Carbon Footprint Appraisal
for
Shrewsbury Town Council

Assessment Period:
1st April 2023 – 30th March 2024

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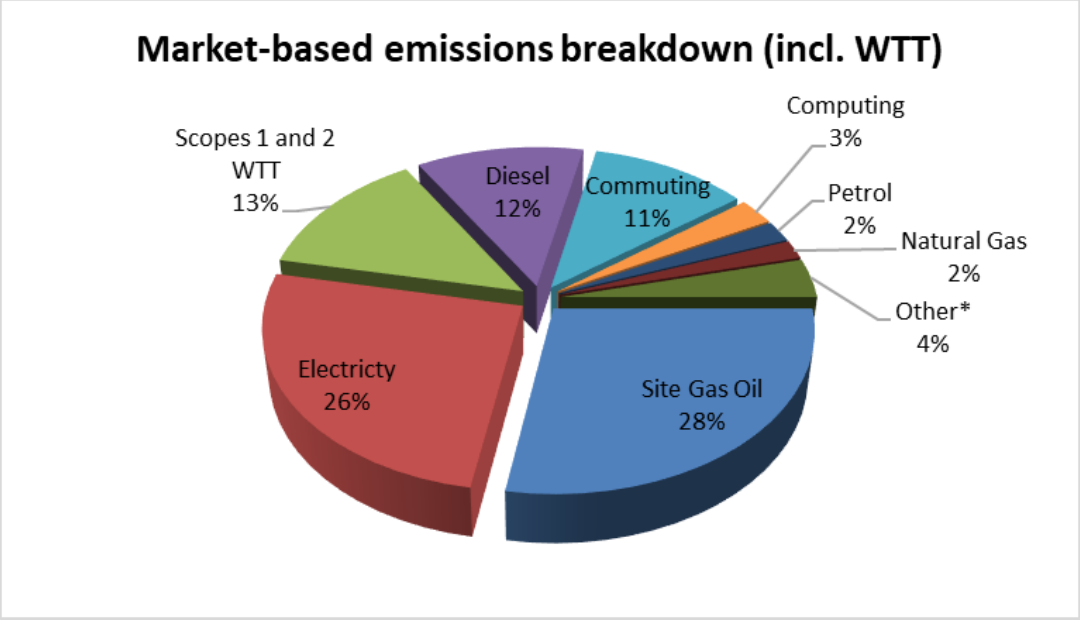
Executive Summary

Current Performance

- → Shrewsbury Town Council's total market-based emissions are 548.34 tCO_2e (with a location-based emissions of 484.03 tCO_2e).
- → The most significant market-based emission source is site gas oil, accounting for 28% of Shrewsbury Town Council's carbon footprint.

Recommendations

- → Investigate adopting an alternative fuel source to gas oil such as HVO or biodiesel to power vehicles with the largest emissions.
- → When leasing/purchasing new vehicles, consider transitioning to electric vehicles (EV) and installing charging points on-site to encourage staff to switch too.
- → Switch to a renewable energy tariff to reduce the emissions associated with electricity use.
- → Investigate what your building owners' plans and targets are for moving away from gas-powered heating to sustainable alternatives
- → Implement a salary sacrifice scheme to encourage employees to use more sustainable transport such electric vehicles and/or a cycle-to-work initiative.
- → Carry out a target setting and supply chain screening to facilitate your reduction strategy and increase the scope of your assessment.
- → Offset the GHG emissions created within this data period to become carbon neutral.



*Other= Transmission & Distribution, Waste, Grey Fleet (Employee-Owned Vehicles), Wastewater, Water, Paper, Homeworking

Year/Element	Location based	Market based
Total number of employees	62	
Turnover in £ million	4	
Tonnes of CO_2e	**484.03**	**548.34**
Tonnes of CO_2e per employee	**7.81**	**8.84**

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Quality Control

Report issue number:	1.0
Date:	14 August 2024
Calculations completed by:	Tom Vaughan
Calculations reviewed by:	Alex Pell
Report produced by:	Tom Vaughan
Report reviewed by:	Alex Pell
Final approval:	Stuart Fowler

1. Introduction

1.1. Company Overview

Shrewsbury Town Council is a large town council in England, created in 2009 as part of local government restructuring. It serves a population of over 70,000 and manages various services including parks, recreation areas, allotments, and the town market. The council also maintains community facilities, bus shelters, street lighting, and public toilets.

1.2. Data supplied for the Carbon Footprint Appraisal

A summary of the data supplied by Shrewsbury Town Council for the appraisal can be provided on request.

1.3. Methodology for the Carbon Footprint Appraisal

The methodology document can be downloaded using this link,
https://www.carbonfootprint.com/docs/carbon_footprint_appraisal_-_methodology_document.pdf

1.4. Abbreviations

AC	Air Conditioning
CO_2e	Carbon Dioxide Equivalent
Defra	Department for Environment, Food and Rural Affairs
EV	Electric Vehicle
GHG	Greenhouse Gas
ISO	International Standards Organisation
IWA	International Workshop Agreement
km	Kilometres
kWh	Kilowatt Hours
T&D	Transmission & Distribution
WTT	Well-To-Tank

2. Calculation Scope and Accuracy

2.1. Scope of this work

Carbon Footprint has assessed the GHG emissions from **1st April 2023 to 30th March 2024** resulting from the energy consumption at Shrewsbury Town Council's facilities and its business transport activities.

2.2. Organisational & reporting boundaries

Figure 1 shows the full boundaries of the *Greenhouse Gas Protocol Corporate and Value Chain Standards*. The organisation has accounted for all quantified GHG emissions and/or removals from facilities over which it has financial control. This assessment covers the reporting boundaries shown in Table 1, in line with the Greenhouse Gas Protocol Accounting and Reporting Corporate Standard.

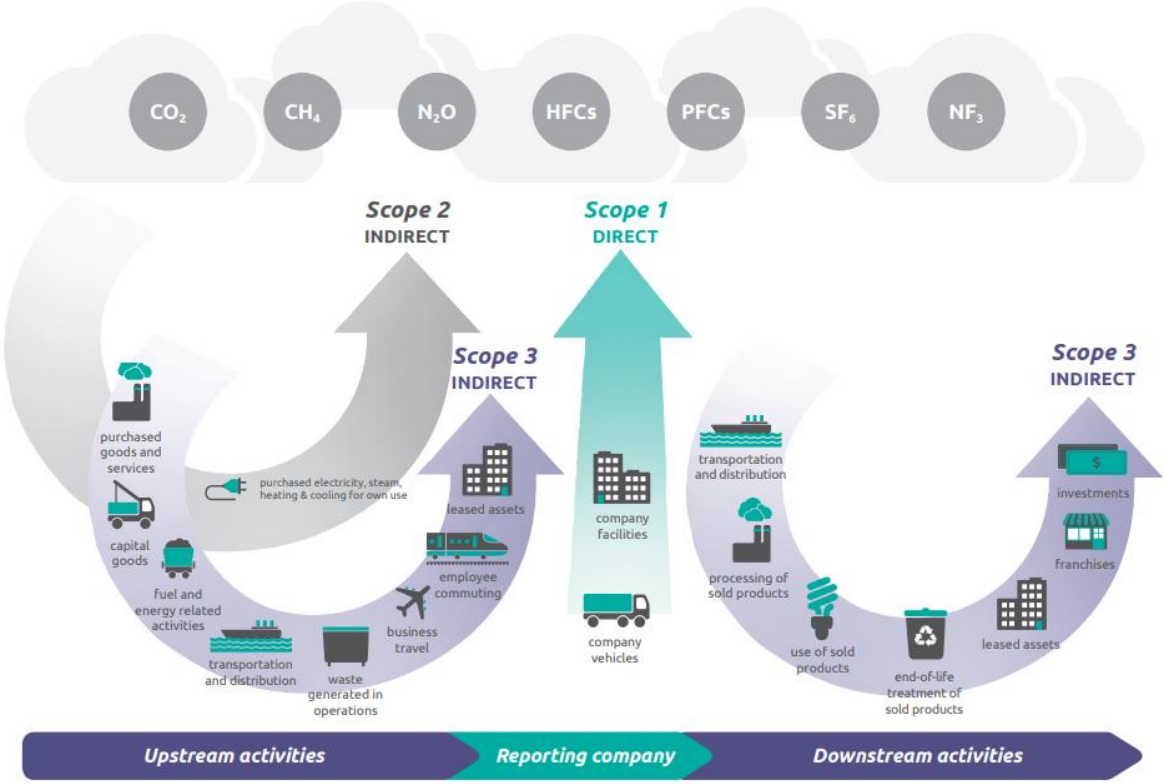


Figure 1: Overview of emissions scopes (GHG Protocol - Scope 3 Calculation Guidance v1.0 - 2013

Table 1: Shrewsbury Town Council's GHG Assessment boundary based on the Greenhouse Gas Protocol Accounting and Reporting Corporate Standard

(All green rows have been included in this assessment; all grey rows are not applicable; orange rows have been excluded)

Scope	Activity	Completion Status	Justification
1	Electricity, heat or steam generated on-site	Not relevant	Not applicable
	On-site fuel use	Complete	
	Company owned vehicles	Complete	
	Fugitive emissions (incl. Refrigerant gases and AC)	Complete	
2	On-site Consumption of purchased electricity, heat steam and cooling	Complete	
3	1. Purchased goods and services	Partial	Paper emissions were included in the assessment.
	2. Capital goods	Partial	Computing emissions were included in the assessment.
	3. Fuel- and energy related activities (not included in scope 1 or scope 2)	Complete	
	4. Upstream transportation and distribution	Not relevant	Not applicable
	5. Waste generated in operation	Complete	
	6. Business travel (not included in scope 1 or scope 2)	Complete	
	7. Employee commuting	Complete	
	8. Upstream leased assets	Complete	
	9. Downstream transportation and distribution	Not relevant	Not applicable
	10. Processing of sold products	Not relevant	Not applicable
	11. Use of sold products	Not relevant	Not applicable
	12. End-of-life treatment of sold products	Not relevant	Not applicable
	13.Downstream leased assets	Not relevant	Not applicable
	14. Franchises	Not relevant	Not applicable
	15. Investments	Not relevant	Not applicable

2.3. Calculation uncertainty assessment & materiality

The result of a carbon footprint calculation varies in accuracy depending on the data set provided. The more accurate the data supplied, the more accurate the final result. Materiality is determined by the percentage contribution of each element to the overall footprint. Based on the accuracy of the data provided (Table 2), a simple uncertainty analysis has been used to estimate the potential error margin for the appraisal results.

Table 2: Assessment accuracy, materiality and simple error analysis

Emission Source	Data source / comments	Materiality	Uncertainty	Market-based Error Margin (tCO_2e)
Commuting	Data was obtained from an employee survey, a 45% response rate was provided, all results were extrapolated to account for total number of employees. Information provided included individual employee transport type, distance commuted and days per week.	Medium (5-20%)	50%	30.83
Electricity (Market-Based)	Data obtained from monthly meter reading (kWh); all sites use the same electricity supplier (Mercia energy) therefore tariff specific market-based emissions could be reported.	High (20-40%)	5%	8.24
Site Gas Oil	Data obtained from invoices, included total gas oil (litres) consumed over the reporting period.	High (20-40%)	1%	1.87
Diesel	Data included annual litres of diesel consumed over the appraisal period obtained from invoices.	Medium (5-20%)	1%	0.81
Waste	Total number of bins, bin capacity and frequency of collection provided along with disposal route.	Very Low (<1%)	10%	0.43
Grey Fleet (employee-owned vehicles)	Total annual expensed mileage and fuel type provided. Average vehicle emissions factor used as vehicle details could not be obtained.	Very Low (<1%)	10%	0.42
Petrol	Data included annual litres of petrol consumed obtained from invoices.	Low (1-5%)	1%	0.15
Computing	Total quantity of purchased computing equipment provided for appraisal period.	Low (1-5%)	1%	0.14
Natural Gas	Data included total kWh consumption obtained from monthly meter readings.	Low (1-5%)	1%	0.12
Homeworking	Data obtained from employee survey, included total homeworking hours and home occupancy type.	Very Low (<1%)	50%	0.06
Water	Data obtained from monthly meter readings (m^3); total annual water consumption provided.	Very Low (<1%)	1%	0.04

Emission Source	Data source / comments	Materiality	Uncertainty	Market-based Error Margin (tCO_2e)
Paper	Total paper sheets consumed provided, included paper size gsm.	Very Low (<1%)	1%	<0.01
Total			**8%**	**43.12**

3. Carbon Footprint Results

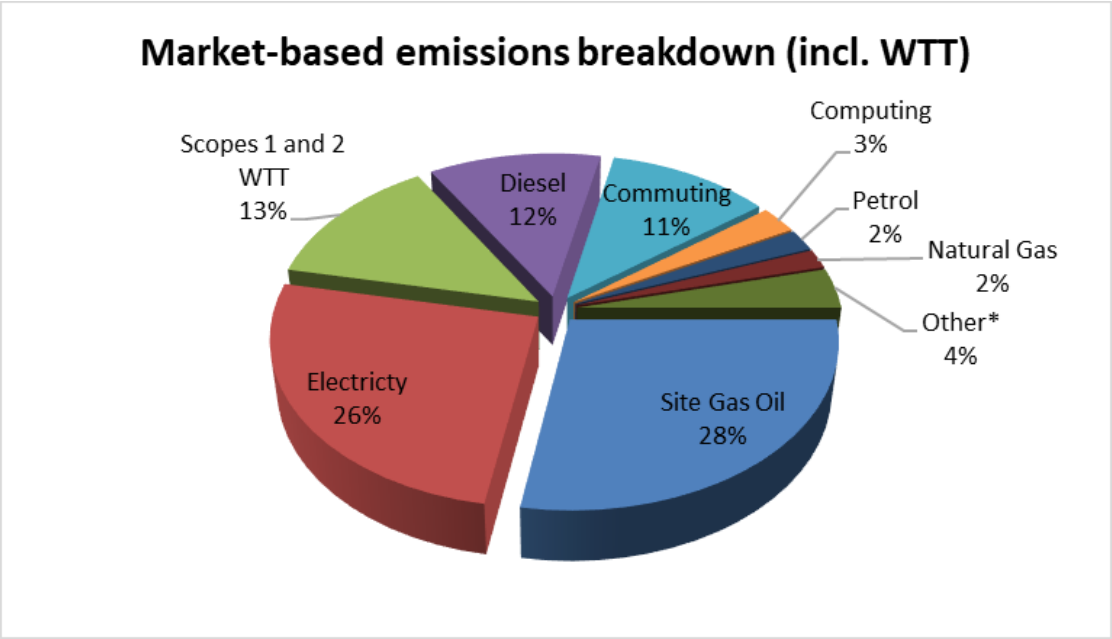
3.1. Summary of results

The total location-based carbon footprint for Shrewsbury Town Council for the period ending 30th March 2024 is 484.03 tonnes CO_2e, and the market-based total is 548.34 tonnes CO_2e.

Table 3: Results of Shrewsbury Town Council's carbon footprint assessment by scope and GHG Protocol emission categories

Scope	Emission Source	Location-Based (tCO_2e)	Market-Based (tCO_2e)
1	Site Gas Oil	151.96	151.96
	Natural Gas	10.13	10.13
	Diesel	65.23	65.23
	Petrol	11.52	11.52
1	**Scope 1 Total**	**238.85**	**238.85**
2	Electricity	75.70	140.02
2	**Scope 2 Total**	**75.70**	**140.02**
3.1	Water	2.04	2.04
	Paper	0.26	0.26
3.2	Computing	14.45	14.45
3.3	Scopes 1 and 2 WTT	72.07	72.07
	Transmission & Distribution	8.00	8.00
3.5	Waste	4.31	4.31
	Wastewater	2.33	2.33
3.6	Grey Fleet (employee-owned vehicles)	4.23	4.23
3.7	Commuting	61.66	61.66
	Homeworking	0.12	0.12
3	**Scope 3 Total**	**169.48**	**169.48**
All	**Tonnes of CO_2e**	**484.03**	**548.34**
	Tonnes of CO_2e per employee	**7.81**	**8.84**
	Tonnes of CO_2e per £ million turnover	**121.01**	**137.09**

A full breakdown of emissions by source has been provided in Annex A.



*Other= Transmission & Distribution, Waste, Grey Fleet (Employee-Owned Vehicles), Wastewater, Water, Paper, Homeworking.

Figure 2: Percentage contribution of each element of Shrewsbury Town Council's market-based carbon footprint

3.2. Emissions from energy usage at site facilities

The table below shows the breakdown of site energy emissions The Weeping Cross site is the largest consumer, accounting for 56.4% of the total emissions used, primarily due to its high gas oil consumption. In contrast, several sites like 'Hill's Lane Public WC' and 'Quarry Nursery' have negligible or no energy consumption.

Regarding energy sources, Gas Oil is the dominant source, contributing to 51.4% of the total energy consumption, followed by electricity at 45.4%. Natural Gas accounts for 3.3% of total site emissions.

Table 4: market-based CO_2e emissions as a result of site energy consumption

Name of Site	Market-based Electricity	Natural Gas	Gas Oil	Total	Percentage of total
Weeping Cross	18.35	-	186.52	204.87	56.4%
Market Hall	46.48	-	-	46.48	12.8%
Quarry	42.12	-	-	42.12	11.6%
Splash Park	14.30	-	-	14.30	3.9%
Grange Youth Centre	6.80	6.56	-	13.36	3.7%
Butcher Row Public WC	7.56	-	-	7.56	2.1%
Livesey House	3.24	3.14	-	6.39	1.8%
Monkmoor Rec Paviliion	5.98	-	-	5.98	1.6%
Sundorne	5.31	-	-	5.31	1.5%
Footways, car parks, lighting	4.47	-	-	4.47	1.2%
Ditherington Community Centre	0.70	2.10	-	2.80	0.8%
Mereside Changing Rooms	2.36	-	-	2.36	0.6%
Abbey Foregate Public WC	1.87	-	-	1.87	0.5%
Quarry Lower Public WC	1.64	-	-	1.64	0.5%
County Ground Pavilion	1.51	-	-	1.51	0.4%
The Quarry	0.90	-	-	0.90	0.2%
Quarry Garages	0.80	-	-	0.80	0.2%
Sydney Avenue Public WC	0.40	-	-	0.40	0.1%
Hill's Lane Public WC	0.00	-	-	0.00	0.0%
Quarry Nursery	0.00	-	-	0.00	0.0%
Total	**164.80**	**11.81**	**186.52**	**363.13**	**100%**

3.3. Emissions from Well to Tank

Well-to-tank emissions relate to the upstream emissions of fuel and energy; accounting for extraction, processing, and transport of fuels/energy. **Shrewsbury Town Council can reduce these emissions by reducing fuel and energy usage.**

Table 5: Well-To-Tank CO_2e Emissions breakdown

Emission Source	Market-Based (tCO_2e)
Site Gas Oil	34.56
Electricity	16.78
Diesel	15.87
Commuting	12.76
Petrol	3.19
Natural Gas	1.67
Transmission & Distribution	1.45
Grey Fleet (employee-owned vehicles)	0.88
Total	**87.17**

4. Comparison, Publication, and Benchmarking

4.1. Base year emissions

A summary of the carbon footprint results can be seen in section 3.1. This will set the base year for all future reports to be compared against.

Carbon Footprint recommends that organisations use the base-year GHG inventory as a benchmark to measure against. When using the base-year GHG inventory as a benchmark, organisations can set realistic reduction targets and measure their progress year on year. This can also provide excellent marketing opportunities, where real figures can demonstrate your commitment towards helping fight climate change.

4.2. External Publication and Benchmarking of Your Carbon Footprint

We strongly encourage you now to **publish your carbon footprint results on Carbon Database Initiative (CaDI)** – our new global platform.

https://carbondi.com/

External publication demonstrates your commitment to carbon management and to responsible transparency. Your results will also be endorsed on CaDI as 'Verified' for additional peace of mind for you and viewers of the data.

Using CaDI, you can also search other organisations that have reported their emissions to benchmark your performance.

As a Carbon Footprint client, your headline carbon footprint results will be automatically uploaded to your CaDI account for your ease – **though, rest assured, they will only be made public upon you choosing to publish them.**

Many companies report Scope 1 & 2 emissions for comparison against others as elements included in Scope 3 can vary greatly. Table 6 summarises the emissions across these Scopes, along with metrics showing emissions per unit turnover and per employee, to help your benchmarking.

Table 6: Shrewsbury Town Council's benchmarked GHG emissions

Year/Element	Location based	Market based
Total number of employees	62	
Turnover in £ million	4	
Tonnes of CO_2e	**484.03**	**548.34**
Tonnes of CO_2e per employee	**7.81**	**8.84**
Tonnes of CO_2e per £ million turnover	**121.01**	**137.09**
Scope 1 & 2 Emissions		
Tonnes of CO_2e	**314.55**	**378.87**
Tonnes of CO_2e per employee	**5.07**	**6.11**
Tonnes of CO_2e per £ million turnover	**78.64**	**94.72**

5. Conclusion

Shrewsbury Town Council, in conjunction with Carbon Footprint Ltd, has assessed its carbon footprint and has qualified to use the Carbon Footprint Standard branding. This can be used on all marketing materials, including website and customer tender documents, to demonstrate your carbon management achievements.

6. Recommendations

6.1. Carbon & sustainability targets

6.1.1. Improving the accuracy of future carbon footprint assessments

The estimated overall error margin is +/- 7.86% (which represents +/- 43.12 tCO_2e of the total assessed emissions).

To improve the accuracy of future assessments, we recommend the following:

- Implement a monthly data and carbon tracking system, such as Carbon Footprint Ltd's Sustrax MX platform.
- Collect more detailed vehicle information like make, model, and year to use more specific emission factors instead of average ones.
- Increase the response rate of the employee survey to obtain a more representative sample.

6.1.2 Expand the Scope of the Assessment

We recommend that the scope of the assessment is expanded in future to include the aspects that are identified as excluded in Table 1.

The most material element would likely be purchased goods and services, due to the nature of your business, so we recommend you focus on capturing data for this ready for next year's appraisal.

6.1.3 Target setting for net zero

Shrewsbury Town Council should set targets based on per employee and/or per £M turnover, which will account for business growth. Many organisations are now setting targets based on typical mid-term and longer terms goals to reach net zero (ISO's International Workshop Agreement on Net Zero Guidance - IWA 42:2022[1]):

- A 50% reduction in emissions per £M turnover/employee by 2030.
- A 90% reduction in emissions per £M turnover/employee by 2045.

All targets set should be reviewed regularly and amended accordingly (i.e. target increased if it is met ahead of schedule). A clear roadmap for individual emissions sources should be in place. This will ensure the strategy for reducing CO_2e emissions and tracking toward a net zero target is appropriate for the business.

A hyperlink to Carbon Footprint Ltd's whitepaper on target setting can be found below:
https://www.carbonfootprint.com/docs/2021_12_cfp_practical_target_setting_-_white_paper_v10.pdf.

[1] ISO - Net Zero Guidelines

6.2. Reducing emissions

To reduce GHG emissions, we recommend the following:

- Investigate adopting an alternative fuel source to power vehicles with the largest emissions. Vehicles could use HVO or biodiesel, also known as FAME (Fatty Acid Methyl Esters) produced from vegetable oils. These fuel types can be used with no mechanical modification of vehicles and have a net emission saving of approximately 80 - 90% compared to standard petrol or diesel vehicles.
- When leasing/purchasing new vehicles, consider transitioning to electric vehicles (EV) and installing charging points on-site to encourage staff to switch too.
- Switch to a renewable energy tariff to reduce emissions associated with electricity use. Many "green" electricity tariffs are now the same price as the traditional brown tariffs.
- Investigate what building owners plans and targets are for moving away from gas-powered heating to more sustainable alternatives such as air-source heat pumps, electric immersion, solar thermal or hydrogen
- Install EV charging points at work. This will encourage and enable staff to switch to low carbon electric vehicles. Providing electric charging facility shows your staff and stakeholders that your business is serious about reducing emissions and will support other staff behavioural change initiatives.
- Offset the GHG emissions created within this data period to become carbon neutral.

6.3. Carbon offsetting

Carbon offsetting is a pragmatic way to compensate for the emissions that you cannot reduce, by funding an equivalent carbon dioxide saving elsewhere.

The majority of projects focus on the development of renewable energy in developing countries, however there are others which have a greater focus on social benefits as well as environmental benefits. Further detail on the type and specific projects that we currently have in our portfolio can be provided on request or be found at: http://www.carbonfootprint.com/carbonoffsetprojects.html.

Annex A

A full breakdown of Shrewsbury Town Council's emission sources is given below. This aligns with the GHG Protocol classification methodology and provides each associated emission source:

Scope	GHG Protocol Emission Category	Emission Source	Location-Based (tCO_2e)	Market-Based (tCO_2e)
1	On-site fuel use	Site Gas Oil	151.96	151.96
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		Petrol	11.52	11.52
Scope 1 Total			**238.85**	**238.85**
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3.1	1. Purchased goods and services	Water	2.04	2.04
		Paper	0.26	0.26
3.2	2. Capital goods	Computing	14.45	14.45
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		Transmission & Distribution	8.00	8.00
3.5	5. Waste generated in operation	Waste	4.31	4.31
		Wastewater	2.33	2.33
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3.7	7. Employee commuting	Commuting	61.66	61.66
		Homeworking	0.12	0.12
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	Tonnes of CO_2e per employee		**7.81**	**8.84**