



EPA Headquarters

PO Box 3000
Johnstown Castle Estate
County Wexford, Ireland

T +353 53 9160600
LoCall 1890 33 55 99
www.epa.ie

**IRELAND'S GREENHOUSE GAS EMISSIONS
PROVISIONAL ESTIMATE FOR 2005**

Summary

The Environmental Protection Agency (EPA) has compiled and submitted to the European Commission Ireland's Greenhouse Gas (GHG) emission estimates for 2005. The figures remain provisional until March 2007 when final estimates are to be submitted to the European Commission. The emission estimates with full supporting background information are to be reported in April to the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC).

The estimates include revision of the full time series since 1990, and take account inter alia of revised energy balance data recently published by Sustainable Energy Ireland (SEI) and the detailed returns to the Agency from participants involved in the EU emissions trading scheme. This briefing note summarises the recent first submission of information sent to the European Commission in order for them to compile total greenhouse gas estimates for the EU.

Key features of the 2005 figures:

Overall

- Total GHG emissions in 2005 were 69.95 million tonnes carbon dioxide equivalent (Mt CO₂eq), which is 1.9 per cent higher than the tonnage of emissions in 2004.

Transport

- By far the greatest increase was in the transport sector where emissions were higher by 868,503 tonnes CO₂eq than in 2004. This represents a 6.9 per cent increase on 2004 and an overall 160 per cent increase on the 1990 transport figures.
- Road transport accounts for 96 per cent of the transport sector emissions.
- The increase in the GHG emissions from the transport sector reflects sustained increases in fuel consumption with petrol usage up 5 per cent and diesel consumption up almost 9 per cent from the previous year.

Energy

- There was an increase of 380,455 tonnes CO₂eq for the energy industries sector, which is 2.4 per cent higher than 2004 and up 38 per cent on 1990 figures.
- Increased peat use was the major contributing factor to increased emissions from the energy industries.

Agriculture

- On the positive side, emissions from Agriculture decreased by 1.8 per cent. Lower sheep and cattle numbers coupled with reduced use of fertiliser resulted in the lower emissions from the agriculture sector.

Residential

- Emissions in 2005 show little change from the 2004 level.

Kyoto Protocol

- Ireland's target in relation to the Kyoto Protocol is to limit emissions to 13 per cent above the baseline estimate in the period 2008-2012. Based on the latest inventory figures, Ireland's emissions in 2005 were 25.4 per cent higher than the baseline estimate that underlies Ireland's allowable emissions of 315 Mt CO₂eq for the period 2008-2012, as proposed to the European Commission in 2006.

Introduction

The Environmental Protection Agency is responsible for compiling the inventories of greenhouse gases (GHG) emissions for Ireland. These inventories are compiled on an annual basis using international best practice guidelines established by the Intergovernmental Panel on Climate Change (IPCC). The full time series since 1990 is revisited and revised annually based on the most up to date guidance and information.

The 2005 figures are given below, followed by an account of how these differ from the latest 2004 figures, a discussion of the longer-term trends in GHG emissions and finally a commentary on the significance of the figures in relation to Ireland's commitments in the first commitment period of the Kyoto Protocol.

Ireland's Greenhouse Gas Emissions in 2005

The latest data indicate that emissions of greenhouse gases in Ireland in 2005 were 69.95 million tonnes (Mt) of CO₂ equivalent. Figure 1 shows the contributions from each of the sectors¹.

Agriculture is the single largest contributor to the overall emissions, at almost 28% of the total, followed by *Energy* (power generation & oil refining) at 23% and *Transport* at 19%. The remaining 30% is made up of GHG from the *Residential* sector at 10%, *Industry* 9%, *Commercial/Institutional* 4%, and *Process* and *Waste* at less than 4% and 3% respectively.

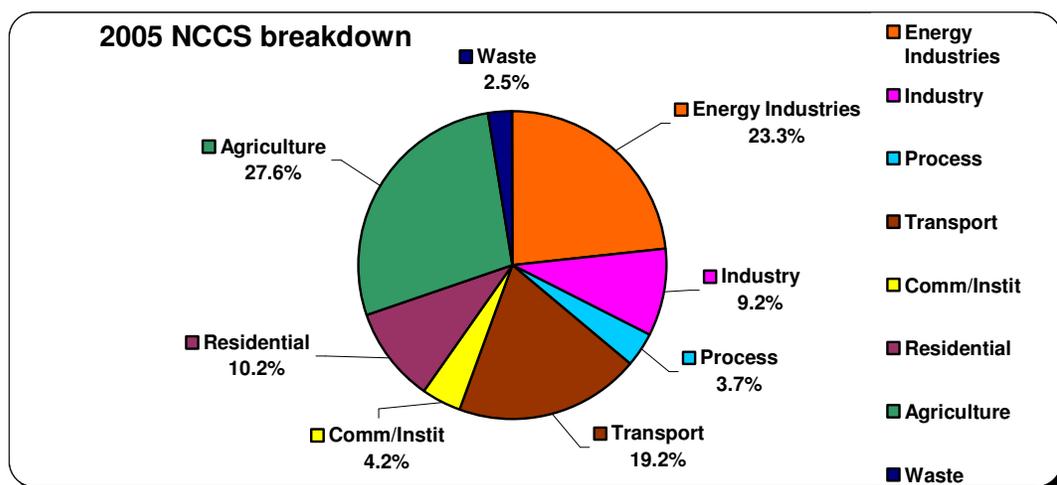


Figure 1. Greenhouse Gas Emissions 2005 by sector

¹ Using the sector categories as set out in the National Climate Change Strategy (NCCS) sectors

Changes in Emissions from Sectors between 2004 and 2005

Notable changes in 2005 compared to 2004 emissions are (Figure 2):

- *Transport* emissions increased by 6.9 per cent from 12.59 Mt CO₂eq in 2004 to 13.46 Mt CO₂eq in 2005. This follows an increase of approximately 6 per cent in the previous year. Road transport accounts for 96 per cent of transport emissions and is the main contributor to the increase in the national total.
- Emissions from *Energy Industries*, principally electricity generation, which had been falling in preceding years, increased from 15.94 Mt CO₂eq in 2004 to 16.32 Mt CO₂eq in 2005, an increase of 2.4 per cent. Increased peat use was the major contributing factor in reversing the previous trend.
- Emissions from *Processes* increased from 2.51 Mt CO₂eq in 2004 to 2.55 Mt CO₂eq in 2005, an increase of 1.8 per cent, reflecting slight increases in CO₂ emissions associated with cement production.
- Emissions from *Agriculture* decreased by 1.8 per cent from 19.67 Mt CO₂eq in 2004 to 19.32 Mt CO₂eq in 2005. The decrease reflects lower methane emissions from cattle and sheep as their populations continue to decline and lower nitrous oxide emissions from reduced fertilizer use.
- Emissions from the *Waste* sector, primarily methane gas released from landfills, amounted to 1.78 Mt CO₂eq and showed little change on the 2004 level. For this source, increased landfill gas utilisation and on-site flaring are offsetting increases in methane production.

Long-term Changes in Emissions from sectors 1990 – 2005

Emissions of carbon dioxide (CO₂) from fossil fuel combustion accounted for 66 per cent of total greenhouse gas emissions in 2005 compared to 55 per cent in 1990. The proportion from *Agriculture*, where methane and nitrous oxide are the relevant greenhouse gases, has fallen from 35.7 per cent in 1990 to 27.6 per cent in 2005.

Between 1990 and 2005 (see Figure 2 and 3), *Transport* shows the greatest increase at 160 per cent. The increase can be attributed to general economic prosperity and increasing population and consequent increasing vehicle numbers as well as the trend towards purchase of larger vehicles and the reliance on private cars, particularly in relation to commuting to and from work. In addition, rapidly increasing road freight transport (i.e. light duty and heavy duty vehicles) has a significant impact on transport emissions and high construction activity is a major influencing factor.

Other sectors showing substantial increases on 1990 are *Energy Industries* at 38 per cent and *Industry* at 52 per cent, which reflect inter alia increasing demand for electricity and higher industrial activity respectively, in a growing economy.

GHGs from *Agriculture* reached a peak in 1998 and have declined to marginally below their 1990 level in the last couple of years, reflecting long-term decline in cattle population and in fertiliser use due to the Common Agricultural Policy.

Increased housing stock is driving the gradual upward trend in the emissions from the *Residential* sector since 1999 following a sharp reduction after 1990 and stabilisation that resulted from fuel switching. The emissions in this sector are again almost at their 1990 level.

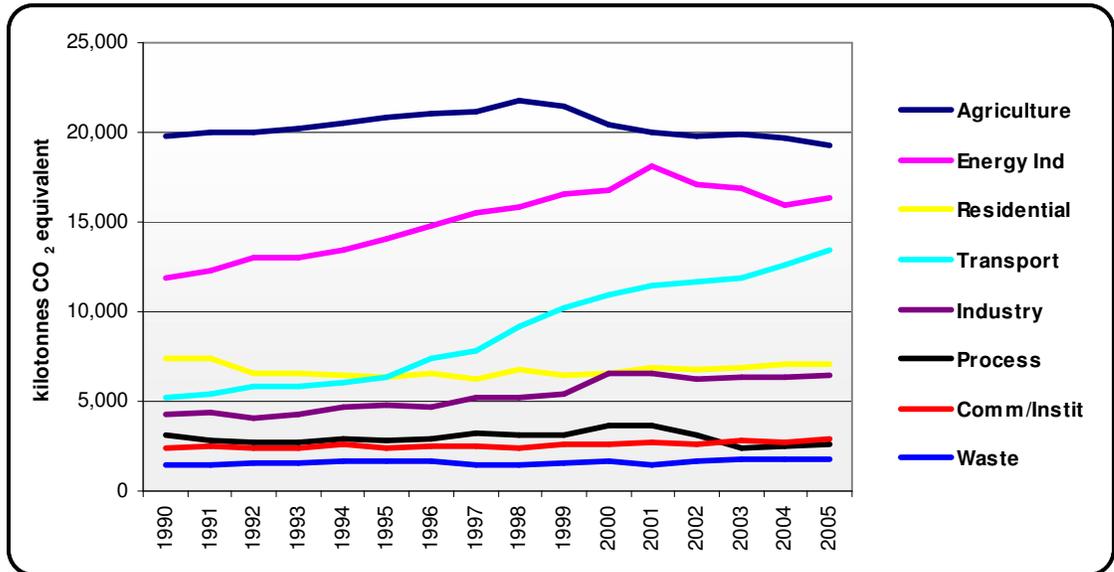


Figure 2. Trends in GHG Emissions by NCCS Sector 1990-2005

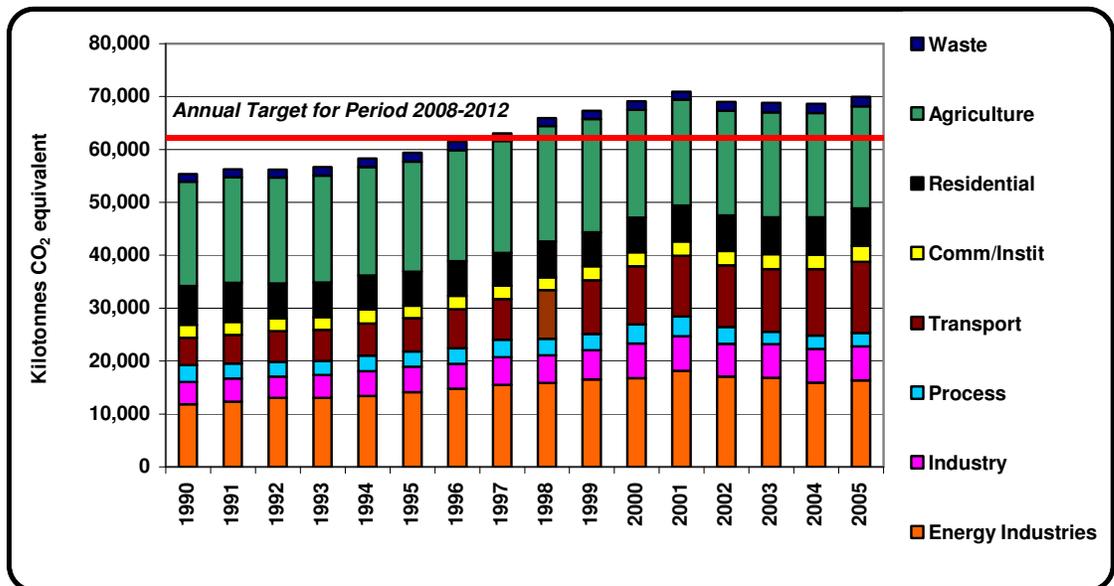


Figure 3. GHG Emissions by NCCS Sector 1990-2005

Long-term changes in Total GHG emissions relative to baseline estimate

Ireland's target in relation to the Kyoto Protocol is to limit emissions to 13 percent above the *baseline* estimate in the period 2008-2012. The baseline estimate for Ireland is calculated as the sum of carbon dioxide, methane and nitrous oxide emissions in 1990 and the contribution from fluorinated gases in 1995. The baseline value was established at 55.78 Mt CO₂eq on the basis of the emissions estimates available in 2006. It determines the proposed total allowable emissions of 315 Mt in the period 2008-2012, which is proposed in Ireland's initial report to the European Commission in 2006 under the Kyoto Protocol. This proposed emission level is subject to independent expert review under the Kyoto Protocol in 2007 before it is adopted for implementation purposes. The percentage changes set out below are determined relative to the baseline of 55.78 Mt CO₂eq.

Figure 4 shows the full time series of emissions from 1990 to 2005 and also the 'straight line' path from the baseline to Ireland's Kyoto target, as represented for simplicity by a 13% increase in 2010. (The figures in this graph are in the form of an index - whereby the base year value is set at 100 and other years are shown relative to this).

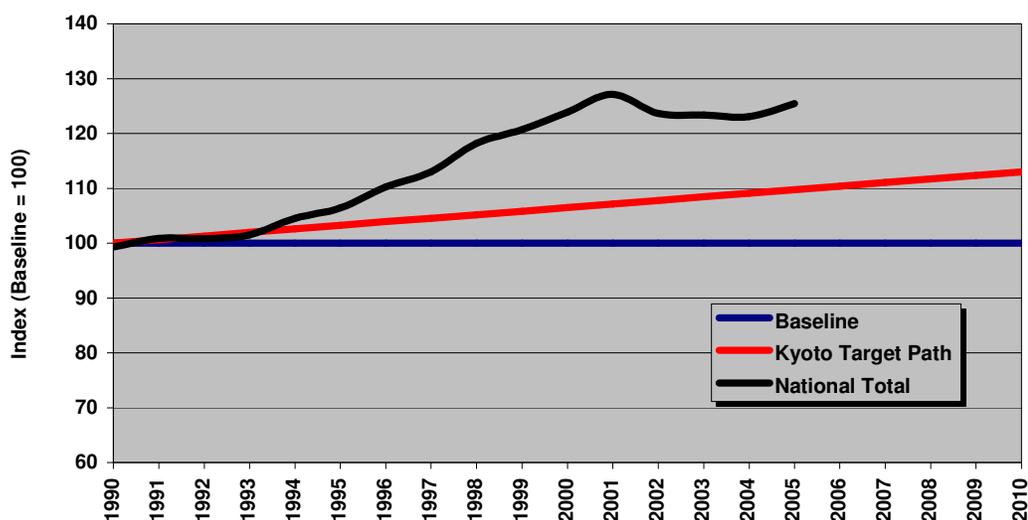


Figure 4. Total GHG Emissions compared to Baseline Level and Kyoto Target Path
(The straight line from baseline in 1990 to 13% above baseline in 2010 represents the Kyoto Target Path)

As noted earlier, GHG estimates are subject to constant revision in the annual reporting cycle to take account of new methodological guidance, the outcome of national research, revised information on energy use and improved data from other sectors. This will explain inconsistencies between the per cent increases presented here and those reported in previous years. The important points to note are the year on year changes reported in 2007, which are computed using the most up-to-date and accurate information.

Based on the new figures for the full time series, Ireland's emissions in recent years in terms of percentage above the baseline estimate described above were:

27.1% in 2001
23.6% in 2002
23.4% in 2003
23.1% in 2004
25.4% in 2005

This shows how the downward trend observed in 2002, followed by little change in the period 2002-2004, has been reversed with emissions rising significantly again in 2005 (see Figure 4 above).

15/02/07

Notes:

Units: 1 Mt = 1,000 Kilotonnes

CO₂ Equivalent: greenhouse gases other than CO₂ (i.e. methane, nitrous oxide and so called F-gases) may be converted to CO₂ equivalent using their global warming potentials.

F-gases: These gases comprise the following three families, HFCs (Hydrofluorocarbons), PFCs (Perfluorocarbons) and SF₆ (Sulphur Hexafluoride). They are much more potent than the naturally occurring GHGs (carbon dioxide, methane and nitrous oxide).

National Climate Change Strategy Sectors: The Government Strategy to combat Climate Change divides the sectors emitting greenhouse gases into eight categories:

1. Transport,
2. Commercial/Institutional (combustion emissions from hospitals, universities, shopping centres, public buildings, businesses and schools),
3. Process (cement, lime, ammonia and nitric acid process emissions only),
4. Energy (power generation),
5. Industry (combustion emissions from industry and industrial F-gases),
6. Agriculture (ruminant digestion, agricultural soils and manures),
7. Waste (decomposition of waste), and
8. Residential (energy used domestically for heating).

**Table: Emissions by National Climate Change Strategy Sectors
(kilotonnes CO₂ Eq)**

Sector	1990	2000	2001	2002	2003	2004	2005
<i>Energy Industries</i>	11,845.04	16,799.39	18,148.19	17,076.55	16,851.14	15,943.95	16,324.40
<i>Industry*</i>	4,224.68	6,560.17	6,567.55	6,206.40	6,343.22	6,361.90	6,436.99
<i>Process</i>	3,130.24	3,596.41	3,675.82	3,162.92	2,345.62	2,509.17	2,553.76
<i>Transport</i>	5,182.11	10,951.43	11,483.10	11,684.06	11,879.48	12,592.37	13,460.87
<i>Comm/Institutional*</i>	2,429.08	2,631.30	2,710.99	2,654.04	2,822.09	2,699.57	2,958.34
<i>Residential</i>	7,350.38	6,553.80	6,862.62	6,778.59	6,915.84	7,099.14	7,115.23
<i>Agriculture</i>	19,752.19	20,394.01	19,996.82	19,760.81	19,858.61	19,668.28	19,318.22
<i>Waste</i>	1,460.75	1,640.45	1,477.36	1,647.70	1,792.65	1,792.06	1,777.61
<i>Total</i>	55,374.47	69,126.96	70,922.45	68,971.06	68,808.65	68,666.44	69,945.42

* The allocation of natural gas between these two sectors in 2004 is under review.