	2020	2021	2022	2023
Consultants and Flexible Work	kg CO <sub>2</sub> e	47,660.8	3,972.09	24,605.1	469.76	636.9
Operation, Management Buildings, Installations	kg CO <sub>2</sub> e	936,736.73	645,166.38	794,168.82	529,846.07	106,662.18
ICT	kg CO <sub>2</sub> e	68,870	75,525.9	53,800	6,511.9	5,037.3
Office equipment and supplies	kg CO <sub>2</sub> e	0	52,811.97	79,360.16	73,649.49	26,379.71
Marketing and Communication	kg CO <sub>2</sub> e	0	242.35	11,153.62	3,668.76	959.6
Research and development	kg CO <sub>2</sub> e	0	36,674.95	4,180.78	84,748.48	1,272.5
Staff-Related	kg CO <sub>2</sub> e	0	340,334	407,152.25	15,944.35	10,368.18

# Waste

CATEGORY	UNIT	2019	2020	2021	2022	2023
Waste	kg CO <sub>2</sub> e	631,000	749,913.93	775,380.27	1,112,086.77	1,036,424.94

CATEGORY	UNIT	2019	2020	2021	2022	2023
Waste	ton	631	624.28	650.06	1,142.46	1,097.19

# Water

The GHG emissions of water for this year are based on figures supplied by the water supplier Vitens. The campus-specific study of 2010 that was used previously has been replaced, as these figures better reflect the current situation. From 2019 onwards, water consumption of the ITC hotel has been included, this causes an increase in water consumption, as this was not done previously.

The amount of water that is consumed has returned to pre-Covid levels. The increase for 2023 is caused partially by a leak that has been resolved.

CATEGORY	UNIT	2019	2020	2021	2022	2023
Water	kg CO <sub>2</sub> e	150,033	28,896.84	31,348.18	38,362.14	38,836.81

CATEGORY	UNIT	2019	2020	2021	2022	2023
Water	m <sup>3</sup>	100,022	72,788	79,362.48	100,953	110,962.3