

# WGBC Net Zero Carbon report for the period Jan – Dec 2023

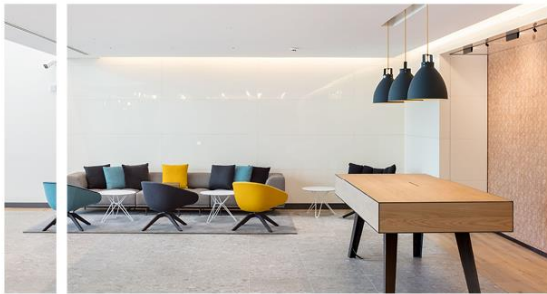
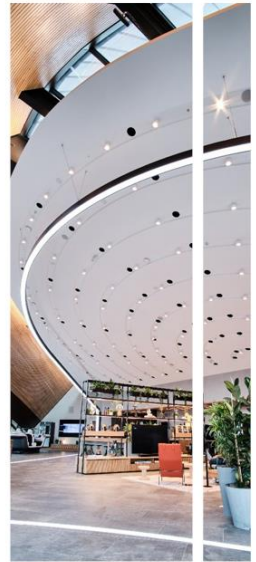
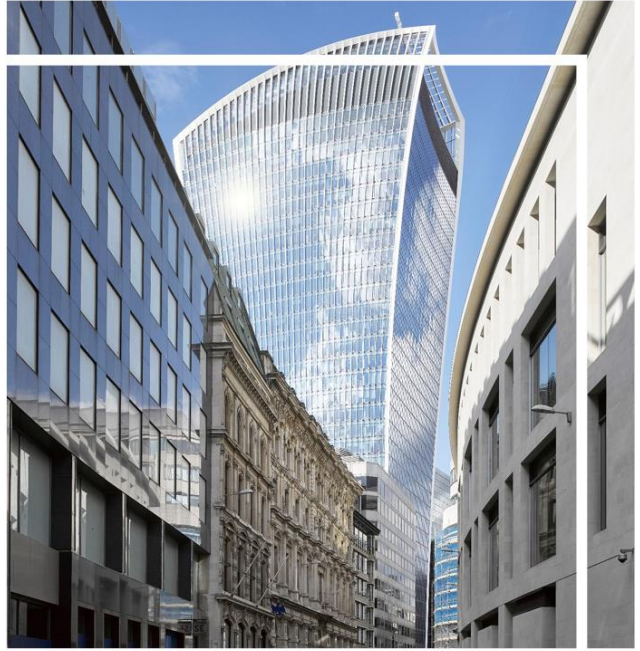
**HM NET ZERO CARBON ASSESSMENT**  
**HILSON MORAN**

30 May 2024

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Issue 03





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**Author:** STEVE JOHNSON

**Checker:** GREENLY

**Approver:** VINCE UGAROW

**HM Project No:** 12345

**HM Office:** The Hub  
Fowler Avenue  
Farnborough Business Park  
Hampshire  
GU14 7JF

T: +44 (0)1252 550 500

 [hilsonmoran.com](https://hilsonmoran.com)

 [@HilsonMoran](https://twitter.com/HilsonMoran)

 [hilson\\_moran](https://www.instagram.com/hilson_moran)

 [Hilson Moran](https://www.linkedin.com/company/HilsonMoran)

## Document History:

Issue	Date	Details
01	24/4/2024	ISSUED FOR COMMENTS
02	10/5/2024	REFERENCE TO FARNBOROUGH SERVER ROOM DELETED
03	30/5/2024	DETAILS OF INDEPENDENT VERIFICATION ADDED TO SECTION 1.4

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# 1. Introduction

## 1.1. Background

Hilson Moran (HM) is an environmental engineering consultancy working on numerous high-profile projects in the UK and around the world. HM provide consultancy on building services, sustainability, energy performance and certification as well as providing consultancy on operational buildings.

On the 30<sup>th</sup> June 2021, HM joined the WGBC Net Zero Carbon Commitment. Signing the Commitment is the latest step in Hilson Moran’s response to the ongoing Climate and Biodiversity Emergency, following the launch of our Climate Manifesto in April 2021.

The Net Zero Carbon Buildings Commitment is developed to recognise and promote advanced climate leadership action from businesses, organisations, cities and subnational governments in decarbonising the built environment, to inspire others to take similar action and remove barriers to implementation.

Since signing up to the commitment our carbon footprint has fallen by around 47% as shown in Figure 1. This is primarily due to moving to a smaller office in Farnborough, and partly the impact of hybrid working.

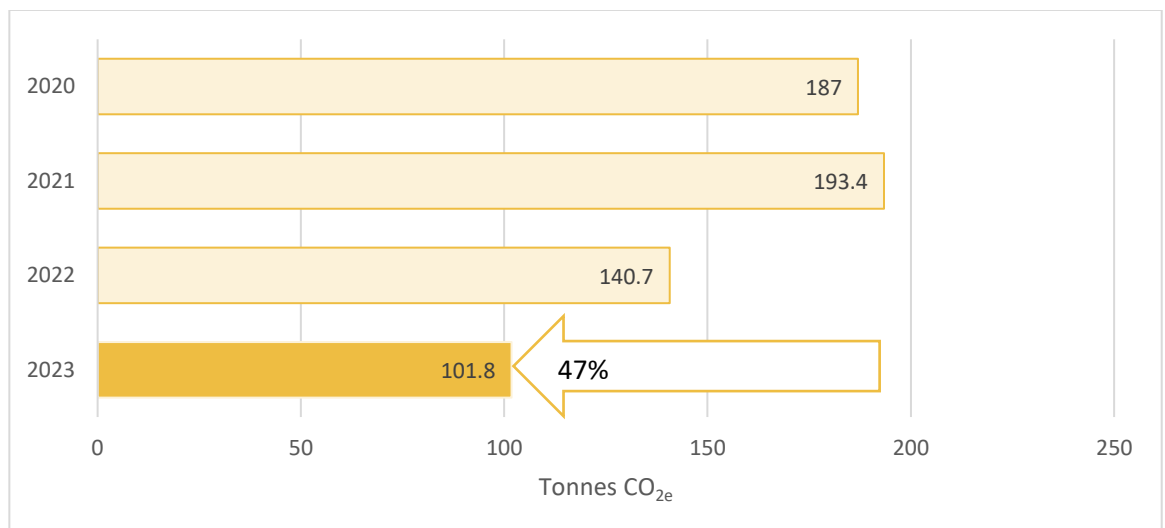


Figure 1 HM Carbon Footprint

## 1.2. Purpose

The report assesses the annual operational energy demand and carbon emissions for all our offices, in line with the requirements of the WGBC Net Zero Carbon Commitment.

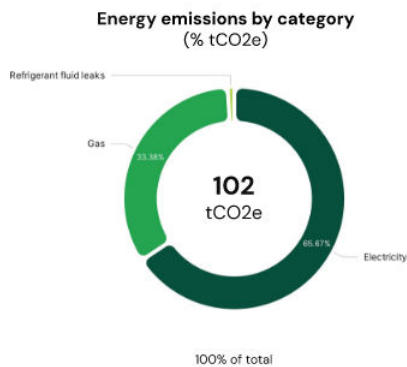
## 1.3. Structure

Following this introductory section, Section 2 describes the offices occupied by HM. Section 3 sets out the assessment methodology. Section 4 assesses HM energy and carbon emissions for 2022.

# 1.4. Independent Verification

This report has been independently verified by Greenly. Greenly is a carbon management platform that helps companies measure, reduce, report, and offset their carbon emissions. Greenly also offers a range of services such as carbon accounting, life cycle assessment. Below are screenshots of pages 17 & 18 from their report dated 27/5/24.

## Focus on Energy



### What is included in this category ?

CO2 emissions from energy are those tied to the production and utilization of energy, encompassing electricity, heat, and fuel. This category covers emissions arising from activities like the extraction, processing, and combustion of fossil fuels, as well as emissions from renewable energy sources. The emissions from energy can differ based on factors such as the type of energy source used, the efficiency of energy consumption, and the carbon intensity of the electricity grid.

### Methodology

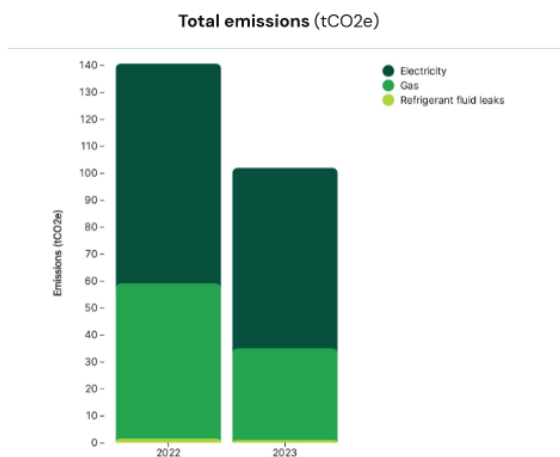
1. Emissions are calculated using an activity-based approach.
2. The carbon intensities of different energy sources are collected from UK Government GHG Conversion Factors for Company Reporting 2022.
3. The only AC units under Hilson Moran's operational control are small cooling units within server rooms at Discovery Place, Farnborough and Shackleton House, London. Therefore refrigerant leakage from AC units serving the buildings are not included in Scope 1. Hilson Moran's 2022 assessment was updated with the latest refrigerant emission factor for an aligned methodological comparison.



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## Focus on Energy - Comparison

Overall comparison : -28%

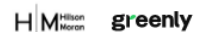


### Comparison by category - 2022 vs 2023

- Electricity : -18%
- Gas : -41%
- Refrigerant fluid leaks : -36%

### Analysis

Utility consumption decreased with the lease termination of Farnborough Office (Discovery Place) in October 2022.



## 2. HM Offices

During 2023, HM leased office space in the following locations:

- London 3<sup>rd</sup> floor, Shackleton House, London Bridge, London
- Farnborough The Hub, Farnborough Business Park, Hampshire
- Manchester 7<sup>th</sup> Floor, Neo, Manchester
- Cambridge Nine Hills Road, Cambridge

*Table 1 Office data*

	Floor area	Staff (FTE)	Notes
London (3 <sup>rd</sup> flr)	1,208 m <sup>2</sup>	123.4	Leased office
Farnborough	215 m <sup>2</sup>	53.5	Space within a serviced office
Manchester	263 m <sup>2</sup>	28.3	Leased office
Cambridge	Circa 9.5m <sup>2</sup>	2 desks	2 out of 18 desks within serviced office (82.5m <sup>2</sup> )

In line with the WGBC convention the Cambridge office has been excluded from this assessment as this is a small, serviced office. See the Appendices for more details on each office.



### 3. Basis of carbon footprint assessment

#### 3.1. Floor areas

Floor areas are based on areas contained within our leasing information.

#### 3.2. Energy Data

In line with WGBC, the measurement methodology for each office is as follows:

**Table 2** Measurement Methodology

	London	Farnborough	Manchester
Tenants Electricity	AMR <sup>1</sup>	RBD <sup>4</sup>	AMR <sup>2</sup>
Heating	WBD <sup>3</sup>	RBD <sup>4</sup>	AMR <sup>2</sup>
Cooling	RBD <sup>5</sup>	RBD <sup>4</sup>	

AMR = Actual Meter readings, WBD = Whole Building Data, RBD = Regional Building Data

1. Monthly meter readings taken for each office. The meters are read manually and entered into the HM Master Utility Spreadsheet.
2. Monthly meter readings taken by our landlord and forwarded to us before being entered into the HM Master Utility Spreadsheet.
3. The Landlord has assessed the heating energy in kWh for each month for our London office for 2023.
4. See Section 3.2.1 for details

##### 3.2.1. Regional Building Data

The regional building data for the London office cooling has been derived from Section 20.3 of CIBSE Guide F (2012). This sets out delivered energy use for good practice and typical offices for four office types:

- Type 1: cellular naturally ventilated
- Type 2: open plan naturally ventilated
- Type 3: 'standard' air conditioned
- Type 4: 'prestige' air conditioned

The London office is likely to be classified as either Type 3 or 4. This assessment is based on the office being classed as 'Type 4 – typical' as a worst-case assessment of the energy demand.

**Table 3** CIBSE Guide F – Cooling delivered energy

	Good practice	Typical
Type 3: 'standard' air conditioned	14	31
Type 4: 'prestige' air conditioned	21	<b>41</b>

No energy data is available for The Hub in Farnborough. It is proposed to use CIBSE Guide F benchmark for a typical Type 3 office as a worst case in energy performance.

**Table 4** CIBSE Guide F – Gas and Electricity Benchmarks

	Good practice	Typical
Type 3: 'standard' air conditioned Gas	97	178
Type 3: 'standard' air conditioned Elec	128	226

### 3.3. Fugitive Emissions from refrigerant systems

A small split DX systems are used to cool the server rooms within the London office. The leakage of refrigerant gas from these systems has been estimated using guidance from the EPA Direct Fugitive Emissions from Refrigeration, Air Conditioning, Fire Suppression, and Industrial Gases (2014) where:

$$\text{Emissions from operation} = C * (x/100) * T$$

Where: C = refrigerant capacity

X = Annual leakage rate

T = Time of year system during reporting period

Table 3 of the EPA guidance suggests that 10% is a suitable leakage rate for residential and commercial AC including heat pumps from 0.5 – 100kg.

**Table 5** Server room split DX systems

	Refrigerant type	Refrigerant charge (C)	Leakage (X)	Usage (T)	Leakage
London (3 <sup>rd</sup> flr)	R410A	5.0 kg	10%	100%	0.5 kg

### 3.4. Carbon Factors

Conversion factors for natural gas and mains electricity have been taken from the UK Government GHG Conversion Factors for Company Reporting for 2023.

*Table 6 CO<sub>2</sub> Conversion Factors*

Electricity generated	0.20707 kgCO <sub>2</sub> e/kWh
Natural Gas (kWh gross CV)	0.18293 kgCO <sub>2</sub> e/kWh
Refrigerants (R410a)	1924 kgCO <sub>2</sub> /kg

## 4. Energy Consumption and Carbon Emissions

The energy and carbon emissions for the Farnborough, London and Manchester offices is set out below:

**Table 7** Energy Consumption

	Gas	Electricity	Gas	Electricity
	kWh	kWh	kWh/m <sup>2</sup>	kWh/m <sup>2</sup>
London	147,270	231,861	122	192
Farnborough	38,285	48,590	178	226
Manchester		42,568		162
<b>Total</b>	<b>185,555</b>	<b>323,019</b>		

**Table 8** Carbon emissions

	Gas	Electricity	Gas	Electricity
	kgCO <sub>2</sub> e	kgCO <sub>2</sub> e	kgCO <sub>2</sub> e /m <sup>2</sup>	kgCO <sub>2</sub> e /m <sup>2</sup>
London	26,940	48,012	22	40
Farnborough	7,003	10,062	33	47
Manchester		8,815		34
<b>Total</b>	<b>33,943</b>	<b>66,889</b>		

**Table 9** WGBC reporting

	Gas	Electricity	Scope 1 <sup>1</sup>	Scope 2
	MWh	MWh	tCO <sub>2</sub> e	tCO <sub>2</sub> e /m <sup>2</sup>
Overall	186	323	34.9	66.9

<sup>1</sup> Scope 1 includes gas and fugitive emissions

**Table 10** Fugitive emissions

	Leakage	Emissions
	kg	tCO <sub>2</sub> e
Refrigerant leaks	0.5	1.0

More detailed information for each office can be found in the appendices.

## Appendix 1 - London Office

The Shackleton House office is located within Hays Galleria in London Bridge. It is understood that the buildings were originally warehouses that were converted to offices in the 1980's. The Hays Galleria is a Grade II listed structure.



Figure 2 Images of Shackleton House

HM have occupied the 3<sup>rd</sup> floor since 2005.

Table 11 Key Facts

Owned or leased	Leased	
Leased area	3 <sup>rd</sup> floor = 1,208 m <sup>2</sup>	
Tenants Electricity	Recharged via landlord	Read manually by HM
Heating	Communal gas boilers. Mikrofil Ethos 350 Gas boilers (Seasonal efficiency = 95.6%)	Energy usage for our floor area calculated by landlord
Cooling	Communal Chillers Daikin Chiller DWSC087L (COP @100% = 6.243)	No energy data available
On floor	Variable air volume system	
Lighting	LED to office areas Mix of compact fluorescent and halogen to meeting rooms	Installed in 2016 Lighting power density = 5W/m <sup>2</sup>
EPC	D (98)	7177-2226-6796-4688-9741 Valid Until 10/12/30
Green certification	N/a	

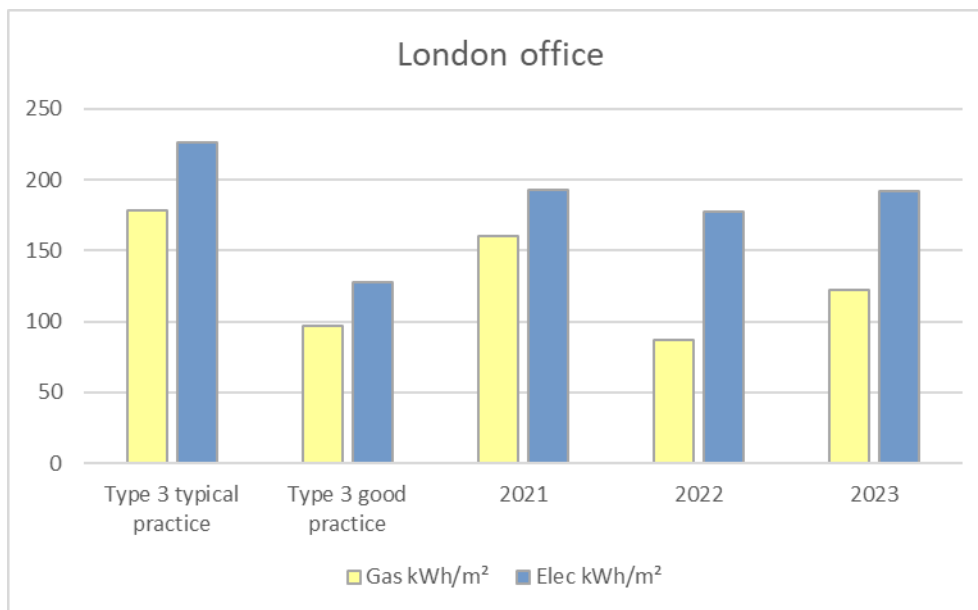
Table 12 sets out the energy data for the London office.

**Table 12** London Energy Data

	Tenants Electricity Meter kWh	Tenancy Electricity Consumption kWh	Tenancy Gas Consumption kWh	Tenancy Cooling Energy kWh
05/01/2023	1,270,603 A	14,113	18,528	3,688 R
01/02/2023	1,284,716 A	12,399	15,136	3,061 R
01/03/2023	1,297,115 A	13,656	13,642	3,610 R
31/03/2023	1,310,771 A	22,785	13,201	4,145 R
23/05/2023	1,333,556 A	5,791	6,946	4,566 R
05/06/2023	1,339,347 A	14,602	9,177	4,372 R
03/07/2023	1,353,949 A	16,042	9,713	7,166 R
02/08/2023	1,369,991 A	19,278	8,072	3,840 R
06/09/2023	1,389,269 A	15,545	8,816	4,136 R
04/10/2023	1,404,814 A	16,041	12,612	4,059 R
01/11/2023	1,420,855 E	16,041	16,642	3,373 R
01/12/2023	1,436,895 E	16,041	14,784	3,513 R
05/01/2023	1,452,936 A			
<b>Total</b>		<b>182,333 kWh</b> 151 kWh/m <sup>2</sup>	<b>147,270 kWh</b> 122 kWh/m <sup>2</sup>	<b>49,528 kWh</b> 41 kWh/m <sup>2</sup>

A = actual reading, E = estimated reading, R = based on regional building data (See Section 3.2.1)

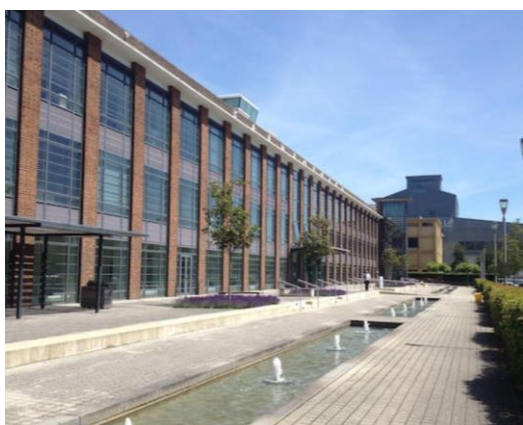
The office energy performance sits between CIBSE Guide F typical and good practice.



**Figure 3** Energy usage compared against CIBSE Guide F benchmarks

## Appendix 2 - Farnborough Office

The Farnborough office is located in the Hub, Fowler Avenue, Farnborough Business Park, Farnborough. The building was constructed in the late 1930's and was originally an airport departures lounge and control tower. The building has been completely renovated, with HM leasing part of the 1<sup>st</sup> floor from Regus.



*Figure 4 Image of The Hub*

HM have occupied this building since October 2022.

*Table 13 Key Facts*

Owned or leased	Leased	
Leased area	Part of 1 <sup>st</sup> floor = 215 m <sup>2</sup>	
Tenants Electricity	Not known	
Heating	Communal gas boilers.	
Cooling	Communal Chillers.	
On floor	4 pipe fan coil units	
Lighting	LED lighting to all areas	
EPC	D (89)	9494-3077-0517-0800-3921 Valid until 9/6/29
Green certification	BREEAM In Use 55.3% Very Good	BIU00005549-1.0 Valid until 14/8/23

As no energy data is available from our Landlord, energy usage is based on CIBSE Guide F benchmarks for a Typical Practice Type 3 air conditioned office. This is very much considered to be a

worst-case scenario. See section 3.2.1 for more details. Table 14 sets out the energy data for The Hub.

**Table 14**    *The Hub Energy Data*

	<b>Tenants gas consumption kWh</b>	<b>Tenants Electricity consumption kWh</b>
01/01/2022	5,835 R	4,049 R
01/02/2022	5,191 R	4,049 R
01/03/2022	4,797 R	4,049 R
01/04/2022	3,510 R	4,049 R
01/05/2022	2,384 R	4,049 R
01/06/2022	1,185 R	4,049 R
01/07/2022	673 R	4,049 R
01/08/2022	760 R	4,049 R
01/09/2022	1,389 R	4,049 R
01/10/2022	2,691 R	4,049 R
01/11/2022	4,329 R	4,049 R
01/12/2022	5,542 R	4,049 R
<b>Totals</b>	<b>38,285 kWh</b> 178 kWh/m <sup>2</sup>	<b>48,590 kWh</b> 226 kWh/m <sup>2</sup>

A = actual reading, E = estimated reading, R = based on regional building data (See Section 3.2.1)



## Appendix 3 - Manchester Office

The Manchester office is located on the 5<sup>th</sup> floor of the Neo Building in Piccadilly, Manchester.

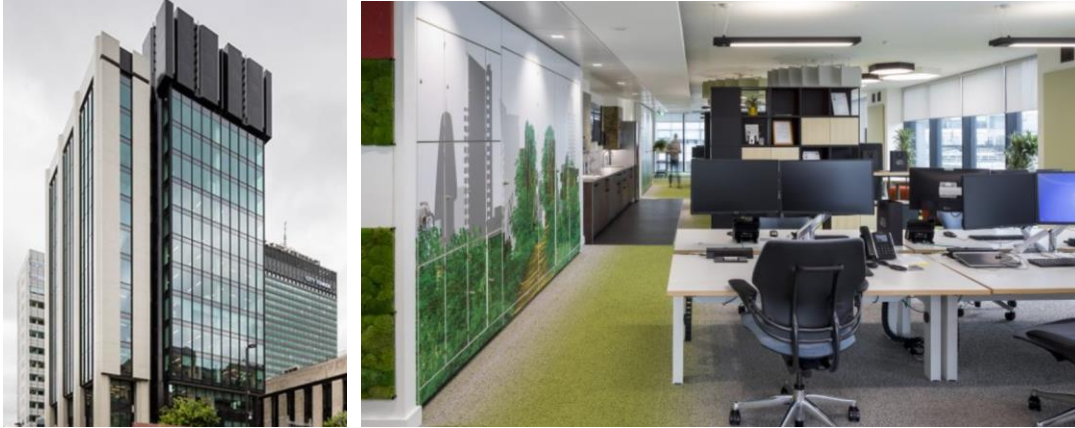


Figure 5 Images of Neo

HM have occupied this building since 2017. HM were involved in the base build renovation works and designed the fitout for our floor. This office is certified to the Well Gold standard.

Table 15 Key Facts

Owned or leased	Leased	
Leased area	Part of 5 <sup>th</sup> Floor = 263 m <sup>2</sup>	
Tenants Electricity	Direct contract	Tenants elec meter read by landlord
Heating	VRF	Condenser elec meter read by landlord
Cooling	VRF	
On floor	VRF	
Lighting	LED lighting to all areas	
EPC	B (49)	0240-3907-0303-2471-4070 Valid until 1/8/27
Green certification		

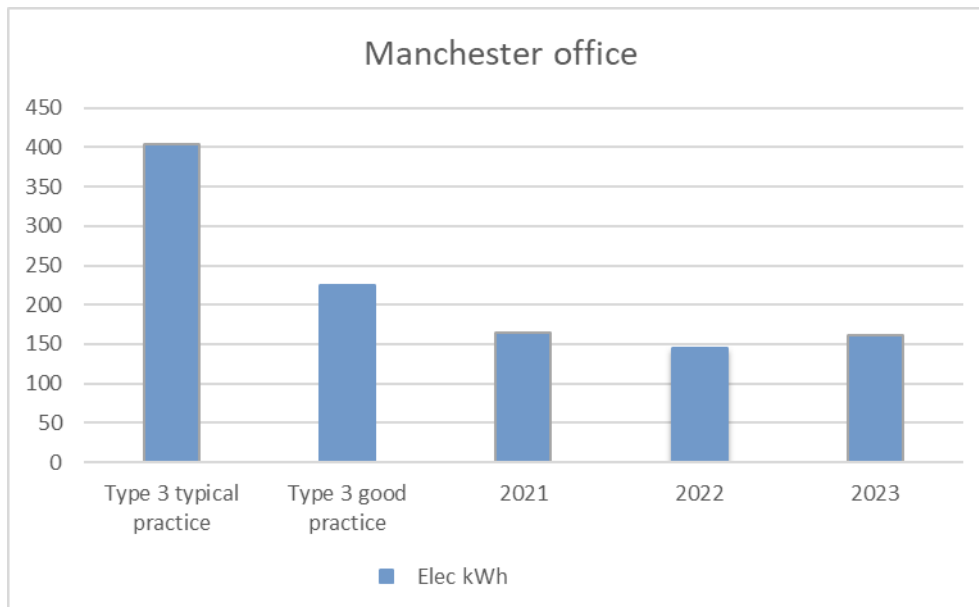
Table 16 sets out the energy data for the Manchester office.

**Table 16 Manchester Energy Data**

	Tenants electricity meter kWh	Tenants electricity kWh	Tenants Condenser Meter kWh	Tenants Condenser kWh
01/01/2023	122,778 A	2,442	99,724 A	2,832
01/02/2023	125,220 A	2,250	102,556 A	2,697
01/03/2023	127,469 A	2,387	105,252 A	2,592
01/04/2023	129,856 A	2,161	107,844 A	1,919
01/05/2023	132,017 A	2,302	109,763 A	234
01/06/2023	134,320 A	2,352	109,997 A	633
01/07/2023	136,672 A	2,358	110,629 A	295
01/08/2023	139,029 A	2,362	110,925 A	281
01/09/2023	141,391 A	2,287	111,206 A	412
01/10/2023	143,678 A	2,239	111,618 A	364
01/11/2023	145,917 A	2,125	111,982 A	1,335
01/12/2023	148,041 A	2,075	113,317 A	1,637
01/01/2023	122,778 A		114,954 A	
Totals		<b>27,339 kWh</b> 104 kWh /m <sup>2</sup>		<b>15,230 kWh</b> 58 kWh /m <sup>2</sup>

A = actual reading, E = estimated reading, R = based on regional building data (See Section 3.2.1)

The office energy performance is better than CIBSE Guide F good practice.



**Figure 6 Electricity usage compared against CIBSE Guide F benchmarks**



**People. Places. Planet.**