



Crown Oil
sustainability



CARBON NEUTRAL
VALIDATED TO
PAS 2060:2014 | GHG VERIFICATION TO
ISO-14064-1

Carbon Assessment Report

PAS 2060: 2014 specification for the demonstration of carbon neutrality

Achievement period: 1st August 2022 – 31st July 2023

Commitment period: 1st August 2023 – 31st July 2024

Date: January 2024



PAS 2060 - Carbon Neutral

The British Standard Institute (BSI) has developed an internationally applicable specification for demonstrating carbon neutrality. Verification to this standard substantiates claims that a business is carbon neutral.

Conformity with this specification can be achieved in three ways:

1. 3rd party certification
2. Other party validation
3. Self-validation

Crown Oil Ltd has chosen “other party verification” through Tunley Engineering. This provided us with the support, documentation and protection required from external criticism, ensuring high confidence in the carbon neutrality statement.

Table 1 provides the PAS 2060 Qualifying Explanatory Statement to demonstrate that we have achieved carbon neutrality in accordance with PAS 2060:2014 on 24th January for the baseline year period of 1st August 2022 to 31st July 2023.

Table 1: Declaration of achievement of carbon neutrality

PAS 2060 Requirement	Response
Entity making declaration	Crown Oil Ltd (Group) including: Crown Oil Ltd (company) Speedy Fuels Ltd, Crown Oil Environmental Ltd, Beesley Fuels Ltd, Nationwide Fuels and Lubricants Ltd
Subject of PAS 2060 declaration	All offices, commercial premises, vehicles, goods and services for which Crown Oil Ltd (Group) has operational control
Description of subject	Crown Oil Ltd (Group) is a group of commercial fuel and lubricant distribution companies providing service coverage across the UK
Rationale for selection of subject	<p>The subject was selected given it represents the operational control boundary of Crown Oil following the WRI GHG Protocol methodology. The boundary is summarised as follows:</p> <ul style="list-style-type: none"> • Scope 1 emissions: Combustion of gas, Combustion of fuel (stationary & mobile), Refrigerant leakage • Scope 2 emissions: Purchased electricity & heat (location based) • Scope 3 emissions: Purchased Goods & services, Capital goods, Well-to-tank & Transmission & distribution losses, Upstream transportation & distribution, Business travel, employee commuting, excluded scope 3 emissions are those associated with: Upstream & downstream leased assets. Use of sold products, processing and end-of-life treatment of sold products. Franchises and investments

Type of conformity assessment	Other party validation
Baseline date for PAS 2060 programme	1st August 2020 to 31st July 2021
Period during which the entity is demonstrating carbon neutrality of the subject has been achieved	1st August 2022 to 31st July 2023
Recorded carbon footprint of the subject during the period stated above	6,209 tonnes CO ₂ e p.a.
Which PAS 2060 recognised methodology has been followed to achieve carbon neutrality?	WBCSD/WRI Greenhouse Gas Protocol, Corporate accounting and Reporting standard (revised edition, March 2004)
How have the reductions in GHG emissions during the period been achieved?	Reductions primarily made by substituting mobile combustion of diesel fuel with that of hydrotreated vegetable oil. Please see Carbon Reduction Opportunities for further information.
Has there been material changes to the subject?	No, the scope and boundary of the assessment is the same as the baseline FY2020/21
Actual reduction in GHG emissions	2,724 tCO ₂ e p.a.
Carbon Offset standard and methodology	Verified Carbon Standard (VCS) (see ‘Carbon Offsetting’ report section)
UK economic growth rate over the application period	2022: 4.3% https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG
Other-party validation statement	Tunley Engineering declare that the information presented in this qualifying explanatory statement in support of PAS 2060:2014 is true and accurate to the best of our knowledge, ability and experience
Name of senior representative	Matthew Greensmith, Managing Director with overall responsibility of Group sustainability, February 2024
Signature	<i>M. Greensmith</i>



Introduction

This assessment has been conducted using the standard protocols and data provided for our business activities. Greenhouse gas emissions (GHG) are quantified in terms of carbon dioxide equivalents (CO₂e) and thus are occasionally referred to as carbon emissions.

The objective of this business carbon assessment is to declare our commitment to achieving carbon neutral status as an organisation in accordance to PAS 2060, a globally recognised standard produced by the British Standards Institute.



Quantification standards

This document forms the PAS 2060 Qualifying Explanatory Statement whereby Tunley Engineering verifies that Crown Oil Ltd has achieved carbon neutrality in accordance with PAS 2060:2014 on 24th January 2024 for the baseline year period of 1st August 2022 to 31st July 2023. Our carbon footprint has been calculated in accordance with the internationally recognised standard ISO-14064-1.

The business carbon assessment involves a detailed and transparent carbon footprint study that covers all aspects of our operations (scope 1, 2 and 3). Business carbon emissions have been quantified and a business carbon emissions inventory is reported. Significant emission sources are identified and highlighted. Our carbon footprint for the 2022/23 financial year has been calculated following the World Resources Institute GHG Protocol - A Corporate Accounting and Reporting Standard, Revised Edition (the GHG Protocol).

This assessment provides a comparison to the baseline inventory measured in the Financial Year (FY) 21/22 and enables a current footprint for the FY22/23 which carbon reduction achievements can be measured, monitored, and reported.

The quantification and analysis facilitate the setting of strategic targets for carbon reduction measures, including areas of 6 focus for carbon reduction efforts and facilitates monitoring of progress towards those targets.

The total GHG for Crown Oil Ltd from 1st of August 2022 to the 31st of July 2023 was 6,209 of carbon dioxide equivalent (tCO₂e) per year.

Quantification of GHG Emissions

We've taken the operational control approach, ensuring everything in our operational control is accounted for in our carbon footprint. To ensure the validation of the Carbon Neutral statement, the carbon inventory is available when requested and a detailed methodology is provided within the Appendix A: GHG Emissions Methodology and Assessment. This ensures our carbon neutral claim is truthful, accurate, clear and unambiguous; in line with the UK's Competition and Markets Authority (CMA) Green Claims Code.

Table 2: Emissions summary

Summary table			
GHG Emissions (tCO ₂ e per annum)			
Scope	Baseline year FY20/21	Baseline year FY21/22	Baseline year FY22/23
Scope 1 *From Biofuels	2,844 *n/a	284 *41	311 *46.4
Scope 2	201	120	63
Scope 3	5,888	5,118	5,835
Total	8,933	5,522	6,209
Percentage change in comparison to baseline	0.0	-38.2	-30.5

Table 3: Emissions summary per category

Scope	Category	FY20/21 tCO ₂ e p.a	FY21/22 tCO ₂ e p.a	FY22/23 tCO ₂ e p.a	% Change tCO ₂ e p.a
S1.1	Stationary combustion	24	36	4	82%
S1.2	Mobile combustion	2,812	307	306	89%
S1.3	Refrigerants	8	0	0	
S2.1	Purchased heat	21	0	0	
S2.2	Purchased electricity	179	120	63	65%
S3.1	Purchased goods & services	2,976	1,134	996	67%
S3.2	Capital goods	944	1,966	2,172	-130%
S3.3	Fuel and energy related activities not included in S1 or S2	946	68	104	89%
S3.4	Upstream transportation & distribution	921	664	992	-8%
S3.5	Waste generated in operations	35	19	10	70%
S3.6	Business travel	16	17	80	-414%
S3.7	Employee commuting (&remote working)	49	120	218	-345%
S3.8	Upstream leased assets	1	excluded	0	
S3.9	Downstream transportation & distribution	0	1,130	1,263	
Total		8,933.5	5,522.3	6,209.1	30%

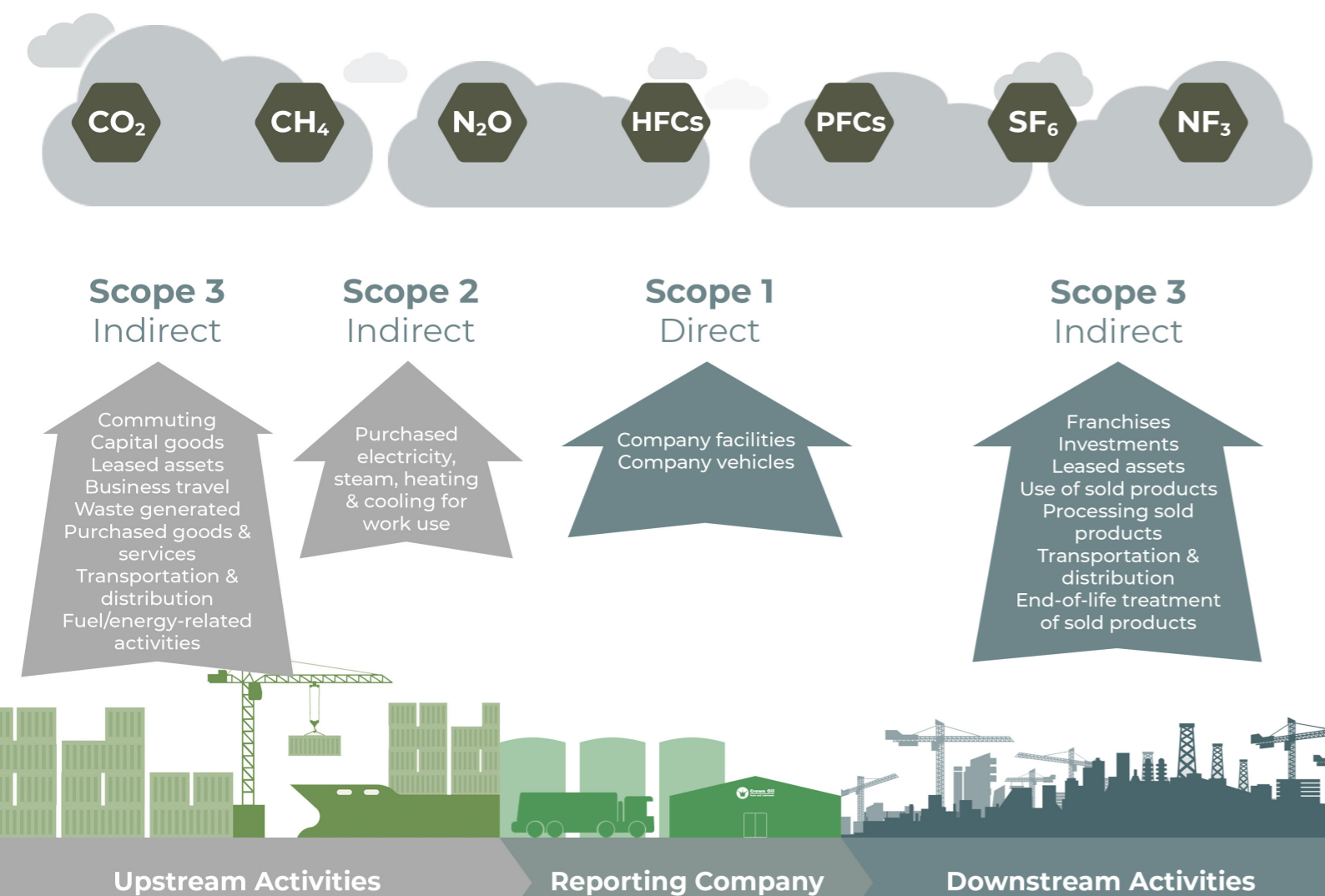
A business carbon assessment is based on data categorised into three scopes, as defined by The Greenhouse Protocol. For each year, the assessment provides detailed quantification of GHG emissions due to:

- **Scope 1:** Direct emissions such as those arising from business travel in company controlled or owned vehicles and fuel consumption by heating
- **Scope 2:** Indirect emissions from purchased electricity usage
- **Scope 3:** Other indirect emissions. This includes usage of water, business travelling, waste disposal, transportation and distribution, and the use of supplies such as food and drink

Appreciating the importance of determining major contributors to the emissions, we have included detailed analysis and discussion on different components in each scope to support us in our decision-making processes to reduce our carbon emissions.

The carbon emission calculations have been completed in line with ISO 14064-1. Following the GHG Protocol, all three scopes of emissions are reported in accordance with the published reporting standard for Carbon Reduction Plans and the Corporate Value Chain Standard. Figure 1 presents all the business activities to be quantified from a carbon assessment.

Fig 1: An overview of the GHG Protocol scopes and emissions across an entire value chain



Carbon emissions methodology

Carbon emissions context

Carbon dioxide (CO₂) and other greenhouse gasses (GHG) must be reduced to avoid the devastating impact from climate change. From local commitments (such as the Greater Manchester's commitment to zero carbon by 2038) to global commitments (such as the Paris Agreement), it's more important than ever for business to reduce their GHG emissions.

We are committed to making significant changes to our business in order to become more sustainable and reduce emissions. To do this, we:

- calculate our carbon footprint per year
- offset these emissions to become carbon neutral
- plan to reduce emissions in the future with aspirations to achieving Net Zero direct emissions

It's important to understand the phrases often used for sustainability and carbon reduction:

Carbon Neutral

Being carbon neutral is to balance carbon emissions with an equivalent amount sequestered or offset. Thus, it's often achieved by calculating the total amount of GHG emissions produced per year and this amount is offset through credits to make up the difference between its emissions and a zero-carbon baseline.

According to PAS 2060:2014, carbon neutral is:

“ *A condition in which during a specified period there has been no net increase in the global emission of greenhouse gases to the atmosphere as a result of the greenhouse gas emissions associated with the subject during the same period.* ”

Net Zero Carbon

Becoming Net Zero is the goal every company should aspire to. It refers to balancing the amount of emitted GHG emissions with the equivalent emissions through offsets or sequestration. However, this should primarily be achieved through a reduction in the amount of GHG emissions produced. Offsets are required when the GHG emissions cannot be reduced any further.

“ *Crown Oil Ltd is a carbon neutral company and aims to achieve Net Zero Scope 1 & 2 emissions by 2030.* ”

Business Activities

A business carbon assessment is based on data categorised into three scopes, as defined by The Greenhouse Protocol. For each year, the assessment provides detailed quantification of GHG emissions due to:

Scope 1: Direct emissions:

- Stationary combustion of fuels e.g. burning natural gas for heating
- Mobile combustion of fuels e.g. burning diesel in company owned vehicles
- F-gases emitted to the atmosphere e.g. refrigerant leaks from air conditioning

Scope 2: indirect emissions from using energy:

- The emissions produced from the generation of purchased electricity used

Scope 3: Other indirect emissions:

- This includes both upstream and downstream business activities from a total of 15 business categories. For example, usage of water, business travelling, waste disposal, transportation and distribution, and the use of supplies such as food and drink

Exclusions

In accordance with guidelines that ensures the carbon neutrality statement does not hide or omit important information, the business activities that are excluded from the business carbon footprint are:

- | | |
|---|---------------------------------|
| 3.8 – Upstream Leased Assets | 3.13 – Downstream Leased Assets |
| 3.10 – Processing of Sold Products | 3.14 – Franchises |
| 3.11 – Use of Sold Products | 3.15 – Investments |
| 3.12 – End of Life Treatment of Sold Products | |

The decision was made to omit some scope 3 emission activities to ensure the accuracy of the carbon assessment.

Further, the global carbon footprint must represent a relevant baseline to our current operation. This approach is in-line with draft guidance from the Science Based Targets institute (SBTi) for the oil & gas industry, which identifies the scope of emissions for downstream distribution companies such as Crown Oil.



Limitations

It's important to understand the limitations of the carbon assessment that are inherently created by the use of certain assumptions required to calculate the GHG emissions. These assumptions and limitations are inevitable and essential when suitable quantified data is unavailable. The limitations undertaken to complete this assessment are as follows.

Estimated Data Used from Assumptions in Place of Primary Data

In certain circumstances, the data required to calculate the GHG emissions was unavailable. For example, the amount of kerosene used at the Oil Centre for heating is unknown because we use our own kerosene supplies and do not record fillings. Therefore, it's estimated that an additional 1,000 litres of kerosene are used for stationary combustion.

The assumptions are noted within Appendix A: GHG Emissions Methodology and Assessment for each subcategory.

Spend Based Emission Calculations

Primary data that accurately measures the amount (in terms of weights and volumes) of business activities conducted was used where available. However, for the purchased goods and services and capitals costs, the data available was in costs instead of amounts. This means the spend based methodology was used, reducing the accuracy of the emission calculations.

For example, for office supplies, the amount of money spent on paper was used to calculate the emissions instead of amount of paper purchased. It is beneficial that emissions from the top 20% of suppliers for purchased goods and services are based on quantity of goods/services in place of spend; however, the current approach is appropriate for the large scale of accounts in place.

Emissions Based on Average Emission Factors

Currently, the emission factors used are best available from DEFRA 2022. For certain business activities, emission factors can vary significantly based on suppliers. For example, stainless steel from a supplier in China could be significantly worse than that from a supplier in Europe depending on multiple factors. Therefore, it is beneficial to begin working with the top 20% of suppliers used to collect accurate emission factors to improve accuracy and reduce emissions from collaboration on joint initiatives.



Crown Oil's Carbon Footprint

GHG Emissions Summary

In the financial year 2022/23, we have reduced our GHG emissions by 2,724 tCO₂e per annum (p.a.) in comparison to the 2020/21 baseline.

However, in comparison to the previous year (FY21/22) the carbon footprint has increased by 687 tCO₂e per year. For the 12-month period from 1st of August 2022 to the 31st of July 2023, our carbon footprint was calculated to be 6,209 tCO₂e per year. Table 3 provides a summary of the carbon footprint in the financial year 2022/23 in comparison to the baseline 2020/21 and 2021/22.

It's important to set an emissions scope boundary in accordance with the operational control approach previously stated.

Table 4: A summary of our GHG emissions per financial year

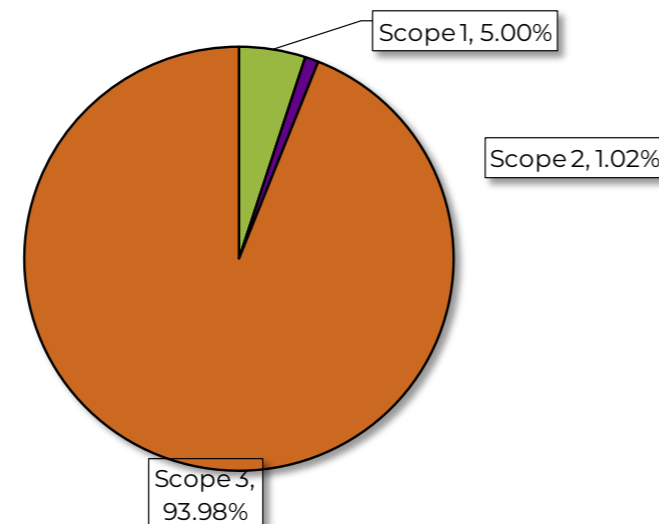
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Total	8,933	5,522	6,209
% change in comparison to baseline	0.0%	-38.2%	-30.5%

Figure 2 shows the 6,186 tCO₂e p.a. as percentage contributions per scope as defined by the GHG Protocol. It shows that we produce GHG emissions directly in our boundary as Scope 1, direct emissions, constitute 5.0% of the carbon footprint at 311 tCO₂e per annum.

Scope 2, indirect emissions from purchased electricity, constitutes another proportion of our emissions, making up 63 tCO₂e per annum.

Finally, Scope 3 contributes the largest proportion of emissions, totalling 94.0% of the total footprint, showing the majority of our GHG total is from indirect emissions caused as consequences of their activities.

Fig 2: Distribution of CO₂ emissions for the FY 2022/23

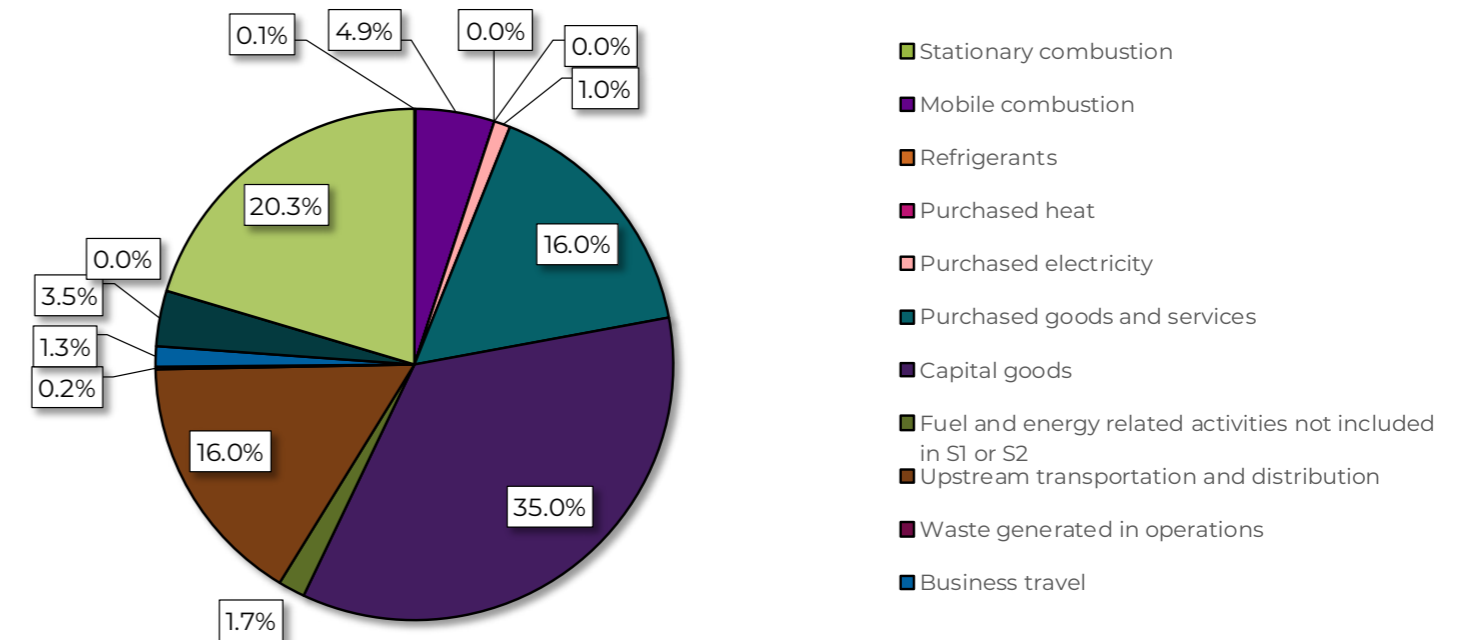


Granularity of GHG emissions

To provide greater granularity and detail of our GHG emission sources and to allow for the development of a carbon reduction plan, the distribution of GHG emissions from the emission sources of business activities are presented. Firstly, the total emissions per business activity are analysed, followed by further detail.

The below figure provides a detailed breakdown of the emissions from our business activities. The emissions are divided between many activities found in all three scopes. Here, scope 1 includes stationary and mobile combustion, electricity is the only source from scope 2, and the remaining are scope 3 emissions.

Fig 2: CO₂ emissions in tCO₂e p.a by percentage contribution per business activity



Scope 1

The direct GHG emissions we produce and release include three major subcategories within Scope 1.

The first is stationary combustion of fuels within Crown Oil facilities, for example burning natural gas in boilers to provide heating. We contribute to just 4.42 tCO₂e p.a. from stationary combustion. This is a significant reduction of 88% in comparison to the previous reporting period. The reduction is due the Bridge House transitioning from natural gas combustion in a boiler to heating provided by burning biomass wood chips.

The largest proportion of emissions from stationary combustion is from the use of kerosene for heating at the Oil Centre. Kerosene is used for heating and the jet wash, contributing to 3.67 tCO₂e in the FY21/22.

Mobile combustion from company-owned (or leased) vehicles is the subcategory that contributed to the largest amount of GHG emissions in scope 1.

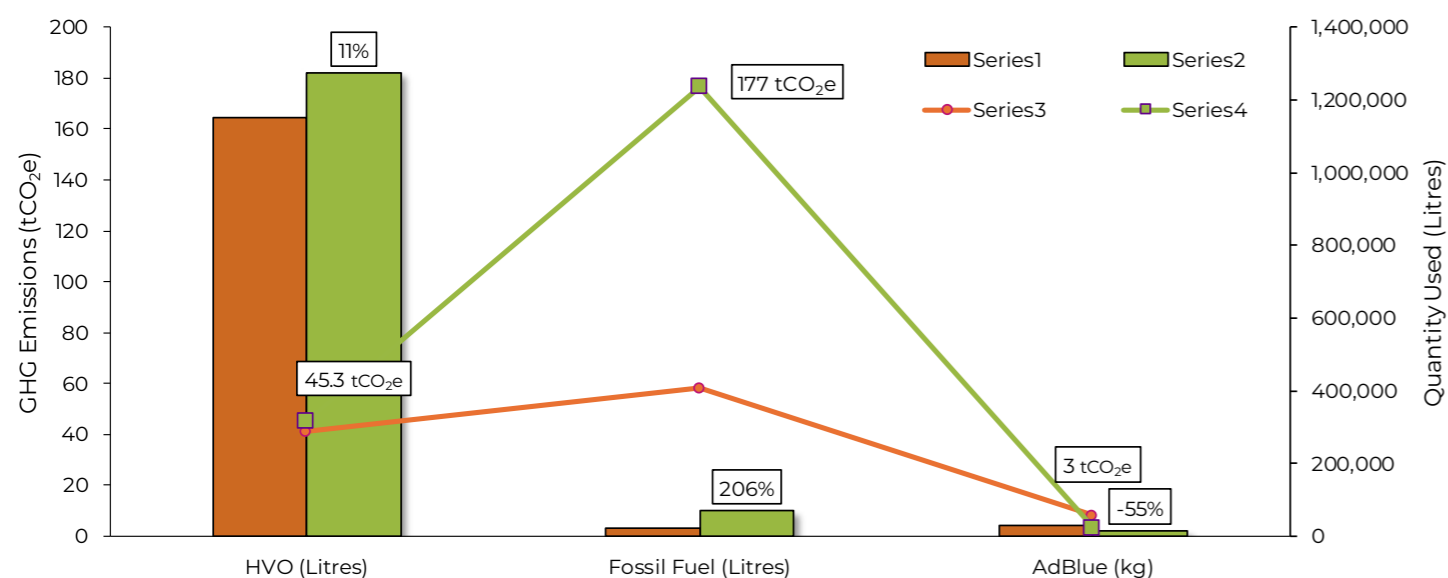
This is due to our large fleet of vehicles used to transport and distribute oil-based products across the UK. The entire transport fleet includes cars, vans and trucks, for which, Crown Oil Ltd use either Hydrotreated Vegetable Oil (HVO) or diesel.

Crown Oil's trucks contribute to 73.6% (225 tCO₂e out of 306 tCO₂e) of the emissions released from mobile combustion.

In comparison to the FY21/22, the emissions from mobile combustion have increased by 58.4 tCO₂e. As can be seen in Figure 3, this is directly because of an increase in usage of the trucks.

An 11% increase in HVO has caused emissions to increase by 4.3 tCO₂e reaching 45 tCO₂e and an increase of 206% in diesel usage has increased emissions by 119 tCO₂e reaching 177 tCO₂e.

Fig 3: A direct comparison of the CO₂ emissions and amount of fuel used



The final subcategory within Scope 1 emissions is fugitive emissions from refrigeration gases from air conditioning and heat pumps within Crown Oil facilities. These refrigerants are GHG's themselves with the global warming potential (GWP) calculated based on its impact by comparison to carbon dioxide.

For example, R134a (one of the most common refrigerants used) has a GWP of 1430 kgCO₂e. Every 1 kg of R134a leaked into the atmosphere is equivalent to 1 kg of carbon dioxide. In the reporting year 2022/23, we reported no refrigerant leaks or air conditioning top up.

Therefore, we produced zero emissions from fugitive emissions. However, it is noted that it is very important for us to record any known leaks and the number of refrigerant gases that are used to top up the systems during maintenance each year.

Scope 2

Scope 2 emissions are caused by the indirect release of GHG emissions that are released to the atmosphere from the generation of electricity and purchased heat, steam, and cooling.

Our Scope 2 emissions make up 1.02% of overall GHG emissions: with all the emissions coming from purchased electricity; 63 tCO₂e per year.

Overall, this is a significant 47% reduction in comparison to the 120 tCO₂e released from purchased electricity in 2021/22. In the reporting year, Crown Oil used 612,765 kWh, therefore, the reduction in usage (16.3% to 520,113kWh) has contributed to this reduction in emissions.

Additionally, implementing a change to Ofgem certified eco tariff's with REGO certifications has further reduced the market based GHG emissions reported here.

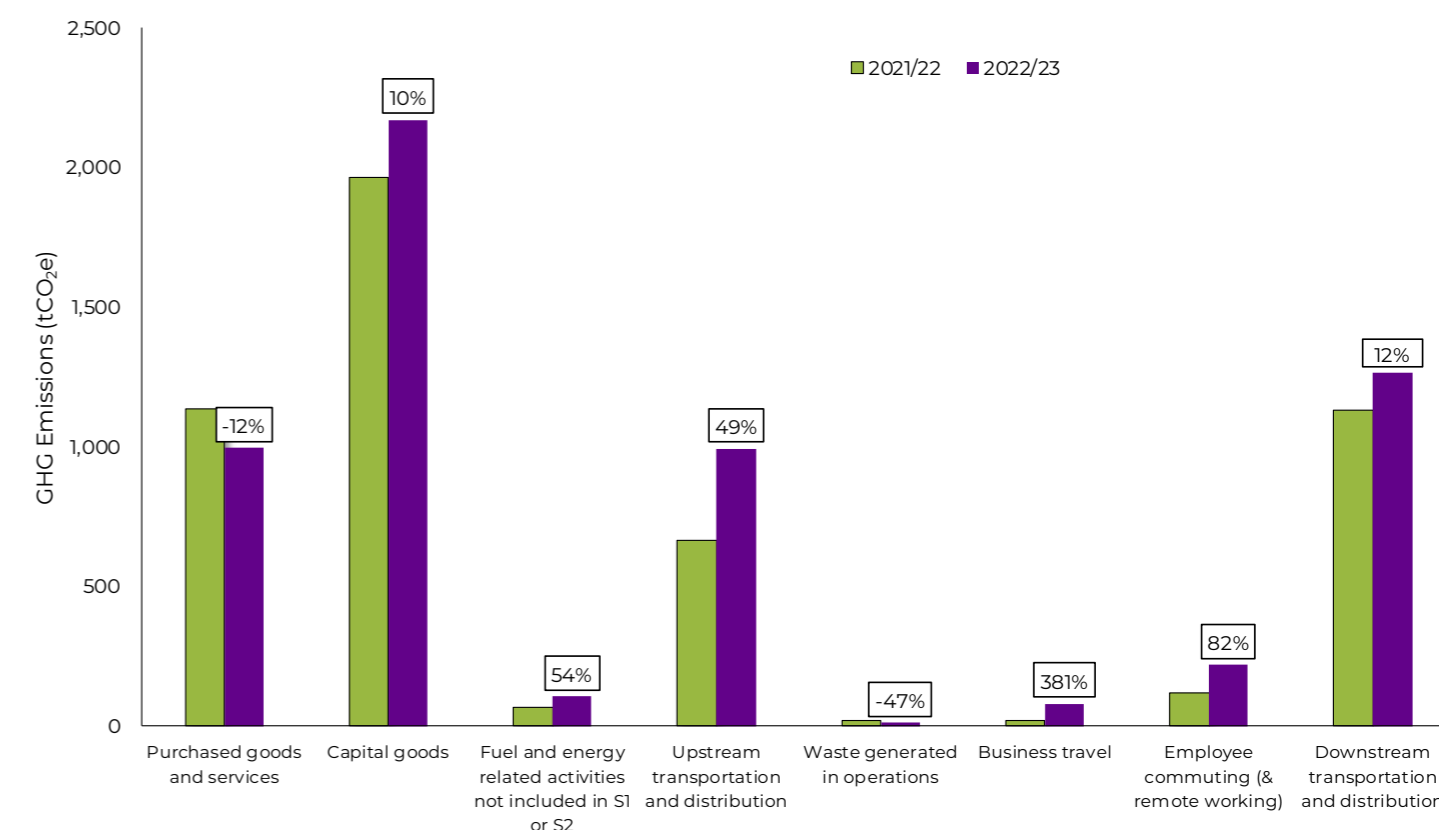
Scope 3

The GHG emissions that we produce indirectly (excluding Scope 2) are our Scope 3 emissions. This includes all business activities from both upstream and downstream business activities as per the fifteen subcategories given by the GHG protocol.

In total, Scope 3 emissions are responsible for 93.8% (5,812 tCO₂e p.a.) of our carbon footprint, with a significant proportion being from capital goods and purchased goods and services; 3,168 tCO₂e per year.

A breakdown of the eight (seven excluded categories) applicable subcategories within scope 3 counted in our carbon footprint is shown in figure 4.

Fig 4: A breakdown of our Scope 3 emissions



Out of Scopes

We understand the impact the products we sell have on the environment. Thus, the impact that the lifecycle of our products have on global warming is still measured and actively reduced via increased marketing of biofuels.

In the financial year 2022/23, the use of products sold released 1,305,073 tCO₂e, while the processing of the sold products from well-to-tank (WTT) released 322,801 tCO₂e.

For transparency in carbon footprint reporting, it's important to understand that if the life cycle phases of the sold products were to be included then this would make up 99.6% of our reporting year's footprint.

In comparison to the previous year, we have reduced emissions from the life cycle phases of the sold products by 79,637 tCO₂e.

Additionally, the biogenic release of carbon dioxide from the use of biofuels is reported in our Out of Scopes. This is because the Scope 1 emission factor contains a zero value for carbon dioxide emissions to account for the carbon dioxide absorbed by the bioenergy sources.

The conversion factor used to calculate the CO₂e from the use of biofuels contains value for nitrous oxide and methane only. However, carbon dioxide is still released by biofuels such as HVO. Therefore, these emissions are reported as outside of scopes and are not included in our total carbon footprint.

Altogether, the use of HVO produces 3,185 tCO₂ per annum of biogenic emissions.

Uncertainty

Data confidence reported reflects the Accuracy and Reliability of data that has been used when calculating and reporting emissions in tCO₂e. Therefore, the uncertainty in these results is considered using the following bands shown in table 5 & 6.

Given the uncertainty bands provided for each GHG emission source, an overall material uncertainty of 5% were estimated for our carbon footprint for the reporting period of 1st August 2022 to 31st July 2023. This has been reduced from 10% in the

Table 5: Reliability band definitions

Reliability Band	Definition
A	Data obtained from a calibrated instrument. Full data set obtained for the period e.g. kWh from an electricity meter for a full year
B	As A but with minor shortcomings. Minor shortcomings might include a small number of outliers in the data set, small data gaps e.g., during a power outage or during the calibration of a meter
C	Data extrapolated from a partial set of A or B reliability band data. e.g. electricity available for 11 months extrapolated to a full year
D	Estimated data derived from an alternative method e.g., electricity usage per m ₂

Table 6: Accuracy band definitions

Accuracy Band	Definition of accuracy, measured to within
1	1% - e.g. laboratory instrumentation accuracy
2	5% - e.g. electricity meters
3	10% - e.g. Averaged between two electricity meters
4	25% - e.g. Extrapolated data where 75% of data is accurately obtained
5	50% - e.g. Extrapolated data where 50% of the data is accurately obtained
6	50 to 100% data is estimated from an alternative data source e.g. kWh of electricity derived from m ₂ of building area
X	Data accuracy cannot be determined – e.g. qualitative or anecdotal

The Accuracy and Reliability that describe the data confidence is reported alphanumerically by estimating each using the above guide. Qualitative data confidence is then reported with the Reliability Band and A, B, C or D where A is the most reliable data, and the Accuracy Band 1 to 6, where 1 is the highest accuracy and 6 the lowest. Thus, data reported as A1 is the has the least uncertainty.



For this assessment the following assignments and justifications were made:

Scope	Category	Uncertainty	Justification
S1.1	Stationary combustion	B2	Majority of the data is reliable accurate data, except the amount of kerosene used at the oil centre that is estimated.
S1.2	Mobile combustion	A2	Accurately measured data from the use of petrol pumps.
S1.3	Refrigerants	C2	The data is from service providers maintaining air conditioning units and is therefore trusted that the units have not been topped up.
S2.2	Purchased electricity	B2	Amount of electricity purchased accurately known from invoices and tariff data provided by suppliers.
S3.1	Purchased goods & services	B2	Amount spent on purchased goods and services known from invoices being stored by accounts.
S3.2	Capital goods	B2	Amount spent on capital goods and services known from invoices being stored by accounts.
S3.3	Fuel and energy related activities not included in S1 or S2	A2	See S1.1, S1.2 and S2.2.
S3.4	Upstream transportation & distribution	B3	Data is reliable with medium accuracy as the locations are known but distance calculated to the locations.
S3.5	Waste generated in operations	B3	Waste suppliers provide the data reliably but with less accuracy as the size of the containers or number of skips are provided and used to calculate mass of waste.
S3.6	Business travel	C3	Employees record mileage and expenses from business travel.
S3.7	Employee commuting (& remote working)	C3	High proportion of employees completed a survey to collect data.
S3.9	Downstream transportation and distribution	D5	Estimated data calculated based on the amount of invoices and the average fuel used by Crown Oil Ltd's deliveries.

Comparison to the Baseline Footprint

The financial year 2022/23 is Crown Oil Ltd's third business carbon assessment. The first was completed for the 12-month period from 1st August 2020 to the 31st July 2021, providing a baseline value of 8,933 tCO₂e per year.

The baseline assessment has established the environmental impact from carbon emissions of Crown Oil Ltd, enabling the identification of carbon hotspots. The baseline enables performance monitoring to assess Crown Oil Ltd's environmental responsibility. Altogether the baseline:

- Creates a reference level against which future performance can be compared with respect to the desired outcome
- Assists with finding carbon emissions hotspots, on which to focus efforts to reduce emissions
- Transparently states any assumptions used to fill data gaps and the limitations this may have on the relevance of the baseline
- Follows the principles of GHG emissions quantification to be followed during this carbon assessment (FY 2022/23) and future assessments
- Follows a process of continual improvement to ensure future baselines reflect current good practices in GHG emissions quantification

A breakdown of GHG emissions in the baseline FY 2020/21 is compared to the current assessment (FY 2022/23) in Table 5.

It is clear to see that we are actively reducing our emissions as our total carbon footprint has decreased by 30.5% in one year since the baseline was completed.

Table 5 shows a significant reduction in S1.2 Mobile Combustion, S3.1 Purchased Goods and Services, and S3.3 Fuel and Energy Related Activities (not included in S1 and S2). Further information regarding the changes in each subcategory for the FY 2021/22 in comparison to the baseline is reviewed within the detailed results, presented in Appendix A: GHG Emissions Methodology and Assessment.

Plus, we have significantly reduced GHG emissions from mobile combustion by 89.1% in comparison to the FY20/21 baseline.

This has been due to a significant decrease in the amount of diesel used due to replacement with Hydrotreated Vegetable Oil (HVO).



What is HVO?

HVO is a second-generation biofuel which is a direct substitute for diesel, with a significantly lower emission factor, and therefore enables lower carbon emissions (Table 3). HVO is derived from waste oils and crops to produce vegetable oil which is then hydrotreated to make biodiesel. Table 2 shows the emission factor for HVO as provided by both DEFRA and our current HVO supplier.

Emission factors for fuels have two key components. The emission factor at end use from combusting the fuel (scope 1) and emission factor for 'well-to-tank' so called as it accounts for the additional emissions to extract, process and transport fuels to the end-user (scope 3). The supplier calculates the emission factor for end use of HVO based on real data and calculations that follow mass balance equations.

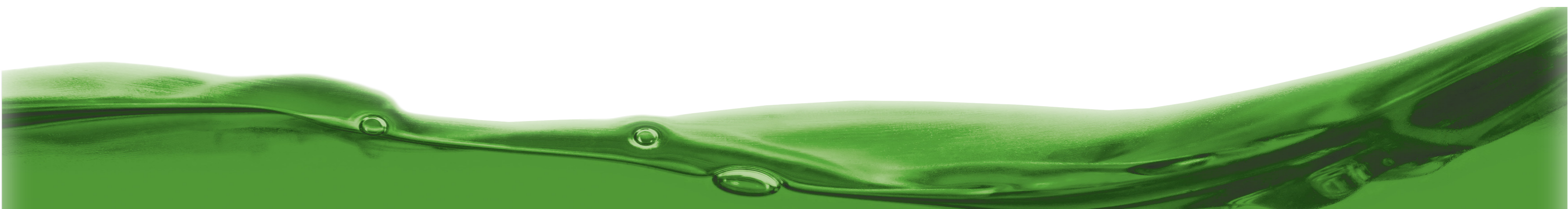
 <p>Clean Zero FAME, sulphur and fossil content. Free from aromatics and metals.</p>	 <p>Compatible Drop-in alternative to diesel compatible with existing infrastructure</p>	 <p>Sustainable Improve your green credentials - HVO reduces net CO₂ emissions by ca. 90%</p>
 <p>Lifespan Extended 10-year storage lifespan with a reduced need for regular testing</p>	 <p>Approved It's a tried and tested product endorsed by a wide range of OEMs</p>	 <p>Performance Unlock year-round performance in all seasons, even in low temperatures</p>

Table 4: Emission factors for fuels used for mobile combustion as provided by DEFRA and supplier data

Fuel	Use of fuel kgCO ₂ e/litre	Well to tank kgCO ₂ e/litre	Total kgCO ₂ e/litre
Diesel	2.55784	0.60986	3.16770
HVO (Supplier Data)	0	0.000348	0.000348
HVO (DEFRA 2022)	0.03558	0.35178	0.38736
HVO (used in calculations)	0.03558	0.000348	0.035928

Table 5: Crown Oil Ltd's GHG emissions breakdown in FY20/21 and FY22/23.

Scope	Category	FY20/21 tCO ₂ e p.a	FY22/23 tCO ₂ e p.a	% Change tCO ₂ e p.a
S1.1	Stationary combustion	24	4	-82
S1.2	Mobile combustion	2,812	306	-89
S1.3	Refrigerants	8	0	-100.00
S2.1	Purchased heat	21	0	-100.00
S2.2	Purchased electricity	179	63	-65
S3.1	Purchased goods & services	2,976	996	-67
S3.2	Capital goods	944	2,172	-130
S3.3	Fuel and energy related activities not included in S1 or S2	946	104	-89
S3.4	Upstream transportation and distribution	921	992	8
S3.5	Waste generated in operations	35	10	-70
S3.6	Business travel	16	80	414
S3.7	Employee commuting (& remote working)	49	218	345
S3.8	Upstream leased assets	1	excluded	N/A
S3.9	Downstream transportation and distribution	excluded	1,263	N/A
S3.10	Processing of sold products	excluded	excluded	N/A
S3.11	Use of sold products	excluded	excluded	N/A
S3.12	End of life treatment of sold products	excluded	excluded	N/A
S3.13	Downstream leased assets	0	excluded	N/A
S3.14	Franchises	excluded	excluded	N/A
S3.15	Investments	excluded	excluded	N/A
Total		8,933.5	6,209	-31



Specific projects to achieve these goals include:

- Switching all fleet fuel from diesel to renewable HVO fuel
- Switching van and car fleet vehicles to electric
- Using heat recovery ventilation systems
- Installing onsite Solar PV
- Improving heating controls
- Switching from oil to electric heating
- Switching yard equipment (such as forklifts) to electric
- Installing additional insulation and draught proofing
- Upgrades to fuel pump motors
- Replacement of lighting with LED lights
- Installation of automatic lighting controls

While these projects are very important in terms of energy saving and reducing scope 1 and 2 emissions, the Baseline report has shown that these projects would reduce GHG emissions by just 29.4%.

Therefore, it is recommended that we develop a scope 3 reduction program by collecting scope 3 data in more detail. Currently, the spend-based method is used to calculate GHG emissions from purchased goods and services and capital goods.

Although this method is considered appropriate for this carbon assessment, it does not provide the granularity required to develop a targeted carbon reduction plan for scope 3 emissions.

A more targeted reduction plan can be developed once primary data for scope 3 business activities (such as waste disposal, business travel and material usage) are obtained.

The following opportunities could further significantly reduce emissions in the future...

Alternative Heating

The use of kerosene for heating should be replaced to ensure stationary combustion is reduced as much as feasibly possible. Various types of electric heating solutions exist. Heat pumps, for instance, are a popular choice due to their impressive efficiency. They are typically three to four times more efficient than conventional gas heating systems. Infrared heaters, particularly those using Far Infrared (FIR) technology, are another viable option. Far Infrared heaters emit infrared light, a form of light that is not visible to humans but is felt as heat. These heaters directly heat the occupants and objects in a room rather than the air, ensuring that less heat is lost through ventilation. Storage heaters are another consideration. These heaters use electricity to store heat during off-peak times when electricity is cheaper and then release the stored heat gradually throughout the day.

This type of heater can be an efficient and cost-effective solution, especially when used in conjunction with a time-of-use electricity tariff. Lastly, there are panel heaters, which provide rapid, top-up heating to specific areas. These are best used for short periods when an immediate heat increase is required, as they can be less energy-efficient for prolonged use. Alternatively, switching to a renewable gas provider is another option.

2023/24

Use renewable energy

Calculations have shown that if Crown Oil ensured 100% of their electricity use was from renewable sources (self-generated or REGO certified), then the market based calculations would see a reduction of 63 tCO₂e per year in comparison to the current carbon footprint.

2025/26

Ensure 100% of waste avoids landfill

In total, 10 tCO₂e can be reduced by replacing landfill with alternative disposal methods. These calculations were conducted using the amount of waste sent to landfill in the current reporting year and comparing the current emissions to those if that waste was sent for combustion.

2024/25

Replace kerosene heater with electric alternative/renewable gas

Additionally, continue to reduce mobile combustion from the use of HVO and electric vehicles. Push drivers to refuel at our depot using HVO more often using gamification and incentives.

Calculations have been conducted by using the current reporting footprint and removing the emissions from the kerosene heater. Plus, a large percentage of the mobile combustion emissions have been removed by estimating the amount of diesel and petrol that can be removed. This has shown a reduction in emissions of 306 tCO₂e.

2026/27

Work with suppliers to transition away from average spend-based emission factors

Collect suppliers' carbon footprint to calculate accurate spend-based emission factor for each supplier. Then work with suppliers to understand their goals enabling an accurate forecast in reducing Scope 3 emissions.

The method to calculate the reduction in Scope 3 emissions from our supply chain is based on a set of strategic assumptions regarding supplier engagement in emission reduction efforts. The process begins with an initial assumption, whereby it's assumed that a specific number of suppliers will commit to calculating their own GHG emissions and actively participate in emission reduction initiatives. Then it's presumed the suppliers shall achieve a 50% reduction in emissions. This reduction percentage is measured against the average emissions factor associated with monetary expenditure within their specific sector, as currently reported in this period. From 2027, those emissions reduced shall continue to increase due to an assumed progressive increase in supplier engagement.

The calculation model incorporates a progressive annual increase in the number of suppliers who successfully reduce their emissions by the stipulated 50%. This approach effectively quantifies the anticipated reductions in Scope 3 emissions by modelling future supplier participation in emission reduction plans and their expected achievement in halving emissions relative to the sector's current average spend-based emission factor. This forward-looking calculation aims to project the potential environmental benefits of sustained and expanding supplier engagement in GHG reduction efforts over time.



Carbon offsetting

For the purposes of achieving “Carbon Neutral” to PAS 2060 in the financial year 2021/22, the following verified offsets were purchased.

Please note, as of Revision D of the report, Crown Oil requires to offset a further 458 tCO₂e on top of the already purchased 5,751 tCO₂e offsets evidenced below.

Date: 2024-01-24
Serial number: 243-1236-165

Order confirmation

Emissions addressed: **5,377 t of CO₂e**

On behalf of **Crown Oil**
Crown Oil, The Oil Centre, Heap Bridge, , BURY, GB

Project information
Landfill Gas Extraction and Electricity Generation, Türkiye

Order name: Crown Oil Group
Description: Scope 3

Status: Reserved, pending payment

Gold Standard

Date: 2024-01-24
Serial number: 243-1236-163

Order confirmation

Emissions addressed: **63.00 t of CO₂e**

On behalf of **Crown Oil**
Crown Oil, The Oil Centre, Heap Bridge, , BURY, GB

Project information
Tambopata-Bahuaja Biodiversity Reserve , Peru

Order name: Crown Oil Group
Description: Scope 2

Status: Reserved, pending payment



Date: 2024-01-24
Serial number: 243-1236-164

Order confirmation

Emissions addressed: **311.00 t of CO₂e**

On behalf of **Crown Oil**
Crown Oil, The Oil Centre, Heap Bridge, , BURY, GB

Project information
Nii Kaniti: Forest Management with Indigenous Communities of Ucayali Region, Peru

Order name: Crown Oil Group
Description: Scope 1

Status: Reserved, pending payment



Date: 2024-02-22
Serial number: 243-1462-105

Order confirmation

Emissions addressed: **458.00 t of CO₂e**

On behalf of **Crown Oil**
Crown Oil, The Oil Centre, Heap Bridge, , BURY, GB

Project information
Landfill Gas Extraction and Electricity Generation, Türkiye

Order name: Crown Oil Group
Description: Scope 3

Status: Reserved, pending payment

Gold Standard

Appendix A

GHG Emissions Methodology and Assessment

To ensure full transparency, the full methodology and assessment is presented in this section as a summary for each subcategory. To begin, an inventory scope was completed to ensure all sub-categories have been considered with justification when deemed “out of scope”.

Table A1: The inventory scope for Crown Oil Ltd's carbon assessment in the FY21/22

Category	In scope?	Justification if out of scope
S1.1: Stationary combustion	In	
S1.2: Mobile combustion	In	
S2.1: Refrigerants	In	
S2.2: Purchased electricity	In	
S3.1: Purchased goods & services	In	
S3.2: Capital goods	In	
S3.3: Fuel & energy related activities not included in S1 & S2	In	
S3.4: Upstream transportation & distribution	In	
S3.5: Waste generated in operations	In	
S3.6: Business travel	In	
S3.7: Employee commuting (& remote working)	In	
S3.8: Upstream leased assets	Out	Buildings leased by Crown Oil included in scope 1 and scope 2 categories
S3.9: Downstream transportation & distribution	In	
S3.10: Processing of sold products	Out	Little to no downstream processing of sold products, no control
S3.11: Use of sold products	Out	Minimal stake compared to product value (<5%), and limited control
S3.12: End of life treatment of sold products	Out	As per 3-11
S3.13: Downstream leased assets	Out	Crown Oil lease tanks to customers with limited control
S3.14: Franchises	Out	No franchises in the business
S3.15: Investments	Out	No significant active revenue investments

GHG Emissions Methodology and Assessment

To encourage completeness, consistency, and readability ISO 14064-1 recommends that the GHG quantification should be reported using the full descriptive categories provided. Therefore, this is fully displayed and categorised in Table A2. Furthermore, the relevant direct (Scope 1) emissions are further detailed into their specific GHG contributions within Table A3.

Table A2: Complete ISO 14064-1 data categorisation table

Category	Description	Emissions (tCO ₂ e)
1	Direct GHG emissions & removals in tCO₂e	311
1.1	Direct emissions from stationary combustion	4
1.2	Direct emissions from mobile combustion	306
1.3	Direct process emissions and removals arising from industrial processes	-
1.4	Direct fugitive emissions arising from release of GHGs in anthropogenic systems	-
1.5	Direct emissions and removals from land use, land use change, and forestry	-
2	Indirect emissions in tCO₂e	63
2.1	Indirect emissions from imported electricity	63
2.2	Indirect emissions from imported energy	
3	Indirect GHG emissions from transportation	2,553
3.1	Emissions from upstream transportation and distribution	992
3.2	Emissions from downstream transportation and distribution	1,263
3.3	Emissions from employee commuting & teleworking	218
3.4	Emissions from client and visitor transport	-
3.5	Emissions from business travel	80
4	Indirect GHG emissions from products used by the organisation	3,178
4.1	Emissions from purchased goods	996
4.2	Emissions from capital goods	2,172
4.3	Emissions from the disposal of solid and liquid waste	10
4.4	Emissions from the use of assets	-
4.5	Emissions from the use of services that are not described in the above subcategories	-
5	Indirect GHG emissions associated with the use of products from Crown Oil	0
5.1	Emissions or removals from the use stage of the product	-
5.2	Emissions from downstream leased assets	-
5.3	Emissions from end-of-life stage of product	-
5.4	Emissions from investments	-
6	Indirect GHG emissions from other sources not specified	104

Table A3: ISO14064-1 data categorisation showing relevant direct (Scope 1) emissions detailed into their specific GHG contributions

Category	Description	Emissions (tCO ₂ e)	CO ₂ (tCO ₂ e)	CH ₄ (tCO ₂ e)	N ₂ O (tCO ₂ e)
1	Direct GHG emissions & removals in tCO₂e	311	306	0	4
1.1	Stationary combustion	4	4	0	0
1.2	Mobile combustion	306	302	0	4

