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Dartmoor National Park Authority 2023/24 Carbon Footprint

CENTRE FOR ENERGY AND THE ENVIRONMENT

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Author(s):	D Lash
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CENTRE FOR ENERGY AND THE ENVIRONMENT
University of Exeter
Hope Hall
Prince of Wales Road
Exeter, EX4 4PL
+44(0)1392 724159
www.exeter.ac.uk/cee

Management Summary

Dartmoor National Park Authority (DNPA) has produced an organisational greenhouse gas inventory (or 'carbon footprint') since 2018/19. DNPA commissioned the Centre for Energy and the Environment (CEE) at the University of Exeter to produce a carbon footprint for the 2023/24 period. The Greenhouse Gas Protocol and EN 14064-1 were used to define the scope of the assessment, which was wider than in previous years and so the results from 2023/24 are not directly comparable to those years. In addition to the GHG Protocol scopes and categories, emissions were also reported under new category headings (buildings, transport, purchased goods and services, investments, and land use). Sources (and sinks) of GHG emissions were calculated based on combining activity data with corresponding emission factors.

DNPA's total net emissions in 2023/24 were 3,096 tCO_2e. The footprint is dominated by the sink observed in Scope 1 from sequestered carbon in woodlands, and the impact of the pension within Scope 3. The following observations are made within each category:

- Buildings: This is a relatively minor category, though one that DNPA has greater direct control over. About three-quarters of emissions here are from offices (i.e. Parke), and visitor centres (mainly Princetown Duchy Hotel). The residual emissions are from staff working at home, and other buildings
- Transport: This is also a relatively minor category, though emissions here are about double those from buildings. About 60% of emissions are from staff commuting with a little over a third from DNPA's own vehicles. Emissions from the grey fleet and business travel are low.
- Purchased Goods and Services: Emissions from this category are 322 tCO_2e and are a significant additional source of emissions compared to previous footprints undertaken by DNPA. Emissions are from a mix or recurring revenue activities, and some fixed term projects. The top category of emissions was associated with visitor management and facilities, at 9% of all purchased goods and services. The method used to calculate these emissions was very high level with a large potential for error.
- Investments: Emissions from the pension were 4,259 tCO_2e for the period. Considering only GHG sources (i.e. not sequestration from land use), this would represent 88% of the entire footprint. DNPA has little to no direct influence on the management of the Devon Pension Fund.
- Land Use: DNPA's woodlands offset a significant amount of GHG due to annual sequestration, representing 36% of all GHG sources. It was not possible to determine the extent to which open habitat sites are a source or sink of GHG emissions.

Contents

1 Introduction

Dartmoor National Park Authority (DNPA) was created by the Environment Act 1995 to conserve and enhance Dartmoor National Park's natural beauty, wildlife and cultural heritage, and to promote opportunities for the public to understand and enjoy the special qualities of Dartmoor National Park. It is headquartered at Parke and has approximately 90 staff.

DNPA has produced an organisational greenhouse gas inventory (or 'carbon footprint') since 2018/19. DNPA commissioned the Centre for Energy and the Environment (CEE) at the University of Exeter to produce a carbon footprint for the 2023/24 period. This included a review of the overall scope of the footprint, and so whilst some parts of the footprint remained the same as in previous years, the revised scope means the output is not directly comparable with the footprints of previous years, and 2023/24 can be taken as a new 'baseline'.

2 Referenced Standards

There are two main standards in use that provide methods for quantifying organisational GHG emissions. The first of these is BS EN ISO 14064-1 [1] (referred to from here as ISO 14064) and the accompanying ISO/TR 14069 [2] which provides specific guidance on applying ISO 14064. The second is the Greenhouse Gas Protocol (referred to from here as the GHG Protocol) [3] and has an accompanying documents [4] and [5] which provide more detail on quantifying emissions from supply chains. In addition, there is the UK's Environmental Reporting Guidelines (ERG) [6] (specifically Chapter 3), which is broadly based on 14064 and the GHG Protocol, but is a lot less detailed. Finally, PAS 2060 [7] enables organisations to demonstrate carbon neutrality. Within PAS 2060 (Annex C Table C.1) it lists ISO 14064, the GHG Protocol, and the ERG as the three standards that can be used by organisations to provide methods to quantify GHG emissions. In general, there is significant overlap between ISO 14064 and the GHG Protocol.

3 General Approach

3.1 Definition of "Carbon Footprint"

A "carbon footprint" is taken here to be the net emissions of carbon dioxide equivalent by an organisation over a year (i.e., an annual GHG inventory), with the full boundaries of the organisation discussed in the sections below. The net emissions are established by calculating emissions from all sources (processes that release GHGs into the atmosphere), sinks (processes that remove GHGs from the atmosphere) and reservoirs (components other than the atmosphere that have the capacity to accumulate GHGs).

GHGs that contribute to anthropogenic climate change include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6). These each have a different contributory impact to climate change for the same fixed mass. The total impact of all GHGs resulting from the activities of an organisation is measured by multiplying the mass of each gas emitted by its Global Warming Potential (GWP) to an equivalent mass of carbon dioxide termed "carbon dioxide equivalent" (measured in tCO_2e). Typically, GHG emission factors will already be based on carbon dioxide equivalents and so no additional calculations will be necessary.

3.2 Guiding Principles

As per Section 4 of ISO 14064 the footprint should be developed with the following principles:

- Relevance: GHG sources (and sinks and reservoirs) and methodologies should be appropriate.
- Completeness: All relevant GHG emissions and removals should be included.
- Consistency: Meaningful comparison in GHG-related information should be enabled.
- Accuracy: Bias and uncertainty should be reduced as much as is practicable.
- Transparency: Information should be sufficiently disclosed.

3.3 Organisational Boundaries

Confirming the organisational boundary is an important step at the outset of the production of the footprint. This is covered in Section 5.1 and Annex A of ISO 14064 and in more detail and with examples in Chapter 3 of the GHG Protocol. The two standards align in their approach. It is stated that organisations can comprise one or more facilities, and that at each of these GHG emissions may be produced from one or more sources or sinks. A facility is defined as a single installation, set of installations or production processes (stationary or mobile), which can be defined within a single geographical boundary, organisational unit, or production process.

Facility-level emissions should then be consolidated by one of the following approaches:

- Control: The organisation accounts for all emissions over which it has either financial or operational control.
- Equity: The organisation accounts for its proportion of GHG emissions from respective facilities. This is more likely to be relevant for joint ventures (JVs) though in discussion with DNPA this was deemed to be not applicable.

The control approach is likely to be the most relevant approach here (the equity share approach is stated as being particularly useful for multinational companies with operations in a number of different jurisdictions). Under the control approach 100% of GHG emissions are accounted for operations over which it has control. Emissions from operations where the organisation owns an interest but has no control are not included. Control is defined in one of two ways, and a choice must be made between them:

- Financial control: An organisation has financial control over the operation if it has the ability to direct the financial and operating policies of the operation with a view to gaining economic benefits from its activities. For example, financial control usually exists if the company has the right to the majority of benefits of the operation, however these rights are conveyed. Similarly, a company is considered to financially control an operation if it retains the majority risks and rewards of ownership of the operation's assets.
- Operational control: An organisation has operational control over an operation if it, or one of its subsidiaries, has the full authority to introduce and implement its operating policies at the operational level.

An operational control boundary has been applied here. It is stated in the GHG Protocol that in most cases, whether an operation is controlled by the company or not does not vary based on whether the financial control or operational control criterion is used (though the oil and gas sector is a notable exception). In practice here, using either approach is likely to result in the same total emissions within the inventory. There may however be some differences in categorisation. For example, Annex F of the GHG Protocol outlines in detail how to account for emissions from leased assets. This will mean that for assets leased to DNPA (e.g. buildings) these will be classified as Scope 1 and 2 emissions, which would be consistent with how this has been reported in previous footprints.

3.4 Reporting Boundaries

Organisations should establish reporting boundaries and sources and sinks of GHG emissions within each. These are separated into direct and indirect emissions with sub-categories as discussed in the next section. This results in Scopes 1, 2 and 3 emissions as follows and shown in Figure 1:

- Scope 1 (direct emissions): Activities owned or controlled by the organisation that release emissions straight into the atmosphere, e.g., combustion in owned boilers or vehicles.
- Scope 2 (energy indirect): Emissions released into the atmosphere associated with the consumption of purchased electricity, heat, steam, and cooling.
- Scope 3 (other indirect): Emissions that are a consequence of the organisation's actions, which occur at sources which are not in ownership or control of the organisation, e.g., business travel by means other than company vehicles, waste disposal, or purchased materials.

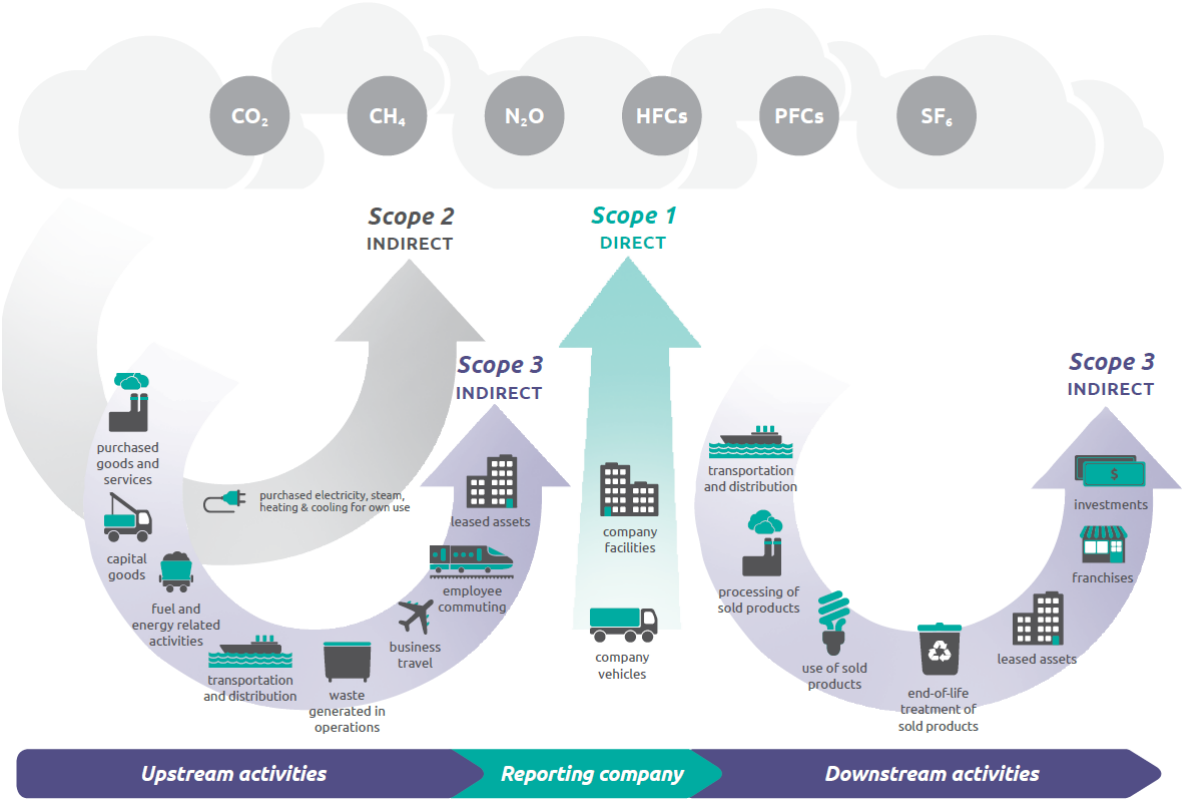

Figure 1: The relationship of direct and indirect emissions [Source: GHG Protocol]

Scope 3 emissions can occur upstream, downstream, or be designated as out of stream. This is helpful to avoid double-counting between organisations. The determining of significance for inclusion of indirect emissions (Scope 3) should be based on magnitude, level of influence, business risk or opportunity, sector-specific guidance, outsourcing and employee engagement. These should be assessed for significance with the help of external experts, sector-specific guidance, literature reviews or third-party databases. Often, a significance test will be clear but where it is not (for example where data is qualitative) then a "deeper analysis of the criteria may be helpful". An example is given where it is estimated that a source is estimated to be approximately 10% of an organisation's total indirect emissions but that relevant data would be very expensive to obtain, and the resulting accuracy would be poor. In all cases where sources of emissions are not included this should be stated in a transparent manner.

3.5 Inventory Categories

Categories within each of the three scopes are provided by ISO 14064 and the GHG Protocol and their secondary documents respectively. These two standards were cross-referenced and in general they align, with some minor differences. A list of categories and whether they have been scoped in and out is shown in Table 1. Specific explanation of what is included within each of these together with data collection and calculation approaches is provided in Section 4.

Table 1: Inventory categories and their recommended inclusion or not within the footprints for DNPA

Scope	Upstream/ Downstream	No.	Category ISO 14064-1	Include/ Exclude
Scope 1: Direct GHG emissions and removals				
1	Direct	1	Direct emissions from stationary combustion	Include
		2	Direct emissions from mobile combustion	Include
		3	Direct process related emissions	Exclude – Not Relevant
		4	Direct fugitive emissions	Include
		5	Direct emissions and removals from Land Use, Land Use Change and Forestry (LULUCF)	Include
Scope 2: Energy GHG indirect emissions				
2	Upstream	6	Indirect emissions from imported electricity consumed	Include
		7	Indirect emissions from consumed energy imported through a physical network	Exclude – Not Relevant
Scope 3: Other indirect GHG emissions				
3	Upstream	8	Energy-related activities not included in direct emissions and energy indirect emissions	Include
		9	Purchased goods and services	Include
		10	Capital equipment	Include
		11	Waste generated from organisational activities	Exclude
		12	Upstream transport and distribution	Exclude
		13	Business travel	Include
		14	Upstream leased assets	Exclude – Not Relevant
		15	Investments	Include
	Downstream	16	Client and visitor transport	Exclude
		17	Downstream transport and distribution	Exclude – Not Relevant
		18	Use stage of the product	Exclude – Not Relevant
		19	End of life of the product	Exclude – Not Relevant
		20	Downstream franchises	Exclude – Not Relevant
		21	Downstream leased assets	Exclude – Not Relevant
		22	Employee commuting	Include
	Varies	23	Other indirect emissions not included in the other 22 categories	Exclude – Not Relevant

Most of the categories excluded in Table 1 were because they were not relevant to DNPA. The following exceptions and their reason for exclusion were:

- Capital equipment: This was aggregated within the previous section on purchased goods and services as it was not able to separate capital from revenue spend.
- Waste generated from organisational activities: No specific waste data was available (e.g. mass of waste for each waste stream and processing method) so this was instead captured via spend on purchased goods and services.
- Upstream transport and distribution: Whilst the supply of goods and services to DNPA will result in emissions from upstream transport and distribution, the magnitude of the emissions are likely to be low, and obtaining meaningful information would be extremely challenging and expensive.
- Client and visitor transport: Emissions from clients and visitors to DNPA specifically are likely to be low, and gathering meaningful information would be challenging. Emissions from visitors to Dartmoor National Park will be significant. However, as all UK national parks are part of Race to Zero[1] which looks looking at overall carbon reduction plans for the national parks, emissions from visitors to Dartmoor were excluded from this organisational footprint.

In addition to the above categories, there is value in reporting against categories that better align with the internal organisation of DNPA. For example, emissions from buildings may arise from stationary combustion (category 1 above), imported electricity (6), energy related activities (8), capital equipment (10) i.e., the construction of new buildings. Reporting emissions under a "buildings" category with additional sub-categories as required, may be more informative. A secondary reporting category list can be produced by mapping all the categories (including splitting categories where necessary) into the new list. Following discussions with DNPA, a secondary category list has produced as follows:

1. Buildings
    - 1.1 Visitor Centres
    - 1.2 Offices
    - 1.3 Other
    - 1.4 Home Working
2. Transport
    - 2.1 DNPA Operated Vehicles
    - 2.2 Business Travel
    - 2.3 Grey Fleet
    - 2.4 Staff Commuting
3. Purchased Goods and Services
    - 3.1 Purchased Goods and Services
4. Investments
    - 4.1 Pensions
5. Land Use
    - 5.1 Woodland
    - 5.2 Open Habitat Sites

[1] https://www.nationalparks.uk/race-to-zero/

3.6 Reporting Periods

The carbon footprint was undertaken for the financial year i.e., April 2023 to March 2024. As this is the first year a revised scope for the footprint was considered, it was taken to be the new baseline footprint.

The underlying data and emission factors used in the calculations should be based on the chosen reporting period. Where there was no data available covering the full reporting period, the following hierarchical approach was taken:

1. If data is available for part of the period, then it was used to provide an average value for that period of time and then multiplied up to estimate the total for a year.
2. If partial data is not available, then data from the previous year's footprint was used.
3. If no data from previous years are available, then estimates should be made using secondary sources of data e.g., benchmark data in the case of building energy consumption.

In all cases, if data was not available for a full year, then measures should be put in place to enable the data to be available for the next year's footprint. In addition, it was clearly stated where estimates have been made in the absence of data being available.

3.7 Quantifying Emissions and Removals

Calculation methodologies were selected to minimise uncertainty and yield accurate, consistent, and reproducible results (being mindful of technical feasibility and cost of data gathering). Within each category, sources and sinks were identified. As it is not practicable to directly measure the actual mass of GHGs emitted from an activity, the calculation will take the form of multiplying some input activity data with an emission factor.

The choice of activity data will depend on what is available, but in principle a data hierarchy approach was taken that priorities primary data (i.e., that collected by the organisation) and site-specific data over secondary data and other estimates. For example, for emissions from vehicles, it would be preferable to use the actual amount of fuel used to the amount spent on fuel, which in turn would be more accurate than knowing the distance travelled. Where a mix of data is available within a category then the hierarchy approach should still be followed. For example, if fuel consumption data exists for some vehicles and mileage data exists for all vehicles, then the fuel consumption data should be used for those vehicles, and the mileage data for the remainder. In addition, steps should be put in place to capture fuel consumption data for all vehicles for the following year's inventory.

Emission factors may come from a range of sources, however the most extensively used will be the UK GHG Conversion Factors for Company Reporting [8](referred to from here as the "Government EFs"). These provide consistent emission factors to be used for a range of activities and are updated annually. For this 2023/24 footprint, the 2023 Government EFs were used as the majority of the financial year falls in the 2023 calendar year.

In all cases, as a minimum an aggregate value should be quantified for each category. However, there will be benefits to maintaining as fine a level of granularity as the source data enables within the calculations and reporting. For example, for buildings this would include calculating emissions on a per-building basis if metered data is available for each building, rather than just as the sum-total of all buildings within the estate. For reporting it may be preferable to only separate out the most significant sources within the category to avoid long unmanageable lists e.g., for large buildings, with smaller buildings or sites aggregated together. The full detail should however be retained within calculation tools or spreadsheets to enable onward analysis.

3.8 Intensity Ratios

The headline inventory was reported in absolute terms as tCO_2e. The nature of DNPA does not lend itself well to normalising by other intensity ratios, for example by number of employees, operating budget, size of estate etc.

3.9 Target Setting

DNPA is in the process of reviewing its targets with a view to aligning with the Science Based Targets Initiative (SBTi).

4 Data Collection and Analytical Approach by Category

4.1 Scope 1: Direct Emissions

4.1.1 Direct emissions from stationary combustion

Description

Direct emissions arising from the combustion of fuels (for example, natural gas or oil) on-site in plant (for example boilers) within the organisational boundaries of the reporting organisation. In practice, this is likely to be predominantly gas boilers in owned buildings.

Approach Taken for Footprint

Aggregated annual fuel consumption data was available for Parke (86,732 kWh of gas and 1,397 litres of heating oil), and Princetown Duchy Hotel (195 tonnes of wood chip). These were multiplied by the corresponding government EFs.

This data is already sufficiently accurate to produce a reliable estimate of GHG emissions, though more insight could be available if energy use was available at greater granularity, for example for Parke half-hourly.

4.1.2 Direct emissions from mobile combustion

Description

Direct emissions arising from fuel burnt in transport equipment within the organisational boundaries of the reporting organisation. In practice, this will be emissions from owned vehicles. Emissions from other transport will be accounted for within Scope 3 categories.

Approach Taken for Footprint

The total volume of diesel and petrol used in DNPA's own vehicles was available for each quarter for both diesel and petrol. These totalled 21,371 litres for diesel and 441 litres for petrol for the year. A small amount of electricity for electric vehicles was also stated, though it was assumed this was also included in the building electricity consumption and so was not included to prevent double counting. In addition, the volume of petrol used in tools was also available. These were multiplied by the government EFs. In addition, there was 100 litres of petrol from the fuel data in section 4.1.1 which was assumed to be used for ranger tools and reported in this section. The fleet for 2023/24 comprised 25 diesel vehicles with associated mileage for that year. For onward analysis (projected emissions), the 21,371 litres were apportioned to each vehicle based on its proportion of the total mileage for the fleet (152,394 miles).

Whilst total fuel consumption is sufficiently accurate to produce a reliable estimate of GHG emissions, the accuracy of individual vehicle GHG emissions could be improved by directly measuring fuel used by each vehicle as well as mileage. Combining the two could be used to establish efficiency metrics (i.e. $kgCO_2e$/mile).

4.1.3 Direct process related emissions

This category has been taken to be out of scope as it is not relevant to the activities of DNPA.

4.1.4 Direct fugitive emissions

Description

These are direct uncontrolled emissions of GHG, with any process that directly utilises GHG being a potential source of emissions. In practice, this will mean emissions of refrigerants for space conditioning systems in buildings (e.g., cooling or heat pumps) and potentially vehicles owned by the organisation.

Approach Taken for Footprint

Estates confirmed there was no leakage of refrigerant in the reporting year.

4.1.5 Direct emissions and removals from Land Use, Land Use Change and Forestry (LULUCF)

Description

GHG emissions and removals from LULUCF may come from anthropogenic land use activities (controlled biomass burning, restoration of wetlands, forest management, rice and other agriculture cultivation, animal husbandry generating enteric fermentation,) direct land use change (afforestation, reforestation, and deforestation), and managed forests, within the organisational boundary. For DNPA this means the flux of GHG emissions from its woodlands and open habitats.

Approach Taken for Footprint

A report produced by Farm Carbon Toolkit in 2023 identified the baseline annual sequestration in DNPA's woodland estate, using the Forestry Commission's Woodland Carbon Code methodology. These numbers were taken directly from Table 1 of the Farm Carbon Toolkit report. They were unable to determine carbon sequestration from the open habitat sites due to a lack of soil sample replication for soil and habitat combinations.

The values used here can be used in future years, though there would be an implicit assumption that woodland areas remain constant. To improve data accuracy going forward would require commissioning further work to understand the level of carbon sequestration from woodland both in terms of quantity of woodland, and its age and condition. Efforts should also be taken to quantify carbon sequestration from open habitats, even if initially these may be high-level estimates with high margins of error.

4.2 Scope 2: Energy Indirect Emissions

4.2.1 Indirect emissions from imported electricity consumed

Description

These are indirect emissions associated with the import of electricity by the organisation. It excludes upstream emissions associated with the production of fuels feeding power stations, embodied emission associated with the production of generation plant, and the transmission and distribution network (these are captured within Scope 3). In practice, this will be electricity consumption from buildings, and increasingly vehicles.

Approach Taken for Footprint

Electricity consumption data (kWh) was available for the reporting period for all buildings occupied by DNPA. In 2023/24 this comprised 12 sites which totalled 148,903 kWh. These were multiplied by the government EFs for grid electricity (generation). The quality of the source data is already sufficient to be able to calculate GHG emissions.

4.2.2 Indirect emissions from consumed energy imported through a physical network

This category has been taken to be out of scope as it is not relevant to the activities of DNPA.

4.3 Scope 3: Other Indirect Emissions

4.3.1 Energy-related activities not included in direct emissions and energy indirect emissions

Description

These are indirect emissions from upstream activities associated with fuel and electricity consumption by the reporting organisation. Examples include the extraction, production, transport, and distribution of fuel and energy. In practice, this will be an additional well to tank (WTT) uplift on all fuel use from stationary and mobile construction, imported electricity, business travel and employee commuting.

Approach Taken for Footprint

These were calculated by establishing these emissions in parallel to the main emission source, as described above. These were applied to direct emissions from stationary and mobile consumption, imported electricity, business travel, and commuting. For each of these, the source 'activity data' was in addition multiplied by the corresponding WTT factor as the main EF used. For electricity, the factor used was the sum of three upstream factors – the generation WTT, transmission and distribution (T&D), and T&D WTT.

4.3.2 Purchased products and services

Description

These are emissions associated with the consumption of goods and services by the reporting organisation that are not otherwise included elsewhere in the inventory. For example, business travel, or electricity consumption are all examples of goods and services that are consumed, but they are already accounted for within specific sub-categories in the inventory that have been created within the standards to improve transparency and consistency. These scope of these emissions are 'cradle to gate' i.e., all emissions that occur up to the point of sale by a producer e.g., raw material extraction, transport to a manufacturing facility, processing etc., but not including onward transport to the customer. In practice, this category will rely heavily on engagement with both procurement departments, and supply chain partners.

Approach Taken for Footprint

DNPA purchase goods and services via a central procurement service (most spend), and additionally from Government Purchase Cards (GPC). This data was analysed using a 'spend based method'.

The central procurement data was analysed first. Each transaction was allocated to an expense area and expense type based on the stated 'activity code' and 'expense code'. In 2023/24 there were 38 expense types and 120 expense types. The expense type was found to be most useful in terms of relating to a sector in the UK economy whereby emission factors are available for each sector (there are 110 high level codes using the Standard Industry Classification [SIC] classification system). Each of the expense types was allocated to one of the SIC codes, or alternatively as either 'included elsewhere'

(e.g., in the case of vehicle fuel), or 'not relevant' (where these spend items were not expected to result in emissions). The most recent and applicable emission factors to be used are from the 2021 UK's carbon footprint dataset [9] in the 'SIC multipliers' sheet. These were adjusted by inflation (CPI) to convert the factors from 2021 to 2023 (2023 index 130.5, 2021 index 111.6 compared to a 2015 index of 100, so to account for inflation multiply 2021 EFs by 111.6/130.5 i.e. 0.86), and spend in each category multiplied by the corresponding EF to obtain GHG emissions.

The GPC dataset only included a description of the purchase and the merchant name, and so it was not possible to easily assign a sector to each spend item as with the centrally procured spend. Instead, a weighted emission factor (0.184 $kgCO_2$/£ spent for 2023/24) was calculated from the centrally procured spend and applied to each line of spend from the GPC data.

Whilst this method is effective at being able to relatively quickly calculate emissions arising from anywhere in the economy, it is important to recognise it is not likely to be accurate and cannot distinguish emissions between spend within a category or between suppliers, and is only really useful as an initial rough 'snapshot' rather than as a tool that can identify specific opportunities or track changes over time (as the only two factors in the calculation are amount spent and the emission factor). To improve data quality in future years, steps should be taken to engage with suppliers to obtain more relevant and specific EFs. Suppliers should be ranked by spend and those with the highest spend targeted first. If specific data is obtained for a supplier then this can be used to replace the spend-based EF used in the current approach, with that approach persisting where specific supplier data is not available.

4.3.3 Capital equipment

Description

These are emissions associated with the purchase of capital goods. There is the potential for overlap in the categorisation of either purchased goods/products, and capital goods and so it is important that they are only accounted for in one place. The GHG Protocol states that *"Capital goods are final products 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, capital goods are treated as fixed assets or as plant, property, and equipment (PP&E). Examples of capital goods include equipment, machinery, buildings, facilities, and vehicles"*. Whilst purchased products are sometimes referred to as "consumables" and are used over a short period of time (e.g., days or usually less than a year), capital goods are used for much longer periods (e.g., 5 to 50 years). Whether a good is classified as a "purchased product" or "capital good", the reporting should make clear which category it is being accounted for in.

Approach Taken for Footprint

The source data from the previous section on purchased goods and services did not enable separation of spend on capital and revenue items, and to capital equipment was included within that section, and not separately reported here. If spend data was separated into revenue and capital spend, then these categories could be separately reported here.

4.3.4 Waste generated from organisational activities

Description

Waste can impact on organisational GHG emissions in several ways, including:

- The use of recycled materials in the products the organisation purchases. These are already accounted for in the section on purchased products and services.

- The transport and subsequent processing of waste generated by the organisation. This is what is covered within this section. Technically, the transport of waste from the organisation to the waste treatment facility would constitute "upstream transport and distribution", however as the Government EFs combine the transport and waste processing impact, they are assumed to be included within this section.
- The onward disposal of waste from products sold by the organisation. This is not applicable to DNPA.

No specific waste data was available (e.g. mass of waste, by waste stream and processing method) so this was instead captured via spend on bought goods and services.

4.3.5 Upstream transport and distribution

Description

This category includes transportation and distribution (both transport and logistics including warehousing) of products purchased by the reporting company in the reporting year between a company's tier 1 suppliers (i.e., those with which the organisation has a direct purchase order) and its own operations, and transportation and distribution services purchased by the reporting company in the reporting year, including inbound logistics, outbound logistics. The transport within the supply chains between tier 1 and 2 suppliers should be included within the "purchased goods and services" section i.e., that section reports "cradle-to-gate" emissions (where gate is the factory gate of a supplier), and this section should report on the transport of those goods from the factory gate to the organisation.

Whilst the supply of goods and services to DNPA will result in emissions from upstream transport and distribution, the magnitude of the emissions are likely to be low, and obtaining meaningful information would be extremely challenging and expensive and so this was not reported here.

4.3.6 Business travel

Description

This section includes emissions from business travel in vehicles owned or operated by third parties and also includes emissions associated with hotel stays on business trips. The aim should be to report emissions by mode of transport and for hotel stays.

Approach Taken for Footprint

Mileage data from the grey fleet was available on a quarterly basis. Annually this resulted in 26,125 miles. This was multiplied by the emission factor for 'an average car with an unknown fuel'.

Distance travelled for three modes of public transport. There were 6,036 km by plane which was multiplied by the emission factor for an economy short haul flight inclusive of radiative forcing. There were 3,685 km by train which was multiplied by the national rail emission factor. There were 702 km travelled by bus which was multiplied by the local bus emission factor. There were 64 nights spend in hotels which were multiplied by UK hotel nightly room emission factor.

The data is generally sufficient to calculate annual GHG emissions. It could be improved by establishing vehicle type (e.g. vehicle fuel petrol/diesel/electric) to provide a more accurate result. This will become more important as electric vehicles become increasingly commonplace.

4.3.7 Upstream leased assets

This category has been taken to be out of scope as it is not relevant to the activities of DNPA.

4.3.8 Investments

Description

Indirect emissions from investments are emissions due to operation of equity investments. An equity investment refers to the holding of shares of stock on a stock market in anticipation of income from dividends and capital gains, as the value of the stock rises. It may also refer to the acquisition of equity (ownership) participation in a private (unlisted) company or a start-up company. For DNPA, this has been taken to be the pension scheme of its staff.

Approach Taken for Footprint

DNPA contribute to the Devon Pension Fund which is part of the Brunel Pension Partnership. The fund regularly published its Weighted Average Carbon Intensity (WACI) which in 2023 was 150 tCO_2/£million. The value of DNPA's investment was £28.39 million, which was multiplied by the WACI to obtain the annual emissions from pension holdings.

This approach is high level, though reasonable for the production of the footprint for DNPA.

4.3.9 Client and visitor transport

Emissions from clients and visitors to DNPA specifically are likely to be low, and gathering meaningful information would be challenging. Emissions from visitors to Dartmoor National Park will be significant. However, as all UK national parks are part of Race to Zero which looks looking at overall carbon reduction plans for the national parks, emissions from visitors to Dartmoor were excluded from this organisational footprint.

4.3.10 Downstream transport and distribution

This category has been taken to be out of scope as it is not relevant to the activities of DNPA.

4.3.11 Use stage of the product

This category has been taken to be out of scope as it is not relevant to the activities of DNPA.

4.3.12 End of life of the product

This category has been taken to be out of scope as it is not relevant to the activities of DNPA.

4.3.13 Employee commuting

Description

This includes transport of employees between their homes and workplaces. In the case of DNPA this would cover transport from the home to the office, with any transport during working hours captured within other sections. This can cover a range of modes but in practice will be mainly driving (either single driver or car sharing) as well as potentially public transport modes and walking/cycling. Also included in this section is 'home working' i.e., emissions arising from energy used to heat homes and operate work equipment whilst staff are home working.

Approach Taken for Footprint

A staff travel survey was undertaken, with the latest results from 2022. This asked staff about their work patterns including numbers of days at home and in the office, their commuting distances, and their modes of travel. A total of 63 responses were gathered. The results were analysed as follows:

- There were nine modes of transport selected by applicants from the survey (small/medium petrol car, small/medium/large diesel car, hybrid vehicle, bicycle, electric bicycle, foot).

- For each survey response the weekly miles by each selected mode (up to three types) were calculated by multiplying the user entered return distance travelled by the user entered number of times a week the journey was made.
- Manual adjustments were made to account for lift sharing with the assumption that a lift share had two occupants to a vehicle. For example, where an applicant chose car as a single mode of transport and that it was a car share, the resulting distance travelled was halved.
- The total number of days worked by each survey respondent was calculated by summing the user entered number of weekly days worked at home with number of days commuted by each mode.
- The total miles per week for each mode were then calculated by summing all the weekly miles each respondent entered for each mode.
- The effective full time equivalent (FTE) responding to the survey was established by dividing the total number of days worked a week (276) by the number of assumed days a week for an FTE (5) resulting in 55.2 FTE. Given there were 63 responses, this is equivalent to an average of 0.88 FTE per respondent.
- The total mileage for each mode was divided by the 55.2 FTE to return weekly miles/FTE for each mode. This was multiplied by an assumed 47 weeks a year to return miles/FTE per year for each mode.
- The number of FTE in the organisation in 2023/24 (80.89 FTE) was multiplied by the miles/FTE for each mode to establish total organisational miles by mode, which could then be multiplied by the corresponding Government EF.
- The number of annual home working hours per FTE was calculated by counting the total number of stated days worked from home in the survey (80.5), establishing the fraction of total equivalent FTE weekdays worked from home (0.29) by dividing by the total number of days worked by survey respondents (276). Based on a 5-day working week and a fraction of 0.29 work from home, this results in an equivalent of 1.46 days/week which for 8 hours a day and 47 weeks is 548.3 hours/FTE. This was multiplied by the number of FTE and the corresponding Government EF for homeworking (heating and power).

The format of the survey is sufficient to enable appropriate analysis for future years. It should be rerun annually, and it should be ensured that there are allowable modal inputs to enable respondents to select electric vehicles (it was unclear if this was allowable in 2023/24, though if it was then no respondent did select it).

4.3.14 Other indirect emissions not included elsewhere

No other sources of emissions have been identified.

5 Results

DNPA's total net emissions in 2023/24 were 3,096 tCO_2e. The footprint is dominated by the sink observed in Scope 1 from sequestered carbon in woodlands, and the impact of the pension within Scope 3, as can be seen in Figure 2. A full breakdown of emissions within GHG Protocol/EN 14064-1 categories is show in Appendix A.

Emissions broken down by theme are shown in Table 2, Figure 3, and Appendix B. The following observations are made within each category:

- Buildings: This is a relatively minor category, though one that DNPA has greater direct control over. About three-quarters of emissions here are from offices (i.e. Parke), and visitor centres

(mainly Princetown Duchy Hotel). The residual emissions are from staff working at home, and other buildings

- Transport: This is also a relatively minor category, though emissions here are about double those from buildings. About 60% of emissions are from staff commuting with a little over a third from DNPA's own vehicles. Emissions from the grey fleet and business travel are low.
- Purchased Goods and Services: Emissions from this category are 322 tCO_2e and are a significant additional source of emissions compared to previous footprints undertaken by DNPA. Emissions are from a mix or recurring revenue activities, and some fixed term projects. The top category of emissions was associated with visitor management and facilities, at 9% of all purchased goods and services. The method used to calculate these emissions was very high level with a large potential for error.
- Investments: Emissions from the pension were 4,259 tCO_2e for the period. Considering only GHG sources (i.e. not sequestration from land use), this would represent 88% of the entire footprint. DNPA has little to no direct influence on the management of the Devon Pension Fund.
- Land Use: DNPA's woodlands offset a significant amount of GHG due to annual sequestration, representing 36% of all GHG sources. It was not possible to determine the extent to which open habitat sites are a source or sink of GHG emissions.

Figure 2: GHG emissions in 2023/24 by GHG Protocol Scope

Table 2: GHG emissions in 2023/24 by theme and sub-category and GHG Protocol Scope

Theme Category	Scope 1	Scope 2	Scope 3	Grand Total

1. Buildings	**27**	**31**	**34**	**92**
1.1 Visitor Centres	8	15	11	33
1.2 Offices	19	11	7	37
1.3 Other		6	2	7
1.4 Home Working			15	15
2. Transport	**55**		**140**	**193**
2.1 DNPA Operated Vehicles	55		13	68
2.2 Business Travel			2	2
2.3 Grey Fleet			9	9
2.4 Staff Commuting			114	114
3. Purchased Goods and Services			**322**	**322**
3.1 Purchased Goods and Services			322	322
4. Investments			**4259**	**4259**
4.1 Pensions			4259	4259
5. Land Use	**-1771**			**-1771**
5.1 Woodland	-1771			-1771
Grand Total	**-1689**	**31**	**4755**	**3096**

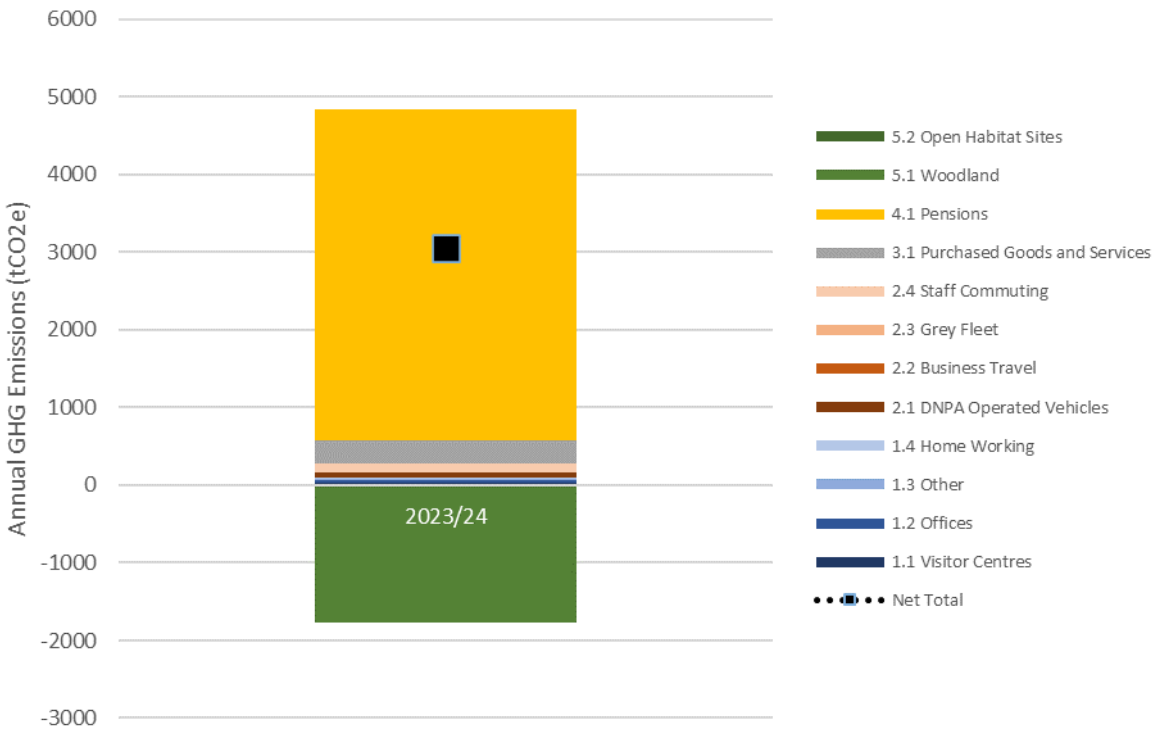

Figure 3: GHG emissions in 2023/24 by theme sub-category

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Appendix A: Inventory Broken Down by Scope and Category

Scope	No	Name	tCO_2e 2023/24	tCO_2e 2023/24
1	1	Direct emissions from stationary combustion	-1689	27
	2	Direct emissions from mobile combustion		55
	3	Direct process related emissions		X
	4	Direct fugitive emissions		0
	5	Direct emissions and removals from Land Use, Land Use Change and Forestry (LULUCF)		-1771
2	6	Indirect emissions from imported electricity consumed	31	31
	7	Indirect emissions from consumed energy imported through a physical network		X
3	8	Energy-related activities not included in direct emissions and energy indirect emissions	4755	58
	9	Purchased products		322
	10	Capital equipment		X
	11	Waste generated from organisational activities		X
	12	Upstream transport and distribution		X
	13	Business travel		10
	14	Upstream leased assets		X
	15	Investments		4259
	16	Client and visitor transport		X

	17	Downstream transport and distribution		X
	18	Use stage of the product		X
	19	End of life of the product		X
	20	Downstream franchises		X
	21	Downstream leased assets		X
	22	Employee commuting		105
	23	Other indirect emissions not included in the other 22 categories		X
Offset	24	Offset Carbon		0
		GRAND TOTAL (net)		3096

Appendix B: Inventory Broken Down by Theme and Detail

Category and Detail	2023/24
1. Buildings	**92**
1.1 Visitor Centres	**33**
Princetown Duchy Hotel	24
Postbridge	5
Haytor	4
1.2 Offices	**37**
Parke	33
Heating Oil	4
1.3 Other	**7**
Works Depot	3
Newbridge Aerial	0
Meldon	1
Ranger Store	0
Dartmeet	2
Higher Uppacott	1
Uppacott	1
1.4 Home Working	**15**
Home Working	15
2. Transport	**194**
2.1 DNPA Operated Vehicles	**68**
Diesel	67
Petrol	1
Rangers Tools	0
2.2 Business Travel	**2**
Hotel Stays	1
Plane	1
Train	0
Bus	0
2.3 Grey Fleet	**9**
Grey Fleet	9
Volunteer Mileage	2
2.4 Staff Commuting	**114**
Small petrol car (up to 1.4 litre)	25
Medium diesel car (1.4-2.0 litre)	35
Hybrid vehicle	0
Small diesel car (up to 1.4 litre)	17
Medium petrol car (1.4-2.0 litre)	25
Average Car Uknown Fuel	2
Foot	0
Large diesel car (over 2.0 litre)	10
Electric bicycle	0
Bicycle	0
3. Purchased Goods and Services	**289**
3.1 Purchased Goods and Services	**322**

Visitor Management And Facilities	28
Ranger Team Vehicles	20
Legal Services	17
Biodiversity	15
Office Accommodation - Princetown	14
Environmental Land Management Scheme	11
Public Rights Of Way	12
Central Services	19
Development Control	11
Ranger Service	18
Hill Farm Project (Pcf)	13
Human Resources	11
Information Technology	10
Visitor Centre Retail	17
Visitor Centres General	5
Central Core	13
Communications Service	10
Dartmoor Headwaters	7
Office Accommodation - Parke	7
All Other Central Procurement	31
Dynamic Dartmoor	13
Archaeology	6
Government Purchase Card Spend	13
Water Consumption	0
4. Investments	**4259**
4.1 Pensions	**4259**
Pension investments	4259
5. Land Use	**-1771**
5.1 Woodland	**-1771**
Blackingstone Rock	-7
Caseley Wood	-37
Castor Copse	-37
Eastpark Copse	-52
Hawnes & Dendles	-122
Haytor	-186
Holne Moor & White Woods	-925
Plasterdown	-6
Sanduck & Huntingpark	-115
Trendlebere	-6
Whiddon Scrubs	-45
Wray Cleave & Steward Woods	-234
Grand Total	**3096**