Audit of Carbon Emissions and Decarbonisation Strategy to Achieve Net Zero

Nordic Energy

FOR THE PERIOD: MAY 2022 - APRIL 2023

DECEMBER 2023

Project Sponsor

Bob Barnes - Director, Nordic Energy

Authors

Bob Bob Barnes - Director, Nordic Energy

Dominic Lavelle - Go Green Experts Ltd

Hannah Cooper - Go Green Experts Ltd

Foreward

At the heart of Nordic Energy lies a commitment to sustainable progress. We are a team of seasoned experts dedicated to the advancement of Net Zero Solutions.

Nordic Energy specializes in the intricate web of services required to design, construct, install, and operate systems that lead us to a carbon-neutral future. Our expertise encompasses district heating and cooling, renewable energy, energy recovery, and building efficiency, to name a few.

Our consultancy in UK Heat Networks is a critical driver for the country's decarbonisation efforts. The UK has an ambition of connecting 20% of its buildings to heat networks. We are working on city-scale heat network propositions, as well as large scale retrofit of insulation and heat pumps.

By implementing advanced and efficient heating solutions, we aid in the reduction of the UK's reliance on fossil fuels, thereby diminishing the national carbon footprint.

As the demand for sustainable energy solutions surges, so does the expansion of Heat Networks, both of which forecast a significant growth trajectory for Nordic Energy.

Our international experience, grounded in our Nordic heritage, provides us with a robust foundation to support and drive this expansion across the UK.
Our four Directors anchor their leadership in a deep-seated commitment to Net Zero. They steer Nordic Energy not just in business strategy but also in the ethos of environmental stewardship. They are fully engaged in realizing a comprehensive carbon reduction plan, ensuring that our corporate actions align with broader environmental goals.

In this unfolding narrative of growth and responsibility, we stand firm in our pledge to deliver sustainable solutions. Our aim is to navigate the present challenges and lay down the groundwork for a cleaner future.

Executive Summary

To achieve Net Zero, Nordic Energy needs to remove carbon from our operations and wider business activities consistently each year until we reach a net zero position by 2045.

Nordic Energy commits to reduce scope 1 and scope 2 GHG emissions by 50% by 2030 from the 2022 baseline period. The specific period for the baseline carbon footprint aligns to Nordic Energy's Financial Reporting period which is 1st May 2022 to 30th April 2023.

Nordic Energy also has an ambition to measure and control scope 3 emissions so that its overall carbon footprint falls by 50% CO2e by 2030 from the 2022 baseline position.

Nordic Energy is looking to grow quickly over the coming years as UK Heat Network expands in line with UK wider Net Zero by 2050 objectives, so the Revenue Carbon Intensity Metric will be tracked as a key performance indicator (KPI) to ensure that emissions are being controlled in the short term as the company grows.

These targets are consistent with a 1.5°C reduction pathway and are set in accordance with the Science-Based Targets Initiative (SBTi) guidance for SMEs.

These ambitious targets are aspirational in the medium to long term and a process of constant review of progress against targets over multiple years is required to achieve success.

SBTi Net Zero guidelines states that carbon offsets must be excluded from emissions reduction targets. Offsetting can be used for beneficial projects such as forest management but cannot be used to comply with emission reduction targets.

Executive Summary Continued...

UK-wide decarbonisation programmes such as the UK Government's plans to ensure that Britain's homes and businesses are powered by affordable, clean and secure electricity in the future whilst encouraging the increase in electric vehicles, per the 2035 end of new ICE car sales, are factored into the reduction plan.

The first step for Nordic Energy in creating the decarbonisation plan and strategy has been to measure our organisation's carbon footprint.

Go Green Experts have measured the carbon footprint of Nordic Energy's carbon emissions including direct and selected indirect emissions, i.e., Scope 1, Scope 2 and selected Scope 3 emissions.

This was undertaken for the 1st May 2022 to 30th April 2023 (referenced as the "2022" period in this report), which is the baseline period for the organisation.

An annual carbon reduction plan then shows how we will reduce carbon emissions between the 2022 baseline period and 2045, with the plan being more detailed in nature between 2022 and the 2030 interim target.

Carbon reduction targets have been set using the market-based methodology of calculating emissions from electricity use - which accounts for purchases of renewable generated power as zero emissions - rather than the location-based methodology which calculates all emissions according to the UK grid-average emissions per kWh used.

Nordic Energy will report both our market-based and location-based carbon footprint each year, and aim to become net zero by 2045 under both measures.

Nordic Energy

green experts

Contents

Nordic Energy

green experts

1. Data Collection and Reporting Standards

In line with the Greenhouse Gas Protocol's accounting and reporting standards, Government published conversion factors have been used to represent the impact of activities in CO_2e. Industry average carbon intensities have been used to estimate supply chain emissions.

Under the Greenhouse Gas Protocol, emissions sources are divided into scopes:

> Scope 1: direct emissions

> Scope 2: emissions from purchased electricity

> Scope 3: indirect emissions and those associated with supply chain and product use

Data has been collected for the 12 month period, May 2022 - April 2023, to create Nordic Energy's carbon footprint.

A raw data table can be found in Appendix 1, with a table of assumptions made in Appendix 2.

2. Reporting Scope

The impact of the following emissions categories have been assessed:

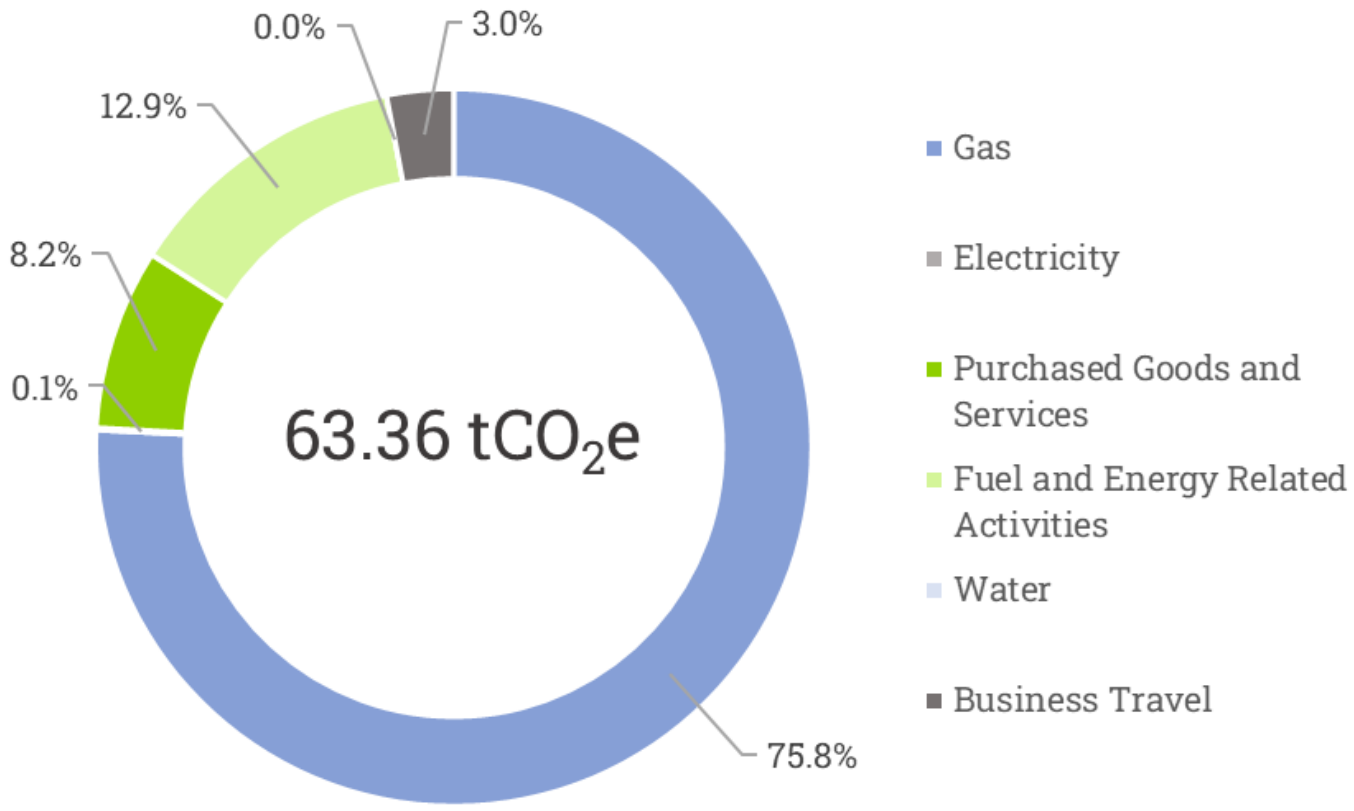
Emission Category	Inclusion	Reason for not Including
Scope 1		
On-Site Fuel Combustion	Yes	
Company-Owned Vehicles	No	No vehicles are owned
Fugitive Emissions	No	No top-ups made
Scope 2		
Mains Electricity	Yes	
Scope 3		
Purchased Goods and Services	Yes	
Capital Goods	No	No capital goods purchased
Fuel and Energy Related Activities	Yes	
Upstream Transportation and Distribution	No	Covered in purchased goods
Wastes Generated	No	No waste generated
Business Travel	Yes	
Employee Commute	No	No employee commute
Working from Home	No	Included in Scope 1 and 2
Upstream Leased Assets	No	Leased assets covered in Scope 1 and 2
Downstream Transportation and Distribution	No	No downstream transportation
Processing of Sold Products	No	No products sold
Use of Sold Products	No	No products sold
End of Life Treatment of Sold Products	No	No products sold
Downstream Leased Assets	No	No owned assets leased to third parties
Franchises	No	No franchises
Investments	No	Not a financial institution

Nordic Energy

3. Carbon Footprint

Location-Based

May 2022 - April 2023



Emission Category	tCO_2e	%
Gas	48.02	75.8
Electricity	0.06	0.1
Purchased Goods and Services	5.17	8.15
Fuel and Energy Related Activities	8.20	12.9
Water	0.00	0.01
Business Travel	1.91	3.0
Total	**63.36**	**100**

Scope	tCO_2e	%
Scope 1	48.02	75.8
Scope 2	0.06	0.1
Scope 3	15.28	24.1
	63.36	**100**

Economic Intensity (KPI)

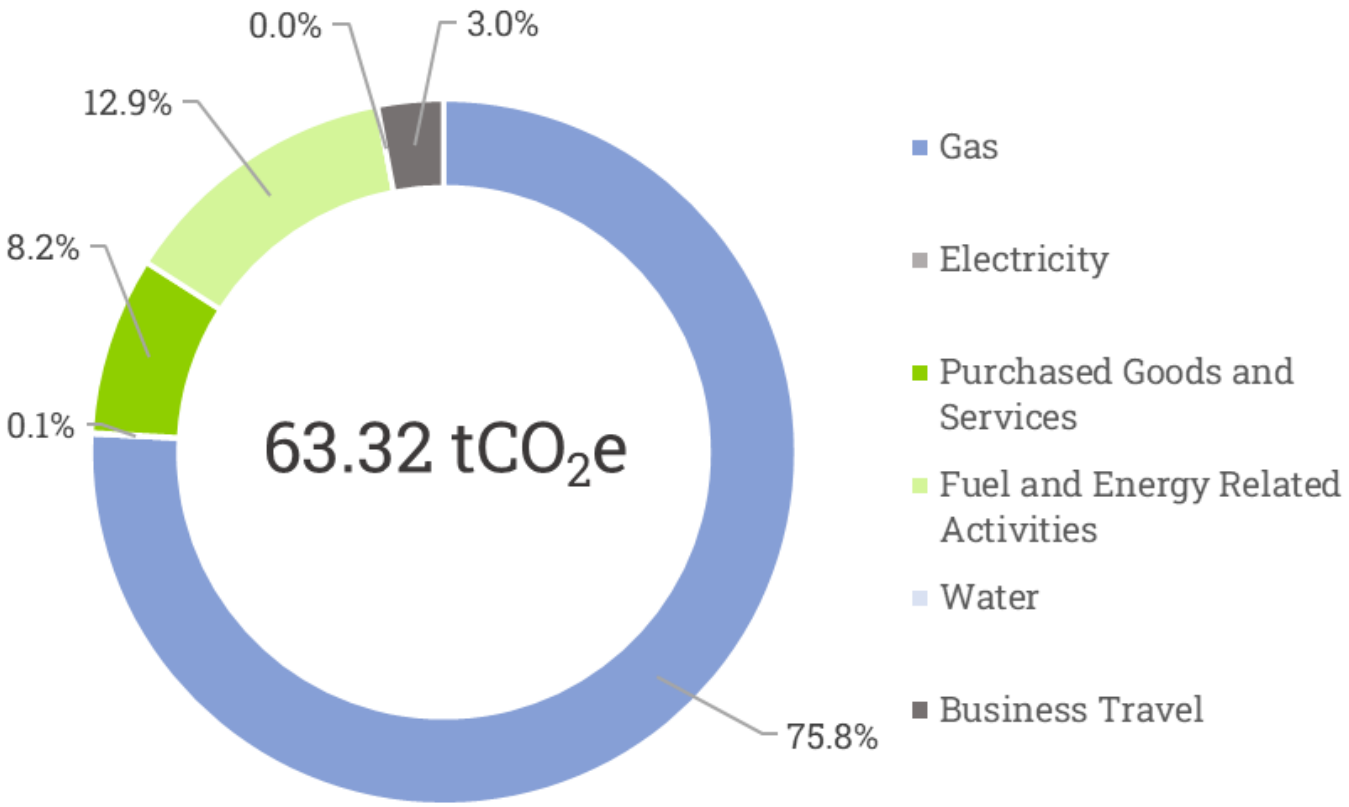
Scope 1 and 2: 0.3 $kgCO_2e$/£ Revenue
Scope 1, 2 and 3: 0.4 $kgCO_2e$/£ Revenue

Nordic Energy

3. Carbon Footprint

Market-Based

May 2022 - April 2023



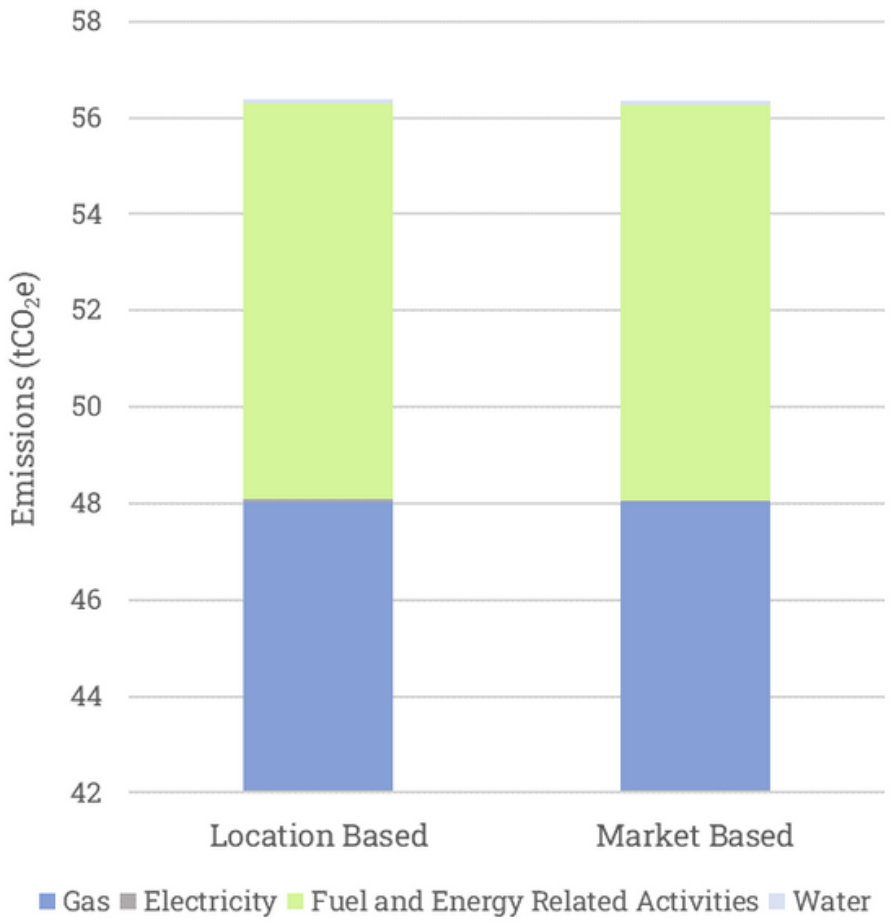
Emission Category	tCO_2e	%
Gas	48.02	75.7
Electricity	0.03	0.05
Purchased Goods and Services	5.17	8.2
Fuel and Energy Related Activities	8.19	12.9
Water	0.00	0.0.1
Business Travel	1.91	3.0
Total	**63.32**	**100**

Scope	tCO_2e	%
Scope 1	48.02	75.8
Scope 2	0.03	0.1
Scope 3	15.27	24.1
	63.32	**100**

Economic Intensity (KPI)

Scope 1 and 2: 0.3 $kgCO_2e$/£ Revenue
Scope 1, 2 and 3: 0.4 $kgCO_2e$/£ Revenue

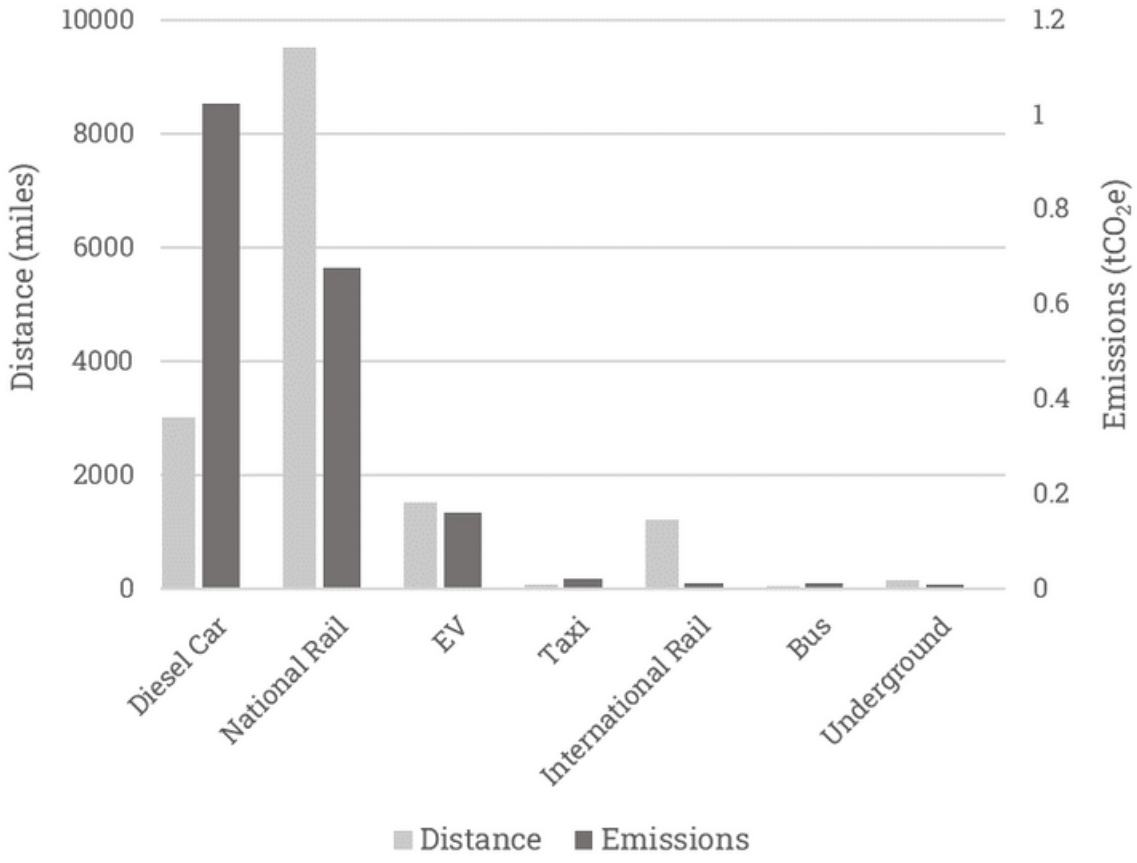
4. Buildings



Building-related emissions combines those associated with heating, cooling and power supply along with water use. Market-based emissions account for the purchasing of renewable electricity, while location-based emissions represent all electricity consumption using the national grid average. 149 kWh of electricity were known to be from renewable sources.

'Fuel and energy related activities' is a Scope 3 category that refers to the transmission and distribution losses of electricity along with the emissions associated with the extraction of fuels for combustion. Combined Scope 1 and Scope 3 emissions associated with gas for space heating make up the majority of building-related emissions.

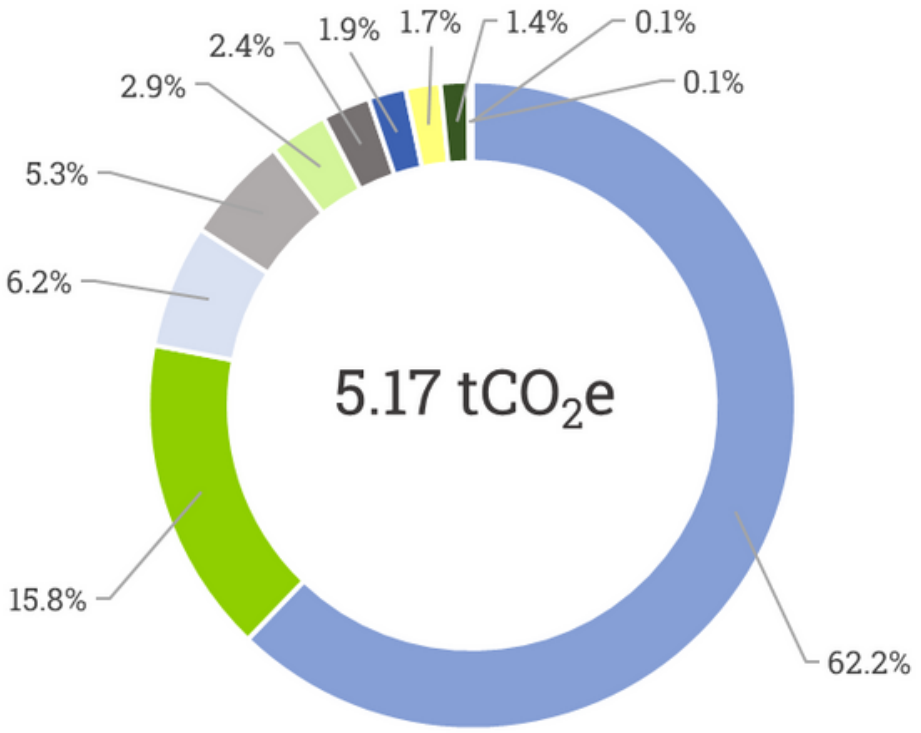
5. Travel



The graph above shows the distance and associated emissions for each mode of transport used for business travel.

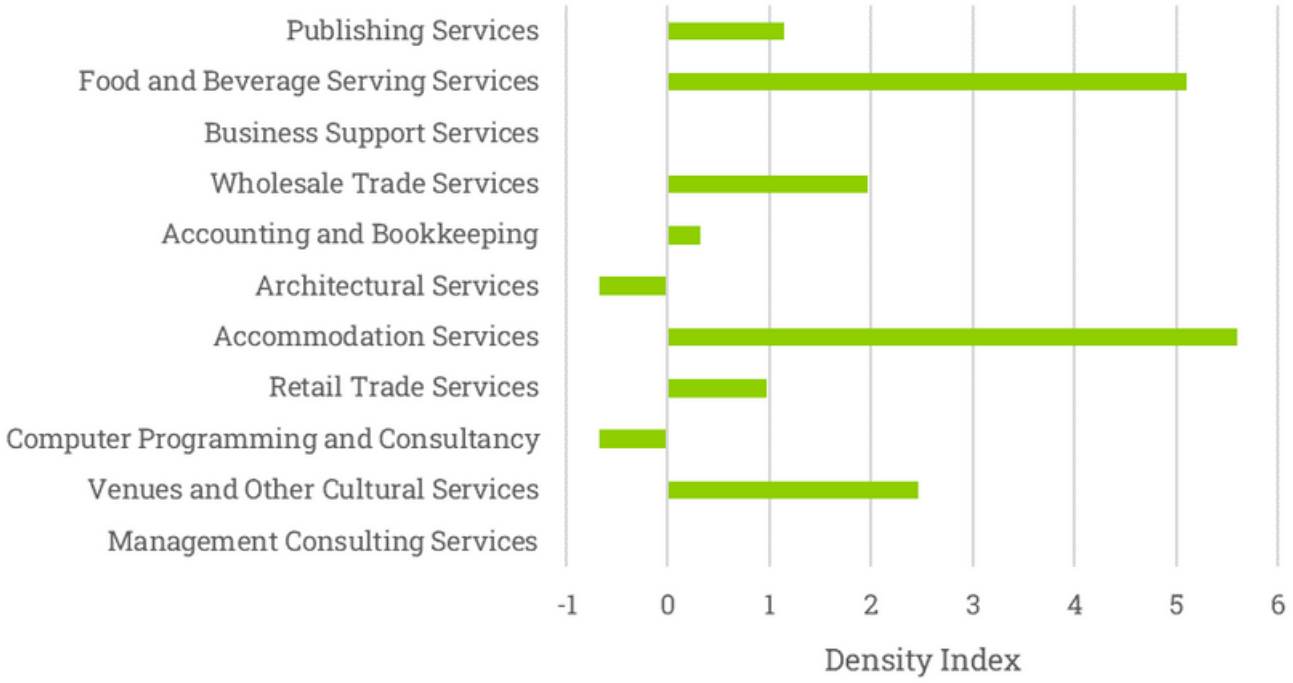
54% of business travel emissions are due to travel in a diesel car. 61% of distance is travel using national rail, while accounting for 35% of emissions.

6. Supply Chain



The spend-method was used to account for supply chain emissions, with suppliers and service providers categorised by SIC code. Average industry carbon intensities were generated using two publicly available datasets from the ONS and Berners-Lee's 'How Bad Are Bananas' publication. These could then be used to estimated emissions, given the spend in each industry sector.

6. Supply Chain (Continued)



A 'density index' was generated by dividing percentage contribution to emissions by percentage contribution to spend. This allows relatively intensive industries to be identified. An industry sector with a density index more than 1 means its contribution to emissions is more than its contribution to spend.

'Food and beverage serving services' and 'accommodation services' represent relatively insensitive industries, collectively accounting for around 0.5% of spend and 3% of supply chain emissions. 'Architectural services' and 'computer programming and consultancy' on the other hand account for around 25% of spend collectively and only 0.5% of supply chain emissions.

7. Carbon Reduction Targets

The key carbon reduction targets are:

1. Scopes 1 & 2 emissions 50% reduction by 2030
2. All scopes 90% reduction by 2045

Following the measurement of the carbon footprint, a detailed analysis has been undertaken to ascertain where the carbon reductions could be made in the short-term, medium-term and long-term.

This has then formed the basis of the ambitious 2045 net-zero target.

This includes reducing emissions to 10% of the baseline 2022 period, which equates to 5 tonnes of CO2e residual emissions by 2045 (all scopes). The equivalent amount of emissions will be removed from the atmosphere using carbon capture technology, in line with the Science-Based Target Initiative (SBTi) guidance, to enable the organisation to become Net-Zero.

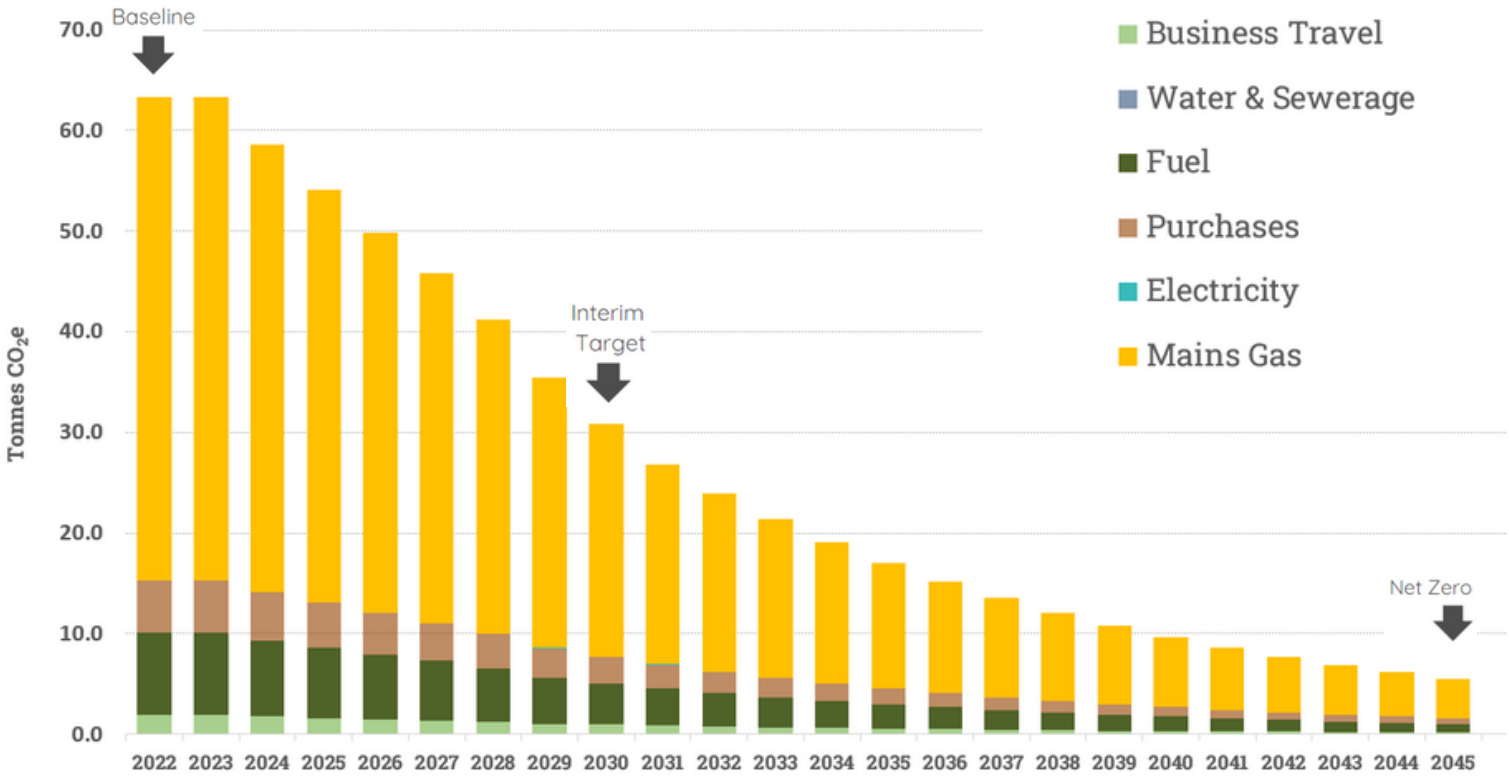
SBTi for SMEs guidance requires that an interim target is set for 2030 which equates to 24 CO2e carbon emissions reduction by 2030 for scope 1 and 2 emissions.

As part of the glide path to net zero informed assumptions on the wider U.K. economy decarbonisation milestones have been made. For example, it is assumed that electricity will become increasingly renewable resulting in a lower greenhouse gas conversion factor. Further, over time, the usage of electric vehicles will increase dramatically, as will the usage of alternative, lower-carbon forms of transport – including cycling, trains, and zero-emissions buses.

Critically, the supply chain, both nationally and internationally will also become less carbon-intensive over time, with more options for very low-carbon products and services, thus supporting a reduction in Scope 3 emissions.

8. Detailed Annual Targets

The below graph shows the annual targeted CO2e reductions required to be consistent with a science based target of no more than 1.5 degrees of warming.



8. Detailed Annual Targets (Continued)

The below table shows the annual targeted reductions required. This is the data used to generate the graph on page 10 of this report.

Baseline

Interim Target

Net Zero

ASPECT	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Mains Gas	48.0	48.0	44.4	41.1	37.8	34.8	31.3	26.9	23.1	19.9	17.7	15.8	14.0	12.5	11.1	9.9	8.8	7.8	7.0	6.2	5.5	4.9	4.4	3.9
Electricity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Purchases	5.2	5.2	4.8	4.4	4.1	3.7	3.4	2.9	2.6	2.3	2.1	1.9	1.7	1.5	1.4	1.2	1.1	1.0	0.9	0.8	0.7	0.7	0.6	0.5
Fuel	8.2	8.2	7.6	7.0	6.4	5.9	5.3	4.6	4.1	3.7	3.3	3.0	2.7	2.4	2.2	2.0	1.8	1.6	1.4	1.3	1.2	1.1	0.9	0.9
Water & Sewerage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Business Travel	1.9	1.9	1.8	1.6	1.5	1.4	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2
Target	**63**	**63**	**59**	**54**	**50**	**46**	**41**	**35**	**31**	**27**	**24**	**21**	**19**	**17**	**15**	**14**	**12**	**11**	**10**	**9**	**8**	**7**	**6**	**5**
Actual	63																							
Reduction	0	0	5	4	4	4	5	6	5	4	3	3	2	2	2	2	1	1	1	1	1	1	1	1
Reduction Comulative	0	0	5	9	13	17	22	28	32	36	39	42	44	46	48	50	51	52	54	55	56	56	57	58
% of Base Year	100%	100%	93%	86%	79%	72%	65%	56%	49%	42%	38%	34%	30%	27%	24%	21%	19%	17%	15%	14%	12%	11%	10%	9%
% Reduction	0	0%	8%	14%	21%	28%	35%	44%	51%	58%	62%	66%	70%	73%	76%	79%	81%	83%	85%	86%	88%	89%	90%	91%

	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Scope 1	48.0	48.0	44.4	41.1	37.8	34.8	31.3	26.9	23.9	21.2	19.0	17.0	15.3	13.7	12.3	11.0	9.9	8.8	7.9	7.1	6.4	5.7	5.1	4.6
Scope 2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scope 1 & 2 Target	**48.1**	**48.0**	**44.4**	**41.1**	**37.8**	**34.8**	**31.3**	**26.9**	**23.9**	**21.2**	**19.0**	**17.0**	**15.3**	**13.7**	**12.3**	**11.0**	**9.9**	**8.9**	**8.0**	**7.1**	**6.4**	**5.7**	**5.1**	**4.6**
Scope 1 & 2 % of Base Yea	100%	100%	93%	86%	79%	72%	65%	56%	50%	44%	40%	35%	32%	29%	26%	23%	21%	18%	17%	15%	13%	12%	11%	10%
Scope 1 & 2 Actual	48																							

9. Carbon Reduction Plan

A key component of our carbon reduction plan is to reduce scope 1 gas usage for heating of premises as in 2022 this activity drove 76% of the total carbon footprint for the organisation. Nordic Energy has already completed some carbon reduction initiatives prior to 2023, and we are committed to further electrify our heating and travel requirements.

Aspect	Completed initiatives	2023 to 2024	2025 to 2030	2036 to 2045
Mains Gas	At one property a full renovation has been completed including floor, wall and roof insulation - Ground Source heat pump replacing oil boiler	Business case completed for switching away from gas towards renewables plus improved insulation for remaining premises.	Switch to Heat Pumps away from Mains Gas. Use grant funding available to support business case, coupled with insulation measures. Water storage to use excess renewable energy generation - to preheat water for heat pumps - 2 storage vessels to pre-heat water for both heating (28*C) and hot water (60*C)	Switch final property away from gas to Heat Pump for heating
Electricity	Some electricity is from a renewable energy supplier	Purchase REGO certificates to move to 100% renewable electricity (Market Based method)	Install rooftop solar array on one of the office properties	Install rooftop solar array and batteries on remaining office properties
Purchases	Website hosted by low carbon provider: Completed	Engage largest Suppliers to ascertain their net zero plans	Work with Supply Chain to reduce emissions, and set up Procurement policy to only work with low carbon suppliers by 2030.	Continue to work with low carbon supply chain to remove remaining emissions to become zero carbon
Business Travel	Purchased Electric Vehicles	Business case and partner agreed to switch all vehicles to EVs. In the interim look to source EVs from local car clubs for long distance client meetings.	Switch half of of vehicle usage to EVs by 2030	Switch 95% of vehicle usage to EVs by 2035.

10. Appendices

Appendix 1: Raw Data Table

Emission Source	Amount	Units	LB tCO_2e	MB tCO_2e
Scope 1				
Combusted Fuel				
Gas	263.06	kWh	48.02	48.02
Scope 2				
Mains Electricity				
Electricity	328.83	kWh	0.06	0.03
Scope 3				
Fuel and Energy Related Activities				
Gas	263.06	kWh	8.18	8.18
Electricity	328.83	kWh	0.02	0.01
Purchased Goods and Services				
Accommodation Services	754.27	£	0.15	0.15
Accounting and Bookkeeping	2420.8	£	0.10	0.10
Architectural Services	12469.08	£	0.12	0.12
Business Support Services	2359.01	£	0.07	0.07
Computer Programming and Consultancy	31874.17	£	0.32	0.32
Food and Beverage Serving Services	37.2	£	0.01	0.01
Management Consulting Services	107148.07	£	3.21	3.21
Publishing Services	54	£	0.00	0.00
Retail Trade Services	4605.2	£	0.28	0.28
Venues and Other Cultural Services	7780.34	£	0.82	0.82
Wholesale Trade Services	996.2	£	0.09	0.09
Water				
Water Supply	0.62	m^3	0.0001	0.0001
Water Treatment	11.72	m^3	0.0031	0.0031

Appendices

Appendix 1: Raw Data Table

Emission Source	Amount	Units	LB tCO_2e	MB tCO_2e
Scope 3 (Continued...)				
Business Travel				
Bus	50	miles	0.01	0.01
Diesel Car	3000	miles	1.02	1.02
EV	1500	miles	0.16	0.16
International Rail	1200	miles	0.01	0.01
National Rail	9500	miles	0.68	0.68
Taxi	70	miles	0.02	0.02
Underground	150	miles	0.01	0.01
Total			**63.36**	**63.32**

Appendices

Appendix 2: Assumptions and Caveats

Emission Source	Scope	Units	Data Source	Assumptions
Gas	1,3	kWh	Consumption Data	Gas consumption was estimated from household bills using floor areas and working hours.
Mains Electricity	2,3	kWh	Consumption Data	Electricity consumption was estimated from household bills using floor areas and working hours.
Business Travel	3	miles	Mileage	Annual business travel mileage was provided for the 12 month period.
Water	3	£	Consumption Data	Cost of water was estimated from household bills using floor areas and working hours. Volume of water estimated using £1.70/m³.
Purchased Goods and Services	3	spend (£)	ONS, Berners-Lee and Supplier-Specific Intensities	Annual spend was provided. Average industry intensities where used from a combination of the ONS database and those published by Berners-Lee.

Glossary

Absolute Reduction	The actual reduction in emissions
Base year	A historical datum (e.g., year) against which a company's emissions are tracked over time.
Base year emissions	GHG emissions in the base year.
Baseline	A hypothetical scenario for what GHG emissions would have been in the absence of a GHG project or reduction activity.
Business travel	Transportation of employees for business-related activities.
Capital Goods	Final goods that have an extended life and are used by the company to manufacture a product, provide a service, or sell, store, and deliver merchandise. In financial accounting, examples of capital goods include equipment, machinery, buildings, facilities, and vehicles.
Carbon Footprint	The total greenhouse gas (GHG) emissions caused by an individual, event, organization, service, place or product, expressed as carbon dioxide equivalent (CO2e).
Carbon intensity	A measure of carbon emission against a variable of business operations such as turnover, output or staff.
Carbon neutral	A measure of the carbon emissions that are emitted over the full life cycle of a product or service and usually expressed as grams of CO2-e.
Circular economy	A circular economy tries to break that cycle of make-use-dispose with adaptive reuse
CO2e **CO2 Equivalent**	The universal unit of measurement to indicate the global warming potential (GWP) of each greenhouse gas, expressed in terms of the GWP of one unit of CO2.
Direct emissions	Emissions from sources that are owned or controlled by the reporting company.

Downstream emmissions	Indirect GHG emissions from sold goods and services.
Embodied carbon	The emissions that result from the entire project
Emission factor	A factor that converts activity data into GHG emissions data (e.g., kg CO2e emitted per litre of fuel consumed, kg CO2e emitted per Kilometre travelled, etc.).
Employee communiting	Transport of employees between their homes and their worksites.
Environmental Product Declaration (EPD)	A document that quantifiably demonstrates the environmental impacts of a product.
Equity Share Approach	A consolidation approach whereby a company accounts for GHG emissions from operations according to its share of equity in the operation.
Extrapolated data	Data from a similar process or activity used as a stand-in for the given process or activity has been customised to represent the given process or activity more.
Global warming potential	A factor describing the radiative forcing impact (degree of harm to the atmosphere) of (GWP) one unit of a given GHG relative to one unit of CO2.
Greenhouse gas	Gasses contributing to global warming. Seven gases, Carbon Dioxide (CO2); Methane (CH4); Nitrous Oxide (N2O); Hydrofluorocarbons (HFCs); Perfluorocarbons (PFCs); Sulphur Hexafluoride (SF6), and Nitrogen Trifluoride (NF3).
Greenhouse gas inventory	A quantified list of an organization's GHG emissions and sources.
Greenwashing	PR tactic used to make a company or product appear environmentally friendly, without meaningfully reducing its environmental impact.
Indirect emissions	Emissions that are a consequence of the activities of the reporting company but occur at sources owned or controlled by another company.
Indirect GHG	Emissions that are a consequence of the operations of the reporting company, but occur at sources owned or controlled by another company. This includes Scope 2 and Scope 3.

Life Cycle Assessment (LCA)	Total emissions from the inputs and outputs throughout a product's life cycle. From the moment it was created to the moment it has decayed.
Location based method	A method to quantify Scope 2 GHG emissions based on average energy generation emission factors for defined locations.
Market based	A method to quantify Scope 2 GHG emissions based on GHG emissions emitted by the generators from which the reporter contractually purchases electricity.
Net zero	A state in which the greenhouse gases going into the atmosphere are balanced by removal from the atmosphere.
Offsetting	The action or process of compensating for carbon dioxide emissions arising from industrial or other human activity, by participating in schemes designed to make equivalent reductions of carbon dioxide in the atmosphere.
Proxy data	Data from a similar process or activity that is used as a stand-in for the given process or activity without being customised to be more representative of the given process or activity.
Reporting year	The year for which emissions are reported.
Scope 1 emissions	Emissions from operations that are owned or controlled by the reporting company.
Scope 2 emissions	Indirect emissions from the generation of purchased or acquired electricity.
Scope 3 emissions	All indirect emissions (not included in Scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions.
Secondary data	Data that is not from specific activities within a company's value chain.
Supply chain	A network of organizations (e.g., manufacturers, wholesalers, distributors, and retailers) involved in the production, delivery, and sale of a product to the consumer.
Upstream emissions	Indirect GHG emissions from purchased or acquired goods and services.

Nordic Energy