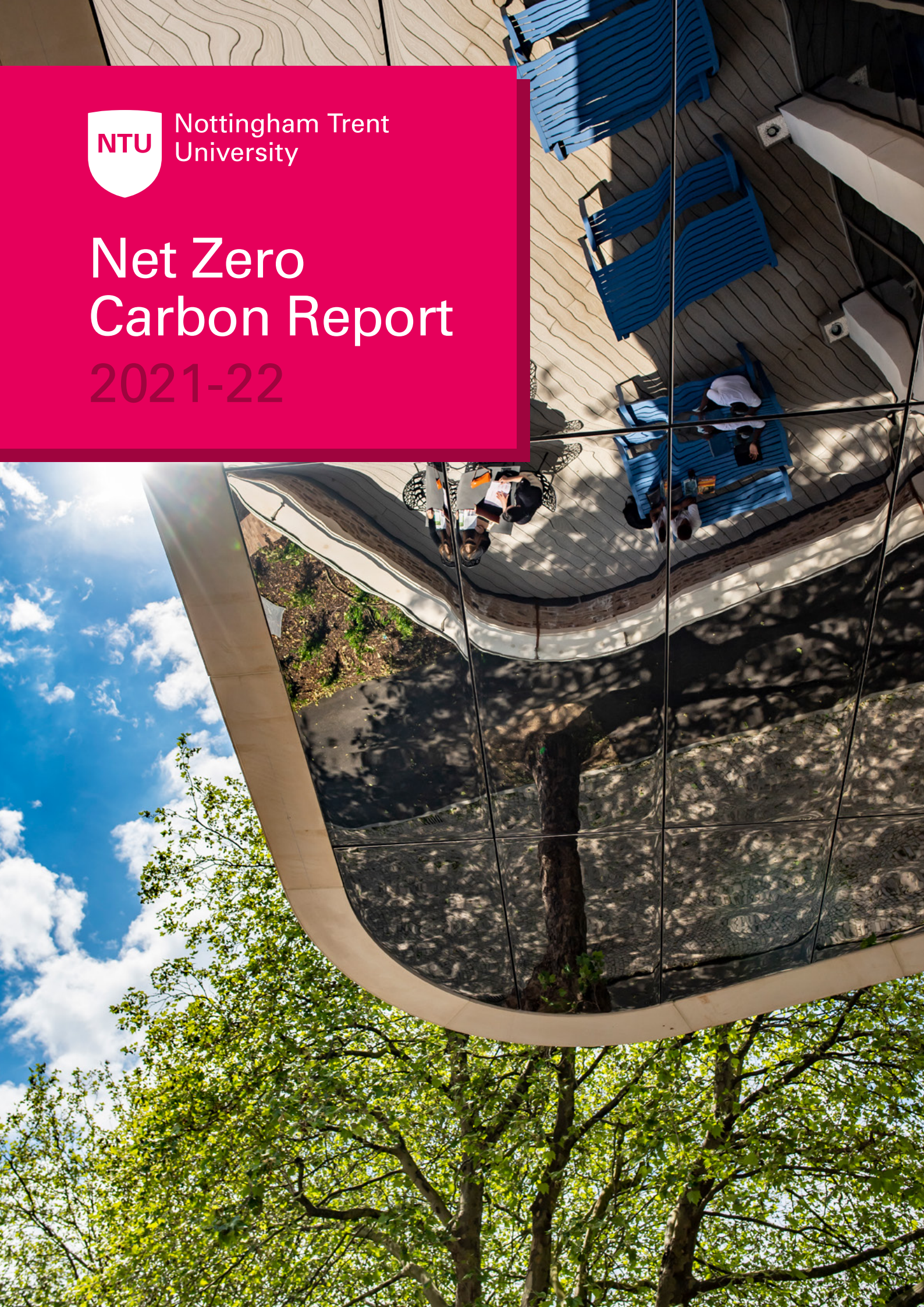
Nottingham Trent University

Net Zero Carbon Report

2021-22



Carbon Emissions Report

This is NTU's Annual Carbon Emissions Report covering all aspects of Nottingham Trent University's (NTU) carbon footprint across scopes 1, 2 and 3.

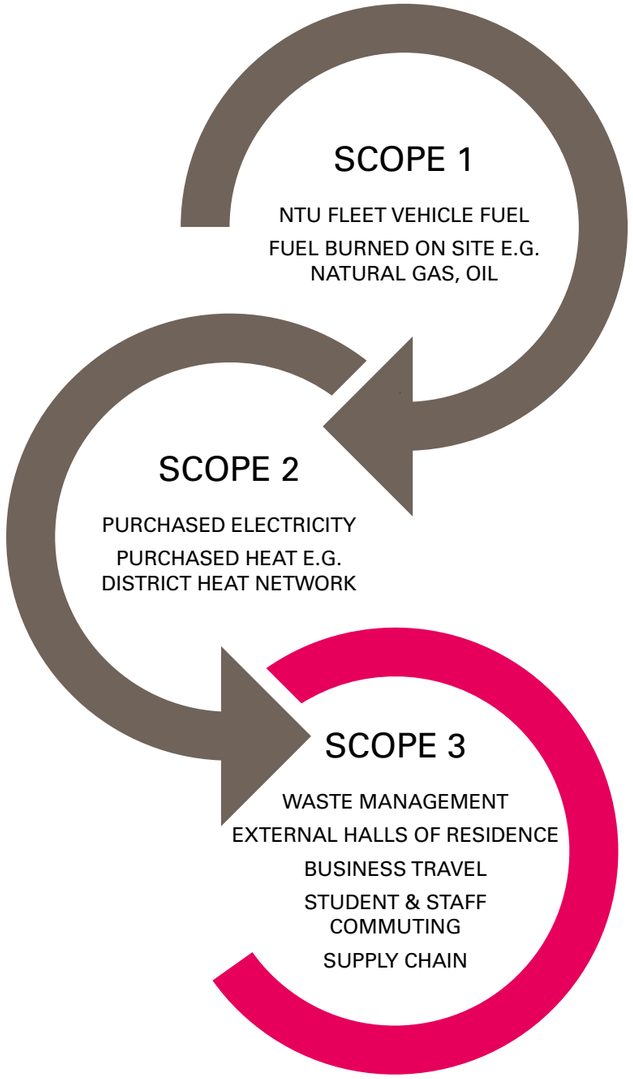


Figure 1, NTU's Carbon Emissions Breakdown

Carbon Emissions Breakdown

Carbon emissions can be broadly split into three categories or "scopes".

Scope 3 carbon emissions are those emissions that arise from sources outside of an organisation's direct control but are associated with its activities. These emissions contrast with scopes 1 and 2 which are, respectively, "direct" emissions and "indirect" emissions. "Direct emissions" may include the use of natural gas in boilers, "indirect emissions" are made up of procured electricity or heat.

The diagram to the left breaks down the three different carbon scopes and explains which activities fall into each category for NTU.

NTU reports on scope 1 and 2 emissions annually and has also reported its scope 3 emissions since 2012. Annual trends are shown on the following pages. Emissions are composed of a range of different greenhouse gases but for reporting purposes they are all given a carbon value, measured in tonnes of carbon dioxide equivalent (tCO_2e). Emissions are also often displayed per "Full Time Equivalent" (FTE) staff and student numbers. This allows for comparisons across years as student and staff numbers fluctuate.

Target

NTU has a target of achieving Net Zero Carbon across all three carbon scopes by 2040

Net Zero Carbon by 2040

Historically, 2005/06 was the baseline used for reducing scopes 1 and 2. The University's total carbon emissions were re-baselined during 2020/2021 to include scopes 1, 2 and 3. The year of 2020/2021 is viewed as an outlier in terms of behaviours and outputs, due to the Coronavirus pandemic. Therefore, the year 2018/2019 was chosen to provide this new baseline for Net Zero Carbon.

NTU has set out key milestones to reach on the journey to net zero carbon. Initially, a 24% reduction against the new baseline is proposed, assuming an annual target reduction of 6% in the subsequent four years from 2020/2021. This is summarised below:

Milestone 1

By 2025, to deliver a 24% reduction in NTU's total carbon emissions against a 2018/2019 baseline

Milestone 2

By 2030, to deliver a 50% reduction in NTU's total carbon emissions against a 2018/2019 baseline

Milestone 3

By 2040, to achieve net zero carbon emissions across our built estate, 10 years ahead of the UK Government's 2050 legally binding target

During 2021/22, our carbon emissions have risen by 21%, from the baseline of 74,782 tCO_2e (tons of carbon dioxide equivalent), to 90,801 tCO_2e. We remain committed to achieving a 24% reduction against the 2018/2019 baseline by 2025. Our emissions are broadly generated through four streams of activity: Supply Chain, Energy & Water, Travel & Transport and Partner Accommodation. For transparent reporting purposes, we have decided to keep "Working Elsewhere" an element of carbon emissions in the 2021/22 data (this was not included in the baseline) as university guidelines support hybrid working for staff.

We have four workstreams who are tasked with delivering a subset of our overall target. They have developed detailed action plans which set out specific and measurable activities to achieve their target carbon reductions. Oversight is through Work Streams reporting to – and challenge from – the Carbon Programme Group.

Authority Reporting Structure for Net Zero Carbon 2040

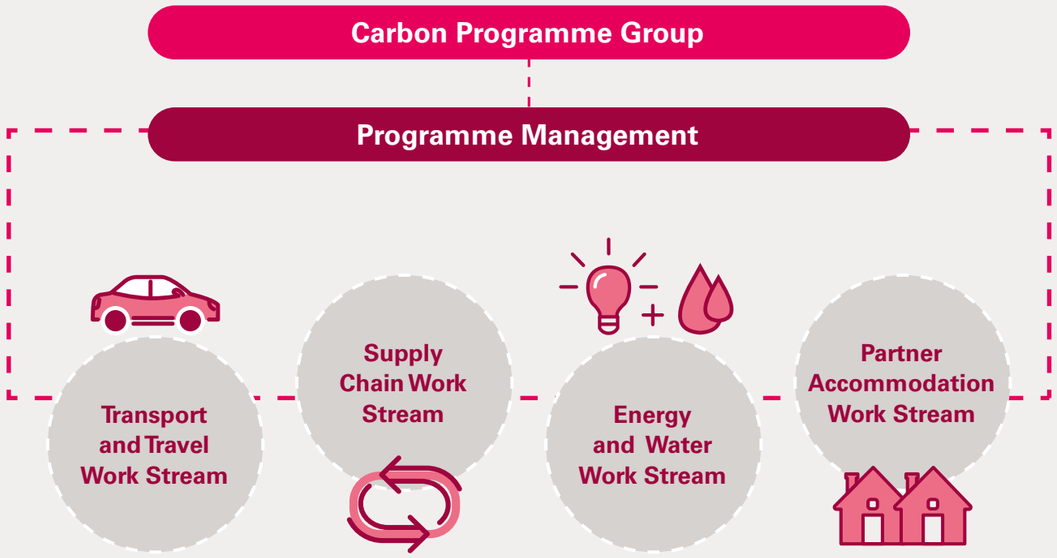


Figure 2, Authority and Reporting Structure for Net Zero Carbon 2040

Data Sources

Emissions Category	Sources of Data
Business Travel	• Calculated using data retrieved from from the NTU Finance Team (mileage claims), Diversity Travel bookings, Studylink bookings, and contracted coach, taxis and hire car suppliers • 2022 BEIS conversion factors used for each mode of transport
Commuting (Staff & Student)	• Modal split for travel from 2018/19 travel survey adjusted to take into account student/staff numbers in 2021/22 • Staff commuting estimated at 40%, due to hybrid working over 47 weeks (taking into account annual leave) • Includes student commuting from home address (one return trip from home post code). Using flights from the capital city of country of origin for international students and a post code model for home students • 2022 BEIS conversion factors used for each mode of transport
Energy Use	• kWh of electricity, gas, district heat, CHP and renewable generation from meter reads (manual and automated) and energy invoices then processed using Systemslink (Estates) • Data on the litres of purchased fuel (provided by Campus Services) • Data on refrigerant gas emissions extracted from leak testing records and servicing (Estates) • All data sources converted to tCO_2e using 2022 BEIS carbon conversion factors
Partner Accommodation (UPP & NTSU Buildings)	• Electricity, gas and district heat consumption retrieved by Estates for NTU supplied energy and UPP's energy team • Converted to tCO_2e using the 2022 BEIS carbon conversion factors
Supply Chain	• North-Eastern Universities Purchasing Consortium (NEUPC) • tCO_2e emissions are associated with institutional procurement spend • Carbon conversion factors updated in October 2021
Waste & Recycling	• Waste composition and disposal methods from main University waste contractors • Converted to tCO_2e using the 2022 BEIS carbon conversion factors for each waste type
Water	• Water consumption in m^3 provided, presumed equivalent waste water generation (Estates) • Converted to tCO_2e using the 2022 BEIS carbon conversion factors
Well-to-Tank and Transmission & Distribution	• Electricity, gas, district heating, fuel & biomass consumption for managed estate retrieved (Estates) • Converted to tCO_2e using the 2022 BEIS carbon conversion factors
Working Elsewhere	• Staff working from home estimated at 60% over 47 weeks, with 19 weeks considered to be 'heating weeks' • Converted to tCO_2e using the 2022 BEIS carbon conversion factors for home working

Changes in Methodology

Emissions from Well-to-Tank (WTT) and Transmission & Distribution (T&D) have been added to the carbon footprint this year. WTT and T&D emissions have also been retrospectively added to the previous years, up to the 2018/19 baseline. NTU has been purchasing a green electricity tariff backed by Renewable Energy Guarantees of Origin (REGO) certificates for a number of years which reduces our market-based carbon emissions. This year the reduction in emissions from REGO certificates has been included in the carbon report. We have also backdated the REGO certificates to the baseline year.

NTU's Carbon Footprint for the Baseline Year (2018/19) and 2021/22

During 2021/22, total emissions increased compared to the previous year, despite a small decrease in emissions from scopes 1 and 2. Due to the COVID-19 restrictions that were in place during 2020/21, which resulted in more working off campus and less travelling for commuting or business, an increase in most categories was expected. Compared to the baseline, emissions from student commuting, supply chain, waste, WTT and T&D have risen, however there have been falls in all of the remaining categories. We will continue to ensure that we have actions in place to reduce emissions in line with the agreed carbon reduction targets.

2018/19

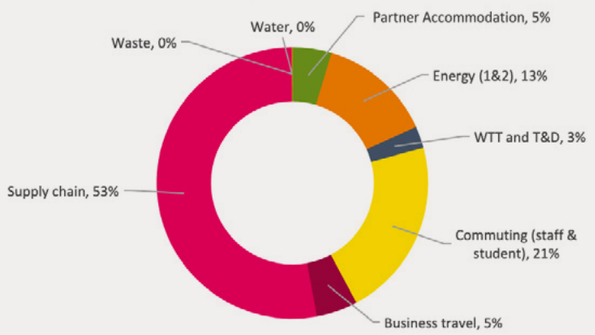


Figure 3, NTU's Carbon Footprint (tCO_2e) Baseline Year 2018/19

2021/22

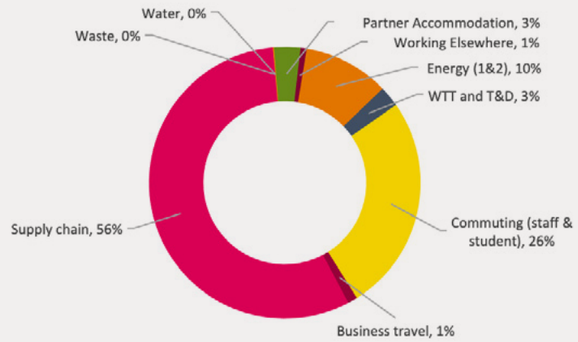
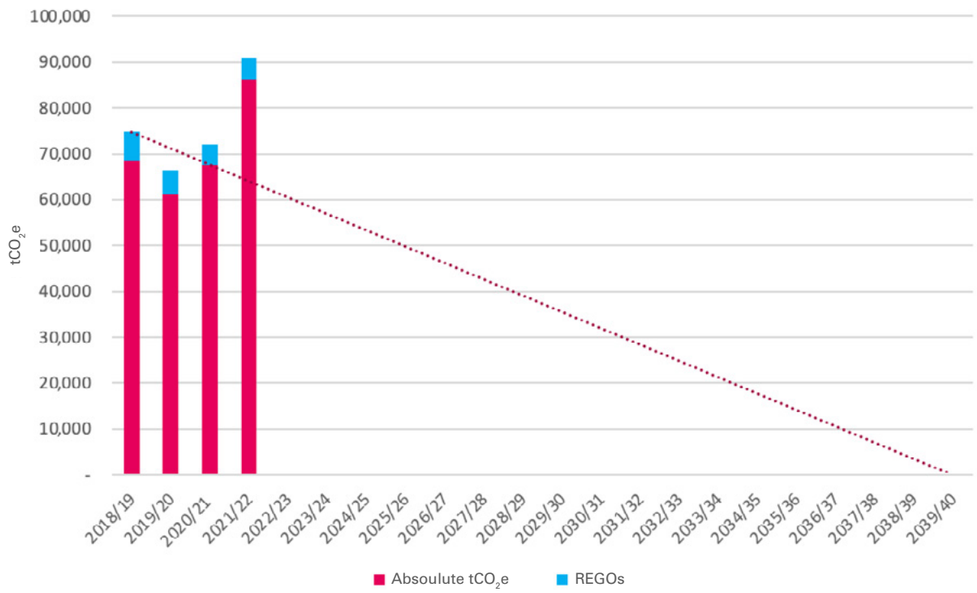


Figure 4, NTU's Carbon Footprint (tCO_2e) 2021/22

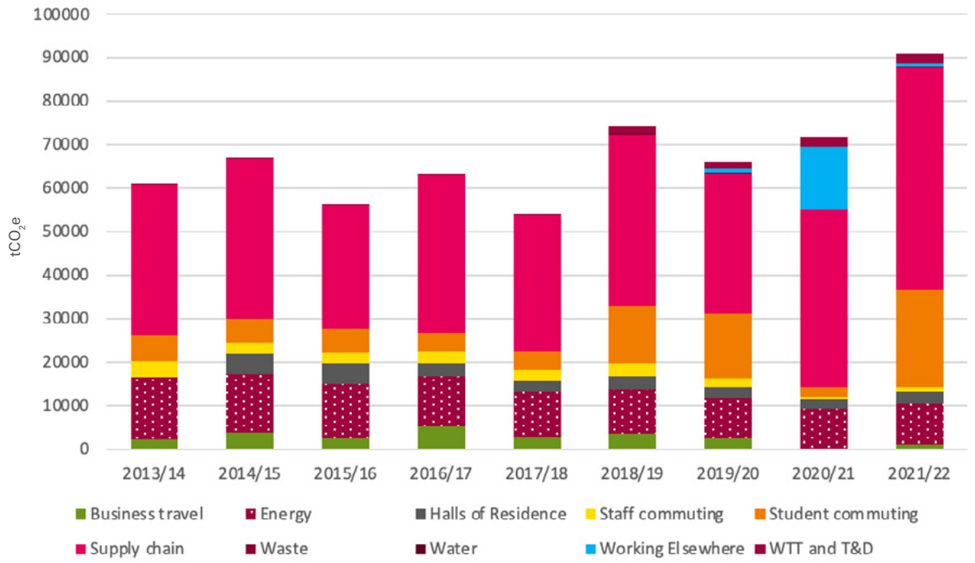
NTU's total Carbon emissions, using 2018/19 baseline, against NZC 2040 milestone targets

Figure 5, NTU total Carbon emissions against Net Zero Carbon 2040 milestone targets



Summary of NTU's Carbon Footprint 2013/14 to 2021/22

Figure 6, NTU's Carbon Emissions since 2013-14



Scope 1 and 2

Historic Summary of Carbon Emissions Associated with NTU's Energy or Scopes 1 & 2 Carbon Emissions, using 2005/06 baseline

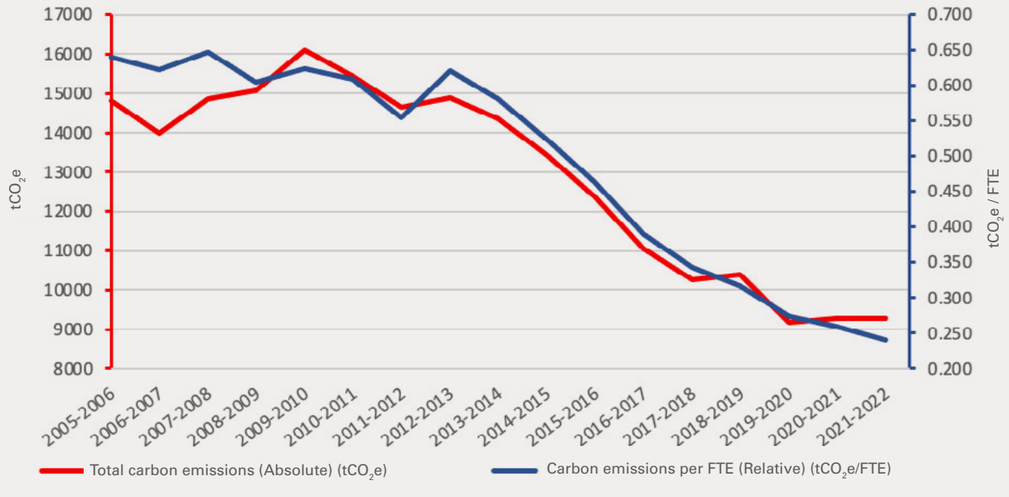
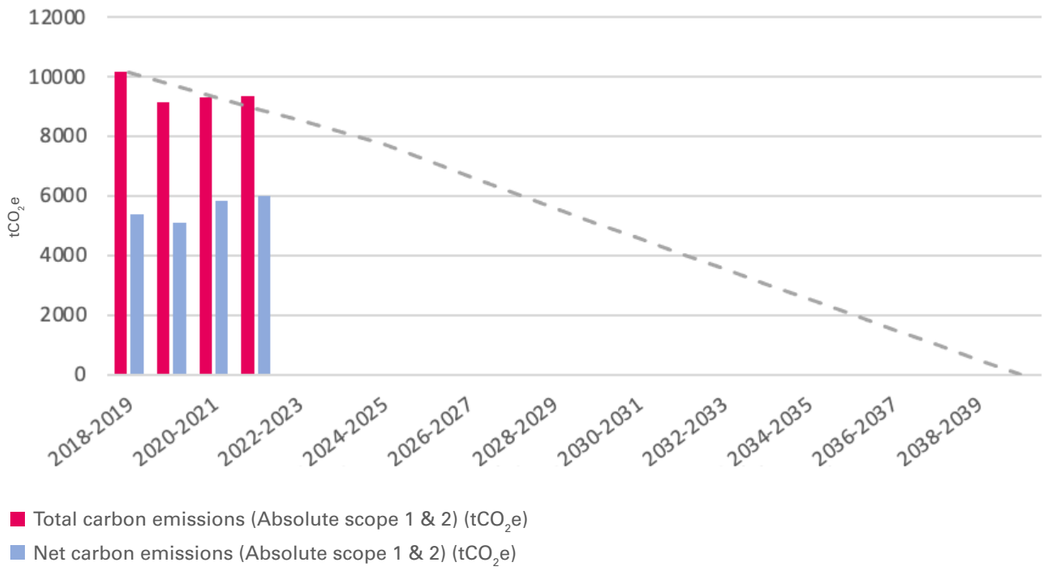


Figure 7, NTU's Scope 1 & 2 Carbon Emissions

NTU's scopes 1 and 2 carbon emissions arise from a range of different types of energy usage. This includes electricity, natural gas, district heating, fuel usage for NTU-owned vehicles, biomass and refrigerant leaks. For 2021/22, absolute emissions were 9,284 tCO_2e which is a small decrease from the previous year, 9,293 tCO_2e, with relative emissions per FTE also falling to 0.24 from tCO_2e per FTE from 0.25 tCO_2e per FTE in the previous year. In 2021/22, PV panels on site generated over 300,000 kWh of electricity which equates to a saving of 59 tCO_2e.

REGO Certificates

Figure 8, NTU's Carbon Footprint (Scope 1 & 2) managed estate



NTU has been purchasing green electricity backed by Renewable Energy Guarantees of Origin (REGO) certificates for a number of years in order to ensure that the electricity it purchases is produced from renewable sources. The graph above shows NTU's net carbon emissions once these carbon credits have been included.

Business Travel

In 2021/22, business travel emissions increased considerably compared to 2020/21 with Covid-19 restrictions lifting, however they have still remained significantly lower than the pre-pandemic years. Emissions from flights were responsible for the highest percentage of business travel emissions. Flight data includes all domestic, short and long-haul flights and includes flights from both staff and students for university business.

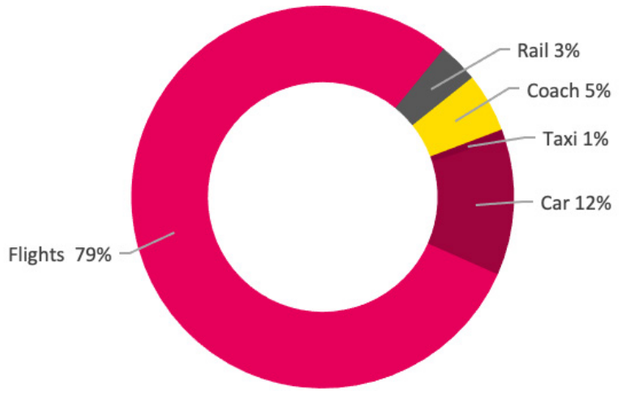


Figure 9, Business Travel

Mode of Transport	tCO_2e
Bus/Tram	0.35
Car	120.96
Coach	51.80
Flights	825.43
Motorcycle	0.07
Rail	35.05
Taxi	7.54
Total	**1,041.21**

Commuting

Car travel is the primary source of carbon emissions from students daily commuting, accounting for 69%, followed by bus/coach travel which accounts for 24%. When calculating the daily commuting emissions for staff, hybrid working has been considered and based on the results from the recent travel survey it has been assumed that staff commute into the university 2 days a week. Car travel is also the primary source of carbon emissions for staff daily commuting at 81%.

International and domestic student travel to and from NTU from home is assumed to take place at the beginning and end of the year. For the purposes of this report, we assume students have made this return journey once per academic year. The emissions from the international students' flights accounts for 93% of the students' commuting from home emissions and just over 65% of the total combined emissions.

Mode of Transport		tCO2e		
		Staff	Students	Combined
Daily Commuting	Bus or coach	136	1,432	1,554
	Car (Passenger or Driver)	933	4,078	4,921
	Motorcycle	4	9	13
	Rail	51	312	358
	Taxi	2	23	24
	Tram	14	82	95
	Van	7	2	8
Daily Commuting	Domestic Students (Travel from home)	-	23,436	23,436
	International Student (Flights to/from home capital to Heathrow at start/end of year)	-	15,255	15,255
Total		**1,146**	**22,291**	**23,436**

Student Daily Commuting

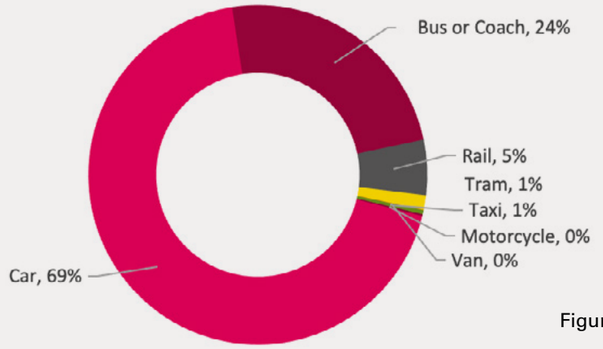


Figure 10, Student Daily Commuting tCO_2e

Student Commuting from Home

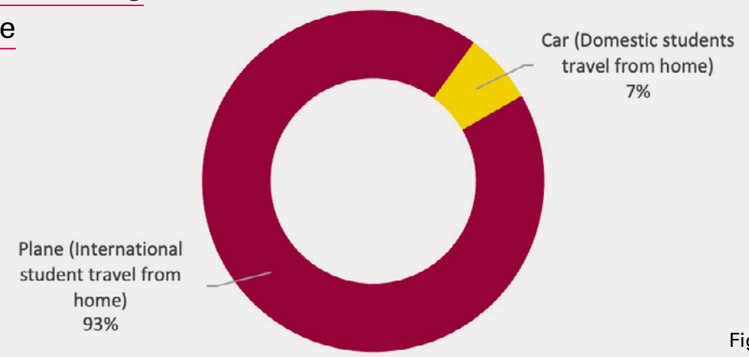


Figure 11, Student Commuting from Home tCO_2e

Staff Commuting

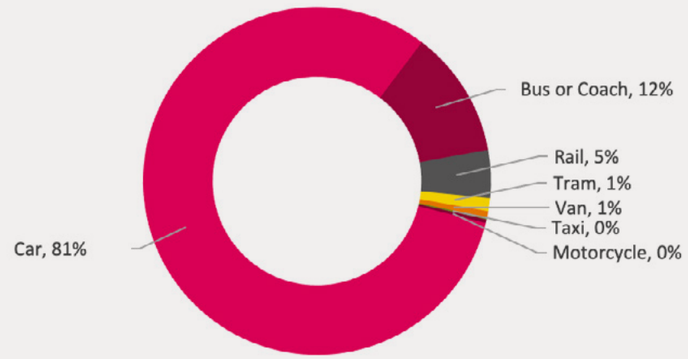


Figure 12, Staff Commuting tCO_2e

Partner Accommodation

University Partnerships Programme (UPP) manage the majority of NTU's Halls of Residence, comprising a total of 4,404 beds. Three of the halls (Byron, Hampden Hall and Sandby Hall) are connected to the Nottingham District Heating Network. Peverell, Blenheim and Norton Court Halls run on electricity only. It should be noted that several halls have utilities partly or fully managed independently of NTU, for example, Blenheim, New Hall, Norton Court, Maltings, Meridian and Simpsons. Dashes denote this fuel is not in use in the table below.

UPP Halls of Residence

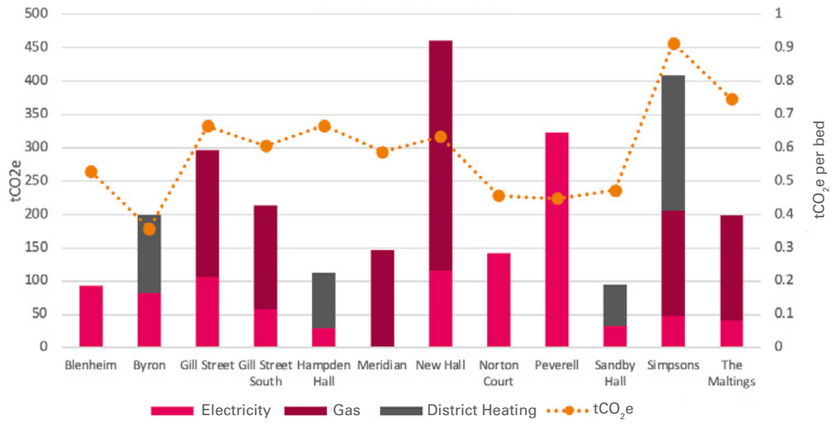


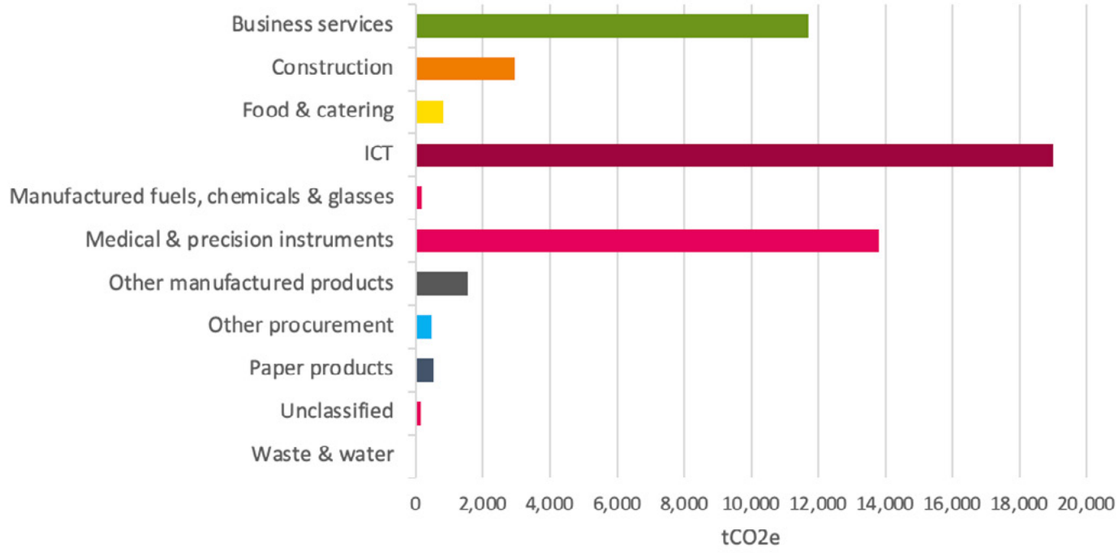
Figure 13, External Halls of Residences tCO_2e

Location	No of Beds	Electricity from Grid (tCO_2e)	Gas Burning (tCO_2e)	District Heating (tCO_2e)	tCO_2e per bed
Blenheim	177	94	-	-	0.53
Byron	559	83	-	117	0.36
Gill Street	446	107	189	-	0.67
Gill Street South	352	58	156	-	0.61
Hampden Hall	168	29	-	82	0.67
Meridian	250	20	147	-	0.59
New Hall	727	115	345	-	0.63
Norton Court	312	143	-	-	0.46
Peverell	722	323	-	-	0.45
Sandby Hall	199	32	-	62	0.47
Simpsons	226	47	159	-	0.91
The Maltiwngs	266	41	157	-	0.75
Beneson (NTSU)	-	30	50	-	-
Byron (NTSU)	-	222	-	40	-
Total for Partner Accommodation	**4,404**	**1,345**	**1,204**	**300**	**Total emissions**
					2,849

Supply chain

During 2021/22, NTU spent approximately £74.9m on goods and services, an increase from £68.9m in the previous year. This spend is split into categories with an associated carbon conversion factor. The data excludes business travel and utility costs to avoid double counting, as energy costs are included in scope 1 and 2 reporting and business travel is reported as part of scope 3. The results of NTU's spend analysis can be seen below:

Figure 14, Supply Chain tCO_2e



Total Procurement Emissions tCO_2e = 51,191.57

Waste

In 2021/22, NTU produced approximately 1,035 tonnes of waste, accounting for 66 tCO_2e.In addition to waste segregated onsite, our waste contractor further segregated waste materials, resulting in approximately 93% of NTU's waste being diverted from landfill in 2021/22.

2018/19

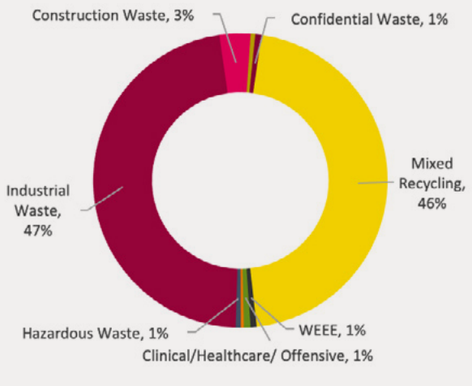


Figure 15, Waste tCO_2e

Waste Category	tCO_2e
Clinical/Healthcare /Offensive	0.48
Confidential Waste	0.45
Construction Waste	2.26
Food	0.22
Glass	0.33
Hazardous Waste	0.37
Industrial Waste	31.24
Mixed Recycling	30.39
WEEE	0.44
Total	**66.18**

Water

In 2021/22, NTU used 87,928 m3 of water in the Managed Estate. Carbon emissions from water are composed of emissions from both supplied water and treated water.

Water Supply tCO_2e	Water Treatment tCO_2e	Total
13.10	23.92	**37.02**

Well-To-Tank and Transmission & Distribution

Well-to-Tank and Transmission & Distribution emissions account for the emissions related to the production of fuels and energy purchased and consumed by the university that are not included in scopes 1 and 2. In 2021/22, this category was responsible for 2,241 tCO_2e, which is a slight increase from 2,187 tCO_2e in the previous academic year.

WTT (Scope 1) tCO_2e	WTT and T&D (Scope 2) tCO_2e	Total
871.20	1,369.49	**2,240.69**

Working Elsewhere

During the COVID-19 pandemic, University staff were encouraged to work from home wherever possible, and since then University guidelines allow staff to hybrid work. The most recent travel survey showed that on average staff only travel onto campus twice a week, so it was therefore assumed that staff work from home 60% of the week. Due to lectures reverting back to in person teaching this year, emissions relating to students working elsewhere has been removed.

Annual electricity tCO_2e for all staff	Annual heating tCO_2e for all staff	Total
132.60	522.26	**654.81**

Next Steps

Carbon emissions target of 24% reduction by 2025 has been set as milestone for NZC. We remain committed to achieving this target and have projects in place across the different workstreams that will deliver carbon savings.

Appendix

1. Total scopes summary:

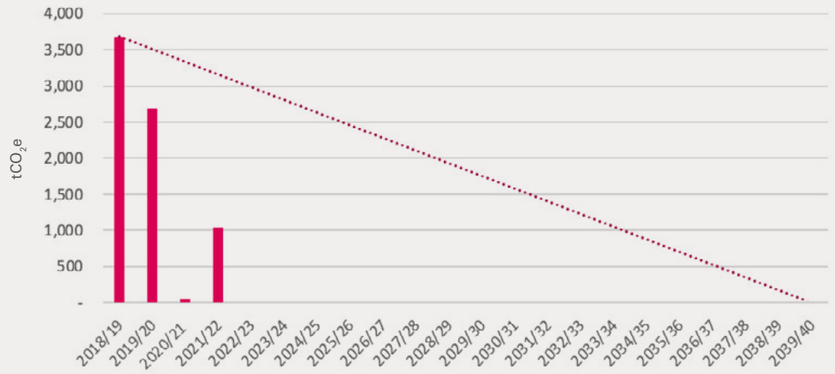
Year	Total Scopes 1 & 2 (tCO_2e)	Total Scope 3 (tCO_2e)	Total tCO_2e All Scopes	Staff and Student FTE	Scope 1 & 2 emissions/ FTE	Scope 1, 2 & 3 emissions/ FTE
2005/06	14819		14819	23169	0.64	
2006/07	13977		13977	22474	0.62	
2007/08	14868		14868	22987	0.65	
2008/09	15076		15076	24906	0.61	
2009/10	16098		16098	25797	0.62	
2010/11	15432		15432	25338	0.61	
2011/12	14653	41889	56542	26415	0.55	2.14
2012/13	14882	47556	62438	23995	0.62	2.60
2013/14	14355	46663	61018	24713	0.58	2.45
2014/15	13420	53382	66802	25634	0.52	2.60
2015/16	12389	43830	56219	26747	0.46	2.10
2016/17	11460	51444	62904	28392	0.40	2.22
2017/18	10239	43711	53950	29877	0.34	1.81
2018/19	10150	64632	74782	31990	0.32	2.34
2019/20	9126	57316	66443	34039	0.27	1.95
2020/21	9293	62836	71130	37630	0.25	1.89
2021/22	9284	81695	90979	38579	0.24	2.36

2. Total scope 2021/22 emissions compared to 2018/19 baseline and 2024/25 milestone target

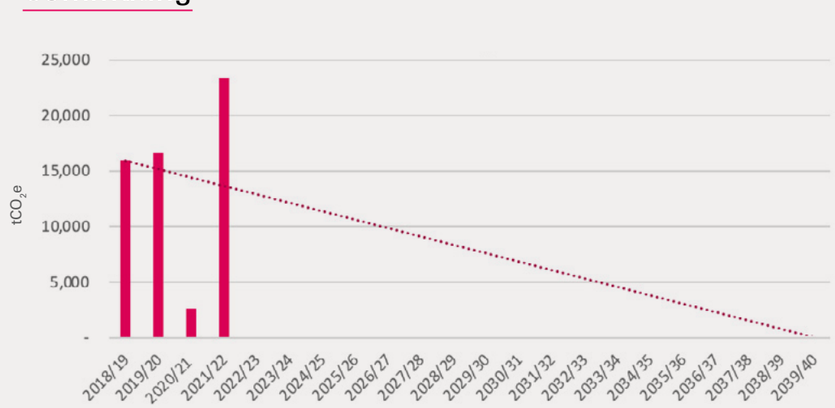
Workstream	2018/19 Baseline emissions (tCO_2e)	Actual 21/22 emissions (tCO_2e)	% Difference	2024/25 Target (Milestone 1)	Carbon Emissions Scope
Energy Use	10,150.00	9,293.00	-9%	7,714.00	1 & 2
Business Travel	3,681.90	1,041.21	-72%	2,798.24	3
Commuting (Staff & Students)	15,967.02	23,311.89	+46%	12,134.92	3
Partner Accommodation (UPP & NTSU Buildings)	3,466.00	2,849.16	-18%	2,634.16	3
Supply Chain	39,501.00	51,369.65	+30%	30,020.76	3
Water	44.00	37.02	-16%	33.44	3
Waste and Recycling	23.54	66.18	+181%	17.89	3
Well-to-tank & Transmission + Distribution	1,948.25	2,240.69	+15%	1,480.67	3
Working Elsewhere*	N/A	654.81	N/A	N/A	3
Total	**72,833.46**	**90,979.11**	**+22%**	**55,353.41**	

3. Individual Work Stream emissions with Net Zero Carbon 2040 milestones against a 2018/2019 baseline

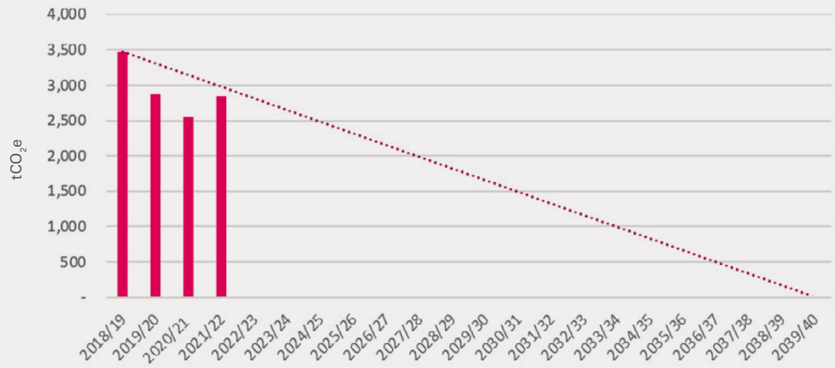
Business Travel



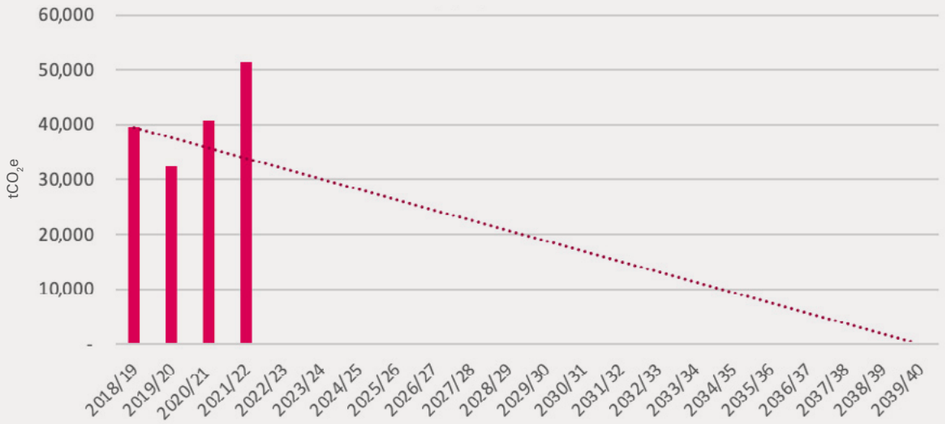
Commuting



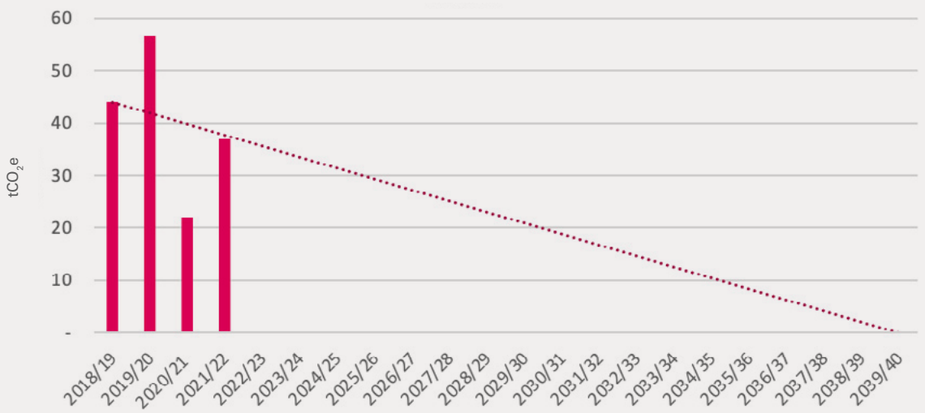
Partner Accommodation



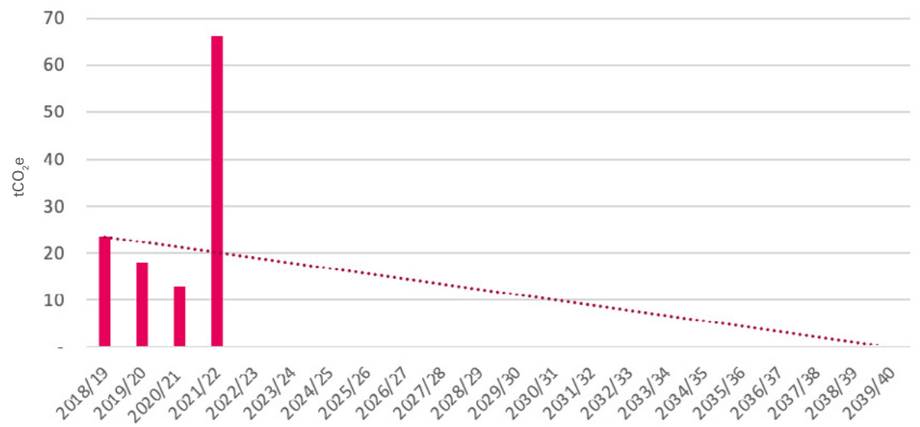
Supply Chain



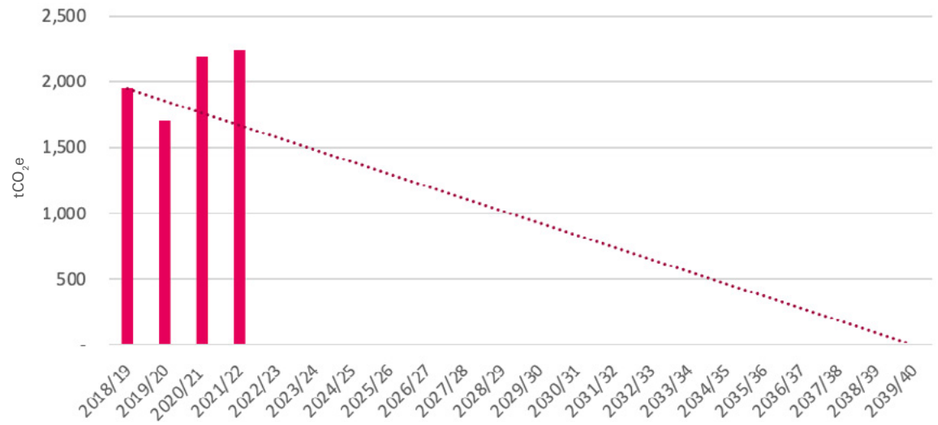
Water



Waste



WTT and T&D



Get in touch and get involved.

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