PROGRESS AGAINST CARBON EMISSIONS TARGETS 2018-2019

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 11% between 2017-18 and 2018-19, and 14 % from the baseline year (2008/9) which is welcome. However, we are still significantly missing our target of 40% by 2020 from a 2008/9 baseline. *See figure one.* We consumed less gas and electricity last year 16,092 MWh compared to 15,158 MWh this year, which is pleasing.
Electricity carbon emissions reduced 18% from last year. This is the first time we have achieved a significant reduction in electricity use 6,018 MWh to the 5,465 MWh a reduction of 9%. More UK electricity is generated from renewable sources so everyone's carbon emissions from electricity went down by 9%.
Gas carbon emissions reduced 3.8% from last year as did consumption from 10,073 MWh to 9,692 MWh. The year was slightly warmer with 4% fewer degree-days.
Fleet carbon emissions decreased 17% from last year however; they are up 15% from our baseline. Diesel consumption reduced from 12,689 to 9,555 litres, petrol has remained similar. Continued reduction is the result of replacing our fleet vehicles to electric.

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

Emissions intensity has decreased by 9% (energy intensity reduced 3.4%) compared to last year and 46% since our 2008-09 baseline year. This measure indicates that whilst we have more people using our buildings, the carbon reduction initiatives on electricity and gas are making a difference. Our recruitment declined slightly by 2.5%. We now have 9,304 full time equivalent students and staff on campus compared to 5,868 in our baseline year.

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

Emissions intensity – floor space has decreased by 11% (energy intensity reduced 5.9%) compared to 2016-17 and by 50% since our 2008-9 baseline year, we are using less energy per square metre, due to the number of carbon savings initiatives we have introduced across campus. We handed back a small residential hall but opened the Art House the buildings are of a similar square meterage.

Scope 3 indirect carbon emissions

Scope 3 emissions* have increased 23% last year, this is predominantly due to changes in our commute travel emissions for both staff and students and 16% from the base year (2012/13). Therefore, we are significantly failing to meet our targets. See figure one. It is important to note one of the two primary contributors to these indirect emissions, procurement, does depend on spend each year. Therefore, if we spend more emissions go up. A factor arguably the university has more influence over is staff and student commuting to campus. Unfortunately, these emissions have increased by 43% in the past year; more people are driving on their own to campus. *See figures 1 & 2 below.*
Full details are shown in the tables below **highlights include**:

- St Johns Campus (SJC) reduced electricity from 3,899 MWh to 3,561 MWh a reduction of 8.6%.
    - 1,283 lights converted to LED on SJC for example 18.5 MWh saved in Woodbury Building saving 10% electricity
    - Students' Union electricity consumption reduced 144MWh during the year due to switching heating from electric to gas.
- Water has increased 33% back to 2016/17 levels. The increase was the result of billing errors made on SJC halls meter. The supplier had been billing the account on actual meter reading since 2017, when in reality the readings were estimates and were underestimated. All under consumption on the account since 2017 is now resolved during this reporting period.
- The percentage of staff driving themselves to campus increased from 57% to 66% and students driving on their own to campus also significantly increased from 29% to 41%. Car share, bus use and walking have all declined.
- Weights have reduced for both black and green waste streams, e.g. black down from 206 to 158 tonnes. Carbon emissions from waste has reduced from 12.2 to 9.1 GHGe, 25.49%.

PROGRESS AGAINST CARBON EMISSIONS TARGETS 2018-2019

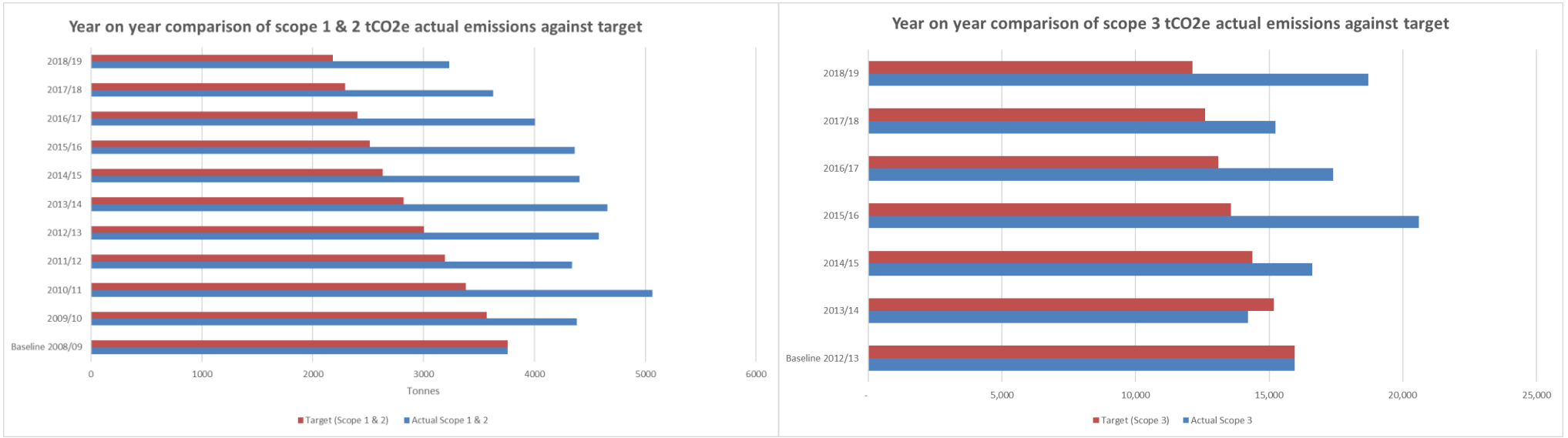

Figure 1: The graphs above show the university total carbon footprint broken down between direct (scope 1 & 2) and indirect (scope 3) carbon emissions. Year on year comparison of carbon emission targets against our actual absolute emissions.

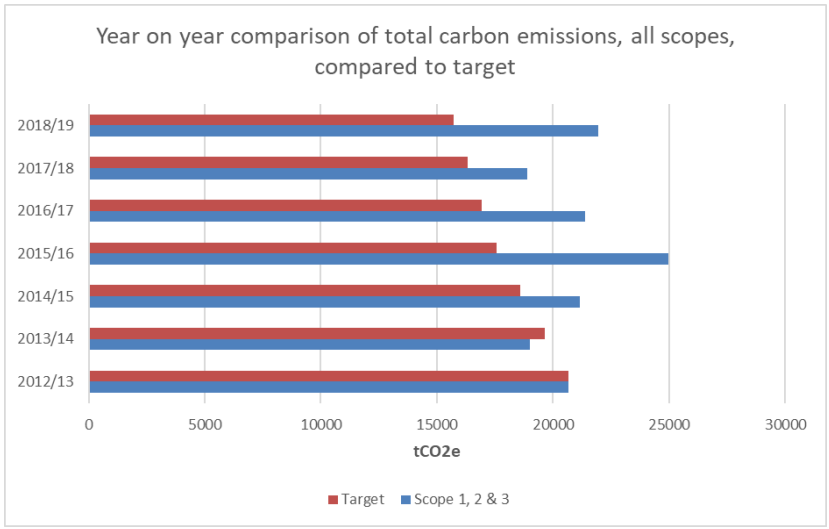

Figure 2: The graph above shows the university total carbon footprint for all scopes direct (scope 1 & 2) and indirect (Scope 3) carbon emissions. Year on year comparison of carbon emission targets against our actual absolute emissions.

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.

PROGRESS AGAINST CARBON EMISSIONS TARGETS 2018-2019

Scope 1, 2 & 3 total emissions tCO2e

	2005-06	2006-07	2007-08	Baseline 1&2, and some 3 **2008-09**	2009-10	2010-11	2011-12	Increased scope 3 envelope **2012-13**	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**Progress against target 5% reduction in tCO2e from 2012/13 baseline**	
Actual	3,725	3,146	3,477	**9,450**	10,771	16,554	14,836	**20,666**	18,997	21,163	24,955	21,392	18,873	**21,931**	**16.2% increase from last year. Increase by 6% since baseline**	**RED**
Target								**20,666**	19,633	18,651	17,719	16,833	15,991	15511		

Scope 1 and 2 total emissions tCO2e

	2005-06	2006-07	2007-08	**Baseline 2008-09**	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**Progress against target 5% reduction in tCO2e from 2008/09 baseline**	
Actual	3,514	2,976	3,277	**3,757**	4,383	5,066	4,339	4,581	4,657	4,407	4,362	4,003	3,620	**3,230**	**14% decrease from baseline 11% decrease from last year**	**AMBER**
Target				**3,757**	3,569	3,381	3,193	3,006	2,818	2,630	2,442	2,141	2,029	1968		

Electricity Generation emissions tCO2e. Conversion factor = 0.2556

	2005-06	2006-07	2007-08	**Baseline 2008-09**	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	
Annual	1,596	1,509	1,797	**1,864**	2,280	2,365	2,415	2,619	2,907	2,675	2,449	2,129	1,706	**1,398**	**Decreased by 18% from 2017-18**	**GREEN**
Per FTE	0.304	0.277	0.321	**0.318**	0.354	0.313	0.311	0.336	0.337	0.320	0.279	0.232	0.1788	**0.1503**	**Decreased by 16% from 2017-18**	**GREEN**
Per GIA	0.0362	0.0342	0.0397	**0.0394**	0.0365	0.0348	0.0347	0.0346	0.0382	0.0351	0.0302	0.0262	0.0210	**0.0172**	**Decreased by 18% from 2017-18**	**GREEN**

PROGRESS AGAINST CARBON EMISSIONS TARGETS 2018-2019

Gas emissions tCO2e. Conversion factor = 0.18385

	2005-06	2006-07	2007-08	**Baseline 2008-09**	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual	1,911	1,453	1,467	**1,856**	2,078	2,675	1,899	1,931	1,700	1,660	1,844	1,802	1,853	**1,782**	**decreased by 3.8% from 2017-18**	**AMBER**
Per FTE	0.364	0.267	0.262	**0.316**	0.323	0.354	0.244	0.248	0.197	0.199	0.210	0.197	0.194	**0.1915**	**Decreased by 1.4% from 2017-18**	**AMBER**
Per GIA	0.0433	0.0329	0.0324	**0.0392**	0.0332	0.0393	0.0273	0.0255	0.0223	0.0218	0.0228	0.0222	0.0228	**0.0220**	**Decreased by 3.8% from 2017-18**	**AMBER**

Fleet emissions tCO2e. Conversion factor = Diesel 2.59411, Petrol 2.2094

	2005-06	2006-07	2007-08	**Baseline 2008-09**	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual	6.94	14.26	13.28	**36.90**	25.70	26.28	25.38	31.53	32.22	70.99	50.65	56.51	51.15	**42.44**	**Decreased by 17% from 2017-18**	**GREEN**

F Gas emissions tCO2e

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual									18.25	1.54	18.16	6.47	10.23	**0**	**decrease by 100% from 2017-18**	**GREEN**

Scope 3 Emissions

Scope 3 Total emissions tCO2e

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	**Baseline 2012-13**	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**
Annual	211.5	169.5	199.7	289.6	333.1	11,438.5	10,496	**16,083**	14,340	16,753	20,594	17,389	15,245	**18701**

PROGRESS AGAINST CARBON EMISSIONS TARGETS 2018-2019

Electricity Distribution Transport & Distribution emissions tCO2e. Conversion factor = 0.0217

	2005-06	2006-07	2007-08	**Baseline 2008-09**	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual	152.0	118.0	140.0	**148.0**	184.0	202.1	190.8	224.0	254.2	220.9	221.0	199.1	145.0	**119.0**	**Decreased by 18% from 2017-18**	**GREEN**
Per FTE	0.0290	0.0217	0.0250	**0.0252**	0.0286	0.0268	0.0245	0.0288	0.0295	0.0264	0.0252	0.0218	0.0152	**0.013**	**Decreased by 16% from 2017-18**	**GREEN**

Water emissions tCO2e. Conversion factor = 0.344

	2005-06	2006-07	2007-08	**Baseline 2008-09**	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual	12.90	8.70	8.70	**9.20**	12.16	15.33	14.70	12.92	13.06	15.67	17.56	22.91	16.91	**22.6**	**increased by 33% from 2017-18**	**RED**
Per FTE	0.00246	0.00160	0.00155	**0.00157**	0.00189	0.00203	0.00189	0.00166	0.00152	0.0019	0.0020	0.0025	0.0018	**0.0024**	**increased by 36% from 2017-18**	**RED**

Wastewater emissions tCO2e. Conversion factor= 0.70800

	2005-06	2006-07	2007-08	**Baseline 2008-09**	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual	30.81	20.81	20.64	**27.96**	27.96	30.04	28.27	25.27	26.88	32.25	36.14	47.14	34.80	**46.4**	**increased by 33% from 2017-18**	**RED**
Per FTE	0.0059	0.0038	0.0037	**0.0048**	0.0043	0.0040	0.0036	0.0032	0.0031	0.0039	0.0041	0.0052	0.0036	**0.0050**	**Decreased by 36% from 2017-18**	**RED**

Waste & Recycling emissions tCO2e – too many to list

	2005-06	2006-07	2007-08	**Baseline 2008-09**	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	change from last year	**Key**
Annual				**73.4**	63.3	73.4	35.2	22.4	48.0	26.1	17.3	18.8	12.2	**9.1**	**Decreased by 25% from 2017-18**	**GREEN**
Per FTE				**0.0125**	0.0098	0.0097	0.0045	0.0029	0.0056	0.0031	0.0020	0.0020	0.0013	**0.00098**	**Decreased by 24% from 2017-18**	**GREEN**

PROGRESS AGAINST CARBON EMISSIONS TARGETS 2018-2019

Hire Car emissions tCO2e. Conversion factor = 0.17663

	2005-06	2006-07	2007-08	**Baseline 2008-09**	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual	7.4	11.1	17.1	**15.5**	41.1	41.1	35.0	35.3	27.57	40.1	20.1	32.9	23.1	**49.5**	**increased by 114% from 2017-18**	**RED**
Per FTE	0.00140	0.00204	0.00305	**0.00264**	0.00638	0.00544	0.00450	0.00453	0.00320	0.00479	0.0023	0.0036	0.00242	**0.0053**	**increased by 119% from 2017-18**	**RED**

Taxi emissions tCO2e. Conversion factor = 0.21024

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	**Baseline 2012-13**	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual							3.5	**2.6**	4.5	2.8	4.2	3.5	1.8	**3.2**	**increased by 77% from 2017-18**	**RED**
Per FTE							0.00045	**0.00033**	0.00053	0.00034	0.00047	0.00039	0.00019	**0.00034**	**increased by 82% from 2017-1**	**RED**

Rail travel emissions tCO2e . Conversion factor = 0.04115

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	**Baseline 2012-13**	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual	8.4	10.9	13.2	15.5	4.7	11.7	13.6	**24.3**	13.1	16.1	15.1	18.4	19.9	**18.3**	**decreased by 8% from 2017-18**	**RED**
Per FTE	0.0016	0.0020	0.0024	0.0026	0.0007	0.0016	0.0018	**0.0031**	0.0015	0.0019	0.0017	0.0020	0.002086	**0.00196**	**decreased by 6% from 2017-18**	**RED**

Air travel emissions tCO2e . Conversion factor = Domestic 0.25, Short-haul 0.16 and Long-haul 0.20

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	**Baseline 2012-13**	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual						118.2	264.9	**252.9**	271.2	318.0	577.0	499.6	450.7	**395**	**Decreased by 12% from 2017-18**	**AMBER**
Per FTE						0.0157	0.0341	**0.0325**	0.0315	0.0380	0.0657	0.0546	0.0472	**0.040**	**Decreased by 10% from 2017-18**	**AMBER**

PROGRESS AGAINST CARBON EMISSIONS TARGETS 2018-2019

Commuter travel emissions tCO2e. Distance calculated by modal spilt and Defra conversion factors by vehicle.

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	**Baseline 2012-13**	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual						6,843.1	6,315.0	**6,142.4**	5,823	5,683.3	5,978.6	7,817.0	5747.6	**8190**	**increased by 42% from 2017-18**	**RED**
Per FTE						0.906	0.813	**0.788**	0.676	0.680	0.680	0.855	0.602	**0.88**	**increases by 46 % from 2017-18**	**RED**

Grey Fleet emissions tCO2e. Conversion factor = 0.17663

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	**Baseline 2012-13**	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual							45.0	**77.6**	25.1	111.3	68.1	86.1	78.4	**42.4**	**Decreased by 46% from 2017-18**	**GREEN**
Per FTE							0.0058	**0.0100**	0.0029	0.0133	0.0078	0.0094	0.0082	**0.0046**	**Decreases by 45% from 2017-18**	**GREEN**

Coach travel emissions tCO2e. Conversion factor = 0.47521

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	**Baseline 2012-13**	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual							8.8	**14.9**	16.6	14.8	16.0	13.7	24.2	**21.5**	**decreased by 11% from 2017-18**	**GREEN**
Per FTE							0.00114	**0.00191**	0.00193	0.00177	0.00183	0.00150	0.00253	**0.002**	**decreased by 9% from 2017-18**	**GREEN**

Procurement emissions tCO2e = Spend data converted by HEFCE procurement methodology

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	**Baseline 2012-13**	2013-14	2014-15	2015-16	2016-17	2017-18	**2018-2019**	**change from last year**	**Key**
Annual							4,153.2	**3,541.4**	9,248.7	7,816.9	10,274	8,629	8,690	**9784**	**Increased by 13% from 2017-18**	**RED**
Per FTE							0.550	**0.456**	1.187	0.908	1.229	0.944	0.911	**1.05**	**increased by 15% from 2017-18**	**RED**

PROGRESS AGAINST CARBON EMISSIONS TARGETS 2018-2019

Full Time Equivalent student and staff numbers

	2005-06	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
FTE Stu/Staff	5,444	5,602	**5,868**	6,435	7,549	7,772	7,790	8,613	8,358	8,781	9,144	9,541	9304
Floor space GIA m2	44,126	45,224	**47,362**	62,515	68,038	69,669	75,647	76,140	76,140	80,978	81,328	81,212	81,172

Source: http://www.ukconversionfactorscarbonsmart.co.uk/

*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 another mild winter with total degree days of 2,004, against five year average of 2,017 degree days. Targets were initially drawn up in December 2007 were set for the five-year period 2007 – 2012, this was reviewed in October 2011 following the adoption of a revised more stringent carbon management strategy in July 2010. This new strategy also changed the baseline year from 2005/6 to 2008/9. A further 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.