

Carbon Reduction Plan 2024

Modulek CRP

Modulek House, Dorset, BH31 6AZ



Prepared for:

May 2025

Modulek Ltd



DE_23377	Draft Issue	First Issue	Second issue	Third issue
Date	20 th May 2025	29 th May 2025		
Produced by	BW	BW		
Checked by	IWP	IWP		
Approved By		ADC		
Applicable regulations				
Revision Notes		Formal release, added logo		

Disclaimer

This report is provided for the sole purpose of providing information for Modulek Ltd It is confidential to Darren Evans Ltd and Modulek Ltd.. Darren Evans Ltd accept responsibility that the report has been prepared with skill, care, and diligence. No responsibility is accepted whatsoever for any other parties. Any such parties rely upon the report at their own risk. Neither the whole nor any part of the report nor reference to it may be included in any published document, circulation, or statement without Darren Evans Ltd and Modulek Ltd prior written approval of the form and content in which it may appear. This report has been created to demonstrate compliance in relation to energy and sustainability policy and regulations only. The impacts of these recommendations on other elements of the project/ building regulations will need to be checked and confirmed by suitably qualified professionals.

Executive Summary

Darren Evans Ltd. has been commissioned to carry out a Carbon Reduction Plan for Modulek Ltd. The Modulek CRP, has been declared in line with the UK government's procurement policy PPN 06/21, which includes all the organisation's GHG Protocol scope 1 and 2 emissions, and a subset of scope 3 emissions.

Below are two figures depicting the company's current 2024 base year emissions, and the plan for reduction over time. The 2024 baseline emissions of **77.78 tCO₂e** will be reported upon annually to track progress against the 2050 Net Zero Goal.

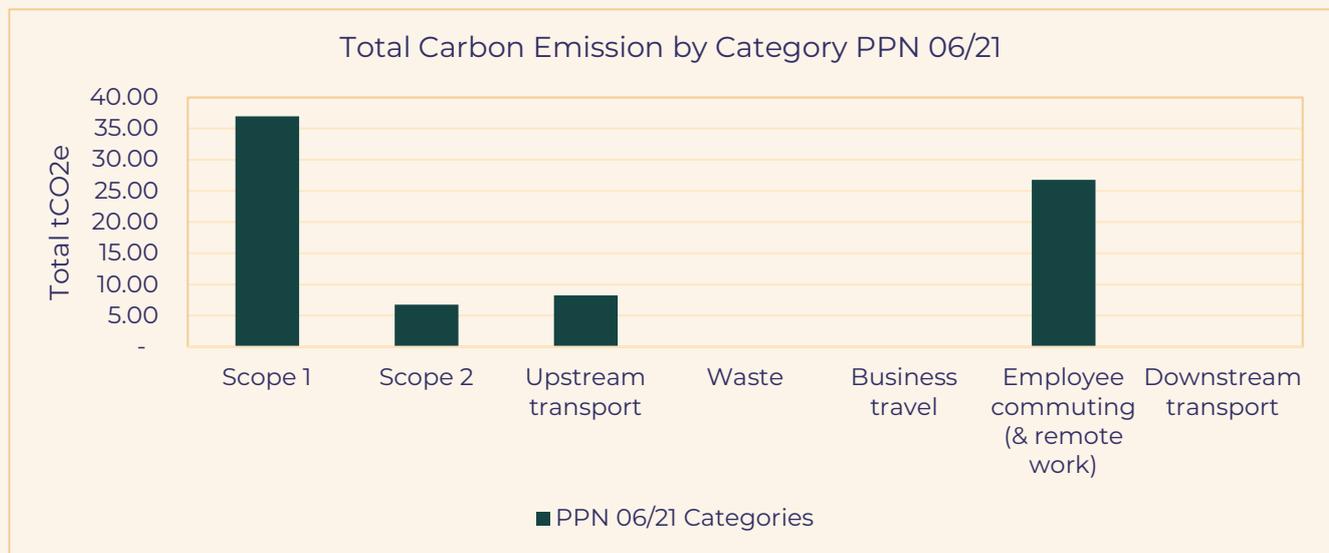


Figure 1: Total Carbon Emission by Category PPN 06/21

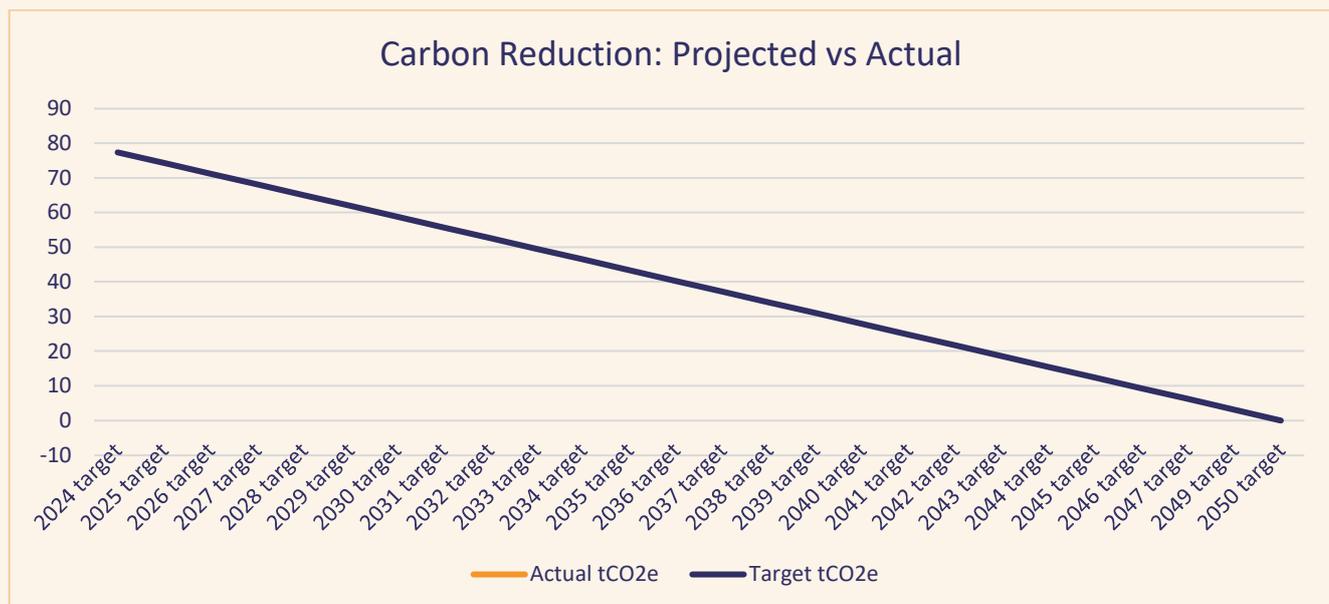


Figure 2: Carbon Reduction Target

Table of Contents

1. Introduction	6
1.1 Methodology.....	6
2. Scope 1 Emissions.....	7
2.1 Scope 1	7
3. Scope 2 Emissions.....	8
3.1 Scope 2	8
4. Scope 3 Emissions.....	9
4.1 Purchased goods and services	9
4.2 Capital goods.....	9
4.3 Fuel and energy not in scope 1 & 2.....	9
4.4 Upstream transport and distribution	9
4.5 Waste generated in operations.....	10
4.6 Business travel.....	10
4.7 Employee commuting	10
4.8 Upstream leased assets.....	11
4.9 Downstream transport and distribution.....	11
4.10 Processing of sold products	11
4.11 Use of sold products	11
4.12 End-of-life treatment of sold products.....	12
4.13 Downstream leased assets.....	12
4.14 Franchises.....	12
4.15 Investment.....	12
5. Results.....	13
5.1 Data Analysis	13
5.2 PPN 06/21	14

6. Future Recommendations.....	17
6.1 Short term 1-3 years.....	17
6.2 Medium term 4-7 years.....	17
6.3 Long term 7-25 years.....	18

1. Introduction

Darren Evans Ltd. has been commissioned to carry out a Carbon Reduction Plan for Modulek Ltd. The assessment was carried out in line with the Greenhouse Gas (GHG) Protocol, under the operational control model. This plan was created with specific reference to the UK Government's subset of declared categories in line with Procurement Policy Note (PPN) 06/21. The goal of this report is to establish a base reporting year, set goals for carbon reduction to achieve net zero carbon emissions by 2050, and provide reasonable and pragmatic guidance on how to achieve this goal.

This document outlines the scale of the challenge and provides advice on steps to achieve Net Zero as quickly as economically feasible, with short, medium, and long-term improvements outlined. This report will be updated and maintained to account for the annual changes in business model, processes, and turnover. This ongoing reporting shall help to ensure progress toward Net Zero.

Modulek Ltd acts as a design and facilitation company. Their operations are contained to their head office, and some worker welfare units placed on build sites while their modules are installed, assembled and completed. Other activities are accounted for in purchased and sold goods as further detailed in this report.

The Baseline reporting year is the emissions produced during the calendar year 2024 (Jan-Dec)

1.1 Methodology

There are two main prevailing industry standards covering GHG reporting methodology in the world, the BS EN ISO 14060 family (notably 14064) and the GHG Protocol. The GHG Protocol is the basis for the UK reporting and therefore the methodology used in this study. These standards, while slightly different, are to be viewed as complimentary in nature. Much of our reporting will use the GHG Protocol standard language categorising the emissions into "scopes", but the ISO 14064 family guidelines have also been followed.

Given the nature of the business, its legal standalone nature, and single office location (incorporating design and warehousing) make direct operational control boundaries ideal for the organisation. The following categorisation of emissions have been outlined with that in mind.

There are many types of greenhouse gases, and this report expresses their effect cumulative effect using tonnes of carbon dioxide equivalent in tCO₂e, or kgCO₂e when smaller numbers are reported, which represents the equivalent emissions of one metric tonne of carbon dioxide released into the atmosphere. Over the next 25 years, this number shall be reduced to zero net emissions. Reporting in CO₂e accounts for all the key GHG sources in one measurable variable.

The UK Government has published, and continues to publish annually, aggregate carbon factors for business reporting. These factors are published under the UK DESNZ department in collaboration with DEFRA.

The calculations reported in this carbon reduction plan have assumed all combustion machinery is in good or average working order, and therefore the DESNZ estimated carbon factors are appropriate.

2. Scope 1 Emissions

2.1 Scope 1

Scope 1 emissions are defined as emissions directly produced by an organisation's activities. Usually by means of direct combustion. There were only had 2 known sources of direct combustion emissions.

1. Combustion of fuel from transportation, specifically:
 - a. Company owned fleet fuel combustion
2. Combustion of fuel from static sources, specifically:
 - a. Site combustion of diesel for stationary generators.

The office building and warehouse have no mains gas connection, or fossil fuel generators, so all energy consumption associated with these site falls under scope 2.

2.1.1 Company controlled fleet, fuel combustion

In 2024 all data from business owned assets providing transport for the company have been accurately accounted for. 15 No. vehicles have been tracked with miles and CO₂ being directly declared. Each car has a manufacturer declared CO₂ rating, apart from 3 No. where DESNZ factors for the appropriate vehicle size have been applied.

The milage was reported for company vehicles as well as grey fleet, all mixed and not differentiated. So, for this year 2024, all grey fleet emissions have been declared as scope 1, and future reporting years will reclassify these emissions as scope 3.6 business travel. Q1 of 2024 was missing, so the data was extrapolated. Excluding the electric car travel, the total distance travelled by the company owned fleet was 85,703 miles.

The total emissions are estimated to be 36,090 kgCO₂e.

2.1.2 Site combustion of diesel for stationary generators

The onsite combustion of diesel fuel for electrical generation appears incomplete, but at least a partial monetary data trail was possible for 3 of the 7 sites totalling £521. It is likely that significant emissions are not being under reported, and thus the impact of this category will be understated in the emissions baseline. Most of the building sites where modules are being installed have established electrical connections, so need and use of the generators varies site by site and remains abnormal. Using a 2024 reasonable worst case estimated average fuel price of £1.50/litre, it is estimated 347.3 litres of diesel was combusted at 2.51279 kgCO₂e/litre.

The total emissions are estimated to be 873 kgCO₂e.

Modulek Ltd have committed to keeping more comprehensive log of site-based activities for all upcoming years.

3. Scope 2 Emissions

3.1 Scope 2

In 2024 Modulek Ltd had three identified electrical consumption sources:

- the main office complex,
- the electrical vehicle fleet, and
- site electrical consumption.

3.1.1 Main Office electricity

There were 27,277 kWh of electricity consumed by the buildings at the main office complex. The buildings have correct meters and measurement systems in place and this data is being captured accurately and fully.

The total emissions are estimated to be 5,648 kgCO₂e.

3.1.2 Electric fleet

There were two electric vehicles a part of the operational control fleet. As per scope 1, owned fleet and grey fleet were mixed, so in future reporting years these emissions may be relocated to scope 3.6 business travel. The emissions were estimated based on the miles corrected as per the scope 1 emissions to account for missing quarter 1 of 2024.

The total emissions are estimated to be 1,102 kgCO₂e.

3.1.3 Site electricity

Modulek Ltd have not previously needed to separate the energy usage of their site welfare units from the wider site totals. The operational emissions of the welfare units are expected to be relatively small, but they cannot be accounted for in the base year. Modulek Ltd have committed to attaching metering devices in the future to isolate their site electrical consumption for declaration.

4. Scope 3 Emissions

All emissions not directly combusted or imported are considered scope 3 emissions. All categories have been identified below, some which aren't applicable to the company's business activities.

4.1 Purchased goods and services

A carbon footprint analysis was prepared by Carbon Footprint Ltd in 2022. This analysis is the most accurate analysis that has been produced for the purchased goods and services to date. It is noted that office supplies and equipment haven't been tracked.

The company creates different types of buildings that have different uses. In 2022, they installed 615m² of buildings and had their purchased goods and services emissions estimated at 167.94 tCO₂e, which equates to a 0.27307tCO₂e/m². The buildings installed in 2024 have total 911m² over 7 sites.

The total emissions are estimated to be 248,770 kgCO₂e.

4.2 Capital goods

Purchased capital goods were not tracked. It was confirmed no significant purchases, like vehicles, were made.

Going forwards, the client has committed to keeping logs of all future purchased items so this can be quantified.

4.3 Fuel and energy not in scope 1 & 2

This category covers the transmission and distribution, and well to tank emissions not covered in the carbon factors of declared scope 1 and 2 emissions. The hidden extra ancillary carbon produced by combusting fuel, or consuming electricity. 5 different emissions were monitored in this category:

1. Water supply for the office; 17.6 kgCO₂e
2. Electricity transmission and distribution; 499.17 kgCO₂e
3. EV specific electricity transmission and distribution; 98.38 kgCO₂e
4. Electricity well to tank emissions; 1252.028 kgCO₂e
5. Site diesel fuel well to tank emissions; 212.20 kgCO₂e

The total carbon estimated is 2,079 kgCO₂e

4.4 Upstream transport and distribution

In 2024 7 sites were active, with 911m² of modules. These modules travelled 5,862 miles from factory to site. The impact of travel is estimated at 1.40489 kgCO₂e/mile. using the DESNZ HGV carbon factor

The total carbon estimated is 8,235 kgCO₂e

4.5 Waste generated in operations

Waste generation is reported separately from two main locations, at the head office and at site.

4.5.1 Office waste

Two types of office waste have been analysed: general waste, collected in 1100L bins, and wastewater.

General waste

The office general waste collections are much like municipal collections, mixed recyclables and black bin general waste. The weight and composition of this waste only started being tracked in the 2nd quarter of 2024, so a 25% estimated increase was added to the total. Office general waste sent to landfill is 1.831 tonnes, and the mixed recyclables was 0.524 tonnes.

The total emissions are estimated to be 15 kgCO₂e.

Wastewater

The office water has been tracked and measured by meter. Wastewater has been measured at 128m³.

The total emissions are estimated to be 24 kgCO₂e,

4.5.2 Site waste

During the base year, Modulek Ltd hasn't been sufficiently tracking waste generated on site. There are subcontractors that are hired to provide finishings to the buildings, and waste collection skips have been hired by the client to facilitate this, however the weight and composition of the material leaving the sites isn't currently available. Information has been requested from the companies involved, but results are yet to arrive at the time of writing this report. Modulek Ltd has committed to tracking this waste comprehensively in the future.

Site water use is as per site electricity and is not currently sub metered. Moving forward, the client will apply water meters to appropriate welfare units to track their proportional site water consumption.

4.6 Business travel

There was some business travel via train, plane and rental car that should be captured. This information wasn't available for the reporting year. Modulek Ltd have committed to keeping travel logs with all business travel for upcoming years.

4.7 Employee commuting

Modulek Ltd has commuting employees and employees that work from home. The emissions associated with this are summarised below:

4.7.1 Traditional commuting

There were roughly 20 employees with various commuting profiles, from small petrol vehicles to large diesel vehicles. This data was gathered from a detailed employee survey covering all employees. The total mileage comes in at just under 100,000 miles for the year over with varying carbon profiles per mile commuted.

The total emissions are estimated to be 24,899 kgCO₂e.

4.7.2 Remote working

There were roughly 6 employees with various remote working profiles, 2 full time from home and 4 with a hybrid working pattern. This equated to 806 working days, at an estimated 7 hours worked/day.

The total emissions are estimated to be 1,883 kgCO₂e.

4.8 Upstream leased assets

There are no upstream leased assets that would need to be declared under this category.

4.9 Downstream transport and distribution

There are no downstream transport and distribution emissions that need to be declared. Because the modules come from the upstream factory and are distributed to their permanent and final location directly, there are zero resulting downstream emissions. All of the transportation and distribution emission are classed as upstream transport.

4.10 Processing of sold products

There is no processing of sold products that would need to be declared under this category. Their product is the final building that is completed and in its final form, sold direct to the consumer. This means that all emissions would be declared under purchased goods and services.

4.11 Use of sold products

Operational estimates for the buildings the client produces are available in the form of EPCs and other modelling estimates of the building's performance over 60 years. These emissions are subject to occupier behaviour and government regulations on emission reductions. They are also dependant on unit typology. Detailed data on end use estimates of the units is ongoing, and currently unavailable. Modulek Ltd will commission in 2025 an updated whole life carbon (WLC) analysis of one of their

buildings to create a more comprehensive picture of total emissions in line with EN 15978:2011 and RICS WLC methodology. A placeholder estimate of 522kgCO₂e/m² has been used in lieu of more accurate information, based on a modern residential model to SAP 10.2. This will be amended with more accurate data as it comes available.

The total emissions are estimated to be 476,018 kgCO₂e.

4.12 End-of-life treatment of sold products

As a part of the client's ongoing WLC analysis, end of life treatments are estimated at 20.60 kgCO₂e/m²

The total emissions are estimated to be 18,766 kgCO₂e.

4.13 Downstream leased assets

There are no downstream leased assets that would need to be declared under this category.

4.14 Franchises

There are no franchises or expected franchises that would need to be declared under this category.

4.15 Investment

There are no current or expected investments that would need to be declared under this category.

5. Results

5.1 Data Analysis

Below is a list of the data by category, and a qualitative estimate on the comprehensiveness of the data. As discussed above, there are gaps in the data, but these gaps are unlikely to alter the advice on decarbonisation. If the company incorporates the missing data in 2025, it is likely there will be an increase in total emissions from the baseline. Accurate emissions accounting is an important step for carbon reduction and ultimate elimination.

Table 1: Summary of emission by category

Emission Category	Included in PPN	Sufficient data	tCO ₂ e estimated
Scope 1	yes	yes	36.96
Scope 2	yes	no	6.75
Purchased goods and services	no	no	248.77
Capital goods	no	no	-
Fuel and energy	no	yes	2.08
Upstream transport	yes	yes	7.69
Waste	yes	no	0.04
Business travel	yes	no	-
Employee commuting (& remote work)	yes	yes	24.90 1.88
Upstream leased assets	no	N/A	0
Downstream transport	yes	N/A	0
Processing sold products	no	N/A	0
Use of sold products	no	no	479.02
End-of-life treatment	no	no	18.77
Downstream leased assets	no	N/A	0
Franchises	no	N/A	0
Investments	no	N/A	0
PPN06/21 total			78.77
True total			827.41

The data highlights the difference in significance between different categories. Because the product is a building, a large proportion of the emissions are associated with purchased goods, and use of sold products. The purchased goods emissions include the embodied carbon associated with the creation of the buildings. The use of sold products quantifies the emissions involved with the ongoing operational energy consumption during the life expectancy of the building, 60 years.

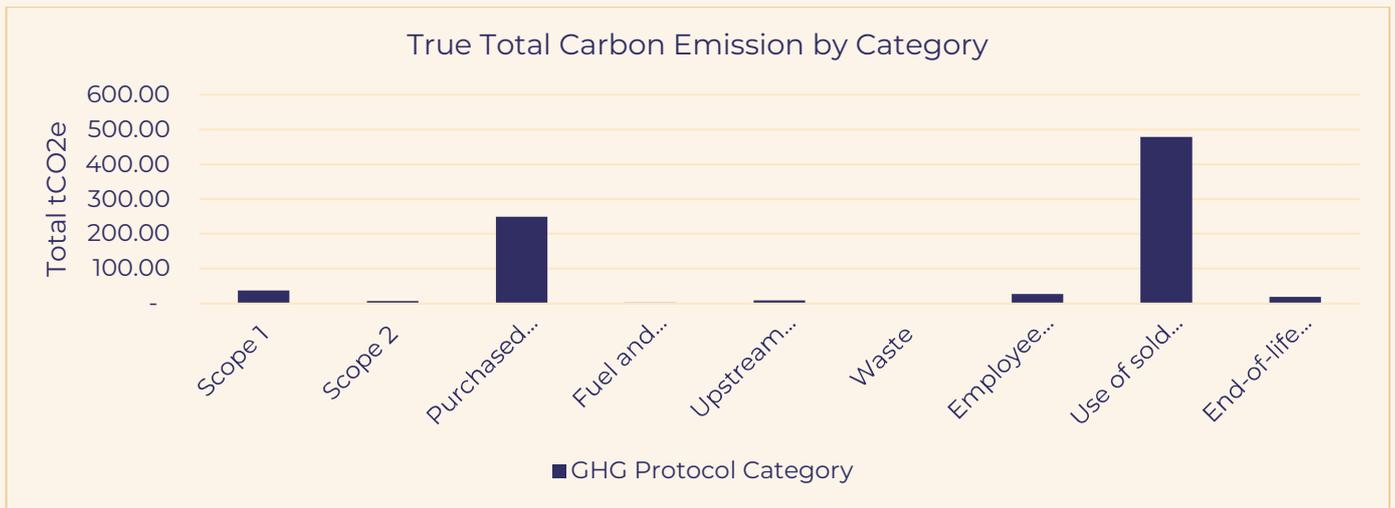


Figure 3: True Total Carbon Emission by Category

The purchased goods and use of sold products categories constitute 90.5% of all of Modulek Ltd.'s emissions. Therefore, even small alterations to the design and material choices to the product, would have significant ramifications on the true overall emissions for the company.

The data gathered for purchased goods, and use of products is representative of the emissions associated with domestic buildings. However, the client's products are much more diverse, thus that these categories and the estimates herein could be significantly different. Even if a different building type is used as a representative, the conclusions would be the same, that the product has or is, so much more significant to the organisation's emissions that decarbonising the product should be the most important priority to the organisation where it's able to exert that organisational control.

5.2 PPN 06/21

The PPN 06/21 for UK governmental procurement is the guiding reporting for UK based carbon reduction plans. The UK government requires a subset of scope 3 emissions be eliminated as a part of an organisations adherence to the procurement note.

In addition to the scope 1 and scope 2 emissions, the following subset of scope 3 emissions must be included for PPN 06/21 compliance; 4. Upstream transport, 5. Waste, 6. Business travel, 7. Employee commuting (including remote working), and 9. Downstream transport. The below graphics show the revised set.

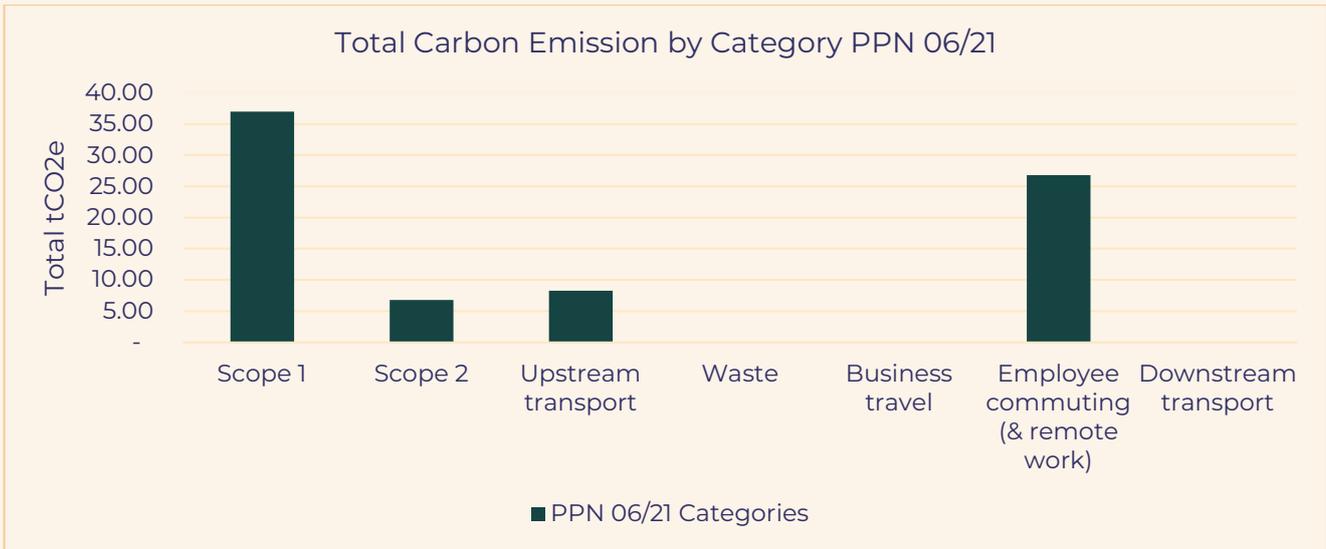


Figure 4: Total Carbon Emission by Category PPN 06/21

As you can see above, the emissions from the fleet travel are the highest overall category. This is primarily due to the significant amount of diesel in the fleet. The commuting activity of the employees consists of the bulk of the remaining emissions.

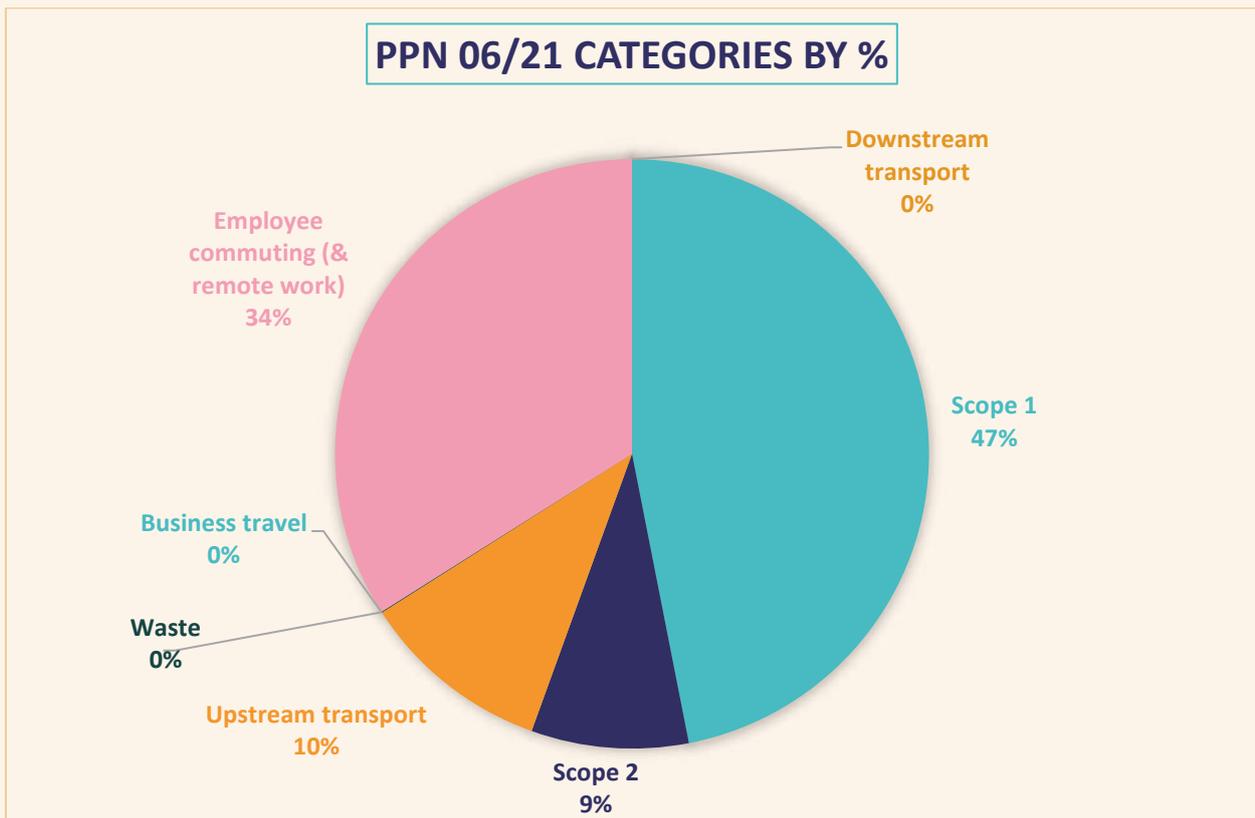


Figure 5: PPN 06/21 categories by %

Vehicle travel therefore constitutes 91% of Modulek’s current reportable business activity. The 10% from upstream transport will be the most difficult to decarbonise, the 34% from employee commuting the easiest, with changes to operations.

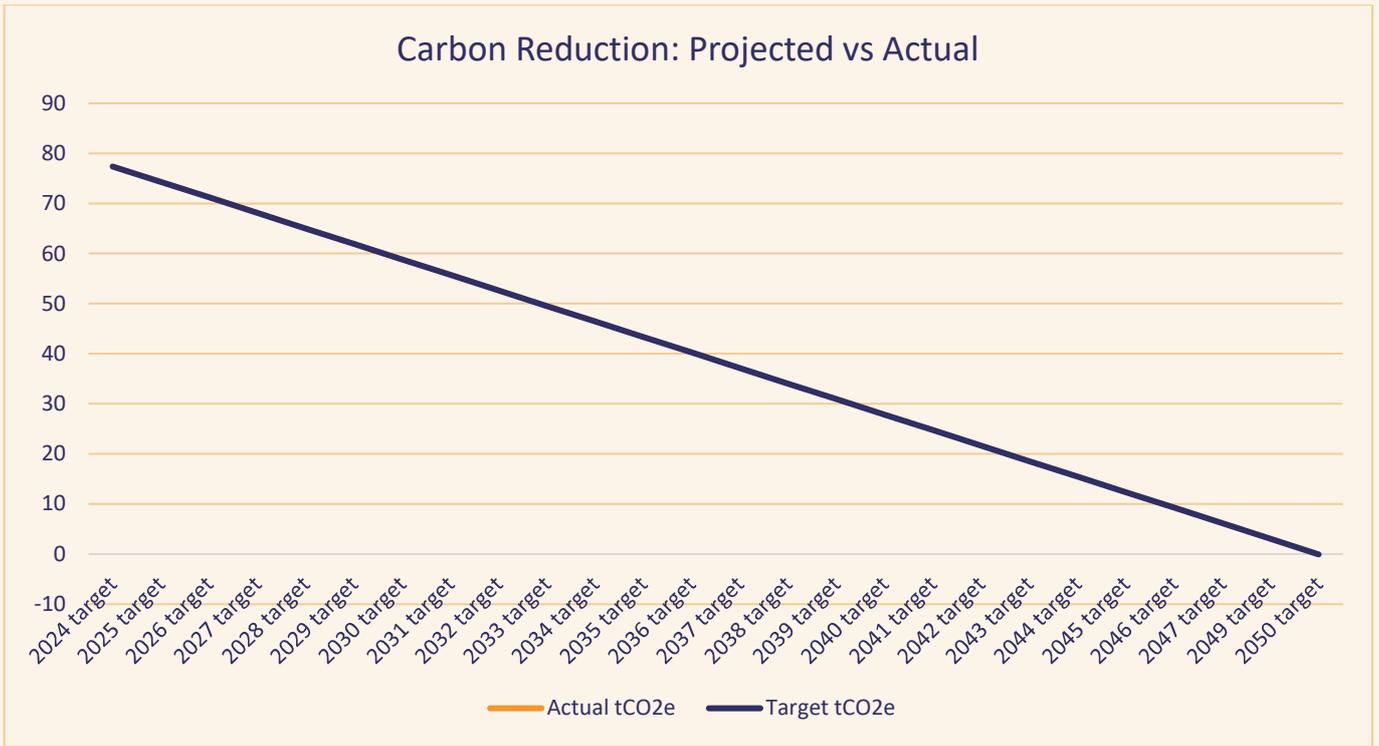


Figure 6: Carbon Reduction Target

The above is the linear progress required for the business to completely decarbonise by 2050. The actual emissions reduced will result in step emission drops as operational changes are made, or physical investments are brought online. The actual emission will be updated annually in line with expectations.

6. Future Recommendations

6.1 Short term 1-3 years

Start monitoring site consumption of electricity, water, and waste. This will need to be done using submeters on sites to isolate your emissions from the wider sites, where generators aren't being provided. In line with this business travel, capital goods and the other categories that aren't being captured by the company needs to start capturing that data appropriately. This will allow Modulek to get a more comprehensive picture of their operations.

In addition to the above, internal procedures around employee commuting and working from home should be reviewed. Due to the majority of the workforce using traditional vehicles for their commute, the workforce commuted a total of nearly 100K miles to and from the office over the course of the year. A work from home employee consumes 2.33 kgCO₂e/day working from home full time (averaged over the course of the year). What this means is any employee commuting to and from the office more than, roughly, 8 miles total will produce more carbon commuting alone. Not to mention the reduction in scope 2 emissions having that employee's workstation no longer draining the business's electricity. This is dependent, of course, on the vehicle driven and the work from home conditions of the employee. Any electric vehicles driven are roughly ~4 times more carbon efficient. It will be impossible and potentially problematic to eliminate commuting for all employees, but where flexible working initiatives can be implemented, they should be encouraged. Likewise, soft encouragement to push employees to switch to electric vehicles will help. The presence of the car chargers at the office already installed is very good to see. It very much is an, "if you build it, they will come" scenario. By allowing the facilitation of the electric transport Modulek has taken an important first step already.

A review of the Whole Life Carbon of Modulek's products should be undertaken to see if any low cost or cost neutral material selections can be implemented. Because the product is so carbon heavy, the best thing Modulek can do is to produce and sell more carbon friendly buildings, even at the expense of their own reporting emissions. Taking the time to give greener choices to their customers will ultimately be the single most important activity that Modulek could undertake to reduce their true environmental impact.

Installing a PV system on the office building as soon as possible would reduce the scope 2 emissions significantly. Please refer to medium term items for more information.

6.2 Medium term 4-7 years

The next major step will be to decarbonise the scope 1 travel, or by extension scope 3.3 business travel. If it's grey fleet, the business will have very little ability to reduce the emissions of the specific vehicles. However, it can encourage travel with more sustainable options. All company vehicles should be electric vehicles. Make it company policy that all new vehicles that are purchased or leased, are electric. Reserve these electric vehicles for shorter trips, or trips where electric charging points are easily accessible along the proposed route. If any significantly longer travel than 200+ miles is needed, trains or other means of public transport may be more efficient depending on destination.

The introduction of a Photovoltaic array should be installed to the building; this could be a short-term measure as well considering financial and carbon payback is significant. This will help to decarbonise the current scope 2 emissions, which is important, but more importantly it will future proof the company's vehicle switch to electric. As the cars swap over to electric, the existence of the PV array will help deal with the increased demand. Scope 1 emissions will naturally move to scope 2 emissions, and it is very much in the business's financial interest to be generating at least some of their own electricity. Depending on cost of installation, economic payback on the PV will be 4-7 years (subject to any grants or paying for the entire system out of pocket). The carbon payback of the same system will be roughly 7 years, depending on how many batteries are used, if any are used in the solution.

The office building itself should undergo a comprehensive energy review. The EPC isn't reflective of the current property. It's not currently required the EPC itself be updated if Modulek isn't planning on leasing or selling the building, but undertaking a comprehensive review of the building energy consumption will point to places where the building could find energy savings and therefore carbon savings.

6.3 Long term 7-25 years

The long-term prediction for the landscape is challenging as the building industry and transportation industries are changing so rapidly. The main long-term goals should be to complete the transition to electric vehicles, and make sure as much of their electrical demand is created at point of charge. Then review the rest of the emission sources and refocus on the most significant of them.

Build a Net Zero future

Join us in creating a more
sustainable built environment –
spaces where people and planet can thrive



Let's chat

0333 5777 577

hello@darren-evans.co.uk

www.darren-evans.co.uk

Darren Evans Ltd

Bristol & Bath Science Park

Dirac Crescent

Emersons Green

Bristol

BS16 7FR