Financial Year 2016

Environmental Management Report

July 2017

BDP.

Contents

BDP's headline environmental targets 2013—2018	BDP's headline 2016 performance against these targets are as follows:
Carbon emissions not to exceed 1000kgCO_2e/capita, with a commitment to ongoing reduction, across all of our UK and Ireland studios	Carbon emissions of 955.1kgCO_2e/capita comprising a 23.96% reduction in scope 1 & 2 CO_2 emissions per capita, against our 2013 baseline
Seek to implement practical measures in our studios to encourage and incentivise travel decisions	The production of a business travel plan to promote sustainable travel decisions
5% reduction of total water consumption per capita on 2013 baseline	3.79% decrease in water consumption per capita against the 2013 baseline

Throughout this report all figures are shown to two decimal places. All percentage changes have been calculated based on the full figures within the background data (not rounded). As such there may be slight discrepancies between percentages shown and those which can be calculated from the figures tabulated in the report.

Headline Performance Figures FY 2016

Throughout our 2016 Environmental Management Report we compare environmental performance with our 2013 baseline figures in addition to the previous year (2015). This enables us to measure progress and areas for improvement against valuable benchmarks.

Total energy consumption (kWh)

2013	2,682,322
2015	2,334,772
2016	2,407,848

Total emissions ($kgCO_2e$)

2013	939,941
2015	883,480
2016	809,387

Total emissions per capita ($kgCO_2e$/person)

2013	1,256
2015	966
2016	955

Total water use (m^3)

2013	6,023
2015	7,505
2016	6,562

Water usage per capita (m^3/person)

2013	8.05
2015	8.25
2016	7.74

Total business travel emissions ($kgCO_2e$)

2013	1,268,089
2015	595,936
2016	543,321

Business travel emissions per capita ($kgCO_2e$/person)

2013	1,912
2015	753
2016	667

Introduction

In our fourth year of public reporting, we continue to record and evaluate performance trends and report on progress against our overarching targets.

The 2015 Annual Environmental Report showed that our CO_2 emissions per capita reduced beyond our 2018 target and therefore a new target was proposed for 2016 to maintain this lowered rate of emissions at no greater than 1,000kgCO_2e/capita/yr, whilst trying to maintain continual improvement. Our 2018 water target remains at achieving a 5% reduction in water consumption per capita from a baseline year 2013. 2016 saw the first year since setting the target that our overall water consumption per capita has decreased.

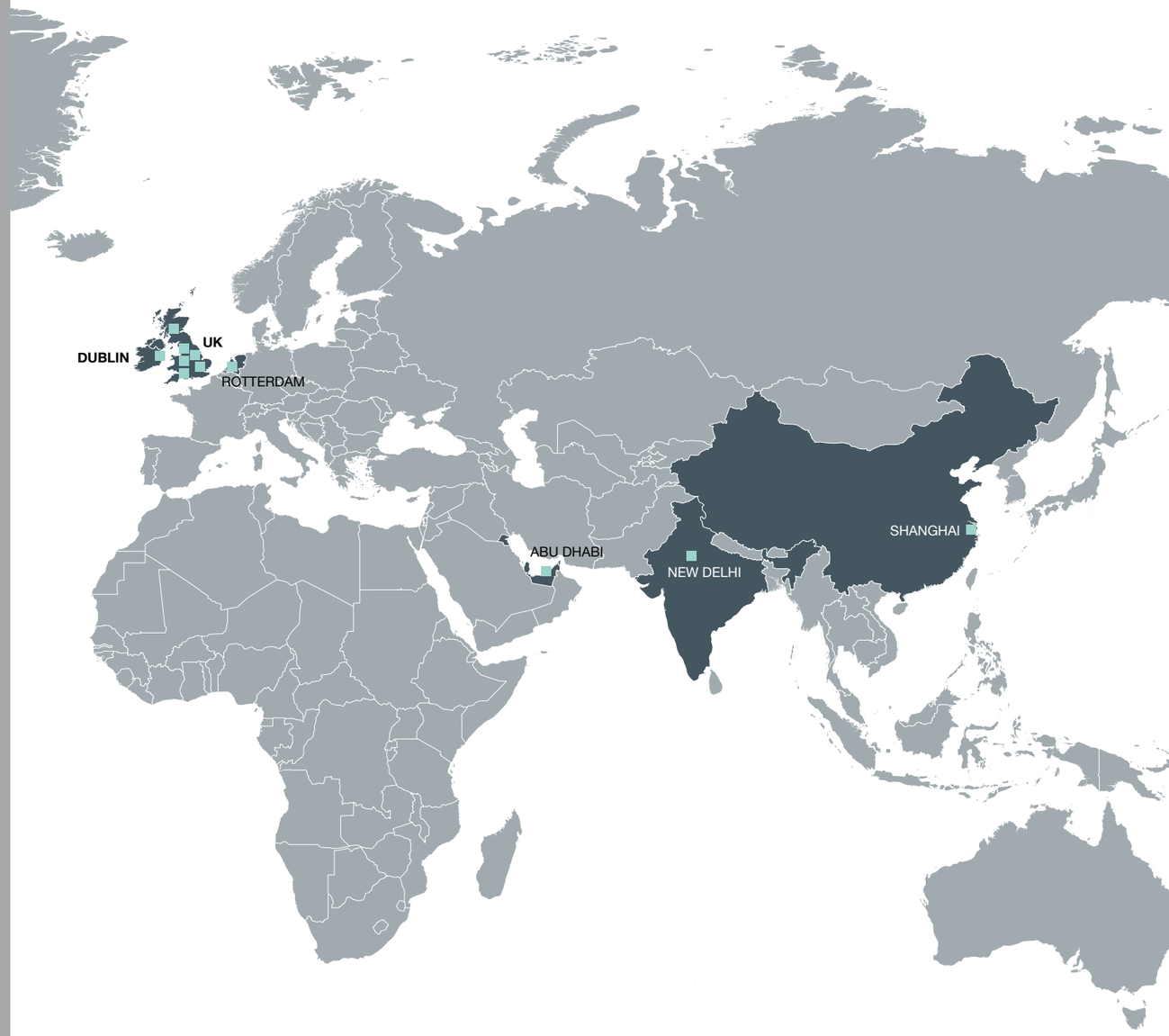
During 2015 we also made significant progress to improve both our reporting and understanding of reasons for environmental studio trends. Mechanisms have remained in place throughout 2016, to monitor and manage our environmental performance. In 2016 we have maintained both ISO 14001 and 50001 certification and continued to improve our environmental management system to simplify the forthcoming transition to ISO14001:2015.

This report provides a comprehensive review and analysis of our environmental performance across all of our UK and Ireland studios during 2016, in line with our own environmental ambitions and commitments under our ISO 14001 and 50001 certification. It reports on progress against targets and aspirations established in our previous Annual Environmental Report (2015), in addition to establishing new ones for the coming year.

Studio environmental headlines 2016

Summarised below are some of the initiatives undertaken in our UK studios throughout 2016 that have contributed to our improved environmental performance:

- Installation of LED lighting in our Glasgow and Bristol studios has contributed to a significant reduction in CO_2 emissions.
- The Bristol and Sheffield studios have upgraded to new AV equipment. All equipment has been procured through our Responsible Procurement Policy and is either listed on the Energy Technology Product List or is Energy Star rated, demonstrating energy efficiency.
- As part of the ongoing environmental management role, BDP's sustainability team is now involved in the studio budget setting. The primary input is to review proposed budgetary projects for environmental risks and opportunities, through identification of a) likely impact on achievement of 2018 environmental targets and b) financial payback (capital spend vs savings through reduced utility costs).
- In our Manchester studio, a pilot Building Management System (BMS) review and recommissioning exercise as part of the ongoing revision of the BMS and metering strategy for the building will result in improved data granularity and sub-metering. The Sheffield studio has also undertaken a review of it's BMS control strategy to ensure performance is optimised.
- Passive Infrared (PIR) motion sensors have been installed in our Bristol studio as part of the refurbishment works of the common toilet areas. This ensures water is only supplied when the facilities are occupied, preventing water wastage through faulty fittings, leaks and occupant misuse when the toilets areas are unoccupied.
- In our Birmingham studio, Carbon Credentials were employed to review the environmental performance of the building. This involved recommissioning of metering equipment as well as an interrogation of the metering configuration and arrangement.



Our Studios

The interdisciplinary practice of BDP emerged in 1961 from one founded in Preston in the north west of England in 1936.

Since then it has grown giving a good geographical spread around the UK and Ireland - in addition to those further afield. While there is no longer a studio in Preston, in the north BDP is now based in Manchester, Sheffield and in the Midlands in Birmingham. In the south the studios are located in London and Bristol; in Scotland, in Glasgow.

In addition to these studios spread across the UK, studios also now exist in Ireland, The Netherlands, the MENA region, India and China.

All of our studios range in size and vary in style – some in historic surroundings, others in the very latest BDP-designed buildings. The number of staff employed by BDP has increased year on year since 2013 with a total of 905 employees at the end of 2016.

Birmingham
Birmingham studio is located at 158 Edmund Street, a high profile newly refurbished building situated within the Colmore Row conservation area in the centre of the city. The premises are billed as highly sustainable, with intelligent lighting throughout and solar PV on the roof. This studio accommodates around 20 people.

Bristol
Bristol studio, built in 1964, is situated close to College Green, in the heart of this historic city. It has a gross area of 563m2 and an average staff number of 50. This studio is currently in lease renewal negotiations.

Dublin
Dublin studio is situated in the Old Stone Building at Blackhall Green, just off Prussia Street. This area was previously known as the gateway to Dublin City. The building has three floors and an overall gross area of 790m2. BDP occupies the ground floor area (197m2). Due to staff number increases, the architectural department has recently moved into a new 325m2 studio adjacent to the existing building. Dublin has an average of 50 staff.

Glasgow
Glasgow studio has developed an enviable reputation as a leading practice in Scotland and is situated in the heart of the city's main shopping area, Buchanan Street. The studio accommodates around 75 staff and has a floor area of around 1500m2.

London
London's characterful studio is situated in a converted brewery in Clerkenwell. The vast reception space hosts a multitude of social and educational events both for BDP and external companies. This is the largest of our UK and Ireland studios with a gross floor area of almost 5000m2 and currently accommodates around 330 staff.

Our London studio is currently in the process of reviewing its occupation and rationalising floor space to provide more sub-let space.

Manchester
The exemplary Manchester studio overlooks the Piccadilly Canal Basin, centrally located adjacent to Manchester's vibrant Northern Quarter. It has been recognised as one of the best new buildings in the city. Designed by BDP, the studio sets new standards for energy efficiency in the north west of England and has achieved a BREEAM Excellent rating – the first naturally ventilated building to receive this rating in Manchester. This is our second largest studio with a gross floor area of around 3000m2 and around 200 staff.

Sheffield
Also designed by BDP, the Sheffield studio has been instrumental in regenerating the historic Wicker area of the city. In recognition of its environmental credentials, the building was awarded a BREEAM Very Good rating. Around 55 staff are located in this studio, and the building has a gross floor area of 1100m2.

Staff Numbers

To account for fluctuation in staff numbers over time, and between studios of different sizes, we set and report against per capita targets. The tables outline our staff numbers for 2013 and 2016 demonstrating the fluctuation and overall increase in staff numbers throughout our reporting years. Scope 1&2 emissions and water consumption per capita figures are calculated based on the total staff occupying our studios (including any subcontractors, temporary staff and tenants who share our floor space). Business travel emissions account only for BDP staff, with Central staff reported separately.

	2013				2016			
	Studio Staff	Central Staff	Other occupants	Total	Studio Staff	Central Staff	Other occupants	Total
Birmingham	12.1			12.1	21.6			21.6
Bristol	56.6	1.0		57.6	47.6			47.6
Dublin	21.5			21.5	48.7			48.7
Glasgow	62.4	1.9		64.3	73.5	1.0	2.0	76.5
London	265.2	12.6	84.9	362.7	320.3	12	57.8	390.1 *2
Manchester	144.4	31.6	*	176.0	166.8	35.2	6.1 *1	208.1
Sheffield	52.3	1.8		54.1	53.1	2.0		55.1
				748.3				**847.7**

*1 The 4th floor of our Manchester studio was tenanted in 2013, 2014 and 2015 (to end Dec 2015). Our environmental reporting discounts the 4th floor occupation and energy/water consumption, which is separate and outside of BDP use. *2 Not all of these staff are based in our studios with an increased number now site based.

ISO 14001 and 50001

All of our UK and Ireland studios have been certified under ISO 14001:2004 since 2011. Key to maintaining the certification is continual improvement, demonstrating year on year progress in reducing the environmental impact of our operations. ISO 14001 also audits the processes and procedures we have in place for both monitoring our environmental performance and engaging staff in contributing to improving environmental performance.

We were surveyed by our auditors (LRQA) in the fourth quarter of 2016 at our Sheffield studio, and in the first quarter of 2017 at our Manchester studio. Generally, this annual statement has contributed significantly to demonstrating to our auditors that BDP as an organisation takes environmental management seriously. It serves as an important communication tool to engage our staff and stakeholders in a combined effort to continually reduce our environmental impact and enhance environmental credentials, as well as confidently justifying our position as an environmentally conscious design practice.

No non-conformities were highlighted during these audits. The following opportunities for improvement were raised, which we are working hard to integrate through revisions to processes and record keeping. These will be reviewed during our next audit in July, in Dublin:

- Alignment of OM budgets with a review outlining energy initiatives
- Integration of a formal documentation process for large products over a certain value, to ensure energy efficient options are selected
- Resolution of data collection issues in Birmingham and Manchester

We have also undergone a transition workshop with a certifier to ensure our systems and processes are readied for transition to the new 14001:2015 standard, which is programmed to occur at recertification in 2018.

BDP's energy management process remains in compliance with ISO 50001 and therefore the Energy Savings Opportunity Scheme.

Our Performance FY 2016

The following section summarises our environmental performance during 2016, our fourth year of formal annual environmental reporting. Our environmental performance targets were established in our first Annual Environmental Report (2013) and are based on improvements against our 2013 baseline year.

Despite some improvements in metering data, there are still some studios for which the provision of accurate data is inhibited by lack of substantive metering/sub-metering. Greater granularity in data will enable more effective interventions, thereby achieving efficiency improvements and consequential utility cost savings. Present and accurate sub-metering is now a key consideration in agreeing new studio lease agreements.

Energy Use and Carbon Emissions

Tables 1—4 provide a summary of our 2016 energy consumption and carbon emissions against our 2013 baseline.

Table 1. Total scope emissions

	2013 (Baseline)	2016	% change from baseline	% change from last year
Scope 1 ($kgCO_2e$)	179,492.48	147,463.50	-17.84	**+13.50**
Scope 2 ($kgCO_2e$)	760,448.30	661,923.80	-12.96	-12.16
Total ($kgCO_2$)	939,940.78	809,387.28	-13.89	-8.39

Table 2. Total scope emissions per capita

Scope 1 ($kgCO_2e$)/ capita	239.90	174.02	-27.45	**+22.47**
Scope 2 ($kgCO_2e$)/ capita	1,016.23	781.12	-23.14	-5.23
Total ($kgCO_2$)/ capita	1,256.13	955.14	-23.96	-1.15

Table 3. Total energy consumption

Scope 1 (kWh)	975,290.61	801,431.87	-17.83	**+13.78**
Scope 2 (kWh)	1,707,031.29	1,606,416.25	-5.89	-1.47
Total kWh	2,682,321.90	2,407,848.12	-10.23	**+3.13**

Table 4. Total energy consumption per capita

Scope 1 (kWh)/ capita	1,303.34	945.75	-27.44	**+22.76**
Scope 2 (kWh)/ capita	2,281.21	1895.70	-16.90	**+6.31**
Total (kWh)/ capita	3,584.55	2,841.45	-20.73	**+11.27**

Overall, scope emissions and energy consumption have decreased against our 2013 baseline, with 2016 seeing an overall 23.96% reduction in emissions per capita. The target of 1000$kgCO_2e$/capita has been achieved overall, however Bristol, Glasgow and Sheffield were balanced by good performance in Birmingham, Dublin and Manchester.

We are pleased to report that nearly all our studios have reported between a 14-22% reduction in scope 2 emissions per capita against last year's performance. This has been attributed to the installation of energy efficient LED lighting, increased space utilisation, and staff awareness campaigns to encourage efficient use of lighting and equipment. Whilst total scope 2 emissions have decreased for our London studio, there has been a small increase in emissions per capita. This is due to a number of the staff now being site based, which has resulted in lower utilisation of our studio space. In 2017, rationalisation of floor space as part of the studio refurb will look to address this.

Though total emissions have decreased against our 2013 baseline, with a significant reduction in scope 2 emissions, 2016 saw an increase in gas consumption per capita in all but one of our studios. Factors out of our control have contributed to this increase in part, with unseasonably cold temperatures requiring heating to be kept on for prolonged periods. However, there are also improvements we can make to address this issue. In many of our studios we have undertaken a review of system performance to optimise energy use as well as staff awareness campaigns to influence occupant behaviour.

Carbon Conversion Factors

We have calculated our carbon emissions throughout the report using carbon conversion factors provided by Defra. Defra revises the UK carbon conversion factors annually, reflecting changes to the UK's energy mix factoring in energy provision and proportion of gas, electricity and fuel imported from abroad. Carbon factors can vary considerably year on year due to the influence of the relative prices of coal and natural gas, as well as fluctuations in peak demand and renewables. Vehicle emissions factors are influenced by advances in automotive fuel efficiency.

The table below shows the carbon conversion factors we have used to calculate our 2013 (baseline) emissions, and emissions in subsequent reporting years (2014, 2015 and 2016). Though we record, we do not currently publish our Scope 3 emissions.

Table 4. Defra Conversion factors

	Units	2013	2015	2016
Scope 1 (natural gas)	$kgCO_2e$/kWh	0.18404	0.18445	0.18400
Scope 2 (grid supplied electricity)	$kgCO_2e$/kWh	0.44548	0.46219	0.41205
Car emissions (average car)	$kgCO_2e$/km	0.19023	0.18635	0.18307
National rail	$kgCO_2e$/km	0.04904	0.04506	0.04885
Domestic flight	$kgCO_2e$/km	0.326615	0.29795	0.27867
Short-haul flight	$kgCO_2e$/km	0.192457	0.16972	0.16844
Long-haul flight	$kgCO_2e$/km	0.226528	0.19813	0.19162

Energy Use and Carbon Emissions by Studio

The graphs below summarise our energy consumption and associated carbon emissions for each of our UK and Ireland studios, over a 2013 baseline and in comparison to the previous year.

Figures 1 and 2 show total energy consumption and carbon emissions by studio. Our carbon emissions are also shown using a per capita normalisation as this allows us to make direct comparisons between our studios and other organisations. The per capita energy consumption and carbon emissions trend per studio are show in Figures 3 and 4.

Figure 1. Energy Consumption (kWh) per studio

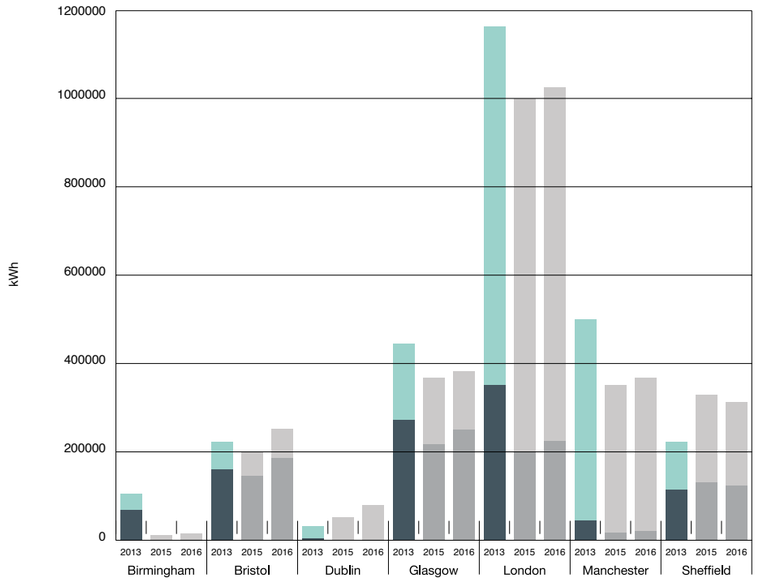


Figure 2. Carbon Emissions (CO_2e) per studio

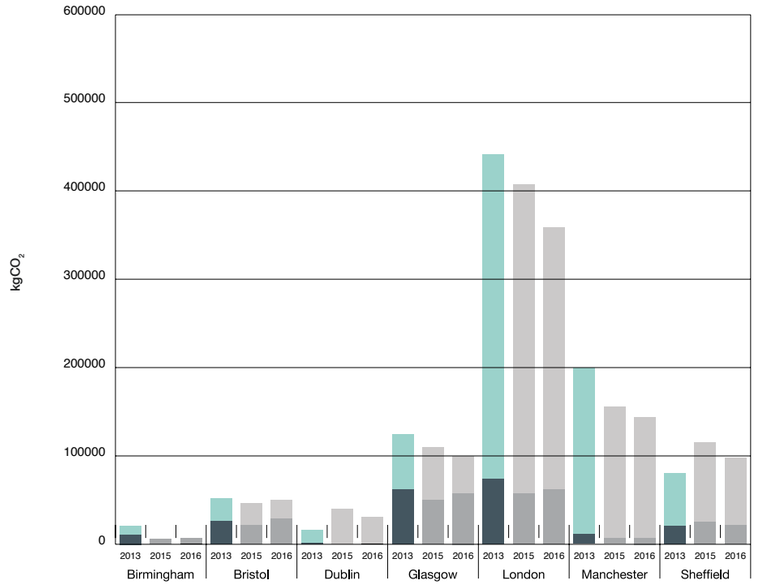


Figure 3. Energy Consumption per capita (kWh/capita) per studio

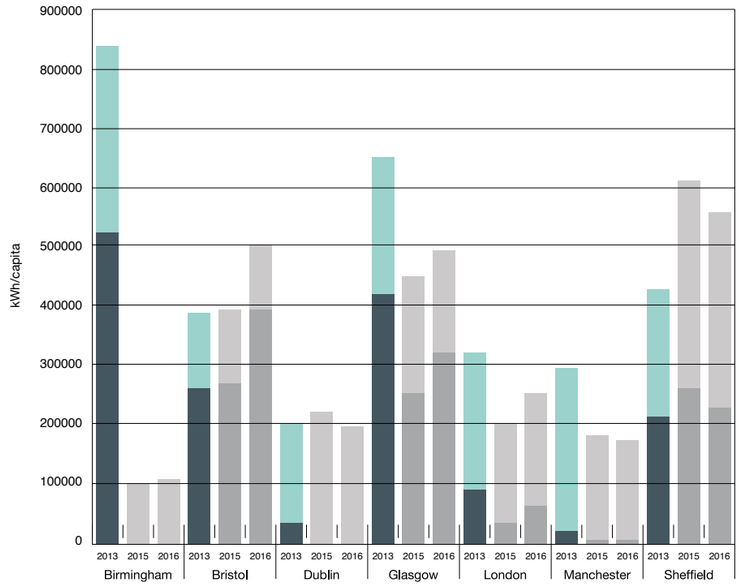
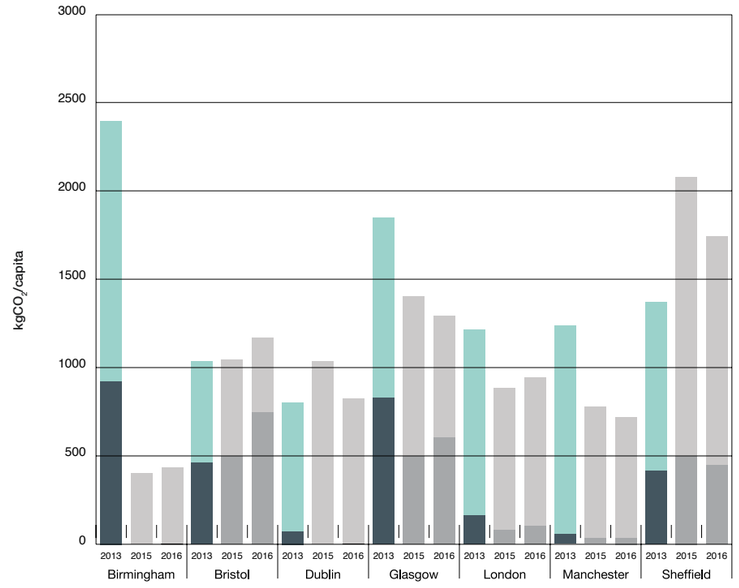


Figure 4. Carbon Emissions per capita (CO_2e/capita) per studio



Weather Normalisation

Heating degree days (HDDs) are a measurement designed to quantify the demand for energy needed to heat a building derived from measurements of outside air temperature (ie sum of the difference between the base temperature and the average day temperature for each day with an average below 15.5°C).

The figures below indicate the impact of the number of heating degree days on annual gas consumption in 2016, compared to the baseline and previous years for each office location. The figures below confirm, as would be expected, that gas consumption varies in accordance with the number of HDD. This applies in all but the Glasgow and Sheffield offices, where it is clear there are other factors that have had a greater influence of heating energy consumption, including improvements made to the boiler settings in Glasgow in 2014, which lead to a reduction in gas consumption in 2015.

Gas Consumption (kWh)
left axis

HDD at 15.5°C
right axis

Figure 5.

Figure 8.

Figure 9.

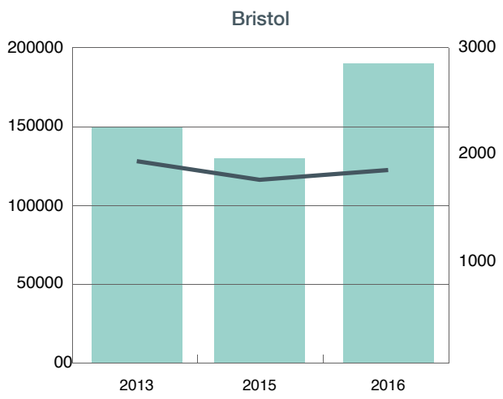


Figure 6.

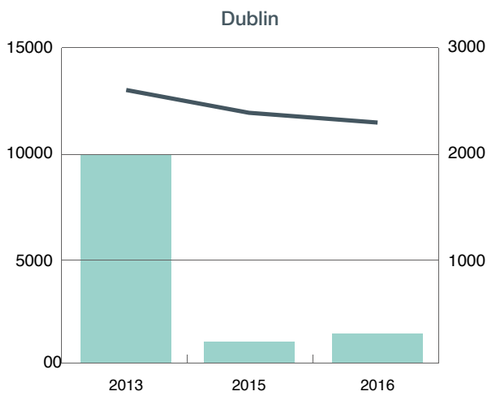


Figure 7.

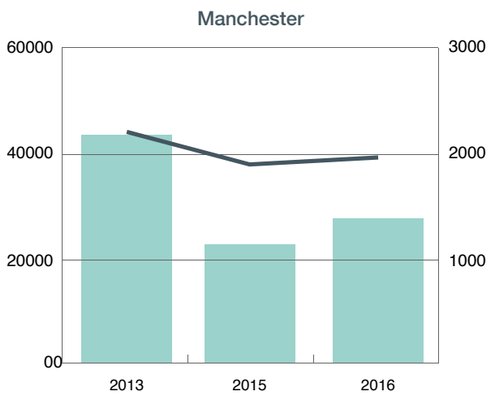


Figure 10.

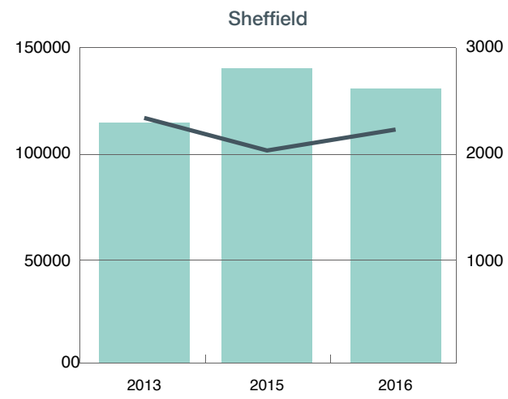


Figure 11.

Water

The figures 12 and 13 show consumption by studio, and normalised per capita. Although our total water consumption has increased by almost 9% over the 2013 baseline, there has been a 13% decrease over the 2015 totals. Per capita, there has been an approximate 4% decrease over the 2013 baseline and a 6% decrease over the 2015 figures.

This can be attributed primarily to improvements in both leak prevention and detection, mainly as a result of the refurbishment of common toilet areas within the Bristol studio where the installation of PIR linked water shut off valves to ensure water is only supplied when the facilities are operated. Optimisation of the BMS within the Manchester studio has also allowed us to identify system issues quickly.

Our water consumption figures are heading in the right direction, but some studios are not performing as well as others. Birmingham saw a large increase against 2015 consumption figures and further interrogation will be carried out in 2017 to understand the reasons behind this. As previously stated, data granularity is still an issue, with water sub-metering not available in all of our UK and Ireland studios.

With an increase in staff numbers, sanitary fittings that use lower volumes of potable water become more important. Where existing sanitary fittings and fixtures in our studio spaces are reaching a significant age, a review will be undertaken to inform a programme of retrofit to water efficient fittings.

Table 5. Total water consumption

Water	2013 (baseline)	2016	% change against baseline	% change over previous year
Total (m^3)	6023.16	6,562.3	+8.95%	-13.01%
Per capita (m^3)	8.05	7.74	-3.79%	- 6.14%

Table 6. Water consumption per studio

m^3	2013 (baseline)	2016	% change against baseline	% change over previous year
Birmingham	50.28	85.87	+70.78%	+70.01%
Bristol	642.21	240.00	-62.63%	-10.25%
Dublin	135.97	317.90	+133.79%	+11.74%
Glasgow	179.00	278.00	+55.31%	+7.34%
London	3075.00	3408.00	+10.83%	-7.64%
Manchester	1590.19	1932.51	+21.53%	-28.21%
Sheffield	350.50	300.00	-14.41	0.00%

Table 7. Water consumption per studio per capita

m^3/capita	2013 (baseline)	2016	% change against baseline	% change over previous year
Birmingham	4.16	3.98	-4.24%	+36.29%
Bristol	11.15	5.05	-54.75%	-4.72%
Dublin	6.32	6.54	+3.36%	-8.55%
Glasgow	2.78	3.63	+30.51%	+12.08%
London	8.48	8.74	+3.08%	+12.38%
Manchester	9.04	9.29	+2.81%	-31.30%
Sheffield	6.48	5.45	-15.93%	-3.41%

Figure 12: Water Consumption (m^3) by studio

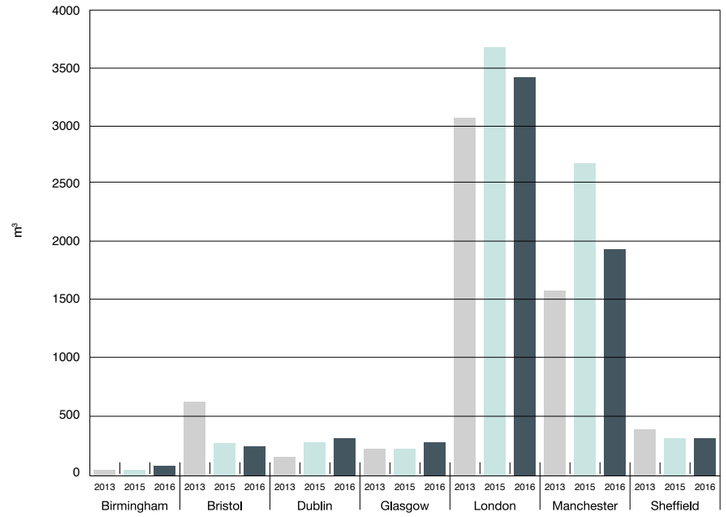
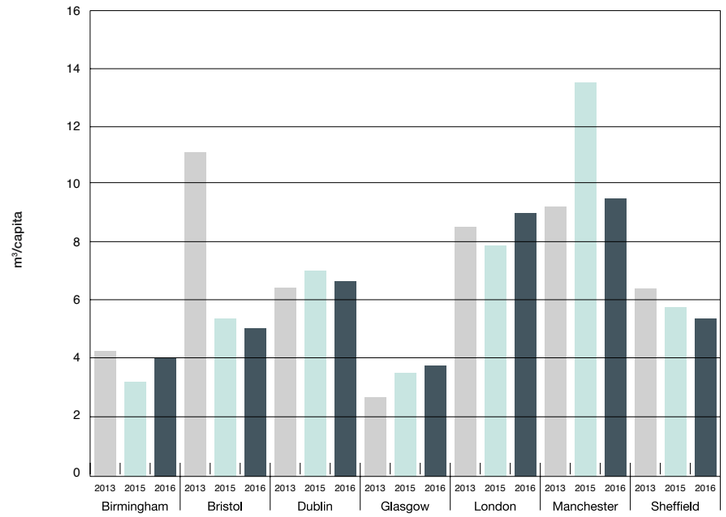


Figure 13: Water Consumption per capita (m^3/capita) by studio



Business Travel Emissions

We continuously strive to improve the way we work and improve the processes we have in place to minimise our impact on the environment. One of the many ways we aim to reduce our carbon footprint is to actively encourage and promote sustainable travel.

UK transport CO_2 emissions are expected to rise by 35% between 1990 and 2030, with transport accounting for around a quarter of UK greenhouse gas emissions. Furthermore, being inactive is a serious threat to our health. Current physical activity levels in the UK are low, with only 40% of men and 28% of women meeting the recommended 30 minutes of exercise at least 5 times a week.

Recognising that the extent of travel required is project specific and largely dictated by clients, we have not set a specific target for a reduction in carbon emissions related to business travel. We are, nonetheless, committed to reducing our emissions and 2016 saw a 57% decrease in business travel emissions against our 2013 baseline and previous year (2015).

Our reported business travel emissions for 2016 have been calculated based on train and rail travel bookings through our travel provider. Following an extensive review of our Corporate Travel Provider in 2016, we switched provider from CTI to Egencia in October 2016. Part of the Expedia group, Egencia is specifically aimed at business travel and it is hoped the move will provide increased visibility and more accurate data. Vehicle emissions are calculated based on business mileage expenses claims. At present we are unable to account for vehicle emissions from taxi journeys, however we are looking at means of accounting for taxi mileage in future business travel emissions reporting. This remains on our action list.

2016 saw the development of our first Business Travel Carbon Management Plan. The aim of this Travel Plan is to provide staff with alternative, sustainable travel options, reducing reliance on single occupancy car use. Benefits of an effective Travel Plan will include:

- Reduced congestion leading to a reduction in harmful carbon emissions and improved air quality
- Opportunities to build healthy exercise into daily life
- Positive impact on BDPs environmental performance through CO_2 reductions
- Reduction in travel costs

As part of the Travel Plan, we have established a 'travel hierarchy', setting out a decision making framework to minimise travel, where possible, and its impact. Staff will be required to follow this framework to help them make the right travel/ transport choice.

BDP Travel Hierarchy

1. **Can the journey be avoided through the use of audio or video conferencing facilities?** Video conferencing facilities and equipment are available in all our studios. Alternatively, Lync is now fully established in all our UK and Ireland studios, allowing employee-employee video conferencing facilities with additional options such as sharing screens.
2. **Can the journey be carried out by foot, bicycle or public transport?** Cycle facilities are provided at nearly all our studios to make it easier for staff to not only commute to work by bike, but to encourage BDP staff to utilise cycle transport for business travel. Two Brompton bikes are available in our Manchester and London studios and an access key for the Santander Cycle Hire scheme is also available in the London office, with a cycle helmet and high-vis jacket available on request. To encourage the use of public transport as an alternative to car use, BDP pays or reimburses the cost of a business journey made on public transport.
3. **Where none of the above options is feasible, private transport can then be considered.** Where car travel is necessary, we encourage our staff to explore opportunities to car share, request a hire car with low emissions, and if possible, utilise a park and ride facility.

The Travel Plan has also set out a framework for Air Travel. Whilst we recognise that air travel may sometimes be required as part of our client facing work, we believe it is still necessary to challenge the need, frequency and mode of travel. The need to fly should take into consideration the purpose of the trip, total duration of the journey and total length of the trip. Staff are required to consider all suitable alternative travel options available before booking air travel.

Figures 14 and 15 show our overall Business Travel emissions per capita and by studio (per capita), over a 2013 baseline and in comparison to the previous year.

Figure 14: Business Travel ($kgCO_2e$) per capita

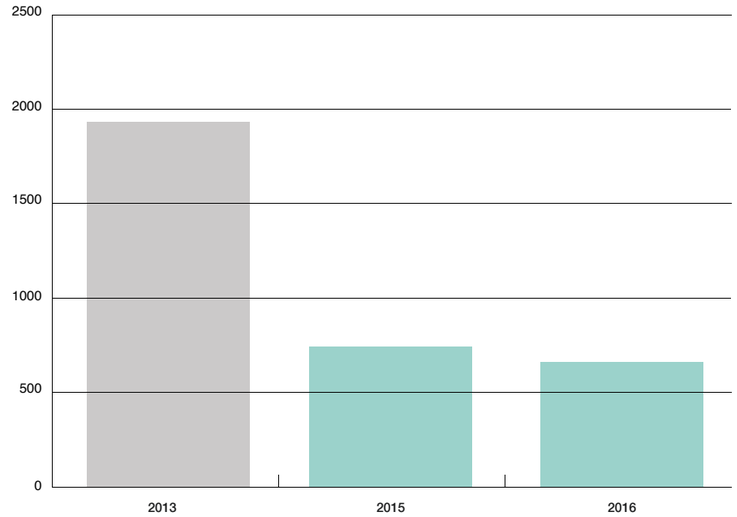
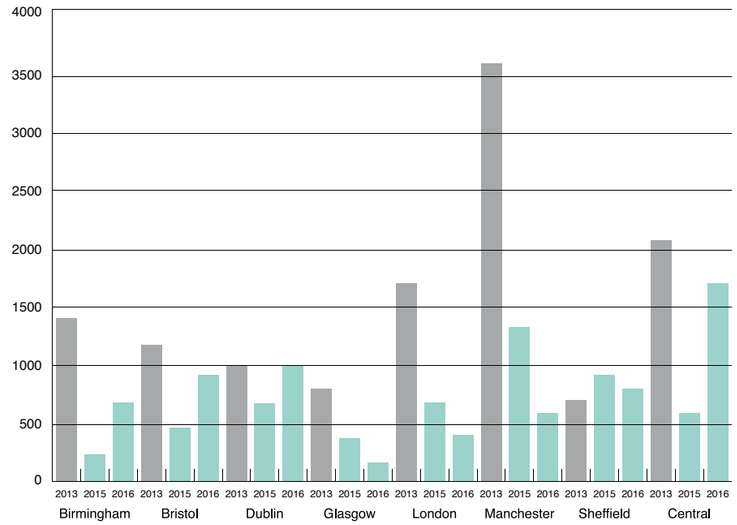


Figure 15: Business Travel ($kgCO_2e$) (by studio) per capita



Materials and Waste

All our studios have robust waste management procedures in place to ensure that we are accountable for the waste we produce and make every effort to maximise waste diversion from landfill. Waste management procedures vary considerably between each studio. For example, in some studios comingled waste is collected for sorting and recycling off site, whilst in other studios waste is separated at source. As of 2016 Birmingham has a waste contractor who now collects printer cartridges and WEEE.

Where our studios are located in multi-tenanted buildings, waste management is typically dealt with on a whole-building basis. Whilst the variation in data per studio does not lend itself well to the analysis of data trends, we feel that it is important to our environmental reporting to include yearly figures. Table 8 below shows the availability of waste data across all of our studios, demonstrating the variation in approach.

Table 8. Waste data availability per studio

Waste		Birmingham	Bristol	Dublin	Glasgow	London	Manchester	Sheffield
	White paper/ Cardboard	✓	✓	✓	✓	✓	✓	✓
	Comingled recyclables (plastic)	✓	✓	✗	✓	✓	✓	✗
	Glass	✗	✓	✗	✓	✓	✗	✗
	Organic waste	✗	✓	✗	✗	✓	✓	✗
	General waste	✗	✓	✗	✓	✓	✗	✓
	Printer cartridges	✗	✓	✗	✓	✓	✗	✓
	Mobile phones	✗	✓	✗	✗	✓	✗	✗
	Computers	✗	✓	✗	✓	✓	✗	✗
	Printers	✗	✓	✗	✓	✓	✗	✗
	Batteries	✗	✓	✗	✗	✓	✗	✗
	Other WEEE	✗	✓	✗	✓	✓	✗	✗

Table 9 reports the quantities of waste and recyclables produced per year since formal environmental reporting began in 2013. When interpreting this table it is necessary to refer to table 8 to note where lack of data availability may impact on reported figures.

Table 9. Quantities of waste and recyclables (kg)

Waste		2013	2015	2016
White paper/Card-board	Kg	14113.20	**25813.00**	**19276.40**
Comingled recycla-bles (plastic)	Kg	75864.00	59690.00	**65849.00**
Glass	Kg	4680.00	789.00	**208.00**
Organic waste	Kg	21020.00	14590.00	**41087.00**
General waste	Kg	42357.00	31422.00	**33422.00**
Printer cartridges	Units	143.00	667.00	**542.00**
Mobile phones	Units	21.50	4.00	**15.00**
Computers	Units	38.00	97.00	**139.00**
Printers	Units	3.00	12.00	**6.00**
Batteries	Kg	164.10	60.00	**25.00**
Other WEEE	units	368.00	1510.60	**638.00**

Studio Analysis 2016

Birmingham

	2013 baseline	2016	% change over 2013 baseline	% change over last year
Scope 1 emissions per capita ($kgCO_2$/capita)	937.24	7.71	Decrease 99.18%	No reliable data
Scope 2 emissions per capita ($kgCO_2$/capita)	1468.76	419.56	Decrease 71.43%	No reliable data
Water consumption per capita (m^3/capita)	4.16	3.98	Decrease 4.24%	Increase 36.29%

2016 was the second year of BDP Birmingham's occupation of 158 Edmund Street and marks the first year of being able to accurately gauge the impact of the sustainability features of this building on the studio's environmental performance. During the early part of 2015, faults were observed in both the gas and electricity meters, meaning there was a lack of reliable data from January to April. This prevented us reporting on annual consumption during 2015 against our 2013 baseline. However, the 2013 baseline does not relate to the current Birmingham studio as BDP has only been in occupancy for approximately two and a half years. Going forward, data collected in 2016 will form the new baseline.

The meter errors have now been rectified and monitoring shows per capita carbon emissions have reduced significantly from our 2013 baseline. This can be attributed to the high sustainability standards associated with the refurbishment of the building. Features include a 10kWp Photovoltaic solar panel system, energy efficient HVAC systems with heat recovery, and presence/daylight linked LED lighting. Occupancy of the second floor is currently shared, with electricity, gas and water consumption by BDP calculated by apportioning second floor meter readings by BDP occupied area. Discussions are ongoing with the building landlord to install BDP specific sub-meters.

2016 initiatives focused on working with the landlord and facilities management team to finetune the building systems, ensuring they were working efficiently and in line with design intent. This included the air conditioning control system which was turning on and off periodically. The issue has now been rectified, optimising comfort conditions and energy use. Items listed within our 2016 action plan have been completed, including a review of temperature controls and training for studio management staff in correct operation of the temperature controls. An issue with the PIR lighting has now been resolved. Lighting sensors have been repositioned in areas where PIR lighting was found to be operational when not required. This should result in further reductions in our electrical consumption.

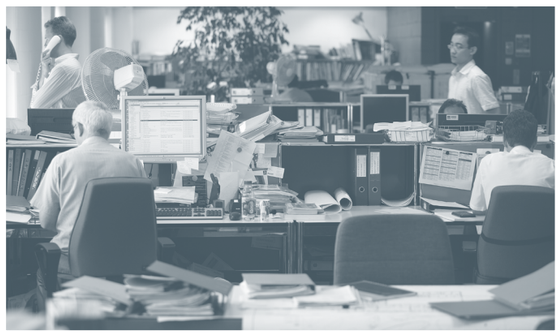
To further understand how energy performance can be optimised and further reduce carbon emissions, the landlord has hired Carbon Credentials to review the environmental performance of the building. This involved recommissioning of metering equipment as well as an interrogation of the metering configuration and arrangement.

Our water consumption per capita figures for 2016 show a decrease of 4.24% over our 2013 baseline but a significant increase compared to 2015 figures, with a large proportion of this increase occurring between August and December 2016. There have been no reported leaks in the building therefore this will be investigated further in 2017.

In 2017, there are plans to convert meeting room space into office space to accommodate higher staff numbers. This should further reduce energy consumption per capita.

Studio Manager: Collene Turner

Bristol



	2013 baseline	2016	% change over 2013 baseline	% change over last year
Scope 1 emissions per capita ($kgCO_2$/capita)	475.53	721.38	Increase 51.70%	Increase 45.69%
Scope 2 emissions per capita ($kgCO_2$/capita)	536.08	458.63	Decrease 14.45%	Decrease 15.59%
Water consumption per capita (m^3/capita)	11.15	5.05	Decrease 54.75%	Decrease 4.72%

Electricity associated carbon emissions have decreased in 2016. During the last quarter of 2015, LED lighting was installed in an area of the studio as part of the refurbishment programme. The replacement of standard fittings with sensor controlled, energy efficient LED lighting is likely to have contributed to this positive trend, together with a studio campaign to encourage staff to switch off appliances. Further upgrades were made to AV equipment with all new equipment either listed on the Energy Technology Product List or Energy Star rated, demonstrating energy efficiency. The reduction in scope 2 emissions is likely to have been greater had there not been heat pump failure in January and February 2016. This resulted in electric heaters being used until 1 March.

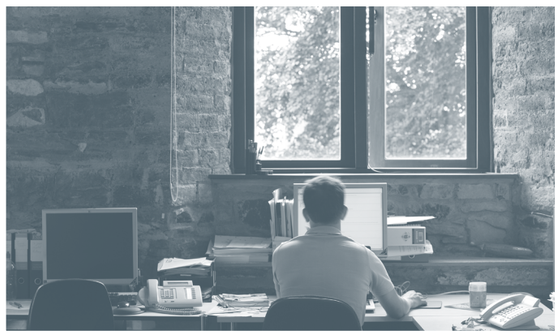
Gas consumption has increased significantly in 2016. Issues associated with occupant behaviour identified in 2015 are still ongoing with staff manually adjusting thermostats, leading to an inefficient use of heating. This contributed to an increase in gas consumption above 2015 levels despite a milder winter 2015/16. Thermostats across the studio are currently being monitored to ensure that settings are not altered independently by staff, alongside an ongoing staff environmental campaign.

Water consumption has continued to decrease over our 2013 baseline, with year on year reductions. Refurbishment of common toilets areas in 2016 included the fitting of PIR motion sensors. This ensures water is only supplied when the facilities are occupied, thereby preventing water wastage through faulty fittings, leaks, and occupant misuse when the toilet areas are unoccupied.

In 2017, upgrades are proposed to the studio kitchen including sensor operated LED lighting and appliance upgrades to meet minimum energy efficiency performance. Improvements in space utilisation will increase desk space, reducing energy consumption per capita. Further requests have been made to the landlord for installation of a water sub-meter for BDP occupied spaces. This will be discussed as part of the lease renewal discussions towards the end of 2017.

Studio Manager: David Vaughan

Dublin



	2013 baseline	2016	% change over 2013 baseline	% change over last year
Scope 1 emissions per capita ($kgCO_2$/capita)	83.41	4.71	Decrease 94.36%	Increase 4.86%
Scope 2 emissions per capita ($kgCO_2$/capita)	673.62	769.01	Increase 14.16%	Decrease 22.89%
Water consumption per capita (m^3/capita)	6.32	6.54	Increase 3.36%	Decrease 8.55%

Our 2015 environmental report showed a significant increase in Scope 2 emissions against the 2013 baseline. This was attributed to the new studio space (the Dublin studio took occupation of new premises adjacent to the existing office in September 2014) utilising electric night storage heating. The electric heaters are both inefficient and have a higher carbon intensity than gas heating. It was noted that replacement with a more efficient gas-fired space heating system was not immediately viable due to the lack of gas supply to the building, but that other areas of environmental improvement would be addressed during 2017.

The significant decrease in gas consumption against the 2013 baseline is attributed to the absence of gas supply within the new studio space. There has been a small increase since 2015, which may be a result of the colder temperatures in November and December 2016.

Whilst total water consumption has continued to increase, in 2016 water consumption per capita declined. A review of existing water and light fittings and lighting controls will be undertaken to inform programme of retrofit once there is greater certainty of the office accommodation strategy later this year.

Studio Manager: Frank Fleming

Glasgow

	2013 baseline	2016	% change over 2013 baseline	% change over last year
Scope 1 emissions per capita ($kgCO_2$/capita)	767.20	589.47	Decrease 23.17%	Increase 23.63%
Scope 2 emissions per capita ($kgCO_2$/capita)	1085.54	693.35	Decrease 36.13%	Decrease 21.44%
Water consumption per capita (m^3/capita)	2.78	3.63	Increase 30.51%	Increase 12.08%

The Glasgow studio has continued to see a significant reduction in Scope 2 emissions against the 2013 baseline. In 2016, a programme of works to replace all lighting with LED fittings was completed. This new, energy efficient lighting system has contributed to the reduction in electricity related carbon emissions against 2015 figures.

Despite improvements being made to the boiler settings in 2014, 2016 has seen an increase in gas consumption over 2014 levels. Furthermore, there has been a significant increase against 2015 figures, with considerably higher consumption in May to August 2016 when compared to the same months in 2015. This has been attributed to an unseasonably cold summer in 2016 which resulted in the heating being kept on for longer. Further cold temperatures in November of the same year caused a spike in gas consumption for this month.

Work has been undertaken to assess the performance of the building's windows and to undertake a high level cost-benefit study to determine the viability of improvements to the windows to improve air tightness and energy efficiency. The window adjustment work required would ensure the windows fit and operate well, thereby reducing heat loss. The preliminary results of this study have found that the costs associated with the works required are prohibitively expensive and it is not recommended that these proposals are carried forward.

In order to reduce the overall gas consumption of the studio, a phased boiler replacement programme is scheduled for 2017/18. The first phase will involve the replacement of two boilers within the second floor plantroom, with replacement of the remaining two boilers in 2018. The new boilers will be high efficiency to reduce overall fuel consumption.

Water consumption has increased since 2015. This may be attributed to estimated water consumption figures for some periods of 2016. An issue with accessibility to the buildings water meters has meant the office manager has been unable to submit accurate readings and over estimation of water usage may have occurred. Communication is ongoing with the building landlord to try and rectify the situation and a further review will be undertaken once accurate meter readings are available.

Studio Manager: Laura Clark

London

	2013 baseline	2016	% change over 2013 baseline	% change over last year
Scope 1 emissions per capita ($kgCO_2$/capita)	170.06	102.04	Decrease 40.00%	Increase 28.14%
Scope 2 emissions per capita ($kgCO_2$/capita)	1023.16	845.46	Decrease 17.37%	Increase 8.72%
Water consumption per capita (m^3/capita)	8.48	8.74	Increase 3.08%	Increase 12.38%

Gas consumption has decreased in the months of December to February against 2014 and 2015 figures before steadily increasing March to June. This has indicated that while the heating is being used more effectively during peak heating demand, it is being kept on for longer into the spring, most likely due to March and April being colder months in 2016. A spike in gas consumption in November 2016 (almost double kWh to 2015), also indicates a colder November.

A thermographic survey was undertaken in December 2016 to determine areas of heat loss and inform a programme of works to improve air tightness and reduce energy inefficiencies. However, it is not currently deemed feasible for any changes to be made due to time left on the lease.

Replacement of all nine boilers with high efficiency condensing boilers is scheduled in summer 2017. This should significantly improve the efficiency of our gas usage.

Electricity consumption has slightly increased per capita but reduced overall. This is due to staff numbers decreasing due to greater numbers of site based staff. It should be noted that the chillers were not working for part of 2016, which would otherwise have been expected to lower electricity consumption.

Similarly, the increase in water consumption per capita and overall reduction can be attributed to the increased number of staff working on site. The proposed increased space utilisation as part of the office redesign should increase the number of staff per floor area, thereby reducing both energy and water consumption per capita.

Studio Manager: Paul Hobbs

Manchester

	2013 baseline	2016	% change over 2013 baseline	% change over last year
Scope 1 emissions per capita ($kgCO_2$/capita)	37.79	20.14	Decrease 46.71%	Increase 9.13%
Scope 2 emissions per capita ($kgCO_2$/capita)	1161.61	662.21	Decrease 42.99%	Decrease 14.11%
Water consumption per capita (m^3/capita)	9.04	9.29	Increase 2.81%	Decrease 31.30%

Due to the subletting of the 4th floor in our Manchester studio, metered data is prorated to include only spaces used by BDP (83% of space). The studio has been undergoing a review and optimisation of the building's BMS since 2015. An initial review in 2015 identified that the system was not operating as designed and a key area for improvement was the ability to obtain meter output data via the BMS. During 2016, the system has been reconfigured and optimised to enable real-time energy management. Six months of data is now available and 2017 will see this data being analysed and interpreted to better understand the building's performance and determine a baseline from which interventions can be implemented and assessed.

Gas consumption per capita increased in the colder winter periods of 2016, while electricity consumption decreased. This can be attributed to an increase in staff numbers, resulting in improved space utilisation. A review of the building's BMS enabled the identification of issues with the accuracy of metering for the studio, resulting in only two thirds of consumption being recorded. A new meter was installed in November 2016 and an increase in consumption for December 2016 demonstrates the impact of this. This has been taken into consideration and the amended figures accounting for the missing 1/3 data are provided as follows.

	2013 baseline	2016	% change over 2013 baseline	% change over last year
Scope 2 emissions per capita ($kgCO_2$/capita)	1161.61	1022.67	Decrease 11.96%	Decrease 0.53%

Water consumption has significantly reduced since 2015. This is primarily a result of the detection and rectification of water leaks identified in both 2014 and 2015, which had adversely impacted water consumption in those years. The optimisation of the BMS will now enable us to identify quickly system issues such as leaks, preventing unnecessary water wastage.

Initiatives for 2017 include the installation of LED fittings in all common areas. Although water consumption has decreased against 2015 levels, it is still higher than the 2013 recorded baseline. The sanitary fittings and fixtures in the studio are nearly 10 years old and some taps and WCs are in need of replacement. A review of all faulty fittings has been undertaken and a programme of replacement is scheduled for 2017.

Studio Manager: Kevin Sutton

Sheffield

	2013 baseline	2016	% change over 2013 baseline	% change over last year
Scope 1 emissions per capita ($kgCO_2$/capita)	393.79	429.61	Increase 9.09%	Decrease 8.69%
Scope 2 emissions per capita ($kgCO_2$/capita)	960.66	1327.59	Increase 38.20%	Decrease 18.15
Water consumption per capita (m^3/capita)	6.48	5.45	Decrease 15.93%	Decrease 3.41%

The 2013 scope 1 and 2 emissions baseline for the Sheffield studio was calculated from aggregated figures based on whole building consumption. Since 2014, the installation of BDP studio specific electricity and gas sub-meters have allowed accurate consumption figures to be recorded. This has shown that although there has been an increase in both gas and electricity consumption over the 2013 baseline, the results of accurate monitoring since 2014 have shown a decrease year on year, with further reductions in consumption in 2016.

Energy saving initiatives in 2016 included a review of the BMS control strategy to ensure performance was optimised. Subsequent modifications to the scheduling of the BMS to suit building occupancy have ensured building services plant is only operated when required, reducing energy consumption.

Meeting room audio visual equipment was upgraded and purchased in accordance with our Responsible Procurement Policy. This ensures only equipment either listed in the Energy Technology Products List or that is Energy Star rated is procured. An energy awareness campaign with staff is ongoing, the aim of which is to raise awareness and instil cultural change to complement other elements of good practice as part of an integrated approach to our energy management.

Directly metered water consumption figures are not available due to the multi-tenanted nature of the building and the lack of sub-metering specific to BDP occupied floor area. Total water consumption figures recorded are estimated based on industry benchmarks of consumption and therefore does not accurately represent consumption within the studio. The fluctuations in per capita consumption reported is a result of changes in studio occupancy.

Studio Manager: Susan Brookes

IT Energy and Environmental Improvements

As part of our ISO 50001 commitments we have developed and implemented a specific responsible procurement policy for IT equipment and services. This policy sits alongside and draws on the principles within our overarching Responsible Procurement Policy. The IT responsible procurement policy includes guidelines for the specification of IT equipment, including specific environmental and energy standards to be achieved for common equipment (monitors, desktops, laptops, projectors, printers, servers).

Across all of our UK and Ireland studios, a programme of continual IT improvements ensures that we benefit from the latest developments in energy efficient and environmentally sound products. Headlines for 2016 include:

- **Continuation of server visualisation to reduce physical space, energy consumption and cooling requirements.** In 2016, a further 15 physical servers were decommissioned (four in London, one in Bristol, one in Sheffield, and one in Glasgow). An existing data storage system was also decommissioned in the London studio.
- **Replacement of all Multifunction Devices within the London studio.** The newly installed KM754 model is designed for energy efficiency and minimum environmental impact and features include:

  reduced annual energy consumption. Typical Electricity Consumption of 5.2kWh, significantly lower than the Energy Star Program's standard value,

  made from recycled materials to minimise environmental impact,

  designed for a longer life span, requiring fewer consumable replacement for parts,

  user can view their 'eco contribution levels' for toner and paper saving. Cumulative power usage can also be displayed,

  promote paper saving with a printer driver that sets duplex printing as the default setting.

- **Reduced cooling requirements.** Operating temperature of the server room in the Manchester studio increased from 18° to 25°, reducing direct energy demand associated with cooling.

Summary

The following graphs provide a summary of the total environmental impact BDP has made over the 2016 financial year. Our performance continues to improve, but the opportunities for easy wins become less obvious, requiring an increase in effort, in investment or both.

We will continue to base our interventions on those that offer the greatest benefit to our working environment, and where the investment required marries with our commercial position and length of lease.

We believe our refined targets now afford us the flexibility to try new things. We will continue to review the relevance of targets and adapt or amend where we feel necessary. In doing this we will ensure that we continue to drive down our environmental impact.

Figure 16. Scope 1 and 2 carbon emissions per capita against 2018 target

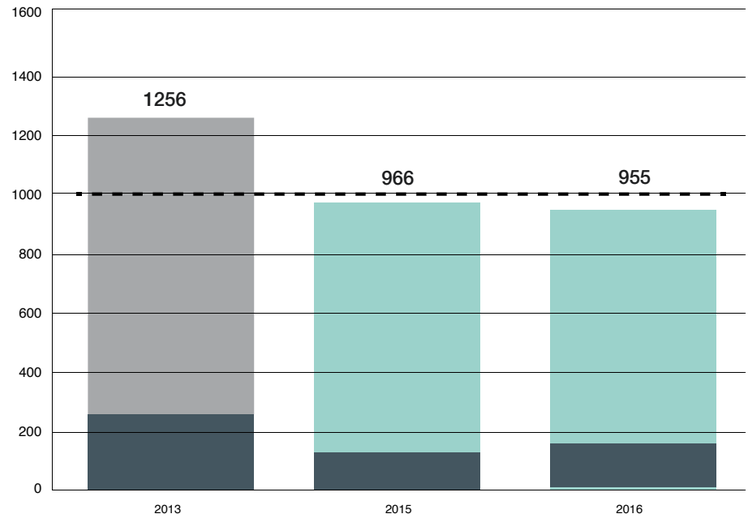
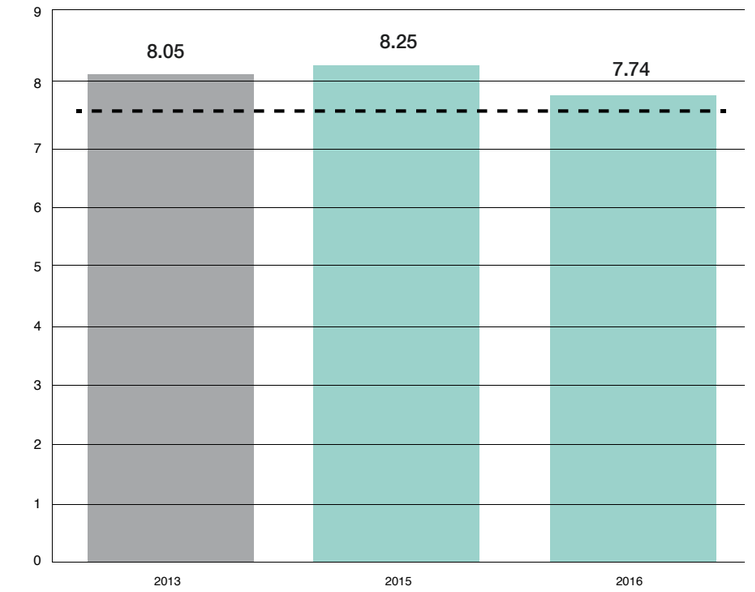


Figure 17. Water consumption per capita against 2018 target



Future Projections

In 2016 we have been successful in considerably reducing our Scope 1 and 2 carbon emissions, and in doing so, exceeding our target that carbon emissions do not exceed 1000kgCO_2e/capita.

The studio analysis pages detail some of the studio-specific initiatives which have been successfully implemented to contribute to a reduction in carbon emissions. Figure 1.1 shows that total emissions are projected fall to 12% against our 2013 baseline by 2018.

The following graph provides a projected energy consumption on the basis of the trend analysis applied to the data collected since 2010.

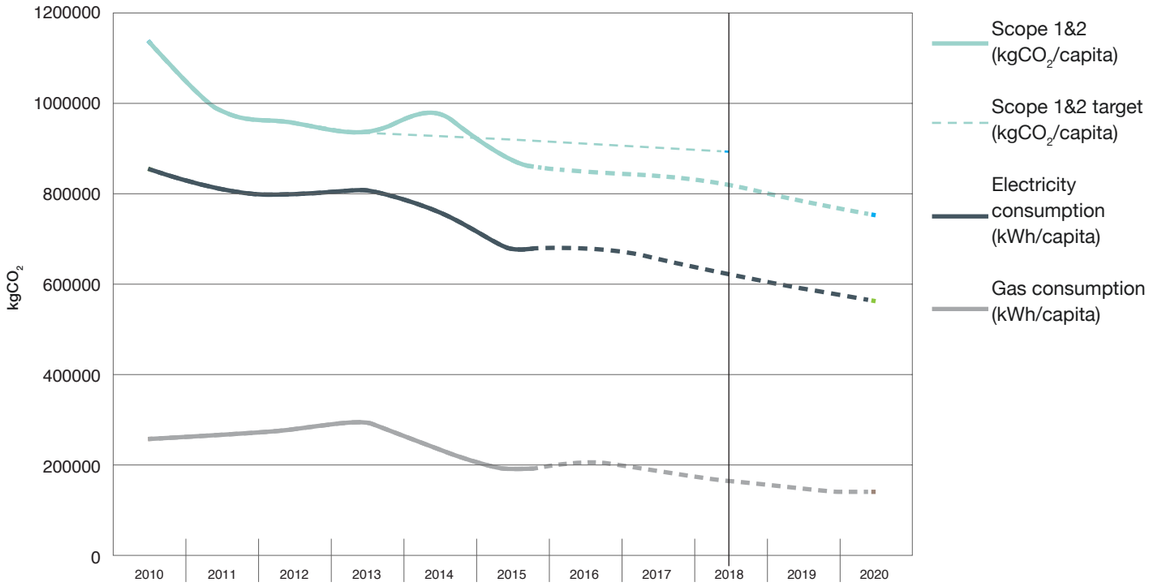


Figure 18 Projected future energy consumption (All Studios)

In 2016 we have also been successful in reducing water consumption, for the first year since 2013, with a reduction of 3.8% per capita below the baseline. This makes good progress towards our target for a 5% reduction in water consumption per capita by 2018. Figure 1.2 indicates that whilst it is expected that a 5% reduction in water consumption per capita will be achieved by 2018, a 5% reduction in absolute water consumption will not be achieved until 2020.

The following graph provides a projected water consumption on the basis of the trend analysis applied to the data collected since 2010.

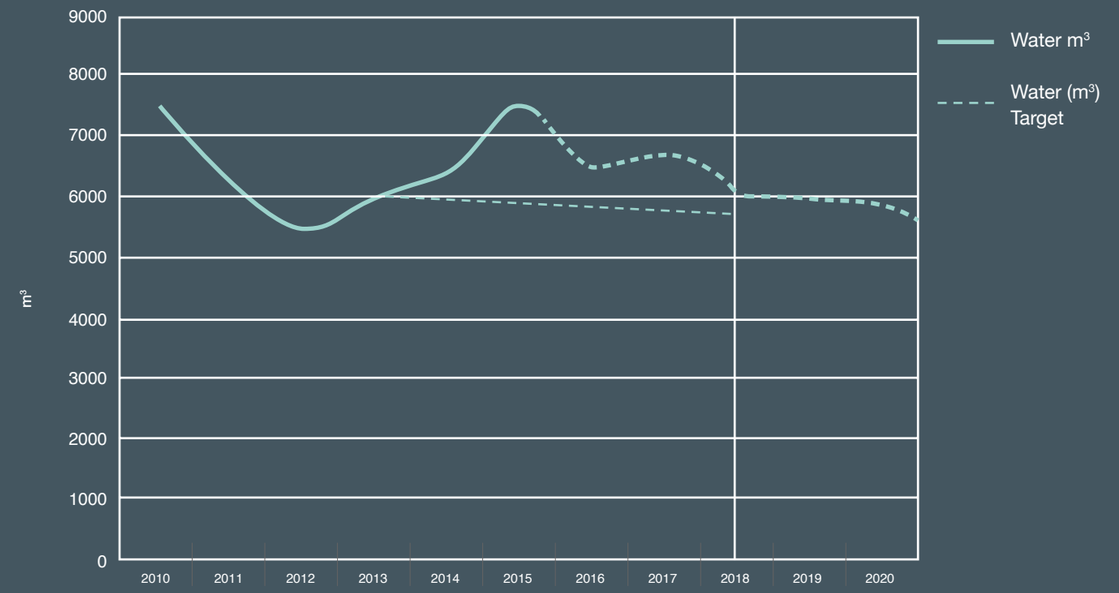


Figure 19 Projected future water consumption (All Studios)

2017 Action Plan

Birmingham

- Convert meeting room space into office space to accommodate higher staff numbers
- Continue discussions with building landlord to introduce sub-metering of electricity and gas in BDP floor areas, and additional sensors

Bristol

- Upgrades to the studio kitchen including sensor operated, LED lighting and appliance upgrades to meet minimum energy efficiency performance
- Improvements in space utilisation to increase desk space, reducing energy consumption per capita
- Discussion as part of the lease renewal for installation of a water sub-meter for BDP occupied spaces

Dublin

- Review existing water and light fittings and lighting controls

Glasgow

- Replacement of two boilers within the second floor plantroom with new high efficiency boilers
- Ongoing communication with the building landlord to ensure access to meters and enable accurate monitoring

London

- Replacement of all boilers

Manchester

- Installation of LED fittings in all common areas
- Replacement of old and inefficient water fittings with water efficient fittings

Sheffield

- Energy awareness campaign with staff

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