Corporate Greenhouse Gas Inventory

On behalf of

Vado

23/10/2023

THG / ECO

Executive Summary

Climate change is affecting the entire world causing extreme weather events and rapidly changing climate conditions. It is our role as a global society to limit global warming to 1.5 degrees Celsius and achieve net-zero.

Conducting a carbon footprint is the key first step in saving the planet. It is necessary to determine the extent of the emissions produced, establish reduction goals and measure progress against them.

Vado has acknowledged their role in the need to take action, to understand where their emissions come from and what actions can be taken to reduce them.

This report provides a comprehensive account of Vado's carbon footprint arising from its operations, covering the full 2022 fiscal year (March 2022- April 2023). This carbon footprint has been calculated in line with the Greenhouse Gas (GHG) Protocol covering Scope 1, 2 and business travel Scope 3 emissions. 8.42 tonnes were unaccounted for in the 2021 greenhouse gas inventory that have been accounted for in this report.

Under the location-based approach, emission equalled 338.12 t CO_2e. Under the market-based approach, emissions equalled 271.13 t CO_2e. The majority of these emissions were produced by Scope 1 fuel use over the 2022 fiscal year. Scope 3 flight emissions made up the second highest area of emissions. It's important to mention that for this reporting period, Vado has made the decision to incorporate Scope 3 hotel stays into the calculations, which was not part of the inventory last year.

The emissions categorised by Scope under location-based and market-based methods are listed in Table 1 and Table 2.

Table 1-Total emissions, location-based

Emissions Source	Emissions (tCO_2e)
Scope 1	197.47
Scope 2 location-based	71.71
Scope 3	68.94
Total	**338.12**

Table 2-Total emissions, market-based

Emissions Source	Emissions (tCO_2e)
Scope 1	197.47
Scope 2 market-based	4.72
Scope 3	68.94
Total	**271.13**

By undertaking this exercise, MyCarbon has identified the key areas in which Vado can focus on to reduce emissions. This includes the need for Vado to address Scope 1 fuel consumption which contributes to 73% of its overall emissions. Of this, 43% originate from diesel emissions and 38% are made up of gas.

Business travel Scope 3 emissions contribute 25% to overall emissions. Within this, 77% originate from flights and 10% from hotels. Vado can make improvements by reducing the need for business travel and adopting meeting technologies.

Other suggestions for improvement are to reduce energy usage in the China office and switch to renewables here. MyCarbon commends Vado for full renewable energy use in the UK offices.

Formal Notes

Client: Vado

Date: 23/10/2023

Reporting Period: March 2022- April 2023

The accuracy of this GHG assessment is directly related to the quality of the data provided by the client.

Primary data representative of activities occurred during the reporting period is used where available. In certain circumstances, secondary data in the form of estimates, extrapolations and/or industry averages is used where primary data is not available.

Assessments based largely on secondary data should only be viewed as an estimate of GHG emissions impact, and actual emissions may vary significantly. It is expected that all clients should aim to improve the proportion of primary data over time.

A Greenhouse Gas inventory produced by The Hut Group and MyCarbon, an inventory service provided by Carbon Green Ltd.

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If Vado are satisfied with the above information and the data provided is representative of authentic client activities within the reporting period of the 2022 fiscal year, please sign below:

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1 Introduction

This is a greenhouse gas (GHG) inventory report for Vado, a division of Norcross group (holdings) limited, for the 2022 fiscal year, produced by The Hut Group and MyCarbon.

Vado is a leading British bathroom brassware manufacturer providing high quality, taps, showers, accessories and fittings to customers across the globe. Vado has previously reported a GHG inventory though The Hut Group and MyCarbon for the 2022 fiscal year.

This report follows the five main reporting principals as outlined by ISO 14064-1:

- Transparency: Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
- Relevance: Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company
- Accuracy: Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.
- Consistency: Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series
- Completeness: Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.

Vado has compiled a GHG inventory report for the 2022 fiscal year to better understand their emissions and carbon footprint.

This report presents the findings of this exercise. The report follows the ISO 14064-1 standard entitled *Specification with Guidance at the Organisation Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals*.

2 Context

2.1 What is the importance of measuring greenhouse gases (GHGs)?

GHG emissions are contributing to global warming and climate change, which have been recognised as a key sustainable development issue. Many governments through local and international efforts are taking steps to reduce GHG emissions through national policies that include the introduction of emissions trading programs, voluntary programs, carbon or energy taxes, and regulations and standards on energy efficiency and emissions. As a result, companies must be able to understand and manage their GHG risks if they are to ensure long-term success in a competitive business environment, and to be prepared for future national or regional climate policies.

Quantification of GHGs emitted by a business or organisation's activities in the form of a carbon footprint is an important tool used by stakeholders to recognise their impact and act, often through offsetting activities.

Offsetting is a particular method employed to reduce, remove, or prevent the release of GHG emissions into the atmosphere, which can be done through the purchase and retirement of carbon credits. Due to the tight control on carbon credits, retirement of a credit is the only method one can do to offset their carbon footprint. For example, if a business produced 100 tonnes of CO_2, they would need to purchase and retire 100 carbon credits to become carbon neutral.

2.2 Reporting standards

When performing a GHG inventory, these assessments should align with one of two recognised standards for accounting and reporting corporate GHG emissions. The most well-known is the "Greenhouse Gas Protocol – Corporate Accounting and Reporting Standard" [1] developed in a partnership of the World Business Council for Sustainable Development (WBCSD) and the World Resource Institute (WRI). The International Organization for Standardization (ISO) also produced the ISO14064 specification series, detailing specification and guidance for the organisation and project levels, as well as for the validation and verification of emissions.

Data supplied by clients is used in GHG assessments, which is quantified into GHG emission estimates by applying relevant and up-to-date emission factor(s) from reputable sources, like DEFRA. An emission factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Quality and accuracy of emission factors can vary between government publications and scientific research journals, therefore it is best practice to apply emission factors only from reputable sources, such as DEFRA.

GHG assessments quantify all six Kyoto Protocol GHGs, where applicable, and are measured in terms of tonnes carbon dioxide (CO_2) equivalence, or tCO_2e, where equivalence means having the same warming effect as CO_2 over a period of 100 years. The six Kyoto Protocol gases are CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), sulphur

hexafluoride (SF_6) and perfluorocarbons (PFCs). The global warming potential (GWP) of each GHG is listed in Table 3.

Table 3-GHGs listed in the Kyoto Protocol and their GWP

Greenhouse Gas	Chemical Formula	GWP (CO_2e)
Carbon dioxide	CO_2	1
Methane	CH_4	28
Nitrous oxide	N_2O	265
Hydro fluorocarbons	HFCs	Depends on gas
Sulphur hexafluoride	SF_6	23,500
Perfluorinated compounds	PFCs	Depends on gas

2.3 Emissions Scopes

Emission sources can be broken down into three distinct categories called Scopes.

2.3.1 Scope 1

Scope 1 accounts for the direct GHG emissions occurring from sources that are owned or controlled by the company, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc; emissions from chemical production in owned or controlled process equipment.

2.3.2 Scope 2

Scope 2 accounts for GHG emissions from the generation of purchased electricity, heat or steam consumed by the company. Purchased electricity, heat or steam is defined as electricity, heat or steam that is purchased or otherwise brought into the organizational boundary of the company. Scope 2 emissions physically occur at the facility where electricity, heat or steam is generated.

2.3.3 Scope 3

Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company but occur from sources not owned or controlled by the company. Some examples of scope 3 activities are extraction and production of purchased materials, transportation of purchased fuels and use of sold products and services.

The GHG Protocol describes the quantification of Scope 1 and 2 as mandatory, whereas Scope 3 emissions are considered optional. Depending on the nature/remit of an organisation, Scope 3 activities can contribute a significant proportion of overall emissions, and therefore to gain a proper understanding of an organisation's GHG emissions it is advisable to include all relevant sources.

3 Methodology

3.1 Emission Factors

The methodologies used to collect and assess the emissions data varied throughout the inventory. The primary methodology used was multiplying GHG activity data by appropriate GHG emission factors. All methodologies were selected based on their ability to provide accurate and consistent results. The use of activity data and emission factors was feasible due to the availability of both accurate activity data and emission factors from reputable organisations.

MyCarbon uses the latest figures from DEFRA and peer reviewed literature for all common emission factors listed in Table 9 in the appendix.

3.2 Organisational Boundaries

The GHG Protocol Corporate Standard outlines two approaches for consolidating GHG data—the equity share approach and the control approach—through organizational boundaries. These are boundaries that determine the operations owned or controlled by the reporting company, depending on the consolidation approach taken. In some cases, it may be possible to apply these approaches directly to emissions/removals associated with sequestered atmospheric carbon.

The GHG inventory report covers all Scope 1, 2, and business travel Scope 3 emissions for Vado. The addresses of the sites included within the organisational boundary of this report are detailed below:

VADO,
Wedmore Road,
Cheddar,
Somerset,
England BS27 3EB

VADO Glastonbury Warehouse,
4, 5-9 Wells Road,
Glastonbury,
Somerset,
England BA6 9AG

VADO,
Room 1007,
No.48,
North Caihong Road,
Yinzhou District,
China 315040

Vado has compiled a GHG inventory report for the 2022 fiscal year to better understand their emissions and carbon footprint. The corporate organisational boundaries for the inventory

were defined according to the requirements of **clause 4.1 of the ISO 14064-1 standard.** The operational control approach was used for the consolidation of corporate GHG emissions.

3.3 Emissions and Exclusions

The following emissions were determined to be relevant within the organizational boundaries:

Scope 1

Stationary combustion of natural gas

LPG

Petrol (including hybrid)

Diesel

Other company vehicles (including plug-in hybrid)

Scope 2

Purchased electricity

Scope 3

Business travel flights

Business travel rail

Business travel taxi

Business travel hotel stays

Excluded Emissions

All other categories of Scope 3 emissions, excluding business travel, have been excluded from this analysis.

3.4 Calculating Emissions from Electricity Consumption

There are two methods for calculating emissions from electricity consumption: the location-based and market-based methods.

The location-based method is used to calculate emissions based on the emissions intensity of the local grid area where the electricity usage occurs. The market-based method calculates emissions on the basis that the company has chosen to purchase renewable electricity.

Electricity consumption from Vado has been calculated using both these methods. As the energy consumed in the Chinese office is sourced entirely from the grid, grid emissions factors were used in place of a market-based emissions factor when calculating under the market-based approach.

Findings and Analysis

4 Emissions Summary

4.1 Summary of All Emissions

The emissions by Scope for Vado, under the location-based approach and market-based approach, are listed in Table 4. It's important to mention that for this reporting period, Vado has made the decision to incorporate hotel stays into the calculations, which was not part of the inventory last year.

Under the location-based approach, Scope 1 was the largest source of emissions, 197.47 t CO_2e, 58% of the total emissions. The Scope 2 and 3 emissions were 71.71 t CO_2e (21%) and 68.94 t CO_2e (20%) respectively. Similarly, taking the market-based approach, Scope 1 again was the largest source of emissions, 197.47 t CO_2e, 73% of the total emissions. The Scope 2 and 3 emissions were 4.72 t CO_2e (7%) and 68.94 t CO_2e (25%).

Table 4-Total emissions across all Scopes for Vado via location and market-based approaches

Emissions Source	Emissions (tCO_2e)	Emissions Source	Emissions (tCO_2e)
Scope 1	197.47	Scope 1	197.47
Scope 2	71.71	Scope 2	4.72
Scope 3	68.94	Scope 3	68.94
Total	**338.12**	**Total**	**271.13**

4.2 Scope 1 Emissions

The Scope 1 emissions by source for Vado are listed in Table 5 and Figure 1. It's important to highlight that fuel consumption has risen in this reporting period because we have introduced hybrid fuel usage, which was not accounted for in last year's GHG inventory. The 2021 and 2022 usage is contained in this inventory.

The greatest source of Scope 1 emissions arose from diesel combustion. In total, 33,395 litres of diesel were consumed, which generated emissions of 85.42 t CO_2e. The next highest source of Scope 1 emissions was natural gas. In total, 411,950 kWh of natural gas was consumed, which generated emissions of 75.19 t CO_2e. Petrol from company vehicles was the next highest source of Scope 1 emissions, 9,800 litres of fuel were consumed, generating 21.19 t CO_2e. Plug in hybrid vehicles and LPG were the other minimal sources of emissions.

Table 5-Vado Scope 1 emissions by source

Emissions Source	Emissions (tCO_2e)
Natural gas	75.20
LPG	2.35
Petrol including hybrid	21.19
Diesel	85.42
Other company vehicles (including plug-in hybrid)	13.32
Total	**197.47**

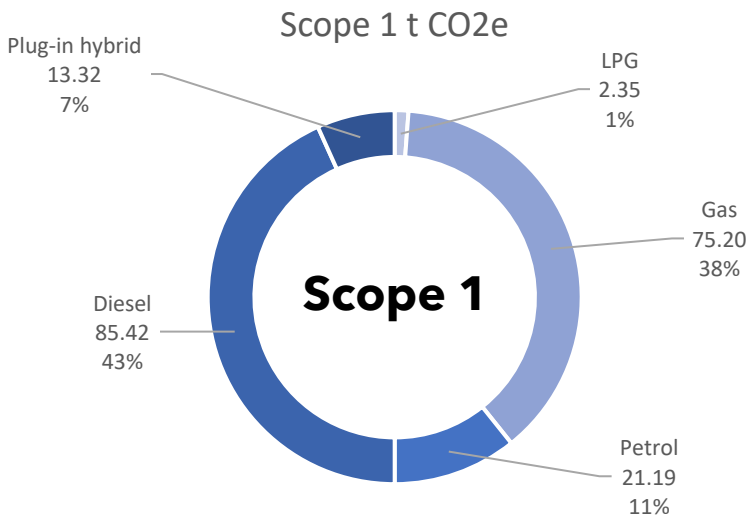

Figure 1-Vado Scope 1, % of emissions tCO_2e

4.3 Scope 2 Emissions

The Scope 2 market emissions by source for Vado are listed in Table 6 and Figure 2. The total market electricity consumption across the UK and China resulted in emissions of 4.72 t CO_2e, with the Chinese office the primary contributor to these emissions. The UK offices had renewable energy tariffs, resulting in 0 t CO_2e.

Table 6-Vado Scope 2 market emissions by source

Emissions Source	Emissions (tCO_2e)
Electricity usage (UK Building 1)	0
Electricity usage (UK Building 2)	0
Electricity usage (UK Building 3)	0
Electricity usage (UK Glastonbury warehouse)	0
Electricity usage (China)	4.72
Total	**4.72**

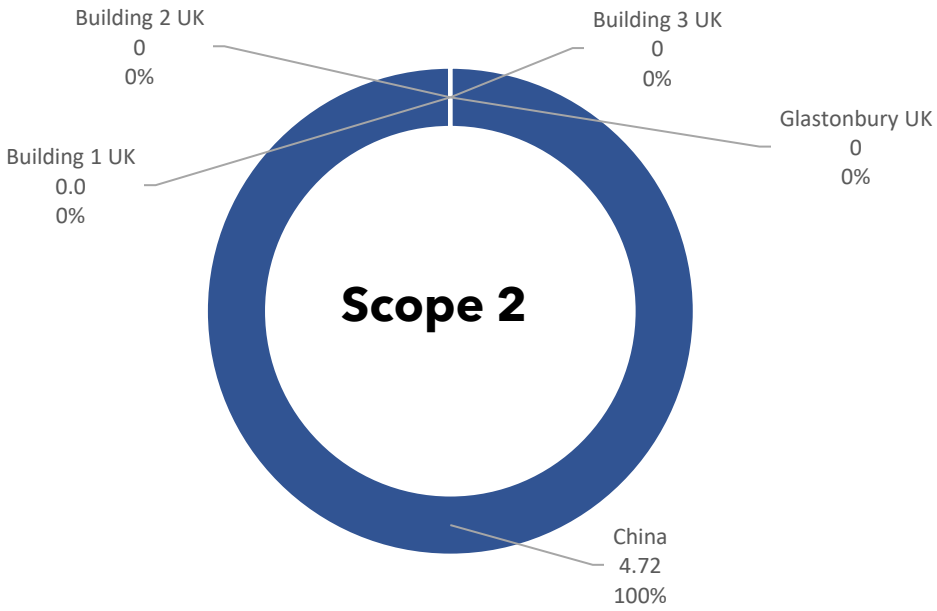

Figure 2-Vado Scope 2, % of emissions CO_2e

The Scope 2 location emissions by source for Vado are listed in Table 7 and Figure 2. The total location electricity consumption resulted in emissions of 71.71 t CO_2e, with the UK offices, most notably Building 2, responsible for the majority of emissions.

Table 7-Vado Scope 2 location emissions by source

Emissions Source	Emissions (tCO_2e)
Electricity usage (UK Building 1)	6.88
Electricity usage (UK Building 2)	27.06
Electricity usage (UK Building 3)	24.95
Electricity usage (UK Glastonbury warehouse)	8.09
Electricity usage (China)	4.72
Total	**71.71**

4.4 Scope 3 Emissions

The Scope 3 emissions for Vado are categorised by emissions source in Table 8 and Figure 3. The largest source of Scope 3 emissions across Scope 1, 2 and 3 arose from business flights (16% of total emissions). A breakdown of flight types and emissions is available in Figure 4. The next largest source of emissions was hotel stays, responsible for 3% of total emissions. The remaining <2% of emissions were generated from rail and taxi business travel.

Table 8-Vado Scope 3 emissions by source

Emissions Source	Emissions (tCO_2e)	% of Total Emissions
Business travel flights	53.21	16%
Business travel rail	3.39	1%
Business travel taxi	1.83	1%
Business travel hotel stays	10.51	3%
Total	**68.94**	**21%**

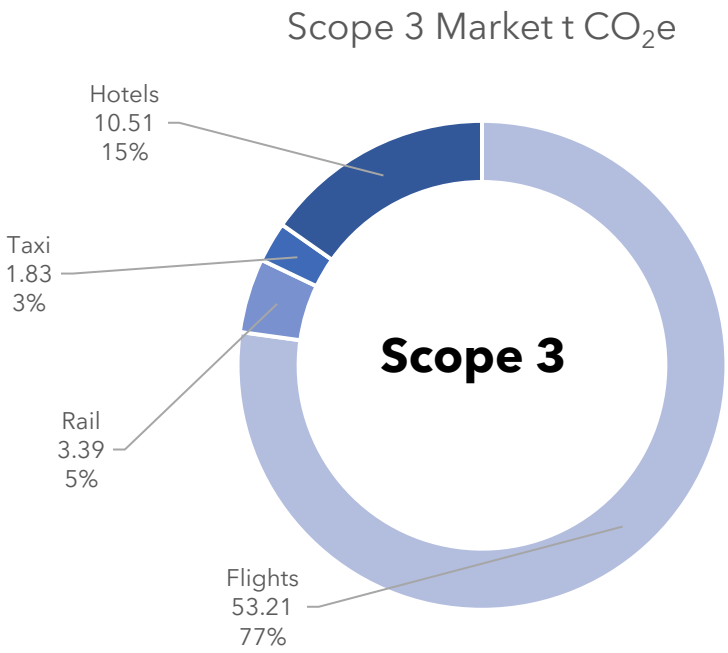

Figure 3-Vado Scope 3, % market emissions tCO_2e

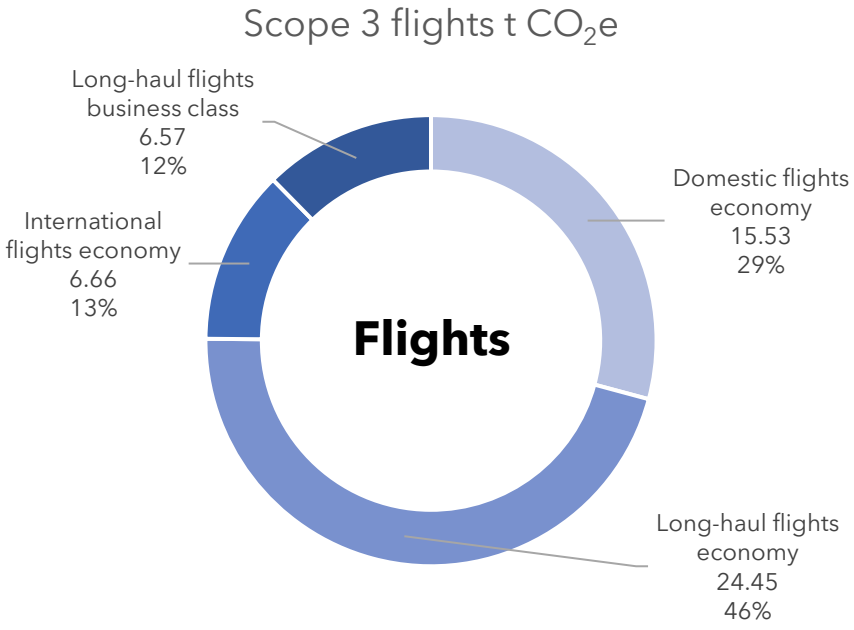

Figure 4-Vado Scope 3 flights emissions tCO_2e

5 Hotspot Analysis

5.1 What Areas Produce the Most Emissions?

In this carbon footprint report for Vado, an in-depth analysis of upstream emissions from March 2022 to April 2023 has been conducted. This section aims to highlight the highest sources of emissions encompassing Scope 1, 2 and business travel Scope 3 emissions. Additionally, initial high-level recommendations for emissions reduction are provided.

Scope 1 is identified as the highest source of emissions within the total Scope 1, 2, and Scope 3 emissions for Vado, accounting for 73% of total emissions. Exploring reductions Vado can make within their Scope 1 area is key. Investigate the feasibility of substituting LPG, Gas, Petrol and Diesel fuels sources and vehicles powered by these fuels for electric or lower emission alternatives. For example, replace old vehicle fleets with electric vehicles to increase the mix of electrical vehicles used in the Scope 1 portfolio. Additionally, to lower emissions in the near-term, phase out diesel and petrol vehicles to hybrid vehicles.

Business travel Scope 3 made up the second highest percentage of overall emissions. As flights made up the highest percentage of business travel Scope 3 emissions, Vado can focus on reducing business travel via flights. Switching to economy rather than flying business class on international flights will reduce emissions. Another practice that would reduce business travel emissions is to transition to video conference calls, where feasible, between offices, suppliers and customers.

Popular video platforms for collaboration include Microsoft Teams or Zoom. Also, engagement with these stakeholders about why Vado are making these changes and setting a good example can drive further carbon reduction to existing practices.

Furthermore, as hotel stays made up the second highest percentage of business travel Scope 3, the initial step here in emissions reduction is a thorough review of hotel stays and whether they are essential, followed by employee engagement before implementing a reduction in hotel stays.

Undertaking these recommendations will provide a positive impact on the carbon footprint of Vado, should they recalculate their emissions again in the future.

References

[1] Greenhouse Gas Protocol, "A Corporate Accounting and Reporting Standard," 2015. [Online]. Available: https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf. [Accessed 3 January 2023].

[2] DEFRA, "Greenhouse gas reporting: conversion factors 2022," 2 June 2022. [Online]. Available: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022.

[3] Institute for Global Environmental Strategies, "IGES List of Grid Emission Factors," 2019. [Online]. Available: https://www.iges.or.jp/en/pub/list-grid-emission-factor/en. [Accessed 04 04 2023].

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Carbon Offsetting

THG Eco Carbon Neutral Certification Requirements

		1-Star	2-Stars	3-Stars
Measure	**Footprint** *(For no more than 12 months prior to the start of certification)*	A carbon footprint of Scopes 1 and 2 (minimum) measured by an external third-party, and reviewed by THG Eco*	A carbon footprint of Scopes 1, 2, and partial 3 (minimum) measured by an external third-party, and reviewed by THG Eco*	A carbon footprint of Scopes 1, 2, and 3 measured by an external third-party, and reviewed by THG Eco*
Reduce	**Targets**	Self-set emission reduction targets	Scope 1, 2, and partial Scope 3 SBTi aligned target	Scope 1, 2, and 3 SBTi approved target
	Net Zero Planning	Reduction target established without plan in place of how to reduce emissions	A commitment submitted to SBTi to achieve Net Zero by 2050, with short-term targets in place to help measure and ensure progress	An overall commitment to become Net Zero by 2050, with near and long-term Science Based Targets across Scopes 1, 2, and 3, with a reduction plan in place to achieve these SBTi-approved targets
Offset	**Offset (quantity)**	Offset Scope 1 and 2 emissions	Offset Scope 1, 2, and partial Scope 3 emissions	Fully offset all Scope 1, 2, and 3 emissions
	Offset (quality)	100% of offsets used must be approved by ICROA	100% of offsets used must be approved by ICROA	100% of offsets used must be approved by ICROA

Appendix

Table 9-Emissions factors used in this assessment.

Category	Emissions Factor	Units	Reference
Natural gas	0.18	kg CO_2e / kWh (Gross CV)	[2]
LPG	1.56	kg CO_2e / litres	[2]
Petrol (average biofuel blend)	2.16	kg CO_2e / litres	[2]
Diesel (average biofuel blend)	2.56	kg CO_2e / litres	[2]
Plug-in hybrid (average car)	0.11	kg CO_2e / miles	[2]
Electricity (UK, location-based)	0.19	kg CO_2e / kWh	[2]
Electricity (UK, market-based)	0.00	kg CO_2e / kWh	[2]
Electricity (China, location-based)	0.53	kg CO_2e / kWh	[3]
Domestic flights, economy	0.25	kg CO_2e / passenger.km	[2]
Long-haul flights, economy	0.15	kg CO_2e / passenger.km	[2]
International flights, economy	0.14	kg CO_2e / passenger.km	[2]
Long-haul flights, business class	0.43	kg CO_2e / passenger.km	[2]
Hotel stays China	53.5	kg CO_2e / room per night	[2]
Hotel stays Germany	13.2	kg CO_2e / room per night	[2]
Hotel stays India	58.9	kg CO_2e / room per night	[2]
Hotel stays Italy	14.3	kg CO_2e / room per night	[2]
Hotel stays Jordan	68.9	kg CO_2e / room per night	[2]
Hotel stays London	11.5	kg CO_2e / room per night	[2]

Hotel stays Oman	90.3	kg CO_2e / room per night	[2]
Hotel stays Turkey	32.1	kg CO_2e / room per night	[2]
Hotel stays UK	10.4	kg CO_2e / room per night	[2]
Hotel stays UAE	63.8	kg CO_2e / room per night	[2]
London Underground	0.03	kg CO_2e / passenger.km	[2]
National rail (UK)	0.04	kg CO_2e / passenger.km	[2]
Regular taxi	0.15	kg CO_2e / passenger.km	[2]