

Annual Carbon Emissions Report 2017/18

And Carbon Management Action Plan 2018/19



**Northumbria
University**
NEWCASTLE

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Key Performance Indicators

Target	Description	Annual Progress	Annual % reduction Target	Annual % reduction Achieved	Overall Progress
Overall Reduction of Scope 1 & 2 emissions	32% reduction from 2005/6 baseline, with annual minimum year on year reductions of: <ul style="list-style-type: none"> 6% 2015/16 7.5% 2016/17 10% 2017/18 to 2019/20 		10%	13%	
Improved efficiency of buildings	Annual improvement in building efficiency (Scope 1 & 2 emissions per m ²) of at least 3%		3%	10%	
Overall Reduction of Scope 1, 2 and 3 emissions	Annual reductions in Scope 1, 2 and 3 emissions of: <ul style="list-style-type: none"> 4% 2015/16 5% 2016/17 7% 2017/18 to 2019/20 		7%	10%	
Improved efficiency per student	Reduce Scope 1,2 & 3 emissions per student by at least 3% per year		3%	11%	
Water reduction	Reduce water consumption by 2% per year from 2015/16		2%	5%	

Total Carbon Emissions for 2017/18

The scope of emissions includes all electricity and gas use, fleet fuel consumption, refrigerant gases for air conditioning units, heat purchased, water, waste, business travel and electricity distribution for the year 1st August to 31st July. It excludes emissions from procurement and commuting.

		Emissions 2014/15	Emissions 2015/16	Emissions 2016/17	Emissions 2017/18	Units
Scope 1	Gaseous fuels	6,059	5,570	4,725	4,725	tCO _{2e}
	Vehicle fleet	65	19	18	27	tCO _{2e}
	Refrigerant Gases	107	153	106	225	tCO _{2e}
	Total	6,231	5,742	4,849	4,978	tCO_{2e}
Scope 2	Purchased electricity (Grid)	13,189	10,670	8,278	6,507	tCO _{2e}
	Purchased electricity (Other)	0	0	0	0	tCO _{2e}
	Heat purchased	686	579	569	540	tCO _{2e}
	Total	13,875	11,248	8,847	7,047	tCO_{2e}
Scope 3	Business Travel	5014	4,616	3,603	3,560	tCO _{2e}
	Water	213	238	243	231	tCO _{2e}
	Waste	26	26	34	32	tCO _{2e}
	Other	1,087	965	774	554	tCO _{2e}
	Total	6,340	5,845	4,654	4,377	tCO_{2e}
Total emissions		26,446	22,835	18,349	16,402	tCO_{2e}

Summary

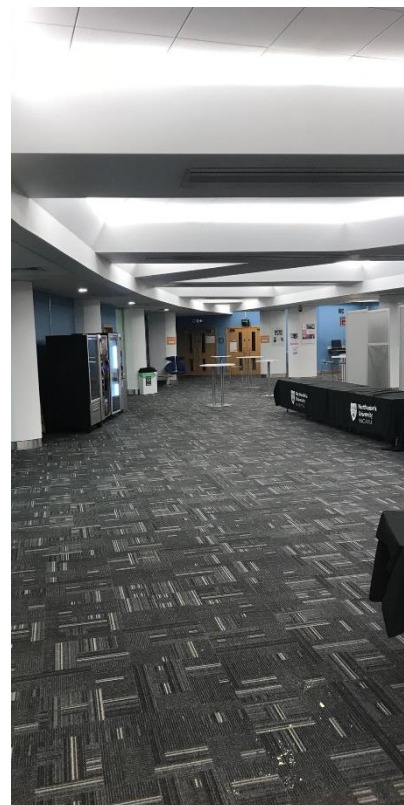
2017/18 has been another busy and successful year for our Carbon Management Programme. We have again exceeded our carbon reduction targets, with emissions now 30% below our 2005/6 baseline, despite a colder than average winter. Therefore, we should exceed our 32.5% reduction target in the next year, a year ahead of schedule. We have also had a good year of water reductions, and water use is down 5%, saving 11 million litres of water.

Projects have included:

- LED lighting and controls in City Campus East Law and Business building
- CoolPhase Free Cooling in Pandon Building
- Natural Ventilation in Northumberland Hub
- Improving Building Management Systems to control building services
- Monitoring of water meters and water surveys to find sources of water loss

Key achievements for the year include:

- Scope 1 & 2 emissions reduced by 13% (1,791 tonnes CO₂e)
- Total of all emissions reduced by 11% (1,947 tonnes CO₂e)
- Financial savings for the year of over £1m, compared to business as usual
- Over 2,300 lamps changed to LED
- Electricity consumption reduced by over 0.5 million kWh, equivalent to the electricity use of 125 houses
- Water use reduced by 11,000,000 litres, equivalent to 137,500 baths
- Green Gown Award Highly Commended in Carbon Reduction category



This work has also been helped by Green Impact Groups across the University. These groups help raise awareness of Sustainability issues amongst colleagues, and then take real action to make improvements in their teams.

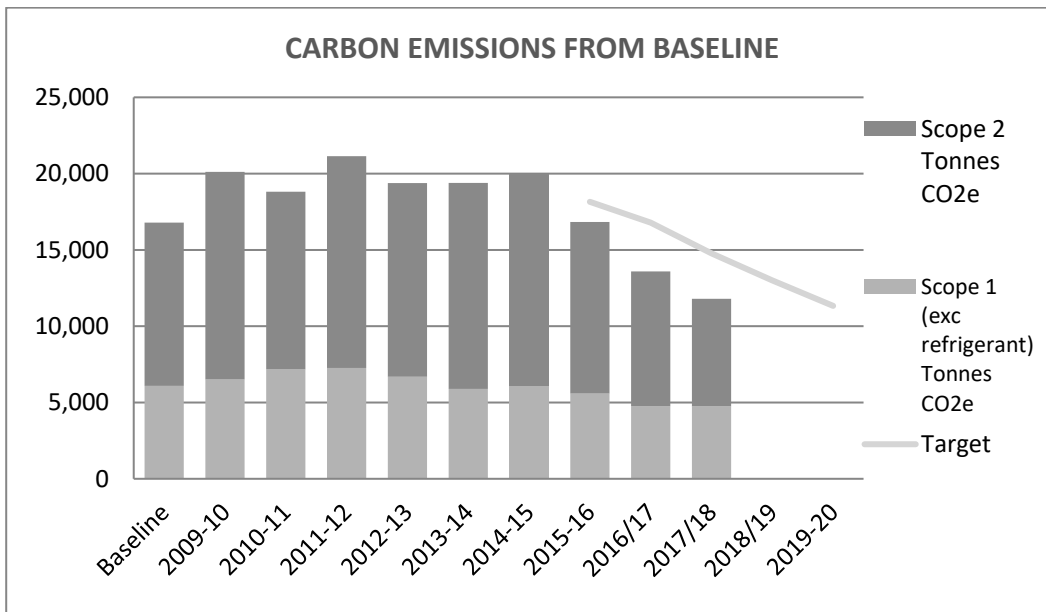


Scope 1 and 2 emissions

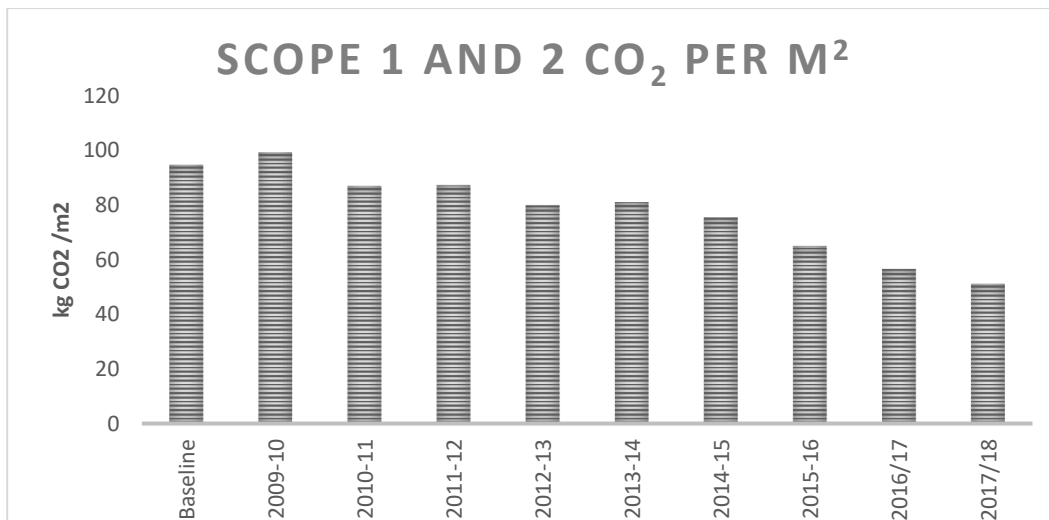
Scope 1 and 2 emissions cover the main emissions from our buildings and fleet vehicles: Gas, electricity, petrol, diesel and heat purchased from the Trinity Square heat network. These were the original emissions included in the 2005/6 baseline

Another successful year, with emissions reductions of 13%, exceeding our 10% annual target. This now means that we are now just 466 tonnes short of our 2020 target.

Emissions from electricity use were down by 21% as a result of reduced electricity consumption and helped by the decarbonisation of the electricity grid. Emissions from gas remained static compared to the previous year, as a result of the colder than average winter. Weather corrected data for gas suggests that we would have achieved a 7% reduction in gas consumption if winter temperatures had been the same as in 2016-17. The reduction in electricity and gas use resulted in costs avoided of over £1 million, compared to energy consumption in 2014/15. Over the last three years total costs avoided are in excess of £2 million.



To show the relative efficiency of our building stock, scope 1 and 2 emissions have been normalised against the total floor area of University buildings.



The graph above shows that the emissions per square metre fell by 10% in 2017/18 compared to the previous year. The carbon intensity of our building stock has now improved by more than 46% compared to the baseline year, falling to 51 kg CO₂/m².

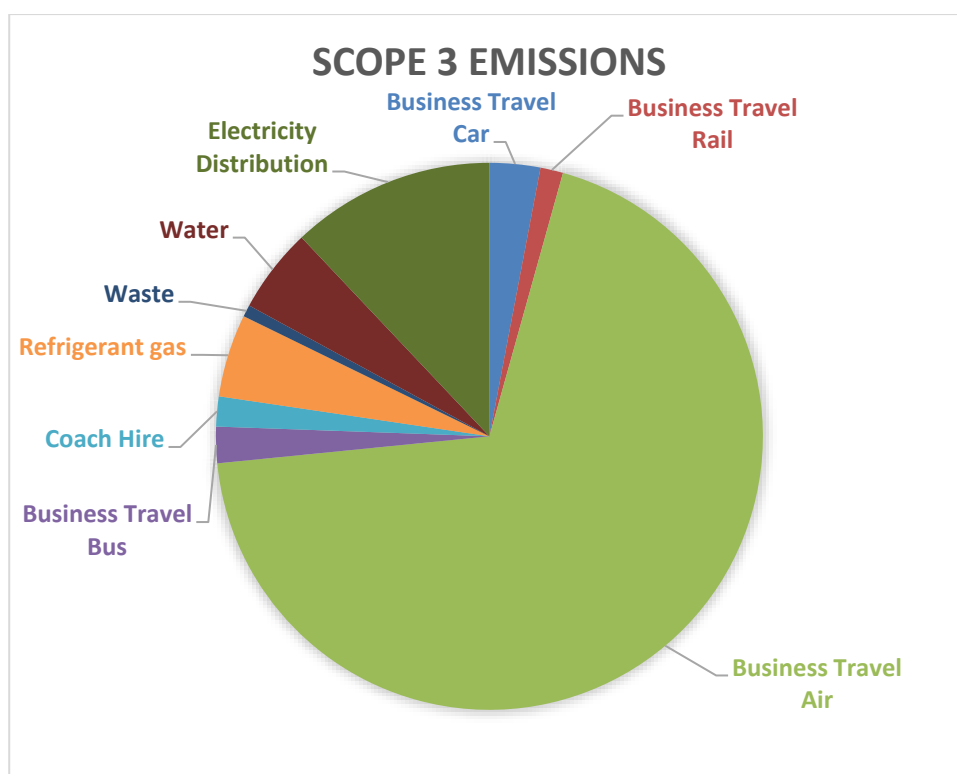
Scope 3 emissions

Scope 3 emissions include emissions from electricity transmission losses, business travel, waste disposal and water use. We have also included refrigerant gas in this section as it was not included in the original baseline. The baseline year for Scope 3 emissions is 2014/15.

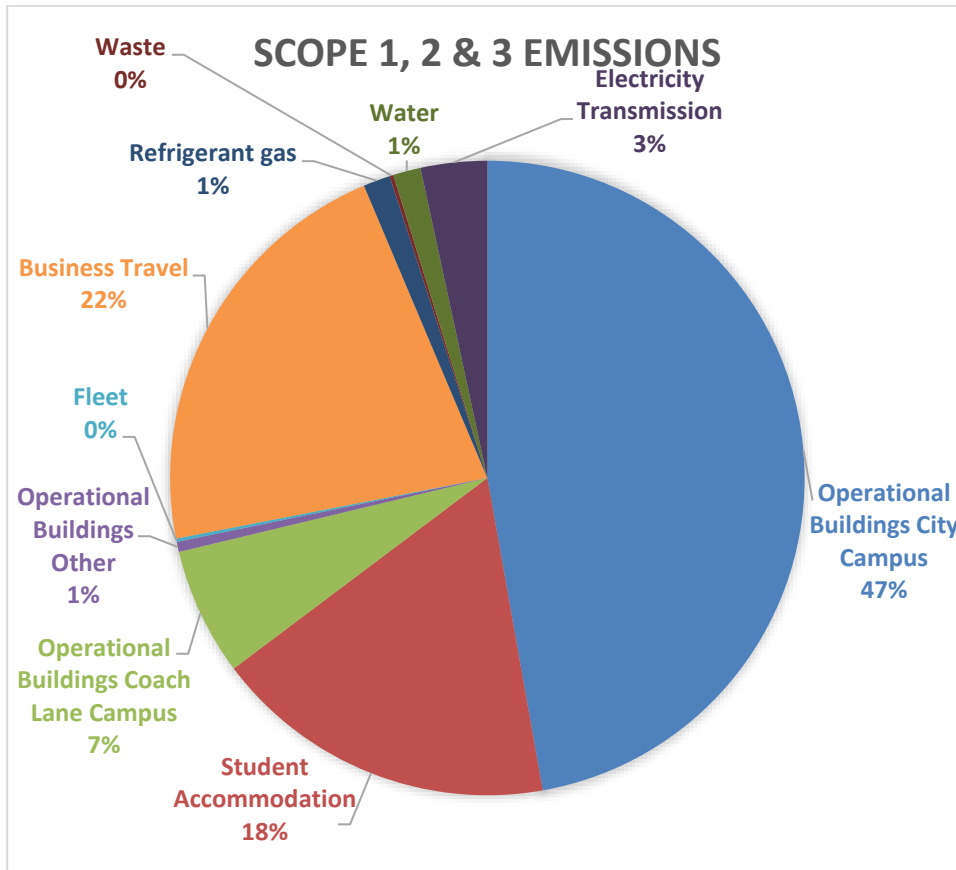
The emissions from these additional sources reduced by 3% compared to 2016/17. Emissions were 4,603 tonnes CO₂e, a reduction of 1,843 compared to the 2014/15 baseline.

Flights remained the highest source of these emissions, accounting for 69% of Scope 3 emissions, but they continued to decrease, with a 4% reduction over the year. Emissions from water use reduced by 5%, due to reduced consumption.

There were small increases in emissions from Car and Bus Business Travel and a large increase in emissions from Refrigerant gas (119 tonnes).

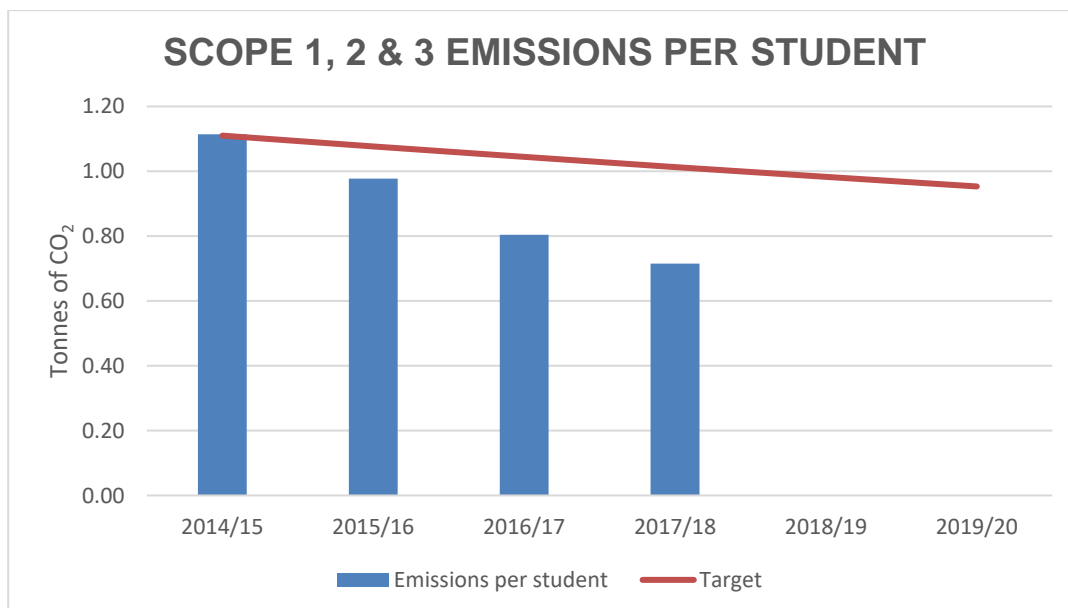


Total Emissions



The total footprint of reported emissions for 2017/18 was 16,402 tonnes of CO₂e. A reduction of 10%, 1,947 tonnes, compared to 2016/17. Well in excess of the 7% reduction target for the year, and equivalent to the annual emissions of around 500 houses.

To provide a benchmark which will allow for comparisons against growth, we also normalise total emissions against the total number of students. 2017/18 saw a 11% reduction in emissions per student, down to 0.7 tonnes per student.



Carbon Management Action Plan 2018/19

Although we have almost reached our overall 2020 target, the annual reduction target for Scope 1 and 2 emissions remains at 10%. This equates to over 1,100 tonnes of CO₂.

We expect decarbonisation of the electricity grid to provide further reductions in 2017/18 This could create savings of approximately 650 tonnes of CO₂.

The projects we are planning to achieve during 2018/19 include:

Project	Description	Capex (£000's)	Predicted annual saving	
			£	CO ₂ tonnes
Fume Cupboard Efficiency	To install fume cupboard controls which will reduce flow rates when not in use.	250	25000	180
Air conditioning Improvements	Carry out improvements or replacement of air conditioning units as recommended in TM44 reports	75	9000	41
LED lighting	PIR controls and LED	440	44500	135
Data Centre Cooling	Subject to feasibility - replacing air con with free cooling and evaporative cooling saving 90% (based on 75kW of cooling)	250	34000	120
BMS Improvements Phase 4	Continuing work to update BMS	250	50000	200
Solar PV array Ellison B and Sutherland	Part of CIS project to install 12 kW of PV	96	10,000	20
Whole Building Retrofit Phase 3	Carrying out multiple energy reduction measures in two buildings under energy performance contract	400	40,000	160
	TOTAL	1761	212,500	856

As can be seen above, the planned projects and grid decarbonisation get us above the 1,100 tonnes of carbon savings target. However, we do have challenges in the year ahead with increased energy consumption due to the opening of the new Sutherland extension and ongoing demand for increased 24/7 opening. But, with ongoing awareness campaigns and Green Impact Groups as well, we are confident of achieving our savings.

Additional projects to reduce Scope 3 emissions, supported the Environmental Sustainability Policy and supporting Action Plans, include:

- Water monitoring and targeting to reduce losses – Target to reduce water use by at least 2%
- Reduce waste – Target to reduce waste by 2%
- Reducing the impact of emissions from flights – Target to reduce emissions from business travel by 2%
- Reducing emissions from staff and student commuting – Target to reduce emissions by 3% by August 2020

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