

## **Harrow College Carbon Footprint**

### **Calendar Year 2017**

#### **Introduction**

The context of our Carbon Footprint Report is that 2017 was one of the hottest years on record worldwide (following on from previous records set in 2014/15 and 16) with an increase in the number of extreme weather events due to climate change. As part of our good governance strategy, we aim to reduce our contribution to the causes of climate change and are therefore very pleased to report that our efforts this year have led to a 7% reduction in our carbon footprint compared to 2016. This has resulted from a significant reduction of 15% in gas consumption from 2016 to 2017, and a 2% reduction in electricity consumption. The gas usage reduction is partly due to our new buildings being mostly heated by electricity, but it also reflects good management as the reduction occurred on both main sites. Electricity consumption at both main sites was lower than last year, however both Whitefriars sites showed increased usage, particularly unit 5 which had a 60% increase in usage. This reflects the difficulty in managing energy usage in satellite sites, but is also partly due to a change in provider and estimated bills. We will update our records when actual figures are available for unit 5.

#### **Boundary and Scope**

Our operational boundary includes carbon emissions from gas and electricity consumption at Harrow on the Hill, Harrow Weald and Units 1 & Unit 5 Whitefriars, as we are responsible for these emissions and we are able to take measures to reduce them. Our efforts to reduce emission are limited at Whitefriars, as these are leased premises and we would be unlikely to achieve a payback for investment within the lease period.

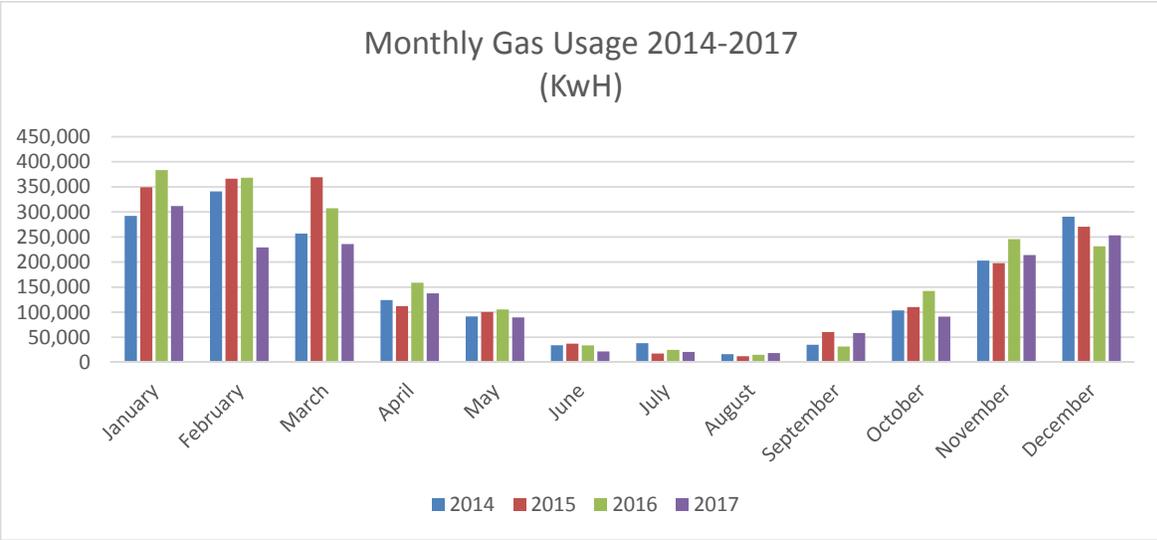
As usual, all directly controlled emissions (gas usage) and indirect emissions (electricity) consumption have been recorded from actual monthly readings on invoices and we are confident that they are accurate and up to date. The CO<sub>2</sub> produced each year is calculated from the Carbon Trust Footprint tool, using the 2016 DEFRA conversion factors, in order to be able to compare this year's figures with previous years. The CRC carbon emissions factors from the Environment Agency for reporting year 2017-18 shows little change in gas factors, while the grid electricity factor has fallen by 14.6% in one year. This change is a result of coal generation being phased out, together with a surge in renewable generation. The carbon intensity of UK grid electricity has fallen by 28% in just three years, so we will see a large reduction in our footprint next year.

We have included emissions from our 4 minibuses in our total carbon footprint, but have not included emissions produced from air travel, business travel, water consumption or waste.

#### **Direct Emissions From the Use of Gas on Site**

Direct emissions result from combustion of fossil fuels on site which produce CO<sub>2</sub> emissions, primarily from heating the College.

#### **Chart 1 Gas Consumption 2014-17 for All HC Sites**



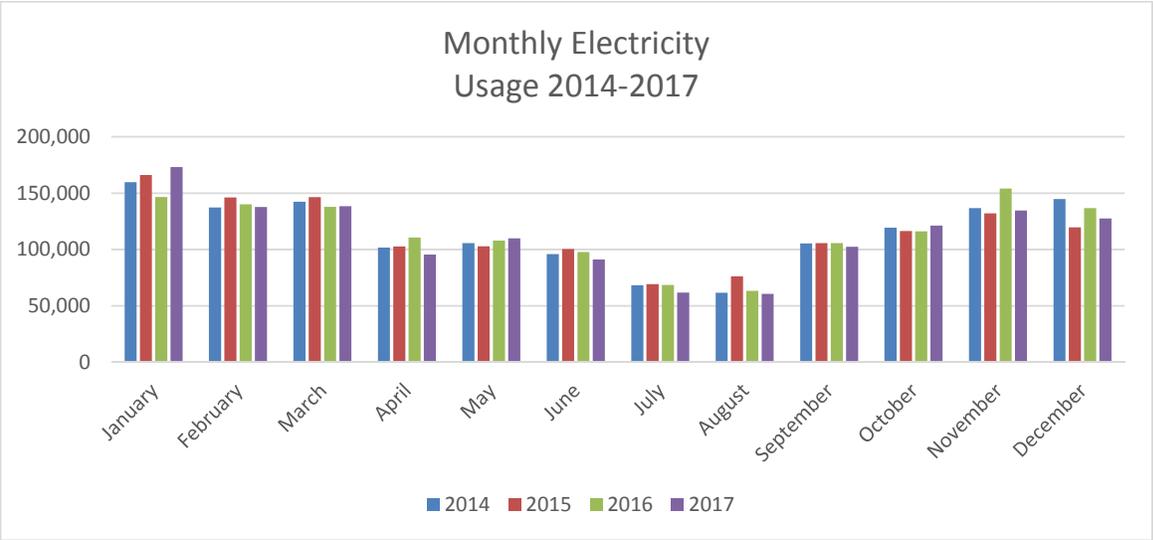
- We reduced our gas consumption by 15% in 2017.
- Gas usage is inherently more variable than electricity usage because it depends on outside temperature as well as management of resources.
- Our gas usage would have reduced more in December but a malfunction in the BMS meant that Harrow on the Hill was heated during the Christmas shutdown above the frost stat setting.

**Indirect Emissions from the use of Electricity**

We use electricity for lighting, heating, cooling and equipment and by purchasing the electricity, Harrow College is indirectly responsible for the release of CO<sub>2</sub>. This year the carbon emissions from electricity in the UK are lower, as some coal fired power stations were closed and more of our electricity was produced from renewables and low carbon sources. In the third quarter of 2016, a record 50% of electricity in the UK was produced by low carbon sources. In order to make comparisons with previous years, the carbon footprints from previous years have been adjusted using 2016 carbon factors.

We have excluded electricity usage from our solar panels, as we do not receive FiTs, the Carbon Trust allows us to discount this from our total electricity usage, for the purpose of being accredited to the Carbon Standard. We produced slightly less electricity from our panels this year, due to annual fluctuations in sunlight, which will result in our electricity consumption being marginally higher. It is interesting to note that our electricity usage dips during the summer term, when electricity usage may be expected to increase, due to the effect of the solar panels.

**Chart 2: Electricity Consumption for all Sites 2014-2017 (excluding electricity produced by our PV panels)**



- We reduced our electricity consumption by 2% from 2016 to 2017 while 2016 consumption was virtually the same as 2015.
- Electricity usage has increased as a percentage of our total energy use, due to the new buildings being electrically heated and cooled, it is therefore vital to continue our efforts to reduce electricity consumption, as we now spend more than 4x as much on electricity as on gas. The Carbon footprint produced by electricity usage is approximately twice as high as gas.

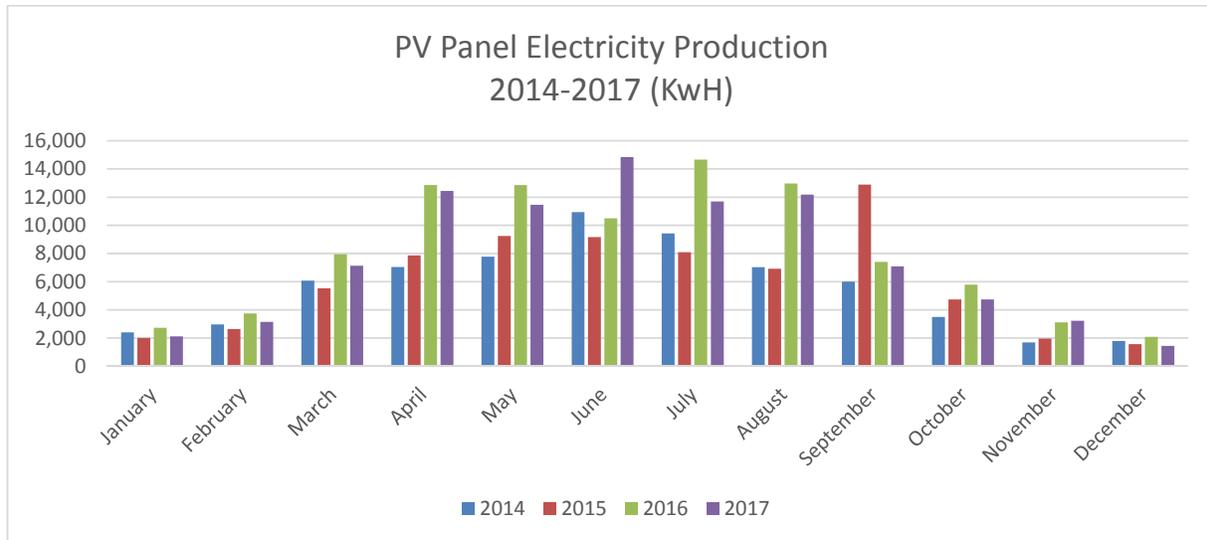
**Electricity Generated by our Solar Panels**

The electricity produced by our solar panels has been deducted from our total electricity usage this year, in compliance with the Carbon Standard requirements. Our solar panels on both sites produced 91,513KwHs in 2017, the slight decrease from 2016 is due to normal fluctuations in levels of sunshine. The increase from 2015 to 2016 being due to the additional solar panels installed on the new buildings as part of the BREEAM Excellent specification. All the electricity our panels produce is consumed on site, thus reducing our requirement for purchased electricity, particularly in the summer months.

**Table 1: Total Annual Electricity Produced by our Solar Panels**

Year	2014	2015	2016	2017
KwHs Produced	66,690	72,646	96,691	91,513

**Chart 3 Showing Monthly Solar Electricity Generation and Use 2014-2017 (KwH)**



**Table 2. Total Energy Used (excluding electricity produced by our solar panels) and Carbon Footprint from 2014-2017**

Year	Gas KWh Total	Gas CO <sub>2</sub> Tonnes	Electricity KWh Total (excl. solar)	Electricity CO <sub>2</sub> Tonnes	CARBON FOOTPRINT CO <sub>2</sub> Tonnes
2014	1,825,213	336	1,379,245	568	904
2015	1,970,681	363	1,384,016	570	933
2016	1,987,840	366	1,387,698	571	937
2017	1,681,750	309	1,353,943	558	867

- CO<sub>2</sub> emissions from gas decreased by 15% in 2017.
- CO<sub>2</sub> emissions from electricity reduced by 2% in 2017.
- Total carbon footprint decreased by 7% this year (as electricity usage produces aprox. 2x as much CO<sub>2</sub> as gas).

**Other Direct and Indirect Emissions**

Additional direct and indirect emissions have to be included in our carbon footprint in order to re-qualify for the Carbon Standard. However the figures for air and business travel have been omitted from this report as they are not yet available. Apart from electricity and gas usage, air travel is the next largest contributor to our carbon footprint and this has been reduced due to the restructuring of the Department of Development, Enterprise and Innovation and fewer international students coming to this country.

**Table 3: Other Direct and Indirect Emissions**

Year	Emissions from Gas Usage tCO <sub>2</sub>	Emissions From Electricity Usage tCO <sub>2</sub>	Emissions from Minibus Usage tCO <sub>2</sub>	Total Carbon Emissions tCO <sub>2</sub>
2014	336	568	3	907
2015	363	570	4	937
2016	366	571	3	940
2017	309	558	3	870

## Energy Costs

**Table 3: Summary of Energy Cost from 2014-2017**

Year	Gas	Electricity	Total
2014	£70,499	£151,022	£221,521
2015	£76,531	£165,021	£241,552
2016	£59,743	£164,854	£224,602
2017	£41,431	£166,322	£207,753

- Our energy costs have reduced by £16,849 in 2017 mainly due to the lower price of gas, with greater use of electricity for heating and cooling in our new buildings.
- Our gas supplier since April 2015 has been Total Gas with a charge of 2.2864p/kWh and a relatively low monthly standing charge.
- As we spend roughly four times as much on electricity, we need to concentrate our efforts mainly on reducing electricity consumption to enable us to maximise savings of both CO<sub>2</sub> emissions and costs.
- Our electricity supplier since April 2015 is Smartest Energy with a rate of 10.75p/kWh (energy and non-energy charge combined) and a daily standing charge of 96.27p each for the two main sites.
- 91,513kWh of solar energy was generated this year, a slight decrease 5,178kWh, due to natural annual variations in hours of sunshine.
- With the unit price of say 10.8p per kWh, we saved £9,883 this year in electricity costs.
- Since the first set of panels were installed in November 2012 they have produced 391,211kWh of electricity – a saving of £42,251 at today's prices.

## Embedding Carbon Management across the College

We have made progress in embedding the culture of energy efficiency across the College this year especially with our new BREEAM Excellent buildings. A very successful Environment Awareness Week was held in March 2017 and energy saving ideas were collected from students and staff on a Padlett wall. The annual Green Travel day was held in Oct 2017 to encourage staff and student to travel to college by bicycle, various types of bicycle were available on the day for student to try and safe cycling route maps were issued. Successful bicycle training courses have since been held for students including a female-only course.

We hope to be reaccredited for the ISO14001 Environmental Standard this year which requires staff training in energy saving. In the 2017 all staff survey, 96% of staff said they were aware of the College's Carbon Reduction Plan and 100% of staff said they were aware of and supported the switch off campaign. All new staff have a clause in their contracts of employment requiring them to support our energy saving initiatives and sustainability is also a major topic in the staff induction programme when new members of staff are informed that we are a leading sustainable college and are asked to actively support this achievement by turning off appliances when not in use, etc.

### **Conclusion and Aims for 2018**

We have improved the energy management of our new BREEAM Excellent buildings which have been in use since September 2015, with greater understanding of how best to manage their energy consumption. We believe that their energy efficient designs will minimise energy consumption in future. A five year carbon reduction plan for Harrow College is being considered which could reduce our carbon emissions by 20% if fully implemented. As electricity is more expensive than gas, we will prioritise efforts to reduce electricity consumption to enable us to maximise savings of both CO<sub>2</sub> emissions and costs.

Harrow College has now merged with Uxbridge College and we intend to combine our skills and assets to achieve joint Carbon Standard accreditation for 2018. A new five year carbon reduction target will be set to encourage further energy efficiency initiatives and good carbon management and a HCUC carbon footprint report will be produced for 2018. Our aims for 2018 also include achieving BREEAM Excellent certification for our new Health & Social Care Building at Harrow Weald.

As a socially responsible organization, we intend to continue to reduce our emissions wherever possible, in order to play a small role in the global effort to mitigate climate change.