Ireland’s Provisional Greenhouse Gas Emissions

1990-2021

July 2022
Environmental Protection Agency

The EPA is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

The work of the EPA can be divided into three main areas:

• Regulation: Implementing regulation and environmental compliance systems to deliver good environmental outcomes and target those who don’t comply.
• Knowledge: Providing high quality, targeted and timely environmental data, information and assessment to inform decision making.
• Advocacy: Working with others to advocate for a clean, productive and well protected environment and for sustainable environmental practices.

Our responsibilities include:

LICENSING
• Large-scale industrial, waste and petrol storage activities;
• Urban waste water discharges;
• The contained use and controlled release of Genetically Modified Organisms;
• Sources of ionising radiation;
• Greenhouse gas emissions from industry and aviation through the EU Emissions Trading Scheme.

NATIONAL ENVIRONMENTAL ENFORCEMENT
• Audit and inspection of EPA licensed facilities;
• Drive the implementation of best practice in regulated activities and facilities;
• Oversee local authority responsibilities for environmental protection;
• Regulate the quality of public drinking water and enforce urban waste water discharge authorisations;
• Assess and report on public and private drinking water quality;
• Coordinate a network of public service organisations to support action against environmental crime;
• Prosecute those who flout environmental law and damage the environment.

WASTE MANAGEMENT AND CHEMICALS IN THE ENVIRONMENT
• Implement and enforce waste regulations including national enforcement issues;
• Prepare and publish national waste statistics and the National Hazardous Waste Management Plan;
• Develop and implement the National Waste Prevention Programme;
• Implement and report on legislation on the control of chemicals in the environment.

WATER MANAGEMENT
• Engage with national and regional governance and operational structures to implement the Water Framework Directive;
• Monitor, assess and report on the quality of rivers, lakes, transitional and coastal waters, bathing waters and groundwaters, and measurement of water levels and river flows.

CLIMATE SCIENCE & CLIMATE CHANGE
• Publish Ireland’s greenhouse gas emission inventories and projections;
• Provide the Secretariat to the Climate Change Advisory Council and support to the National Dialogue on Climate Action;
• Support National, EU and UN Climate Science and Policy development activities.

ENVIRONMENTAL MONITORING & ASSESSMENT
• Design and implement national environmental monitoring systems: technology, data management, analysis and forecasting;
• Produce the State of Ireland’s Environment and Indicator Reports;
• Monitor air quality and implement the EU Clean Air for Europe Directive, the Convention on Long Range Transboundary Air Pollution, and the National Emissions Ceiling Directive;
• Oversee the implementation of the Environmental Noise Directive;
• Assess the impact of proposed plans and programmes on the Irish environment.

ENVIRONMENTAL RESEARCH AND DEVELOPMENT
• Coordinate and fund national environmental research activity to identify pressures, inform policy and provide solutions;
• Collaborate with national and EU environmental research activity.

RADIOLOGICAL PROTECTION
• Monitoring radiation levels and assess public exposure to ionising radiation and electromagnetic fields;
• Assist in developing national plans for emergencies arising from nuclear accidents;
• Monitor developments abroad relating to nuclear installations and radiological safety;
• Provide, or oversee the provision of, specialist radiation protection services.

GUIDANCE, AWARENESS RAISING, AND ACCESSIBLE INFORMATION
• Provide independent evidence-based reporting, advice and guidance to Government, industry and the public on environmental and radiological protection topics;
• Promote the link between health and wellbeing, the economy and a clean environment;
• Promote environmental awareness including supporting behaviours for resource efficiency and climate transition;
• Promote radon testing in homes and workplaces and encourage remediation where necessary.

PARTNERSHIP AND NETWORKING
• Work with international and national agencies, regional and local authorities, non-governmental organisations, representative bodies and government departments to deliver environmental and radiological protection, research coordination and science-based decision making.

MANAGEMENT AND STRUCTURE OF THE EPA
The EPA is managed by a full time Board, consisting of a Director General and five Directors. The work is carried out across five Offices:

• Office of Environmental Sustainability
• Office of Environmental Enforcement
• Office of Evidence and Assessment
• Office of Radiation Protection and Environmental Monitoring
• Office of Communications and Corporate Services

The EPA is assisted by advisory committees who meet regularly to discuss issues of concern and provide advice to the Board.
Table of Contents

Key Findings 2

1. Introduction 3

2. Ireland’s provisional Greenhouse Gas Emissions in 2021 5

3. Compliance with National and EU commitments 7

3.1 National Climate Objective 7

3.2 European targets 8

4. Greenhouse gas emissions by sector 11

4.1 Agriculture 12

4.2 Transport 14

4.3 Energy Industries 15

4.4 Residential 17

4.5 Manufacturing and Industry 19

4.6 Other Sectors 20

4.7 LULUCF 22

5. International Aviation and Maritime Emissions 24


7. Conclusion 27

Appendix 28

Additional Tables 28

Background Notes 30

GWPs 30
## Key Findings

### Increase in overall GHG emissions driven by coal fired electricity

2021 total national greenhouse gas emissions are estimated to have increased by 4.7% on 2020 levels to 61.53 million tonnes carbon dioxide equivalent (Mt CO₂eq). This increase in total emissions was driven by increased use of coal and oil for electricity generation and increases in both the Agriculture and Transport sectors. It highlights that further, transformative measures will be needed to meet National Climate ambitions.

### EU Effort Sharing limits exceeded

The provisional estimates of greenhouse gas emissions indicate that Ireland will exceed its 2021 annual limit, without the use of flexibilities, set under the EU’s Effort Sharing Regulation (ESR) by 2.71 Mt CO₂eq. This is the first year of compliance under the ESR.

### Higher 2021 emissions both within and outside the Emissions Trading Scheme

Emissions from Ireland’s Emissions Trading Sector (ETS) increased by 15.2% or 2.02 Mt CO₂eq in 2021 while ESR emissions increased by 1.6% or 0.73 Mt CO₂eq.

### Carbon Budget 2021-2025

Provisional National total emissions (including LULUCF) for 2021 at 69.29 Mt CO₂eq have used 23.5% of the 295 Mt CO₂eq Carbon Budget for the five-year period 2021-2025. This leaves 76.5% of the budget available for the succeeding four years, requiring an 8.4 per cent average annual emissions reduction from 2022-2025 to stay within budget.

### More coal and less wind means more emissions from electricity generation

Emissions in the Energy Industries sector increased by 17.6% or 1.53 Mt CO₂eq in 2021. This is attributable to a tripling of coal and oil use in electricity generation as gas fired plant were offline. Electricity generated from wind and hydro decreased by 16% and 20% respectively in 2021. Emissions intensity of power generation increased from 296g CO₂/kWh in 2020 to 331g CO₂/kWh in 2021.

### More livestock and fertiliser use increase Agriculture emissions

Agriculture emissions increased by 3.0% or 0.67 Mt CO₂eq in 2021, driven by increased fertiliser nitrogen use (5.2%), limestone application (49.5%) increased numbers of livestock including dairy cows (2.8%), other cattle (0.3%), sheep (0.3%) and pigs (4.5%). Total milk production increased by 5.5% in 2021, with milk output per cow also increasing (2.5%).

### Transport emissions increase post COVID

Greenhouse gas emissions from the Transport sector increased by 6.1% or 0.63 Mt CO₂eq in 2021. This increase was largely driven by ending COVID travel restrictions on passenger car and public transport usage. By the end of 2021 there were 47,000 electric vehicles in Ireland, ahead of the Climate Action Plan trajectory. International aviation, not included in national total emissions, also increased by 11.6% in 2021 or by 0.14 Mt CO₂eq.

### Residential emissions decrease

Greenhouse gas emissions from the Residential sector decreased by 4.9% or 0.36 Mt CO₂eq driven by a combination of: reduced time in the home due to ending COVID restrictions, a milder winter, increased fuel prices and a possible stockpiling of heating oil from 2020. Coal, peat and kerosene sales declined by 4.6%, 5.0% and 11.8% whilst natural gas showed an increase of 0.9%.
1. Introduction

The EPA is responsible for compiling the inventories of greenhouse gas emissions for Ireland and for reporting the data to the relevant European and international institutions. As such, Ireland’s legal reporting obligations require that we submit data for the period 1990-2021 in January, March and April 2023 to the European Commission and the United Nations Framework Convention on Climate Change (UNFCCC).

The EPA is publishing the provisional inventory data in July 2022. This is three months earlier than usual, in response to climate governance and legislative advancements in 2021, grounded in the Climate Action and Low Carbon Development (Amendment) Act 2021. The earlier publication will facilitate the monitoring and reporting processes associated with the National Climate Objective and associated Carbon budgets, annual review of the Climate Action Plan and greater level of sectoral reporting and more in-depth assessment and reporting of Policies and Measures.

The provisional estimates of Ireland’s greenhouse gas figures for the years 1990-2021 are based on interim energy balances provided by the SEAI in June 2022 and the latest available data from other data providers such as the Central Statistics Office and the Department of Agriculture, Food and the Marine (DAFM). These are compiled using methodologies in accordance with UNFCCC reporting guidelines. Verified emissions data from installations within the EU’s Emissions Trading Scheme (ETS) are included.

Ireland’s emissions targets

Ireland’s EU and National legislative commitments have different emissions reduction requirements and timeframes for achievement. Ireland’s 2030 target under the EU’s Effort Sharing Regulation (ESR) is to deliver a 30% reduction of emissions compared to 2005 levels by 2030. There are also annual binding emission allocations over the 2021-2030 period to meet that target. Ireland’s compliance status at 2030 can only be determined when the 2030 inventory is compiled. Under the ESR two flexibilities may be utilised (use of EU Emissions Trading Scheme allowances and credit from action undertaken in the Land use, Land use Change and Forestry (LULUCF) sector) to allow for a fair and cost-efficient achievement of the targets.

Ireland’s national emission reduction objectives as set in the Climate Action and Low Carbon Development (Amendment) Act 2021, are to achieve a 51% emissions reduction (including LULUCF) by 2030 compared to 2018 and achieve a climate neutral economy by no later than the end of 2050. The Act provides for the establishment of carbon budgets to support achievement of Ireland’s climate ambition. The 51% target, relative to 2018, is the primary constraint on carbon budgets over the course of the first two budget periods ending on 31 December 2030, see Table 1. The Climate Action Plan 2021 sets out a major programme of policies and measures that aim to achieve significant progress towards those objectives.

This year Ireland’s emissions inventory has been compiled using Global Warming Potentials (GWPs) as specified in the 5th IPPC assessment report (AR5) for the first time. Ireland’s National emissions reduction objective, carbon budgets and European target under the ESR are all now estimated on an AR5 basis and this change simplifies the assessment of progress towards these targets.

---

Table 1. European Union and National GHG Targets comparison

<table>
<thead>
<tr>
<th>Base Year</th>
<th>Reduction required by 2030</th>
<th>Scope</th>
<th>Other key points to note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>European Union Targets</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>30%</td>
<td>Sectors covered by the Effort Sharing Regulation (excludes ETS)</td>
<td>Annual binding emission limits (AEAs) define the permitted budget and some flexibilities are available.</td>
</tr>
<tr>
<td><strong>National Targets</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>51%</td>
<td>Economy-wide target (includes ETS)</td>
<td>Unlike the EU target, the national target includes LULUCF. Binding Carbon budgets set the required reduction trajectory.</td>
</tr>
</tbody>
</table>

This report provides a summary of the 2021 provisional emission estimates accompanied by an assessment of changes relative to the 2020 estimates. The recent and long-term trends in greenhouse gas emissions across key sectors, and their significance in relation to Ireland's target under the EU's Effort Sharing Regulation and National Climate Action Plan 2021 are also presented.

Methodology changes in the 1990-2021 Inventory

Changes are made each year to update and improve the underlying data and methods being used to estimate emissions. For this inventory submission, two important changes occurred, use of the 2019 Refinement to the 2006 IPCC Guidelines and changes to Global Warming Potentials for greenhouse gases.

In 2019 the IPCC published a refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The aim of the refinement is to provide an updated scientific basis for supporting the preparation and continuous improvement of national GHG inventories. This is achieved by firstly providing supplementary methodologies where gaps or new technologies or processes have emerged or were not well covered in the 2006 IPCC Guideline. Secondly updated default values for emission factors and other parameters are provided taking on board the latest scientific information and finally additional or alternative guidance is provided as clarification and/or elaboration of guidance in the 2006 IPCC Guidelines. These refinements have been applied across the full time-series 1990-2021 in these provisional estimates for the Agriculture sector. The impact of these changes amounts to increasing Agriculture sectoral emissions by an average 0.06 Mt CO$_2$ eq per annum.

In previous Inventory reports GWPs from the 4th IPCC assessment report (AR4) were used. Ireland’s National emissions reduction objective, carbon budgets and European target under the ESR are all now estimated on an AR5 basis and this change simplifies the assessment of progress towards these targets. GWPs allow methane, nitrous oxide and other greenhouse gases to be expressed in CO$_2$ equivalent terms based (for Inventory reporting) on a 100-year time horizon. A comparison of AR4 and AR5 GWPs is presented in the Background notes section.
2. Ireland’s provisional Greenhouse Gas Emissions in 2021

For 2021, provisional total national greenhouse gas emissions (excluding LULUCF) are estimated to be 61.53 million tonnes carbon dioxide equivalent (Mt CO$_2$eq) which is 4.7% higher (or 2.76 Mt CO$_2$eq) than emissions in 2020 (58.77 Mt CO$_2$eq) and follows a 3.4% decrease in emissions reported for 2020. Emissions are over 1% higher than pre-pandemic 2019 figures.

In 2021, national total emissions excluding Land Use Land Use Change and Forestry (LULUCF) increased (4.7%), ETS\(^2\) emissions increased (15.2%) and ESR emissions increased (1.6%). When LULUCF is included, total national emissions increased by 5.5%. LULUCF emissions are discussed in more detail in section 4.7.

Emissions per capita increased from an historic low of 11.8 tonnes CO$_2$eq/person in 2020 to 12.3 tonnes CO$_2$eq/person in 2021. Ireland’s average tonnes of GHG/capita over the last ten years were 12.8 tonnes. With recent CSO preliminary 2022 census data showing a population of 5.12 million people and with population projected to increase to 5.5 million in 2030, 5.9 million in 2040 and 6.2 million by 2050, per capita emissions need to reduce significantly in order to meet reduction targets. At current per capita emission levels, each additional 500,000 people would contribute an additional 6 million tonnes of CO$_2$eq annually.

The inter-annual change in total greenhouse gas emissions is presented in Figure 1 and sectoral share of emissions (excluding LULUCF) in Figures 2 and 23. Detailed sectoral data are shown in Table 4.

Agriculture is the largest contributor to the overall emissions at 37.5% of the total (excluding LULUCF). Transport and Energy Industries are the second and third largest contributors at 17.7% and 16.7% respectively. Residential and Manufacturing Combustion emissions account for 11.4% and 7.5% respectively. These five sectors accounted for 90.9% of national total emissions in 2021. The remainder is made up by the Industrial Processes sector at 4.0%, F-Gases at 1.2%, Commercial Services at 1.3%, Public Services at 1.1% and Waste at 1.5%. Figure 2 shows the contributions from each of the sectors in 1990 and 2021.

\(^{2}\) ETS emissions in this report refers to CO$_2$ emissions from stationary installations and from domestic aviation. It does not include emissions from intra-EU aviation as those are not considered part of Ireland’s total reportable greenhouse gas emissions.
Figure 1. Inter Annual Changes in GHG Emissions 1990-2021

ETS emissions in this report refer to CO₂ emissions from stationary installations and from domestic aviation. It does not include emissions from intra-EU aviation as those are not considered part of Ireland’s total reportable greenhouse gas emissions.

Figure 2. Profile of GHG Emissions (excluding LULUCF) in 1990 and 2021 by Sector
3. Compliance with National and EU commitments

Ireland has several greenhouse gas emission reduction commitments, both set out in National legislation and by virtue of its EU membership and commitment to UN goals under the Framework Convention on Climate Change (UNFCCC). These various commitments have different scope and interim targets associated with them, but all ultimately require Ireland playing its part in achieving the global goal of limiting global temperature rise.

3.1 National Climate Objective

The Climate Action and Low Carbon Development (Amendment) Act 2021 sets a national climate objective of achieving a climate resilient and climate neutral economy by the end of the year 2050. A key milestone to achieving this aim, an interim target has been set out to achieve a reduction of 51% in total emissions (including LULUCF) over the period 2018 to 2030. Climate Action Plan 2021, published in November 2021 outlines many of the policies and measures to be implemented to achieve the objective, with further measures to be developed in future plans.

Carbon Budgets

The Climate Action and Low Carbon Development (Amendment) Act 2021 provides for the establishment of carbon budgets in support achieving Ireland's climate ambition. The 51% target is the primary constraint on carbon budgets over the course of the first two budget periods ending on 31 December 2030, relative to 2018. The provisional carbon budget proposed for 2031 to 2035 continues the trajectory towards climate neutrality by 2050.

Three Carbon budgets for the period up to 2035 have been approved by the Oireachtas and came into force on 6th April 2022, with sectoral budgets also set to be determined shortly. Figure 3 illustrates a linear emissions reduction trajectory towards achieving the 51% reduction target, along with the extent to which the first carbon budget (for the period 2021-2025 has been ‘used up’ based on emissions in 2021.

Budget pathways for each period and sectoral budgets have yet to be finalised, and LULUCF emissions/removals are included in the carbon budgeting process.

- Budget 1 from 2021-2025 has been set at 295 Mt CO\textsubscript{2} eq.
- Budget 2 from 2026-2030 has been set at 200 Mt CO\textsubscript{2} eq.
- Budget 3 from 2031-2035 has been set at 151 Mt CO\textsubscript{2} eq.

---

3 Climate Action and Low Carbon Development (Amendment) Act 2021 (irishstatutebook.ie)
To put Ireland on a linear trajectory towards achieving the Climate Act target of a 51% reduction in emissions by 2030 on the 2018 level would require an annual average emission reduction of 7.5% over the remaining nine years until 2030. While the carbon budgets do not currently prescribe the compliance trajectory, they do implicitly incorporate an acceleration of emissions reductions in the second budget period compared to the first, reflecting the time lag inherent in the implementation of some measures. Provisional national total emissions including LULUCF for 2021 of 69.29 Mt CO$_2$eq account for 23.5% of the first five-year Carbon Budget of 295 Mt CO$_2$eq. To stay within budget for the first carbon budget period would require an 8.4 per cent average annual emissions reduction from 2022-2025, or over 5 Mt CO$_2$eq emissions reductions annually.

### 3.2 European targets

The greenhouse gas emission inventory for 2021 is the first of ten years over which compliance with targets set in the European Union’s Effort Sharing Regulation (EU 2018/842) will be assessed. This Regulation sets 2030 targets for emissions outside of the Emissions Trading Scheme (known as ESR emissions) and annual binding national limits for the period 2021-2030. Ireland’s target is to reduce ESR emissions by 30% by 2030 compared with 2005 levels, with a number of flexibilities available to assist in achieving this.

#### Compliance assessment

**Annual Emissions Allocation**

Ireland’s ESR emissions annual limit for 2021 is 43.48 Mt CO$_2$eq. Ireland’s provisional 2021 greenhouse gas ESR emissions are 46.19 Mt CO$_2$eq, this is 2.71 Mt CO$_2$eq more than the annual limit for 2021, see Table 2 and Figure 4. This value is the national total emissions less emissions generated by stationary combustion and aviation operators that are within the EU’s emissions trading scheme. This indicates that Ireland is not in compliance with its 2021 Effort Sharing Regulation annual limit, exceeding the allocation by 0.80 Mt CO$_2$eq after using the ETS flexibility. Agriculture and Transport accounted for 73.4% of total ESR emissions in 2021.
Emissions Trading Scheme

Since 2005, emissions in the ETS sector have decreased by 31.7% or 7.12 Mt CO$_2$eq whereas emissions under the ESR only decreased by 5.1% or 2.50 Mt CO$_2$eq, considerably short of Ireland’s 30% reduction commitment. Within the ETS sector, electricity generation and the cement sectors, are responsible for most of the decrease. Since 2005, emissions under the ESR decreased in the Transport, Residential, Public Services, Commercial Services, F-Gases and Waste sectors, with the Agriculture and Energy Industries sectors increasing.

Table 2. Compliance with EU ESR Targets 2021-2030 (all numbers in the table are rounded to the nearest kt CO$_2$eq)

<table>
<thead>
<tr>
<th></th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>2029</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total greenhouse gas emissions without LULUCF</td>
<td>61,528</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Total verified emissions from stationary installations under Directive 2003/87/EC</td>
<td>15,320</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- CO$_2$ emissions from domestic aviation</td>
<td></td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total ESR emissions</td>
<td>46,188</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU ESR Targets†</td>
<td>43,479</td>
<td>42,357</td>
<td>41,235</td>
<td>40,113</td>
<td>38,991</td>
<td>37,869</td>
<td>36,747</td>
<td>35,625</td>
<td>34,503</td>
<td>33,381</td>
</tr>
<tr>
<td>Gross distance to target</td>
<td>-2,709</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ annualised ETS flexibility†</td>
<td>1,908</td>
<td>1,908</td>
<td>1,908</td>
<td>1,908</td>
<td>1,908</td>
<td>1,908</td>
<td>1,908</td>
<td>1,908</td>
<td>1,908</td>
<td>1,908</td>
</tr>
<tr>
<td>+ annualised projected LULUCF flexibility*</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Net distance to target</td>
<td>-801</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* No flexibility projected to be available under the EPAs “With Existing Measures” scenario
† Set out in Annex II and Annex III of Commission Implementing Decision (EU) 2020/2126

The data presented in Figure 5 shows the sectoral shares of emissions covered by the Effort Sharing Regulation in 2005 and 2021.

**Figure 5. Profile of Effort Sharing Regulation relevant GHG Emissions in 2005 and 2021 by Sector**

**Year 2005**
- Agriculture: 43.5%
- Transport: 26.8%
- Energy Industries: 0.4%
- Residential: 17.2%
- Manufacturing Combustion: 2.9%
- Commercial Services: 2.2%
- Public Services: 1.94%
- F-Gases: 2.3%
- Industrial Processes: 0.4%

**Year 2021**
- Agriculture: 49.9%
- Transport: 23.6%
- Energy Industries: 1.6%
- Residential: 15.2%
- Manufacturing Combustion: 2.4%
- Commercial Services: 1.8%
- Public Services: 1.4%
- F-Gases: 1.6%
- Industrial Processes: 0.4%
4. Greenhouse gas emissions by sector

For the purposes of this report emissions are classified into ten key sectors and fluorinated gases (F-gases). Although F-gases can be emitted from any sector it is helpful to group them collectively as the emissions from any one sub-sector are seldom significant, and measures to reduce them are often cross-sectoral in nature. The sectoral breakdown used in this report, and changes in emissions for those sectors between 2020 and 2021, are presented in Table 3 below and described in more detail in the Appendix.

This sectoral breakdown is produced for National reporting purposes (including comparisons with the 2021 Climate Action Plan) and although generally in alignment with the classification used for UNFCCC reporting, some adjustments have been made for ease of comparison with national policies. Key energy subcategories; Energy Industries (largely electricity generation), Residential, Manufacturing Combustion, Transport, Commercial Services and Public Services are also shown separately rather than as part of an overarching Energy category as reported to the UNFCCC. In this section, the time series since 1990 is graphically presented, as 1990 is the historical base year used for UNFCCC reporting.

Table 3. Ireland’s Provisional Greenhouse Gas Emissions for 2020 and 2021 by Sector

<table>
<thead>
<tr>
<th>Million tonnes CO₂eq</th>
<th>2020</th>
<th>2021</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>22.431</td>
<td>23.097</td>
<td>3.0%</td>
</tr>
<tr>
<td>Transport</td>
<td>10.285</td>
<td>10.912</td>
<td>6.1%</td>
</tr>
<tr>
<td>Energy Industries (including electricity generation)</td>
<td>8.738</td>
<td>10.272</td>
<td>17.6%</td>
</tr>
<tr>
<td>Residential</td>
<td>7.400</td>
<td>7.040</td>
<td>-4.9%</td>
</tr>
<tr>
<td>Manufacturing Combustion</td>
<td>4.552</td>
<td>4.593</td>
<td>0.9%</td>
</tr>
<tr>
<td>Industrial Processes</td>
<td>2.107</td>
<td>2.460</td>
<td>16.8%</td>
</tr>
<tr>
<td>F-Gases</td>
<td>0.739</td>
<td>0.738</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Commercial Services</td>
<td>0.843</td>
<td>0.817</td>
<td>-3.0%</td>
</tr>
<tr>
<td>Public Services</td>
<td>0.689</td>
<td>0.663</td>
<td>-3.8%</td>
</tr>
<tr>
<td>Waste</td>
<td>0.982</td>
<td>0.937</td>
<td>-4.5%</td>
</tr>
<tr>
<td>LULUCF</td>
<td>6.943</td>
<td>7.767</td>
<td>11.9%</td>
</tr>
<tr>
<td><strong>Total excluding LULUCF</strong></td>
<td><strong>58.766</strong></td>
<td><strong>61.528</strong></td>
<td><strong>4.7%</strong></td>
</tr>
<tr>
<td><strong>Total including LULUCF</strong></td>
<td><strong>65.709</strong></td>
<td><strong>69.295</strong></td>
<td><strong>5.5%</strong></td>
</tr>
</tbody>
</table>
4.1 Agriculture

Total emissions from the agriculture sector in 2021 were 23.1 Mt CO$_2$eq an increase of 3.0% on 2020. The most significant drivers for the increased emissions in 2021 were increased use of synthetic nitrogen fertiliser use of 5.2% and higher dairy cow numbers of 2.8% with an increase in milk production of 5.5%.

Methane emissions originate from Enteric Fermentation, Manure Management and fuel combustion. In 2021, CH$_4$ emissions contribute 69.6% to the Agriculture sector and have increased by 1.8% since 2020.

Nitrous Oxide emissions originate from Manure Management, Agricultural Soils and fuel combustion. In 2021, N$_2$O emissions contribute 24.8% to the Agriculture sector and have increased 3.4% since 2020.

Carbon dioxide emissions originate from Liming, Urea Application and fuel combustion. In 2021, CO$_2$ emissions contribute 5.6% to the Agriculture sector and have increased by 17.3% since 2020. Agriculture emissions by source category and by gas are presented in Figures 6 and 7. Increasing methane emissions are evident in the gas share trend, 16.1 Mt CO$_2$eq (69.6% share) in 2021 compared to 13.5 Mt CO$_2$eq (67.2% share) in 1990, increasing in level by 19.3%. The current situation indicates methane emissions from agriculture are steadily increasing due to increased production when methane emissions reduction of almost 30% is required to achieve at least a 22% reduction in Agriculture emissions compared to 2018, the lower end of the range committed to in the 2021 Climate Action Plan.

This is the 11th consecutive year of increases in dairy cow numbers. Milk output per cow also increased (2.5%), therefore increased production was driven by an increase in livestock numbers in conjunction with an increase in milk yield per cow. In 2021, total cattle numbers increased by 0.8% and sheep numbers increased by 0.3%, pig numbers increased by 4.5% and the poultry population decreased by 0.5%.

Total fossil fuel consumption in agriculture/forestry/fishing activities remained at similar levels to 2020. In 2021, liming on soils increased by 49.5%, a welcome measure in improving soil fertility, which should lead to a reduction in fertiliser nitrogen use in future years.
Figure 6. Trend in Agriculture 1990-2021

![Chart showing trends in agriculture emissions from 1990 to 2021 for enteric fermentation, manure management, agricultural soils, liming, urea application, and fishing.]

Figure 7. Trend in Agriculture, by Gas 1990-2021

![Chart showing trends in agriculture emissions from 1990 to 2021 for CH4, N2O, and CO2 emissions.]
4.2 Transport

Transport emissions and the expected rebound effect from the partial lifting of COVID restrictions started to take effect with a 6.1% increase in 2021. Emissions from road transport were relatively stable for the period 2015-2019, at an average 11.6 Mt CO$_2$eq but reduced to 9.7 Mt CO$_2$eq in 2020. The expected increase in road transport activity in 2021 has seen emissions rise to 10.3 Mt CO$_2$eq, still below pre-pandemic levels. Total energy consumption in road transport increased by 6.3% in 2021; petrol, +6.1%, diesel +6.7%, bioethanol +4.6% and biodiesel +1.9%.

Transport emissions in 2021 were 24.5% below peak levels in 2007 primarily due to the effect of some continued COVID restrictions, economic downturn and also due to improving vehicle fuel efficiency, the increased use of biofuels and a significant decrease in fuel tourism in recent years.

At the end of 2021, there were just under 47,000 battery electric (BEVs) and plug-in hybrid electric (PHEVs) vehicles in Ireland, approximately 24% (compared to 14% in 2020) of the Climate Action Plan target for 2025 of 195,300 (With Additional Measures scenario) or <5% of the 2030 policy target of 945,000 vehicles (WAM). As a result, the continued uptake of electric vehicles has meant the annual trajectory target in 2021 was exceeded, see Figure 8.

**Figure 8. Total Electric Vehicles and Climate Action Plan target (WAM) 2025**

The impact of Electric Vehicles in reducing Transport emissions is still very small due to the low number in the vehicle fleet but they are projected to contribute substantially to emissions reductions towards the latter half of the 2020s. Evidence of this shift appears in the 2021 vehicle numbers whereby newly registered fully electric cars and hybrid vehicles more than doubled compared to 2020.

Passenger cars were responsible for 54% of road transport emissions in 2020, with Heavy Goods Vehicles responsible for 20%, Light Goods Vehicles for 18% and Buses 7%. Modal share data for 2021 is not available for these provisional estimates.
Figure 9. Trend in Transport 1990-2021

4.3 Energy Industries

Sectoral emissions in the Energy Industries sector show an increase of 17.6% in 2021 which is attributable to a tripling of both coal and fuel oil use in electricity generation. The use of peat has continued to decline, a 68% reduction in 2021, and is currently at an all time low within the electricity generation sector. There was also a reduction in natural gas use by 8.9% as plants were offline in 2021.

In 2021, overall electricity generated from renewables reduced from 42% in 2020 to 35%, due to low rainfall for hydro and low wind. Electricity generated from hydro reduced by 20% and from wind by 16% in 2021. The reduction in hydro and wind generation, combined with an increase in coal and oil use, resulted in the emissions intensity of power generation in 2021 increasing by 11.9%, 331 g CO$_2$/kWh compared with 296 g CO$_2$/kWh in 2020.

In 2021 renewables accounted for 34.7%, (down from a high of 42.3% in 2020) and natural gas 49.8% of electricity generated in 2021. In 2021, Ireland also imported almost 1,600 GWh of electricity which would have resulted in additional emissions of over 500 kt of CO$_2$, if generated in Ireland. See Figures 10 and 11.

Emissions from electricity generation had decreased year-on-year from 2016 to 2020, but 2021 has seen an increase of 18.8% compared to 2020. The return to using more carbon intensive fuel along with less renewables and natural gas plant availability has played a big part in reversing the trend. The emission categories relevant under the Energy Industries sector are: Public electricity and heat production, Petroleum refining, Manufacture of solid fuels and other energy industries and fugitive emissions, Figure 12.
Figure 10. Emissions Intensity of Electricity Generation 1990-2021

![Graph showing emissions intensity of electricity generation from 1990 to 2021. The graph displays a decreasing trend in emissions intensity over the years, with notable peaks around 1990 and 2005. The x-axis represents the years from 1990 to 2020, and the y-axis represents g CO₂/kWh generated. Key values include 896 g CO₂/kWh in 1990 and 296 g CO₂/kWh in 2020.]

Figure 11. Electricity Generated by Fuel 1990-2021

![Graph showing electricity generated by fuel from 1990 to 2021. The graph displays a bar chart with the years from 1990 to 2020 on the x-axis and GWhrs on the y-axis. The chart includes bars for coal, peat, oil, natural gas, wastes (NR), renewables, and net imports. Key values include 34.7% for renewables and 46.1% for net imports.]
4.4 Residential

Emissions in the Residential sector are 7.04 Mt CO$_2$eq in 2021 and decreased by 4.9% or 0.36 Mt CO$_2$eq since 2020. Within the different fuels used in household space and water heating, decreases were seen in; coal, peat and kerosene by 4.6%, 5.0% and 11.8% respectively. Natural gas and heating oil however increased by 0.9% and 4.6% respectively in 2021.

There were 2.5% less heating degree days$^7$ in 2021 than in 2020. Fuel switching, from coal and peat to oil and natural gas use, as well as improvements in buildings regulations helped reduced emissions per household from 7.0 t/CO$_2$ per year in 1990 to a low of 3.5 t/CO$_2$ per year in 2014. Since 2014, fuel use per household has increased by 12% with CO$_2$ emissions per household increasing to 3.8 t CO$_2$ in 2021. See Figures 13 and 14. While weather is a key variable from year to year, the flattening of the historic downward trend in per household CO$_2$ emissions evident in Figure 14, indicates a need for increased energy efficiency retrofit activity in order to achieve future emissions reduction commitments.

Degree days are a measure of the heating or cooling requirement on a given day with reference to a level where neither is required (typically 15.5°C). The number of degree days in a year is a strong indicator of the annual Residential energy demand.

---

$^7$ Degree days are a measure of the heating or cooling requirement on a given day with reference to a level where neither is required (typically 15.5°C). The number of degree days in a year is a strong indicator of the annual Residential energy demand.
Figure 13. Trend in Residential 1990-2021

![Trend in Residential 1990-2021](chart)

- **Solid Fuels**
- **Peat**
- **Liquid Fuels**
- **Natural Gas**
- **Renewables**
- **CO₂ eq emissions from Residential Sector**

Figure 14. CO₂ emissions per Household 1990-2021

![CO₂ emissions per Household 1990-2021](chart)

- **No. of Households**
- **Tonnes CO₂/household**
4.5 Manufacturing and Industry

Emissions relating to Manufacturing Combustion and Industrial Processes combined accounted for 11.5% of Ireland’s total emissions in 2021, or 7.05 Mt CO$_2$ eq. Emissions from the Manufacturing Combustion sector increased by 0.9% or 0.04 Mt CO$_2$ eq in 2021. There were decreases in combustion emissions from major sub sectors including chemical and the food processing, beverages and tobacco sector, i.e. 3.2% and 4.4% respectively. However, combustion emissions from non-metallic minerals (including cement) increased significantly by 10.5% and 0.12 Mt CO$_2$ eq. See Figure 15.

**Figure 15. Trend in Manufacturing Combustion 1990-2021**

Emissions from the Industrial Processes sector increased by 16.8% (0.35 Mt CO$_2$ eq) in 2021 from 2.11 Mt of CO$_2$ eq to 2.46 Mt CO$_2$ eq, following a 7.1% decrease in 2020. The yearly increase is due to an upturn in cement production levels after a COVID affected year in 2020. Total process emissions from the mineral products subsector (including cement) increased by 18.1%.

In 2021, total emissions (combustion and process) from the cement sector increased by 16.8% and amount to 3.13 Mt CO$_2$ eq, or 5.1% of national total emissions. Cement sector emissions are now 106.2% higher than the 2011 low during the economic recession, see Figure 16.
4.6 Other Sectors

Emissions from F-Gases, Commercial Services, Public Services and Waste account for 5.1% of total national emissions in 2021.

Commercial and Public Services

Emissions from Commercial Services and Public Services decreased by 3.0% and 3.8% respectively. Natural gas use in both sectors decreased by 5.0% with oil also reducing by 3.1% within Public Services.

Waste

Emissions from the Waste sector decreased by 4.5% in 2021, largely as a result of a decrease in emissions of methane from landfills by 5.4%. Overall emissions decreased by 0.04 Mt CO$_2$eq. See Figure 17.

Long-term decreases are a result of decreased quantities of municipal solid wastes (MSW) disposed of at landfills which now are combusted in Waste to Energy (WtE) plants and a decrease in the proportion of organic materials (food and garden waste) in MSW as well as a diversion of paper products from landfills. A large proportion of organic food and garden waste is now treated in composting and anaerobic digestion facilities, which have significantly lower emissions than landfills. The emissions associated from combustion at WtE plants are estimated under electricity generation in Energy Industries. Improved management of landfill facilities, including increased recovery of landfill gas utilised for electricity generation and flaring is also a big driver in decreased emissions from the waste sector. The increasing trend of methane emissions from landfills from 2009 to 2016 is due to a decrease in landfill gas flaring as overall landfill gas volumes decrease.
Fluorinated Gas Emissions

F-Gas emissions were down 0.2% from 2020 to 2021, following a decrease of 14.6% in the previous year. This is driven by a reduction in refrigeration and air conditioning emissions. Emissions of F-gases (HFCs, PFCs, SF₆ and NF₃) were 0.74 Mt CO₂eq in 2021 compared to 0.04 Mt CO₂eq in 1990, a 21-fold increase over the time series, see Figure 18. However, F-gas emissions have risen from a very low base and only accounted for 1.2 per cent of the national total in 2021. F-gases include a wide range of substances that are used in a diverse range of products and manufacturing processes.

The main reason behind the more recent decreases in F-gas emissions has been the phasing out of refrigerant and air conditioning (AC) gases with high global warming potentials (GWPs), due to the implementation of the F-Gas Regulation (EU) No. 517/2014. These refrigerant gases are being replaced with products containing a blend of HFCs and hydrofluoroolefins (HFOs) with low GWPs in this subcategory, Refrigeration and Air Conditioning.
4.7 LULUCF

The LULUCF sector is made up of six land use categories (Forest Land, Cropland, Grassland, Wetlands, Settlements, and Other Land) and Harvested Wood Products. This sector accounts for 11.2% of national total emissions (including LULUCF). See Figure 19. These categories are sub-divided into land remaining in the same category (e.g. Forest land remaining forest land) and land converted from one category into another (e.g. grassland converted to forest land).

The sector is a net source of CO$_2$ eq emissions in all years 1990-2021. The net CO$_2$ emissions to, or removals from, the atmosphere are estimated with respect to overall carbon gain or loss for relevant carbon pools for the defined land categories. These pools$^8$ are above-ground biomass, below-ground biomass, litter, dead wood, soils and harvested wood products. Emissions from biomass burning (wildfires), drainage of organic soils and emissions from mineralisation in soils are also estimated.

The main source of emissions is the drainage of grasslands on organic soils and the exploitation of wetlands for peat extraction. Forest land and Harvested wood products are a carbon sink (CO$_2$ removal) for all years 1990-2021. See Figure 20. The carbon sink associated with Forest land is on a declining trend.

A complex dynamic exists between land use categories and the relative contributions between the carbon pools in biomass and soils lead to fluctuations in emissions and removals over the period 1990-2021. In any one year the Croplands land use can act as either a small sink (removal) or a small source of emissions. This results from the dynamic of using temporary grassland as part of cropping rotations. The Settlements and Other Land uses are comparatively less important and do not affect the absolute level of emissions or the trend over time to a significant extent.

Emissions from the LULUCF sector in 2021 were 24.8% above those in 1990 and increased by 11.9% between 2020 and 2021. There has been a significant long-term decline in the area of land afforested annually and an increase on the level of harvest and increased emission from forestry on organic soils resulting in a reduction in the contribution of the forest land sector to the removal of CO$_2$ from the atmosphere. Afforestation rates have declined from c. 15,000 ha in the 1990s to c. 2,000 ha by 2021 resulting in a decreasing carbon sink in land converted to forest land. For forest land remaining forest land, it is transitioning from a sink to an emission source due an increase in the level of harvest from 1.7 million m$^3$ in 1990 to 4.3 million m$^3$ in 2021.

---

$^8$ A carbon pool is a reservoir of carbon that has the capacity to both take in and release carbon.
Figure 19. Profile of GHG Emissions (including LULUCF) in 1990 and 2021 by Sector

**Year 1990**
- Agriculture: 32.7%
- Energy Industries: 10.1%
- Manufacturing Combustion: 6.6%
- Residential: 12.3%
- Commercial Services: 1.7%
- Public Services: 1.8%
- F-Gases: 0.1%
- Waste: 2.8%
- Transport: 8.4%
- Land Use, Land Use Change and Forestry: 10.1%

**Year 2021**
- Agriculture: 33.3%
- Energy Industries: 14.8%
- Manufacturing Combustion: 6.6%
- Residential: 10.2%
- Commercial Services: 1.2%
- Public Services: 1.0%
- F-Gases: 1.1%
- Transport: 15.7%
- Land Use, Land Use Change and Forestry: 11.2%

Figure 20. Trend in LULUCF 1990-2021

Legend:
- Forest land
- Cropland
- Harvested wood products
- Grassland
- Wetlands
- Settlements
- Other land
- Emissions CO₂eq
5. International Aviation and Maritime Emissions

Emissions from international aviation and maritime navigation are reported as “memo items” in the national emission inventory. This means they are not counted as part of Ireland’s national total emissions but are reported by Ireland to the UNFCCC and EU for information purposes. A substantial proportion of Ireland’s international aviation emissions is included in the EU ETS, such as all intra EU flights and flights within the European Economic Area (EEA) including; Iceland, Norway and Liechtenstein. In 2021, total international aviation contributed 1.32 Mt CO$_2$ from over 52,500 return flights from Irish airports, see Figure 21. This is a significant reduction on recent trends, with international aviation emissions averaging over 3.0 Mt CO$_2$ eq per year prior to the COVID pandemic.

In recent years, CO$_2$ emissions from international aviation have increased very rapidly and it is therefore important that they are closely monitored for comparison with other sources and for the benefit of the international organisations that will have to develop control strategies for them in the future.

International marine navigation is another important source of emissions that is also excluded from Ireland’s national total emissions and any EU or UN reduction commitments. In 2021, emissions from this source amounted to 0.48 Mt CO$_2$ eq, which is very similar to 2020.

Figure 21. Trend in International Aviation 1990-2021

As 1990 is the historical base year used by most countries in relation to UNFCCC reporting, it is instructive to look at how emissions have evolved over the longer timeframe from 1990 to the present. The share of CO\textsubscript{2} in total greenhouse gas emissions has increased to 61.0% of total greenhouse gas emissions in 2021 compared to 59.6% in 1990. The share of CH\textsubscript{4} and N\textsubscript{2}O emissions, primarily from the agriculture sector, have fallen from 40.3 of total greenhouse gas emissions in 1990 to 37.8% in 2021 as emissions (primarily CO\textsubscript{2}) from other sectors grew at a faster rate. Emissions from F-gases account for 1.2% of the total in 2021.

The trend in national total emissions (excluding LULUCF) from 1990 to 2021 is +11.4%, shown in Figures 22 and 23 and Table 4 in the Appendix.

Between 1990 and 2021, Transport shows the greatest overall increase of GHG emissions at 112.1%, from 5,143.5 kt CO\textsubscript{2}eq in 1990 to 10,911.6 kt CO\textsubscript{2}eq in 2021, with road transport increasing by 115.1%. Fuel combustion emissions from Transport accounted for 9.3 per cent and 17.7 per cent of total national greenhouse gas emissions in 1990 and 2021, respectively. The increase in emissions up to 2007 can be attributed to general economic prosperity and increasing population, with a high reliance on private car travel as well as rapidly increasing road freight transport. Over the time series passenger car numbers increased by 178% and commercial vehicles increased by 167%. Both the increase in transport emissions up to 2007 and the subsequent fall during the financial crisis highlight that transport emissions have not yet been effectively decoupled from economic activity through sustainable planning or electrification.

Energy Industries show a decrease in emissions of 9.4% over the period 1990 to 2021. Over the time series, emissions from electricity generation have decreased by 10.5% whereas total electricity consumption has increased by 150.5%. Emissions from electricity generation increased from 1990 to 2001 by 54.3% and have decreased by 42.1% between 2001 and 2021. This decrease reflects the improvement in efficiency of modern gas fired power plants replacing older peat and oil-fired plants and the increased share of renewables, primarily, wind power along with increased interconnectivity. This year was the lowest year in the 32-year time series for peat fired electricity generation, 68% less than in 2020. These reductions reflect the gradual ending of peat fired electricity generation for market and climate policy reasons. Emissions from electricity generation had decreased year-on-year from 2016 to 2020, but 2021 has seen an increase of 18.8% compared to 2020.

In 2021, there was a tripling of coal and oil used for electricity generation due to the unavailability of enough gas-fired generation and lower renewables. This threatens to undo some of the good work done over recent years and negatively impact achievement of National targets, particularly for the first carbon budget period.

The latest estimates show that total emissions in the Agriculture sector have increased by 15.0% from 1990 to 2021 mainly driven by a 17.7% increase in methane emissions from enteric fermentation and a 29.6% increase in emissions from manure management. After initially showing a rising trend in emissions in the 1990s, the Agriculture sectoral emissions began to decrease steadily between 1998 until 2011.

However, since 2011, emissions have trended upwards again with an overall peak in emissions reported in the latest inventory year, 2021. Meanwhile, total fossil fuel combustion emissions from agriculture/forestry/fishing activities have decreased by 20.3% since 1990. In the last 10 years, dairy cow numbers have increased by 44.5% with a corresponding milk production increase of 62.8%. This reflects national plans to expand milk production under Food Wise 2025 and the removal of the milk quota in 2015.

In the same 10-year period sheep numbers increased by 20.2%, pigs by 9.9% and poultry by 27.7%.
Increased housing stock and a growing population drove the gradual upward trend in the emissions from the **Residential** sector after 1997 following emission reductions in the early 1990s due to fuel switching, from coal and peat to oil and natural gas, to reach a peak in 2010. The 2021 emissions in this sector are 4.9% lower than 2020 levels and are 7.0% lower than their 1990 level, whereas the housing stock increased by 79.5% and population by 42.9% between 1990 and 2021. Winter heating demand is the most important annual variable in emissions from this sector.

**Figure 22. GHG Emissions by Gas 1990-2021**

![Graph showing GHG emissions by gas from 1990 to 2021.](image)

**Figure 23. Trend in Emissions for Largest Sectors 1990-2021**

![Graph showing trend in emissions for largest sectors from 1990 to 2021.](image)
7. Conclusion

The impact of restrictions to tackle the COVID-19 pandemic continued into 2021, albeit to a lesser extent than in 2020 and a projected\(^9\) rise in emissions as some sectors recovered has been borne out in the 2021 emissions data. The overall increase in greenhouse gas emissions in 2021 was just under 5% compared to 2020, underlining the challenge presented by Ireland’s Climate Act 2021 and Carbon Budget targets.

The 2021 data for the Transport sector suggests that we are on a trajectory back to pre-pandemic levels of activity, Transport emissions increased by 6.1% in 2021 compared to 2020, an additional 0.63 Mt CO\(_2\)eq.

Emissions from Electricity generation in 2021 were 9.4% higher than the pre-pandemic 2019 year, driven by a return to higher levels of coal use. Additionally, 2021 was a less windy year than 2020 and there was a consequent reduction in renewable electricity generation. The emissions intensity of electricity generation had been falling year-on-year over the last four years to an all-time low in 2020, but these factors led to a 11.9% increase in 2021. The effect of current geopolitical impacts on fuel pricing could result in a continued increase in the amount of coal being used, particularly over the first carbon budget period, which could seriously impact budget achievement.

Emissions from the Agriculture Sector grew by 3.0% in 2021, driven by a further increase in the number of dairy cows in the herd, along with increased nitrogen fertiliser usage. Although some measures to mitigate agricultural nitrous oxide emissions (such as use of stabilised urea fertilisers and Low Emission Slurry Spreading) are starting to be implemented, measures to tackle methane emissions also need to be implemented, as methane accounts for almost 70% of Agricultural greenhouse gas emissions.

Some decreases in emissions were observed in 2021, Residential emissions decreased by 4.9%, driven by a combination of milder winter weather, easing of COVID restrictions and an increase in fuel prices. However, Residential emissions are still 2.8% above pre-pandemic 2019 levels. There were also emission reductions in some of the smaller sectors, Commercial services, Public services, F-gases and Waste (3.0%, 3.8%, 0.2% and 4.5% respectively).

That 23.5% of the budget for the first (2021-2025) Carbon Budget period has already been used up in 2021, places additional pressure on emissions reductions in the subsequent years and implementation of effective measures will need to be swiftly stepped up to avoid the budget being exceeded. Globally the situation is the same with the IPCC Working Group III report highlighting that “It’s now or never” if the target of limiting global temperature rise to 1.5 degrees is to be achieved, with no further implementation delays possible.

Moving away from fossil fuels for heating and transport needs improves the air quality in our towns and cities, something that has been observed during the COVID-19 lockdown periods where traffic volumes were reduced. For individuals, environmentally ‘greener’ choices such as active travel, building lower energy buildings and reducing food waste are often also ‘better’ choices, benefiting our health and pockets and safeguarding us from the uncertainty of future energy costs.

---


The Climate Action and Low Carbon Development (Amendment) Act 2021.
## Appendix – Additional Tables

### Table 4. Ireland’s Provisional GHG Emissions by Sector 1990-2021 (kilotonnes CO₂ equivalent)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Industries</td>
<td>11,335</td>
<td>13,482</td>
<td>16,202</td>
<td>15,901</td>
<td>13,461</td>
<td>12,898</td>
<td>11,534</td>
<td>11,343</td>
<td>11,953</td>
<td>12,675</td>
<td>11,908</td>
<td>10,647</td>
<td>9,437</td>
<td>8,738</td>
<td>10,272 16.7% 14.8% 17.6%</td>
<td></td>
</tr>
<tr>
<td>Public electricity and heat production</td>
<td>10,947</td>
<td>13,126</td>
<td>15,747</td>
<td>15,235</td>
<td>12,880</td>
<td>12,352</td>
<td>10,994</td>
<td>10,831</td>
<td>11,380</td>
<td>12,136</td>
<td>11,362</td>
<td>10,100</td>
<td>8,954</td>
<td>8,242</td>
<td>9,795 15.9% 14.1% 18.8%</td>
<td></td>
</tr>
<tr>
<td>Petroleum refining</td>
<td>169</td>
<td>181</td>
<td>275</td>
<td>412</td>
<td>310</td>
<td>314</td>
<td>295</td>
<td>279</td>
<td>359</td>
<td>314</td>
<td>311</td>
<td>322</td>
<td>275</td>
<td>301</td>
<td>294 0.5% 0.4% -2.2%</td>
<td></td>
</tr>
<tr>
<td>Solid fuels and other energy industries</td>
<td>101</td>
<td>69</td>
<td>87</td>
<td>172</td>
<td>173</td>
<td>145</td>
<td>161</td>
<td>134</td>
<td>114</td>
<td>125</td>
<td>129</td>
<td>118</td>
<td>107</td>
<td>92</td>
<td>81 0.1% 0.1% -12.1%</td>
<td></td>
</tr>
<tr>
<td>Fugitive emissions</td>
<td>119</td>
<td>106</td>
<td>93</td>
<td>83</td>
<td>97</td>
<td>87</td>
<td>85</td>
<td>98</td>
<td>99</td>
<td>100</td>
<td>106</td>
<td>107</td>
<td>102</td>
<td>102</td>
<td>102 0.2% 0.1% -0.7%</td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>7,571</td>
<td>6,650</td>
<td>7,181</td>
<td>8,403</td>
<td>8,972</td>
<td>7,247</td>
<td>7,060</td>
<td>6,257</td>
<td>6,689</td>
<td>6,971</td>
<td>6,592</td>
<td>7,084</td>
<td>6,846</td>
<td>7,400</td>
<td>7,040 11.4% 10.2% -4.9%</td>
<td></td>
</tr>
<tr>
<td>Manufacturing Combustion</td>
<td>4,065</td>
<td>4,278</td>
<td>5,414</td>
<td>5,441</td>
<td>4,199</td>
<td>3,864</td>
<td>4,016</td>
<td>4,261</td>
<td>4,310</td>
<td>4,367</td>
<td>4,504</td>
<td>4,719</td>
<td>4,625</td>
<td>4,552</td>
<td>4,593 7.5% 6.6% 0.9%</td>
<td></td>
</tr>
<tr>
<td>Commercial Services</td>
<td>1,016</td>
<td>1,085</td>
<td>1,031</td>
<td>1,052</td>
<td>912</td>
<td>901</td>
<td>923</td>
<td>803</td>
<td>903</td>
<td>836</td>
<td>772</td>
<td>839</td>
<td>837</td>
<td>843</td>
<td>817 1.3% 1.2% -3.0%</td>
<td></td>
</tr>
<tr>
<td>Public Services</td>
<td>1,126</td>
<td>920</td>
<td>865</td>
<td>694</td>
<td>568</td>
<td>511</td>
<td>598</td>
<td>591</td>
<td>616</td>
<td>630</td>
<td>643</td>
<td>683</td>
<td>652</td>
<td>689</td>
<td>663 1.1% 1.0% -3.8%</td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>5,143</td>
<td>6,269</td>
<td>10,774</td>
<td>13,117</td>
<td>11,523</td>
<td>10,826</td>
<td>11,050</td>
<td>11,332</td>
<td>11,811</td>
<td>12,293</td>
<td>12,014</td>
<td>12,196</td>
<td>10,285</td>
<td>10,912</td>
<td>17.7% 15.7% 6.1%</td>
<td></td>
</tr>
<tr>
<td>Domestic aviation</td>
<td>48</td>
<td>46</td>
<td>70</td>
<td>80</td>
<td>49</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>14</td>
<td>20</td>
<td>0.0% 0.0% 43.0%</td>
<td></td>
</tr>
<tr>
<td>Road transportation</td>
<td>4,789</td>
<td>5,884</td>
<td>10,354</td>
<td>12,338</td>
<td>10,977</td>
<td>10,358</td>
<td>10,580</td>
<td>10,828</td>
<td>11,315</td>
<td>11,750</td>
<td>11,506</td>
<td>11,643</td>
<td>11,624</td>
<td>9,693</td>
<td>10,301 16.7% 14.9% 6.3%</td>
<td></td>
</tr>
<tr>
<td>Railways</td>
<td>147</td>
<td>123</td>
<td>136</td>
<td>135</td>
<td>135</td>
<td>130</td>
<td>119</td>
<td>121</td>
<td>124</td>
<td>128</td>
<td>129</td>
<td>135</td>
<td>108</td>
<td>116</td>
<td>0.2% 0.2% 8.1%</td>
<td></td>
</tr>
<tr>
<td>Domestic navigation</td>
<td>86</td>
<td>92</td>
<td>153</td>
<td>211</td>
<td>200</td>
<td>183</td>
<td>192</td>
<td>225</td>
<td>222</td>
<td>266</td>
<td>235</td>
<td>260</td>
<td>277</td>
<td>322</td>
<td>322 0.5% 0.5% 0.0%</td>
<td></td>
</tr>
<tr>
<td>Other transportation</td>
<td>73</td>
<td>125</td>
<td>62</td>
<td>153</td>
<td>161</td>
<td>139</td>
<td>145</td>
<td>146</td>
<td>137</td>
<td>135</td>
<td>127</td>
<td>140</td>
<td>142</td>
<td>148</td>
<td>152 0.2% 0.2% 2.9%</td>
<td></td>
</tr>
<tr>
<td>Industrial Processes</td>
<td>3,162</td>
<td>2,902</td>
<td>3,700</td>
<td>2,763</td>
<td>1,463</td>
<td>1,561</td>
<td>1,477</td>
<td>1,821</td>
<td>2,007</td>
<td>2,151</td>
<td>2,239</td>
<td>2,295</td>
<td>2,267</td>
<td>2,107</td>
<td>2,460 4.0% 3.5% 16.8%</td>
<td></td>
</tr>
<tr>
<td>Mineral industry</td>
<td>1,117</td>
<td>1,084</td>
<td>1,909</td>
<td>2,553</td>
<td>1,299</td>
<td>1,392</td>
<td>1,302</td>
<td>1,650</td>
<td>1,830</td>
<td>1,968</td>
<td>2,040</td>
<td>2,095</td>
<td>2,058</td>
<td>1,907</td>
<td>2,253 3.7% 3.3% 18.1%</td>
<td></td>
</tr>
<tr>
<td>Chemical industry</td>
<td>1,875</td>
<td>1,668</td>
<td>1,577</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>Metal industry</td>
<td>26</td>
<td>25</td>
<td>29</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td></td>
</tr>
<tr>
<td>Non-energy products from fuels and solvent use</td>
<td>116</td>
<td>96</td>
<td>156</td>
<td>177</td>
<td>128</td>
<td>132</td>
<td>138</td>
<td>134</td>
<td>140</td>
<td>144</td>
<td>161</td>
<td>162</td>
<td>170</td>
<td>160</td>
<td>167 0.3% 0.2% 4.3%</td>
<td></td>
</tr>
<tr>
<td>Other product manufacture and use</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td>33</td>
<td>36</td>
<td>36</td>
<td>37</td>
<td>37</td>
<td>38</td>
<td>38</td>
<td>39</td>
<td>40</td>
<td>40</td>
<td>0.1% 0.1% 0.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-Gases</td>
<td>36</td>
<td>215</td>
<td>709</td>
<td>1,147</td>
<td>1,082</td>
<td>1,081</td>
<td>1,117</td>
<td>1,180</td>
<td>1,181</td>
<td>1,260</td>
<td>1,179</td>
<td>872</td>
<td>865</td>
<td>739</td>
<td>738 1.2% 1.1% -0.2%</td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Agriculture</td>
<td>20,077</td>
<td>21,817</td>
<td>21,787</td>
<td>21,247</td>
<td>20,015</td>
<td>20,199</td>
<td>20,903</td>
<td>20,375</td>
<td>20,925</td>
<td>21,482</td>
<td>22,196</td>
<td>23,053</td>
<td>22,134</td>
<td>22,431</td>
<td>23,097</td>
<td>37.5%</td>
</tr>
<tr>
<td>Enteric fermentation</td>
<td>11,901</td>
<td>12,583</td>
<td>12,833</td>
<td>12,643</td>
<td>11,830</td>
<td>12,390</td>
<td>12,937</td>
<td>12,837</td>
<td>13,198</td>
<td>13,643</td>
<td>13,955</td>
<td>13,590</td>
<td>13,772</td>
<td>14,013</td>
<td>14,013</td>
<td>22.8%</td>
</tr>
<tr>
<td>Manure management</td>
<td>2,089</td>
<td>2,240</td>
<td>2,315</td>
<td>2,371</td>
<td>2,263</td>
<td>2,438</td>
<td>2,444</td>
<td>2,391</td>
<td>2,492</td>
<td>2,568</td>
<td>2,636</td>
<td>2,720</td>
<td>2,610</td>
<td>2,647</td>
<td>2,707</td>
<td>4.4%</td>
</tr>
<tr>
<td>Agricultural soils</td>
<td>4,825</td>
<td>5,258</td>
<td>5,167</td>
<td>4,817</td>
<td>4,574</td>
<td>4,345</td>
<td>4,731</td>
<td>4,539</td>
<td>4,556</td>
<td>4,609</td>
<td>4,875</td>
<td>5,155</td>
<td>4,835</td>
<td>4,858</td>
<td>5,031</td>
<td>8.2%</td>
</tr>
<tr>
<td>Liming</td>
<td>355</td>
<td>495</td>
<td>366</td>
<td>267</td>
<td>428</td>
<td>229</td>
<td>516</td>
<td>391</td>
<td>401</td>
<td>434</td>
<td>333</td>
<td>461</td>
<td>461</td>
<td>399</td>
<td>597</td>
<td>1.0%</td>
</tr>
<tr>
<td>Urea application</td>
<td>97</td>
<td>86</td>
<td>92</td>
<td>61</td>
<td>98</td>
<td>46</td>
<td>47</td>
<td>55</td>
<td>64</td>
<td>79</td>
<td>84</td>
<td>89</td>
<td>92</td>
<td>109</td>
<td>102</td>
<td>0.2%</td>
</tr>
<tr>
<td>Agriculture/Forestry fuel combustion</td>
<td>723</td>
<td>998</td>
<td>900</td>
<td>944</td>
<td>746</td>
<td>681</td>
<td>590</td>
<td>529</td>
<td>510</td>
<td>535</td>
<td>555</td>
<td>590</td>
<td>590</td>
<td>590</td>
<td>590</td>
<td>1.0%</td>
</tr>
<tr>
<td>Fishing</td>
<td>88</td>
<td>158</td>
<td>113</td>
<td>145</td>
<td>76</td>
<td>70</td>
<td>78</td>
<td>74</td>
<td>65</td>
<td>60</td>
<td>71</td>
<td>84</td>
<td>73</td>
<td>57</td>
<td>57</td>
<td>0.1%</td>
</tr>
<tr>
<td>Waste</td>
<td>1,709</td>
<td>2,020</td>
<td>1,643</td>
<td>1,443</td>
<td>1,564</td>
<td>572</td>
<td>746</td>
<td>953</td>
<td>1,042</td>
<td>1,052</td>
<td>1,027</td>
<td>994</td>
<td>991</td>
<td>982</td>
<td>937</td>
<td>1.5%</td>
</tr>
<tr>
<td>Landfills</td>
<td>1,476</td>
<td>1,784</td>
<td>1,420</td>
<td>1,128</td>
<td>312</td>
<td>339</td>
<td>516</td>
<td>726</td>
<td>814</td>
<td>840</td>
<td>804</td>
<td>776</td>
<td>758</td>
<td>748</td>
<td>707</td>
<td>1.1%</td>
</tr>
<tr>
<td>Biological treatment of solid waste</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>48</td>
<td>50</td>
<td>45</td>
<td>46</td>
<td>42</td>
<td>42</td>
<td>41</td>
<td>47</td>
<td>46</td>
<td>49</td>
<td>49</td>
<td>50</td>
<td>0.1%</td>
</tr>
<tr>
<td>Incineration and open burning of waste</td>
<td>98</td>
<td>101</td>
<td>80</td>
<td>133</td>
<td>62</td>
<td>48</td>
<td>45</td>
<td>42</td>
<td>42</td>
<td>25</td>
<td>27</td>
<td>24</td>
<td>33</td>
<td>30</td>
<td>30</td>
<td>0.0%</td>
</tr>
<tr>
<td>Wastewater treatment and discharge</td>
<td>135</td>
<td>135</td>
<td>143</td>
<td>135</td>
<td>140</td>
<td>139</td>
<td>139</td>
<td>143</td>
<td>144</td>
<td>147</td>
<td>149</td>
<td>148</td>
<td>151</td>
<td>155</td>
<td>150</td>
<td>0.2%</td>
</tr>
<tr>
<td>Land use, land-use change and forestry</td>
<td>6,224</td>
<td>7,104</td>
<td>7,626</td>
<td>7,856</td>
<td>7,861</td>
<td>6,227</td>
<td>6,909</td>
<td>6,639</td>
<td>7,272</td>
<td>6,549</td>
<td>8,262</td>
<td>8,680</td>
<td>8,699</td>
<td>6,943</td>
<td>7,767</td>
<td>11.2%</td>
</tr>
<tr>
<td>Forest land</td>
<td>-2,550</td>
<td>-1,314</td>
<td>-239</td>
<td>-1,103</td>
<td>-2,104</td>
<td>-2,863</td>
<td>-3,181</td>
<td>-2,734</td>
<td>-2,352</td>
<td>-2,768</td>
<td>-1,885</td>
<td>-2,003</td>
<td>-1,946</td>
<td>-2,105</td>
<td>-434</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Cropland</td>
<td>-100</td>
<td>17</td>
<td>17</td>
<td>-8</td>
<td>-210</td>
<td>62</td>
<td>-33</td>
<td>-87</td>
<td>-94</td>
<td>-114</td>
<td>-93</td>
<td>-199</td>
<td>-140</td>
<td>-111</td>
<td>-10</td>
<td>0.0%</td>
</tr>
<tr>
<td>Grassland</td>
<td>7,281</td>
<td>6,489</td>
<td>6,873</td>
<td>6,774</td>
<td>6,963</td>
<td>7,068</td>
<td>7,452</td>
<td>6,926</td>
<td>6,941</td>
<td>6,969</td>
<td>6,988</td>
<td>7,042</td>
<td>7,035</td>
<td>6,921</td>
<td>7,566</td>
<td>10.9%</td>
</tr>
<tr>
<td>Wetlands</td>
<td>1,920</td>
<td>2,450</td>
<td>1,836</td>
<td>2,872</td>
<td>3,669</td>
<td>2,258</td>
<td>3,151</td>
<td>3,127</td>
<td>4,221</td>
<td>3,079</td>
<td>3,904</td>
<td>2,643</td>
<td>2,574</td>
<td>2,784</td>
<td>2,003</td>
<td>2.9%</td>
</tr>
<tr>
<td>Settlements</td>
<td>86</td>
<td>118</td>
<td>210</td>
<td>385</td>
<td>306</td>
<td>315</td>
<td>126</td>
<td>115</td>
<td>131</td>
<td>136</td>
<td>168</td>
<td>156</td>
<td>190</td>
<td>231</td>
<td>208</td>
<td>0.3%</td>
</tr>
<tr>
<td>Other land</td>
<td>1</td>
<td>23</td>
<td>53</td>
<td>67</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>54</td>
<td>52</td>
<td>49</td>
<td>47</td>
<td>45</td>
<td>45</td>
<td>43</td>
<td>0.1%</td>
</tr>
<tr>
<td>Harvested wood products</td>
<td>-413</td>
<td>-680</td>
<td>-1,123</td>
<td>-1,130</td>
<td>-819</td>
<td>-669</td>
<td>-662</td>
<td>-763</td>
<td>-729</td>
<td>-804</td>
<td>-869</td>
<td>-826</td>
<td>-858</td>
<td>-819</td>
<td>-1,609</td>
<td>-2.3%</td>
</tr>
<tr>
<td>National Total</td>
<td>55,241</td>
<td>59,639</td>
<td>69,307</td>
<td>71,208</td>
<td>62,759</td>
<td>59,661</td>
<td>59,423</td>
<td>58,916</td>
<td>61,437</td>
<td>63,717</td>
<td>63,072</td>
<td>63,375</td>
<td>60,851</td>
<td>58,766</td>
<td>61,528</td>
<td>100.0%</td>
</tr>
<tr>
<td>National Total with LULUCF</td>
<td>61,464</td>
<td>66,742</td>
<td>76,933</td>
<td>79,064</td>
<td>70,620</td>
<td>65,888</td>
<td>66,332</td>
<td>65,555</td>
<td>68,710</td>
<td>70,266</td>
<td>71,334</td>
<td>70,235</td>
<td>67,750</td>
<td>65,709</td>
<td>69,295</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Environmental Protection Agency
Background Notes

Units: 1 Mt = 1,000 kilotonnes

\( \text{CO}_2 \) Equivalent: greenhouse gases other than \( \text{CO}_2 \) (i.e. methane, nitrous oxide and F-gases) may be converted to \( \text{CO}_2 \) equivalent using their global warming potentials (GWPs).

F-gases: These gases comprise HFCs (Hydrofluorocarbons), PFCs (Perfluorocarbons), \( \text{SF}_6 \) (Sulphur Hexafluoride) and \( \text{NF}_3 \) (Nitrogen Trifluoride). They are much more potent than the naturally occurring greenhouse gas emissions (carbon dioxide, methane and nitrous oxide).

GWPs

<table>
<thead>
<tr>
<th>Industrial designation or common name</th>
<th>Chemical formula</th>
<th>GWP for 100-year time horizon IPCC 4th assessment report (AR4)</th>
<th>GWP for 100-year time horizon IPCC 5th assessment report (AR5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</td>
<td>( \text{CO}_2 )</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Methane</td>
<td>( \text{CH}_4 )</td>
<td>25</td>
<td>28</td>
</tr>
<tr>
<td>Nitrous oxide</td>
<td>( \text{N}_2\text{O} )</td>
<td>298</td>
<td>265</td>
</tr>
<tr>
<td>Hydrofluorocarbons</td>
<td>HFCs</td>
<td>12 to 14,800</td>
<td>4 to 12,400</td>
</tr>
<tr>
<td>Perfluorinated compounds</td>
<td>PFCs</td>
<td>7,390 to 12,200</td>
<td>6,630 to 11,100</td>
</tr>
<tr>
<td>Sulphur hexafluoride</td>
<td>( \text{SF}_6 )</td>
<td>22,800</td>
<td>23,500</td>
</tr>
<tr>
<td>Nitrogen trifluoride</td>
<td>( \text{NF}_3 )</td>
<td>17,200</td>
<td>16,100</td>
</tr>
</tbody>
</table>

Ireland’s GHG Sectors: include the following eleven sectors for analysis:

1. Energy Industries (electricity generation, waste to energy incineration, oil refining, briquetting manufacture and fugitive emissions)
2. Residential (combustion for domestic space and hot water heating)
3. Manufacturing Combustion (combustion of fuels for heating, steam generation and powering machinery)
4. Commercial Services (combustion for Commercial Services space and hot water heating)
5. Public Services (combustion for Public services space and hot water heating)
6. Transport (combustion of fuel used in road, rail, navigation, domestic aviation and pipeline gas transport)
7. Industrial Processes (process emissions from mineral, chemical, metal industries, non-energy products and solvents)
8. F-Gases (gases used in refrigeration, air conditioning and semiconductor manufacture)
9. Agriculture (emissions from fertiliser application, ruminant digestion, manure management, agricultural soils and fuel used in agriculture/forestry/fishing)
10. Waste (emissions from solid waste disposal on land, solid waste treatment (composting and anaerobic digestion), wastewater treatment, waste incineration and open burning of waste).
11. Land Use Land-use Change and Forestry (LULUCF) covers the following categories; Forest land, Cropland, Grassland, Wetlands, Settlements, Other land and Harvested Wood products.
Tá an GCC freagrach as an gcomhshaoil a chosaint agus a fheabhsú, mar shócháin luachmhár do mhuintir na hÉireann. Táimid tionanta do dhaoine agus don chomhshaoil a chosaint ar thionchar do bhliain agus an cheist a tháilte. Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

- Rialaí: Rialaí agus córais chomhlionta chomhshaoil eifeachtacha a chur i bhfeidhm; chun dea-thorthaí chomhshaoil a bhaint amach agus d'fhoradh orthu sóid nach mbiónn ag clog leo.
- Eolas: Eolas agus seanceachtaí ar dhíchéidean, spróidchúirthe agus an triúr chur a fáil le feadh an chomhshaoil chun bonn eloais a chur faoin gceann go dtí freagrachtaí.
- Abbóideachta: Ag obair le daoine eile ar son timpeallachta glaine, táirgíula agus deas-chosanta agus ar son cleachtas inbhuanaithe ó dtaoibh an chomhshaoil.

I measc ár gcuid freagrachtaí tá:

- Gníomhachtaí tionscail, dramhaíola agus stórála peitril glaine, táirgíula agus deas-cosanta agus ar son cleachtas inbhuanaithe ó dtaoibh an chomhshaoil.

CEADÚNÓ

- Gnignoimhachtaí tionscail, dramhaíola agus stórála peitril glaine, táirgíula agus deas-cosanta agus ar son cleachtas inbhuanaithe ó dtaoibh an chomhshaoil.

FORFHEIDHMHÚ NÁISIÚNTA LEITH GÚRSAÍ COMHSHAOIL

- Inúchadh agus cigireacht ar shaoráidí a bhfuil ceadúnas acu ón GCC;
- Cur i bhfeidhm an dea-chlachtas a stúradh i ngniomhaochtaí agus i sochaileachtaí;
- Maoirseachtaí a dhéanamh ar fhreagrachtaí an udaráis aithiúil as cosaint an chomhshaoil;
- Caighdeán an usice oil poiblí a rialaí agus údarúthtaí ón eitlcheadh fuiluisce uirighbhí ón forfheidhmhú;
- Maoirseachtaí an usice oil poiblí agus poiblí le hiompraíocht um éifeachtúlacht acmhainní agus aistriú cheapadh agus a chur i bhfeidhm; Caighdeán an usice oil poiblí dheireadh,
- Comhairle a dhéanamh ar liathnú eolaíochtaí a dhéanamh ar traidisiúin, traidisiún a dhéanamh ar traidisiúin agus chun deas-chosanta a dhéanamh.
- An díliú i airthear ar chomhshaoil agus an díliú domhanda do chomhshaoil.

BAINISTÍOCHT DRAMHAÍOLA AGUS CEIMICEÁIN SÁ COMHSHAOIL

- Rialachán dramhaíola a chur i bhfeidhm agus a fhorfheidhmhú lena n-áirítear saisteachtanna forfheidhmhíd náisiúnta;
- Statistici dramhaíochta náisiúnta a uillmhuigh agus a fhiosróirí chomh maith leis an bPlean Náisiúnta um Bainistíocht Dramhaíola Gaíse;
- An Clár Náisiúnta um Chosc Draoihaíola a thabhairt agus a chur i bhfeidhm;
- Reachtálaíocht ar rialú ceimiceáin sa timpeallacht a chur i bhfeidhm agus tuiscint ar an reachtálaíocht.

BAINISTÍOCHT UISCE

- Píodh le struchtúr túlaíochta náisiúnta agus réidhíneachta rialachach agus oibríochtach chun an Chheat-treoir Uisce a chur i bhfeidhm;
- Monatóireacht, meásúnú agus tuiscint ar dhubhchúir, cáilíochta leis an gceisteanna i gcónaí a dhéanamh ar sholáthar.
- An Clár Náisiúnta um Chosc Draoihaíola a dhéanamh uirthi, bonn eolaíochtaí a chur i bhfeidhm agus a chur ar fáil.

EOLAÍOCHT AERÁIDE & ATRHÚ AERÁIDE

- Faidhail agus réamh-mheastachtaí a choiósachtaí agus rúnaíochtachtaí a dhéanamh ar chomhghnéiseanna agus coisialtaí a dhéanamh.
- Rúnaíochtachtaí agus an triúr chur a fáil de an Chomhairle Chomhshaoil leis an bhFhorbairt Aeráide a dhéanamh.
- Tacú le gníomhaíochtaí forbartha Náisiúnta, AE agus NA um Eolaíocht agus Beartas Aeráide.

MONATÓIREACHT & MEASÚNÚ AR AN GCOMHSHAOIL

- Côrais náisiúnta um monatóireacht chomhshaoil a chheadadh agus a chur i bhfeidhm: teicneolaíochtaí, bainistíochtí, sanais, anáilis agus ríochtaíBHÍSTÍOCHT, agus an triúr chur a fáil.
- Tuairiscí ar Staistí Thiompéalleacht na hÉireann agus ar Tháscairí a chur i bhfeidhm.
- Monatóireacht a dhéanamh ar an tAerachnú a bhaint a chur i bhfeidhm leis an gCoimhthiúin ar an Ráth Acharraí na Trideo Fhadaoin Tráeauta, agus an triúr chur i leith i mna na Náisiúnta Náisiúnta.
- Maoirseachtaí a dhéanamh ar chur i bhfeidhm na Trócaire i leith na Teorann Náisiúnta Náisiúnta.
- Maoirseachtaí a dhéanamh ar chur i bhfeidhm na Trócaire i leith na Teorann Náisiúnta.
- Maoirseachtaí a dhéanamh ar chur i bhfeidhm na Trócaire i leith na Teorann Náisiúnta.
- Maoirseachtaí a dhéanamh ar chur i bhfeidhm na Trócaire i leith na Teorann Náisiúnta.

TAIGHDE AGUS FORBAIRT COMHSHAOIL

- Comhoibriú le gníomhaíochtaí a chuirfeadh as an chomhshaoil agus a thabhairt leis an chomhshaoil.

COSAINT RAIDEOLAÍOCR

- Monatóireacht a dhéanamh ar leibhéal raideolaíochta agus a bhurteadh as an chomhshaoil agus as an radaíocht.
- Maoirseachtaí a dhéanamh ar an radaíocht.
- Maoirseachtaí a dhéanamh ar an radaíocht.
- Maoirseachtaí a dhéanamh ar an radaíocht.
- Maoirseachtaí a dhéanamh ar an radaíocht.

TREOR, ARDÚ FEASACHTA AGUS FAISNÉIS INRÓCHTANA

- Tuairiscíocht, comhairle agus treoir neamhspleách, fianaisneachtaí ar chur a fáil.
- An nasc idir sláinte agus folláin, ag seachasacht ar an radaíocht.
- An nasc idir sláinte agus folláin, ag seachasacht ar an radaíocht.
- An nasc idir sláinte agus folláin, ag seachasacht ar an radaíocht.
- An nasc idir sláinte agus folláin, ag seachasacht ar an radaíocht.

COMPHÁIRTÍOCHT AGUS LEIÓNRÚ

- Oilbhríocht, gníomhaíochtaí a dhéanamh, comhairle agus treoir neamhspleách, fianaisneachtaí.
- An fhuireadh agus a chur a fáil.
- An fhuireadh agus a chur a fáil.
- An fhuireadh agus a chur a fáil.

BAINISTÍOCHT AGUS STRUCHTUR NA GNÍOMHAIREACHTA

- An GCC a bainistiú ag Bord lánaimseartha, ar a bhfuil coinbhinsiú dar smaointe a fhorbairt.
- An GCC a bainistiú ag Bord lánaimseartha, ar a bhfuil coinbhinsiú dar smaointe a fhorbairt.
- An GCC a bainistiú ag Bord lánaimseartha, ar a bhfuil coinbhinsiú dar smaointe a fhorbairt.

An Ghníomhaireacht Um Chaomhnú Comhshaoil

Tá an GCC a bainistiú ag Bord lánaimseartha, ar a bhfuil coinbhinsiú dar smaointe a fhorbairt. Déantar an obair ar fud cuig cinn d’Oifigiúil:

- An Oifig um Thionscal Gníomhaireachtaí, agus an triúr chur a fáil.
- An Oifig um Thionscal Gníomhaireachtaí, agus an triúr chur a fáil.
- An Oifig um Thionscal Gníomhaireachtaí, agus an triúr chur a fáil.
- An Oifig um Thionscal Gníomhaireachtaí, agus an triúr chur a fáil.