

EPA Greenhouse Gas Emissions Report

2023



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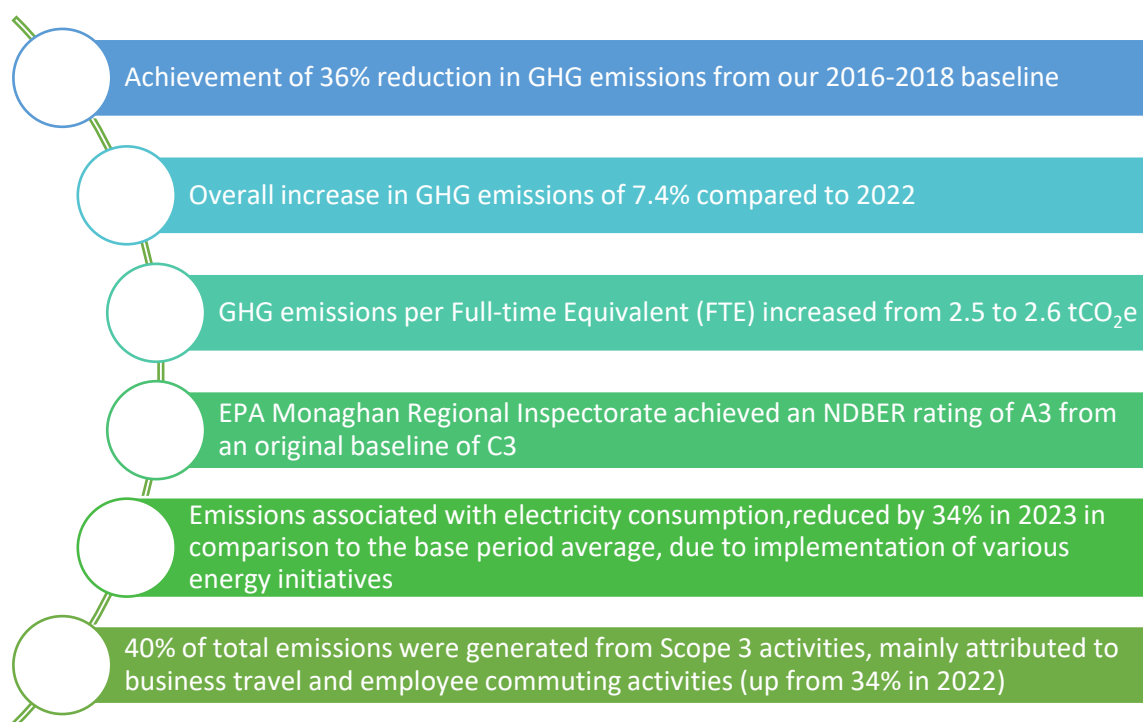
Appendix C –Emissions Inventory

Executive Summary

This Greenhouse Gas (GHG) Emission Report and associated Greenhouse Gas Inventory have been prepared using the Greenhouse Gas Protocol Corporate Standard - Revised Edition (GHG Protocol, 2015). The graphs and tables presented within the report summarise the 2023 emissions under scopes 1, 2, and 3 for the Environmental Protection Agency (EPA). The total GHG emissions generated by the EPA in 2023 were 1,228 tCO₂ equivalent (CO₂e).

The purpose of this report is to provide a comprehensive breakdown of the EPA's greenhouse gas emissions in 2023 arising from internal operations across 6 main locations; EPA Headquarters, Johnstown Castle, Co. Wexford and EPA Regional Inspectorates located in Dublin, Castlebar, Kilkenny, Monaghan and Cork.

All data is reported in tonnes of carbon dioxide equivalent (tCO₂e). The data is also provided in emissions per EPA location. The main highlights of the report include:



Relevant activity data on energy consumption, heating, transport, water usage, and waste management is collected across the EPA and converted using appropriate emission factors to Greenhouse Gas Emissions. These emissions are calculated by collecting activity data (e.g., kWhr of electricity, litres of fuel, km travelled) within the EPA's internal database and subsequently uploading this data to sustainability software which, in turn, uses emission conversion factors from the Sustainability Energy Authority of Ireland (SEAI) and the UK's Departments for Energy Security and Net Zero & the Department for Environment Food and Rural Affairs (DEFRA). This report has been prepared by reviewing and analysing the emissions data for 2023 generated by bespoke sustainability software. All Scope 1 and 2 emissions as well as some Scope 3 emissions (Business travel by road (including public transport) and air) for 2023 are submitted to the Sustainable Energy Authority of Ireland (SEAI) under annual reporting obligations. The remaining Scope 3 emissions (employee commuting, waste generated and water usage) which are reported internally are also presented in this report.

This report details the methodology used to quantify the GHG emissions attributable to the EPA and presents the results of the data tracking for 2023. Total GHG emissions generated by the EPA in 2023 were 1,228 tCO₂ equivalent. The largest emissions were generated from Scope 3 activities accounting for 40% of total with Scope 1, accounting for slightly less than a quarter (18%).

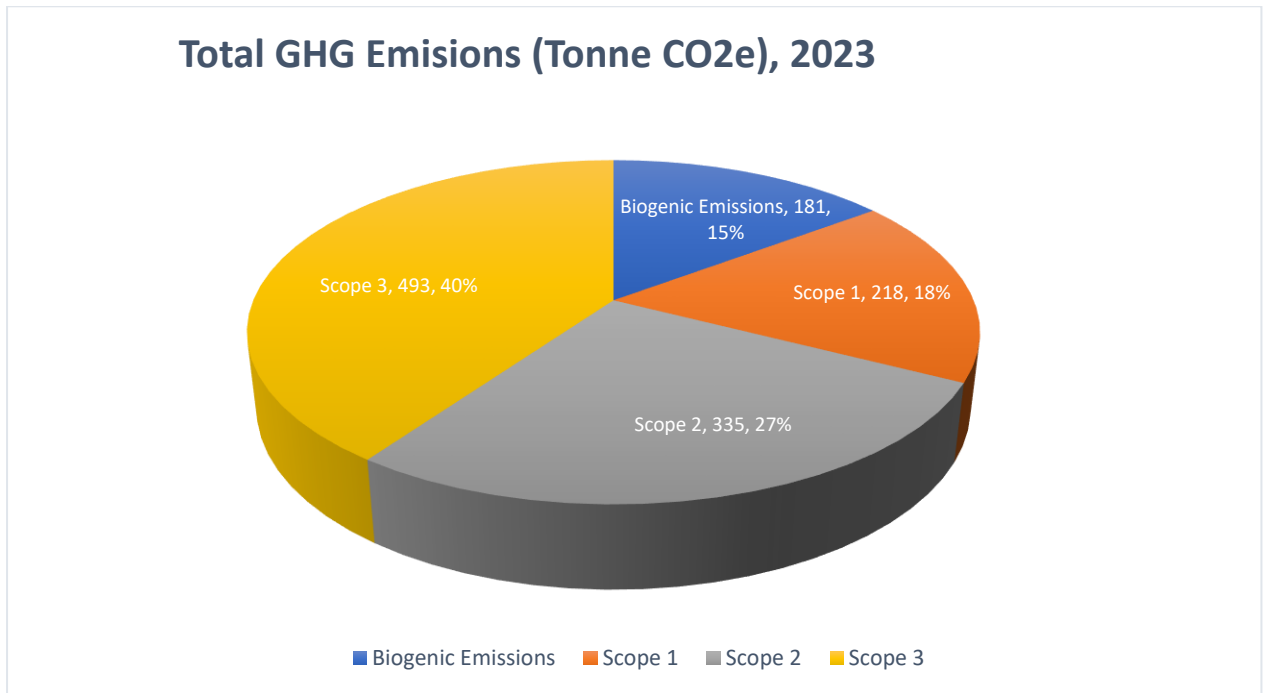


Figure 1: Total EPA GHG emissions (tCO₂e) 2023

The report also analyses comparatively against performance in previous years dating back to the 2016 - 2018 base period. Data for the base period has been averaged as shown in Figure 2. The use of the averaged base period provides a benchmark for tracking our emissions in alignment with our Strategy to reduce total GHG emissions by at least 30 percent by 2026 on our transition to carbon neutrality.

All data collected and analysed within this report follows the Greenhouse Gas (GHG) Protocol principles of relevance, completeness, consistency, transparency and accuracy.

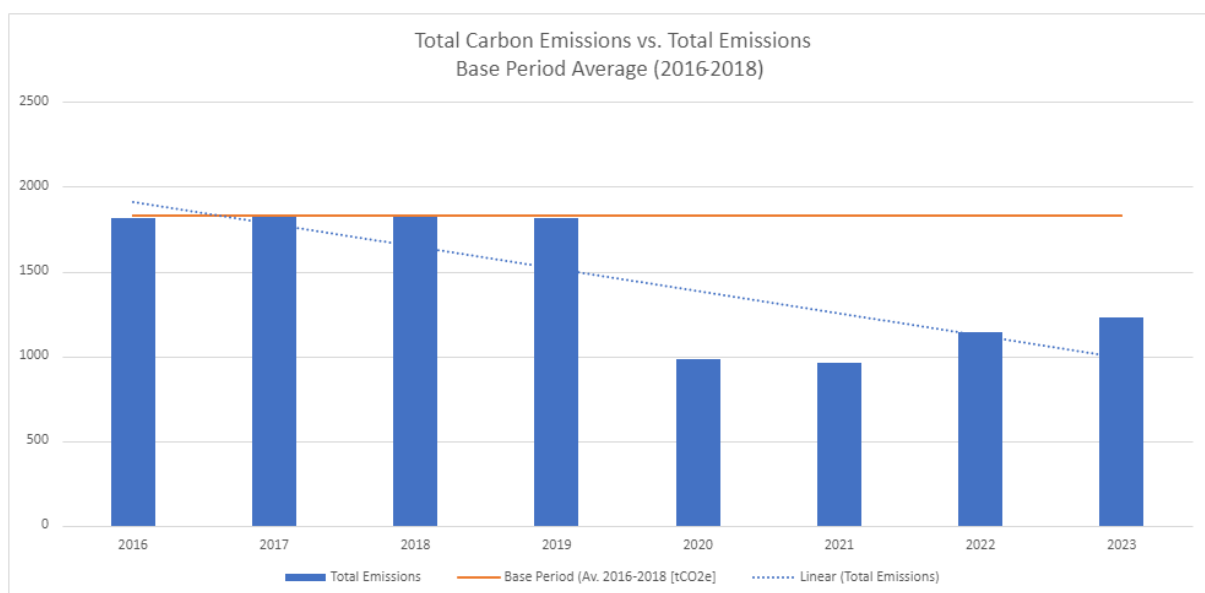


Figure 2: Total GHG emissions vs. total emissions base period average (tCO₂e)

Staffing levels have increased to 476 full-time-equivalent staff (increase of 33% since 2010) as of 31st December 2023. This reflects a reduction in emissions by over 33% from the base period average (2016-2018), when comparing the total emissions generated in 2023 per FTE EPA staff member. The GHG emissions per FTE increased from 2.5 to 2.6 tCO₂e. See Figure 3 overleaf which illustrates this trend.

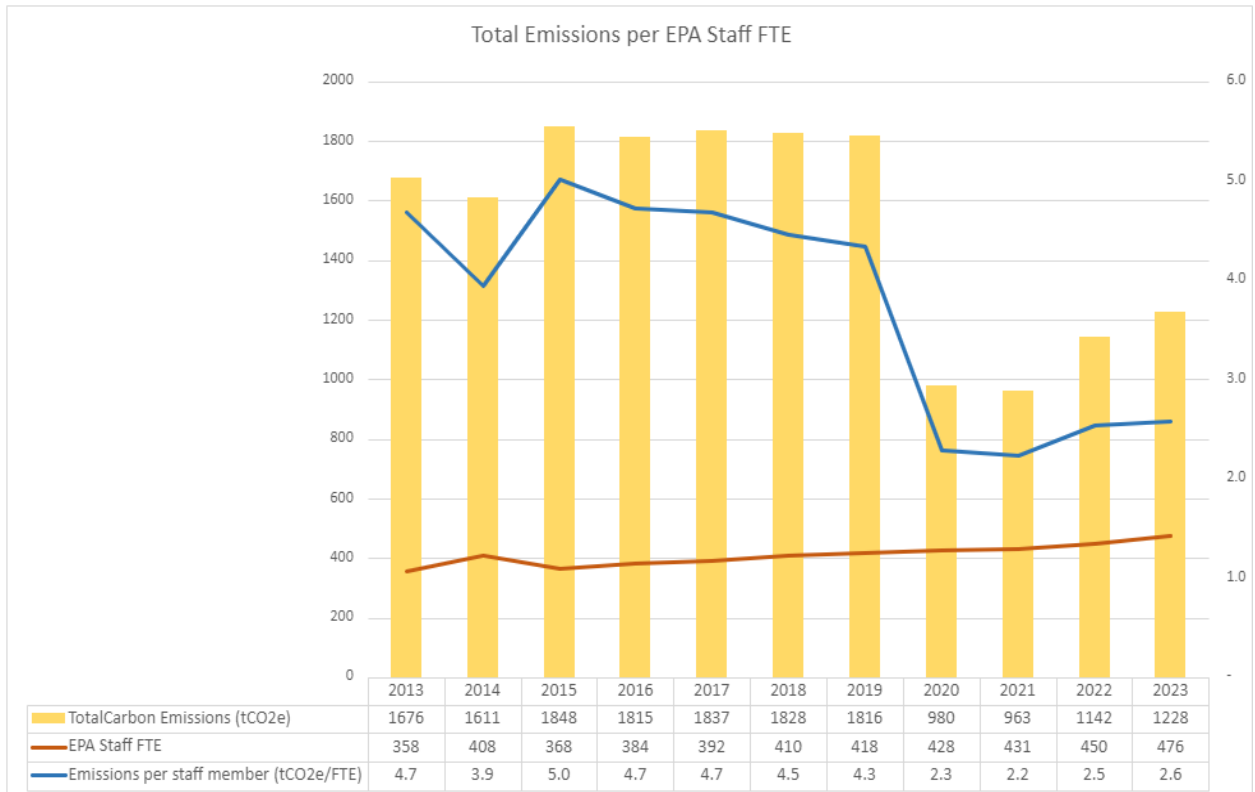


Figure 3: Total emissions per EPA FTE vs Total FTE staff numbers (tCO₂e)

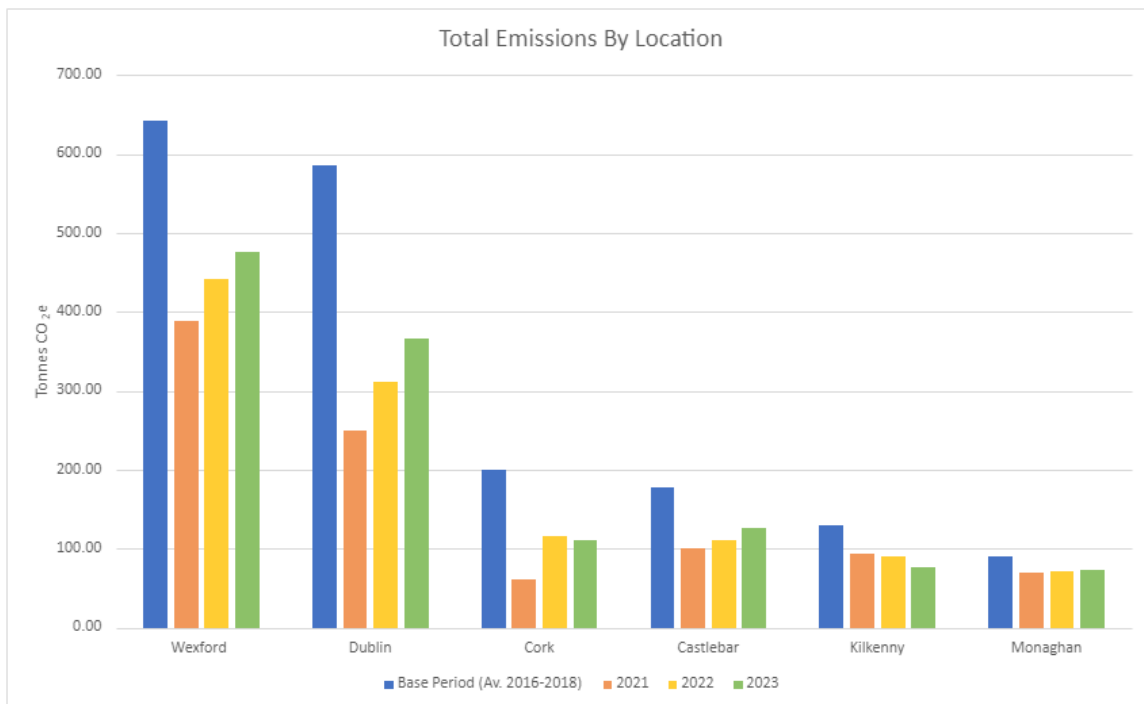


Figure 4: Total GHG emissions by EPA location (tCO₂e)

1 INTRODUCTION

1.1 Description of the EPA

The Environmental Protection Agency (hereinafter the 'EPA') is an independent regulatory body established in 1992. The purpose of the Environmental Protection Agency (EPA) is to protect, improve and restore Ireland's environment. We do this through regulation, scientific knowledge and working with others.

We have a broad environmental remit and play a key role in environmental regulation, provision of knowledge and advocacy for the environment. Our principal functions are set out in the EPA Acts 1992 to 2020 and the Radiological Protection Act 1991 to 2014 and other relevant legislation. Responsibilities include Regulation, Licensing and Enforcement, Monitoring and Reporting on the environment, Regulating and reporting Ireland Greenhouse Gas emissions, Research and development, Strategic Environmental Assessment, Guidance, Education and Public Access of environmental Information.

We have a responsibility to raise environmental awareness, influencing positive behavioural change by supporting businesses, communities, and the general population. Our vision for Ireland is ambitious and reflects the transformation needed so that we all live sustainably, that we have an environment which supports our health and well-being, and that is vibrant and healthy. We are committed to incorporating exemplary environmental management practices into our everyday activities. We aim to minimise the environmental impact of our own activities to achieve continual environmental improvement, to prevent pollution, to measure and reduce our Greenhouse Gas (GHG) emissions, adapt to climate change, and encourage environmental awareness within the EPA.

We achieved formal certification of our environmental management system to the enhanced international standard (ISO 14001:2015) in 2017, following six years of certification to the previous standard. We continue to maintain an Environmental Management System (EMS), to help us control our impact on the environment from our activities and facilities.

Through an Environmental Management Programme (EMP), we have identified several significant aspects of the EPA's operation that impact or have the potential to impact the environment. This report presents our GHG emissions for the period 2023.

In line with 2021 energy performance, we again surpassed the 2020 national energy efficiency target of 33% with an overall energy consumption reduction of 55.3% in 2023.

We are continuing our journey towards the next challenge ahead which will be to reduce our emissions even further. Targets have been set under the 2020 Climate Action and Low Carbon Development (Amendment) Bill to set Ireland on the path to net- Zero emissions no later than 2050, and to a 51% reduction in emissions nationally by the end of this decade. The EPA is affecting and monitoring change across our organisation to reduce emissions resulting from our activities over time.

This report demonstrates our continuing commitment to sustainable development and our ambition to persuade others of the changes required to reduce our collective impact on the environment.

1.2 Purpose of Report

We have reported Greenhouse Gas emissions data since 2013 and summary GHG emissions have previously been presented as part of our Environmental Performance Reports. This data was also used to inform other reports including the EPA's Climate Action Roadmap 2024, EPA Annual Report, 2023, SEAI Public Sector reports. This third formal EPA GHG Emissions report is supported by consistent, timely, and reliable data in accordance with the GHG Protocol.

This report presents the GHG emissions associated with the EPA's activities with the inclusion of all Scope 1 and 2 emissions together with certain activities falling within Scope 3. Reporting on Scopes 1 and 2 emissions are mandatory under the GHG Protocol while Scope 3 reporting is voluntary.

1.3 Methodology – The Greenhouse Gas Protocol

The calculation of our GHG emissions is based on the methodology and guidance of the Greenhouse Gas Protocol (*A Corporate Accounting and Reporting Standard* (Revised Edition)¹ and the Greenhouse Gas Protocol Corporate Value Chain Scope 3 Accounting and Reporting standard (The GHG Protocol Scope 3 standard) (WBCSD and WRI, 2004, 2011).

The GHG Protocol Initiative is a unique multi-stakeholder collaboration of businesses, NGOs, and governments, led by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). The Protocol is science based, internationally renowned and widely used as a foundation for developing inventories and GHG Emissions reporting. The latest edition of the Standard was published in 2004 and updated with guidance on Scope 2 in 2015².

This report establishes the activities undertaken by the EPA which fall within the respective scopes of the Greenhouse Gas Protocol and provides a comprehensive breakdown of our GHG emissions for 2023 arising from internal operations across six main locations; EPA Headquarters, Johnstown Castle, Wexford, and EPA Regional Inspectorates located in Dublin, Castlebar, Kilkenny, Monaghan, and Cork. This report also analyses comparatively against performance in previous years dating back to the chosen 2016-2018 base period.

1.3.1 Overview of Greenhouse Gases

The GHG Protocol covers the accounting and reporting of the six greenhouse gases covered by the Kyoto Protocol — carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆). In line with the GHG Protocol, EPA emissions data are reported for all six GHGs separately in metric tonnes and in tonnes of CO₂ equivalent:

Carbon dioxide equivalent (CO₂e) – a carbon dioxide equivalent or CO₂eq is a metric measure used to compare the emissions from various greenhouse gases based on their global warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential over a 100-year time period.

- Carbon dioxide (CO₂) – carbon dioxide enters the atmosphere through the burning of fossil fuels (coal, natural gas, and oil), solid waste, trees, and other biological materials.

¹ <https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf>

² (<http://www.ghgprotocol.org>)

- Methane (CH₄) – methane is emitted during the production transport and combustion of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices, land use and by the decay of organic waste in municipal solid waste landfills.
- Nitrous oxide (N₂O) – nitrous oxide is emitted during agricultural, land use, and industrial activities; combustion of fossil fuels and solid waste; as well as during treatment of wastewater.
- Fluorinated gases (hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF₆)) – these are synthetic, powerful greenhouse gases that are emitted from a variety of household, commercial, and industrial applications, and processes. Fluorinated gases are typically emitted in smaller quantities than other greenhouse gases, but they are potent greenhouse gases.

1.4 Persons Responsible for Data Verification

Since 2018, the EPA's Facility Management & Sustainability team supported by the EPA Green Team, and Site Environmental Managers (SEM's) have worked towards building a process and system for the calculation and evaluation of the carbon footprint associated with EPA activities.

The 2023 emissions data generated from the EPA's operational activities has been reviewed by the EPA Green Team and verified as accurate and representative for the reporting period.

1.5 Selection of the Base Period

1.5.1 [Approach to Selecting the Base Year or Period](#)

In line with the GHG Protocol Methodology, we were required to choose and report a base year/period for which verifiable emissions data are available from the earliest relevant point in time for which they have reliable data. There are two methods of base year selection outlined under the GHG Protocol:

- A single year of historical data (**base year**) or
- An average of multiple years (**base period**).

The choice of base periods allows us to balance the effort of data gathering with the potential impacts of early action. Using multi-year base periods has the added advantage of smoothing out any unrepresentative data within years (e.g., increased heating needs due to extremely cold winters).

1.5.1.1 Previous Reporting Base Year

Aligning with the Public Sector Climate Action Strategy and Public Sector Climate Action Mandate the base period of 2016 -2018 was selected as the base period applied for EPA emissions reporting. The timeframe was also more representative of the current situation with the EPA in terms of staffing numbers and provides an ambitious benchmark upon which to base future targets for reduction measures. The selection of the base period (2016-2018) defines the baseline that the EPA will use when reporting on the 2030 GHG Emission reduction target of 51%. The 2016-2018 base period has been applied for the 2023 GHG Emissions report.

2 ORGANISATIONAL AND OPERATIONAL BOUNDARY

2.1 Organisational Boundary

The EPA's core functions include regulation, enforcement, and assessment. The current EPA Strategy - EPA Strategic Plan 2022–2026 sets out strategic outcomes that provide a clear focus for the work of the EPA. The EPA has a full-time Executive Board and is organised into five offices, each led by a Director with 13 programme areas.

The organisational boundary defines the businesses and operations that establish the organisation for the purpose of accounting and reporting GHG emissions. For reporting, two distinct approaches can be used to consolidate the GHG emissions of an organisation: the equity share and the control approaches. Under the control approach, organisations can choose to report emissions from operations which they have financial or operational control over. Under the equity share approach, organisations can account for GHG emissions from operations according to their share of equity in the operation.

A financial control approach was used to set organisational boundaries for the EPA. The EPA directs financial and operating functions of 6 main locations; EPA HQ, Johnstown Castle, Wexford, and EPA Regional Inspectorates located in Dublin, Castlebar, Kilkenny, Monaghan, and Cork

At the end of 2023, there were 476 EPA employees located across the 6 EPA sites. In 2023, 385 EPA staff were working in a blended working arrangement which facilitated working from home up to a maximum of 50% of the time.

2.2 Operational Boundary

Once an organisation has determined its organisational boundaries in terms of the operations it owns and controls, it then sets its operational boundaries. This involves identifying GHG emissions associated with its operations, categorising them as direct (Scope 1) and indirect (Scope 2 & 3) emissions, and choosing the scope of accounting and reporting for indirect emissions. All Scope 1 and Scope 2 emissions were quantified and reported as was mandated by the GHG Protocol standard.

Identified **Scope 1** emission sources are the stationary combustion of natural gas, kerosene, and bio-LPG for heat and energy generation, mobile combustion of diesel and petrol from the operation of EPA owned vehicles.

Indirect stationary combustion from purchased electricity is the only **Scope 2** emission source identified. These emissions are a result of stationary combustion at the site of electricity generation. The Scope 2 emissions relate to lighting and heating of EPA buildings and mobile transport in EPA owned electric vehicles (EVs).

Scope 3 emissions are optional to quantify and report under the GHG Protocol standard (WBCSD and WRI, 2004). Further assessment of the EPA's Scope 3 activities was carried out by the internal Green Team in 2021 to identify which additional activities merited inclusion in the GHG Emissions report. The feasibility of the inclusion of all Scope 3 activities in GHG emissions reporting was assessed during the consultation process based on the quality of data currently recorded by the EPA, the level of effort

required to gather datasets, and their relevance to the overall carbon footprint. The aim was to identify the activities that were material to the EPA’s carbon footprint (i.e., heavy emitters) and to consider their inclusion in the overall emissions calculation. The EPA formally adopted Scope 1, 2 and 3 activities for use in all future emissions calculations as shown in the following Table 2.

Over time, activities will be added to Scope 3 that have a material impact on overall emissions as soon as the data becomes readily available. In 2024 and 2025 the EPA plans to further screen and identify additional scope three emissions categories and data for inclusion into the organisational boundary. It is anticipated that products, goods and services will be identified as a relevant category with data identified and calculated in line with the GHG Protocol scope 3 calculation standard.

Table 1: EPA CO₂ Emission Sources

	Emission Source	Nature of Source	EPA Location
Scope 1	Heating sources (Stationary combustion) in EPA Buildings	Stationary combustion of natural gas, kerosene, wood chip and bio-LPG for space heating	Wexford, Dublin, Cork, Monaghan, Kilkenny & Castlebar
	EPA Owned Vehicles	Mobile combustion of petrol and diesel	Wexford, Dublin, Cork, Monaghan, Kilkenny & Castlebar
Scope 2	Purchased Electricity	Indirect Stationary Combustion	Wexford, Dublin, Cork, Monaghan, Kilkenny & Castlebar
Scope 3	Business Travel	Mobile combustion of motor fuel (Private Motor Vehicle and Public transport (Bus, Taxi, Rail (National, DART & Luas)) Mobile combustion of aeroplane fuel	Wexford, Dublin, Cork, Monaghan, Kilkenny & Castlebar
	Employee Commuting	Mobile combustion of motor fuel	Wexford, Dublin, Cork, Monaghan, Kilkenny & Castlebar
	Purchased Goods and Services	Water consumption	Wexford, Dublin, Cork, Monaghan, Kilkenny & Castlebar
	Waste Disposal	EPA generated non-hazardous and hazardous waste for recovery/disposal	Wexford, Dublin, Cork, Monaghan, Kilkenny & Castlebar
Biomass	Wood Chip and Bio-LPG	Stationary combustion of wood chip and Bio-LPG fuel for space heating	EPA HQ Wexford

3 REPORTING BOUNDARIES

The GHG Protocol methodology categorises emissions sources into direct (Scope 1) and indirect emissions (Scope 2 & Scope 3).

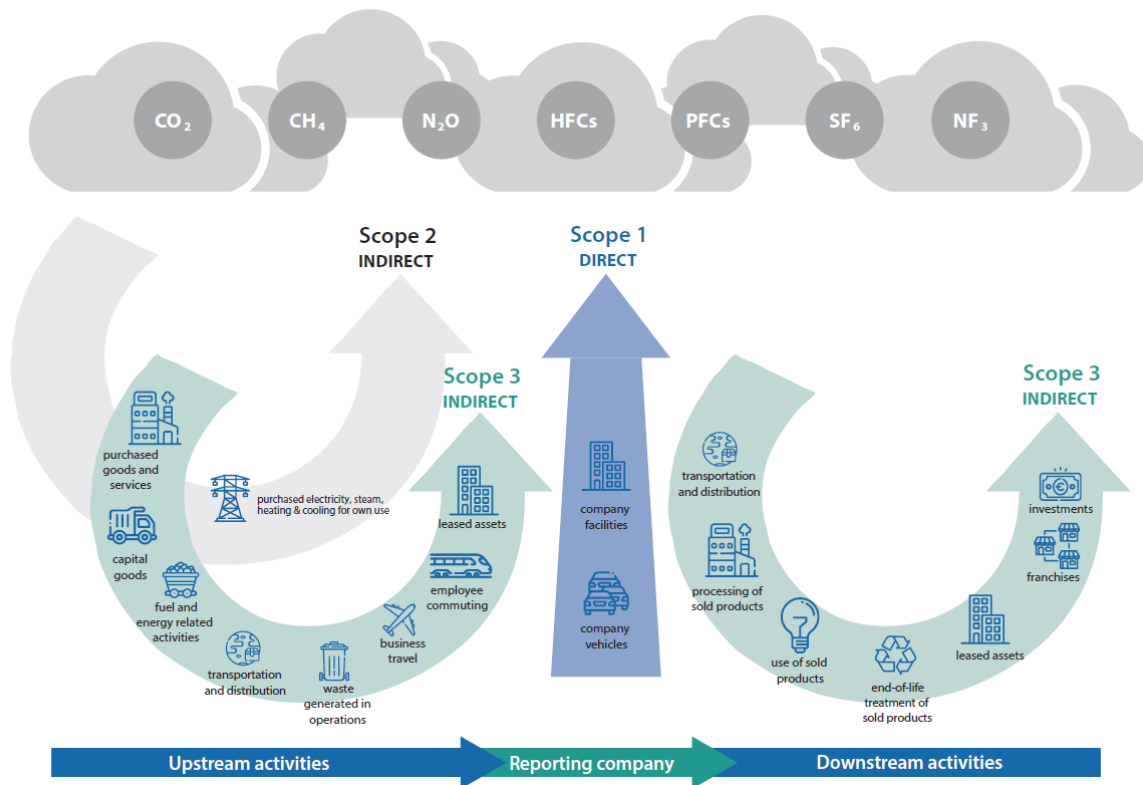


Figure 5: Scope 1, 2, 3 activities under the GHG Protocol

The EPA’s activities are currently categorised into three scopes as listed below.

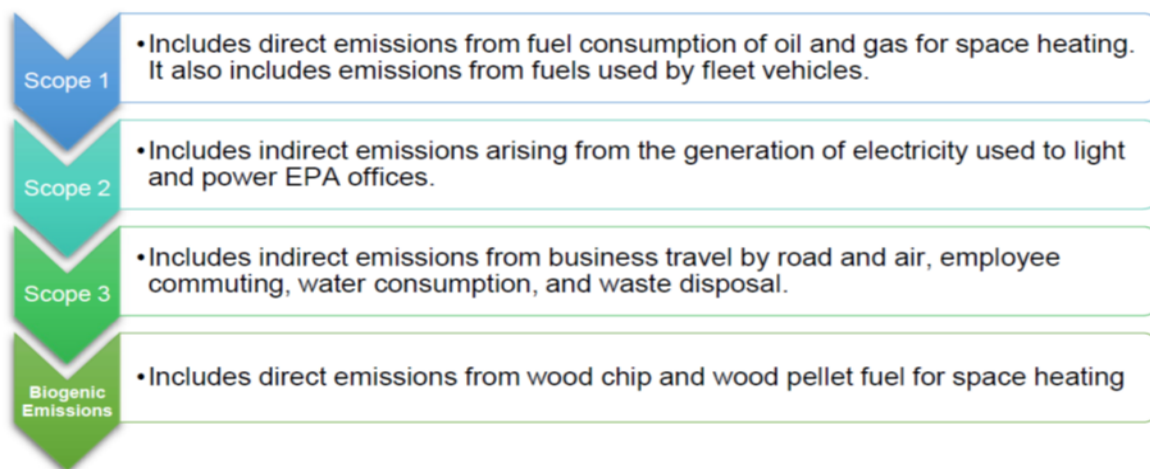


Figure 6: EPA Activities by Scope

3.1 Direct Emissions (Scope 1)

Direct emissions are emissions from sources which are owned or controlled by the EPA. All direct emissions generated from EPA activities are included in Scope 1. These include emissions from the stationary combustion of natural gas, kerosene, and bio-LPG for space heating; and emissions from the mobile combustion of diesel and petrol in EPA-owned vehicles as shown in Table 3.

Table 2: Scope 1 Emissions

Source Category	Activity Name	EPA Location
Mobile Combustion – Owned Fleet	EPA Owned Fleet – Fuel Cards	EPA Regional Inspectorates - Dublin, Kilkenny, Monaghan, Castlebar, Cork
Stationary Combustion	Natural Gas	EPA Regional Inspectorates - Dublin, Kilkenny, Castlebar
Stationary Combustion	Kerosene	EPA Regional Inspectorates – Cork
Stationary Combustion	Bio LPG	EPA Headquarters Wexford, EPA Regional Inspectorates - Monaghan
Stationary Combustion	Wood Chip	EPA Headquarters Wexford

Biogenic emissions are reported separately to the three scopes as per GHG Protocol methodology. Biogenic emissions incorporate direct emissions from the combustion of wood chip and Bio-LPG (CH₄ & N₂O fraction) for space heating at EPA HQ in Wexford and supplementary heating in Monaghan.

3.2 Indirect Emissions (Scope 2)

Indirect emissions are emissions which are a consequence of the activities of the EPA but occur at sources owned or controlled by another entity. All indirect emissions are included in scopes 2 and 3.

3.2.1 [Scope 2 Indirect Emissions](#)

Scope 2 includes indirect emissions arising from the generation of electricity. These emissions are a result of stationary combustion at the site of electricity generation. The scope 2 emissions relate to lighting and heating of EPA buildings and mobile transport in EPA owned electric vehicles (EVs).

Table 3: Scope 2 Emissions

Source Category	Activity Name	EPA Location
Purchased and Used electricity	Electricity	EPA Regional Inspectorates - Dublin, Kilkenny, Monaghan, Castlebar, Cork. EPA Headquarters Wexford – Lighting and heating of buildings, Laboratories, and canteen under the Operational Control of the EPA
Purchased and Used electricity	Electricity	EPA Regional Inspectorates - Dublin, Kilkenny, Monaghan, Castlebar, Cork. EPA Headquarters Wexford – charging of EPA owned (fleet) Electric vehicles (EVs)

3.2.2 [Scope 3 Indirect Emissions](#)

In 2021 the Green Team led a screening exercise to evaluate the EPA activities that fell within Scope 3 emissions to be included in the GHG Emissions report in line with GHG Protocol Standard. The aim was

to identify the activities that are material to our carbon footprint (i.e., heavy emitters) and consider their inclusion in the overall GHG emissions calculation.

The Scope 3 Standard recommends that organisations identify which scope 3 activities are expected to have the most significant emissions, offer the most significant reduction opportunities, and are most relevant to the company’s business goals. The relevant EPA activities falling within the Scope 3 emissions categories (voluntary for inclusion) are listed in Table 5 below.

Table 4: EPA Activities which fall within Scope 3

Scope 3 Emissions	Activity	Relevance to EPA Activity (Upstream, Downstream or Not Applicable)
1. Purchased Goods and Services	<ul style="list-style-type: none"> Laboratory supplies Stationary, Paper, Ink IT Services IT equipment Construction materials Outsourced Contractor services -Construction Facilities fit out (maintenance, carpets, painting, lighting) Provision of Clean Water 	Upstream
	<ul style="list-style-type: none"> Offsite Storage of EPA Files Outsourced contractor services – legal, consultancy, maintenance, IT, Security, offsite file storage, monitoring, Events management Courier Services Landscaping Use of Clean Water 	Downstream
2. Capital Goods	<ul style="list-style-type: none"> Laboratory Equipment (machines) Vehicles and Plant Furniture 	Upstream
3. Fuel & energy related activities (not included in Sc 1 or Sc 2)	<ul style="list-style-type: none"> Other fuels - sampling activities, pumps boats, 	Downstream
4. Upstream Transportation and Distribution	<ul style="list-style-type: none"> Transportation of Goods and Services Transportation of related activities - Purchased Fuels, Biomass 	Upstream
5. Waste Generated in operations	<ul style="list-style-type: none"> Waste disposal of EPA generated waste 	Upstream
6. Business travel	<ul style="list-style-type: none"> All other travel on vehicles not owned/controlled by EPA including private motor vehicles, public transport by road and rail and air travel Hotel Stays 	Downstream
7. Employee Commuting	<ul style="list-style-type: none"> Commuting to Work Working from Home 	Downstream

The feasibility of including all Scope 3 activities in this GHG Emissions report was assessed during the screening process. Factors such as the quality of data currently recorded by the EPA, the level of effort required to gather datasets and their relevance to the overall carbon footprint were considered.

Challenges were identified that required consideration within the EPA. The main challenges identified were:

- **Data availability:** Scope 3 covers a broad range of goods and services. The level of readiness of external providers to provide the required data is low at present but is expected to improve in the coming years; and
- **Resource Commitment:** Capturing data begins at procurement stage and requires on-going effort particularly where services are ongoing (e.g., outsourced sampling, consultancy). A resource commitment will be required from all business units procuring goods & services and a centralised resource will be required to support and co-ordinate the data gathering/reporting.

While these challenges exist for all organisations, the EPA ambition is to add activities that have a material impact as soon as the data becomes readily available. To this end the Green Team has developed a Materiality Matrix that will be used to determine the sequence new activities to be added to Scope 3. This Matrix will be reviewed in the coming years and initially secondary data will be utilised for any new scope 3 categories with a gradual move to improved data quality and the use of primary data for robust calculations and reporting.

3.2.3 [Materiality Matrix](#)

A set of criteria was developed to assist in the evaluation of the identified Scope 3 emissions sources of relevance to the EPA. The criteria were sourced from the GHG Protocol and additional criteria were added to provide a specific context for EPA when screening Scope 3 activities. The GHG Protocol criteria are presented in Figure 7 below.

Table [ii] Criteria for identifying relevant scope 3 activities

Criteria	Description of activities
Size	They contribute significantly to the company's total anticipated scope 3 emissions
Influence	There are potential emissions reductions that could be undertaken or influenced by the company
Risk	They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and technology, compliance/litigation, and reputational risks)
Stakeholders	They are deemed critical by key stakeholders (e.g., customers, suppliers, investors or civil society)
Outsourcing	They are outsourced activities previously performed in-house or activities outsourced by the reporting company that are typically performed in-house by other companies in the reporting company's sector
Sector guidance	They have been identified as significant by sector-specific guidance
Spending or revenue analysis	They are areas that require a high level of spending or generate a high level of revenue (and are sometimes correlated with high GHG emissions)
Other	They meet any additional criteria developed by the company or industry sector

Source: Adapted from table 6.1 from the *Scope 3 Standard*

Figure 7: Criteria for identifying relevant Scope 3 activities [Source: GHG Protocol]

A rating score was applied to the criteria which resulted in a materiality matrix being developed. Each of the EPA activities which fell within the GHG Protocol Scope 3 categories were scored in line with the materiality matrix. The results provided confidence in the Scope 3 activities included in the data being reported and identified additional Scope 3 categories that will be considered for potential future inclusion. Scope 3 activities that have been included in the 2023 GHG emissions report is presented in Table 5.

Table 5: Scope 3 inclusions

Scope 3 (Indirect) emissions	EPA Activity	EPA Location
Business travel (downstream)	All business travel on vehicles not owned/controlled by EPA including air travel, public transport (buses, trains, taxis) and travel by road in private vehicles (expensed travel)	All Locations
Waste generation (in operations)	Waste recycling and disposal of EPA generated waste	All Locations
Employee commuting (downstream)	Commuting to work by car, bus, train, tram or motorcycle	All Locations
Purchased goods and services (downstream)	Use of clean water	All Locations

3.3 Progressive approach to GHG Emissions reporting

The first essential steps were made in 2021 and 2022 in terms of reporting against the 2030 Climate Action targets. This step focused on strengthening and streamlining our existing data collection process. An environmental database was enhanced and in use throughout all locations through the SEM's. This database forms a central repository for relevant energy, electricity, waste, water, and employee (numbers only) data that must be recorded within the EPA.

The Green Team has spent considerable time in 2024 reviewing and validating the 2023 Scope 1, 2 and 3 data to ensure that information included in this report is accurate and representative of our activities.

It is planned to repeat the materiality matrix review in order to extend the number of activities that the EPA include under scope 3. In line with SEAI public sector reporting the mandatory inclusion of business travel by public transport was captured for 2023 data.

The extension of inclusions into Scope 3 will be on-going year on year until the EPA determines that all applicable and relevant activities are captured.

3.4 Base Period (2016-2018) Selected

When selecting a base year or period, the GHG Protocol recommends selecting a year which includes a complete dataset from which to glean comparisons from the earliest relevant point in time for which the EPA has reliable data for. There are two recommended methods of base year selection outlined the GHG Protocol: (a) selecting a single year of historical data (**base year**) or (b) selecting an average of multiple years (**base period**).

The selection of a **base period** allows us to balance the effort of data gathering with the potential impacts of early action. Using multi-year base periods has the added advantage of smoothing out any unrepresentative data within years (e.g., increased heating needs due to extremely cold winters).

The National Climate Action Plan sets out Public Sector Decarbonisation targets with the aim of reducing emissions by 51% by 2030. The base period of 2016-2018 for achieving this target is set out in the Climate Action Plan.

Aligning with the Climate Action Plan, we selected 2016-2018 as the most appropriate base period for reporting (See table 6). The timeframe is also more representative of the current situation with the EPA in terms of staffing numbers and provides an ambitious benchmark upon which to base future targets for reduction measures.

Table 6: Total and averaged Annual base period emissions

Year	2016	2017	2018	Base Period (Average 2016-2018)
Biogenic Emissions	194.33	185.95	154.70	178.33
Scope 1	319.15	322.89	348.69	330.24
Scope 2	576.91	592.46	534.14	567.84
Scope 3	724.45	736.07	790.79	750.43
Total	1814.85	1837.36	1828.31	1826.84

Section B

4 GHG EMISSIONS 2023

4.1 Methodologies used to calculate emissions.

An emission factor is a calculated ratio relating emissions to a measurement of activity; for example, using emissions from electricity production relates to the combustion of fuel to create the electricity and total electricity consumed nationally. An emission factor for emissions per kWh of electricity consumed within that nation may be calculated (WBCSD and WRI, 2004).

Emissions were calculated as carbon dioxide equivalent (CO₂e). Emission factors that were as regionally reflective as possible, were chosen.

4.1.1 [Use of Sustainability Software](#)

To condense and streamline the conversion of multiple activity/energy streams, the EPA engaged an online sustainability software platform. All data related to Scope 1, 2 and 3 activities is populated into a bespoke excel template and uploaded onto the online platform. Data is then converted into tonnes of CO₂ equivalent from their respective units (litres, kWhrs, passenger-km travelled, vehicle km, m³ of water used, tonnes of waste etc.) using industry/internationally recognised GHG emission conversion factors. The platform uses nationally and internationally recognised emissions factors from the SEAI and the UK's Department for Energy Security and Net Zero and DEFRA. Emissions factors applied for 2023 are presented in full in **Appendix A** to this report.

4.2 Annual Emissions Summary

Total emissions for 2023 are presented in the following tables (Table 7 and Table 8) and figures (Figure 8 & 9). The total annual emissions are presented in Tonnes of CO₂ equivalent.

Table 7: Total Annual GHG Emissions 2016-2023 (Tonnes CO₂e)

Scope	2016	2017	2018	2019	2020	2021	2022	2023
Biogenic emissions (Biomass & Bio-LPG)	194.33	185.95	154.70	185.25	133.54	162.46	169.79	181.43
Scope 1	319.15	322.89	348.69	334.78	224.77	243.11	262.70	217.96
Scope 2	576.91	592.46	534.14	530.27	385.41	330.96	320.98	335.32
Scope 3	724.45	736.07	790.79	765.96	236.35	226.40	388.42	493.04
Total Emissions	1,814.85	1,837.36	1,828.31	1,816.26	980.07	962.92	1,142.89	1,227.75

Our total GHG emissions generated in 2023 was 1,227.75 tCO₂e. The largest emissions were generated from Scope 3 activities accounting for 40% of total emissions with Scope 1 accounting for 18% or slightly less than a quarter.

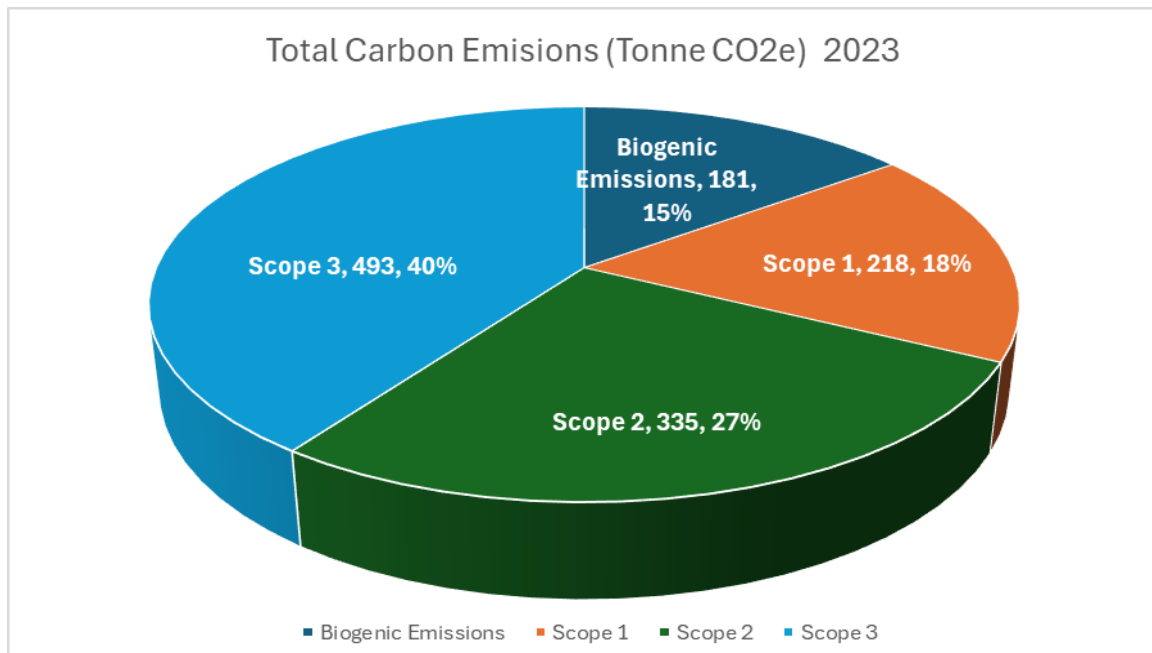


Figure 8: Total GHG Emissions (tCO₂e) 2023 by Scope

Our Scope 3 emissions have continued to increase in 2023 (an increase of 6% from 2022), mainly attributed to business travel by road and employee commuting post-pandemic. Air travel is one mode of transport with a decrease of >10% below 2022 levels. Another contributing factor to our increase is our staff growth with an increase of 5.7% since 2022, commensurate with our growing remit. Staffing levels have increased to 476 full-time-equivalent staff (increase of 33% since 2010) and are expected to grow to approx. 550 by the end of 2024. We have also seen a significant increase in waste generated as we re-organise our office space to provide for shared desking and increase the utilisation of our space in the blended working environment. Our core operations in 2023 continued to be delivered with EPA staff working in a blended working arrangement with 2-3 days per week spent on site.

Table 8: Activity data 2019-2023 vs base period

Activity	Base Period (2016-2018)	2019	2020	2021	2022	2023
Heating	362.14	370.58	277.68	322.90	332.97	306.33
EPA Owned Fleet	146.42	149.45	85.96	82.66	99.52	93.05
Purchased Electricity	567.84	530.27	385.41	354.23	343.55	374.29
Business Travel Air	157.72	149.94	18.19	1.57	51.45	45.98
Business travel - Mileage	216.97	186.35	60.67	46.58	121.44	145.29
Employee Commuting	367.36	417.19	146.02	152.85	191.81	246.98
Water usage	0.72	0.99	0.70	0.14	0.46	2.07
Waste Generated	7.66	11.49	5.45	1.97	0.7	15.59
Total GHG Emissions (tCO₂e)	1,827	1,816	980	963	1,142	1,228

With a move to hot-desking and blended work arrangements, many EPA staff completed desk clear-outs in 2023 which generated additional waste across all locations and can be seen in the increase in associated waste emissions. Water-related emissions increased slightly due to a water leak, the building management system identified the leak as intended and it was efficiently repaired but did result in an increase in water-related emissions.

As personnel resumed site attendance, meetings, and events however a marked increase in business travel and employee commuting was observed in 2022 and 2023.

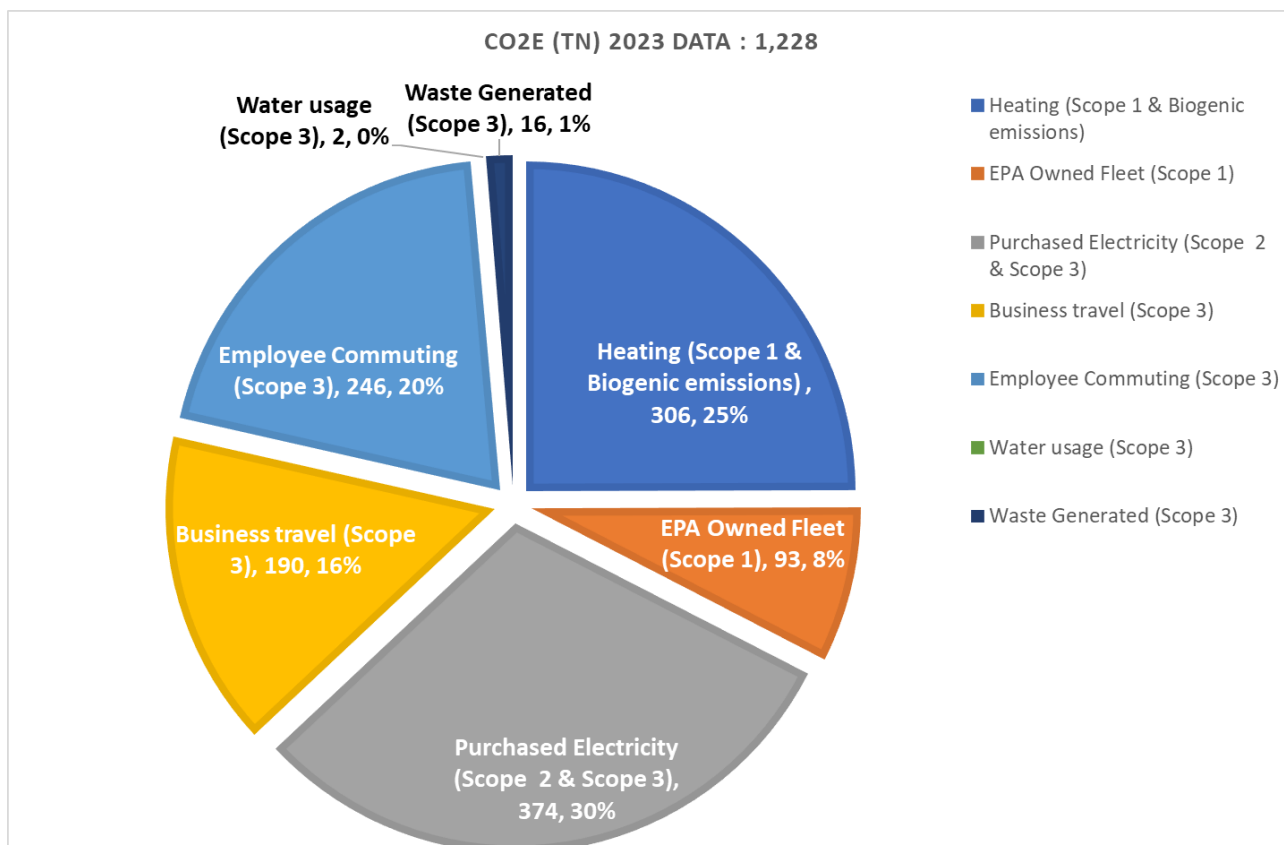


Figure 9: GHG emissions, 2023 by Activity (tCO_{2e})

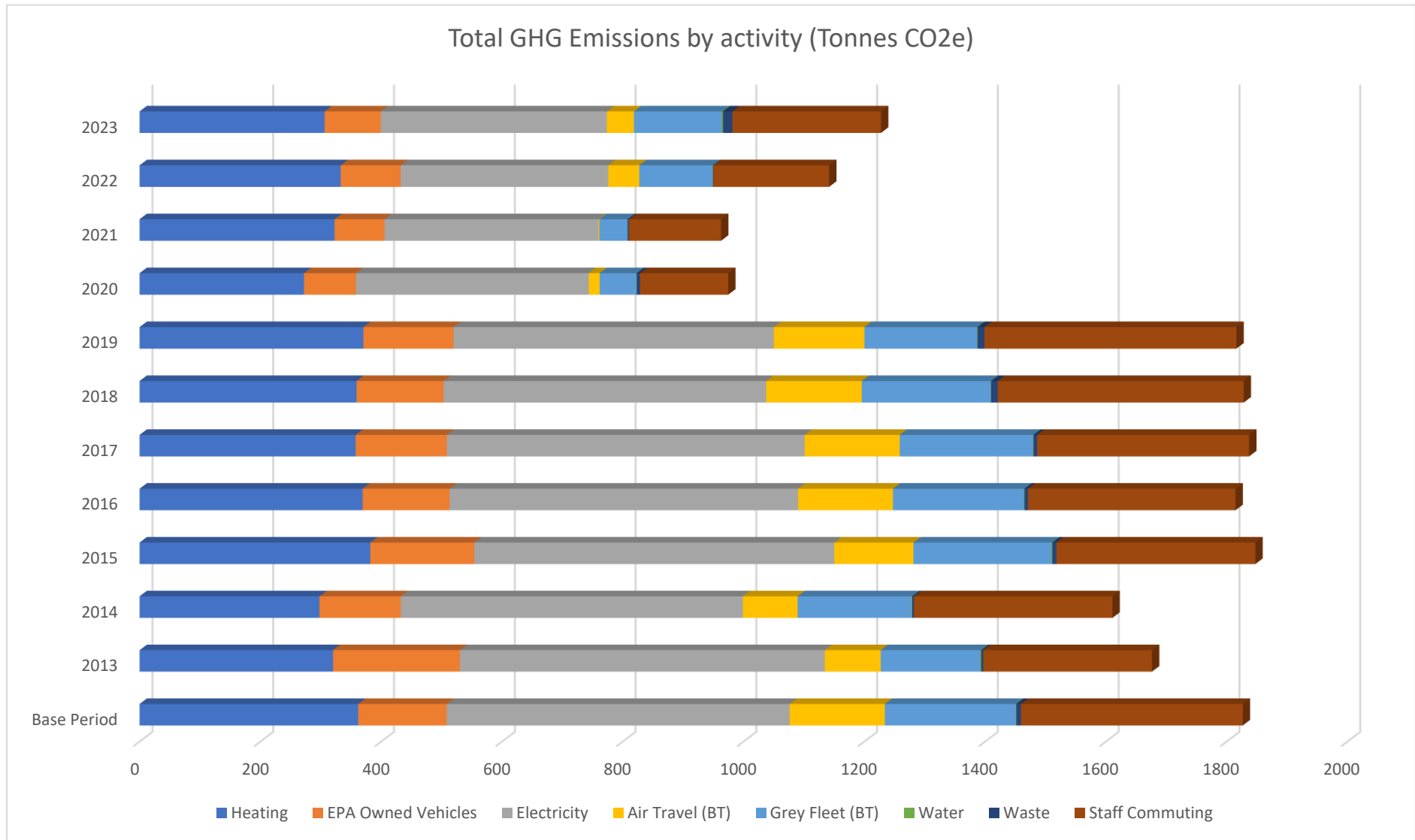


Figure 10: GHG Emissions by Source Activity (tCO_{2e})

4.3 Emissions Overview

4.3.1 [Scope 1](#)

Scope 1 emissions comprise direct emissions which were generated from stationary combustion of natural gas, wood chip, bio-LPG and kerosene at EPA Locations as well as the combustion of petrol and diesel in EPA fleet vehicles.

When compared against the Base Period (average 2016-2018), the results for 2023 indicate fluctuations in Scope 1 emissions with a 36% reduction in fuel usage from owned fleet, 17% decrease in kerosene use, a 27% reduction in natural gas consumption, and an increase of 44% in wood chip use.

When compared to 2019 there was a 31% reduction in natural gas usage and a 21% decrease in kerosene usage in 2023.

Table 9: Scope 1 comparison with Base Period (Tonnes CO2e)

Source Category	Activity Name	Base Period	2019	2020	2021	2022	2023
Mobile Combustion	Owned Fleet	146.42	149	85.96	82.67	99.52	93.06
	Fuel						
Mobile Combustion - Owned Fleet Total		146.42	149.45	85.96	82.67	99.52	93.06
Stationary Combustion	Bio-LPG	0	0	0.04	0.03	0.03	0.02
	Kerosene	42.56	44.41	41.07	56.43	63.07	35.25
	LPG	21.38	9.64	0	0	0	0
	Natural Gas	115.24	123.09	93.10	98.06	95.69	84.60
	Wood Chip	5.22	6.973	4.054	5.929	4.39	5.02
	Wood Pellet	1.73	1.231	0.553	0	0	0
Stationary Combustion Total		186.14	185.33	138.81	160.445	163.18	124.90
Grand Total		332.56	334.78	224.77	243.11	262.70	217.96

We are transitioning towards more sustainable solutions and are moving to convert heating systems at EPA Locations to more sustainable types, e.g., conversion to electric heat pumps and installation of Solar PV in all locations. This transition will continue in line with the EPA's commitment under our own Strategy and National Climate Action Policies.

4.3.2 [Scope 2 - Indirect Emissions](#)

4.3.2.1 [Electricity](#)

Electricity data is captured by the Site Environmental Managers (SEM's) from onsite meters and logged onto the EPA's internal Environmental Database monthly. This data is recorded in Kilowatt hours and is verified by the SEM's monthly against electricity utility bills.

Electricity is used by the EPA to power and light all EPA offices (and more recently heat in both the Dublin & Monaghan offices) across the country. In addition, electricity is used to power the EPA fleet of electric vehicles. At the time of writing, the EPA has five fully electric vehicles in the fleet and five

hybrid vehicles accounting for 32% of total fleet. There are plans to add an additional three fully electric commercial vehicles by Q4 2024, replacing older diesel equivalents.

Emissions associated with electricity consumption (335.3 tCO₂e) was significantly reduced (by 34%) in 2023 in comparison to the base period average (567.84 tCO₂e). This reduction is due to the efficiency measures undertaken by the EPA over the past number of years, and it is expected that this reduction in Scope 2 emissions will continue as further measures are implemented such as the completion of the installation of Solar PV at all EPA locations and the completion of energy-efficient lighting in remaining locations. The planned installation of Solar PV on all our buildings is estimated to reduce our emissions by 107tn CO₂e and generate >28% of our electricity needs.

4.3.3 Scope 3 Emissions

Figure 12 below presents the percentage breakdown of Scope 3 emissions included in the 2023 GHG Emissions Report. Most Scope 3 emissions are derived from emissions from mobile combustion during employee commuting (54%) and business travel by road and air (42%).

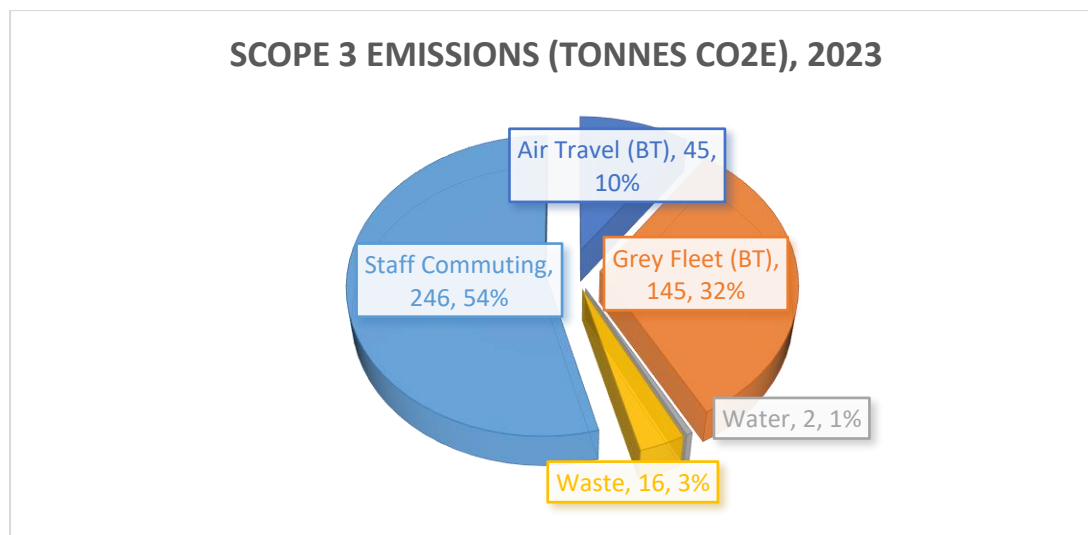


Figure 11: Scope 3 GHG emissions (Tonnes CO₂e) breakdown 2023

Further analysis of the scope 3 emissions selected for inclusion in the GHG Emissions Report is detailed below.

4.3.3.1 Business travel (Air travel, Road travel by public transport and private car (expensed mileage))

Business travel is an essential requirement for the fulfilment of many of our core functions. Business travel by car is captured through the travel and subsistence claims for mileage. This data is logged by employees into the EPA's expense claims system and includes information such as distance travelled, vehicle make and model, engine size and VRT tax band. The information is then used to consolidate total kilometres travelled by VRT band per EPA Location (where the staff member is normally based). This method of data capture has been in place at the EPA for many years and is well established.

When compared to the base period, emissions from travel by road has reduced by 33% (216.97 tCO₂e [Base Period] vs 145.29 tCO₂e [2023]). When compared to 2019 there has been a 32% reduction in emissions from travel by road.

In 2023, Air travel generated 44.98 tCO₂e of emissions and is still well below the Base period average (157.72t CO₂e) and 70% lower than 2019 emissions levels.

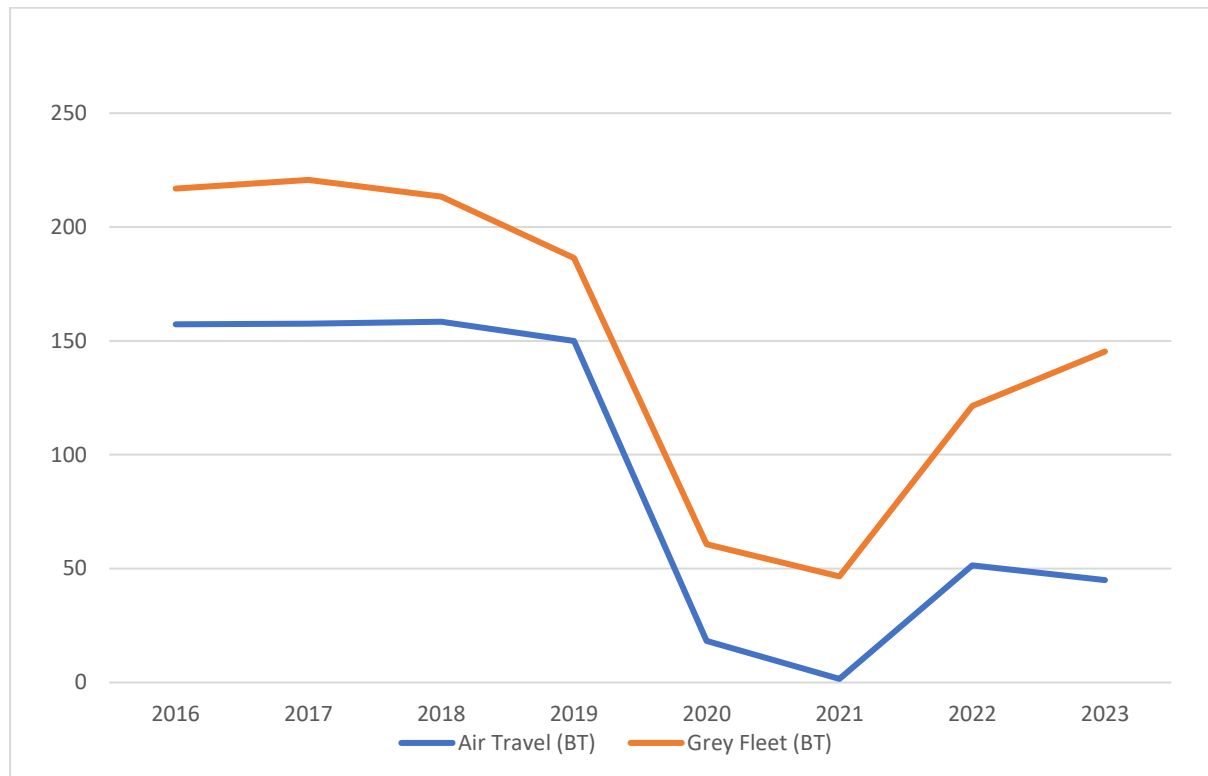


Figure 12: Business travel trends 2016-2023 (tCO₂e)

In 2022, mandatory reporting of business travel by public transport to the SEAI was introduced. This includes expensed travel by rail, tram, bus, and taxi.

4.3.3.2 Employee Commuting (car, rail, bus, motorcycle)

This category includes all commuting activities carried out by EPA staff in 2023 and covers travelling by all modes of transport from home to their normal place of work. Emissions arising from travel by private car, bus, and train were included. Information on walking and cycling was collated also.

Data on commuting patterns was obtained via an online survey which was rolled out to all EPA staff in March 2024. The Survey asked the respondents about commuting patterns to and from work between January and December 2023. A summary of the survey questions is provided in Appendix B to this report.

Significant effort was made to encourage and engage with staff across the EPA to maintain a high participation rate for the 2023 survey.

Response rates for the 2023 survey and previously conducted surveys are presented below.

Table 10: EPA Employee commuting survey response rates

Year of Survey	2014	2019	2021	2022	2023
Total Number of FTE Staff	366	408	431	450	476
Total number of survey respondents	312	272	177	308	313
Response Rate	85%	67%	41%	68%	66%

In line with GHG Protocol guidance, the responses from the survey were a sample of the total employee population and therefore the data was factored up to provide a figure representative of the whole EPA. Emissions were calculated for the responses received in the reporting year. This represented 65.75% (response rate) of the total EPA commuting emissions. The remaining 34% was factored by calculation and the use of an intermodal figure³.

Intermodal employee commuting for the reporting year and the base period were based on the extrapolation rates presented in Table 11.

Table 11: Extrapolation rates

Year	2016	2017	2018	2019	2021	2022	2023
Total Number of FTE Staff	384	392	400	408	431	450	476
Total number of survey respondents	312	312	272	272	177	308	313
Response Rate	81.25%	79.59%	68%	66.667%	41.067%	68.444%	65.75%
<i>Basis for Extrapolation Calculation</i>	18.75%	20.41%	32%	33.34%	58.93%	31.56%	34.24%

Annual employee commuting data has been recalculated as described above for all years from 2016 to 2023 to provide a comparable like-for-like benchmark and is presented graphically below in Figure 13.

³ The total carbon contribution of the represented response rate was used as the basis of the extrapolation calculation rather than the carbon contribution of individual modes of transport.

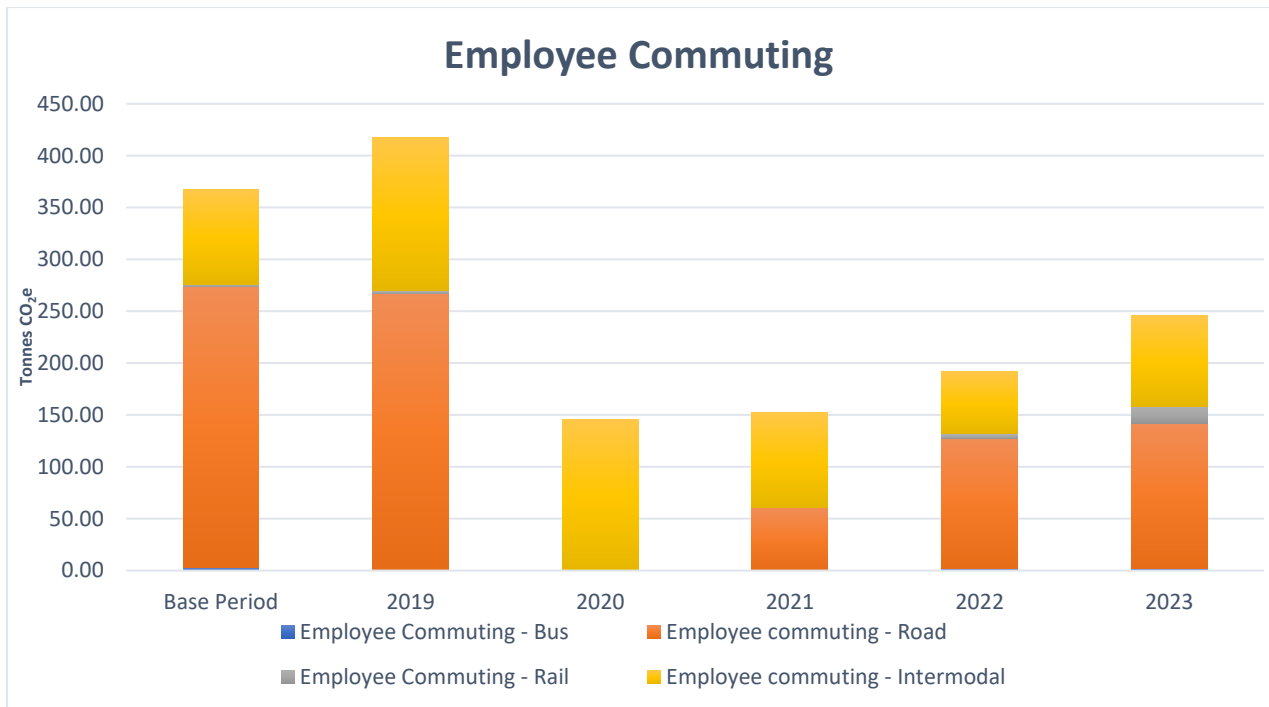


Figure 13: Employee commuting patterns 2016 - 2023

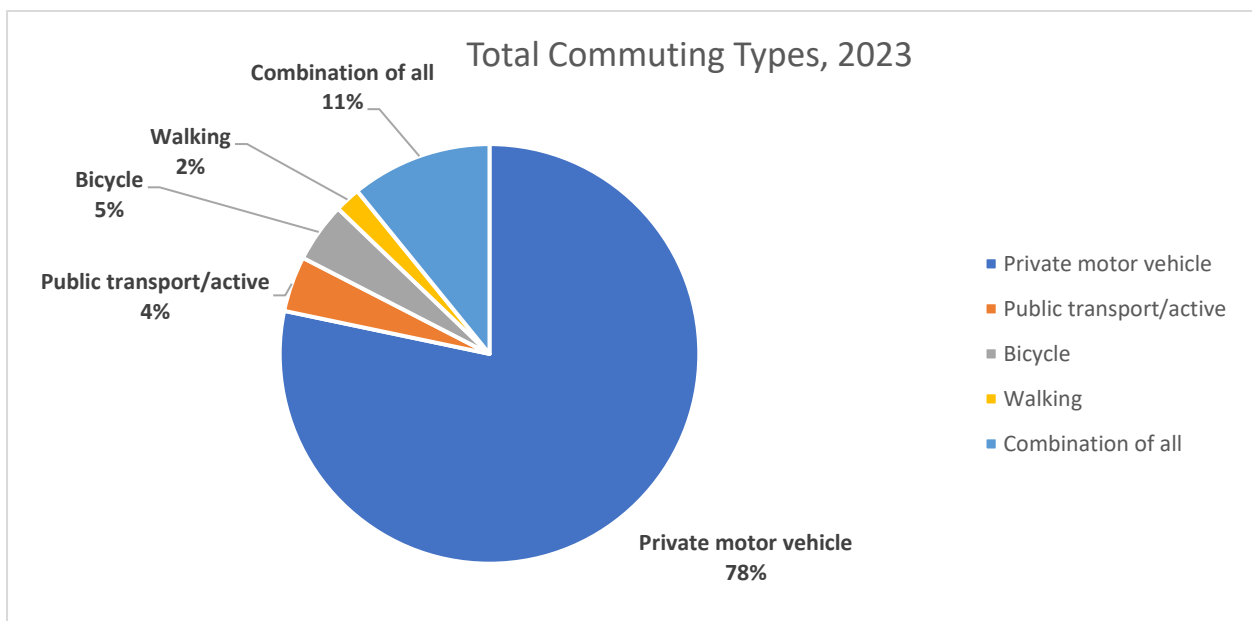


Figure 14: Commuting survey responses

Commuting patterns in 2023 indicated a heavy reliance on private vehicles to get to and from designated places of work. This is to be expected given the rural locations of many of the EPA offices. Despite this, in terms of emissions, the average reported distance travelled by employees in their daily commute ranged between 26km– 70km per day.

Use of public buses in 2023 (1.34 tCO₂e) has shown a 52% reduction in emissions in comparison to the base period (2.82 tCO₂e), however when compared to 2019 (1.16 tCO₂e) commuting by bus increased by 15%. Overall GHG emissions generated by employee commuting has fallen by 121.38 tCO₂e in 2023

from the Base Period which reflects a 33% reduction in emissions because of the blended working approach.

4.3.3.3 Waste Generated in operations.

Waste treatment in facilities owned or operated by third party contactors is included in Scope 3. Treatment of waste generated is categorised in the GHG protocol as an upstream Scope 3 category as the services are purchased by the EPA under contract. Waste treatment includes disposal at landfill, recovery for recycling, energy recovery, and composting. The EPA’s Scope 3 emissions from waste generated in operations is derived from the Scope 1 and Scope 2 emissions of the solid waste management companies who are contracted to accept and treat the waste collected from the EPA.

For the purposes of the GHG Report, only non-hazardous solid wastes are included in Scope 3. Waste types included mixed municipal waste from offices and laboratories, non-hazardous mixed dry recyclables, and food waste from canteens. In addition, offices were re-configured to facilitate hot desking, and additional bulky waste was generated. While some equipment and furniture were reused and re-purposed, this report does not include data for this activity. In 2023 waste generated represented 16% of Scope 3 emissions.

The EPA use a waste-type-specific method of emission calculation for the 2023 GHG emissions report and have applied this to waste streams where standard recognised emission factors were readily available (refer to Appendix A to this report for emission factors).

The EPA generates some hazardous wastes from laboratories and general waste electrical materials at EPA locations; however, the quantities are not sufficient to justify the level of effort in calculating the total associated GHG emissions nor were there any appropriate emissions factors available for use.

Additionally, emissions associated from the transportation of waste in waste collection vehicles operated by the waste contractor are not included in the emissions calculation for waste generated in 2023.

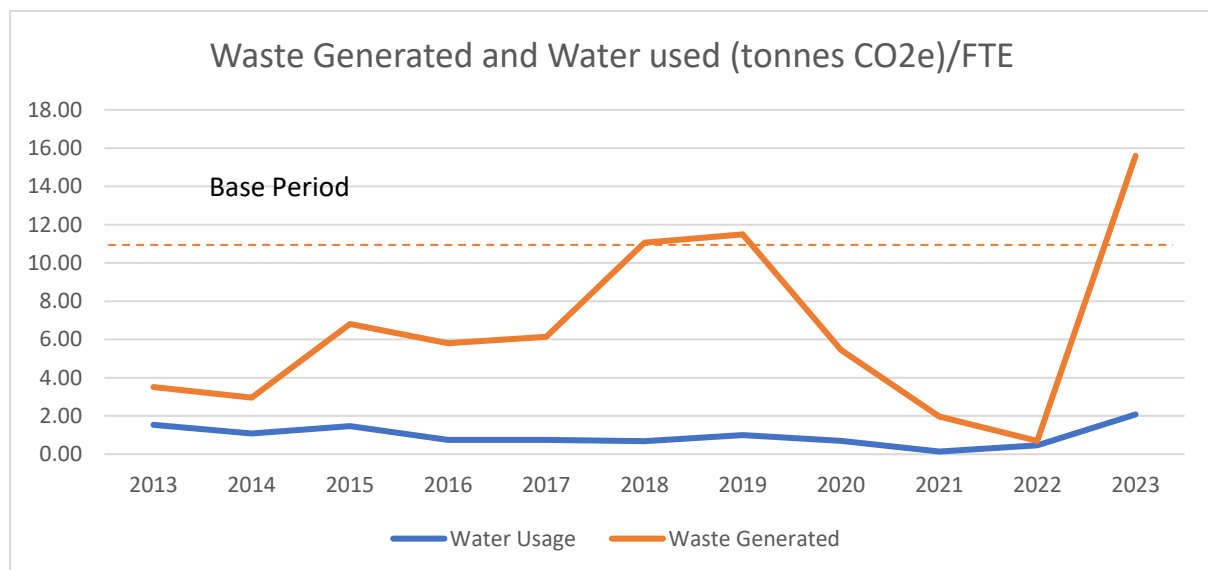


Figure 15: Waste and Water trends (tCO_{2e})

4.3.3.4 Purchased Goods and Services - Water Usage

Water usage is currently the only EPA activity included from Purchased Goods and Services. Water consumption by the EPA is mainly for domestic and laboratory analytical purposes. Continuous monitoring of water usage is the most useful way to detect leaks or anomalies.

The emissions associated with water usage are insignificant in comparison to the other Scope 3 activities; however, we recognise that water is a precious resource, and remain committed to ensure that water conservation and consumption are tracked across all locations.

Significant progress in water management has been made by the EPA over the last ten years. Meter reading/OPW metered readings are in place at all EPA locations. Drinking water filtration systems have been installed on mains water for drinking, preventing the generation of plastic bottles for drinking water. Water conservation projects have been rolled out in Dublin, Wexford, and Kilkenny where reduced flush cisterns, tap restrictors and waterless urinals have been installed.

Emissions associated with water usage in 2023 (2.08 tCO₂e) significantly increased (up 187%) in comparison to the Base Period emissions. This increase is primarily due to water leaks which have been identified by our active monitoring and resolved.

4.4 Base Period (2016-2018) Emissions Profile

The chosen base period is an average of total emissions from 2016, 2017 and 2018 inclusive. See Figure 17 which shows the total emissions for 2019 - 2023 in comparison to the base period average. These years were selected as a representative benchmark from which to compare our GHG emissions to. It should be noted that total emissions in 2023 were 7.3% higher [86 tonne CO₂e] than 2022 levels. Total emissions (1,228 tCO₂e) for 2023 are still substantially (33%) lower than the chosen base period (1,826.84 tCO₂e) overall and we continue our efforts to reduce GHG emissions across all of our operations.

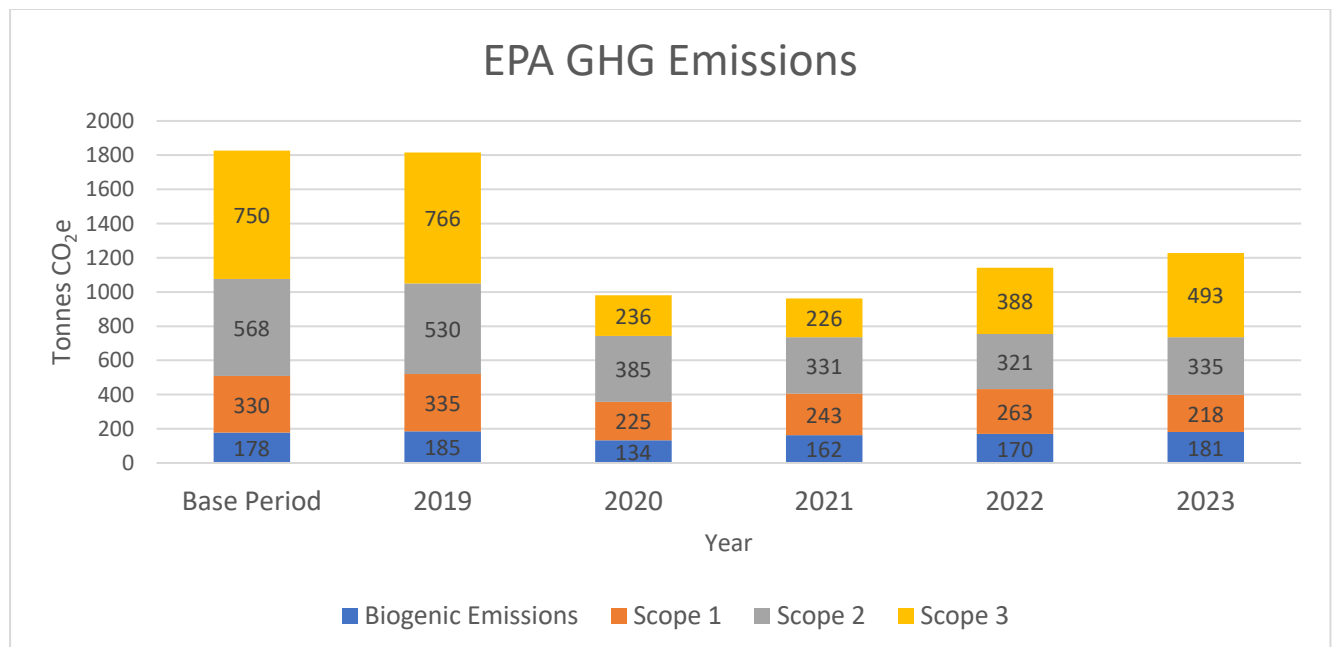


Figure 16: Total Emissions 2019-2023 by Scope (tCO₂e)

Figure 18 below provides an indicative trendline for GHG emissions since the 2016-2018 base period. While our emissions have been increasing annually as we emerge from the pandemic, we are continuing to maintain annual emissions well below our base period.

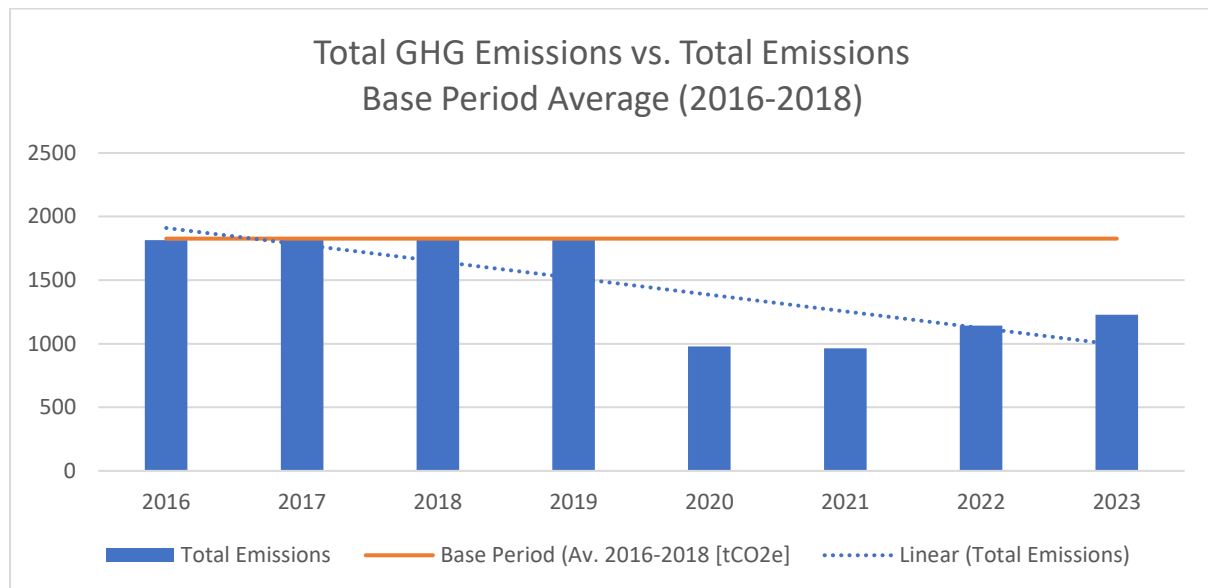


Figure 17: Total GHG Emissions per year tracked against Base Period average (tCO₂e)

4.5 Exclusions

The Scope 3 activities detailed in Table 12 have been excluded from the EPA GHG Emissions Report for 2023. The EPA’s ambition is to add activities that have a material impact on emissions as soon as the data becomes readily available. Consequently, Scope 3 inclusions will need to be periodically reviewed using the materiality matrix tool.

Table 12: Scope 3 Exclusions GHG Emissions Report 2023

Scope 3 (Indirect) emissions	EPA Activity
Purchased goods and services (downstream)	Offsite Storage of EPA Files, Outsourced contractor services – legal, consultancy, maintenance, IT, Security, monitoring, Events management, Courier Services, Landscaping,
Fuel and Energy related activities (not included in scope 1 or scope 2) (downstream)	Other fuels - sampling activities, pumps boats,
Use of sold products (downstream)	Use of product distributed during EPA Events
Upstream Fuel and Energy related activities (not included in scope 1 or scope 2)	Fuel and Energy used in upstream activities (e.g. fuel/energy used in power generation)
Purchased goods and services (Upstream)	Laboratory supplies, Stationary, Paper, Ink, IT Services, IT equipment Construction materials, Outsourced Contractor services - Construction Facilities fit out (maintenance, carpets, painting, lighting) Provision of Clean Water

Scope 3 (Indirect) emissions	EPA Activity
Upstream capital goods including vehicles, plant, buildings, and equipment	Laboratory Equipment (machines), Vehicles and Plant, Furniture
Upstream transportation and distribution	Fuel used in the transport of Purchased Goods and Services
Upstream waste generation	Waste generated in the manufacture/supply of Purchased Goods and Services

5 GHG REDUCTION INITIATIVES AND PERFORMANCE TRACKING

We have identified opportunities to demonstrate leadership as a public sector climate conscious organisation. Making public commitments and taking action to reduce GHG emissions is a priority for the EPA. We are also committed to staff engagement and participation in the climate conversation through facilitating a collective understanding of the EPA's own GHG emissions. This will enable better understanding for staff and wider stakeholders the issues involved and allow individual ownership of CO₂ emissions reduction efforts.

5.1 Reduction Initiatives Summary 2023

Ireland's Climate Action Plan up to 2030 includes ambitious reductions and changes in energy use by way of a decarbonisation pathway and as such we are well placed to continue energy and carbon reduction initiatives with further building improvements planned for lighting upgrades with energy efficient LED, expansion of Solar PV, moving towards decarbonising our vehicles and a continued focus on the reduction of GHG emissions.

In order to build on our successes to date, we carried out detailed energy audits of all EPA buildings in order to identify both 'quick wins' and strategic ways to reduce GHG emissions and increase our energy efficiency. We are investing in more renewable heating solutions, efficient building systems and have developed a three-year rolling plan to increase efficiency and reduce emissions through improvement of building fabric (insulation, glazing, air tightness), adding of additional solar PV, LED, and geothermal solutions.

Prioritisation and selection of solutions are based on availability of budget, life-cycle costing, predicted carbon savings, energy efficiency gains and business continuity. We are committed to improving the energy efficiency of our buildings beyond 50%, and bring buildings to a minimum Non-Domestic Building Energy Rating (NDBER) of B. Since our last GHG emissions report, our regional inspectorate in Monaghan has achieved an NDBER status of A3 from a baseline of C3. Projects completed to achieve this rating include: building fabric improvements, heating upgrade (electric heat pump), Energy Efficient LED Lighting and SolarPV installation.

5.2 Public Sector Statutory Performance Tracking obligations

The National Energy Efficiency Action Programme (NEEAP) set a target for public bodies to improve its own energy efficiency by 33% by 2020. We have achieved significant success in relation to achieving the public sector energy efficiency savings by reducing our energy demand with a reduction of over 50% since 2006. Figure 18 details the update EPA Energy Performance Indicator profile 2006-2023.

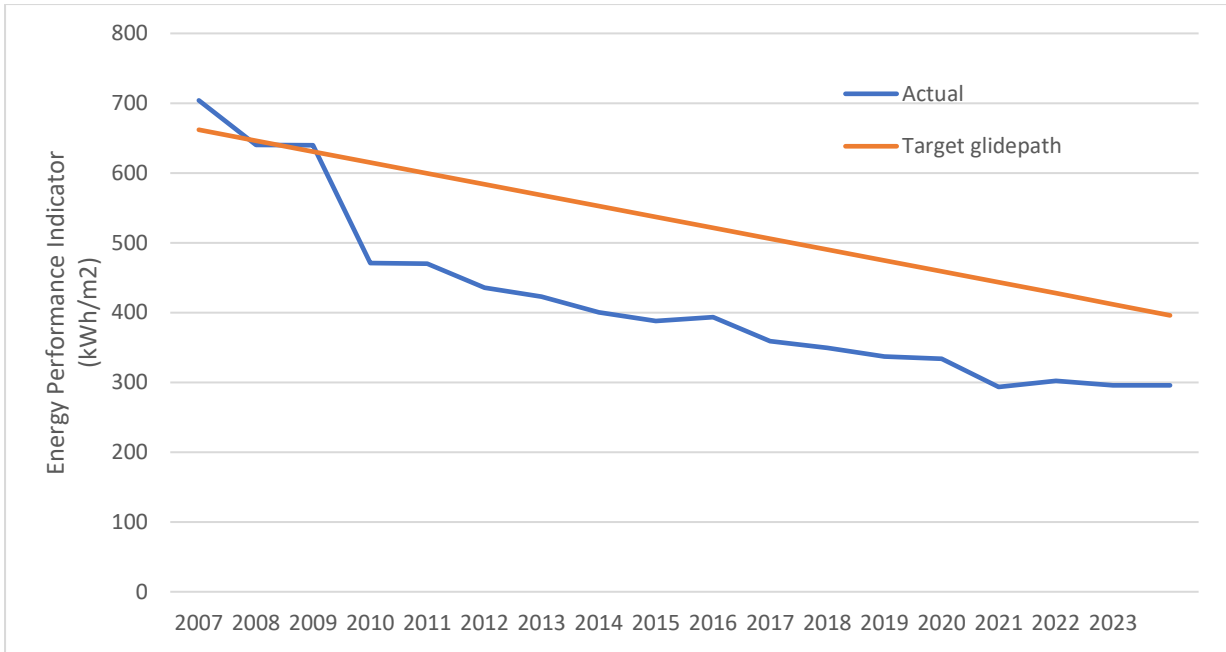


Figure 18: EPA Energy Performance Indicator 2006-2023 kWh/M2

6 NEXT STEPS

We have made significant progress in 2023 evaluating and calculating the Carbon footprint associated with our activities. The commitment to obtaining accurate and meaningful GHG emission data is evident in the quality of empirical data collected and used as the basis for this report. To improve the accuracy of GHG emission reporting in the future there are several points to consider which are set out below.

6.1 Improvement plans for Scope 3 data capture.

6.1.1 [Category 1 – Purchase goods and services](#)

As outlined in Section 3.2 the materiality matrix was developed in 2021 to assist with the screening process for future inclusions into Scope 3. There are plans to review this matrix to identify any potential activities from this category can be captured and included in 2024 GHG emissions report.

6.1.2 [Category 5 – Waste](#)

The waste category does not include hazardous waste; nor does it include transport emissions from waste collection vehicles travelling from EPA locations to the various waste treatment destinations. All waste streams and activities associated with waste collection will be considered for inclusion in future reports once data is available.

6.1.3 [Category 6 – Business travel](#)

During 2022, the SEAI required all Public Sector bodies to report emissions data on business travel by public transport. This data capture is facilitated through expenses reports in the EPA's timekeeping system and once available, the GHG emissions can be calculated via the Carbon accounting software platform. An initial review of all employee vehicles used for mileage expense claims has been undertaken to facilitate the improved accuracy of the emissions generated for various VRT bands assigned.

6.1.4 [Category 7 – Commuting](#)

The response rate to the 2023 employee commuting survey was vastly improved in comparison to the 2021 survey results, some minor edits are required to the survey questions in advance of the roll out of the 2024 survey in the Spring of 2025.

7 CONCLUSION

This GHG Emissions Report presents the EPA's total calculated GHG emissions arising from Scope 1, Scope 2, and Scope 3 activities of the EPA in 2023. The methods used for creating the Base Period GHG emission data have also been detailed.

The average Base Period emissions for 2016-2018 are 1,827 tCO₂e. GHG emissions in 2023 were 33% below that figure at 1,228 tCO₂e, however, this presents an overall increase in GHG emissions of 7% when compared with 2022.

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Appendix A Emission Factors

Scope	Activity Name	Activity Input	Emission Type	Publisher	Publication Title	Date Emission Factor Published	Published Emission Factor	CO ₂ e Units		
Biogenic Emissions	Stationary Combustion	Bio-LPG	Biofuel CO ₂	DEFRA/DECC	2023 UK Government GHG Conversion Factors for Company Reporting	28/06/2023	0.232236	kg CO ₂ e/kWh		
						28/06/2023	0.213805	kg CO ₂ e/kWh		
		Wood Chips	CO ₂	DEFRA/DECC	2023 UK Government GHG Conversion Factors for Company Reporting	28/06/2023	0.35	kg CO ₂ e /kWh		
Scope 1	Stationary Combustion	Bio LPG	CO ₂ e	DEFRA/DECC	2023 UK Government GHG Conversion Factors for Company Reporting	28/06/2023	0.000322	kg		
			CO ₂ e				0.000297	CO ₂ e/kWh		
		LPG	CO ₂	DEFRA/DECC	2023 UK Government GHG Conversion Factors for Company Reporting	28/06/2023	0.229284	kg CO ₂ e/kWh		
	Mobile Combustion - EPA	Diesel	CO ₂	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	2.683306	kg		
								CO ₂ e	0.01074	kg CO ₂ e/kWh
								CO ₂	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).
Mobile Combustion - EPA	Diesel	CO ₂	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	2.683306	kg			
							CO ₂ e	DEFRA/DECC	2023 UK Government GHG Conversion Factors for Company Reporting	28/06/2023
Mobile Combustion - EPA	Diesel	CO ₂	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	2.683306	kg			
							CO ₂ e	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023

	Owned Fleet	Petrol	CO ₂	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	2.310723	kg CO ₂ e /L
Scope 2	Electricity	Electricity	CO ₂	AIB	European Residual Mixes. Results of the calculation of Residual Mixes for the calendar year 2021	31/05/2022	570.09	g CO ₂ e /kWh
				SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	295.8	g CO ₂ e /kWh
Scope 3	Air Business Travel	International, to/from non-UK - Economy class	CH ₄	DEFRA/DECC	2024 UK Government GHG Conversion Factors for Company Reporting	08/07/2024	0.00001	kg CO ₂ e /pkm
			CO ₂				0.07880	kg CO ₂ e /pkm
			N ₂ O				0.00067	kg CO ₂ e /pkm
			RF CO ₂				0.13397	kg CO ₂ e /pkm
			CH ₄				0.00001	kg CO ₂ e /pkm
			CO ₂				0.10703	kg CO ₂ e /pkm
			N ₂ O				0.00090	kg CO ₂ e /pkm
			RF CO ₂				0.18196	kg CO ₂ e /pkm
Public Transport -	Bus - Coach	CO ₂	The Greenhouse Gas	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.03	kg/pkm	

Business Travel		Protocol Initiative				
	CH4	The Greenhouse Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.0038	kg/pkm
	CO2	The Greenhouse Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.1523	Kg/pkm
Regular taxi	CH4	The Greenhouse Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.0017	g/pkm
	N20	The Greenhouse Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.0038	g/pkm
	CO2	The Greenhouse Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	101.283504	g/pkm
Tram	CH4	The Greenhouse Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.0019	g/pkm
	N20	The Greenhouse Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.0014	g/pkm
Light Rail	CO2	The Greenhouse Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	101.283504	g/pkm

		CH4	The Green-house Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.0019	g/pkm
		N20	The Green-house Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.0014	g/pkm
		CO2	The Green-house Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	114.953671	g/pkm
	National Rail	CH4	The Green-house Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.0029	g/pkm
		N20	The Green-house Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion)	13/03/2017	0.0098	g/pkm
		CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.14	Kg/vkm
		CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.155	Kg/vkm
		CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.17	Kg/vkm
		CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.19	Kg/vkm
		CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.225	Kg/vkm
Business Travel - Employee Mileage	Petrol Car, 0.9-1.2 Litre engine	CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.14	Kg/vkm
	Petrol Car, 1.21-1.5 Litre engine	CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.155	Kg/vkm
	Petrol Car, 1.51-1.7 Litre engine	CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.17	Kg/vkm
	Petrol Car, 1.71-1.9 Litre engine	CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.19	Kg/vkm
	Petrol Car, >1.9 Litre engine	CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.225	Kg/vkm

	Diesel Car, 1.2-1.5 litre engine	CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.14	Kg/vkm
	Diesel Car, 1.71-1.9 litre engine	CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.17	Kg/vkm
	Diesel Car, > 1.9 litre en- gine	CO2	SEAI	Sustainable Energy Authority of Ireland	13/06/2008	0.19	Kg/vkm
Business Travel - Mileage	VRT Band A0 zero grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0	kg CO ₂ e /vkm
	VRT Band A1 1-80 grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0.08	kg CO ₂ e /vkm
	VRT Band A2 81-100 grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0.1	kg CO ₂ e /vkm
	VRT Band A3 101-110 grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0.11	kg CO ₂ e /vkm
	VRT Band A4 111-120 grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0.12	kg CO ₂ e /vkm
	VRT Band B1 121-130 grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0.13	kg CO ₂ e /vkm
	VRT Band B2 131-140 grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0.14	kg CO ₂ e /vkm

	VRT Band C 141-155 grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0.155	kg CO ₂ e /vkm
	VRT Band D 151-170 grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0.17	kg CO ₂ e /vkm
	VRT Band E 171-190 grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0.19	kg CO ₂ e /vkm
	VRT Band G more than 225 grams CO2/km	CO2	SEAI	Sustainable Energy Authority Ireland	13/06/2008	0.26	kg CO ₂ e /vkm
Electricity	Electricity	T&D CO2	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	20.8	g CO ₂ e /kWh
		CH4	The Green-house Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion).	13/03/2017	0.00381	g CO ₂ e /pkm
	Bus - Coach	CO2	The Green-house Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion).	13/03/2017	0.03	kg CO ₂ e /pkm
Employee Commuting - Bus		N2O	The Green-house Gas Protocol Initiative	World Resources Institute (2017). Emission Factors from Cross-Sector Tools March 2017. (Mobile Combustion).	13/03/2017	0.0018	g CO ₂ e /pkm
	Diesel	CO2	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	2.682652	kg CO ₂ e /L

	E85 Ethanol/Gasoline	CO2	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	0.353342	kg CO ₂ e /L
	Electricity	CO2	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	0.3246	kg CO ₂ e /kWh
	Petrol	CO2	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	2.355616	kg CO ₂ e /L
Employee commuting - Inter-modal	CO2 equivalent	CO ₂ e	IPCC	IPCC Fourth Assessment Report: Climate Change 2007 (AR4)	01/01/2007	1	mt CO ₂ e /mt
	Diesel	CO2	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	2.682652	kg CO ₂ e /L
Employee commuting - Road	E10 Ethanol/Gasoline	CO2	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	2.120054	kg CO ₂ e /L
	Electricity	CO2	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	0.3246	kg CO ₂ e /kWh
	Petrol	CO2	SEAI	Energy in Ireland 2023 Report. Workbook of Energy conversion and emission factors for publication on SEAI website (v1.2).	31/12/2023	2.355616	kg CO ₂ e /L
Employee Commuting - Train		CH ₄	The Greenhouse Gas Protocol Initiative	World Resources Institute (2015). GHG Protocol Tool for Mobile Combustion. Verson 2.6	18/05/2018	0.001243	g CO ₂ e /pkm
	National rail	CO ₂	The Greenhouse Gas Protocol Initiative	World Resources Institute (2015). GHG Protocol Tool for Mobile Combustion. Verson 2.6	18/05/2018	114.953671	g CO ₂ e /pkm
		N ₂ O	The Greenhouse Gas	World Resources Institute (2015). GHG Protocol Tool for Mobile Combustion. Verson 2.6	18/05/2018	0.000621	g CO ₂ e /pkm

		Protocol Initiative					
Waste	Mixed municipal waste - Energy Recovery - Combustion	CO2	DEFRA/DECC	2024 UK Government GHG Conversion Factors for Company Reporting	08/07/2024	6.41061	kg CO ₂ e /mt
	Mixed municipal waste - Recycling - Open Loop	CO2	DEFRA/DECC	2024 UK Government GHG Conversion Factors for Company Reporting	08/07/2024	6.41061	kg CO ₂ e /mt
	Organic Waste: Food and Drink Waste – Composting	CO2	DEFRA/DECC	2024 UK Government GHG Conversion Factors for Company Reporting	08/07/2024	8.88386	kg CO ₂ e /mt
	Paper and board: Board (Av. board: 78% corrugate, 22% cartonboard) - Recycling - Closed loop	CO2	DEFRA/DECC	2024 UK Government GHG Conversion Factors for Company Reporting	08/07/2024	6.41061	kg CO ₂ e /mt
	Paper and board: Paper - Recycling - Closed loop	CO2	DEFRA/DECC	2024 UK Government GHG Conversion Factors for Company Reporting	08/07/2024	6.41061	kg CO ₂ e /mt
Water Usage	Water Supply	CO2	DEFRA/DECC	2024 UK Government GHG Conversion Factors for Company Reporting	08/07/2024	0.15311	kg CO ₂ e /cu. m

Appendix B

Commuter Survey 2023



EPA Commuter survey 2023

Welcome to the EPA's 2023 Commuter survey! We are gathering information to calculate the carbon footprint associated with your commute to and from the office in 2023. This information will be used in the quantification of our total carbon footprint in 2023.

Please have the following items to hand to complete this survey :

1. Your Vehicle Registration Number (if your vehicle is pre 2008 you will also require the engine size and fuel type)
2. Google maps – to calculate the distance of your commute

Question 1.1. The data collected in this survey will be used for reporting, analysis and management of EPA's greenhouse gas emissions arising from transport.

- I accept
- I do not accept

Question 1.2

Please insert your Employee ID number – _____

Your id number can be found on the top left hand side of the screen on the Core System at log in.

Question 1.3

Were you working for the EPA in 2022?

- Yes
- No

Question

1.4

Please select your designated EPA Location in 2022:

Castlebar, Co Mayo
Clonskeagh Sq., Dublin
Inniscarra, Co Cork
Callan, Co Kilkenny

EPA Headquarters, Johnstown Castle, Co
Wexford

Monaghan, Monaghan
Richview, Dublin,

Question

What office are you assigned to?

- ODG
- OCCS
- OEA
- OEE
- OES
- ORM

Question 1.6

How did you commute to work in 2022?

- Walking
- Bicycle
- Bus
- Luas
- Dart
- National Rail
- Private Road Vehicle (Car, motorcycle, etc)

Question 1.7

What is your total daily commute in km? This refers only to your commute from home to work - not site inspections or other business-driving. If you commute by car some days and bike other days, please estimate your total daily commute for each mode of transport. Multiply your one-way daily commute by 2 to get total KM travelled each day.

Walking	_____	Bicycle	_____
Private Car	_____	Motorbike	_____
Carpool	_____	Bus	_____
Luas	_____	Dart	_____
National Rail	_____	Other	_____

Question 1.8

What VRT band is your car in? For cars sold since 2008, you can find your VRT band and associated CO₂ emissions here: <https://www.motortax.ie/OMT/motortaxinforeg.do>

Response

- I don't use a car to commute
- 0-0 gr/km CO₂ (electric car)
- 1-50 gr/km CO₂
- 51-80 gr/km CO₂
- 81-90 gr/km CO₂
- 91-100 gr/km CO₂
- 101-110 gr/km CO₂
- 111-120 gr/km CO₂

- 121 – 130 gr/km CO₂
- 131-140 gr/km CO₂
- 141 – 150 gr/km CO₂
- 151 – 160 gr/km CO₂
- 161 – 170 gr/km CO₂
- 171 – 190 gr/km CO₂
- 191 – 200 gr/km CO₂
- 201 – 225 gr/km CO₂
- 226 – 999 gr/km CO₂
- It's not in these bands, its pre-2008 (go to question 1.9)


Question 1.9

If you don't have a VRT band what is the engine size of your vehicle

Petrol Car	<0.9;	0.9-1.2l;	1.21-1.5;	1.51-1.7;	1.71-1.9;	>1.9;
	>3.0					
Diesel Car	1.2-1.5;	1.51-1.7l;	1.71-1.9l;	>1.9;		
Small Motorbike,	up to 125cc					
Medium Motorbike,	125cc to 500cc					
Large Motorbike,	over500cc					

Thank you for your time If you would like to provide us with feedback on the survey, please do so in the box below:

Appendix C Emission Inventory

GHG Protocol Emissions Inventory Report		
Company:	EPA	
Scope:	1, 2, 3, Biogenic Emissions, Outside of Scopes	
Source Categories:	Water, Mobile Combustion - Owned Fleet, Employee Business Travel, Employee Commuting, Purchased and Used Electricity, Waste, Electricity Generation, Stationary Combustion	
Activity Types:	Stationary Fuel Use, Purchased & Used Electricity, Road Transport, Rail Transport, Air Transport, Water, Waste, Electricity Generation, Intermodal Travel	
Organisation Level:	EPA	
Period:	01/01/2023 - 31/12/2023	
Report Create Date:	28/08/2024 14:42:09	

GHG Emissions disaggregated by Scope			
Scope Name	tonne	tonne Location based	tonne Market based
Biogenic Emissions	181.43		
Scope 1	217.96		
Scope 2		335.32	535.37
Scope 3	493.93		

Scope	Biomass	CO2	CH4	N2O
Biogenic Emissions	181.43295			
Scope 1		217.955844		
Scope 2				
	Location based	335.321062		
	Market based	535.365011		
Scope 3		493.661958	0.009526	0.255775

CO2 Emissions from Biogenic combustion (Biomass) in tonne CO2**Carbon Offsets Purchased in tonne CO2****Carbon Captured and Stored in tonne CO2**

GHG Emissions Summary		
	tonne CO2e Location based	tonne CO2e Market based
Gross Emissions (Scope 1, 2, 3)		
Scope 1	217.96	217.96
Scope 2	335.32	535.37
Scope 3	493.93	493.93
Climate Mitigation		
Net Emissions	1047.20	1247.25

Scope 1, 2, 3 Emissions disaggregated by Activity End Use

Activity End Use	tonne CO2e
Business Travel	238.35
Employee Commuting	247.01

Facility Electricity Supply	909.66
Facility Heating	124.90
Facility Waste Disposal	15.59
Facility Water Supply	2.08
Not Specified	44.98

Scope 1 Emissions Breakdown

Scope 1 Emissions disaggregated by GHG Type	
GHG Type	Scope 1 tonne CO2e
Carbon Dioxide	212.91
CO2e	5.05

Scope 1 Emissions disaggregated by Source Category	
Source Category	Scope 1 tonne CO2e
Mobile Combustion - Owned Fleet	93.06
Stationary Combustion	124.90

Scope 1 Emissions disaggregated by Country/Region	
Country/Region	Scope 1 tonne CO2e
Ireland	217.96

Scope 1 Emissions disaggregated by Facility	
Facility	Scope 1 tonne CO2e

EPA Regional Inspectorate Dublin	72.38
EPA Regional Inspectorate Kilkenny	27.02
EPA Regional Inspectorate Monaghan	36.24
EPA Headquarters,	5.05
EPA Regional Inspectorate Castlebar	48.57
EPA Regional Inspectorate Cork	28.69

Scope 2 Emissions Breakdown

Scope 2 Emissions disaggregated by GHG Type		
GHG Type	Scope 2 tonne CO2e Location based	Scope 2 tonne CO2e Market based
Carbon Dioxide	335.32	535.37

Scope 2 Emissions disaggregated by Source Category		
Source Category	Scope 2 tonne CO2e Location based	Scope 2 tonne CO2e Market based
Purchased and Used Electricity	335.32	535.37

Scope 2 Emissions disaggregated by Country/Region		
Country/Region	Scope 2 tonne CO2e	Scope 2 tonne CO2e Market based

	Location based	
Ireland	335.32	535.37

Scope 2 Emissions disaggregated by Facility		
Facility	Scope 2 tonne CO2e Location based	Scope 2 tonne CO2e Market based
EPA Regional Inspectorate Dublin	57.96	92.54
EPA Regional Inspectorate Kilkenny	23.65	37.77
EPA Regional Inspectorate Monaghan	23.65	37.76
ClonskeaghSq	86.03	137.36
EPA Headquarters,	108.71	173.56
EPA Regional Inspectorate Castlebar	20.02	31.96
EPA Regional Inspectorate Cork	15.30	24.42

Scope 3 Emissions Breakdown

Scope 3 Emissions disaggregated by GHG Type	
GHG Type	Scope 3 tonne CO2e
Carbon Dioxide	347.31
CO2e	88.95
Methane	0.01
Nitrous Oxide	0.26
Radiative Forcing CO2	18.43
T&D Losses CO2	38.97

Scope 3 Emissions disaggregated by Source Category	
Source Category	Scope 3 tonne CO2e
Employee Business Travel	190.28
Employee Commuting	247.01
Fuel- and Energy-Related Activities Not Included in Scope 1 or Scope 2	38.97
Purchased goods and services	2.08
Waste	15.59

Scope 3 Emissions disaggregated by Country/Region	
Country/Region	Scope 3 tonne CO2e

Ireland	493.93
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Scope 3 Emissions disaggregated by Facility	
Facility	Scope 3 tonne CO2e
EPA Regional Inspectorate Dublin	114.36
EPA Regional Inspectorate Kilkenny	24.49
EPA Regional Inspectorate Monaghan	11.99
Castlebar	1.60
Clonskeagh Sq	10.07
Dublin	27.42
EPA Headquarters,	167.11
EPA Regional Inspectorate Castlebar	56.25
EPA Regional Inspectorate Cork	64.69
Kilkenny	1.77
Monaghan	0.45
Wexford (Headquarters) Air Business Travel	13.74

Global Warming Potentials		
Gas	Reference	Global Warming Potential
CH4	IPCC Fifth Assessment Report (AR5 - 100 year)	28

CO2e	IPCC Fourth Assessment Report (AR4 - 100 year)	1
N2O	IPCC Second Assessment Report (SAR - 100 year)	310
CO2e	IPCC Second Assessment Report (SAR - 100 year)	1
CO2	IPCC Fourth Assessment Report (AR4 - 100 year)	1
CH4	IPCC Fourth Assessment Report (AR4 - 100 year)	25
CO2	IPCC Second Assessment Report (SAR - 100 year)	1
CH4	IPCC Second Assessment Report (SAR - 100 year)	21
CO2e	IPCC Fifth Assessment Report (AR5 - 100 year)	1
N2O	IPCC Fifth Assessment Report (AR5 - 100 year)	265
CO2	IPCC Fifth Assessment Report (AR5 - 100 year)	1
N2O	IPCC Fourth Assessment Report (AR4 - 100 year)	298