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IRELAND'S FINAL GREENHOUSE GAS EMISSIONS IN 2015

KEY HIGHLIGHTS

- The EPA has produced provisional estimates of greenhouse gas emissions for the time period 1990 - 2015.
- For 2015, total national greenhouse gas emissions are estimated to be 59.88 million tonnes carbon dioxide equivalent (Mt CO_2eq). This is 3.7% higher (2.12 Mt CO_2eq) than emissions in 2014.
- In 2015, emissions in the European Union's Emissions Trading Sector[1] (ETS) sector increased by 5.5% or 0.88 Mt CO_2eq and non-ETS emissions increased by 3.0% or 1.24 Mt CO_2eq.
- Emissions in the *Energy Industries* sector show an increase of 5.4% or 0.61 Mt CO_2eq which is attributable to an increase in coal and peat use for electricity generation by 19.6% and 1.0% respectively and a decrease in natural gas use by -5.5%. There was a significant increase in electricity generated from renewables (+ 22.9%) with wind increasing by 27.9%, hydro by 13.8% and a decrease in biomass by -18.7%. There was a 1.9% increase in the emissions intensity of power generation in 2015 (476 g CO_2/kWh) compared with 2014 (468 g CO_2/kWh). Renewables now account for 27% of electricity generated in 2015 (up from 23% in 2014).
- The *Industrial Processes* sector show an increase in emissions of 10.2% or 0.18 Mtonnes of CO_2eq, mainly from increased cement production. Within this sector, process emissions from mineral products increased by 10.9%, with cement process emissions increasing by 13.1%. These emissions are included in the ETS sector and contribute significantly to the ETS sector increase in 2015.
- Emissions from the *Manufacturing Combustion* sector increased by 0.23 Mtonnes of CO_2eq or 5.2% in 2015. Increased emissions from companies within the ETS were evident in the food and drink and cement sectors, with emissions increasing by 4.3% and 6.8% respectively. This is reflected with increased use of natural gas use (+12.1%) and petroleum coke (+10.0%) in 2015.
- *Agriculture* emissions increased by 1.6% or 0.32 Mtonnes of CO_2eq in 2015. The most significant drivers for the increased emissions in 2015 are higher dairy cow numbers (+7.7%)

[1] The European Union's Emissions Trading Scheme

with an increase in milk production of 13.2%. This reflects national plans to expand milk production under Food Wise 2025 and the removal of the milk quota in 2015. There were also increased CO_2 emissions from liming (+2.7%) and urea application (+12.8%). Other cattle, sheep and pig numbers all decreased by 0.1%, 3.3% and 1.6% respectively. Total fossil fuel consumption in agriculture/forestry/fishing activities decreased by 4.7% in 2015.

- Greenhouse gas emissions from the *Transport* sector increased by 4.2% or 0.48 Mtonnes of CO_2eq in 2015. This is the third year of increases in transport emissions following five consecutive years of decreases since 2007. In road transport in 2015, gasoline use continued to decrease by 5.2% while diesel use increased by 8.9% and biofuels use increased by 10.3%.

- Greenhouse gas emissions from the *Residential* sector increased by 5.1% or 0.30 Mtonnes of CO_2eq mainly from increased oil (+11.5%) and natural gas (+3.6%) consumption. Within the different oil products used in household space and water heating, kerosene use increased by 15.8%, which may reflect the relatively low prices in 2015. Coal use in households decreased by 5.8%, whereas biomass use increased by 26.2% with little change in peat use. The weather in 2015 was slightly colder than in 2014, with over 8% more degree days.

- Emissions from the *Waste* sector increased by 10.9% in 2015, with increases in all sub categories; landfills (+14.4%), incineration and open burning (+1.3%) and wastewater treatment (+0.9%). Overall emissions increased by 0.10 Mtonnes of CO_2eq, mainly due to a 14.2% decrease in methane recovered for utilisation or flaring at landfill sites in 2015.

- *Agriculture* and *Transport* accounted for 73.5% of total non-ETS emissions in 2015.

- These figures indicate that Ireland will be in compliance with its 2015 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC[2].

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 1990-2015 in January, March and April 2017 to the European Commission and the UNFCCC.

The final estimates of Ireland's greenhouse gas figures for the years 1990-2015, based on the SEAI's final energy balances released in August 2016 and are estimated using methodologies employed in the inventory in accordance with UNFCCC reporting guidelines and the latest available input data. In addition, verified emissions data from installations covered by the ETS are included.

The 2015 estimates are given below, followed by an account of how these differ from the 2014 estimates. The longer-term trends in greenhouse gas emissions and their significance in relation to Ireland's target under the EU's ESD on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020 are also assessed.

[2] EU Effort Sharing Decision 406/2009/EC

Ireland's Greenhouse Gas Emissions in 2015

For 2015, total national greenhouse gas emissions are estimated to be 59.88 million tonnes carbon dioxide equivalent (Mt CO_2 eq) which is 3.7 % higher (or 2.12 Mt CO_2 eq) than emissions in 2014 (57.76 Mt CO_2 eq). This follows the 0.3% decrease in emissions reported for 2014 following a mild winter in that year. Emission reductions have been recorded in 8 of the last 10 years, largely as a result of reduced economic activity. In 2015, emissions from the ETS sector increased by 5.5% or 0.88 Mt CO_2eq and non-ETS emissions increased by 3.0% or 1.24 Mt CO_2eq.

The inter-annual change in total greenhouse gas emissions is presented in Figure 1 and sectoral emissions in Figures 2 and 3. Detailed sectoral data are shown in Table 3.

Agriculture remains the single largest contributor to the overall emissions at 33.1% of the total. *Transport* and *Energy Industries* are the second and third largest contributors at 19.8% and 19.7% respectively. *Residential* and *Manufacturing Combustion* emissions account for 10.1% and 7.6 % respectively. These five sectors account for over 90% of national total emissions. The remainder is made up by the *Industrial Processes* at 3.3%, *F*-Gases at 1.9%, *Waste* at 1.6%, *Commercial Services* at 1.6% and *Public Services* at 1.3%. Figure 2 shows the contributions from each of the sectors in 1990 and 2015.

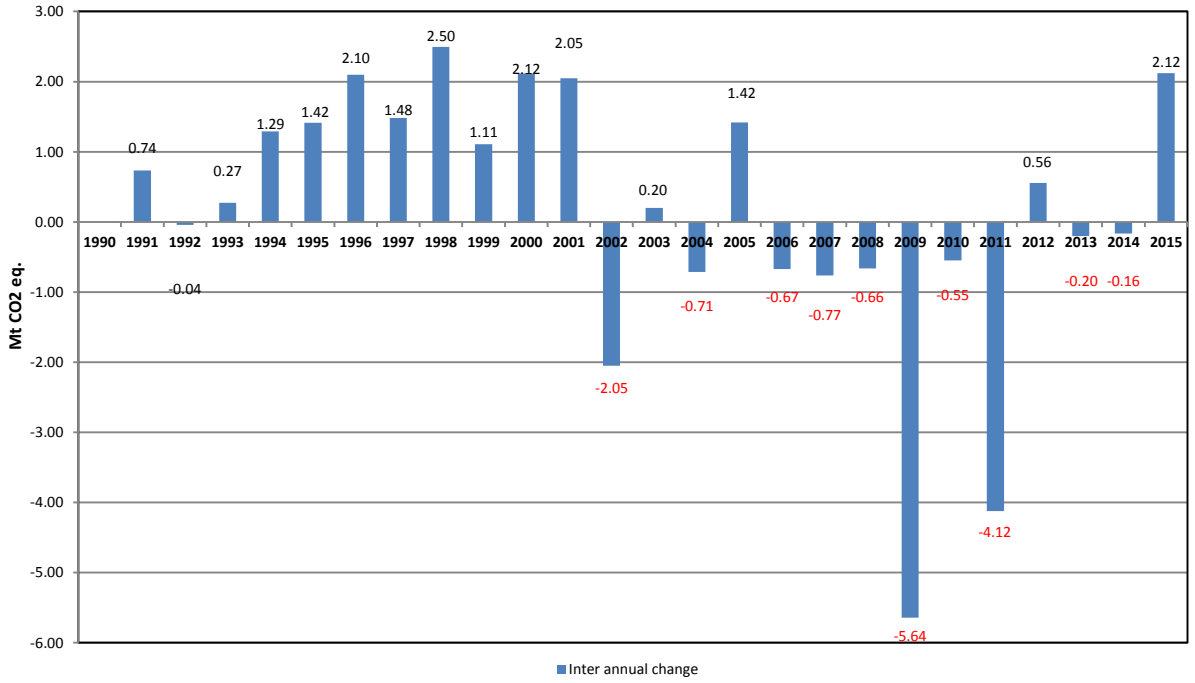

Figure 1. Inter annual changes in GHG emissions 1990-2015

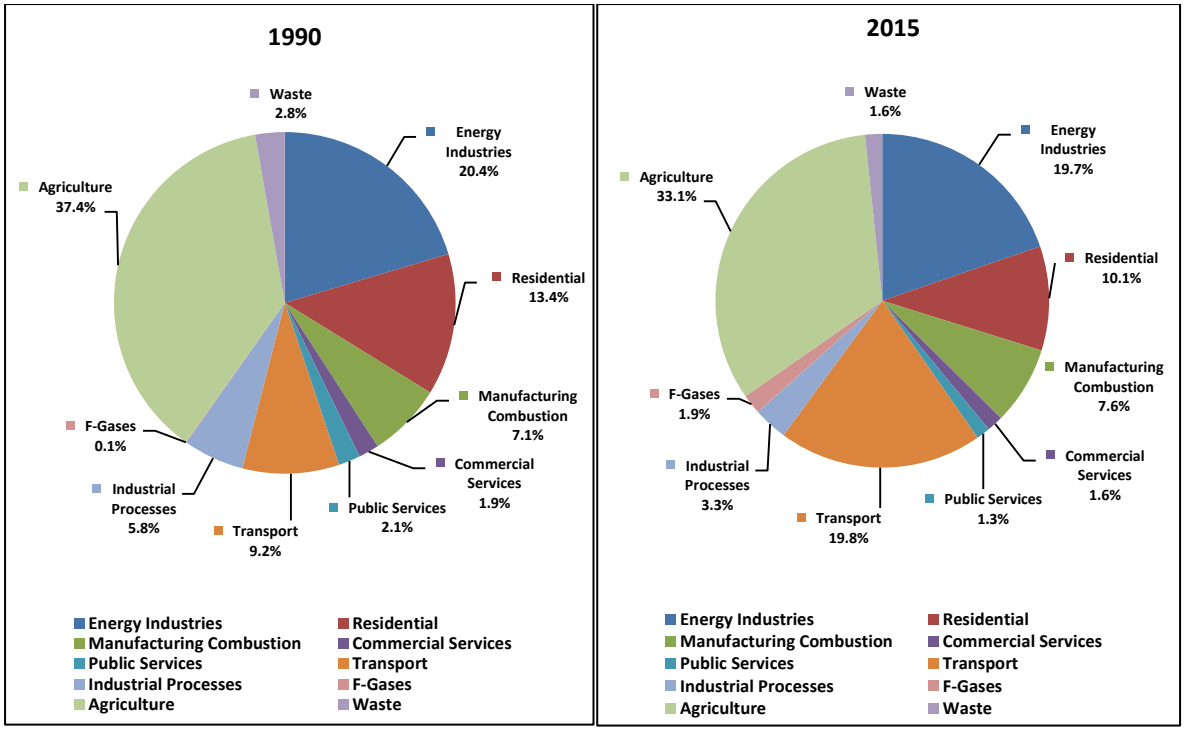

Figure 2. Greenhouse Gas Emissions in 1990 and 2015 by Sector

Changes in Emissions from Sectors between 2014 and 2015

An overview of changes in emissions since the previous year is presented in Table 1.

Table 1. Final greenhouse gas emissions for 2014 and 2015 for Ireland

Mtonnes CO_2 eq	2014	2015	% Change
Energy Industries	11.197	11.803	5.4%
Residential	5.746	6.041	5.1%
Manufacturing Combustion	4.323	4.549	5.2%
Commercial Services	0.957	0.935	-2.3%
Public Services	0.816	0.806	-1.2%
Transport	11.347	11.827	4.2%
Industrial Processes	1.807	1.993	10.2%
F-Gases	1.194	1.143	-4.3%
Agriculture	19.491	19.807	1.6%
Waste	0.879	0.974	10.9%
Total	**57.758**	**59.878**	**3.7%**

Sectoral emissions in the *Energy Industries* sector show an increase of 5.4% which is attributable to an increase in coal and peat use for electricity generation by 19.6% and 1.0% respectively and a decrease in natural gas use by -5.5%. There was a significant increase in electricity generated from renewables (+ 22.9%) with wind increasing by 27.9%, hydro by 13.8% and a decrease in biomass by -18.7%. There was a 1.9% increase in the emissions intensity of power generation in 2015 (476 g CO_2/kWh) compared with 2014 (468 g CO_2/kWh). Renewables now account for 27% of electricity generated in 2015 (up from 23% in 2014). In 2015, total final consumption of electricity increased by 3.9%.

The *Industrial Processes* sector shows a 10.2% increase in emissions (0.18 Mtonnes of CO_2eq) mainly from increased cement production. Total process emissions from mineral products increased by 10.9%, with cement process emissions increasing by 13.1%. These emissions are included in the ETS sector and contribute significantly to the ETS sector increase in 2015.

Emissions in the *Residential* sector increased by 5.1% or 0.30 Mtonnes of CO_2eq mainly from increased oil (+11.5%) and natural gas (+3.6%) consumption. Within the different oil products used in household space and water heating, kerosene use increased by 15.8%, which may reflect the relatively low prices in 2015. Coal use in households decreased by 5.8%, whereas biomass use increased by 26.2% with little change in peat use. The weather in 2015 was slightly colder than in 2014, with over 8% more degree days.

Emissions from the *Manufacturing Combustion* sector increased by 5.2% or 0.23 Mtonnes of CO_2eq in 2015. Increased emissions from companies within the ETS were evident in the food and drink and cement sectors, with emissions increasing by 4.3% and 6.8% respectively. This is reflected with increased use of natural gas use (+12.1%) and petroleum coke (+10.0%) in 2015.

Emissions from *Commercial Services* and *Public Services* decreased by 2.3% and 1.2% respectively, with reductions of 3.5% in gasoil use in both sectors in 2015.

Agriculture emissions increased by 1.6% in 2015 or 0.32 Mtonnes of CO_2eq. The most significant drivers for the increased emissions in 2015 are higher dairy cow numbers (+7.7%) with an increase in milk production of 13.2%. This reflects national plans to expand milk production under Food Wise 2025 and the removal of the milk quota in 2015. There were also increased CO_2 emissions from liming (+2.7%) and urea (+12.8%) application. Other cattle, sheep and pig numbers all decreased by 0.1%, 3.3% and 1.6% respectively. Total fossil fuel consumption in agriculture/forestry/fishing activities decreased by 4.7% in 2015.

Transport emissions increased by 4.2% in 2015 or 0.48 Mtonnes of CO_2eq. This is the third year of increases in transport emissions following five consecutive years of decreases since 2007. In road transport in 2015, gasoline use continued to decrease by 5.2% while diesel use increased by 8.9% and biofuels use increased by 10.3%. Looking at the underlying drivers, the number of passenger diesel cars increased by 11.2% in 2015 while the number of passenger petrol cars decreased by 4.1% and commercial vehicle numbers increased by 4.1% as employment grew in 2015.

Emissions from the *Waste* sector increased by 10.9% in 2015, with increases in all sub categories; landfills (+14.4%), incineration and open burning (+1.3%) and wastewater treatment (+0.9%). Overall emissions increased by 0.10 Mtonnes of CO_2eq, mainly due to a 14.2% decrease in methane recovered for utilisation or flaring at landfill sites in 2015.

Long-term Changes in Sectoral Emissions 1990 – 2015

The trend in emissions from 1990 to 2015 is shown in Figures 3 and 4 and Table 3. The share of CO_2 in total greenhouse gas emissions has increased to 64.1% of total greenhouse gas emissions in 2015 compared to 58.5% in 1990. In contrast, CH_4 and N_2O emissions, primarily from the agriculture sector, have fallen from 41.4% of total greenhouse gas emissions in 1990 to 34.0% in 2014. Emissions from F-gases account for 1.9% of the total in 2015.

Between 1990 and 2015, *Transport* shows the greatest overall increase at 130.3%, with road transport increasing by 136.7%. Emissions increased by 4.2% in 2015, the third year of increases in *Transport* emissions following 5 consecutive years of decreases since 2007. However, *Transport* emissions have decreased by 17.8% below peak levels in 2007 primarily due to the economic downturn, improving vehicle standards due to the changes in vehicle registration tax and the increase use in biofuels. The increase up to 2007 can be attributed to general economic prosperity, increasing population with a high reliance on private car travel as well as rapidly increasing road freight transport.

Energy Industries (mainly electricity generation) shows an increase in emissions of 3.2% over the period 1990 – 2015. Over the time series, CO_2 emissions from electricity generation have increased by 3.4% whereas total electricity consumption has increased by 111%. Emissions from electricity generation increased from 1990 to 2001 by 54.2% and have decreased by 32.9% between 2001 and 2015. 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.

Emissions from *Agriculture* reached a peak in 1998 and have decreased to below their 1990 level since 2002, reflecting long-term decline in livestock populations and in fertiliser use due to the Common Agricultural Policy. Emissions from *Agriculture* in 2015 are now 5.5% below their 1990 levels but have increased for 3 out of the last 4 years, 2012, 2013 and 2015. The fluctuations in *Agriculture* emissions are underpinned by higher animal numbers; dairy cows population was 7.7% higher in 2015 compared with 2014 with an increase in milk production of 13.2%. This reflects national plans to expand milk production under Food Wise 2025 and following removal of milk quota in 2015.

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 that resulted from fuel switching to reach a peak in 2010. The 2015 emissions in this sector show 5.1% increase on 2014 levels and are 19.7% lower than their 1990 level whereas the housing stock has increased by 74.1% in the same period. Winter heating demand is the most important variable determining emissions from this sector.

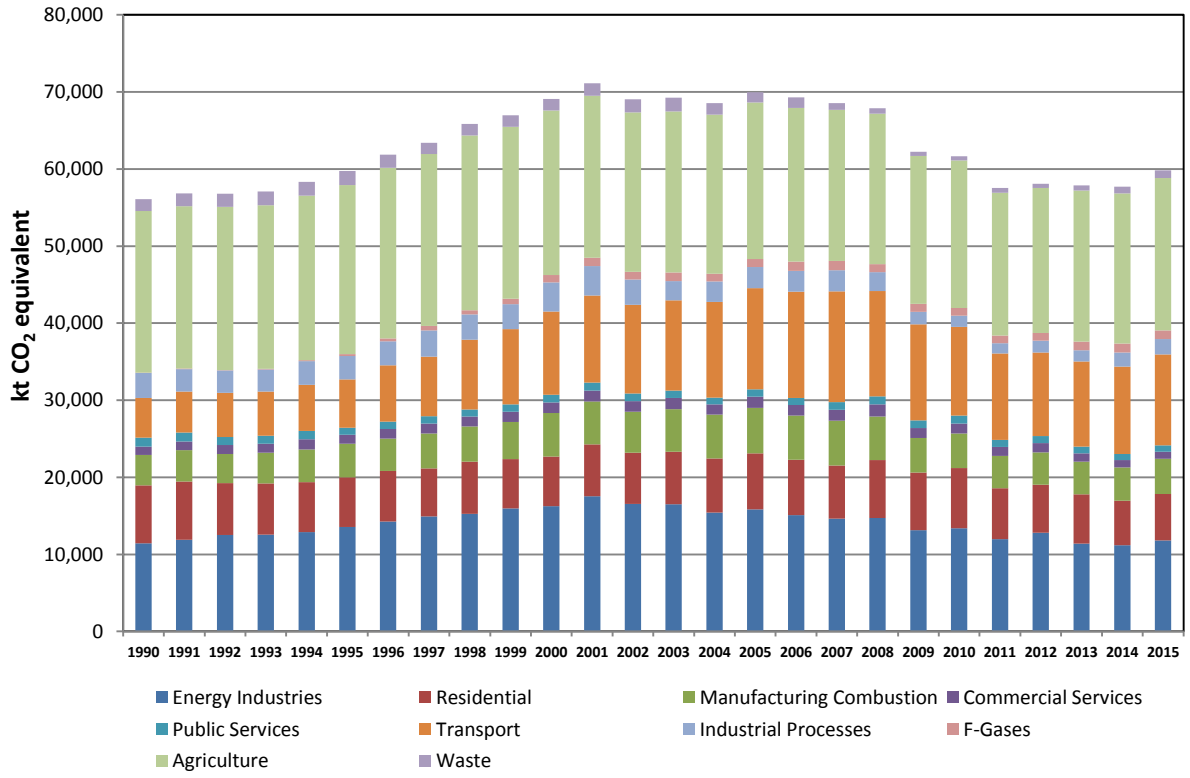

Figure 3. GHG emissions by sector 1990-2015

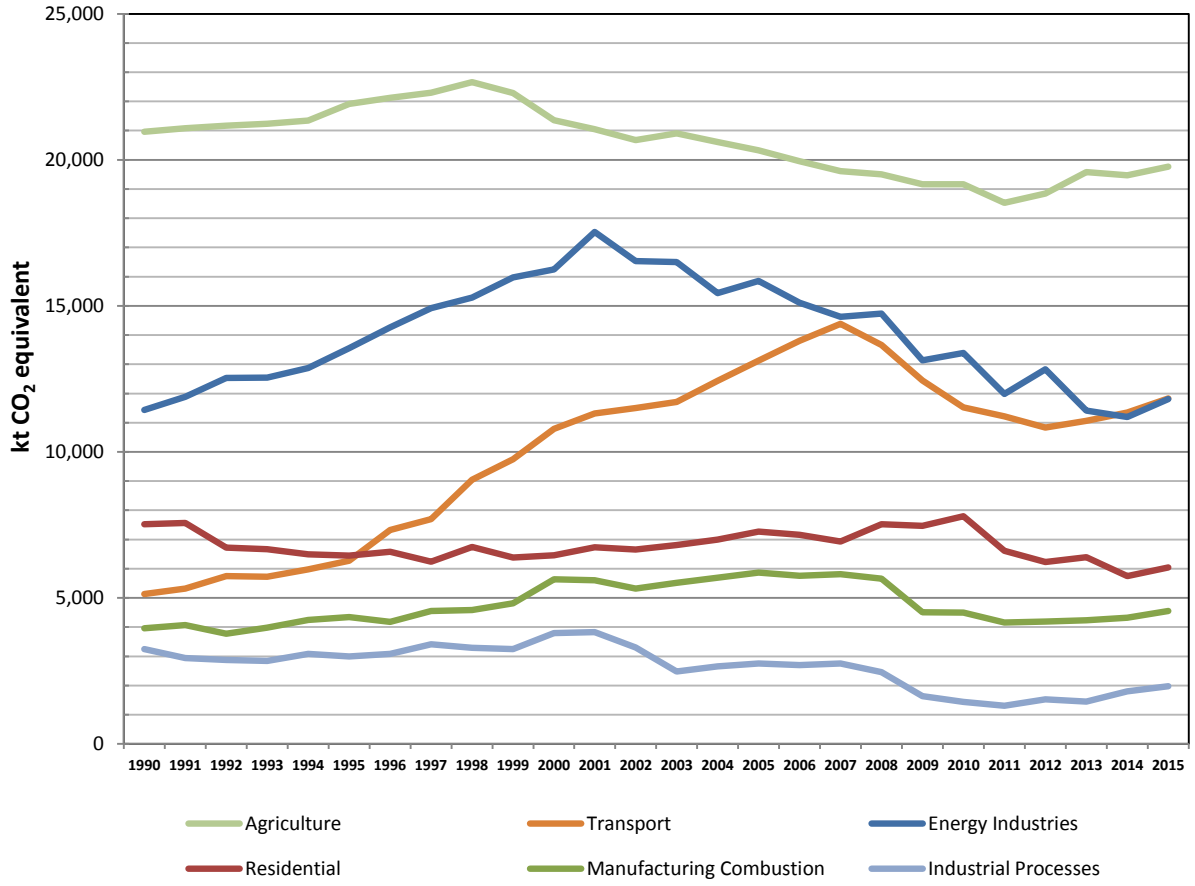

Figure 4. Trend in emissions for largest sectors 1990-2015

Compliance with EU and international commitments

The greenhouse gas emission inventory for 2015 is the third year that compliance under the European Union's Effort Sharing Decision (Decision 406/2009/EC) will be assessed. This Decision sets 2020 targets for sectors outside of the Emissions Trading Scheme (known as non-ETS sector emissions) and annual binding limits for the period 2013-2020. Ireland's target is to reduce non-ETS emissions by 20% by 2020 compared with 2005 levels.

Final compliance for 2013 and 2014 was completed in August 2016 following submission of official data in March 2016 and review of this data by the European Commission. The outcome of this review led to a methodological revision to the estimates of methane generation from solid waste disposal on land (landfills) in the waste sector. This change in methodology revised emissions from the waste sector downwards by, on average 0.60 Mt CO_2 eq, for the years 2005 to 2014. The EPA carried out the necessary transactions on the ESD Registry for the 2013 ESD compliance cycle in April 2017. A European Commission Decision on the 2014 ESD Compliance Cycle is expected in May 2017. This will commence the four month compliance/flexibility period (May 2017-September 2017) within which Ireland must demonstrate ESD compliance. ESD Transactions may be viewed on the EU website at http://ec.europa.eu/environment/ets/transactionsCompliance.do?languageCode=en

Ireland's final 2015 greenhouse gas emissions for non-ETS sectors are 43.037 Mt CO_2 eq. This value is the national total emissions less emissions covered by the EU's emissions trading scheme for stationary and aviation operators. Agriculture and Transport accounted for 73.5% of total non-ETS emissions in 2015.

Ireland's annual target for 2015 is 44.630 Mt CO_2 eq which is 1.593 Mt CO_2 eq higher than the 2015 final estimates. See Table 2 and Figure 5 for detail. This indicates that Ireland will be in compliance with its 2015 Effort Sharing Decision annual limit.

Table 2. Compliance with EU ESD Targets 2013-2020

		2013	2014	2015	2016	2017	2018	2019	2020	
A	Total greenhouse gas emissions without LULUCF[1]	57,922.5	57,757.9	59,879.4						kt CO_2eq
B	NF_3 emissions	0.9	1.0	1.0						kt CO_2eq
C	Total greenhouse gas emissions without LULUCF and without NF3 emissions	57,921.6	57,757.0	59,878.5						kt CO_2eq
D	Total verified emissions from stationary installations under Directive 2003/87/EC[2]	15,685.9	15,952.7	16,829.7						kt CO_2eq
E	CO_2 emissions from 1.A.3.A civil aviation	10.0	9.4	10.4						kt CO_2eq
F	**Total ESD emissions (=C-D-E)**	42,225.7	41,794.9	43,037.2						kt CO_2eq
G	**EU ESD Targets**	46,891.9	45,760.9	44,629.9	43,498.9	40,885.1	39,807.1	38,729.2	37,651.3	kt CO_2eq
	Distance to target (=F-G)	-4,666.2	-3,966.0	-1,592.7						

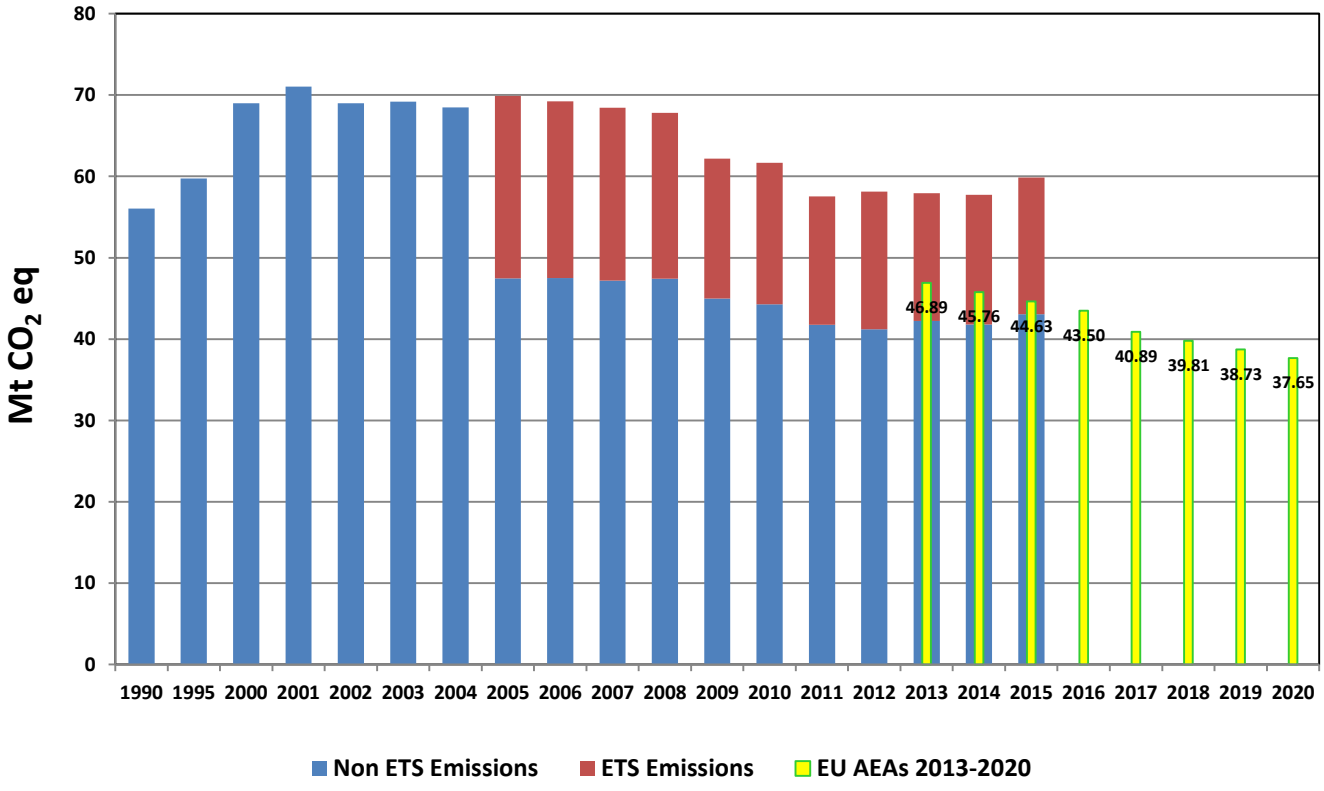

Figure 5. ESD Targets 2013-2020

Table 3. Ireland's GHG Emissions by Sector 1990-2015 (kilotonnes CO_2 equivalent)

1990-2015_Submission 2017 FINAL	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Annual change	kt CO2
Energy Industries	11434.98	13553.17	16245.03	15858.06	15103.65	14624.58	14730.24	13135.54	13385.81	11989.19	12823.80	11413.94	11197.24	11803.22	**5.4%**	**605.97**
Public electricity and heat production	10953.92	13132.91	15754.35	15244.75	14527.04	14055.76	14155.13	12610.63	12895.10	11556.54	12356.28	10952.93	10771.89	11328.27	5.2%	556.37
Petroleum refining	168.67	181.27	274.80	411.87	377.14	360.80	367.48	315.39	310.47	285.42	313.55	294.55	279.50	358.72	28.3%	79.23
Solid fuels and other energy industries	100.54	69.44	87.15	110.10	120.22	114.13	124.11	145.54	121.32	93.26	104.84	122.71	97.68	73.11	-25.2%	-24.57
Fugitive emissions	211.85	169.54	128.73	91.34	79.25	93.89	83.52	63.99	58.91	53.97	49.14	43.76	48.18	43.12	-10.5%	-5.06
Residential	7523.66	6452.05	6462.60	7271.95	7157.48	6928.53	7521.57	7467.04	7800.95	6609.75	6232.39	6395.36	5745.61	6041.36	**5.1%**	**295.75**
Manufacturing Combustion	3961.75	4347.62	5642.37	5870.71	5752.70	5811.69	5654.19	4505.24	4497.09	4159.66	4188.59	4238.57	4323.40	4548.82	**5.2%**	**225.42**
Commercial Services	1083.49	1165.57	1374.71	1475.69	1380.08	1414.82	1547.67	1297.82	1296.57	1194.97	1184.39	1066.17	956.98	934.77	**-2.3%**	**-22.21**
Public Services	1160.65	936.34	989.43	952.53	912.74	958.76	1052.75	1001.79	1021.03	913.57	930.82	871.09	815.51	806.02	**-1.2%**	**-9.48**
Transport	5135.48	6271.71	10788.98	13121.30	13801.50	14388.11	13660.61	12441.37	11528.46	11219.54	10835.82	11065.56	11347.38	11827.35	**4.2%**	**479.97**
Domestic aviation	51.71	48.86	74.41	65.37	77.29	71.48	67.18	55.20	40.97	19.33	11.50	10.18	9.52	10.51	10.3%	0.98
Road transportation	4786.27	5887.49	10366.46	12554.87	13184.26	13839.38	13084.70	11896.78	10984.32	10734.65	10364.99	10593.83	10841.35	11328.94	4.5%	487.59
Railways	148.87	124.51	137.65	136.58	136.58	147.71	156.54	137.36	136.31	136.52	131.93	131.38	120.53	122.83	1.9%	2.31
Domestic navigation	85.77	92.10	152.65	211.19	250.13	197.53	204.73	199.52	200.12	173.73	183.60	179.59	224.81	221.73	-1.4%	-3.08
Other transportation	62.86	118.75	57.80	153.28	153.24	132.01	147.46	152.51	166.74	155.31	143.81	150.58	151.17	143.34	-5.2%	-7.83
Industrial Processes	3236.94	2989.36	3787.40	2749.05	2697.07	2752.76	2458.77	1640.31	1446.80	1315.90	1539.22	1453.96	1807.43	1992.57	**10.2%**	**185.14**
Mineral industry	1116.73	1084.18	1908.78	2552.80	2538.74	2582.80	2303.11	1486.14	1300.01	1168.75	1393.44	1301.70	1650.45	1830.36	10.9%	179.91
Chemical industry	1985.55	1754.44	1663.30	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		
Metal industry	26.08	24.80	28.80	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		
Non-energy products from fuels and solvent use	77.24	93.75	152.64	159.30	120.49	130.83	115.57	113.64	106.06	106.25	104.79	111.20	115.77	120.76	4.3%	5.00
Other product manufacture and use	31.34	32.20	33.88	36.96	37.84	39.12	40.10	40.53	40.72	40.90	40.99	41.06	41.21	41.44	0.6%	0.23
F-Gases	35.23	284.29	955.35	1019.96	1178.19	1174.62	1036.59	1037.90	1011.70	1016.49	996.33	1122.77	1194.49	1142.75	**-4.3%**	**-51.74**
Agriculture	20963.29	21929.50	21318.16	20347.33	19976.66	19618.16	19507.47	19172.15	19178.90	18533.14	18852.70	19598.23	19491.07	19807.19	**1.6%**	**316.13**
Enteric fermentation	11356.97	11480.10	11260.82	10843.14	10789.48	10586.99	10539.09	10370.00	10162.10	10045.18	10379.27	10532.74	10668.87	10936.46	2.5%	267.59
Manure management	1821.98	1842.62	1811.91	1781.05	1759.24	1721.54	1719.27	1700.05	1666.58	1653.29	1729.87	1744.38	1755.55	1790.31	2.0%	34.76
Agricultural soils	6566.36	6905.83	6813.80	6329.93	6099.86	5920.76	5913.30	5860.31	6047.45	5656.64	5735.07	6109.47	6050.67	6079.52	0.5%	28.86
Liming	355.04	494.60	366.38	266.73	254.86	376.77	262.21	307.32	427.93	360.68	229.40	515.69	382.32	392.51	2.7%	10.19
Urea application	44.47	39.68	42.25	27.90	29.55	23.36	30.76	40.93	45.16	32.32	21.32	21.66	25.09	28.31	12.8%	3.22
Agriculture/Forestry fuel combustion	730.62	1008.11	909.76	953.63	914.19	868.02	939.19	796.63	753.49	721.93	687.92	596.55	534.52	514.98	-3.7%	-19.54
Fishing	87.85	158.55	113.24	144.94	129.47	120.74	103.65	96.92	76.18	63.10	69.85	77.73	74.06	65.11	-12.1%	-8.95
Waste	1567.29	1842.96	1511.63	1315.05	1351.14	873.64	712.91	540.78	524.59	615.22	539.97	696.84	878.81	974.16	**10.9%**	**95.36**
Landfills	1318.08	1592.76	1268.16	1007.00	1049.30	615.99	463.84	284.80	278.65	381.56	302.79	460.97	648.10	741.41	14.4%	93.31
Biological treatment of solid waste	0.00	0.00	0.00	13.77	13.70	12.48	16.44	21.07	20.99	22.91	22.41	22.73	19.30	19.30	0.0%	0.00
Incineration and open burning of waste	92.48	94.43	75.83	131.19	128.31	83.69	62.64	64.11	54.80	42.45	45.60	43.57	39.65	40.15	1.3%	0.51
Wastewater treatment and discharge	156.74	155.77	167.64	163.10	159.84	161.47	169.99	170.79	170.15	168.30	169.17	169.57	171.77	173.30	0.9%	1.54
National Total	**56102.77**	**59772.57**	**69075.66**	**69981.63**	**69311.22**	**68545.65**	**67882.79**	**62239.95**	**61691.90**	**57567.45**	**58124.04**	**57922.47**	**57757.92**	**59878.21**	**3.7%**	**2120.30**

Notes

Units: 1 Mt = 1,000 kilotonnes

CO_2 Equivalent: greenhouse gases other than CO_2 (i.e. methane, nitrous oxide and F-gases) may be converted to CO_2 equivalent using their global warming potentials (GWPs).

F-gases: These gases comprise HFCs (Hydroflurocarbons), PFCs (Perfluorcarbons), SF_6 (Sulphur Hexafluoride) and NF_3 (Nitrogen Trifluoride). They are much more potent than the naturally occurring greenhouse gas emissions (carbon dioxide, methane and nitrous oxide).

GWPs:

Industrial designation or common name	Chemical formula	GWP for 100-year time horizon IPCC 4th assessment report (AR4)
Carbon dioxide	CO_2	1
Methane	CH_4	25
Nitrous oxide	N_2O	298
Hydrofluorocarbons	HFCs	12 to 14,800
Perfluorinated compounds	PFCs	7,390 to >17,340
Sulphur hexafluoride	SF_6	22,800
Nitrogen trifluoride	NF_3	17,200

Ireland's GHG Sectors: include the following ten 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 for Manufacturing industries)
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), wastewater treatment, waste incineration and open burning of waste).