



Ireland's National Greenhouse Gas Emissions Inventory for 2007

PROVISIONAL FIGURES

Includes comparison with

Ireland's Kyoto Limit for 2008-2012

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IRELAND'S GREENHOUSE GAS EMISSIONS IN 2007

Summary

The EPA has produced provisional estimates of greenhouse gases up to 2007 as the basis for the Government's carbon budget, ahead of their submission to the EU in early 2009. Following normal practice, the estimates include revision of previously published estimates for earlier years, as appropriate, taking into account any updated information obtained from key data providers and peer review recommendations following in-depth review of Ireland's 2006 submission to the UNFCCC secretariat. This briefing note summarises the status of Ireland's GHG emissions in October 2008.

Key features of the provisional 2007 estimates:

Overall

- Total GHG emissions in 2007 were 69.28 million tonnes carbon dioxide equivalent (Mt CO₂eq), which is 0.463 Mt CO₂eq (0.66 percent) lower than the level of emissions in 2006.

Transport

- Transport continues to be the dominant growth sector with emissions at 650,000 tonnes CO₂eq higher in 2007 than in 2006. This represents a 4.7 percent increase on 2006 levels and 178 percent increase on the 1990 transport emissions.
- Road transport accounts for 97 percent 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 1.9 percent and diesel consumption up 7.4 percent from the previous year.

Energy

- There was a decrease of 580,000 tonnes CO₂eq for energy industries, which follows a similar decrease in the previous year. Emissions were down 3.7 percent on 2006 and 26.7 percent higher than in 1990.

- Displacement of oil by natural gas largely accounts for the decrease in emissions in energy in 2007.

Agriculture

- The emissions from Agriculture decreased by 740,000 tonnes or 3.8 percent in 2007, continuing the downward trend from the 1998 peak. Lower sheep and cattle numbers coupled with reduced use of fertiliser resulted in the lower emissions from the agriculture sector.

Residential

- Emissions in 2007 decreased by 233,900 tonnes CO₂ eq or 3.2 percent from the 2006 level.

Kyoto Protocol

- Ireland's limit in relation to the Kyoto Protocol has been set as 314.184272 Mt CO₂eq for the entire five year period 2008-2012. This equates to an average of 62.837 Mt CO₂eq per annum over the period (i.e. 13 percent above the baseline estimate). Compliance with the Kyoto Protocol limit is achieved by ensuring that Ireland's total GHG emissions in the period 2008-2012, less any changes due to forest sinks as well as any purchases of Kyoto Protocol credits, are below the limit at the end of the five year period.
- Based on these latest inventory figures, Ireland's emissions in 2007 were 6.441 Mt CO₂eq higher than the limit as an annual average, while forest sinks (i.e. reductions) were 1.36 Mt CO₂eq resulting in a "current" annual distance to target of 5.081 Mt CO₂eq.

Introduction

The Environmental Protection Agency is responsible for compiling the inventories of greenhouse gases (GHG) emissions for Ireland and for reporting the estimates to the EC and the UNFCCC. These inventories are compiled on an annual basis using the good practice guidelines established by the Intergovernmental Panel on Climate Change (IPCC). Previously published estimates are revised as appropriate to account for improved methods and revisions in national input data used by the EPA.

The 2007 estimates are given below, followed by an account of how these differ from the latest 2006 estimates, the longer-term trends in GHG emissions and their significance in relation to Ireland's target in the first commitment period of the Kyoto Protocol.

Ireland's Greenhouse Gas Emissions in 2007

The latest data indicate that emissions of greenhouse gases in Ireland in 2007 were 69.28 Mt CO₂eq. Figure 1 shows the contributions from each of the sectors¹ as used for the Government's National Climate Change Strategy.

Agriculture is the single largest contributor to the overall emissions, at 26.8% of the total, followed by *Energy* (power generation & oil refining) at 21.7% and *Transport* at 20.8%. The remainder is made up by the *Residential* sector at 10.2%, *Industry and Commercial* at 17.8%, and *Waste* at 2.8%.

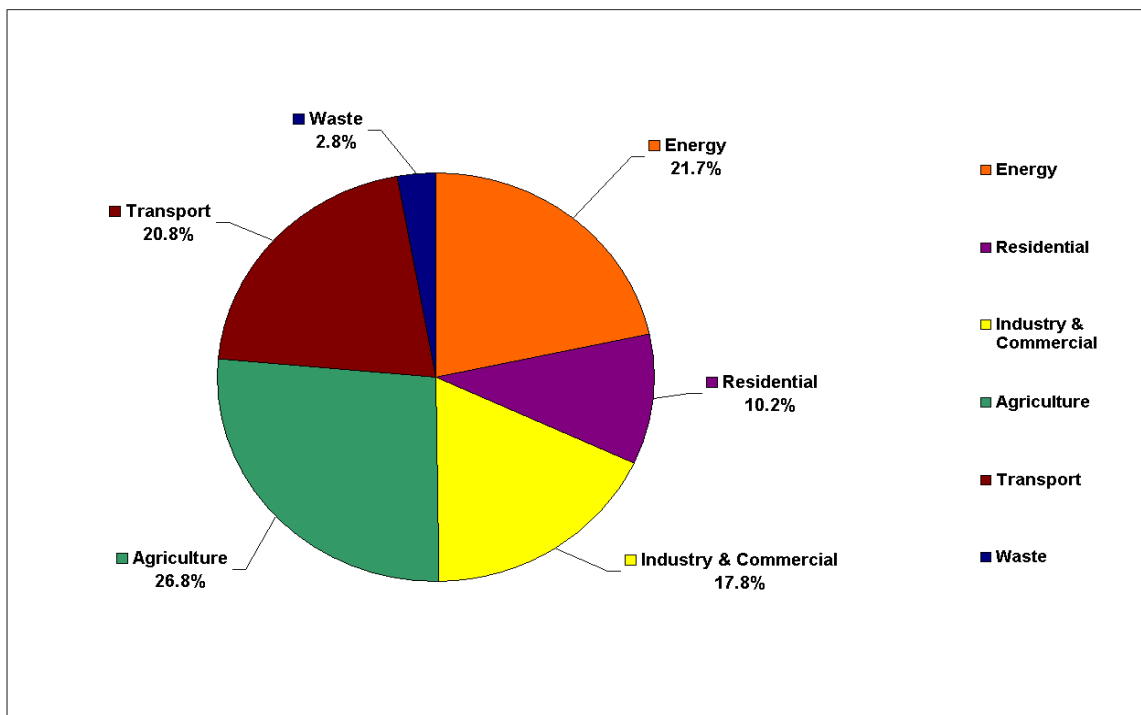


Figure 1. Greenhouse Gas Emissions in 2007 by Sector

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

Changes in Emissions from Sectors between 2006 and 2007

Notable changes in 2007 compared to 2006 are:

- *Transport* emissions increased by 4.7 percent from 13.728 Mt CO₂eq in 2006 to 14.378 Mt CO₂eq in 2007. This follows an increase of approximately 5.6 percent in the previous year. Road transport accounts for 97 percent of transport emissions;
- Emissions from *Energy Industries*, principally electricity generation, which continue to fluctuate, decreased from 15.590 Mt CO₂eq in 2006 to 15.009 Mt CO₂eq in 2007, a decrease of 3.7 percent. A reduction in the use of heavy fuel oil in Tarbert and Great Island power stations accounts for the bulk of this decrease;
- Emissions from *Industry and Commercial* increased 2.8 percent from 12.006 Mt CO₂eq in 2006 to 12.343 Mt CO₂eq in 2007 reflecting slight increases in CO₂ from combustion in industry and commercial sectors;
- Emissions from *Agriculture* decreased by 3.8 percent from 19.296 Mt CO₂eq in 2006 to 18.557 Mt CO₂eq in 2007, continuing the downward trend from 1999. 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 1.936 Mt CO₂eq and showed 5.7 percent increase on the 2006 level. For this source, landfill gas utilisation and on-site flaring are to some extent offsetting increases in methane production but the estimates are highly uncertain.

Long-term Changes in Sectoral Emissions 1990 – 2007

The trend in emissions from 1990 to 2007 is shown in Figure 2. Emissions of carbon dioxide (CO₂) from fossil fuel combustion accounted for 64.7 percent of total greenhouse gas emissions in 2007 compared to 54.4 percent in 1990. The proportion from *Agriculture*, where methane and nitrous oxide are the relevant greenhouse gases, has fallen from 35.9 percent in 1990 to 26.8 percent in 2007.

Between 1990 and 2007, *Transport* shows the greatest increase at 178 percent. 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 has been a major influencing factor.

Other sectors showing substantial increases on 1990 are *Energy Industries* at 26.7 percent and *Industry and Commercial* at 26.3 percent respectively, which reflect increasing demand for electricity and higher industrial activity respectively.

Emissions from *Agriculture* reached a peak in 1998 and have decreased to 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 drove the gradual upward trend in the emissions from the *Residential* sector after 1998 following a sharp reduction in the early 1990s and stabilisation that resulted from fuel switching. The 2007 emissions in this sector are 4% below their 1990 level.

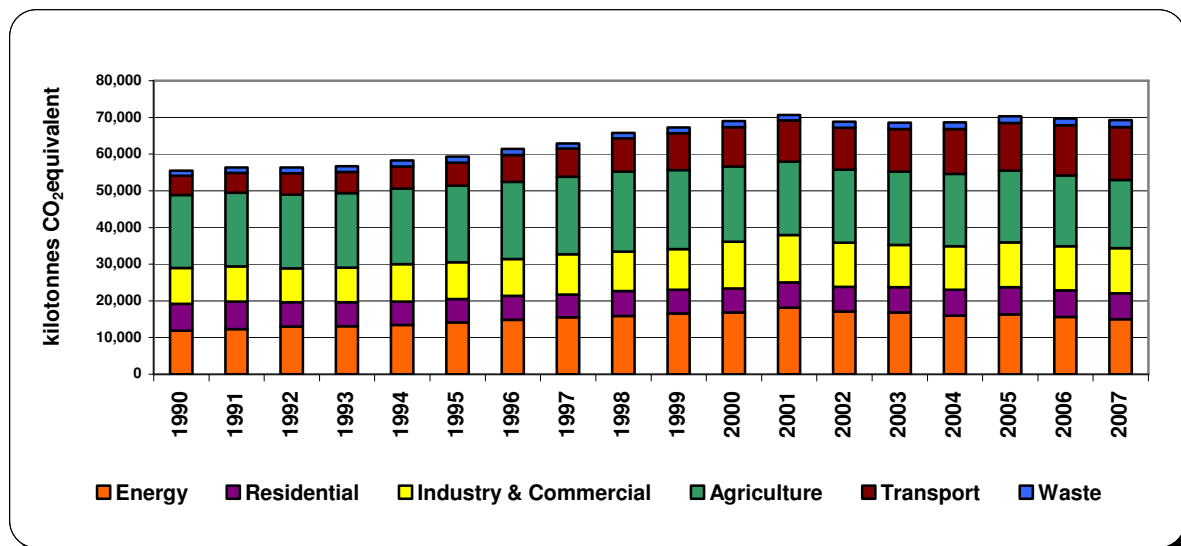


Figure 2. Trends in GHG Emissions by NCCS Sector 1990-2007

Long-term changes in Total GHG emissions relative to Kyoto limit

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 55.607 Mt CO₂eq following in-depth review of Ireland's 2007 submissions to the UNFCCC and results in total allowable emissions of 314.184272 Mt CO₂eq in the period 2008-2012 under the Kyoto Protocol, which equates to the average of 62.837 Mt CO₂eq per annum (i.e. 13 percent above the baseline estimate). Compliance with the Kyoto Protocol limit is achieved by ensuring that Ireland's total GHG emissions in the period 2008-2012, adjusted for any changes due to forest sinks, purchases of Kyoto Protocol credits and surrenders of any additional credits from those covered by the EU Emissions Trading Scheme, are below the limit at the end of the five year period.

Figure 3 shows the emissions for the period 1990 to 2007 relative to Ireland's Kyoto limit, expressed as a five year average. Also shown for reference purposes is Ireland's *baseline*.

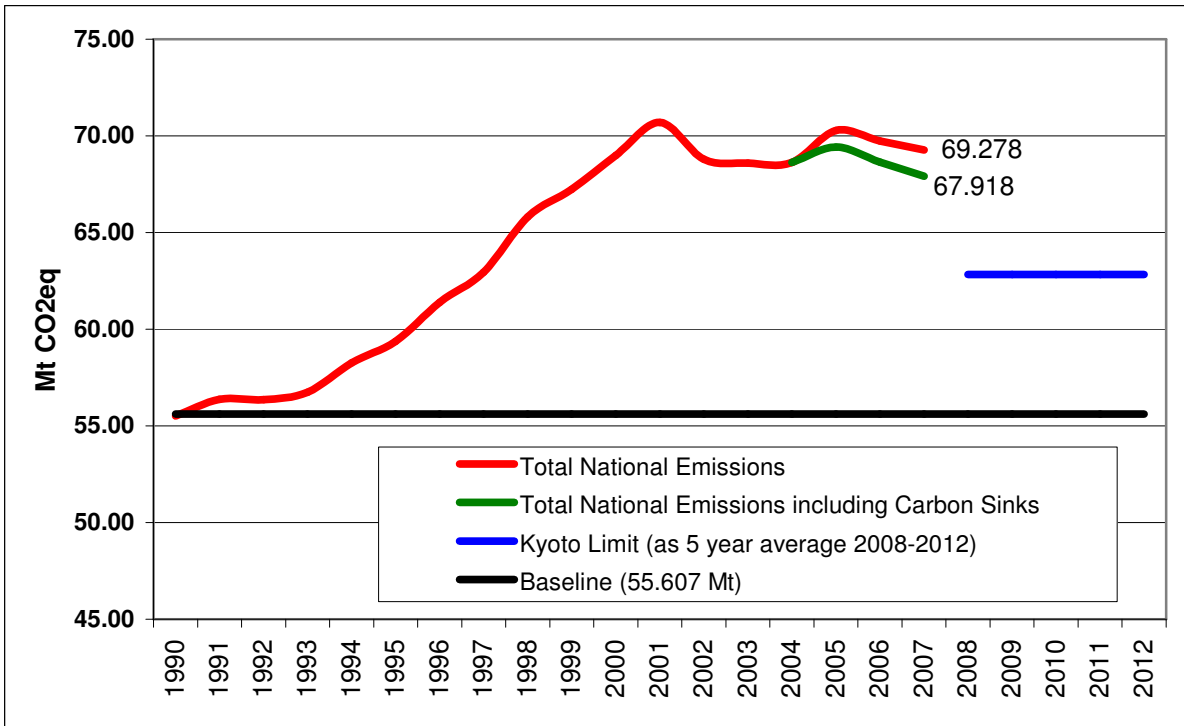


Figure 3. Distance to Ireland's Kyoto Limit

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 any inconsistencies between the percent increases presented here and those reported in previous years. The important points to note are the year on year changes reported for 2007, which are computed using the most up-to-date and accurate information.

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 uses the following six sectors for analysis:

1. Energy (electricity generation and oil refining)
2. Residential (combustion for domestic heating)
3. Industry and Commercial (combustion emissions from industrial and commercial activities, industrial process emissions, f-gas emissions),
4. Agriculture (ruminant digestion, agricultural soils and manures)
5. Transport (road, rail, navigation and domestic aviation)
6. Waste (solid waste disposal, wastewater treatment)

Table 1. Emissions by National Climate Change Strategy Sectors (kilotonnes CO₂ eq)

	Energy	Residential	Industry & Commercial	Agriculture	Transport	Waste	Total
1990	11,846.36	7,350.38	9,774.08	19,917.73	5,170.94	1,461.00	55,520.49
1991	12,342.21	7,427.31	9,666.50	20,065.38	5,373.59	1,496.02	56,371.01
1992	13,032.65	6,592.07	9,218.13	20,137.87	5,829.50	1,541.30	56,351.52
1993	13,058.34	6,553.89	9,431.40	20,325.19	5,790.69	1,586.91	56,746.41
1994	13,418.29	6,419.67	10,189.09	20,560.09	6,032.81	1,636.52	58,256.47
1995	14,116.49	6,404.01	10,023.39	20,868.41	6,266.64	1,688.56	59,367.49
1996	14,830.82	6,547.89	10,057.20	21,011.70	7,321.92	1,627.23	61,396.76
1997	15,493.83	6,233.16	10,960.74	21,150.24	7,672.47	1,432.27	62,942.71
1998	15,885.78	6,757.96	10,773.80	21,840.18	9,040.22	1,509.40	65,807.34
1999	16,566.40	6,453.42	11,128.44	21,542.86	10,001.75	1,550.34	67,243.21
2000	16,803.99	6,552.01	12,763.60	20,493.07	10,736.30	1,643.43	68,992.41
2001	18,152.52	6,860.54	12,926.10	20,025.21	11,247.77	1,481.77	70,693.91
2002	17,079.93	6,776.50	11,996.12	19,858.56	11,432.37	1,651.90	68,795.38
2003	16,856.01	6,913.64	11,485.96	19,931.15	11,607.85	1,794.90	68,589.51
2004	15,951.00	7,116.57	11,843.80	19,687.80	12,240.89	1,792.08	68,632.15
2005	16,336.47	7,384.41	12,211.70	19,567.19	13,005.77	1,773.52	70,279.06
2006	15,590.04	7,289.87	12,006.02	19,296.19	13,728.09	1,831.42	69,741.64
2007	15,009.03	7,056.00	12,342.60	18,556.72	14,377.71	1,936.26	69,278.31