

Thatcham Town Council

Carbon Footprint Report

Assessment Period: 1st January 2022 – 31st December 2022

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Executive Summary

An assessment of the greenhouse gas emissions (GHG) for Thatcham Town Council over the period of 1st January 2022 to 31st December 2022 is reported. This is the third carbon footprint report prepared for Thatcham Town Council. The first report was prepared by the company Carbon Footprint Ltd for the calendar year 2019 and the second, in this format, was prepared by Cllr David Lister. This report takes the report for 2021 and applies data for 2022.

Current Performance (year 2022)

- Thatcham Town Council GHG footprint is 23.4 tonnes CO₂e.
- Site Utilities (Gas and Electricity) account for 98% with electricity consumption dominating GHG at 62% of total.
- 'Grey' fleet car usage accounts for the remaining 2%.

Management Guidance

- In comparison to year 2019 the GHG footprint has reduced by 13.3 tonnes (36.2%).
- 2021 was impacted by Covid resulting in reduced usage of community halls. By 2022 usage had recovered, giving a more realistic indication of the reduction in GHG footprint since 2019.
- The largest single electricity demand is associated with the public toilets, and this has increased. Checks should be put in place to ensure water heating and lighting is switched off during out-of-hours periods.
- The two installations of solar panel systems saved 3.2 tonnes of CO₂ in 2022, compared to 3.4 tonnes in 2021. This equates to approximately 14% of the Council's total 2022 GHG (carbon equivalent) footprint.
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This report includes an analysis of the Greenhouse Gas Emissions for Thatcham Town Council which is dominated by usage of utility services – electricity and gas – that contribute to 98% of the Council's GHG.

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Introduction

The report defines the Green House Gas (GHG) emissions for Thatcham Town Council. The GHG is a broader measure of the carbon footprint that includes emissions such as CO₂ and additional gasses that contribute to climate change.

The report identifies the GHG emissions for Scope 1, 2 and 3. Scope 1 and 2 emissions are mostly associated with direct emissions, whilst Scope 3 are associated with indirect emissions. The contributions for each that are under the Council's operational control are described in the following table.

Scope 1	Gas consumed on site	Company van travel (fleet vehicle)
Scope 2	Primary consumption of electricity	
Scope 3	Electricity transmission & distribution	Employee business travel

Table 1: Summary of Scope 1, 2, 3 – noting that from November 2020 the Council no longer maintains its own fleet vehicle.

The report is structured as follows:

- Methodology is provided which enables the Council to replicate this approach and update its GHG emissions on an annual basis.
- The results are then presented for each of Scope 1, 2 and 3.
- The report then provides key observations followed by recommendations for future carbon reductions.

Methodology

The calculation for the GHG is dependent on accurate electricity and gas meter readings at the location of each premises under the management of the Council. These readings are then multiplied by the carbon intensity emission factor associated with each energy resource, available from public tables maintained by the UK Government (Department of Business, Energy & Industrial Strategy) and updated annually.

A similar approach is used for vehicle usage: record the number of litres consumed of each of petrol and diesel over the year and multiply by the relevant carbon intensity for the fuel.

The reporting is provided for Scope 1, 2 and 3 separately however for the Council the most important measure is the total GHG emissions which is the summation of each.

The formal approach is as follows:

Step	Resource
1. Record the meter reading for calendar year for each premise under the Council's management	Meter readings from utility company or direct reading representing calendar year period. Units of kilowatt-hours [kWh].
2. Record each of litres of petrol and diesel consumed by employees conducting business travel	Employee business expenses and reporting. Units of litres.

3. Electricity: Extract the “total kg CO ₂ e per unit” for appropriate year.	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting Tab: “UK Electricity” where CO ₂ e represents carbon dioxide equivalent.
4. Gas: Extract the “total kg CO ₂ e per unit” for Natural Gas, kWh, net CV.	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting Tab: “Fuels”
5. Petrol: Extract the “total kg CO ₂ e per unit” for “Petrol (average biofuel blend)” litres.	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting Tab: “Fuels”
6. Diesel: Extract the “total kg CO ₂ e per unit” for “Diesel (100% mineral diesel)” litres.	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting Tab: “Fuels”
7. For each meter reading multiply the number of units consumed by the CO ₂ e for each unit.	
8. For each of petrol and diesel, multiply the number of litres consumed by the CO ₂ e per litre.	

Table 2: Process to calculate GHG.

The final stage is to collate the total CO₂e from each premise and transport in suitable formats for presentation.¹

Results

For completeness and to support comparison with previous years, the following tables contain entries that commence from the baseline year 2019. This was the first year in which a carbon footprint report was prepared.

Year of meter reading	Public Conveniences	Thatcham Market	Town Council Offices		Burdwood Community Centre		Frank Hutchings Community Hall		The Moors Workshop	The Moors Sports Pavilion	London Road Cemetery	Lighting	Grey fleet car		Vans	
	Electricity	Electricity	Electricity	Gas	Electricity	Gas	Electricity	Gas	Electricity	Electricity	Electricity	Electric.	Diesel	Petrol	Diesel	Petrol
2019	7394	6610	5458	28124	3805	45914	7133	50650	2238	5303	1685	3973	21.5	0	588.2	0
2020	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2021	7928	3916	5320	43499	2261	25369	4301	23524	2105	3088	205	3925	62	156	0	0
2022	14914	2202	5198	21365	3007	21015	4940	36534	2900	2690	167	3911	39.7	191.4	0	0

Table 3: All contributing demand units (units of kWh for gas and electricity, and litres for petrol and diesel, steps 1-2).

¹ This report is provided with an Excel spreadsheet from which graphics and tables used in this report can be extracted.

	Elec Scope2 [kgCO2e/kWh]	Elec Scope3 [kgCO2e/kWh]	Gas [kgCO2e/kWh net]	Petrol [kgCO2e/litre]	Diesel [kgCO2e/litre]		Date published
2019	0.26	0.022	0.18	2.21	2.59		28-Jul-20
2020	0.23	0.02	0.18	2.17	2.55		17-Jul-21
2021	0.21	0.019	0.18	2.19	2.51		24-Jan-22
2022	0.19	0.018	0.18	2.16	2.56		22-Jun-22

Table 4: Carbon intensity figures (steps 3 – 6) extracted from public tables issued by UK government: Note: Scope 2 uses CO₂e to include total CO₂ impact; Scope 3 uses T&D (tab); Gas uses gross CV consistent with Carbon Footprint.

	Scope 1			Scope 2		Electricity Transmission & Distribution	Scope 3 Employee owned car (grey fleet)		Overall Total kg CO ₂ e
	Company Van Travel	Site Gas	Sub Total	Electricity Generation	Sub Total		Sub Total		
2019	1526	22924	24450	11144	11144	946	56	1002	36596
2020	0	0	0	0	0	0	0	0	0
2021	0	16923	16923	7017	7017	621	498	1119	25059
2022	0	14405	14405	7721	7721	706	515	1222	23348

Table 5: Calculation of kg CO₂e with sub-totals for Scope and Overall Total (steps 7-8).

Summary:

- In 2022 the total GHG emissions for Thatcham Town Council is 23.4 tonnes of CO₂ equivalent, down from 25.1 tonnes in 2021.
- Of these emissions, Scope 1 and Scope 2 together contribute 22.1 tonnes of CO₂, down from 23.9 tonnes in 2021.
- Scope 3 contributes a further 1.2 tonnes of CO₂, up from 1.1 in 2021.

Key Observations

Breakdown of total GHG footprint for 2022

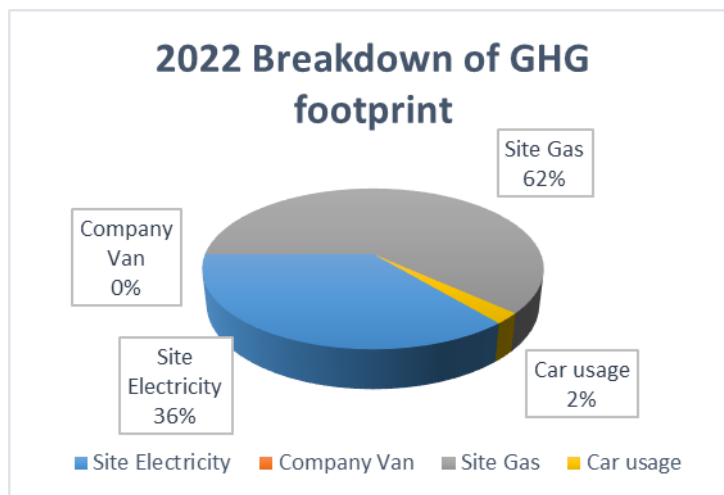


Figure 1: Breakdown of total GHG emissions.

Observations:

- Following the termination of a company van fleet hire in November 2020, the three remaining contributions in year 2022 to the GHG emissions were electricity (sites and lighting), gas (heating and hot water), and private cars used by employees for business travel.
- Electricity (sites and lighting) dominated the GHG footprint in 2021 accounting for 86% of all emissions, however that percentage changed in 2022 to 36%.
- Emissions from electricity and gas fell in the council offices but increased in other the buildings under council control, probably due to their increased usage following Covid-19.

Year on Year Comparison of major GHG contributors

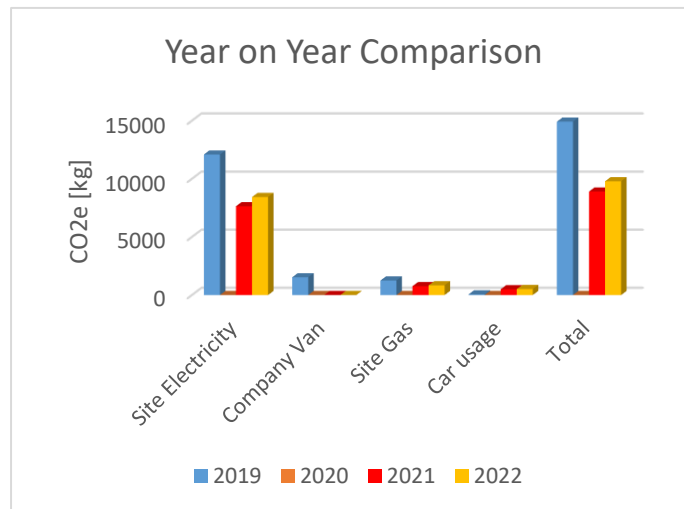


Figure 2: Year on year of CO2 broken down by major contributors.

Observations:

- The Total GHG reduced from 36.6 tonnes of CO₂e in 2019 (reference year) to 25.1 tonnes in 2021 decreasing to 23.4 tonnes in 2022.
- The dominance of gas as a driver for CO₂e emissions is apparent.
- Electricity increased slightly in 2022 from 2021, but gas consumption decreased. The cost-of-living crisis coupled with heightened awareness of environmental concerns are likely factors in these figures. Note that more normal usage of buildings following Covid-19 was also attained.

Year on Year Comparison of Electricity Consumption

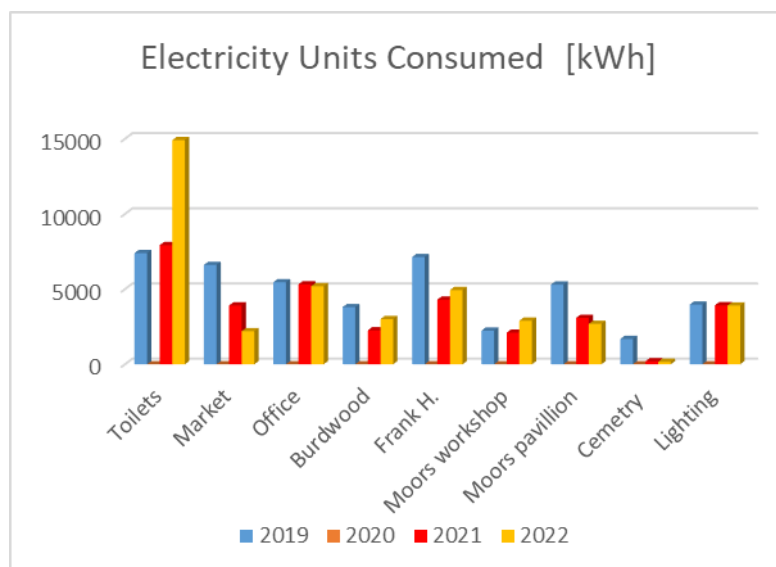


Figure 2: Premises and lighting consumption of electricity.

Observations:

- The public toilets are the largest single contributor to electricity demand and to the 88% increase from 2021 to 2022. The energy consumed by this premise is required for hot-water, heating, and lighting. It is recommended that the Council checks that these energy draws are all switched-off after lock-up during out-of-hours periods. Potential energy savings could be obtained by considering the following – are hot water taps and valves fully sealed and switching off after use and can lighting transition to LEDs at a future refurbishment.
- Electricity consumed at the Market, Office, Moors Pavilion and the cemetery have all been reduced relative to the reference year of 2019. Whilst this energy reduction in 2021 may have reflected less usage of the facilities following Covid-19, it is encouraging to see that although building usage increased during 2022 to more normal levels, electricity consumption was only slightly higher in these buildings.
- The Town Council Office reduced electricity consumption by 2% from 2021 and gas consumption by 51%, showing a good energy-conscious attitude by staff.
- The toilets had an increase in electricity consumption of 88% compared with 2021 which was itself up compared with 2019. Further investigation found that the increase in electricity consumption could be attributed to lax locking up of the facilities.
- The last report commented that, “unlike other community facilities, the Moors Workshop only reduced its consumption by 6%. This is slightly surprising as it may be expected to have a similar reduction in activity to the community halls. This suggests there may be an energy draw (such as lighting or hot-water heating) that is being left on during periods when the facilities are closed.” The figure for 2022 is up further, by 38% on 2021, and last year’s observation still merits investigation.

Year on Year Comparison of Gas Consumption

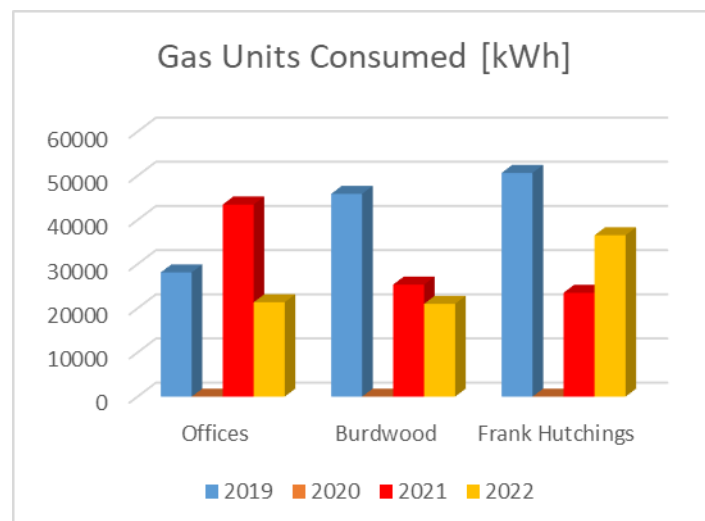


Figure 4: Gas consumption for three main sites.

Observations:

- The Burdwood Community Hall has continued to have reduced gas consumption significantly relative to the reference year 2019 but the usage in Frank Hutchings Hall is significantly higher than in 2021. This most probably reflects an end to the change in usage following the Covid pandemic but needs monitoring.
- The Council Offices' gas usage has ostensibly reduced significantly from 2021 and is now also down on the reference year, 2019, by 24%. The 2021 figure may have arisen from an error in the conversion from meter units to energy, but the 2022 figure is correct.

Solar Generation

The Town Council has two photo-voltaic (PV) roof mounted solar systems. There is an 8kW peak installation at the Council Offices and 4kW peak at the Frank Hutchings Hall. A generation meter reading is available that provides information on the total amount of energy (in kWh) that is generated over a year.

The power generated from these systems will be used on site, and if there is an excess of power then it will be exported to the utility company. Without information from an export meter reading, it will be assumed that all power generated is consumed on site².

	Offices - solar resource [kWpeak]	Offices (Solar generation) [kWh]	Offices (Total demand) [kWh]	% of demand from solar	Ratio of generation to peak [kWh/kWp]	Frank H. - solar resource [kWpeak]	Frank H. (Solar generation) [kWh]	Frank H. (Total demand) [kWh]	% of demand from solar	Ratio of generation to peak [kWh/kWp]	Carbon saved [kg]
2019	8	7725	13183	59%	966	4	4415	11548	38%	1104	3366
2020	8		0			4					
2021	8	7725	13045	59%	966	4	4415	8716	51%	1104	3366
2022	8	7719	12917	60%	965	4	3900	8840	44%	975	3222

Table 6: Solar generation meter readings, % of demand served by solar, performance of panels, and carbon savings *note in the absence of an updated reading for 2021 an estimate based on 2019 generation readings are used *

Observations:

- The solar panels provide up to 3.4 tonnes of CO₂ saving in 2019 which was the last year of generation meter readings.
- At both locations the total demand exceeds the solar power generated, so it is likely that most of the solar power generated is being used on site.
- For the total 2022 CO₂ footprint (23.4 tonnes), if all 3.2 tonnes (2022) solar energy is used on site then this is equivalent to a total saving of the Council's footprint of approximately 14%.
- Both systems are delivering approximately 1000kWh for each kWpeak installed. This is a measure of overall performance and indicates that both systems are working well.

² In practice a proportion of power will be exported, and this will be more significant when radiance is high (the sun is shining) as up to 8kW/4kW can be generated at each premises. The consequence of this assumption is that the carbon savings in Table 6 will be an upper estimate.

Summary

The Council has made progress in reducing its GHG (carbon equivalent) footprint relative to the reference year in 2019 and relative to 2021, although by a smaller margin. To maintain progress towards Net Zero, further work is necessary to achieve dramatic decreases.

- Thatcham Town Council's GHG footprint in 2022 was 23.4 tonnes CO₂e compared with 25.1 tonnes in 2021.
- Site utilities (gas and electricity) account for 98% with gas consumption amounting to 62%.
- 'Grey' fleet car usage accounts for the remaining 2%.

Management guidance:

- In comparison to year 2019 the GHG footprint has reduced by 13.3 tonnes (36.2%).
- 2021 was impacted by Covid resulting in reduced usage of community halls. By 2022 usage had recovered, giving a more realistic indication of the reduction in GHG footprint since 2019.
- The largest single electricity demand is associated with the public toilets, and this has increased. Checks should be put in place to ensure water heating and lighting is switched off during out-of-hours periods.
- The two installations of solar panel systems saved 3.2 tonnes of CO₂ in 2022, compared to 3.4 tonnes in 2021. This equates to approximately 14% of the Council's total 2022 GHG (carbon equivalent) footprint.