PROGRESS AGAINST CARBON EMISSIONS TARGETS 2021-2022

Approved Oct 2022

In July 2019 the University declared a Climate Emergency. In September 2020 the University Executive Board approved a new Sustainability Strategy 2020 - 2030 which reviewed the carbon journey since 2008/9 baseline and projected, based on a 1.5-degree warming scenario, the university aims to reduce its direct and indirect GHGe emissions to be net zero by 2030 from a new baseline year 2018/19 where the total footprint is 21,931 tCO2e. The University will reduce its emissions by 50% and as a last resort will offset the remaining emissions in credible sector specific offsetting and carbon sequestration schemes. The following tables and charts show our performance against our overarching carbon emissions targets and year on year comparison. The University measures and reports on carbon emissions in three ways:

1. Absolute emissions

Scope 1 & 2 absolute emissions* (tCO2e) decreased 13% between 2020-21 & 2021-22 with a decline of 15% from the baseline year 2018/19. See figure 1. In absolute terms, the University's energy consumption of natural gas and electricity decreased from 16,380MWh in 2020/21 to 14,561MWh in 2021-22, representing an 11% absolute decrease in energy consumption during the period. To achieve Net Zero against carbon emission targets, energy will need to reduce on average by 8.4% against the 2018/19 baseline year. Heating/gas carbon emission baseline year figure of 1,782 CO2e will need to reduce an average of 149 GHGe tonnes per annum during the life of the strategy. Electricity carbon emission baseline year figure of 1,398 GHGe will need to reduce on average of 117 GHGe tonnes per annum. Gas, we are struggling, but this has been driven by increased ventilation requirements with COVID, requiring more energy to heat the rooms to acceptable temperatures while remaining well ventilated. Electricity we are performing well with reduced usage, and an ever-growing suite of PV installations across the university. The year was warmer with 14% fewer degree-days.

Fleet carbon emissions increased 80% from last year; but 47% down from our baseline, 2018/19, largely driven by a return to 'normality' following COVID

2. In relation to the number of students and staff at the University (tCO2e/FTE and kWh/FTE)

There has been a 6% decrease in the number of students and staff full-time equivalent (FTE) since 2018/19. In 2009-2010, the University had a space energy intensity of 288 kWh/m2 GIA which reduced to 156 kWh/m2 GIA in 2021-2022, representing a 46% improvement indicating carbon reduction measures implemented throughout the estate are working.

3. In relation to university buildings – floor space (tCO2e/sqm and kWh/sqm))

There has been a large 14% increase in the size of the estate gross internal area (GIA) m2 since last year and a 15% increase since the base year. This is driven by the recognition of Berrows house of which refurb/construction is being finalised, plus acquisition of other sites on Severn campus. These other sites are largely expected to be demolished, pending construction of 2 new teaching buildings in the upcoming years. We have 93,575 square metres of floor space on 3 major campuses.

Scope 3 indirect carbon emissions

Scope 3 emissions* have Increased by 35% since last year, but reduced by 1% from the base year (2018/19). This is due to much restoration of travel activity following Covid for business use. Staff and student commuting has been positive, with very good figures reported in the annual travel survey. Waste has seen a minor increase with more campus activity as the campus has become more active following COVID. Procurement has seen a large jump, driven by major capital projects, namely the construction / refurb of the New Medical School, scheduled to open next year. Full details are shown in the tables below. Procurement emissions are calculated using the HE sector HESCET tool

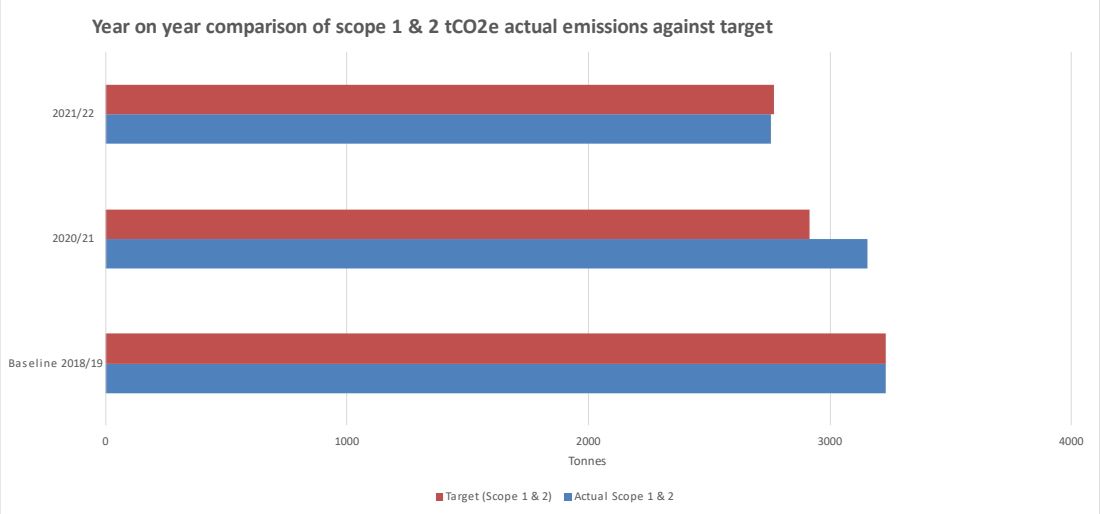

Figure 1: Year on year comparison of scope 1 & 2 carbon emissions (tCO2e) against target of 5% reduction from 2018/19 base year

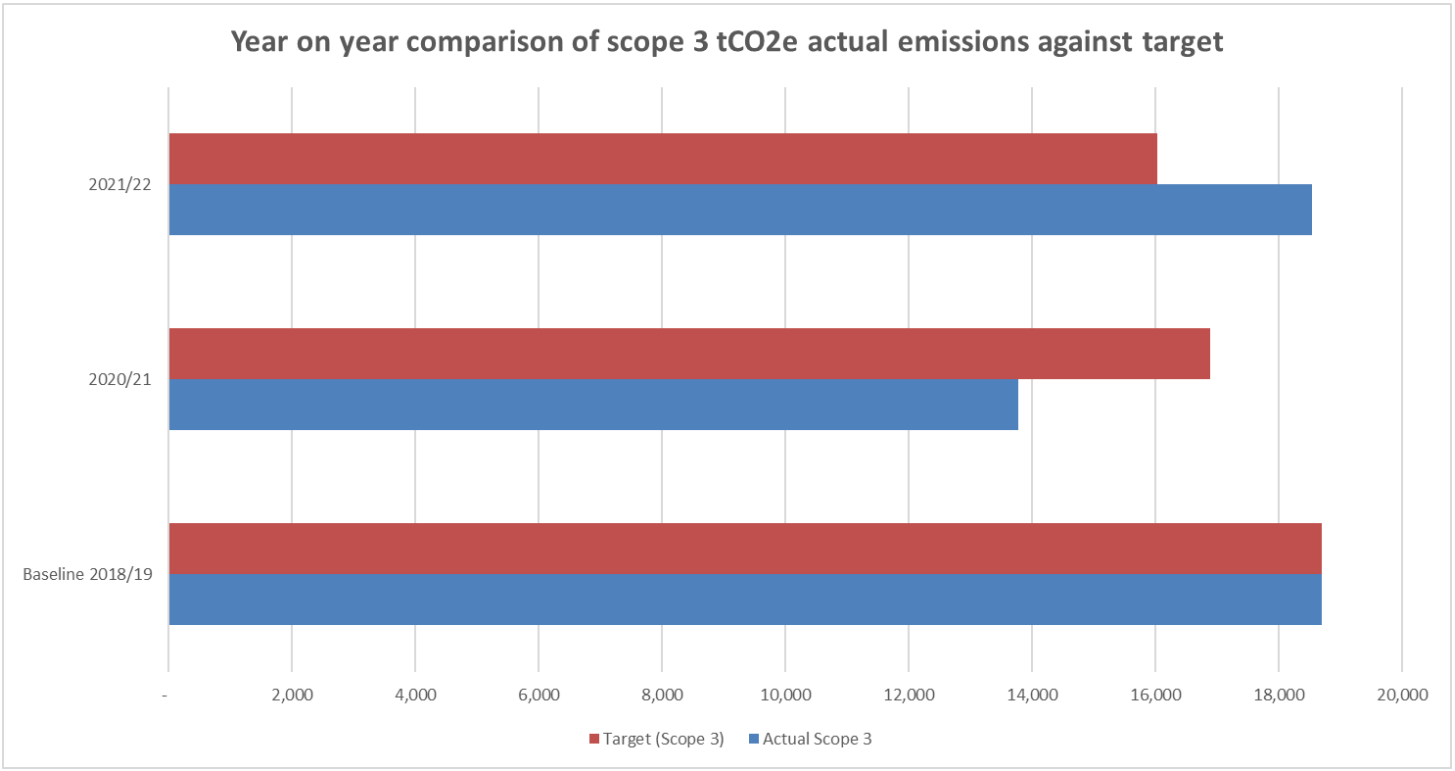

Figure 2: The graphs above show the university indirect (scope 3) carbon emissions tCO2e. Year on year comparison of carbon emission targets against our actual absolute emissions against target of 50% reduction from 2018/19 base year.

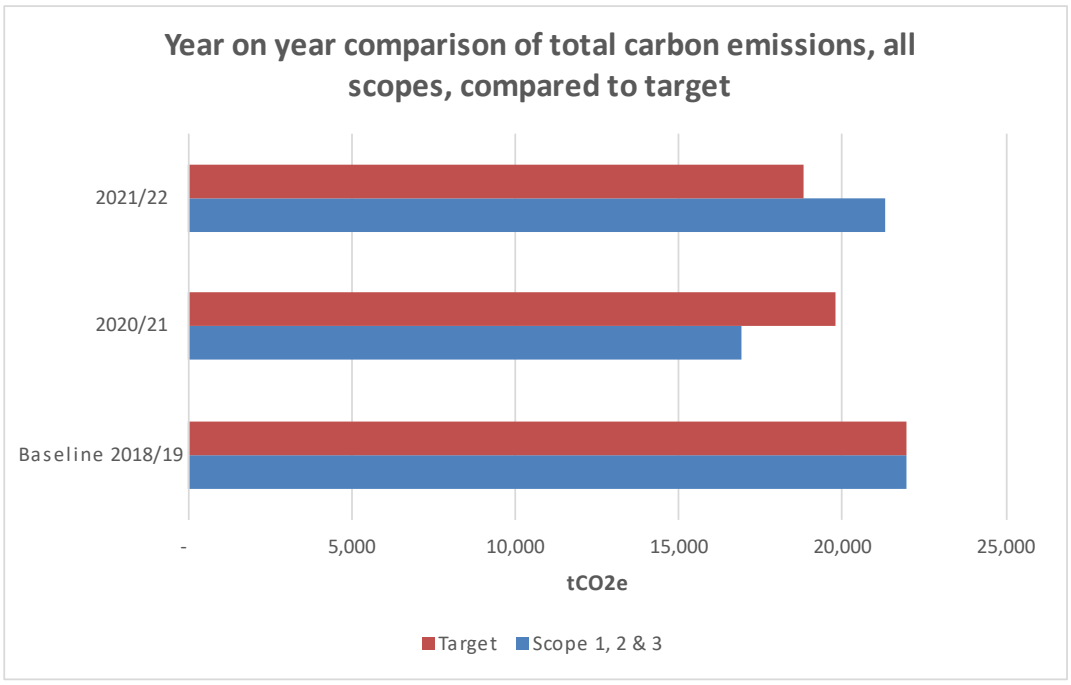

Figure 3: The graph above shows the university total carbon footprint for all scopes direct (scope 1 & 2) and indirect (Scope 3) carbon emissions. Year on year comparison of carbon emission targets against our actual absolute emissions against target of 50% reduction from 2018/19 base year.

Key: **RED** - does not meet target **AMBER** - needs monitoring **GREEN** - meets the target **GREEN★** - exceeds the target.
FTE = staff and students, GIA = Gross Internal Area.

Scope 1, 2 & 3 total emissions tCO2e

	Baseline 2018-19	2019-2020	2020-2021	2021-22	Progress against target 5% reduction in tCO2e from 2020/21	KEY
Actual	**21,931**	18,149	16,935	**21,291**	**26% Increase from last year. Decrease by 3% since baseline. Scope 1 & 2 positive, Scope 3 challenging following return to 'normality' following COVID and significant capital projects with the construction of the Medical School**	**RED**
Target	**21,931**	20,834	19,738	**18,803**		

Scope 1 and 2 total emissions tCO2e

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Progress against target 5% reduction in tCO2e from 2020/21	KEY
Actual	**3,230**	2,817	3,154	**2,754**	**13% reduction vs last year and 15% decrease from baseline. Gas high in 20/21 with increased ventilation required from covid, dealt with more efficiently 21/22. More PV Panels driving lower Electric Draw**	**GREEN**
Target	**3,230**	3,069	2,907	**2,769**		

Electricity Generation emissions tCO2e. Conversion factor = 0.21233

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	**1,398**	1,059	947	**895**	**Decreased by 5% from 2020-21**	**GREEN**
Per FTE	**0.1503**	0.12	0.11	**0.1**	**Decreased by 8% from 2020-21**	**GREEN**
Per GIA	**0.0172**	0.01	0.01	**0.01**	**Reduction YoY, but below sensitivity**	**GREEN**

Gas emissions tCO2e. Conversion factor = 0.18316

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	**1,782**	1,719	2,183	**1,813**	**17.01% Reduction vs 2020-21. Covid requirements for windows to be open dealt with more efficiently 21/22. Still above baseline for that reason**	**GREEN**
Per FTE	**0.1915**	0.19	0.26	**0.21**	**Decreased by 19% from 2020-21**	**GREEN**
Per GIA	**0.0220**	0.021	0.027	**0.019**	**Decreased by 27% from 2020-21**	**GREEN**

Fleet emissions tCO2e. Conversion factor = Diesel – 2.51233, Petrol – 2.70553

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	42.44	30.00	12	**22**	**Increased by 80 % from 2020-21, increased business travel post COVID. Still half baseline year.**	**RED**

F Gas emissions tCO2e

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	0	1	3	**12**	**Increase by 270% from 2020-21. 1 incident 20/21, 2 incidents 21/22 so still infrequent**	**RED**

Scope 3 Emissions

Scope 3 Total emissions tCO2e

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Progress against target 5% reduction in tCO2e from 2018/19 baseline	Key
Annual	18,701	15,322	13,781	**18,537**	**35% Increase from last year. Decrease by 1% since baseline**	**RED**

Electricity Distribution Transport & Distribution emissions tCO2e. Conversion factor = 0.01879

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	119.0	91.00	84	**82**	**Decreased by 2% from 2020-21**	**GREEN**
Per FTE	0.013	0.010	0.010	**0.009**	**Decreased by 5% from 2020-21**	**GREEN**

Water emissions tCO2e. Conversion factor = 0.14900

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	22.6	21	6	**7**	**Increased by 19% from 2020-21**	**RED**
Per FTE	0.0024	0.0023	0.007	**0.008**	**Increased by 15% from 2020-21**	**RED**

Wastewater emissions tCO2e. Conversion factor= 0.27200

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	46.4	43	11	**13**	**Increased by 18% from 2020-21**	**RED**
Per FTE	0.0050	0.0048	0.0013	**0.0015**	**Increased by 15% from 2020-21**	**RED**

Waste & Recycling emissions tCO2e – Conversion factor 21.294

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	9.1	6	6	**6**	**Increased by 7% from 2020-21**	**RED**
Per FTE	0.00098	0.00008	0.00007	**0.0007**	**Decreased by 6% from 2020-21**	**GREEN**

Hire Car emissions tCO2e. Conversion factor = 0.1714

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	49.5	23	1	**9**	**Increased by 1461% from 2020-21, restored travel post COVID**	**RED**
Per FTE	0.0053	0.0026	0.0001	**0.0011**	**Increased by 1419% from 2020-21, restored travel post COVID**	**RED**

Taxi emissions tCO2e. Conversion factor = 0.20826

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	3.2	3.5	1	**1**	**Increased by 14% from 2020-21**	**RED**
Per FTE	0.00034	0.0004	0.00010	**0.00011**	**Increased by 11% from 2020-21**	**RED**

Rail travel emissions tCO2e. Conversion factor = 0.03549

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	18.3	13	0.3	**4**	**Increased by 1,389% from 2020-21, restored travel post COVID**	**RED**
Per FTE	0.00196	0.001468	0.000033	**0.000479**	**Increased by 1,348% from 2020-21, restored travel post COVID**	**RED**

Air travel emissions tCO2e. Conversion factor = Domestic 0.24587, Short-haul 0.15353 and Long-haul 0.19309

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	395	176	19	**40**	**Increased by 112% from 2020-21, restored travel post COVID**	**RED**
Per FTE	0.040	0.02	0.002	**0.005**	**Increased by 106% from 2020-21, restored travel post COVID**	**RED**

Commuter travel emissions tCO2e. Distance calculated by modal spilt and Defra conversion factors by vehicle, vehicle type based on survey data.

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	8190	4552	5519	**4384**	**Decreased by 21% from 2020-21**	**GREEN**
Per FTE	0.88	0.51	0.65	**0.5**	**Decreased by 23% from 2020-21**	**GREEN**

Grey Fleet emissions tCO2e. Conversion factor = 0.16843

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	42.4	37.7	5	**26**	**Increased by 407% from 2020-21**	**RED**
Per FTE	0.0046	0.0042	0.0006	**0.0029**	**Increased by 393% from 2020-21**	**RED**

Coach travel emissions tCO2e. Conversion factor = 0.45896

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	21.5	10.5	3	**3**	**Increased by 1% from 2020-21**	**RED**
Per FTE	0.002	0.001	0.0003	0.0003	**Decreased by 2% from 2020-21**	**GREEN**

Procurement emissions tCO2e using HESCET tool

	Baseline 2018-19	2019-2020	2020-21	2021-2022	Change from last year	Key
Annual	9784	10,355	8,127	**13,962**	**Increased by 72% from 2020-21, Major Capital works at Berrows House**	**RED**
Per FTE	1.05	1.17	0.96	**1.6**	**Increased by 67% from 2020-21**	**RED**

Full Time Equivalent student and staff numbers

	Baseline 2018-19	2019-2020	2020-21	2021-2022
FTE Stu/Staff	**9304**	8,863	8,466	**8,705**
Floor space GIA m2	**81,172**	81,172	81,904	**93,575**

Source: https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting

*Notes: The World Resource Institute developed a classification of emissions sources around 3 scopes. Scope 1 emissions are direct emissions from the combustion in owned boilers and vehicles, scope 2 accounts for emissions from the generation of purchased electricity consumed by an organisation, and scope 3 is all other indirect emissions which are a consequence of the activity of the organisation - for example procurement and commuting. Degree Days account for the effect of weather on measuring energy management. Last year it was cold winter with total degree days of 2,164, against five-year average of 1,987-degree days. I

A review of the Carbon Management Strategy in April 2014 increased the scope 3 envelope. The emissions factors are for all greenhouse gases and follow Defra reporting guidelines.

**Wastewater figure is based on fascial consumption and does not include grey water, which is not metered.