

# Rebel Energy 2023 Carbon Footprint: Business Operations



Prepared in July 2024 by




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# Executive Summary

Rebel Energy is a fast-growing UK retail energy company selling energy predominantly to household consumers. They are committed to a clean and affordable energy transition to meet the climate emergency. Rebel Energy commissioned Pilio to calculate its first business' operations carbon footprint for 2023. The carbon footprint calculates the greenhouse gas emissions from office and home-working energy use, procurement, business travel, staff commuting, water and waste. The GHG Protocol methodology for company carbon accounting and the DEFRA GHG emission conversion factors were used.



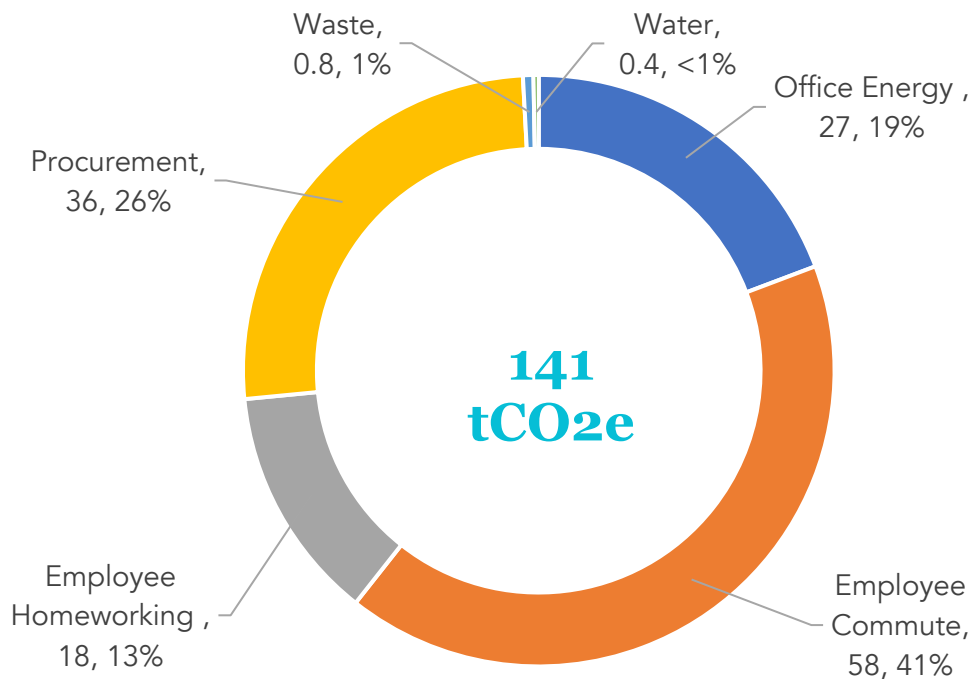
**Total carbon emissions for Rebel Energy in 2023 were 141 tCO<sub>2</sub>e.**

Relative emissions are:

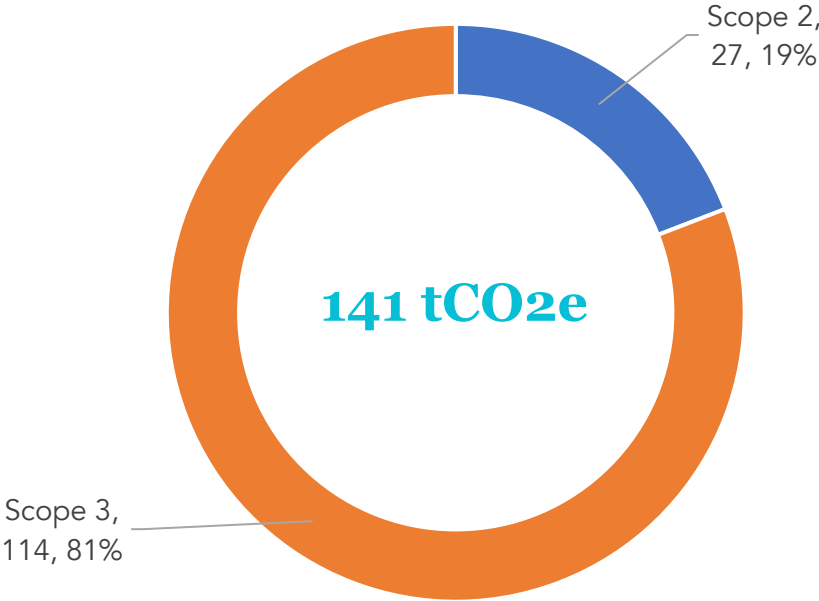
- **2.8 tCO<sub>2</sub>e** per Rebel Energy employee.
- **1.6 tCO<sub>2</sub>e** per total staff (including contracted).

Of the total 141 tCO<sub>2</sub>e of emissions, four-fifths of the emissions (81%,114 tCO<sub>2</sub>e) are associated with GHG emissions not in their direct control (known as scope 3).

## Total 2023 Operations Carbon Footprint tCO<sub>2</sub>e by Impact Area



# Total 2023 Operations Carbon Footprint tCO2e by Scope



By looking at emissions by Impact area, transport is at the top at 41% of the total emissions, followed by Energy (32%) and Procurement (25%).

## Recommendations to reduce Rebel Energy’s carbon footprint

As energy company, Rebel Energy can help drive the societal transition to a decarbonised energy system by advocating for a regulatory framework that incentivises investment in renewable energy sources and the adoption of low-carbon electricity technologies (e.g. heat pumps).

Rebel Energy should develop a company sustainability strategy that will set out its roadmap for delivering its sustainability aims and objectives – this should encompass governance, policies and reporting, action plan for reducing the environmental impacts of its business operations, its customer services and green investments (internally as externally).

Rebel Energy should develop its sustainability to reflect its fresh thinking on how to unlock and accelerate the transition for a sustainable future for people and planet as demonstrated with setting a “carbon pollution tax” which is donated then to Rebel Restoration to distribute grants to non-profits doing grassroots efforts to restore nature.

Considering the results of this baseline carbon footprinting exercise, Rebel Energy could further reduce their business operations carbon footprint by:

### Energy-Related GHG Emissions, Scope 1 & 2

- **Office energy use:** ensure that equipment is optimally managed by looking at out-of-office energy usage, making sure that no energy is wasted during the night. At the same time, ensure that space heating and cooling settings are optimised, and that environmentally friendly behaviours are followed by staff and office management.
- **Office lease:** ensure to foster collaboration on energy usage and procurement with the office landlords, and to select office spaces that have green excellence certificates (e.g., BREEAM or LEAD). Building fabric and equipment (e.g. on-site photovoltaic panels, walls insulation, etc.), together with energy tariff type, can have a significant effect on the office carbon emissions. Rebel Energy has partners to deliver customer services – based in South Africa, which has a high carbon electricity grid – and therefore should work with these partners to be in green offices.
- **Staff training:** Provide climate literacy and energy savings courses for staff in both the workplace (Scope 1&2) and at home (Scope 3).
- **Staff responsibility:** Appoint “Sustainability Champions”: have a dedicated person within the staff to focus on environmental reporting, staff and customers engagement on environmental topics, and compliance. Have at least one board member that would bring these matters at the board’s level.

### All Other GHG Emission Sources, Scope 3

- **Staff commute:** have a green travel policy. Incentivise bike to work schemes, public transport or carpooling, low emission taxis, no-flight mileage thresholds and install or select locations that have electric vehicles charging stations at the office.
- **Procurement (Upstream emissions):** develop a green supply chain policy. Businesses can have direct impacts on their suppliers, no matter the size. Ensure to fast-track suppliers that have a solid environmentally friendly reputation backed by facts. Due to the nature of the business, ensure that data centres and cloud computing are efficient and powered by low carbon electricity, together with considering water usage and scarcity issues for their cooling systems.
- **Customer Energy Use (Downstream emissions):** the emissions arising from the use of sold products is most likely to have the biggest impact in Rebel Energy’s carbon footprint. Although out of scope for this exercise, ensure that this is correctly monitored and accounted for. Together with this, Pilio recommends Rebel Energy to think on how to support the final energy users in introducing energy saving practices, low carbon equipment and support on their decarbonisation options.

Overall, Pilio recommends that a fuller carbon accounting of Scope 3 emissions of the whole company (and not just their operations) would include the emissions arising from the company's sold products. These emissions will most likely have a material impact on Rebel Energy's carbon footprint. In this context, it is important to emphasise that while an electricity trading company may not produce electricity, its role in the value chain means it has a significant indirect impact on GHG emissions.



In 2023 Rebel Energy had 40,000 householder customers purchased approximately 384 million kWh\*. The carbon emissions associated with this electricity use in 2023 would be **82,000 tonnes of CO<sub>2</sub>e**.

*\*Average household energy use based on OFGEM figures. Assumed 60% of Rebel Energy's customers purchase gas and electricity.*

# Context

The UK government has committed to reaching net zero emissions by 2050 in response to the climate and nature crisis. As a fast-growing energy supplier serving primarily household residential customers, Rebel Energy has the ability to play a key role in catalysing and accelerating the UK's net zero goal. By providing access to renewable energy at affordable prices, Rebel Energy is supporting a just transition to green infrastructure with a commitment to see the end of fuel poverty in the UK.

As an energy company focused on sustainability, it is important for Rebel Energy to understand its own energy and carbon impacts. Pilio was commissioned to calculate and prepare Rebel Energy's carbon footprint, the results of which are presented in this report.

Rebel Energy joins a growing number of companies in the UK that are measuring their energy and carbon impacts. This effort has primarily focused on company Scope 1 and 2 emissions, with growing interest in supply chain Scope 3. The aim of measuring a carbon footprint is to gain an understanding of where a company's biggest emissions impacts are in order to identify opportunities for reduction.

## Reporting period

1<sup>st</sup> Jan 2023 to 31<sup>st</sup> Dec 2023

## Intensity ratios

Rebel Energy Employees = 50

Rebel Energy full staff (including contracted staff) = 87

# Methodology

The methodology used to prepare Rebel Energy's carbon footprint was the Greenhouse Gas (GHG) Protocol. The Protocol is a comprehensive international standard framework for companies to measure and report GHG emissions from their operations, value chains and mitigation actions. The GHG Protocol has developed over the course of a 20+ year partnership between the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

Under the Protocol, GHG emissions are organised under three scopes:

- **Scope 1:** direct emissions (e.g. gas and transport fuels),
- **Scope 2:** indirect energy-related emissions (e.g. electricity),
- **Scope 3:** all other indirect emissions (e.g. business travel, procurement, home working, waste, and water).

We used the GHG Protocol Value Chain Standard for voluntary reporting of Scope 3 GHG emissions.

## Calculating Rebel Energy's operation footprint

Using the GHG Protocol, the method used to calculate Rebel Energy's Scope 1 and 2 emissions is based on an 'operational control' approach. The aim and scope of this Rebel Energy's footprint is not to calculate the company's full Scope 1, 2 and 3 emissions. Rather, it is to calculate the impact that their operations only have on the environment.

To calculate the company's full Scope 1, 2 and 3 emissions, Pilio recommends doing a materiality assessment, to ensure that key areas are not left out.

It is important to emphasise that most of the emissions calculated here are based on estimates due to a lack of actual data. Further methodological details are provided in each impact chapter.

To calculate its 2023 carbon emissions, Rebel Energy has included the following impacts:

- Scope 1 & 2:
  - Employees office energy use (together with homeworking energy use)
- Scope 3:
  - Transport (staff commute only, together with contracted employees staff commute)
  - Employees water usage in office and at home
  - Employees waste generation in office and at home
  - Procurement



- Lifecycle emissions of an employee's workstation
- Energy usage in contracted offices (i.e. Rotherham Web Help)

An electricity trading company like Rebel Energy, unlike traditional electricity generation companies, focuses primarily on buying and selling electricity rather than producing it. Nevertheless, it still has associated greenhouse gas (GHG) emissions that need to be accounted for. These emissions can be categorised under the GHG Protocol framework into three scopes:

- **Scope 1:** These are direct GHG emissions from sources that are owned or controlled by the company. For Rebel Energy, these could include emissions from on-site fuel combustion in company-owned vehicles or backup generators.
- **Scope 2:** These are indirect GHG emissions from the consumption of purchased electricity, steam, heating, and cooling. These emissions occur at the facility where the electricity is generated. For Rebel Energy, Scope 2 emissions would be primarily from the electricity used in their offices and data centres (if not outsourced).
- **Scope 3:** These are all other indirect emissions that occur in Rebel Energy's value chain, including both upstream and downstream emissions. In this case, Scope 3 main source of emissions could include:
  - Emissions from the production and transportation of purchased goods and services.
  - Well To Tank and Cradle to gate for the fuels and raw materials used in the production of purchased goods and services.
  - Emissions from business travel.
  - And finally, emissions associated to contractors energy use and server infrastructure.

Although Rebel Energy's is committed to a green energy transition and reducing environmental damage, the company's rapid growth presents challenges in securing direct renewable energy from generators to meet their customers' needs. This means that an undisclosed amount of energy sold by Rebel Energy to their customers still relies on fossil fuels.

Rebel Energy has set up an organisation to fund restoration projects through a self-imposed carbon tax. Rebel Energy is then channelling the proceeds from their self-imposed carbon tax into environmental restoration projects and delivering energy-saving solutions to alleviate poverty in the UK.

In this context, Pilio recommends that a fuller carbon accounting of Scope 3 emissions of the whole company (and not just their operations) would include the emissions arising from

the company's sold products. These emissions will most likely have a material impact on Rebel Energy's carbon footprint. These emissions fall under Scope 3 and include:

- **Electricity generation for consumption by customers:** The most significant Scope 3 emissions for Rebel Energy probably come from the generation of sold electricity used its by customers. It is important to stress that these emissions depend on the energy mix used to generate the electricity.
- **Transmission and distribution losses:** As electricity is transmitted and distributed through power lines, some energy is lost as heat. The GHG emissions associated with this lost electricity can be significant, depending on the amount of electricity distributed.
- **Lifecycle emissions of power stations and distribution network:** This includes the construction, maintenance, and decommissioning of power stations and associated infrastructure, contributing to the overall carbon footprint of the electricity provided by the utility.

In this context, it is important to emphasise that while an electricity trading company may not produce electricity, its role in the value chain means it has a significant indirect impact on GHG emissions.

## Emission conversion factors

Consumption data has been converted into GHG emissions following the 2023 DEFRA Carbon Conversion Factors for Company Reporting.

# Results

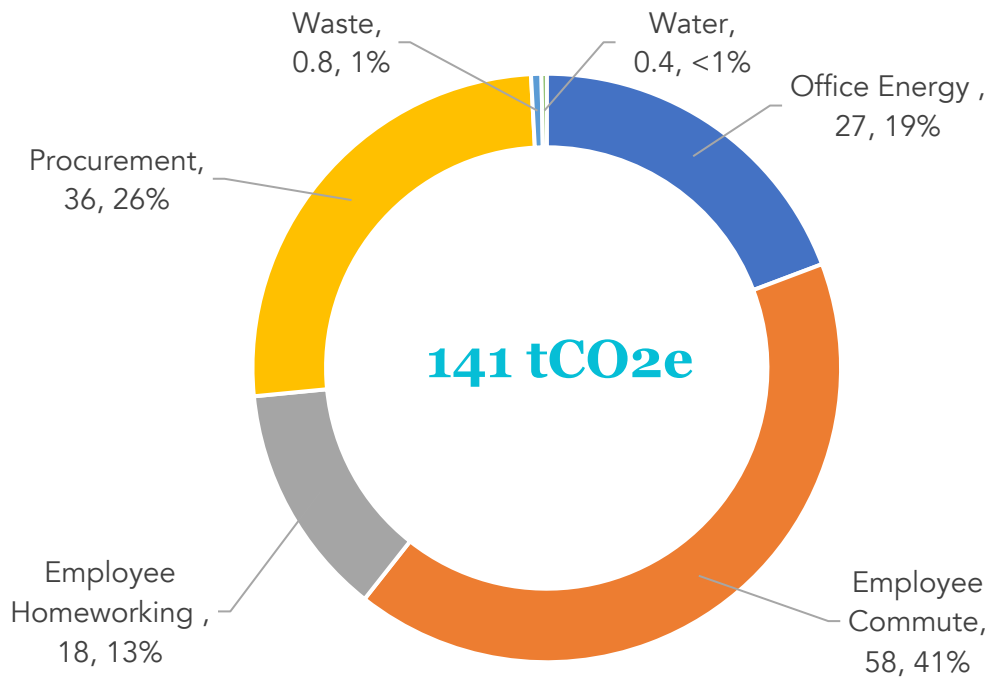
The following presents the operations only footprint for Rebel Energy in 2023. Results are presented as 'CO<sub>2</sub>e' (carbon dioxide equivalent), referring to all greenhouse gases emitted expressed in equivalent global warming potential as CO<sub>2</sub> (carbon dioxide).

Units are expressed in tonnes of CO<sub>2</sub>e. 1 tonne = 1,000 kilograms.

## Total carbon emissions

 Total carbon emissions for Rebel Energy in 2023 were **141 tCO<sub>2</sub>e**.

## Total 2023 Operations Carbon Footprint tCO<sub>2</sub>e by Impact Area

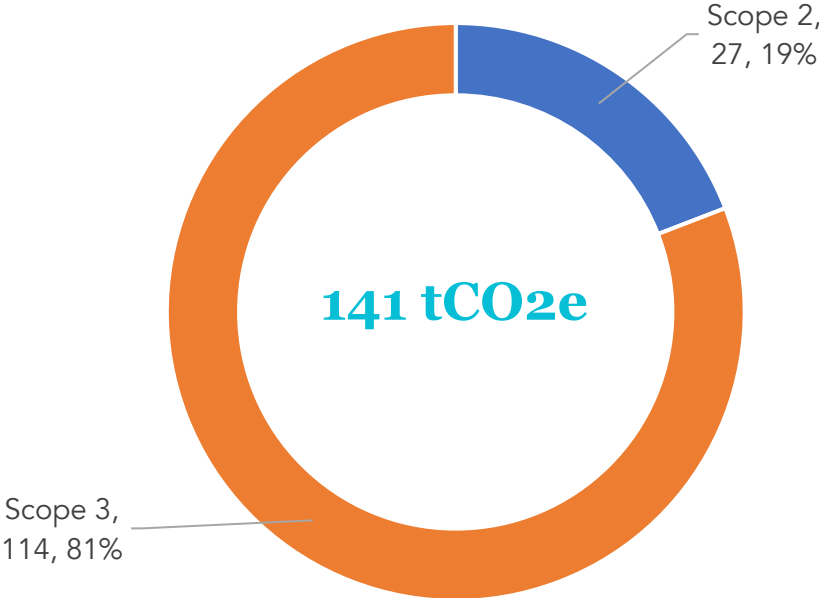


The biggest impact area is staff travel (Transport), accounting for 42% of emissions, or **58 tCO<sub>2</sub>e**. This is followed by energy from controlled offices (Energy), accounting for 32%, or **45 tCO<sub>2</sub>e**.

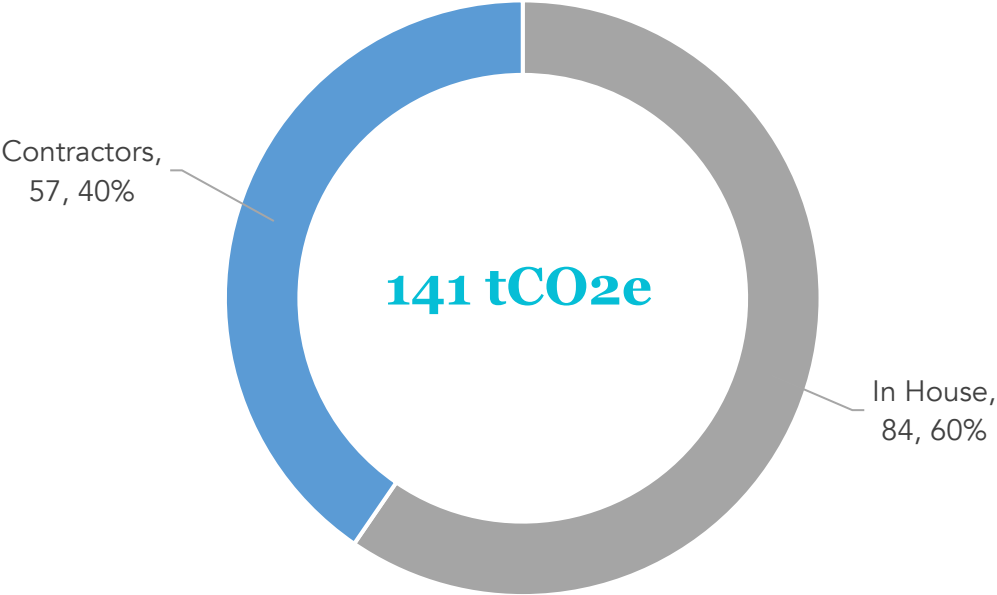
Category	2023 tCO <sub>2</sub> e*	Data Confidence
<b>SCOPE 1 &amp; 2</b>	<b>27</b>	Poor
<b>SCOPE 3</b>	<b>114</b>	Poor
<b>Staff commuting and homeworking</b>	<b>58</b>	Poor
Staff Commuting	22	Poor
Home working	18	Poor
Contracted Staff Commuting	36	Poor
<b>Procurement</b>	<b>36</b>	Poor
Capital goods	17	Poor
Contractors	20	Poor
<b>Waste</b>	<b>0.8</b>	Poor
<b>Water</b>	<b>0.4</b>	Poor

\*the total might not tally up due to rounding.

### Total 2023 Operations Carbon Footprint tCO2e by Scope



### Total 2023 Operations Carbon Footprint tCO2e In house vs contractors



## Office energy



Total carbon emissions from energy in were **27 tCO<sub>2</sub>e**.

These emissions refer Scope 2 emissions only, as the company operated offices are fully electric.

### METHODOLOGY

No actual data was available to calculate the energy consumption in the Rebel Energy offices.

Rebel Energy has operational control over 2 all-electric offices, the HQ in Bedford and a second smaller office in Teddington.

To calculate energy emissions, Pilio has estimated the office size based on the number of employees working at the office. These numbers have been shared with Pilio by Rebel Energy and are reported below:

- Teddington = 10 employees
- Bedford = 40 employees

According to Gov UK's DBEIS, the median energy intensity of all-electric offices is 124 kWh/m<sup>2</sup> per year.

(Source: DBEIS, Building Energy Efficiency Survey 2014-15: Overarching report, 2016, Page 55).

The average range of office space for businesses in the UK ranges from 14 to 28 square metres per person. Pilio used the average value of 21 square meters in the calculation of Rebel Energy's office space.

(Source: <https://primeofficespace.co.uk/faq12.htm>)

## Employee commuting and home working



Total emissions from employee commute and home working were **76 tCO<sub>2</sub>e.**

These emissions refer to upstream GHG Protocol Category 7, emissions from the transportation of employees between their homes and their worksites during the reporting year (in vehicles not owned or operated by the reporting company); including emissions from teleworking (a.k.a., home working).

### COMMUTING



Total emissions from employee commute were **58 tCO<sub>2</sub>e.**

These emissions are Scope 3, and are generated by the energy use for equipment and space heating by Rebel Energy employees during their work from home time.

Together with their working-from-home emissions, Rebel Energy decided to include their employees' office commute within the scope of this carbon footprint.

Rebel Energy has shared with Pilio that 15% of the total workforce has an average mileage of 250 miles per month. Pilio assumed that this is done in a single-occupancy average car (unknown fuel)

For the remaining staff, Pilio assumes that:

- 62.5% of the employees use public transport (not London)
- 22.5% use a private car (single occupancy)
- the average round trip is 20 miles per employee
- The Rebel Energy staff goes to the office only 40% of the time, as the staff works from home the remaining 60% of the time. There were 251 working days in the UK in 2023. Assuming that the Rebel Energy staff has a 25-day annual leave allowance, the total working days per Rebel Energy employee in 2023 was 228. Of which 40% (91.2) were days in which they travelled to the office.

## HOMEWORKING



Total emissions from employee home working were **18 tCO<sub>2</sub>e**.

These emissions are Scope 3, and are generated by the energy use for equipment, lighting and space heating by Rebel Energy employees during their work from home time.

Rebel Energy has flexi-work policy allowing employees to work from home for a proportion of the work week, and this is why they have decided to include the associated carbon emissions within their scope.

Rebel Energy has shared with Pilio that, for the average employee, 60% of their time is work-from-home time, and the remaining 40% of the time is spent in the office. This behaviour is assumed to be the same across the whole year (i.e. the average employee doesn't work more from home during winter and less during summer).

There were 251 working days in the UK in 2023. It is assumed that Rebel Energy provides a 25-day annual leave allowance as well as national holidays. The total working days per Rebel Energy employee in 2023 was 228. Pilio assumes that a day is 8 working hours.

In order to calculate energy-related emissions, Pilio uses DEFRA's per Full Time Equivalent (FTE) Working Hour emissions factors methodology to calculate the kWh used and assumes that space heating is done exclusively using natural gas.

- Office equipment = 0.15 kWh of electricity per hour
- Space heating = 1.65 kWh of natural gas per hour



## Procurement

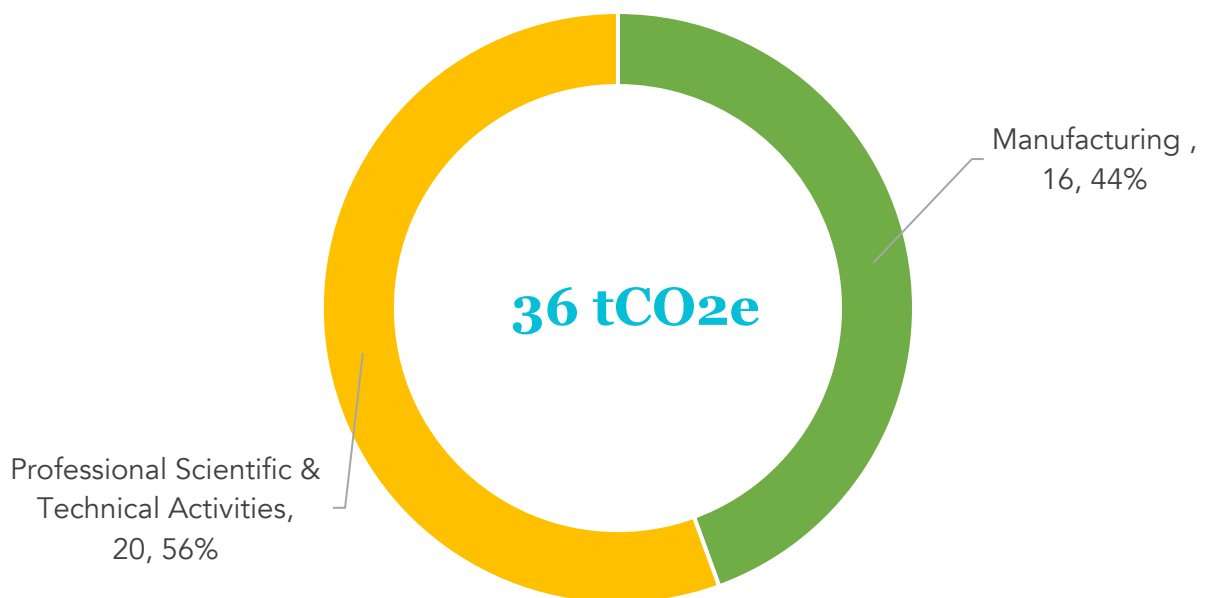


Total emissions from procurement were **36 tCO<sub>2</sub>e**.

These emissions refer to upstream GHG protocol Category 1. Purchased goods and services, which include upstream (i.e., cradle-to gate) emissions from the extraction, production and transportation of goods and services purchased or acquired by the reporting company in the reporting year. Only emissions from Rotherham Web Help are in scope of this footprint.

These emissions include also the upstream GHG Protocol Category 2. Capital goods, which include extraction, production, and transportation of capital goods purchased or acquired by the reporting company in the reporting year. Only emissions from Rebel Energy employees working station (IT only) are in scope of this footprint.

### Total procurement emissions tCO<sub>2</sub>e by category



## METHODOLOGY

Representative embodied emissions for user devices derived for 2020 are:

- 200 kg CO<sub>2</sub>e for a laptop,
- 100 kg CO<sub>2</sub>e for a PC display

(Source: N. Lövehagen et al., Assessing embodied carbon emissions of communication user devices by combining approaches, Renewable and Sustainable Energy Reviews, 2023)

- 9.12 kg CO<sub>2</sub>e for mouse & keyboard
- 4.32 kg CO<sub>2</sub>e for a headset

(Source: Logitech <https://www.logitech.com/en-us/sustainability/carbon-clarity.html>)

Pilio assumes that a single working station is made of a laptop, a PC display, a keyboard & mouse, and a headset. Due to material composition, it is assumed that keyboard and mouse emissions will represent a minority of the emissions and thus have been excluded from the calculation due to a lack of reliable sources.

No actual data was available to calculate the energy consumption in the Rotherham Web Help offices.

To calculate energy emissions, Pilio has estimated the office size based on the number of employees working at the office. The figure has been shared with Pilio by Rebel Energy and is equal to 37 employees.

According to Gov UK's DBEIS, the median energy intensity of all-electric offices is 124 kWh/m<sup>2</sup> per year. In accordance with the methodology used to calculate Rebel Energy's office use, Pilio assumes that the Rotherham Web Help office is fully electric too.

(Source: DBEIS, Building Energy Efficiency Survey 2014-15: Overarching report, 2016, Page 55).

The average range of office space for businesses in the UK ranges from 14 to 28 square metres per person. Pilio used the average value of 21 square meters in the calculation of Rebel Energy's office space.

(Source: <https://primeofficespace.co.uk/faq12.htm>)

## Waste



Total emissions from the treatment of waste generated by Rebel Energy were **0.8 tCO<sub>2</sub>e**.

These emissions refer to GHG Protocol Category 5, emissions from the disposal and treatment of waste generated in the reporting company's operations in the reporting year (in facilities not owned or controlled by the reporting company).

### RESULTS

Group	tCO <sub>2</sub> e	%
Rebel Energy	0.485	57%
Rotherham Web Help	0.359	43%
<b>Total</b>	<b>0.844</b>	<b>100%</b>

### METHODOLOGY

The average office waste per employee is about 2kg of waste each day.

(Source: Business Waste, <https://www.businesswaste.co.uk/sectors/office-waste-management/office-waste-facts/>)

Rebel Energy had 50 employees in 2023. Pilio assumes that the waste generation per employee while working from home is the same as the work from the office.

There were 251 working days in the UK in 2023. Assuming that Rebel Energy provides a 25-day annual leave allowance, the total working days per Rebel Energy employee in 2023 was 228.

## Water



Total emissions from the supply and treatment of water were **0.4 tCO<sub>2</sub>e**.

The total GHG emissions from supply and treatment of water were 0.4 tCO<sub>2</sub>e.

### RESULTS

Group	tCO <sub>2</sub> e	%
Rebel Energy	0.216	57%
Rotherham Web Help	0.16	43%
<b>Total</b>	<b>0.376</b>	<b>100%</b>

### METHODOLOGY

On average, water consumption for office buildings is 50 litres for each employee each working day.

(Source: Water use in your business, South Staffs Water)

Rebel Energy had 50 employees in 2023. Pilio assumes that the water consumption per employee while working from home is the same as the work from the office.

There were 251 working days in the UK in 2023. Assuming that Rebel Energy provides a 25-day annual leave allowance, the total working days per Rebel Energy employee in 2023 was 228.



# About Pilio

Pilio supports businesses to meet their climate ambitions through equipping them with the tools and expert advisory to implement change. Pilio spun out of the University of Oxford in 2011. Founders Catherine Bottrill and Dr. Russell

Layberry have been working together for over 20 years, bringing a deep knowledge of energy and carbon science and accounting. Pilio follows the philosophy of the butterfly effect, helping companies make small changes that catalyse transformative change towards a fair future for people and planet.

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