



# Getting to a Zero Carbon Future at Wolfson College



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## Introduction

College utility meters track the consumption of gas, electricity and water in units [1]. These units were converted [2] by members of the Carbon Reduction Committee in Easter Term 2019 [3] to help evaluate Wolfson's total monthly and annual Greenhouse Gas (GHG) emissions in carbon dioxide equivalent (CO<sub>2</sub>e) metric tonnes/year for 2009-2019.

These preliminary findings were then reported and advice given to the President and Council [4] on necessary steps to meet the published International and UK Greenhouse Gas targets for achieving Carbon Zero well before 2050.

The basis for the conversion of utility data to carbon dioxide equivalent emissions is published factors [2] as appropriate to reporting GHG emissions. These key factors vary yearly for each major utility: UK gas supply; UK electricity generation, grid transmission and distribution; water supply and waste treatment. Figure 1 shows significant changes for UK electricity.

Further validated data and CO<sub>2</sub>e (CO<sub>2</sub> equivalent) emissions values were requested by Council, the Sustainability Committee and WCSA representatives [5-10] for comments before any general release for research communications events such as WRE2020.

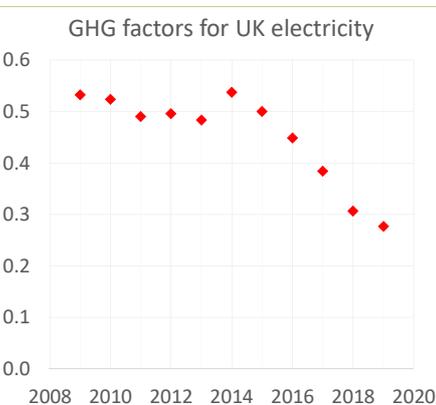


Figure 1. GHG factors for UK electricity (generation and supply) [2].

## Cautionary Notes

Wolfson's electricity metering does not always display in kWh: for the 2 largest residential blocks the meters display in 10kWh units. Some of the Wolfson gas meters used before 2013 recorded consumption in cubic feet not cubic metre (cum).

This information became apparent after trying to reconcile Wolfson's historical meter readings with records held by the College Accountant [6]. The reconciled consumption values underlie the GHG emissions per academic year reported to Council [9] and shown in this poster.

## Methods

Monthly gas, electricity and water (utility) meter readings from Wolfson Office (Accounts) records are used to monitor College utility consumption expressed in the respective units (cum, kWh, cum).

UK Government GHG conversion figures [2] have been used for Wolfson College annual emissions. This exercise permitted comparisons year-by-year to establish trends in College emissions based on a 2018/19 benchmark annual CO<sub>2</sub>e emissions value.

## Results

Figure 2 shows utility GHG emissions/year for the last 10 academic years, for gas, electric and the total to show their relative proportion in the total and highlight relative changes in recent years. (The GHG emissions level for water is stable at 3% total.)

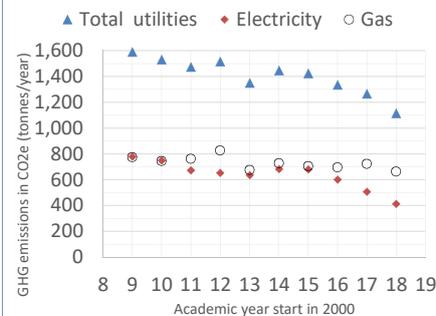
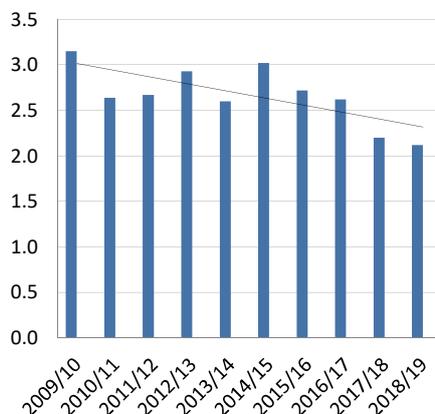


Figure 2. GHG emissions/year from Wolfson utilities for '09-'18 [9].

With the ongoing baseline year set at 2018/2019, the total GHG emissions is 1116 tonnes CO<sub>2</sub>e/year. The 10 year data trend gives an annual total CO<sub>2</sub>e GHG emissions reduction of 3% at Wolfson College. A closer inspection reveals most of this reduction was due to that in the GHG factor for UK electricity.

Chart 1. Wolfson College utilities GHG CO<sub>2</sub>e tonnes/yr/FT student.



## Discussion

Chart 1 shows a further conversion of these yearly figures to total CO<sub>2</sub>e emissions per full-time (U/G and P/G) student, based on those registered in the published annual accounts of Wolfson College. The 10 year trend is an annual CO<sub>2</sub>e reduction of 2%.

Faced with tough GHG emissions reduction targets, Wolfson College recently undertook surveys [11] for UK Energy Performance Certification of its buildings and these surveys imply very similar emissions for the whole College, based on UK average occupancy.

We could all try to do our bit to help clear the air. Other GHG emissions streams need evaluating to determine actions by students and staff together, and it is hoped that these projects can be funded to provide further evidence of their scale and priority.

Wolfson's current annual GHG emission trends of only 2-3%/year can also be compared with UK Gov, Cambridge City and UoC limits and the increasingly rapid timescales for achieving a zero carbon future.

## Conclusions

This first public exploration of Wolfson College GHG emissions levels and annual trends revealed a small %reduction mainly following the UK Grid electricity factor. College will have to switch from gas (60%) and grid electricity (37%) within the next 30 years. This will require major investments in sustainability.

The scale of GHG emissions from Wolfson College exceeds 1100 tonnes CO<sub>2</sub>e/year, equivalent to the weight of 88 London Buses or ca. 440 luxury Rolls-Royce cars launched into the atmosphere/year [12].



"Wolfson must drastically reduce its' CO<sub>2</sub>e GHG equivalent of x88 London buses or x440 Rolls-Royce cars being launched per year into the air"

## Cautionary Notes (2)

Estimates of accommodation occupancy and full-time (FT) student numbers depended on the resources used – either as reported by accounts or by senior tutor reports. At almost every step, data had to be cross-checked in order to provide some reliable quantitative values for reporting our GHG emissions calculations per FT student.

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## References

1. Wolfson Utility Meter Readings, recorded monthly by Neil Newman, compiled by Barbara Alois (accounts) and requested by Stephen Hoath
2. UK Government GHG Conversion Factors for Company Reporting, Condensed set for most users, and accessed on-line by year
3. Carbon Reduction Committee meeting July 2019; Stephen Hoath (Chair), David Izuogu (WCSA President) and Kim Eileen Ruf (acting WCSA Green Officer)
4. Letter to Council (August 2019) Stephen Hoath and John French
5. Feedback on letter to Council from Governing Body (October 2019) Jane Clarke (Wolfson President) and Stephen Hoath
6. Inspection of Accounts spreadsheets and with advice, November 2019, Stephen Hoath and Wendy Dyce (Accountant)
7. Inspection of Electricity metering, Stephen Hoath and Neil Newman Clerk of Works
8. Sustainability Committee meeting October 2019; Stephen Hoath (Chair) and Paul Matthews (WCSA Vice-President)
9. Revised letter to Council (November 2019) Stephen Hoath
10. Sustainability Committee meeting January 2020; Stephen Hoath (Chair), Charlie Barty-King (WCSA Green Officer) and Bonni Lee (WCSA Secretary)
11. EPC surveys reported in minutes of the Buildings & Estate Committee (March 2020) copied to the Sustainability Committee
12. Wikipedia – weights of London Bus and Rolls Royce luxury cars