Annual Carbon Management Report 2021/22

Air Source Heat Pumps being lifted on City Campus East – April 2022

Northumbria University NEWCASTLE

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Carbon Manager

Our Carbon Commitment

Northumbria University recognises the need for urgent action to reduce carbon emissions to tackle dangerous climate change. Our aim for 2030, detailed in our Carbon Management Strategy, is to have a highly efficient and low carbon University that leads the way in delivering real reductions in energy consumption and carbon emissions, and which puts the University on a trajectory to achieve Net Zero Carbon by no later than 2040.

Summary

- **61% reduction in Carbon Emissions since 2015**
  - **22% reduction in gas consumption**
  - **30% reduction in electricity consumption**
- **15% increase in emissions compared to previous year – due to COVID lockdowns in previous year**
- **580 tonnes CO_2e below 2021/22 Target**
- **30% reduction in water consumption since 2016**
- **First major Heat Decarbonisation project completed on City Campus East**

2021-22 was the first full year without COVID lockdowns and building closures since 2018/19. As a result, emissions are higher than the previous two years, but we remain below our target for the year, and are on course to meet our 2030 80% reduction target.

Over the past year we have carried out projects including LED lighting upgrades and Building Management System improvements to improve energy efficiency and reduce energy use, as well as our first Heat Decarbonisation project; installing over 1MW of Air Source Heat Pumps on City Campus East. This exemplar project was aided with a £1.7m grant from the Public Sector Decarbonisation Scheme and will reduce carbon emissions by 300 tonnes per year. We are also developing a Heat Decarbonisation Strategy for all of the buildings on City campus, to determine the most effective method of removing fossil fuels from our heating systems.

Carbon Emissions 2021-22

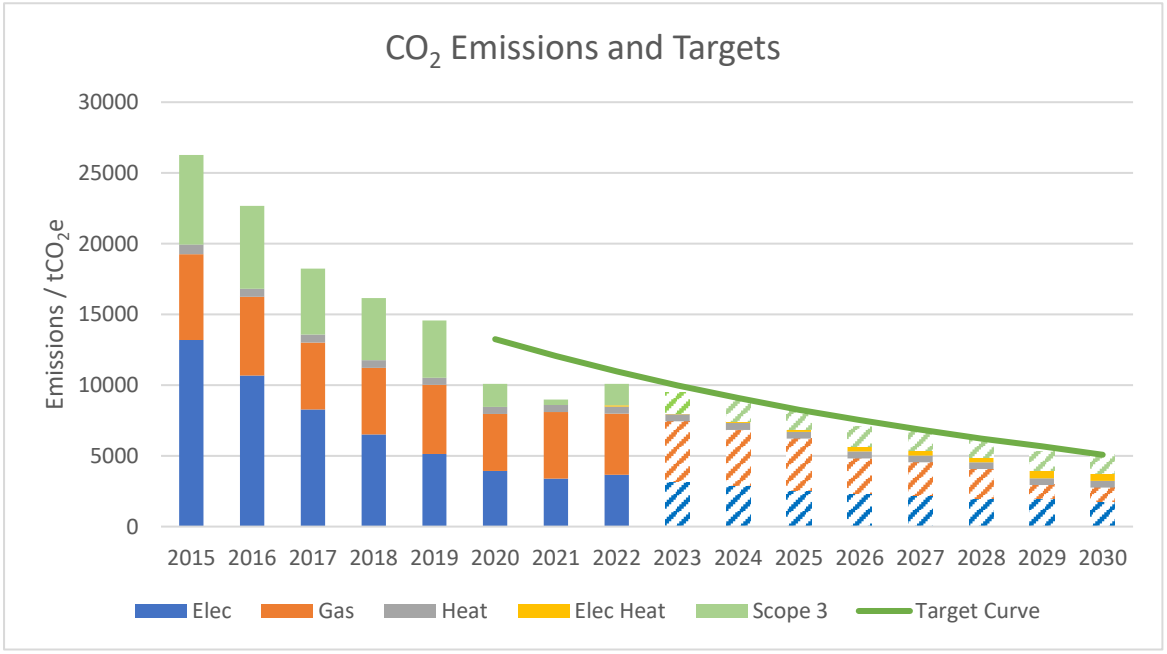
We report on Scope 1, Scope 2 and a selection of Scope 3 emissions which we have reliable data for. These include those from: gas, electricity, petrol, diesel and heat purchased from the Trinity Square heat network, refrigerant gases, business travel, waste, water and electricity transmission losses.

The baseline year for these emissions, which we report against annually, is 2014/15.

All of our electricity is purchased through "Green" energy tariffs, but we report emissions as grid average.

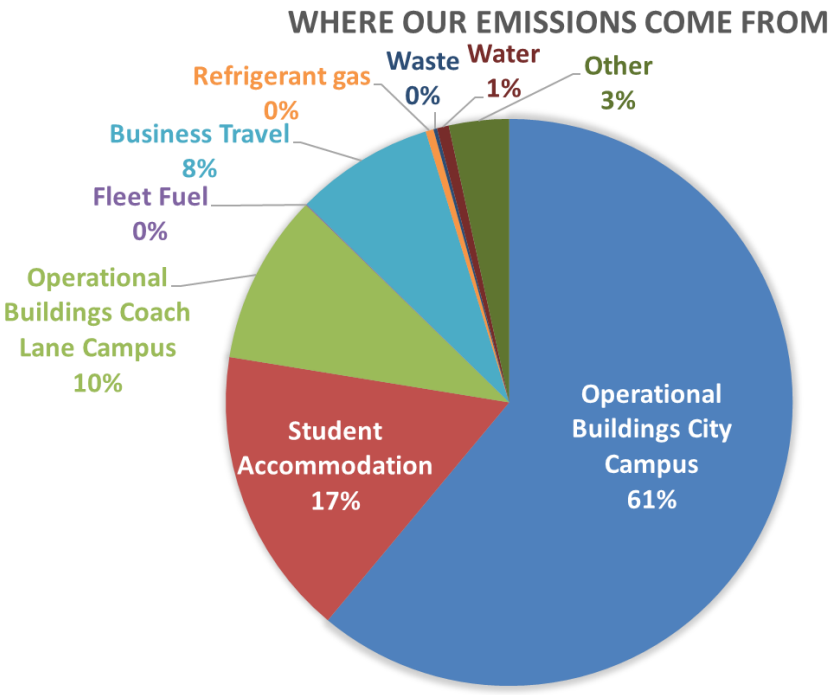
		Emissions 2014/15	Emissions 2015/16	Emissions 2016/17	Emissions 2017/18	Emissions 2018/19	Emissions 2019/20	Emissions 2020/21	Emissions 2021/22	Units
Scope 1	Gaseous fuels	6,059	5,570	4,725	4,725	4,791	4,029	4,712	4,663	tCO_{2e}
	Vehicle fleet	65	19	18	27	26	19	19	28	tCO_{2e}
	Refrigerant Gases	107	153	106	225	72	19	13	47	tCO_{2e}
	Total	**6,231**	**5,742**	**4,849**	**4,978**	**4,889**	**4,067**	**4,744**	**4,738**	**tCO_{2e}**
Scope 2	Purchased electricity (Grid)	13,189	10,670	8,278	6,507	5,118	3,943	3,396	3,878	tCO_{2e}
	Purchased electricity (Other)	0	0	0	0	0	0	0	0	tCO_{2e}
	Heat purchased	686	579	569	540	507	498	492	492	tCO_{2e}
	Total	**13,875**	**11,248**	**8,847**	**7,047**	**5,625**	**4,441**	**3,888**	**4,370**	**tCO_{2e}**
Scope 3	Business Travel	5014	4,616	3,603	3,560	3,420	1,134	15	840	tCO_{2e}
	Water	213	238	243	231	160	126	56	70	tCO_{2e}
	Waste	26	26	34	32	30	23	15	21	tCO_{2e}
	Other	1,087	965	774	554	434	339	300	355	tCO_{2e}
	Total	**6,340**	**5,845**	**4,654**	**4,377**	**4,044**	**1,622**	**386**	**1,286**	**tCO_{2e}**
Total emissions		**26,446**	**22,835**	**18,349**	**16,402**	**14,558**	**10,130**	**9,018**	**10,394**	**tCO_{2e}**

Our Carbon Emissions for 2021/22 were 10,394 tonnes CO_2e. This was a small increase on the two previous years, which were artificially low due to COVID restrictions which restricted travel and closed some buildings during lockdowns. However, despite this increase, emissions were 5% below the target for the year, which was 10,970 tonnes CO_2e.



Scope 1 and 2 emissions from electricity and gas were slightly higher than forecast for the year, partly due to additional ventilation required in buildings as part of the COVID risk mitigation measures.

Business Travel emissions were below forecast, as the number of flights had not increased following COVID restrictions by as much as predicted. However, business flights remain a big risk to future emissions targets. During 2021/22 there were 4.3 million kms travelled by air, which is significantly less than the 17.2 million kms travelled during 2018/19. To meet future targets flights must remain at least 50% lower than pre COVID levels.



Energy use

	kWh	litres	GJ
Electricity	20,054,433		72,196
Onsite Renewable Electricity	286,220		1,030
Gas	25,545,373		91,963
Heat Network	2,882,323		10,376
Fleet Fuel		8,938	367
Total			**175,933**

In line with our Net Zero carbon Strategy, our purchased electricity is from “Green” energy tariffs. Therefore, low carbon energy used was 73,226 GJ.

Looking Ahead

Work will continue to improve energy efficiency of the estate over the next year, as well as applying for PSDS Grant funding for low carbon heating. Planned projects include:

- LED Lighting projects – Sutherland Building, Winn Studios and New Bridge Street Accommodation
- Solar PV array on Wynne Jones
- Air Source Heat Pumps, LED Lighting and Solar PV array at Coach Lane East (subject to grant from PSDS Phase 3b)
- Upgrade of lab Fume Cupboards to Variable Air Volume (VAV)
- Upgrade of Ventilation Fans at City Campus East.

In addition to the above projects, in light of the current energy crisis, we will also be carrying out surveys to identify quick wins, such as PCs not currently turning off at night, lights not controlled by sensors and reviewing building opening times to reduce hours of operation where possible.

The move to Low Carbon Heating remains the biggest challenge to achieving out Net Zero targets. Work will continue to develop our Heat Decarbonisation Strategy for City Campus, alongside supporting Newcastle City Council's development of a citywide heat network.