



**Central Statistics Office**  
An Phríomh-Oifig Staidrimh

# **Environmental Indicators Ireland 2012**

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## Introduction

The National Statistics Board (NSB) 2009-2014 Strategy for Statistics recommended that the CSO expand the move towards evidence-based policy-making by developing a set of indicators based around environmental data. The NSB requested that the selected indicators should be consistent with international statistical concepts and facilitate international comparison.

In comparison with social and economic statistics, the environment domain is undeveloped in terms of depth and coverage. The intention is to publish this report on a biennial basis and it is expected that the 2014 report will contain changes and enhancements arising from user feedback and an increase in data availability. Hence, this report should be seen as a preliminary analysis rather than a definitive or comprehensive report.

A total of 92 indicators covering nine separate domains have been selected for this publication. The CSO consulted with various departments and agencies in order to ensure the most appropriate indicators were used. Most of the indicators are presented in a time-series format for Ireland, while the international context is shown by comparing Ireland with other EU Member States for the latest year for which data are available. The environment area is wide-ranging and the nine domains cover areas as diverse as greenhouse gases, waste, and biodiversity. There is a large number of EU legal requirements to compile environment related statistics in areas such as energy balances, waste materials, special habitats, and material flow accounts. This report attempts to bring together the most important indicators from these domains to facilitate easy access for users.

The CSO wishes to thank: Birdwatch Ireland; Coillte; Department of Agriculture, Food and the Marine; Department of Arts, Heritage and the Gaeltacht; Department of the Environment, Community and Local Government; Department of Transport, Tourism and Sport; DKM Economic Consultants; Environmental Protection Agency; Forest Service; Met Éireann; Office of Public Works; Sea Fisheries Protection Authority, Sustainable Energy Authority of Ireland and University College Dublin for providing us with data and technical advice on the most appropriate indicators for Ireland.

*Photographs in this publication are supplied courtesy of Bord na Mona, Department of Agriculture, Food and the Marine, Dave Lester, Gerry Brady, Gerry Walker, Niall Brew, Paul Molony, Sea Fisheries Protection Authority and Thornton's Recycling.*

## Main findings

### Air

- Air quality in Ireland has improved quite considerably over the last decade. By 2010, emissions for three of the four pollutants (sulphur dioxide, ammonia and non-methane volatile organic compounds) under the National Emission Ceiling (NEC) Directive were below their respective emissions ceilings. Emissions of nitrogen oxides (NO<sub>x</sub>) were 12% above the prescribed ceiling in 2010.
- Benchmarking EU Member States 2010 emissions, in comparison with the NEC Directive targets, showed Ireland ranked 17<sup>th</sup> for sulphur dioxide, 22<sup>nd</sup> for nitrogen oxides, 19<sup>th</sup> for ammonia, and 12<sup>th</sup> in terms of NMVOC emissions.

### Greenhouse Gases and Climate Change

- Greenhouse gas emissions fell substantially in 2009 and by 2010 Ireland was only slightly above the five years average limit set by the Kyoto Protocol.
- Energy (22%), agriculture (30%), and transport (19%) accounted for just over 70% of Ireland's greenhouse gas emissions in 2010.
- Ireland's greenhouse gas emissions on a per capita basis were the second highest in the EU in 2009.

### Water

- Ireland ranked fourth among EU Member States (after Cyprus, Malta and Greece) in terms of compliance with bathing water quality guide values in 2010.
- In 2010, 99.8% of public drinking water supplies in Ireland and 95.9% of group water supplies complied with E.coli standards.
- 93% of urban waste water in Ireland received secondary treatment in 2009.

### Land Use

- In 2010, 10.7% of Ireland's land was covered by forestry. This was the second lowest proportion of forest cover in the EU.
- Although the area farmed organically increased by over 150% between 1997 and 2009, Ireland had the third lowest percentage of agricultural land designated as organic in the EU in 2009.
- Ireland had the fifth largest cattle herd in the EU in 2010 with 6.8% of total cattle numbers.
- House completions in Ireland peaked in 2006 with 93,400 completions and have since fallen to 10,500 in 2011. In 2010, there were 3.3 house completions per 1,000 population in Ireland.

### Energy

- Ireland's primary energy requirement increased from 9.5 million tonnes of oil equivalent in 1990 to 16.5 million t.o.e. in 2008 but then decreased to 14.8 million in 2010.
- Transport accounted for 40% of Ireland's final energy consumption in 2010.
- Renewable energy accounted for 2% of Ireland's total final energy consumption in 2010.
- Ireland had an imported energy dependency ratio of 89% in 2009, the fourth highest in the EU.

## **Transport**

- There has been a substantial increase in the number of low emission vehicles licensed since the introduction in 2008 of motor taxation rates based upon emissions. In 2011, 90% of new private vehicles licensed were in emission bands A and B.
- There was a substantial fall in the number of air passengers travelling through Irish airports from 29.2 million in 2008 to 21.7 million in 2010.
- The proportion of women aged 15 or over at work who drove to work increased from 27% in 1986 to 62% in 2006. In contrast the corresponding proportions for men were 42% in 1986 and 54% in 2006.
- 14% of working women aged 15 or over walked to work in 2006 compared with 9% of working men aged 15 or over.

## **Waste**

- The amount of municipal waste generated fell from 800 kilograms per capita in 2006 to 620 kgs per capita in 2010.
- Municipal waste sent to landfill was just below 1.5 million tonnes in 2010 which was an improvement on the two million tonnes in 2007.
- In 2008, there were 9 kgs per capita of electrical waste collected from Irish households, which is more than twice the 4 kgs specified in the EU Waste Electrical and Electronic Equipment (WEEE) directive.

## **Biodiversity and Heritage**

- Ireland had the smallest percentage of land in the EU designated as a Special Protected Area, under the EU Birds Directive, at only 3% of total land area in 2010.
- Ireland at 11% had less land designated as a Special Protected Area under the EU Habitats Directive than the EU average of 14% in 2010.

## **Environmental Economy**

- Revenue from environmental related taxes fell by €660 million between 2007 and 2010.
- The consumer price index for petrol and diesel increased by 13.5% and 16.5% respectively between December 2010 and December 2011.
- In 2011, Ireland imported €6.8 billion of fuel.

# 1. Air

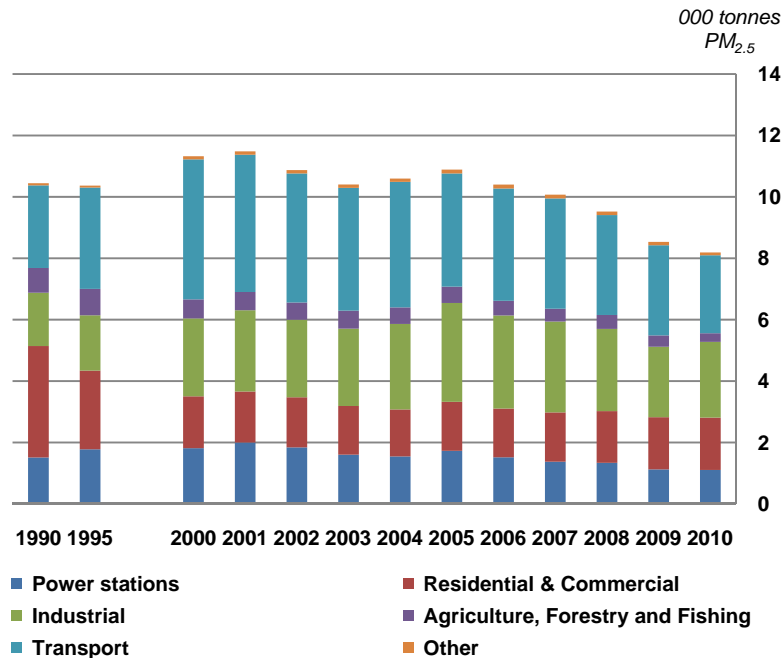


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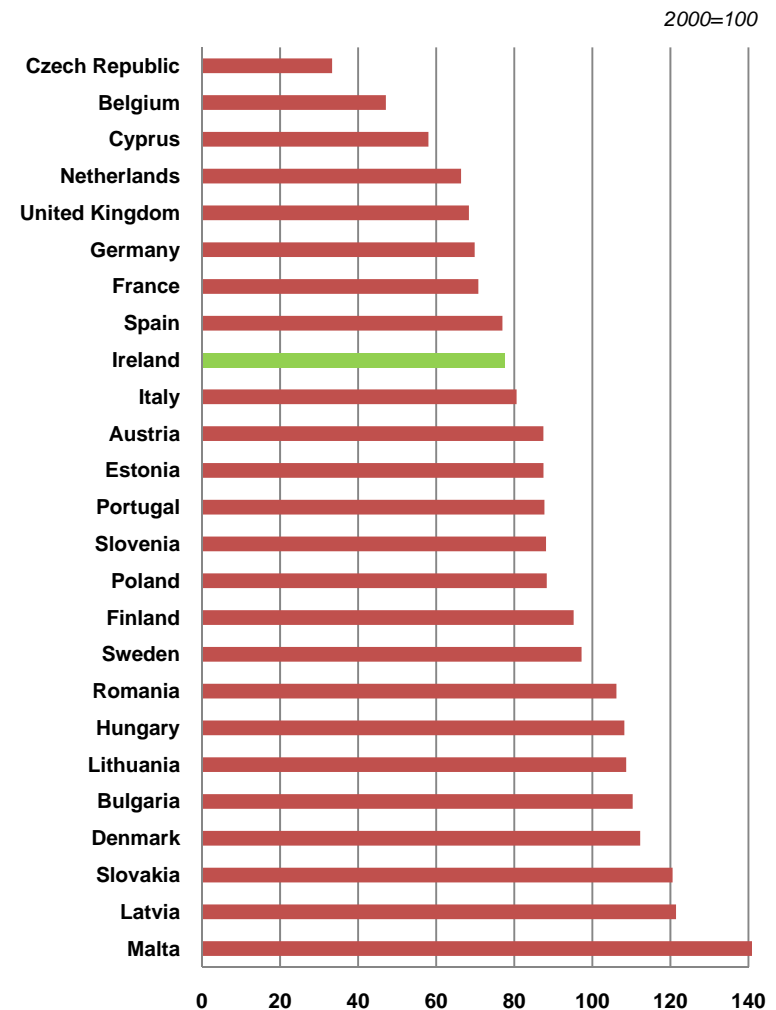
### 1.1 Ireland: Particulate matter (PM<sub>2.5</sub>) emissions 1990-2010



Source: Environmental Protection Agency

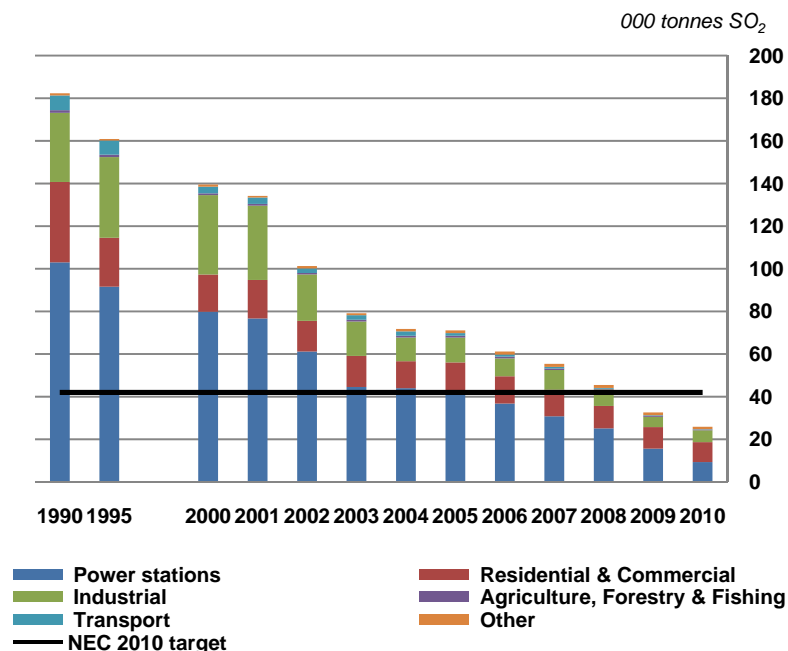
- Emissions of PM<sub>2.5</sub> varied between 10,000 and 11,500 tonnes between 1990 and 2007. Emissions then decreased by 19% between 2007 and 2010 to 8,200 tonnes.
- Transport accounted for 31% of emissions of PM<sub>2.5</sub> in 2010, with Industry accounting for 30%.
- Ireland ranked 9th in 2009 among EU Member States for emissions of PM<sub>2.5</sub> in terms of the relative change since 2000.

### 1.2 EU: Particulate matter (PM<sub>2.5</sub>) emissions 2009



Source: European Environment Agency

### 1.3 Ireland: Sulphur dioxide emissions 1990-2010



Source: Environmental Protection Agency

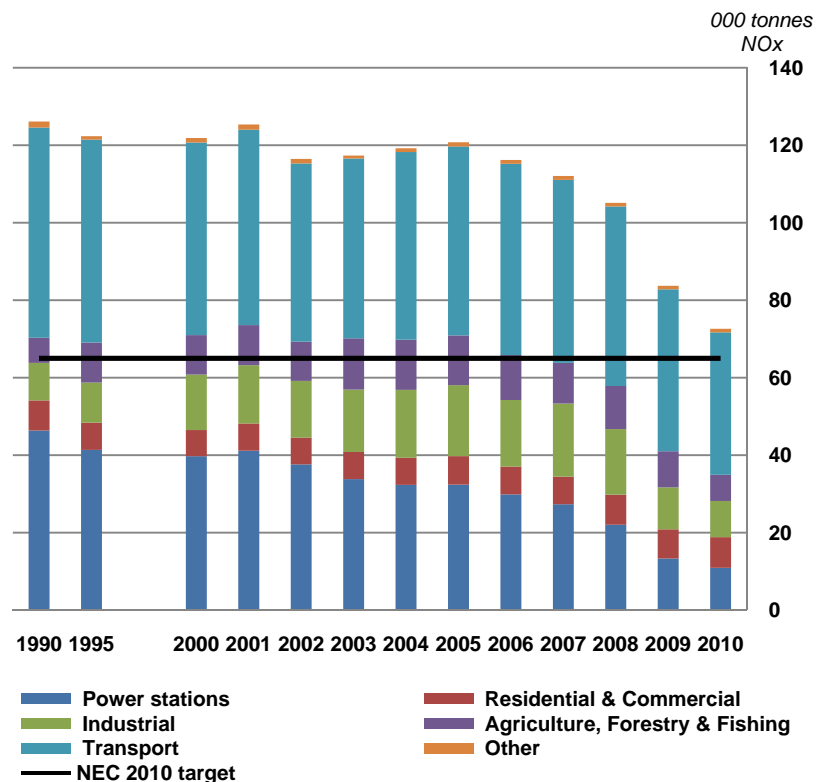
- Ireland's sulphur dioxide emissions have fallen from 182,300 tonnes in 1990 to 25,900 tonnes in 2010. Emissions from Power stations fell by 93,700 tonnes in the same period.
- The fall in the emissions from Power stations is mainly due to a switch from oil and coal to gas and the installation of technologies which reduce sulphur emissions.
- Ireland was below the National Emissions Ceiling (NEC 2010) for sulphur dioxide for the first time in 2009.
- All 27 Member States were below their ceiling level of emissions in 2010. Ireland ranked 17th among EU Member States in terms of 2010 emissions relative to the 2010 NEC ceiling.

### 1.4 EU: Sulphur dioxide emissions 2010 and NEC 2010 ceiling

000 tonnes SO <sub>2</sub>			
Country	2010 emissions	NEC 2010 ceiling	% Below 2010 ceiling
Hungary	29	500	-94%
Latvia	7	101	-93%
Denmark	14	55	-75%
Lithuania	38	145	-74%
Slovenia	10	27	-61%
Romania	372	918	-59%
Portugal	68	160	-58%
Luxembourg	2	4	-58%
Italy	210	475	-56%
Bulgaria	387	836	-54%
Austria	19	39	-52%
Greece	266	523	-49%
Sweden	35	67	-49%
Cyprus	22	39	-43%
Spain	444	746	-41%
Finland	67	110	-39%
Ireland	26	42	-38%
Slovakia	69	110	-37%
Czech Republic	170	265	-36%
Netherlands	34	50	-32%
Belgium	67	99	-32%
Poland	970	1,397	-31%
United Kingdom	406	585	-31%
France	262	375	-30%
Estonia	83	100	-17%
Germany	449	520	-14%
Malta	8	9	-10%

Source: European Environment Agency

### 1.5 Ireland: Nitrogen oxides emissions 1990-2010



Source: Environmental Protection Agency

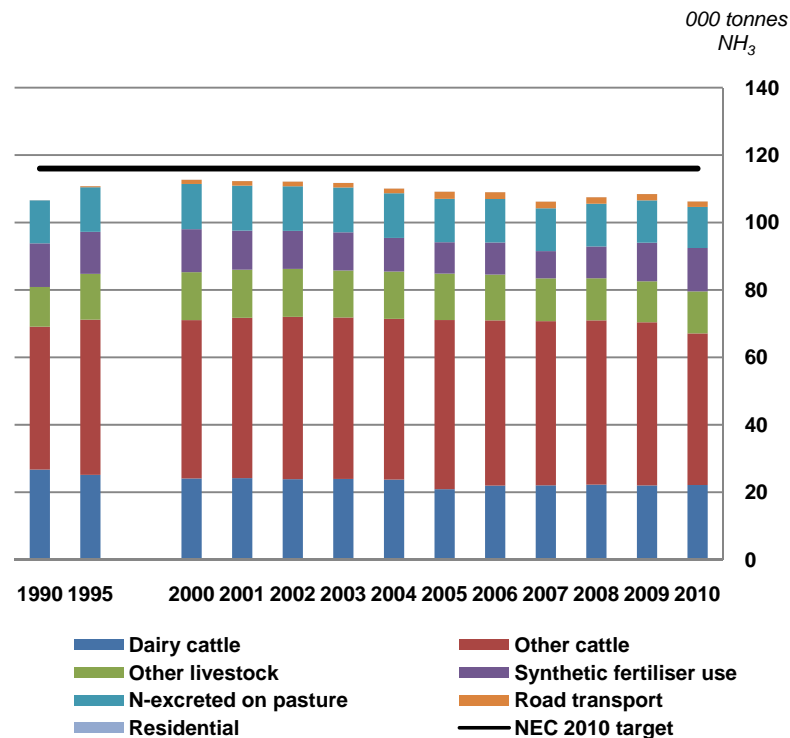
- Ireland's nitrogen oxides emissions have fallen from 121,000 tonnes in 2005 to 72,600 tonnes in 2010. This is still 12% above the NEC ceiling of 65,000 tonnes.
- In 2010, 16 of the EU Member States were below their emissions ceiling. Ireland ranked 22nd among EU Member States in 2010 in terms of emissions relative to the 2010 NEC ceiling.

### 1.6 EU: Nitrogen oxides emissions 2010 and NEC 2010 ceiling

000 tonnes NOx			
Country	2010 emissions	NEC 2010 ceiling	% Above/Below ceiling
Bulgaria	120	247	-51%
Lithuania	58	110	-47%
Latvia	35	61	-42%
Estonia	37	60	-39%
Romania	272	437	-38%
Slovakia	89	130	-32%
Portugal	180	250	-28%
Cyprus	18	23	-22%
Hungary	159	198	-20%
Czech Republic	239	286	-16%
Greece	316	344	-8%
United Kingdom	1,106	1,167	-5%
Finland	166	170	-3%
Italy	966	990	-2%
Slovenia	45	45	-1%
Poland	877	879	0%
Malta	8	8	1%
Denmark	129	127	1%
Netherlands	276	260	6%
Spain	900	847	6%
Sweden	161	148	9%
Ireland	73	65	12%
Belgium	221	176	25%
Germany	1,323	1,051	26%
France	1,080	810	33%
Austria	144	103	40%
Luxembourg	21	11	87%

Source: European Environment Agency

### 1.7 Ireland: Ammonia emissions 1990-2010



Source: Environmental Protection Agency

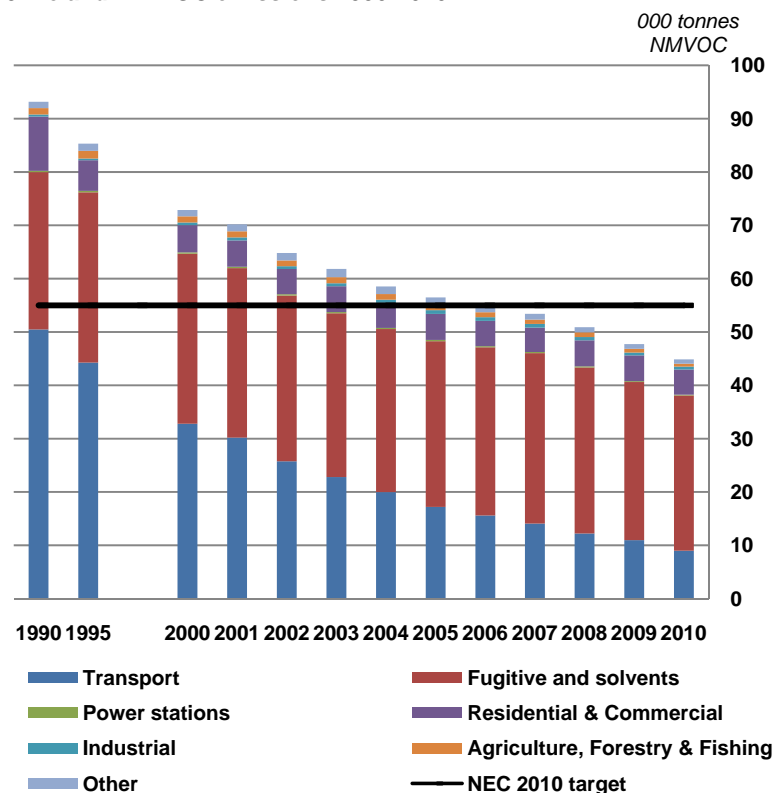
- Ireland was 8% below the NEC 2010 emissions ceiling for ammonia in 2010.
- All but two EU Member States were at or below their respective 2010 ceilings. Ireland ranked 19th in 2010 in terms of emissions relative to the NEC 2010 ceiling.

### 1.8 EU: Ammonia emissions 2010 and NEC 2010 ceiling

Country	2010 emissions	NEC 2010 ceiling	% Above/Below ceiling
Estonia	10	29	-64%
Lithuania	30	84	-64%
Latvia	17	44	-61%
Bulgaria	51	108	-53%
Malta	2	3	-50%
Portugal	48	90	-47%
Luxembourg	4	7	-43%
Cyprus	5	9	-41%
Poland	278	468	-41%
Slovakia	24	39	-37%
Hungary	65	90	-28%
Romania	161	210	-23%
France	645	780	-17%
Czech Republic	69	80	-14%
Slovenia	17	20	-13%
Greece	65	73	-12%
Italy	379	419	-10%
Sweden	52	57	-9%
<b>Ireland</b>	<b>106</b>	<b>116</b>	<b>-8%</b>
Belgium	69	74	-7%
Austria	62	66	-6%
Netherlands	122	128	-5%
United Kingdom	284	297	-4%
Germany	548	550	0%
Denmark	69	69	0%
Spain	368	353	4%
Finland	37	31	20%

Source: European Environment Agency

### 1.9 Ireland: NMVOC emissions 1990-2010



Source: Environmental Protection Agency

- Ireland's emissions of Non-Methane Volatile Organic Compounds fell below the NEC 2010 ceiling for the first time in 2007. The majority of these emissions are derived from Fugitive and solvents.
- Emissions from transport have fallen from 50,500 tonnes in 1990 to 9,000 tonnes in 2010.
- Ireland ranked 12th among EU Member States in 2010 in terms of emissions relative to the 2010 NEC ceiling. Two EU Member States were still above their emission ceiling in 2010.

### 1.10 EU: NMVOC emissions 2010 and NEC 2010 ceiling

000 tonnes NMVOC			
Country	2010 emissions	NEC 2010 ceiling	% Above/Below ceiling
Malta	3	12	-79%
Slovakia	62	140	-55%
Latvia	65	136	-52%
Bulgaria	93	175	-47%
United Kingdom	789	1,200	-34%
Czech Republic	154	220	-30%
Greece	184	261	-30%
Lithuania	69	92	-25%
Belgium	105	139	-25%
Estonia	38	49	-22%
Hungary	107	137	-22%
Ireland	45	55	-19%
Cyprus	11	14	-19%
France	852	1,050	-19%
Netherlands	151	185	-19%
Poland	653	800	-18%
Sweden	197	241	-18%
Austria	132	159	-17%
Slovenia	34	40	-16%
Romania	441	523	-16%
Finland	115	130	-12%
Portugal	169	180	-6%
Italy	1,103	1,159	-5%
Luxembourg	9	9	-2%
Denmark	84	85	-1%
Spain	672	662	2%
Germany	1,053	995	6%

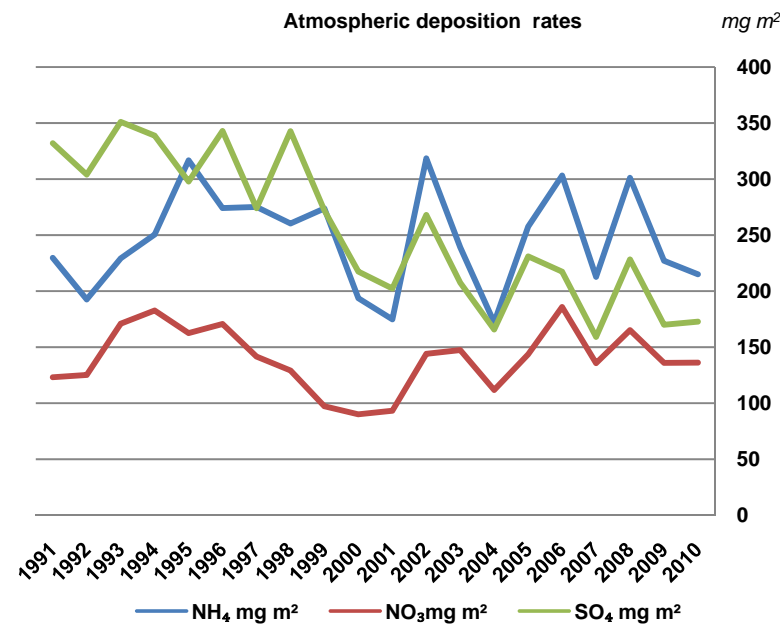
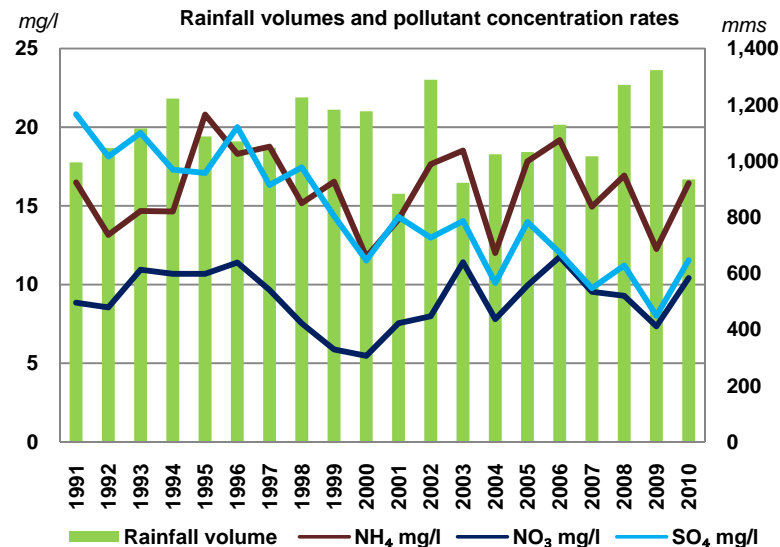
Source: European Environment Agency

### 1.11 Ireland: Atmospheric deposition rates 1991-2010

Year	Concentration				Deposition		
	Rainfall volume mm	NH <sub>4</sub> mg/l	NO <sub>3</sub> mg/l	SO <sub>4</sub> mg/l	NH <sub>4</sub> mg m <sup>-2</sup>	NO <sub>3</sub> mg m <sup>-2</sup>	SO <sub>4</sub> mg m <sup>-2</sup>
1991	995	16	9	21	230	123	332
1995	1,087	21	11	17	317	163	298
2000	1,177	12	5	12	194	90	217
2001	883	14	8	14	175	93	202
2002	1,289	18	8	13	319	144	268
2003	922	19	11	14	239	147	207
2004	1,024	12	8	10	172	112	166
2005	1,031	18	10	14	258	144	231
2006	1,129	19	12	12	303	186	217
2007	1,016	15	10	10	213	136	159
2008	1,271	17	9	11	301	165	228
2009	1,323	12	7	8	227	136	170
2010	934	16	10	12	215	136	173

Source: Met Éireann, University College Dublin and Coillte

- Deposition of sulphate (SO<sub>4</sub>) has fallen from 332 mgs per m<sup>2</sup> in 1991 to 173 mgs per m<sup>2</sup> in 2010. Similarly, the concentration of SO<sub>4</sub> in rainwater has also almost halved from 21 mgs per litre in 1991 to 12 mgs per litre in 2010.
- The level of concentration and deposition of NH<sub>4</sub> and NO<sub>3</sub> in rainfall has varied widely from year to year, mainly due to variations in rainfall.



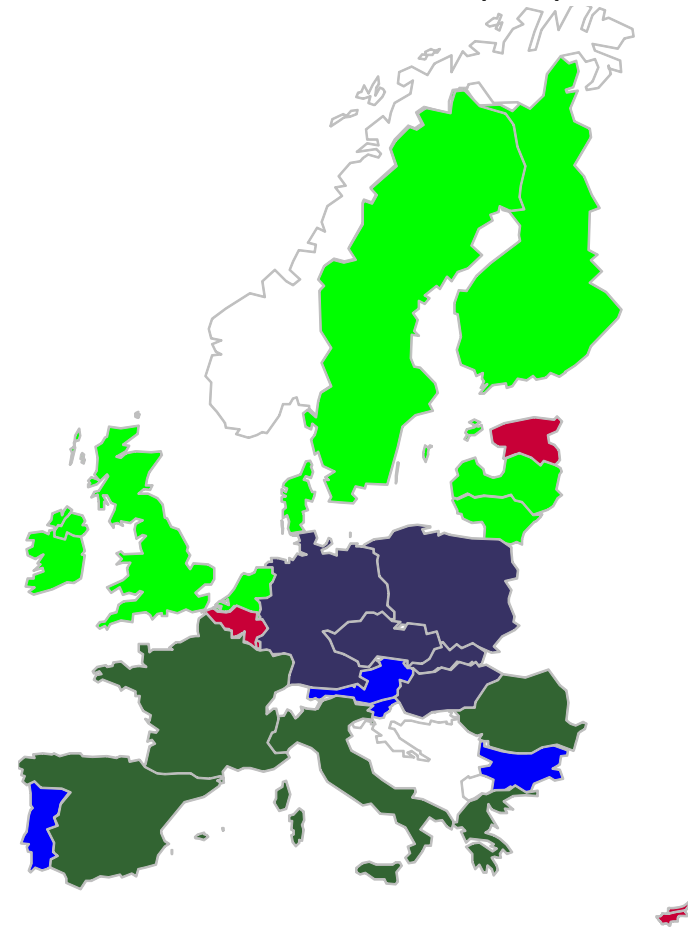
### 1.12 Ireland: Ozone threshold exceedances 1998–2010

Year	Days
1998	10
1999	7
2000	4
2001	7
2002	0
2003	18
2004	5
2005	3
2006	11
2007	10
2008	12
2009	3
2010	4

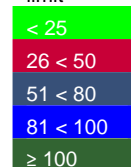
Source: Environmental Protection Agency

- Under EU Directive 2008/50/EC, every EU Member State is permitted a maximum of 25 days per year in which an ozone threshold of  $120 \mu\text{g}/\text{m}^3$  may be exceeded. Ireland did not exceed this number of days in any year during the period 1998 to 2010. The year with the highest number of exceedances was 2003, when 18 days were recorded as being above the threshold value.
- During the months of April to September 2010, both Ireland and Latvia had the fewest number of days exceeding the ozone threshold, when four days were above the  $120 \mu\text{g}/\text{m}^3$  limit. Nineteen EU Member States exceeded the maximum 25 days limit.

### 1.13 EU: Ozone threshold exceedances April–September 2010



Number of days exceeding limit



Source: European Environment Agency





## 2. Greenhouse Gases and Climate Change

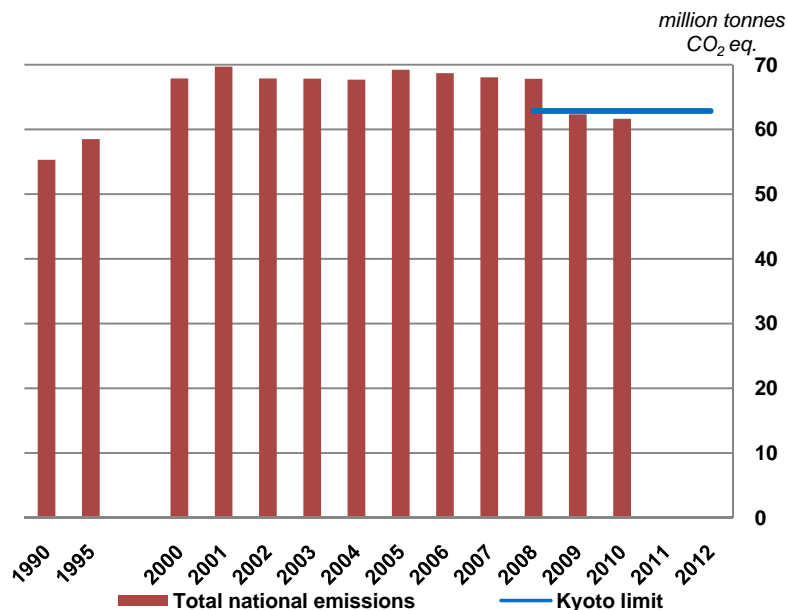


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*Photographs: Lough Ennell, Co. Westmeath and Kilmainham, Co. Dublin courtesy of Paul Molony*

## 2.1 Ireland: Greenhouse gas emissions 1990-2010



Source: Environmental Protection Agency

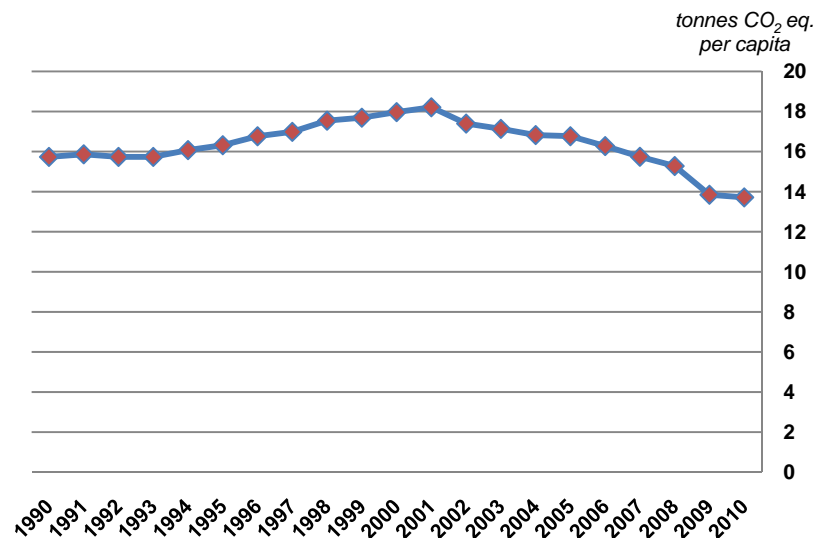
- Under the Kyoto Protocol, Ireland's total emissions are limited to an average of 62.8 million tonnes carbon dioxide (CO<sub>2</sub>) equivalent per annum in the period 2008-2012. After the first three years of this period Ireland is currently 5.5 million tonnes above the target when the impact of the EU Emissions Trading Scheme and approved forest sinks are taken into account.
- Greenhouse gas emissions for Ireland in 2009, at 61.7 million tonnes CO<sub>2</sub> equivalent, fell below the five year (2008-2012) average annual Kyoto limit. Emissions fell again to 61.3 million tonnes CO<sub>2</sub> equivalent in 2010.
- Ireland's 2009 emissions ranked 19<sup>th</sup> among EU countries relative to the Kyoto limit. In 2009, six EU Member States were above their respective Kyoto emissions limits.

## 2.2 EU: Greenhouse gas emissions 2009

Indexed to Kyoto base year			
Country	2009 emissions index	Kyoto limit index	% Above/Below target
Estonia	40	92	-57%
Latvia	41	92	-55%
Lithuania	44	92	-52%
Bulgaria	45	92	-51%
Romania	47	92	-49%
Hungary	58	94	-38%
Slovakia	60	92	-35%
Poland	67	94	-29%
Czech Republic	68	92	-26%
Sweden	83	104	-20%
United Kingdom	73	88	-17%
Belgium	85	93	-8%
Greece	115	125	-8%
France	92	100	-8%
Finland	93	100	-7%
Germany	75	79	-5%
Portugal	124	127	-2%
Netherlands	93	94	-1%
Ireland	112	113	-1%
Italy	95	94	2%
Slovenia	95	92	3%
Spain	127	115	10%
Denmark	88	79	11%
Austria	101	87	16%
Luxembourg	89	72	24%

Note: Data not available for Cyprus or Malta  
Source: Eurostat

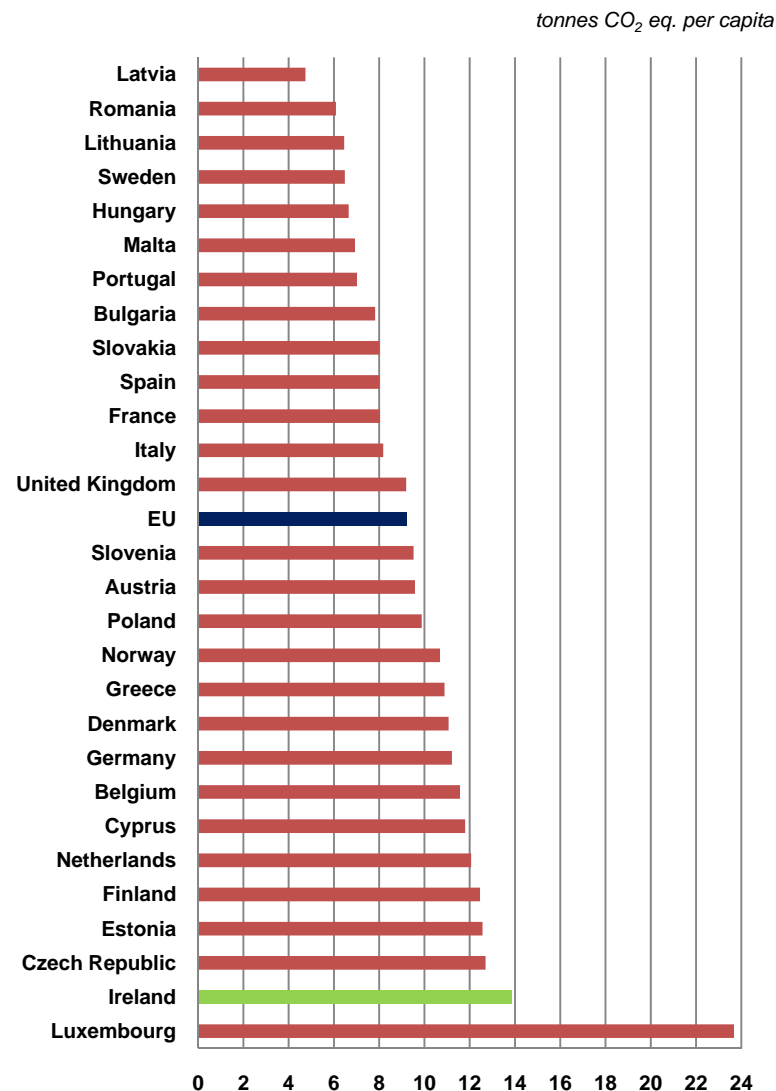
### 2.3 Ireland: Greenhouse gas emissions per capita 1990-2010



Source: Environmental Protection Agency and CSO

- Although Ireland's emissions of greenhouse gases per capita have been falling steadily since 2001, Ireland had the second highest level in the EU in 2009, exceeded only by Luxembourg.
- The high emissions levels for Luxembourg can be attributed to the large number of people who travel to and from neighbouring countries to work and contribute to the national emissions.
- At 13.8 tonnes of CO<sub>2</sub> equivalent per capita, Ireland was 50% higher than the EU average of 9.2 tonnes of CO<sub>2</sub> equivalent per capita in 2009.

### 2.4 EU: Greenhouse gas emissions per capita 2009



Source: European Environment Agency

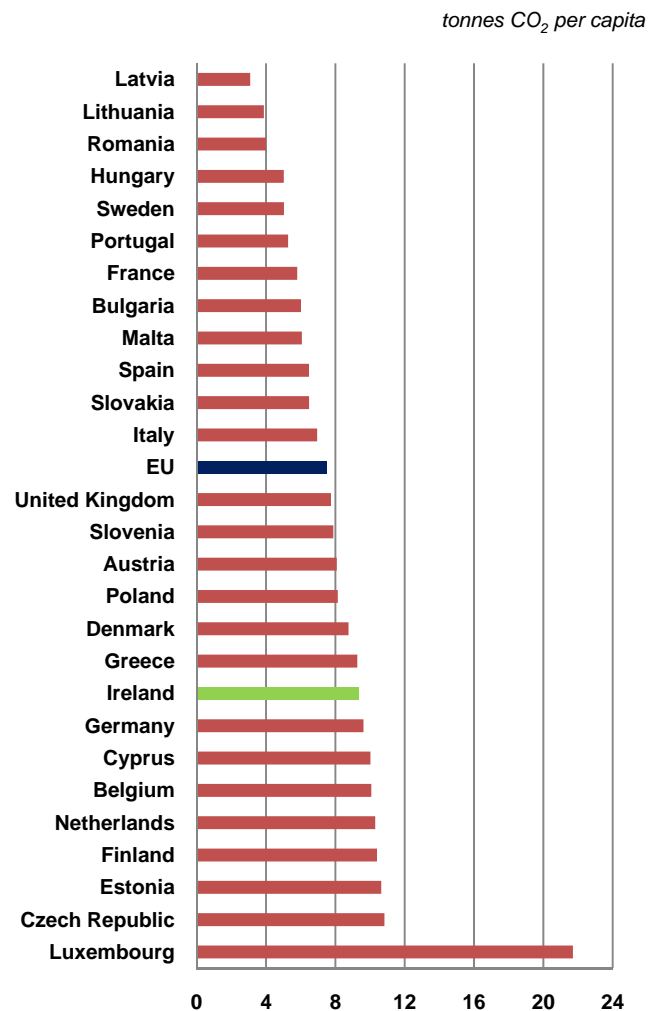
## 2.5 Ireland: Greenhouse gas emissions by gas 1990-2010

Year	% of total				000 tonnes CO <sub>2</sub> eq.
	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFC, PFC, SF <sub>6</sub>	Total
1990	59%	25%	17%	0%	55,163
1995	60%	24%	16%	0%	58,771
2000	66%	20%	14%	1%	68,103
2001	67%	19%	13%	1%	70,065
2002	67%	20%	13%	1%	68,155
2003	66%	20%	12%	1%	68,199
2004	68%	19%	12%	1%	68,064
2005	69%	18%	12%	1%	69,315
2006	69%	19%	12%	1%	68,897
2007	69%	18%	11%	1%	68,303
2008	70%	18%	11%	1%	67,567
2009	67%	19%	12%	1%	61,741
2010	67%	19%	13%	1%	61,314

Source: Environmental Protection Agency

- Carbon dioxide (CO<sub>2</sub>), which accounted for 59% of Ireland's greenhouse gas emissions in 1990 increased to 67% in 2010.
- Ireland ranked second highest in the EU in terms of per capita greenhouse gas emissions in 2009 and ninth highest for per capita carbon dioxide emissions in the same period. The difference in ranking shows the contribution of the agriculture sector to Ireland's greenhouse gas emissions, where methane and nitrous oxides accounted for 19% and 13% respectively of Ireland's total greenhouse gas emissions in 2010.

## 2.6 EU: CO<sub>2</sub> emissions 2009



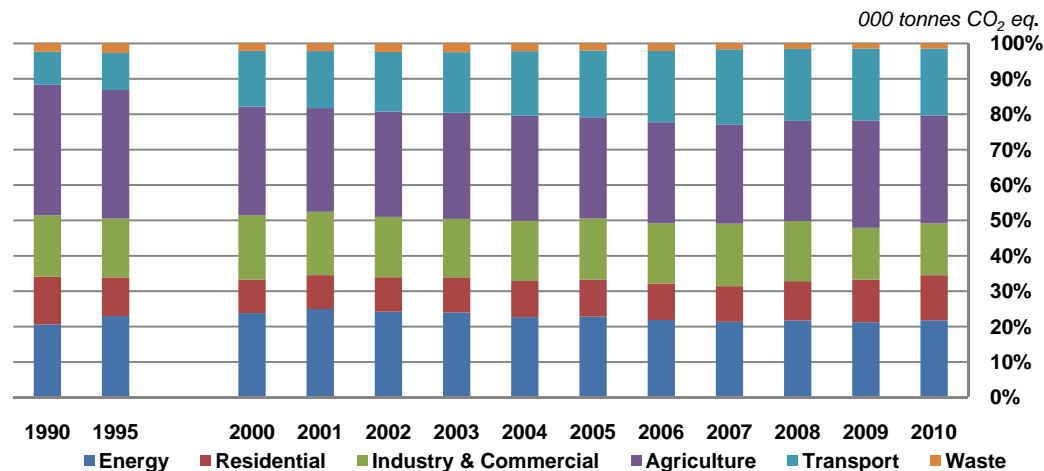
Source: European Environment Agency

## 2.7 Ireland: Greenhouse gas emissions by sector 1990-2010

Year	% of total						Total	Average annual % change
	Energy	Residential	Industry & Commercial	Agriculture	Transport	Waste		
1990	21%	14%	17%	37%	9%	2%	55,163	
1995	23%	11%	17%	36%	11%	3%	58,771	1.3%
2000	24%	9%	18%	31%	16%	2%	68,103	3.0%
2001	25%	10%	18%	29%	16%	2%	70,065	2.9%
2002	24%	10%	17%	30%	17%	2%	68,155	-2.7%
2003	24%	10%	17%	30%	17%	2%	68,199	0.1%
2004	23%	10%	17%	30%	18%	2%	68,064	-0.2%
2005	23%	10%	17%	29%	19%	2%	69,315	1.8%
2006	22%	10%	17%	29%	20%	2%	68,897	-0.6%
2007	21%	10%	18%	28%	21%	2%	68,303	-0.9%
2008	22%	11%	17%	28%	20%	2%	67,567	-1.1%
2009	21%	12%	15%	30%	20%	1%	61,741	-8.6%
2010	22%	13%	15%	30%	19%	1%	61,314	-0.7%

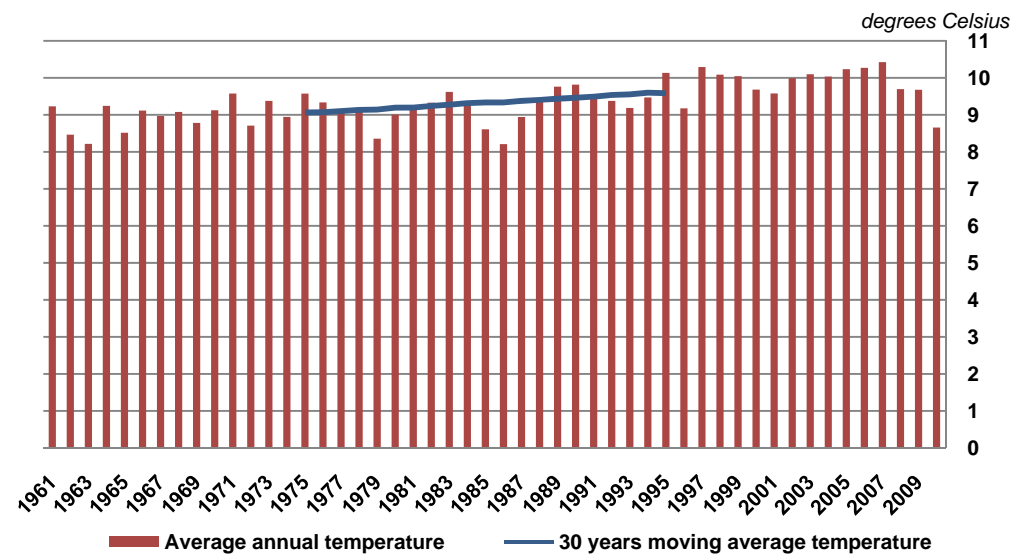
- Agriculture accounted for 30% of Ireland's greenhouse gas emissions in 2010.
- The transport share of greenhouse gas emissions in Ireland increased from 9% of in 1990 to 21% in 2007, before falling to 19% in 2010.

Ireland: Share of greenhouse gas emissions by sector 1990-2010



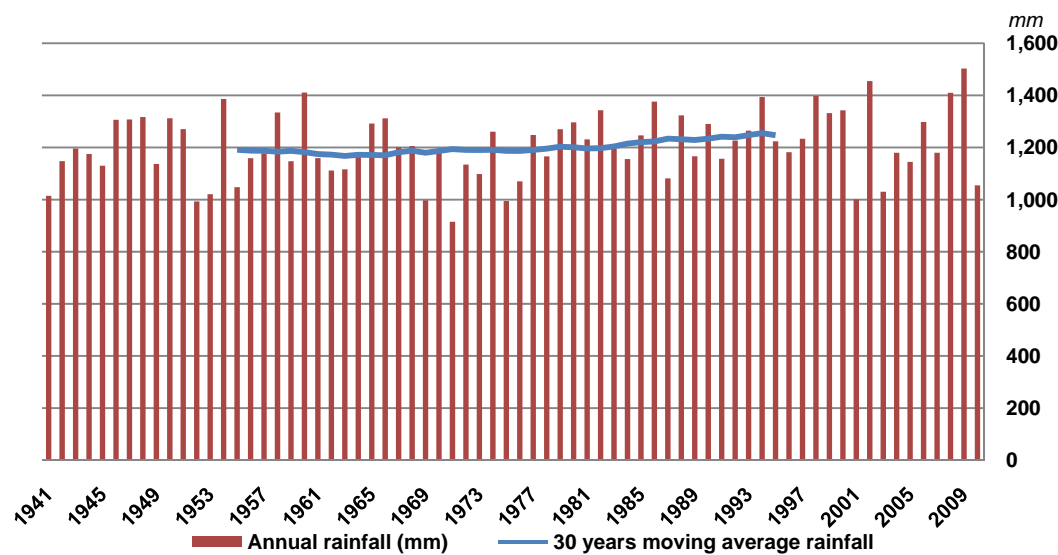
Source: Environmental Protection Agency

2.8 Ireland: Average annual temperature 1961-2010



- Average temperatures in Ireland varied between 8° and 10.5° Celsius since 1961. The warmest year was 2007 with an average temperature of 10.4° Celsius.
- The thirty years moving average shows that the average temperature for 1981-2010 is 0.5° Celsius higher than the average for 1961-1990.
- The wettest year in the period shown was 2009, when 1,503 mms of rain were recorded, whereas the driest year in this period was 1971, when 915 mms of rain were recorded.

2.9 Ireland: Annual rainfall 1941-2010



Source: Met Éireann





### 3. Water



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- 3.1 Ireland: Bathing water quality 1998-2010
- 3.2 EU: Bathing water quality 2010
- 3.3 Ireland: Drinking water quality 1999-2010
- 3.4 Ireland: Urban waste water treatment 1998-2009
- 3.5 Ireland: River water quality 1987-2009
- 3.6 Ireland: Nitrates in groundwater 1995-2009
- 3.7 EU: Chemical status of groundwater bodies 2009

*Photographs: Dun Briste, Co. Mayo, Gougane Barra, Co. Cork, courtesy of Paul Molony; Powerscourt Waterfall, Co. Wicklow, courtesy of Niall Brew.*

### 3.1 Ireland: Bathing water quality 1998-2010

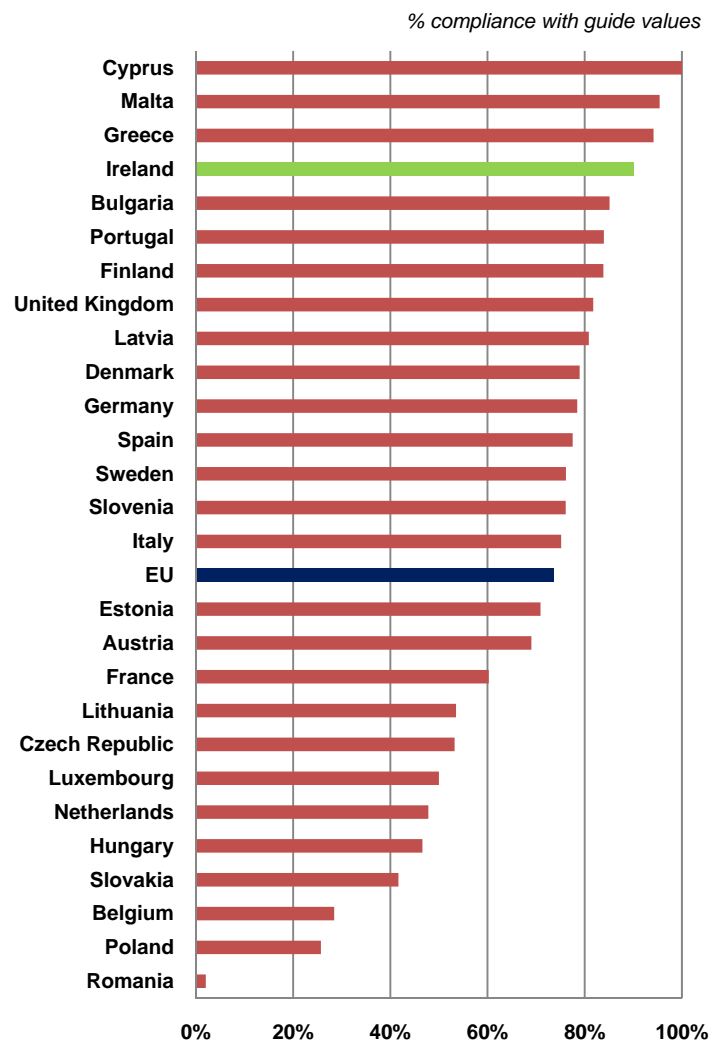
*% of total sites surveyed*

Year	Sufficient water quality	Good water quality
1998	98.5%	80.8%
1999	98.5%	89.2%
2000	98.5%	91.5%
2001	97.7%	87.8%
2002	97.7%	84.7%
2003	96.9%	84.7%
2004	97.7%	87.8%
2005	96.2%	90.8%
2006	96.9%	90.1%
2007	96.9%	80.2%
2008	93.1%	77.9%
2009	93.1%	82.4%
2010	96.9%	90.1%

*Source: Environmental Protection Agency*

- During the 1998 to 2010 period, the proportion of sites with good bathing water quality has varied from a high of 91.5% in 2000 to a low of 77.9% in 2008. The proportion stood at 90.1% in 2010.
- Ireland had the fourth best bathing water quality in the EU in 2010, when 90% of sites complied with guide values. This comprises both coastal and inland bathing sites. The EU average was 74% compliance.

### 3.2 EU: Bathing water quality 2010



*Source: European Environment Agency*

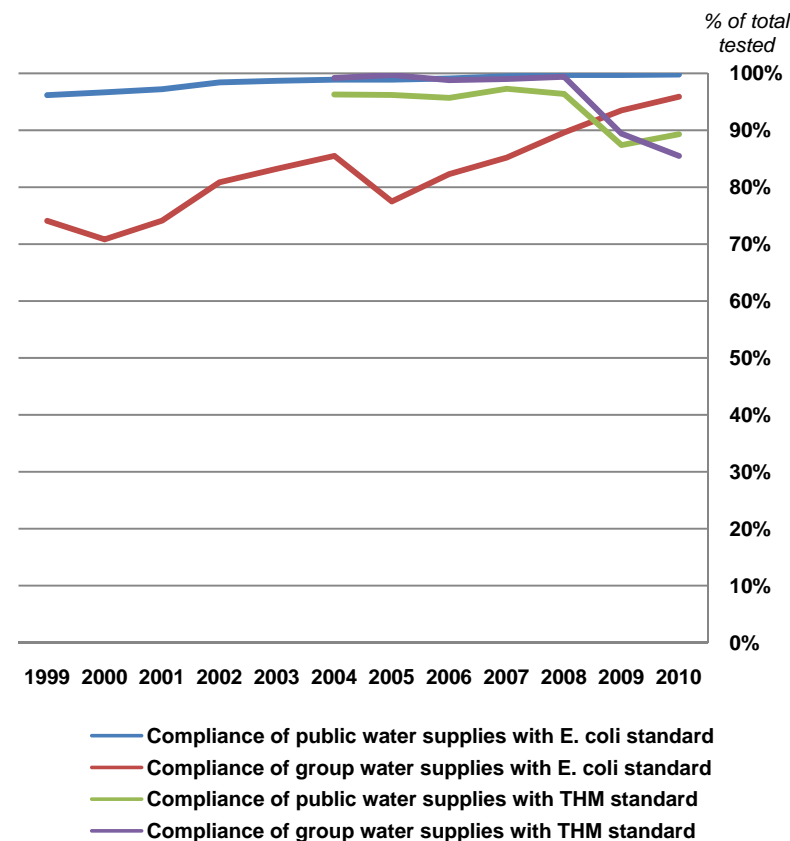
### 3.3 Ireland: Drinking water quality 1999-2010

Year	% of total tested			
	Compliance of public water supplies with E. coli standard	Compliance of group water supplies with E. coli standard	Compliance of public water supplies with THM standard	Compliance of group water supplies with THM standard
1999	96.2%	74.1%	:	:
2000	96.7%	70.8%	:	:
2001	97.2%	74.1%	:	:
2002	98.4%	80.9%	:	:
2003	98.7%	83.2%	:	:
2004	98.9%	85.5%	96.3%	99.2%
2005	98.9%	77.5%	96.2%	99.7%
2006	99.1%	82.3%	95.7%	98.8%
2007	99.5%	85.2%	97.3%	99.0%
2008	99.7%	89.6%	96.4%	99.4%
2009	99.7%	93.5%	87.4%	89.4%
2010	99.8%	95.9%	89.3%	85.5%

Source: Environmental Protection Agency

- The quality of public drinking water supplies has increased from 96% compliance with the E.coli standard in 1999 to almost 100% since 2007. While group water schemes did not have as high levels of compliance in earlier years, the quality of group water schemes has improved to 96% compliance in 2010.
- Before 2004, there was no parametric limit for compliance with levels of trihalomethanes (THM). Public water supplies had a compliance rate of around 96% between 2004 and 2008. This fell in 2009 when the limit changed from 150 ug/l to 100 ug/l.
- Group water supplies also had a high compliance rate between 2004 and 2008 of over 99%. This fell in 2009 when the more stringent parametric limit was enforced.

### Ireland: Drinking water quality 1999-2010



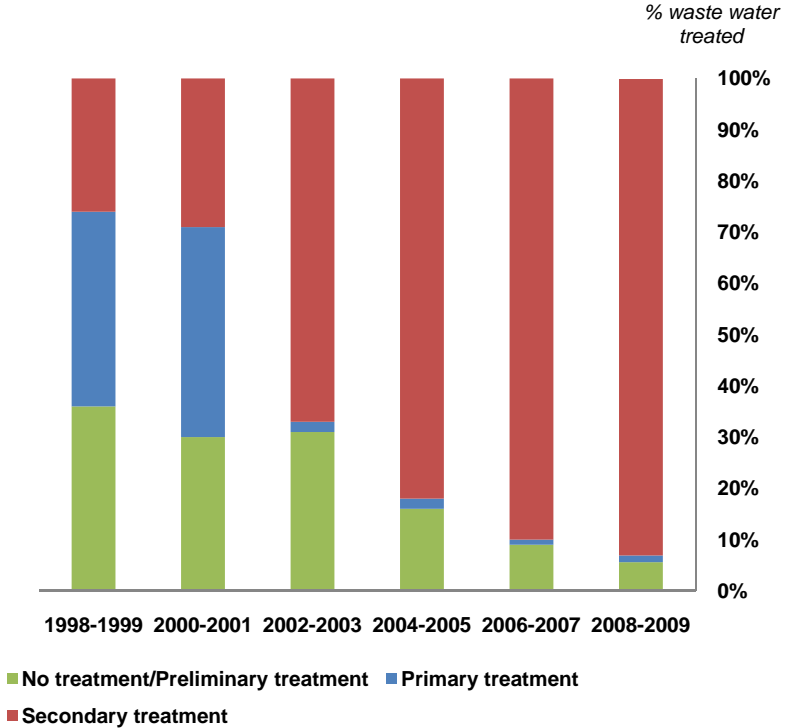
3.4 Ireland: Urban waste water treatment 1998-2009

Years	% waste water treated		
	No treatment / Preliminary treatment	Primary treatment	Secondary treatment
1998-1999	36%	38%	26%
2000-2001	30%	41%	29%
2002-2003	31%	2%	67%
2004-2005	16%	2%	82%
2006-2007	9%	1%	90%
2008-2009	6%	1%	93%

Source: Environmental Protection Agency

- There has been a significant improvement in the level of treatment of urban waste water at agglomerations of over 500 persons. In 2008-2009, 93% of urban waste water received at least secondary treatment compared with only 26% in the 1998-1999 period. Only 6% of urban waste water received none or only preliminary treatment in 2008-2009 compared with 36% in 1998-1999.

Ireland: Urban waste water treatment 1998-2009



### 3.5 Ireland: River water quality 1987-2009

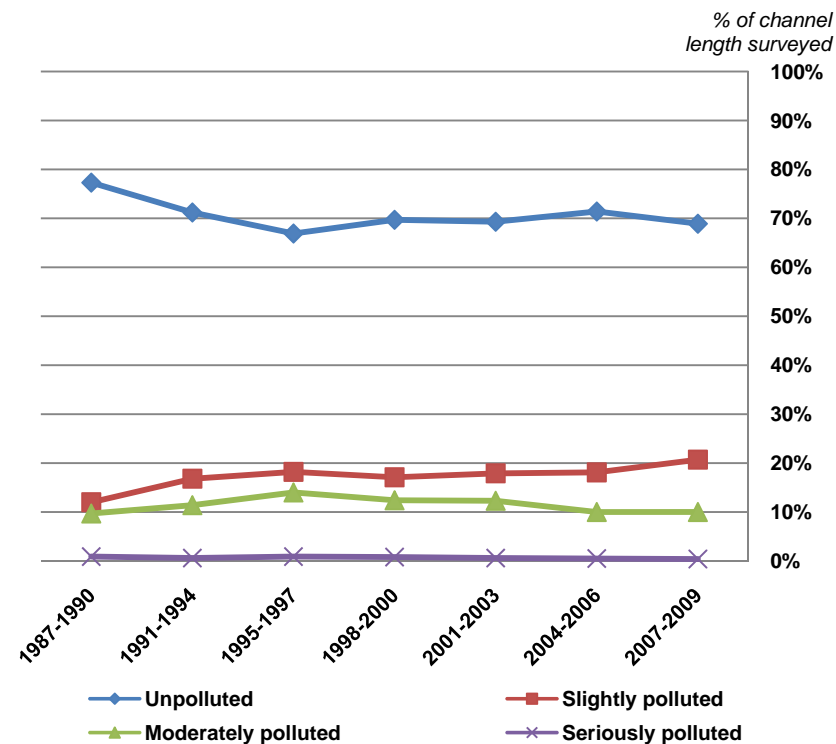
% of channel length surveyed

Year	Unpolluted	Slightly polluted	Moderately polluted	Seriously polluted
1987-1990	77%	12%	10%	1%
1991-1994	71%	17%	11%	1%
1995-1997	67%	18%	14%	1%
1998-2000	70%	17%	12%	1%
2001-2003	69%	18%	12%	1%
2004-2006	71%	18%	10%	1%
2007-2009	69%	21%	10%	0%

Source: Environmental Protection Agency

- The proportion of unpolluted river water has fallen from 77% in 1987-1990 to 69% in 2007-2009. However, the percentage of slightly polluted water has increased from 12% in 1987-1990 to 21% in 2007-2009.
- The level of seriously polluted river water has remained at 1% or less during the same 1987 to 2009 period.

### Ireland: River water quality 1987-2009



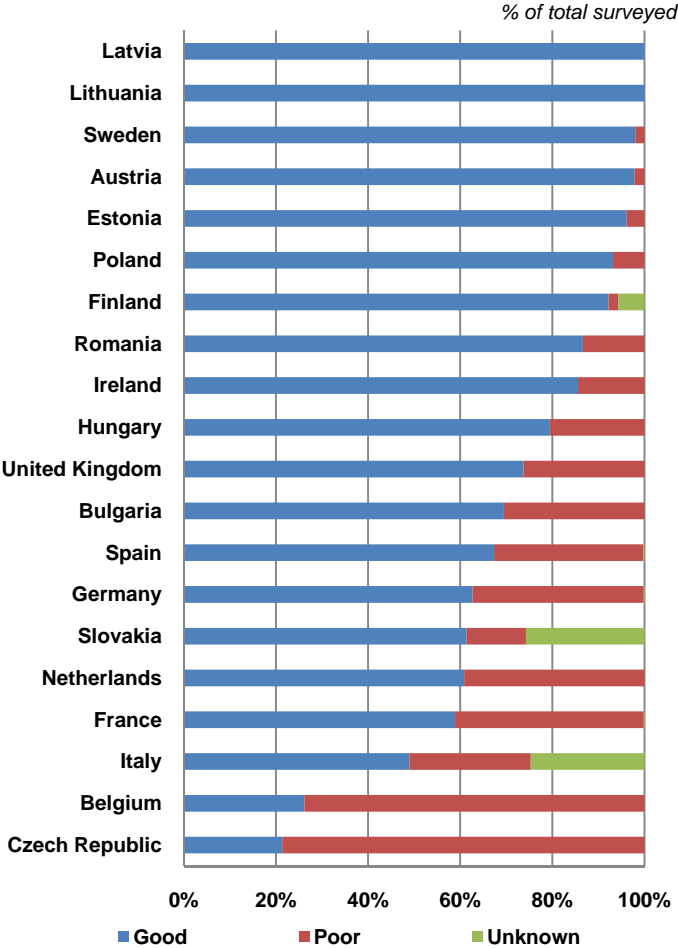
3.6 Ireland: Nitrates in groundwater 1995-2009

Year	NO <sub>3</sub> mg/l (% of total)					
	< 5	5 - 10	10 - 25	25 - 37.5	37.5 - 50	> 50
1995-1997	14%	18%	48%	14%	5%	0%
1998-2000	19%	16%	48%	10%	5%	2%
2001-2003	15%	17%	47%	12%	7%	2%
2004-2006	17%	12%	49%	11%	9%	2%
2007-2009	22%	20%	41%	12%	4%	1%

Source: Environmental Protection Agency

- Around 50% of cases had between 10 and 25 mg/l of nitrates in groundwater until the 2007-2009 period, when the proportion fell to 41%. The less than 5 mg/l category increased from 14% in 1995-1997 to 22% in 2007-2009.
- From the latest data available for 20 EU Member States, Ireland ranked ninth in the chemical status of groundwater, with 86% of groundwater bodies deemed to be in good condition. Ireland had 776 bodies sampled, of which 664 were of good status.

3.7 EU: Chemical status of groundwater bodies 2009



Note: Data available for 20 EU Member States  
Source: European Environment Agency





## 4. Land Use



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- 4.8 Ireland: Fertiliser sales 1980-2011
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- 4.12 Ireland: House completions 1970-2011
- 4.13 EU: House completions 2006-2010

*Photographs: Grazing cattle and winter ploughing courtesy of Department of Agriculture, Food and the Marine*

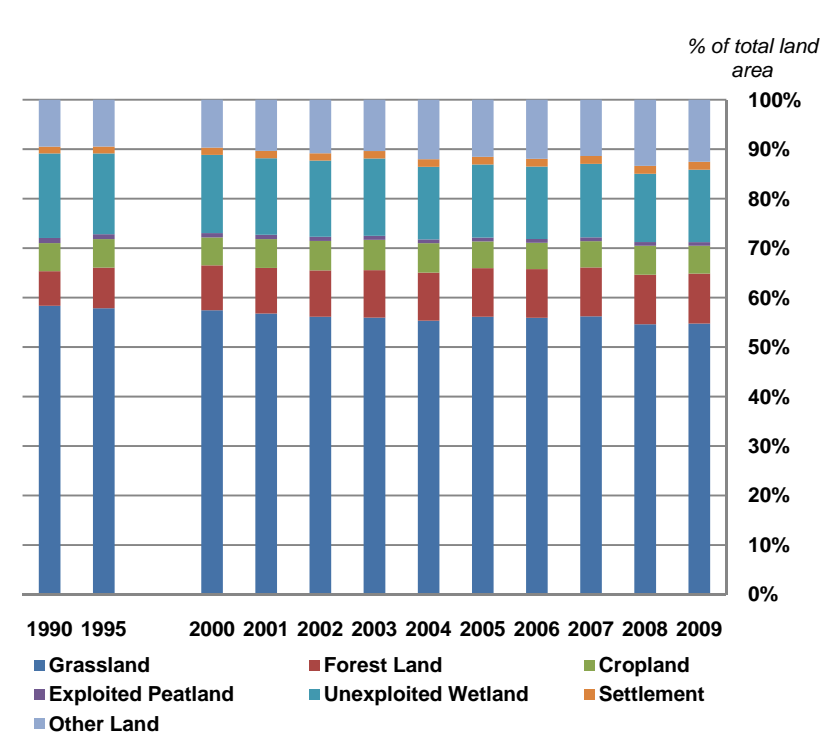
4.1 Ireland: Land use categories 1990-2009

% of total land area							
Year	Grassland	Forest Land	Cropland	Exploited Peatland	Unexploited Wetland	Settlement	Other Land
1990	58%	7%	6%	1%	17%	1%	9%
1995	58%	8%	6%	1%	16%	1%	9%
2000	57%	9%	6%	1%	16%	1%	10%
2001	57%	9%	6%	1%	15%	1%	10%
2002	56%	9%	6%	1%	15%	1%	11%
2003	56%	10%	6%	1%	16%	2%	10%
2004	55%	10%	6%	1%	15%	2%	12%
2005	56%	10%	5%	1%	15%	2%	12%
2006	56%	10%	5%	1%	15%	2%	12%
2007	56%	10%	5%	1%	15%	2%	11%
2008	55%	10%	6%	1%	14%	2%	13%
2009	55%	10%	6%	1%	15%	2%	13%

Source: Environmental Protection Agency

- Grassland accounts for the majority of land use in Ireland, although it has fallen from 58% to 55% of the total land area between 1990 and 2009.

Ireland: Land use categories 1990-2009



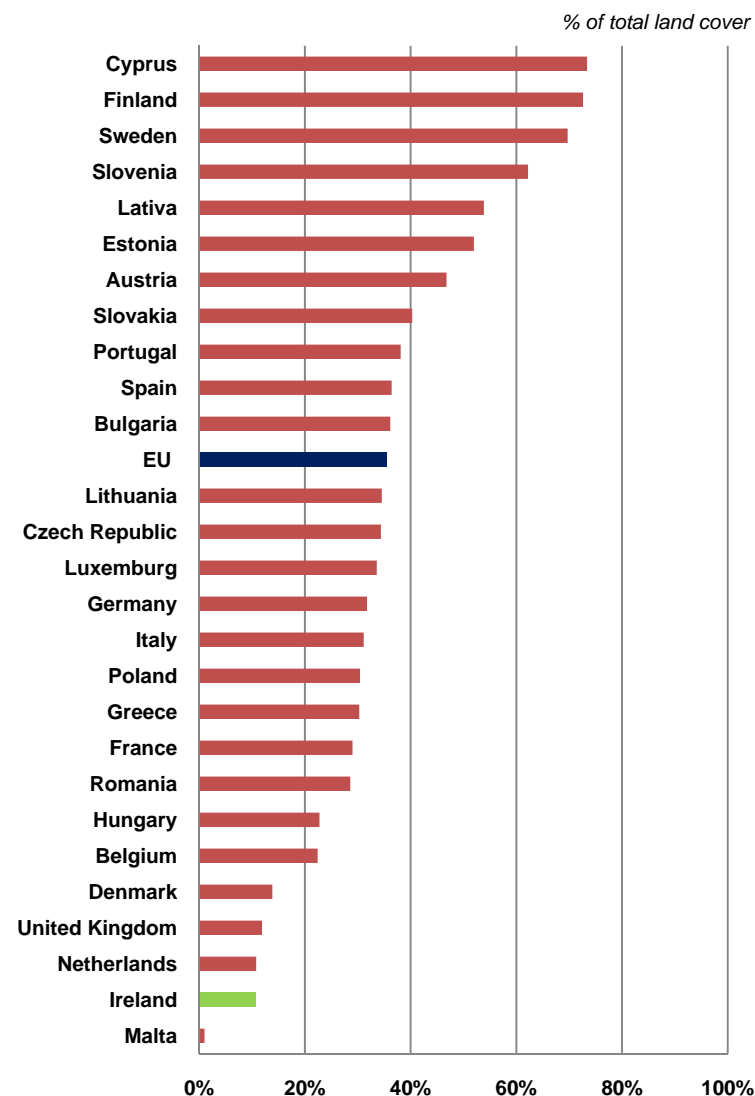
#### 4.2 Ireland: Forest cover 1980-2010

Year	000 ha		000 ha		000 ha	
	Private forest	% of total	Public forest	% of total	Total forest	Average annual % change
1980	90	23%	295	77%	385	:
1985	92	22%	323	78%	415	1.5%
1990	120	25%	353	75%	473	2.6%
1995	179	32%	389	68%	568	3.7%
2000	243	38%	399	62%	642	2.5%
2001	258	39%	400	61%	657	2.4%
2002	272	41%	400	59%	672	2.3%
2003	281	41%	400	59%	681	1.4%
2004	291	42%	400	58%	691	1.4%
2005	301	43%	400	57%	701	1.5%
2006	309	44%	400	56%	709	1.1%
2007	316	44%	400	56%	716	1.0%
2008	322	45%	400	55%	722	0.9%
2009	329	45%	400	55%	729	0.9%
2010	337	46%	400	54%	737	1.1%

Source: Department of Agriculture, Food and the Marine (Forest Service)

- Ireland's total forest cover area increased by 91% between 1980 and 2010.
- The area of forest owned privately increased from 23% of the total in 1980 to 46% in 2010.
- Forestry accounted for 10.7% of Ireland's total land area in 2010. In contrast, 35.5% of the total land area of the EU in 2010 was under forest cover. Ireland ranked 26th among EU countries in terms of the proportion of land area under forest cover.

#### 4.3 EU: Forest cover 2010

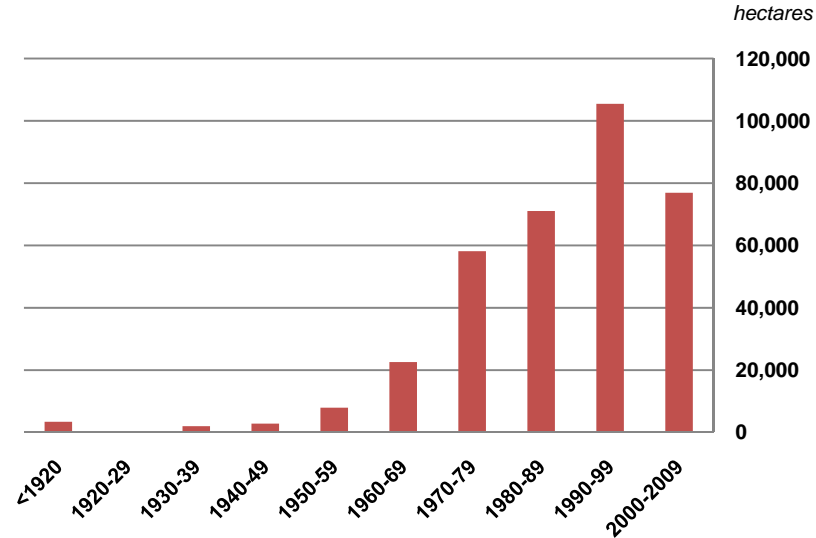


Source: Forest Europe

4.4 Ireland: Planting period in public forestry 1920-2010

000 hectares			
Planting period	Coillte	Farm partners	Total
<1920	3	0	3
1920-29	0	0	0
1930-39	2	0	2
1940-49	3	0	3
1950-59	8	0	8
1960-69	23	0	23
1970-79	58	0	58
1980-89	71	0	71
1990-99	99	6	106
2000-2009	70	6	76
2010-11	3	0	3
Total planting	344	13	356
Temporarily Unstocked / Being Restocked	33	-	33
Total	375	13	387

Source: Coillte



4.5 Ireland: Public forest 2004-2010

000 hectares			
Year	Area of Afforestation	Area of Reforestation	Area Clearfelled
2004	0.7	9.1	9.9
2005	0.6	7.8	8.4
2006	0.2	6.7	8.0
2007	0.2	7.2	8.1
2008	0.1	7.3	7.2
2009	0.1	5.4	7.8
2010	0.1	5.6	7.4

Source: Coillte

- Of the 387,000 hectares of public forestry planted since records began, over 20% was planted since the year 2000.
- A total of 33,000 hectares or 9% of forest land is currently either unstocked or being restocked.
- In the period 2004 to 2010, 56,800 hectares of trees on public forest land were felled. In the same period, just over 49,000 hectares were reforested.

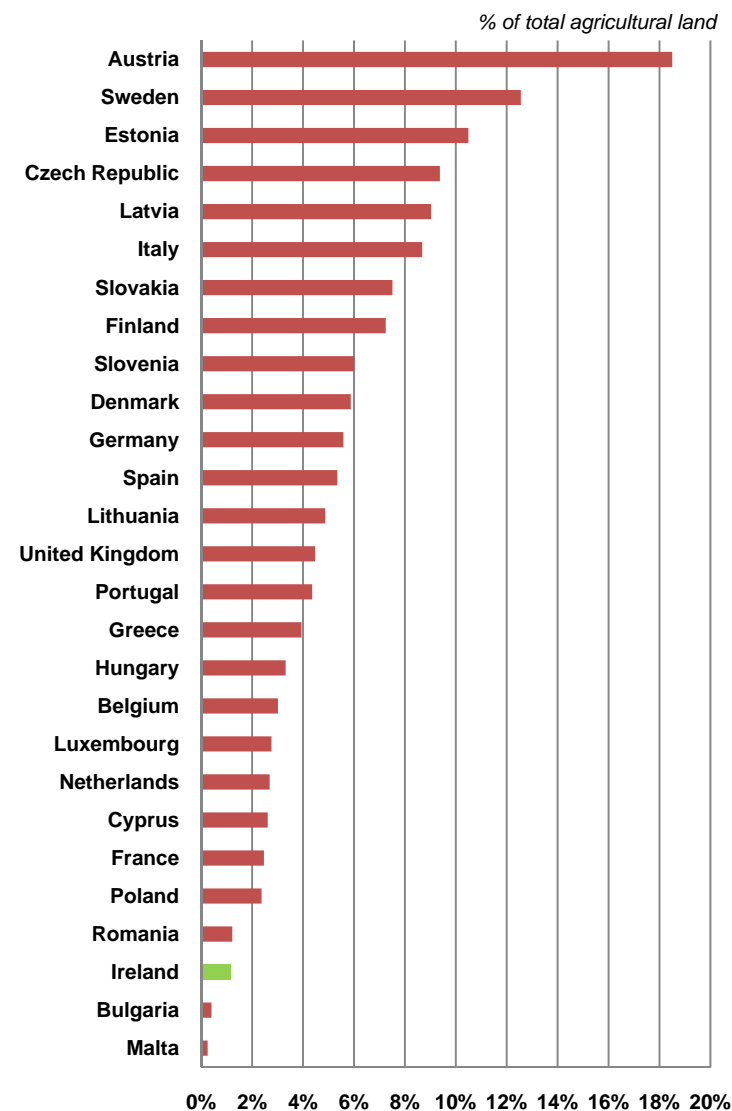
#### 4.6 Ireland: Organic agricultural land 1997-2009

Year	Organic land area	Agricultural land area	Organic as % of total agricultural land
1997	19	4,408	0.4%
1998	22	4,408	0.5%
1999	29	4,408	0.7%
2000	27	4,408	0.6%
2001	30	4,408	0.7%
2002	30	4,408	0.7%
2003	29	4,408	0.7%
2004	31	4,372	0.7%
2005	35	4,219	0.8%
2006	40	4,219	1.0%
2007	41	4,139	1.0%
2008	45	4,139	1.1%
2009	48	4,139	1.2%

Source: Department of Agriculture, Food and the Marine

- The amount of land used for organic farming in Ireland has grown by 156% between 1997 and 2009. It now accounts for 48,000 hectares.
- Land used for organic farming accounted for 1.2% of total agricultural land in 2009 - the third smallest percentage of agricultural land given over to organic farming in the EU. Austria, with 18.5%, had the highest percentage of agricultural land farmed organically.

#### 4.7 EU: Organic agricultural land 2009



Source: Research Institute of Organic Agriculture FiBL

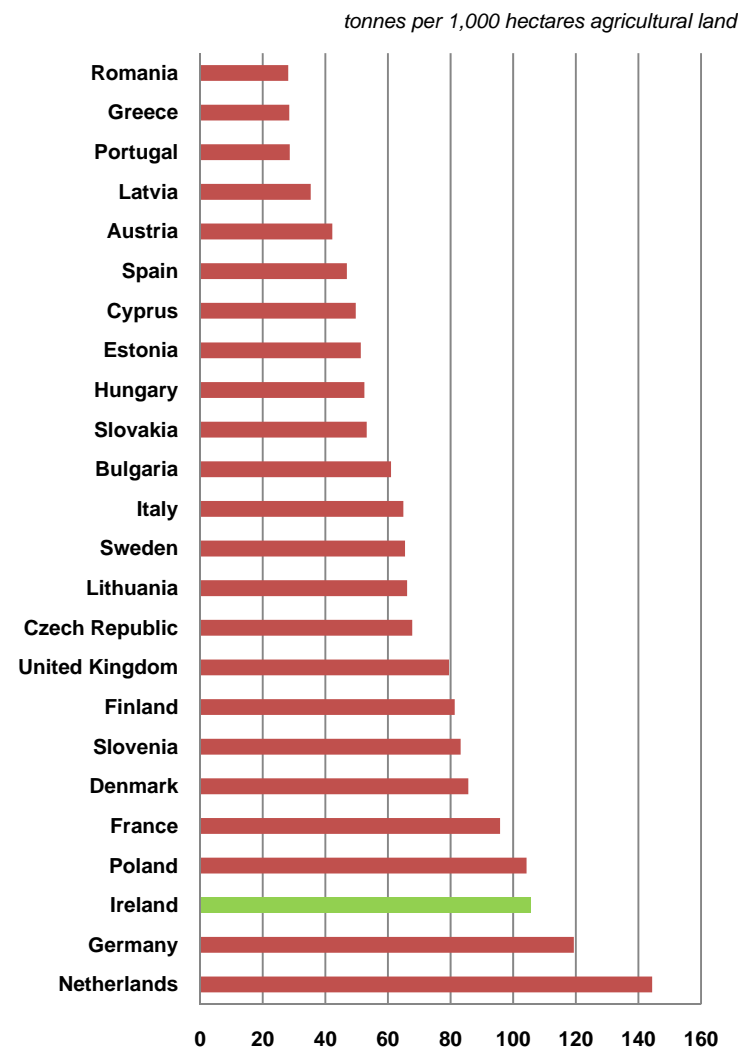
#### 4.8 Ireland: Fertiliser sales 1980-2011

	000 tonnes		000 tonnes		000 tonnes
Year	Nitrogen	Average annual % change	Phosphorus	Average annual % change	Total
1980	248	:	68	:	315
1985	328	5.8%	66	-0.6%	394
1990	379	3.0%	65	-0.4%	444
1995	429	2.5%	62	-0.7%	491
					-
2000	408	-1.0%	49	-4.6%	457
2001	369	-9.6%	43	-13.3%	411
2002	364	-1.4%	42	-1.9%	405
2003	388	6.8%	44	4.7%	432
2004	363	-6.6%	43	-2.7%	405
2005	352	-2.9%	39	-9.4%	391
2006	345	-2.0%	37	-3.7%	382
2007	322	-6.8%	32	-12.9%	354
2008	309	-3.9%	26	-18.7%	335
2009	307	-0.7%	20	-23.2%	327
2010	362	18.1%	29	45.0%	392
2011	314	-13.5%	29	-1.9%	342

Source: Department of Agriculture, Food and the Marine

- Sales of fertilisers fell on a year by year basis every year from 2000 to 2009, barring a small increase in 2003. The sales of fertilisers increased substantially in 2010, due mainly to lower prices, better weather leading to an improved response and higher prices for cattle, sheep and milk leading to a better return on usage. The measure for annual fertiliser sales is from October to September.
- Ireland had the third highest usage of fertiliser in the EU in 2009, at 105 tonnes per 1,000 hectares of agricultural land. The highest was the Netherlands at 144 tonnes per 1,000 hectares of agricultural land.

#### 4.9 EU: Fertiliser sales 2009



Source: Eurostat (Fertiliser Europe)

## 4.10 Ireland: Livestock numbers June 1980-June 2011

Year	000	Average annual % change	000	Average annual % change	000	Average annual % change
	Total cattle		Total sheep		Total pigs	
1980	6,909	:	3,292	:	1,031	:
1985	6,819	-0.3%	4,487	6.4%	1,004	-0.5%
1990	6,816	0.0%	8,539	13.7%	1,194	3.5%
1995	7,034	0.6%	8,332	-0.5%	1,550	5.4%
2000	7,037	0.0%	7,555	-1.9%	1,722	2.1%
2001	7,050	0.2%	7,330	-3.0%	1,743	1.2%
2002	6,992	-0.8%	7,210	-1.6%	1,785	2.4%
2003	7,000	0.1%	6,849	-5.0%	1,726	-3.3%
2004	7,016	0.2%	6,777	-1.0%	1,653	-4.2%
2005	6,983	-0.5%	6,392	-5.7%	1,688	2.1%
2006	6,916	-1.0%	5,973	-6.6%	1,643	-2.6%
2007	6,704	-3.1%	5,522	-7.6%	1,588	-3.4%
2008	6,902	3.0%	5,061	-8.3%	1,462	-7.9%
2009	6,891	-0.2%	4,778	-5.6%	1,385	-5.3%
2010	6,607	-4.1%	4,642	-2.9%	1,518	9.6%
2011	6,493	-1.7%	4,803	3.5%	1,555	2.4%

Source: CSO

- Sheep numbers declined from a record of 8.5 million in 1990 to 4.8 million in 2011 – a fall of 44%. Cattle numbers increased marginally from 6.9 million in 1980 to 7 million in 1995, before falling to 6.5 million in 2011.
- In 2010, Ireland had 6.8% of the total cattle population of the EU and 1% of the total pig population.

## 4.11 EU: Share of total livestock numbers December 2010

Country	% of total	
	Cattle	Pigs
Malta	0.0%	0.0%
Cyprus	0.1%	0.3%
Luxembourg	0.2%	0.1%
Estonia	0.3%	0.2%
Latvia	0.4%	0.3%
Slovakia	0.5%	0.5%
Slovenia	0.5%	0.3%
Bulgaria	0.6%	0.4%
Greece	0.8%	0.7%
Hungary	0.8%	2.1%
Lithuania	0.9%	0.6%
Finland	1.0%	0.9%
Czech Republic	1.5%	1.2%
Portugal	1.6%	1.4%
Sweden	1.7%	1.0%
Denmark	1.9%	8.1%
Romania	2.3%	3.6%
Austria	2.3%	2.1%
Belgium	2.9%	4.1%
Netherlands	4.6%	8.1%
Poland	6.4%	9.8%
Italy	6.7%	6.2%
Ireland	6.8%	1.0%
Spain	7.0%	17.0%
United Kingdom	11.4%	2.9%
Germany	14.7%	17.8%
France	21.9%	9.3%
Total	100.0%	100.0%
Total livestock (000)	86,629	151,054

Source: Eurostat

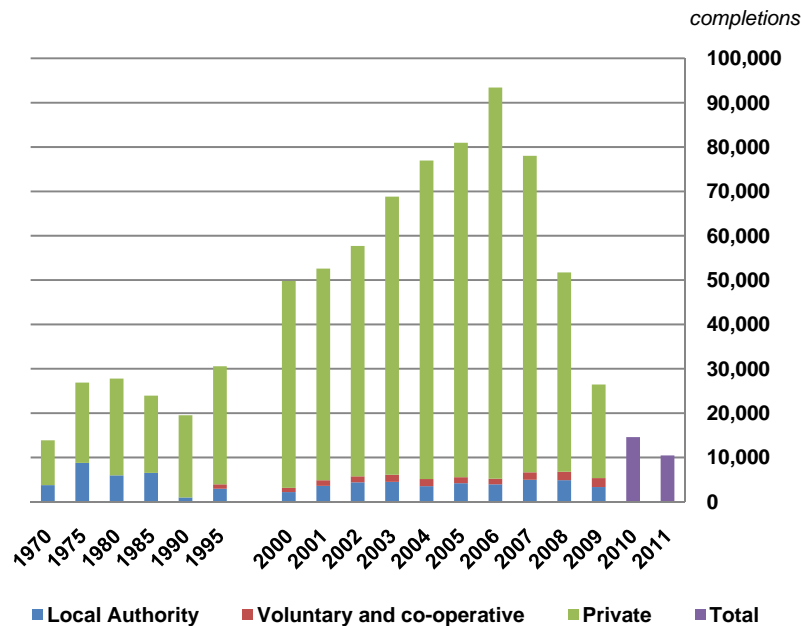


#### 4.12 Ireland: House completions 1970-2011

Year	% of total completions			Total 000	Average annual % change
	Local Authority	Voluntary and co- operative	Private		
1970	27%	0%	73%	13.9	:
1975	33%	0%	67%	26.9	14.1%
1980	22%	0%	78%	27.8	0.7%
1985	27%	0%	73%	23.9	-2.9%
1990	5%	0%	95%	19.5	-4.0%
1995	10%	3%	87%	30.6	9.4%
2000	4%	2%	94%	49.8	10.3%
2001	7%	2%	91%	52.6	5.6%
2002	8%	2%	90%	57.7	9.7%
2003	7%	2%	91%	68.8	19.3%
2004	5%	2%	93%	77.0	11.8%
2005	5%	2%	93%	81.0	5.2%
2006	4%	1%	94%	93.4	15.4%
2007	6%	2%	92%	78.0	-16.5%
2008	10%	4%	87%	51.7	-33.7%
2009	13%	8%	80%	26.4	-48.9%
2010	:	:	:	14.6	-44.8%
2011	:	:	:	10.5	-28.2%

Source: Department of the Environment, Community and Local Government

#### Ireland: House completions 1970-2011



- In 2006 – the peak year for house completions – private houses accounted for 94% of all house completions. This has since declined to 80% in 2009.

- Total house completions rose steadily from 19,500 in 1990 to 93,400 in 2006 before falling sharply to just 10,500 in 2011.
- The percentage of house completions by Local Authorities has risen from 4% in 2006 to 13% in 2009. Over the same period the percentage of Voluntary and co-operative house completions has risen from 1% to 8%.

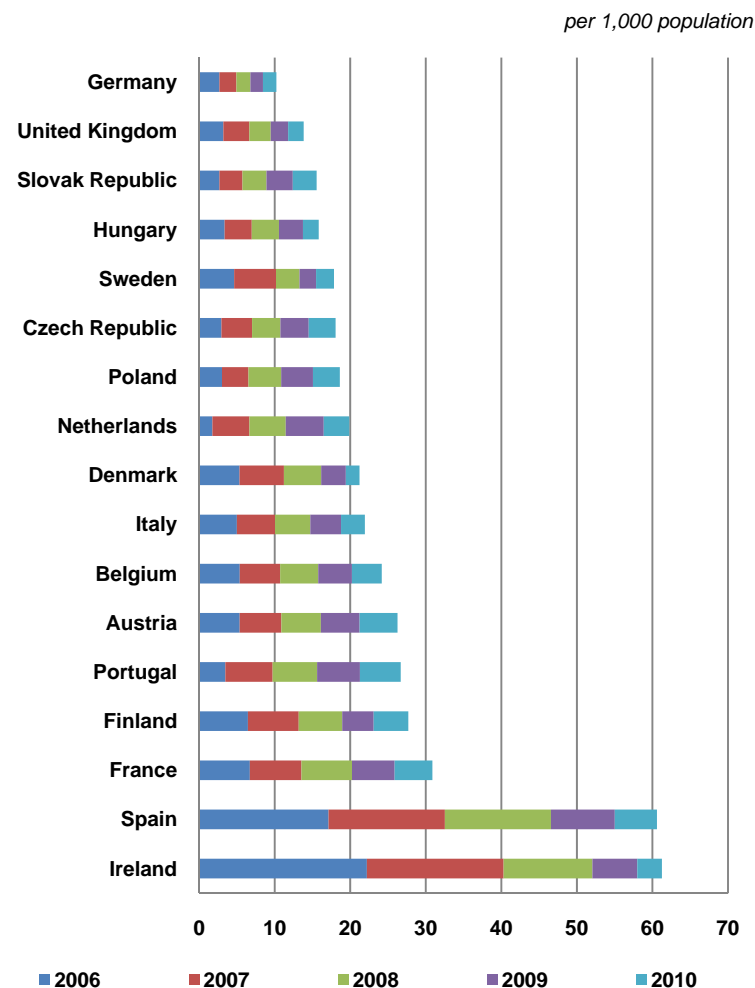
## 4.13 EU: House completions 2006-2010

Country	2006	2007	2008	2009	2010
Germany	2.7	2.3	1.9	1.7	1.8
United Kingdom	3.2	3.4	2.8	2.3	2.1
Slovak Republic	2.7	3.1	3.2	3.5	3.1
Hungary	3.4	3.6	3.6	3.2	2.1
Sweden	4.6	5.5	3.1	2.2	2.4
Czech Republic	2.9	4.1	3.7	3.8	3.6
Poland	3.0	3.5	4.3	4.2	3.6
Netherlands	1.8	4.9	4.8	5.0	3.4
Denmark	5.3	5.9	4.9	3.3	1.8
Italy	5.0	5.1	4.7	4.1	3.2
Belgium	5.4	5.3	5.0	4.5	3.9
Austria	5.4	5.5	5.2	5.1	5.0
Portugal	3.5	6.3	5.9	5.7	5.4
Finland	6.5	6.7	5.8	4.2	4.6
France	6.7	6.8	6.7	5.6	5.0
Spain	17.1	15.4	14.0	8.4	5.6
Ireland	22.2	18.1	11.8	5.9	3.3

Source: DKM, Euroconstruct, Eurostat

- Ireland and Spain had the highest levels of house completions per 1,000 population over the period 2006 to 2010.
- In 2010, there were 3.3 house completions per 1,000 population in Ireland. Although this was considerably lower than in the 2006 to 2009 period, it was still the tenth highest of the 17 EU countries that data were available for.

## EU: House completions 2006-2010



## 5. Energy



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*Photographs: Lough Nahanagan, Wicklow Gap, lower lake of the Turlough Hill hydroelectric power plant, courtesy of Gerry Brady; Grand Canal Basin, Dublin, courtesy of Paul Molony*

## 5.1 Ireland: Primary energy requirement and final energy consumption 1990-2010

*000 tonnes oil eq.*

Year	Primary energy requirement	Final energy consumption	Final energy consumption as % of Primary energy requirement
1990	9,497	7,249	76.3%
1995	10,568	7,979	75.5%
2000	13,780	10,814	78.5%
2001	14,579	11,262	77.3%
2002	14,756	11,308	76.6%
2003	14,629	11,630	79.5%
2004	15,150	12,013	79.3%
2005	15,794	12,686	80.3%
2006	15,948	13,051	81.8%
2007	16,202	13,290	82.0%
2008	16,454	13,325	81.0%
2009	14,815	12,154	82.0%
2010	14,763	12,044	81.6%

Source: Sustainable Energy Authority of Ireland

- Ireland's primary energy requirement increased from 9.5 million tonnes of oil equivalent (t.o.e.) in 1990 to 16.5 million t.o.e. in 2008 before falling to 14.8 million t.o.e. in 2010.
- Final energy consumption as a proportion of the primary energy requirement has grown from 76% in 1990 to 82% in 2010.
- Transport accounted for 40% of Ireland's final energy consumption in 2010.
- Oil accounted for 60% of Ireland's total final energy consumption in 2010 (see Table 5.3).

## 5.2 EU: Final energy consumption by economic sector 2010

*% of total final energy consumption*

Country	Transport	Industry	Residential	Agriculture	Services	Other
Finland	19%	44%	22%	3%	7%	5%
Romania	22%	31%	36%	2%	8%	1%
Slovakia	23%	38%	20%	1%	18%	0%
Czech Republic	25%	34%	26%	2%	12%	1%
Sweden	25%	37%	22%	2%	14%	0%
Hungary	26%	17%	34%	3%	19%	0%
Poland	27%	23%	32%	6%	13%	0%
Estonia	27%	20%	35%	3%	14%	0%
Netherlands	28%	27%	21%	6%	18%	0%
Belgium	28%	31%	25%	2%	14%	0%
Latvia	28%	18%	35%	4%	14%	0%
Germany	28%	28%	29%	0%	15%	0%
Austria	31%	32%	25%	2%	10%	0%
EU	32%	25%	27%	2%	13%	1%
France	32%	20%	28%	2%	15%	4%
Bulgaria	33%	29%	25%	2%	11%	0%
Lithuania	33%	19%	33%	2%	13%	0%
Denmark	33%	16%	32%	6%	14%	0%
Italy	34%	25%	25%	3%	14%	0%
Slovenia	36%	26%	26%	2%	10%	1%
United Kingdom	37%	20%	31%	1%	10%	1%
Ireland	40%	16%	27%	2%	14%	0%
Portugal	41%	30%	16%	3%	11%	0%
Spain	41%	26%	18%	3%	11%	1%
Greece	43%	18%	24%	4%	10%	0%
Cyprus	54%	12%	15%	2%	12%	4%
Luxembourg	61%	17%	11%	1%	10%	0%
Malta	62%	11%	14%	0%	12%	1%

Source: Eurostat

### 5.3 EU: Final energy consumption by fuel type 2010

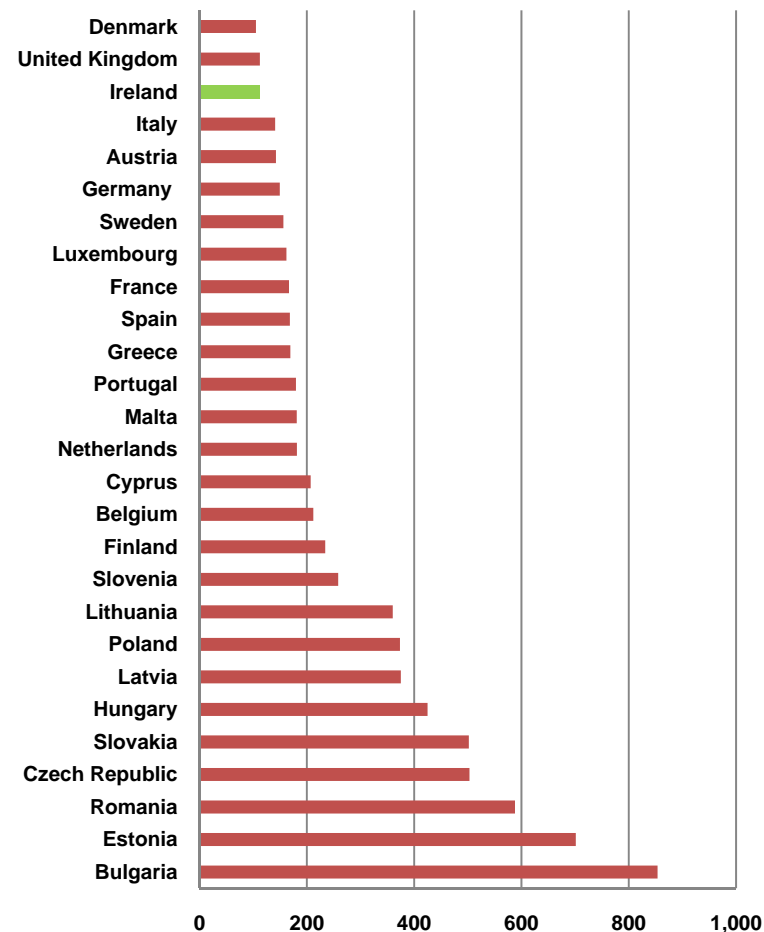
% of total final energy consumption

Country	Oil	Solid fuel	Gas	Electricity	Renewable energy	Derived heat
Cyprus	72%	1%	0%	22%	5%	0%
Malta	69%	0%	0%	31%	0%	0%
Luxembourg	67%	2%	16%	13%	2%	1%
Greece	64%	2%	4%	24%	6%	0%
Ireland	60%	5%	14%	18%	2%	0%
Spain	52%	1%	16%	25%	6%	0%
Portugal	51%	0%	9%	24%	14%	2%
Slovenia	49%	1%	13%	21%	12%	4%
Denmark	44%	1%	12%	18%	8%	18%
United Kingdom	42%	3%	33%	20%	2%	1%
France	42%	3%	20%	24%	8%	2%
Belgium	41%	3%	31%	20%	4%	2%
EU	40%	4%	23%	21%	7%	5%
Italy	39%	2%	31%	21%	4%	3%
Austria	39%	4%	18%	19%	14%	6%
Germany	38%	4%	25%	21%	6%	5%
Bulgaria	36%	5%	11%	26%	11%	11%
Latvia	34%	2%	12%	13%	25%	14%
Netherlands	34%	2%	41%	17%	1%	4%
Lithuania	34%	4%	12%	15%	16%	19%
Estonia	33%	3%	7%	20%	19%	18%
Poland	31%	20%	14%	15%	8%	11%
Finland	30%	3%	4%	27%	18%	18%
Sweden	29%	3%	2%	33%	18%	15%
Hungary	28%	3%	38%	18%	7%	7%
Romania	27%	4%	28%	16%	18%	7%
Czech Republic	26%	12%	26%	19%	7%	9%
Slovakia	20%	14%	36%	18%	5%	7%

Source: Eurostat

### 5.4 EU: Energy intensity 2010

kgoe per €1,000 GDP



Source: Eurostat

- Ireland had the third lowest energy intensity in the EU in 2010, at 113 kgs of oil equivalent (kgoe) per €1,000 of GDP.

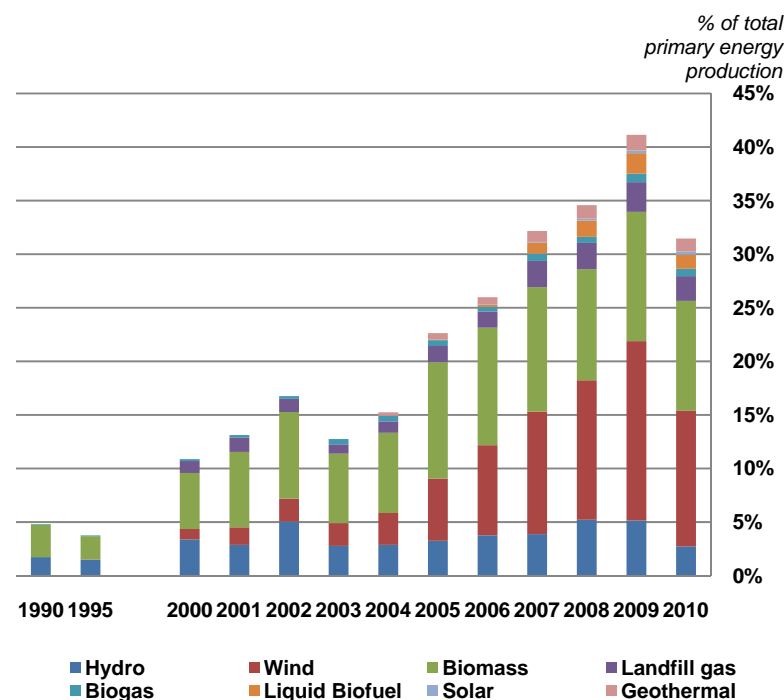
## 5.5 Ireland: Primary energy production 1990-2010

% of total primary energy production			
Year	Peat products	Natural gas	Renewable energy
1990	41%	54%	5%
1995	41%	55%	4%
2000	45%	44%	11%
2001	50%	37%	13%
2002	39%	44%	17%
2003	58%	30%	13%
2004	48%	37%	15%
2005	50%	28%	23%
2006	49%	25%	26%
2007	43%	25%	32%
2008	43%	22%	35%
2009	37%	21%	41%
2010	51%	17%	31%

Source: Sustainable Energy Authority of Ireland

- The use of renewable energy sources as a proportion of total primary energy production in Ireland increased from 5% in 1990 to 41% in 2009. This fell to 31% in 2010.
- Natural gas, as a proportion of total primary energy production has fallen from 54% in 1990 to 17% in 2010.
- The production of peat increased from 37% to 51% of total final energy production between 2009 and 2010.

## 5.6 Ireland: Renewable energy production 1990-2010



Source: Sustainable Energy Authority of Ireland

- Wind has become the main source of renewable energy production in recent years, increasing from less than 1% of total production in 1995 to over 40% in 2010.
- The use of water and biomass has fallen over the same period and they now account for 9% and 33% respectively of the total renewable energy being produced. This is in contrast to the early 1990s when they comprised virtually all of Ireland's renewable energy production.

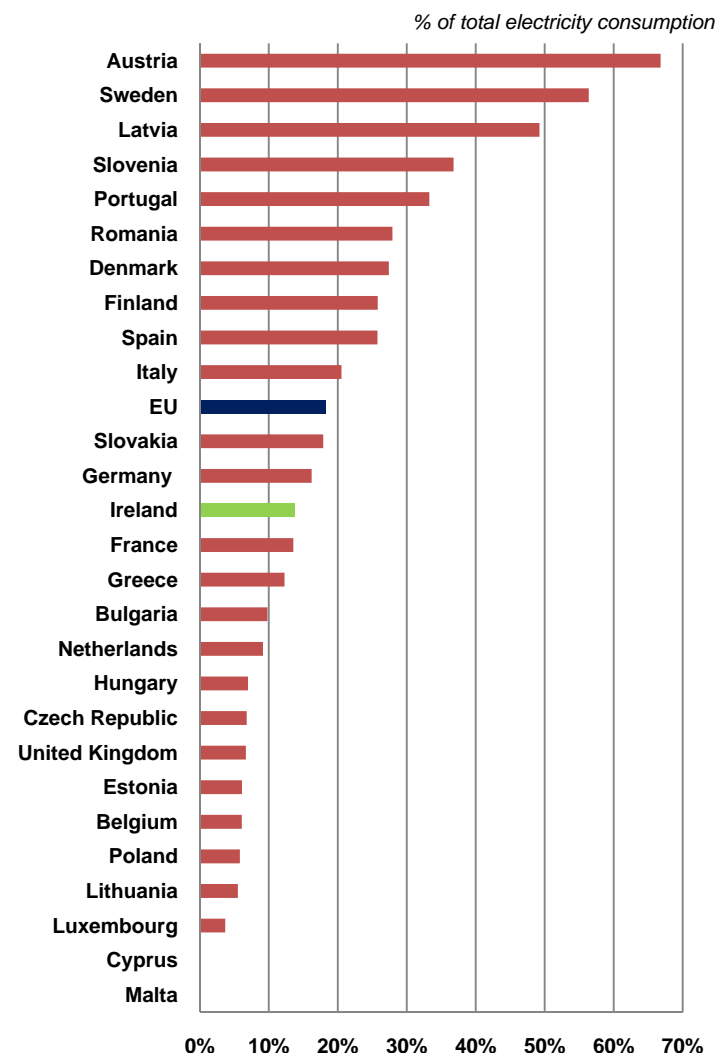
## 5.7 Ireland: Electricity consumption from renewable sources 1990-2010

% of total electricity consumption				
Year	Hydro	Wind	Biomass	Total
1990	5.3%	0.0%	0.0%	5.3%
1995	4.5%	0.1%	0.0%	4.6%
2000	3.4%	1.0%	0.4%	4.8%
2001	3.3%	1.3%	0.4%	5.0%
2002	3.2%	1.4%	0.3%	5.0%
2003	3.1%	1.8%	0.3%	5.2%
2004	2.9%	2.7%	0.4%	6.0%
2005	2.7%	4.0%	0.5%	7.2%
2006	2.6%	5.6%	0.4%	8.7%
2007	2.5%	6.8%	0.6%	9.9%
2008	2.5%	7.9%	0.7%	11.1%
2009	2.6%	10.2%	0.9%	13.7%
2010	2.6%	11.1%	1.1%	14.8%

Source: Sustainable Energy Authority of Ireland

- The use of renewable energy sources in the consumption of electricity increased from 5.3% in 1990 to 14.8% in 2010. The EU Renewable Energy Directive 2010 target for electricity for Ireland was 13.2%.
- Wind is the main source of renewable energy used in the consumption of electricity, with its share growing to 11.1% of electricity consumption in 2010.
- Ireland's use of renewable energy in total electricity consumption in 2009 at 13.7% was 13th highest among EU countries.
- Austria had the highest proportion of renewable energy in total electricity consumption; 67% of its electricity consumption was from renewable energy sources in 2009.

## 5.8 EU: Electricity consumption from renewable sources 2009



Source: Eurostat



### 5.9 Ireland: Heat consumption from renewable sources 1990-2010

% of total heat consumption

Year	Biomass	Biogas	Solar	Geothermal	Total
1990	2.5%	0.1%	0.0%	0.0%	2.6%
1995	2.1%	0.1%	0.0%	0.0%	2.1%
2000	2.3%	0.1%	0.0%	0.0%	2.4%
2001	2.5%	0.1%	0.0%	0.0%	2.6%
2002	2.5%	0.1%	0.0%	0.0%	2.6%
2003	2.3%	0.1%	0.0%	0.0%	2.5%
2004	2.6%	0.1%	0.0%	0.1%	2.8%
2005	3.2%	0.1%	0.0%	0.2%	3.5%
2006	3.3%	0.1%	0.0%	0.2%	3.6%
2007	3.3%	0.1%	0.0%	0.3%	3.7%
2008	3.1%	0.1%	0.1%	0.4%	3.6%
2009	3.6%	0.1%	0.1%	0.4%	4.3%
2010	3.7%	0.1%	0.1%	0.4%	4.4%

Source: Sustainable Energy Authority of Ireland

- Consumption of heat from renewable energy sources has grown from 2.6% in 1990 to 4.4% in 2010. Biomass accounted for 3.7% of the total heat consumption in 2010. There is a national target of 12% of heat from renewable energy sources by 2020.

### 5.10 Ireland: Transport use from renewable sources 2006-2010

% of total transport energy consumption

Year	Biodiesel	Biogasoline	Pure plant oil	Total
2006	0.0%	0.0%	0.0%	0.1%
2007	0.4%	0.1%	0.0%	0.5%
2008	0.8%	0.4%	0.1%	1.2%
2009	1.2%	0.5%	0.0%	1.8%
2010	1.5%	0.8%	0.1%	2.4%

Source: Sustainable Energy Authority of Ireland

- Renewable energy sources for transport have only been used since 2006 and have grown to 2.4% of total transport energy consumption in 2010. Biodiesel and biogasoline accounted for almost all of the renewable energy sources.
- The national and EU targets for transport use from renewable energy sources is 10% by 2020. This target was announced in the 2007 Energy White Paper.

### 5.11 Ireland: Imported energy dependency 1990-2010

% of total energy requirement

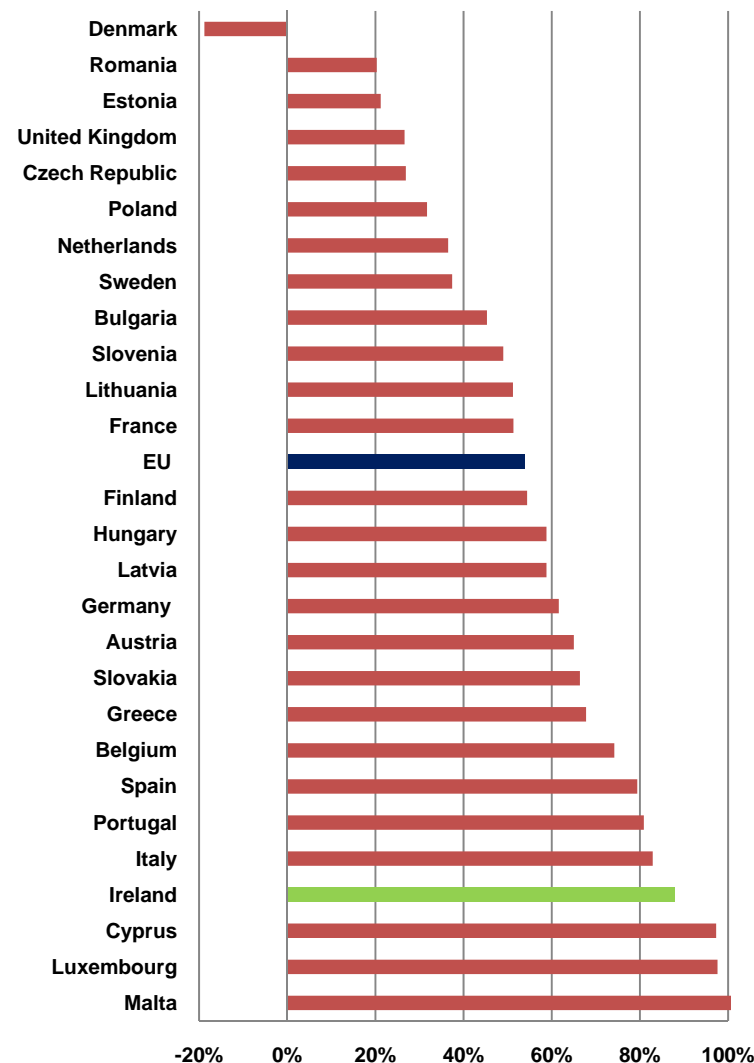
Year	Oil	Gas	Coal	Peat, electricity and other fuels	Total import dependency
1990	49%	0%	20%	0%	69%
1995	51%	1%	17%	0%	69%
2000	57%	15%	12%	0%	84%
2001	60%	17%	13%	0%	89%
2002	59%	18%	12%	0%	89%
2003	57%	21%	11%	1%	90%
2004	57%	19%	12%	1%	89%
2005	58%	19%	12%	1%	90%
2006	57%	22%	10%	1%	90%
2007	55%	24%	9%	1%	89%
2008	54%	25%	10%	0%	89%
2009	52%	27%	9%	1%	89%
2010	50%	29%	6%	1%	86%

Source: Sustainable Energy Authority of Ireland

- Ireland's imported energy dependency increased from 69% in 1990 to 90% in 2005 then fell to 86% in 2010.
- Gas accounted for 29% of Ireland's imported energy dependency in 2010. The import dependency on oil has fallen from 60% in 2001 to 50% in 2010. In 2009, Ireland had the fourth highest level of imported energy dependency in the EU, at 89%.

### 5.12 EU: Imported energy dependency 2009

% of total energy requirement



Source: Eurostat

### 5.13 Ireland: Fuel imports 1990–2010

Year	% of total				000 tonnes oil eq.
	Coal	Crude oil	Other oil products	Natural gas	
1990	29%	29%	42%	0%	10,760
1995	24%	30%	45%	1%	11,821
2000	14%	25%	41%	20%	12,203
2001	14%	25%	40%	21%	13,639
2002	13%	25%	40%	22%	13,596
2003	13%	25%	39%	24%	13,243
2004	14%	22%	43%	22%	13,534
2005	13%	24%	41%	21%	14,116
2006	11%	23%	41%	25%	14,369
2007	10%	24%	38%	27%	14,327
2008	11%	22%	38%	28%	14,674
2009	10%	22%	38%	30%	13,127
2010	7%	24%	34%	34%	12,805

Source: Sustainable Energy Authority of Ireland

- Ireland's imports of fuel have been falling since 2006. The proportion accounted for by imports of natural gas has grown from 20% in 2000 to 34% in 2010.
- Other oil products, (such as diesel, gasoline, LPG, kerosene and jet kerosene) accounted for 34% of Ireland's fuel imports in 2010.



## 6. Transport



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- 6.9 EU: International air passengers 2010
- 6.10 Ireland: Means of travel to work 1986-2006

*Photographs: Aircraft, courtesy of Gerry Walker; Samuel Beckett Bridge, Dublin, courtesy of David Lester*

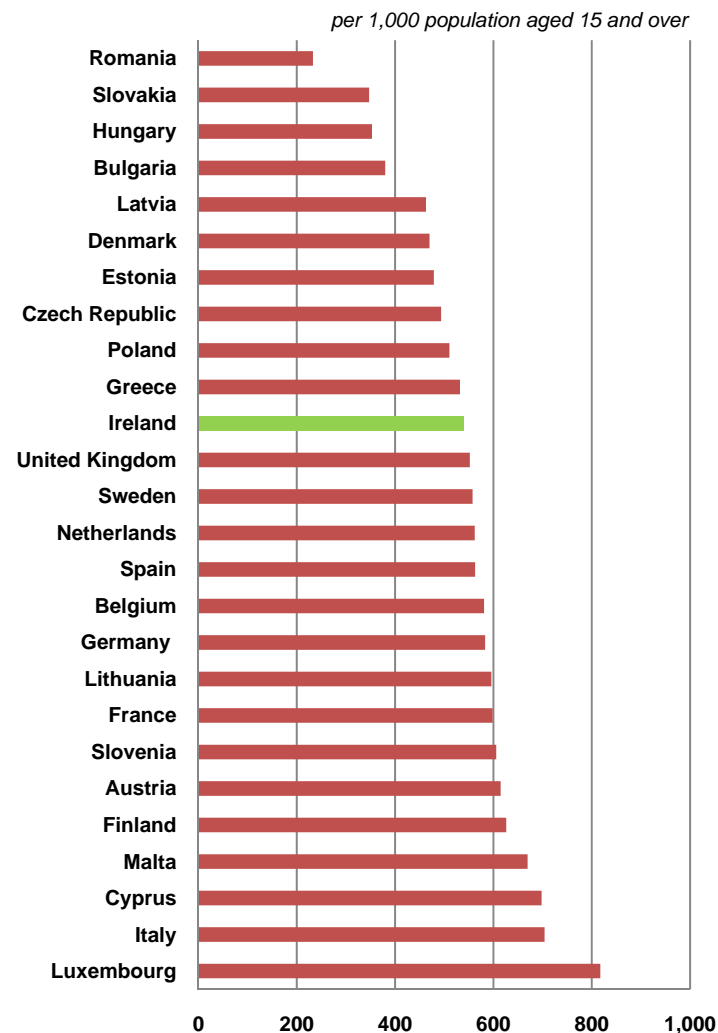
## 6.1 Ireland: Vehicles under current licence 1985-2010

Year	Private cars 000	Average annual % change	Goods vehicles 000	Average annual % change	Other vehicles 000	Average annual % change	Total 000
1985	710	:	93	:	112	:	915
1990	796	2.3%	143	8.9%	115	0.5%	1,054
1995	990	4.5%	142	-0.2%	130	2.6%	1,263
2000	1,319	5.9%	206	7.7%	157	3.8%	1,682
2001	1,385	5.0%	220	6.8%	165	5.1%	1,770
2002	1,448	4.6%	233	6.2%	169	2.2%	1,850
2003	1,507	4.1%	251	7.7%	179	6.0%	1,937
2004	1,583	5.0%	268	6.8%	185	3.5%	2,036
2005	1,662	5.0%	287	6.9%	190	2.5%	2,139
2006	1,779	7.0%	319	11.2%	199	4.7%	2,296
2007	1,883	5.8%	346	8.6%	213	7.0%	2,442
2008	1,924	2.2%	351	1.6%	222	4.3%	2,498
2009	1,902	-1.1%	344	-2.1%	221	-0.3%	2,468
2010	1,873	-1.6%	327	-4.9%	217	-2.1%	2,416

Source: Department of Transport, Tourism and Sport

- The number of licensed vehicles increased by 164%, from 915,000 to 2.4 million, between 1985 and 2010. Private cars accounted for the majority of this growth with an increase of almost 1.2 million between 1985 and 2010.
- The number of goods vehicles licensed has grown by 130% in the same period from 93,000 to 327,000. As with private cars, the numbers peaked in 2008 and there were subsequently decreases in 2009 and 2010.
- Ireland had 540 passenger cars per 1,000 of the population aged 15 or over in 2009. This was the 11th lowest in the EU. Luxembourg had the highest ratio, at 817 and Romania the lowest at 233.

## 6.2 EU: Passenger cars 2009



Note: Data for Denmark and United Kingdom refer to 2008  
Data not available for Portugal  
Source: Eurostat

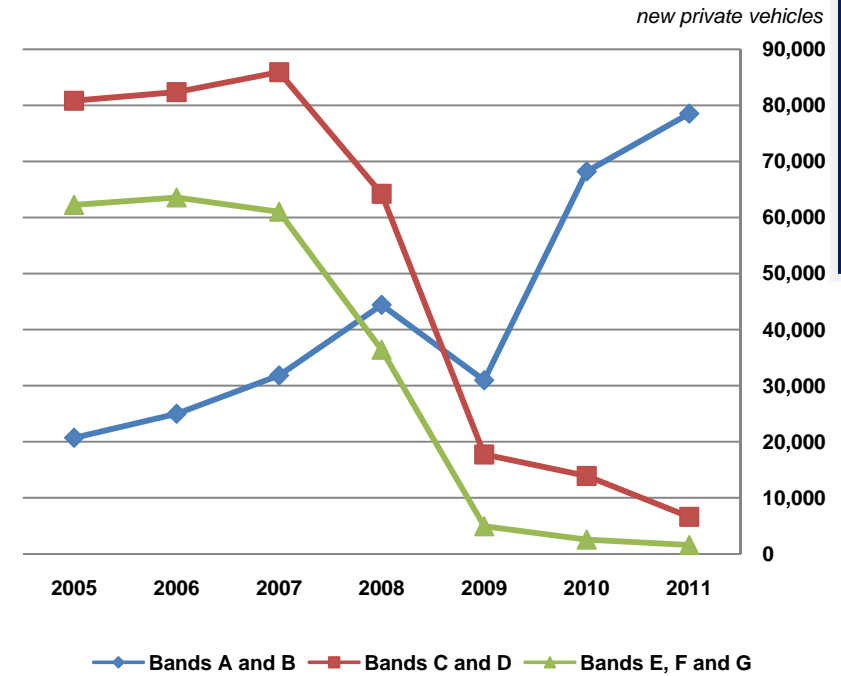
### 6.3 Ireland: New private vehicles licensed by emission class 2005-2011

Year	% of total				Total 000
	Bands A and B	Bands C and D	Bands E, F and G	Unclassified	
2005	12%	49%	37%	2%	166.3
2006	14%	48%	37%	1%	173.3
2007	18%	48%	34%	1%	180.8
2008	30%	44%	25%	1%	146.5
2009	57%	33%	9%	2%	54.4
2010	80%	16%	3%	0%	84.9
2011	90%	8%	2%	0%	86.9

Source: CSO

- On July 1<sup>st</sup> 2008, the basis for motor taxation charges changed from engine size to the emission rating of the vehicle.
- The proportion of new vehicles registered in emission bands A and B increased from 12% in 2005 to 90% in 2011.

### Ireland: New private vehicles licensed by emission class 2005-2011





#### 6.4 Ireland: Road freight transport 1990-2010

Year	million Tonne- kilometres	Average annual % change	million Tonnes carried	Average annual % change	million Vehicle- kilometres	Average annual % change
1990	5,130	:	81,440	:	783	:
1995	5,493	1.4%	85,317	0.9%	974	4.5%
2000	12,263	17.4%	191,264	17.5%	1,595	10.4%
2001	12,291	0.2%	199,829	4.5%	1,585	-0.6%
2002	14,282	16.2%	224,907	12.5%	1,851	16.8%
2003	15,679	9.8%	251,791	12.0%	1,966	6.2%
2004	17,011	8.5%	273,557	8.6%	2,139	8.8%
2005	17,819	4.7%	291,883	6.7%	2,312	8.1%
2006	17,322	-2.8%	299,030	2.4%	2,242	-3.0%
2007	18,707	8.0%	299,307	0.1%	2,332	4.0%
2008	17,289	-7.6%	245,788	-17.9%	2,207	-5.4%
2009	12,071	-30.2%	148,328	-39.7%	1,585	-28.2%
2010	10,924	-9.5%	125,865	-15.1%	1,457	-8.1%

Source: CSO

- Road freight transport in Ireland peaked in 2007, when there were just under 300 billion tonnes carried and over 18.7 billion tonne-kilometres travelled. This fell significantly in the next three years, with only 126 billion tonnes carried and just under 11 billion tonne-kilometres travelled in 2010.
- Relative to 2005, Ireland had the lowest tonne-kilometres and vehicle-kilometres travelled of EU Member States for which data were available in 2010. Tonne-kilometres were at 61% of the level in 2005.

#### 6.5 EU: Road freight transport 2010

Country	Tonne-kilometres	Vehicle-kilometres
Ireland	61.3	63.0
Denmark	64.5	74.6
Austria	77.4	86.4
Cyprus	78.0	76.5
Belgium	79.8	73.9
Italy	83.0	81.2
Portugal	83.0	81.0
France	88.8	88.8
Spain	90.1	87.2
Netherlands	90.7	84.1
United Kingdom	90.9	84.3
Finland	92.7	95.1
Sweden	94.0	102.0
Estonia	96.4	87.0
Luxembourg	98.8	79.4
Germany	101.0	101.5
Czech Republic	119.3	93.4
Greece	120.3	122.0
Lithuania	121.9	102.5
Slovakia	122.2	108.3
Latvia	126.2	100.7
Hungary	134.1	121.1
Slovenia	144.4	125.5
Poland	188.5	155.9

Note: Data not available for Bulgaria, Romania or Malta  
Greece data refers to 2009  
Source: Eurostat

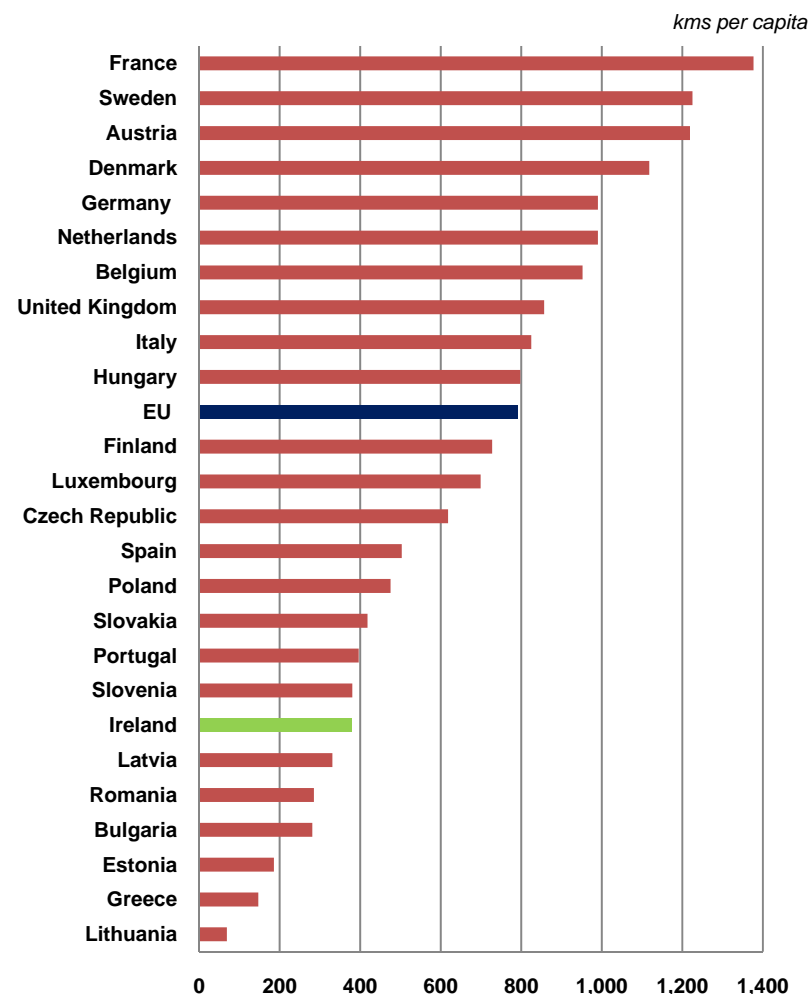
## 6.6 Ireland: Rail and bus passenger and vehicle traffic 1996-2010

Year	million		million	
	Rail passenger-kilometres	% change	Bus and coach vehicle-kilometres	% change
1996	1,295		:	
1997	1,387	7.1%	:	:
1998	1,421	2.4%	:	:
1999	1,458	2.6%	:	:
2000	1,389	-4.7%	255	:
2001	1,515	9.1%	267	4.7%
2002	1,628	7.4%	267	0.0%
2003	1,601	-1.7%	276	3.4%
2004	1,582	-1.2%	288	4.3%
2005	1,781	12.6%	290	0.7%
2006	1,872	5.1%	295	1.7%
2007	2,007	7.2%	304	3.1%
2008	1,976	-1.6%	315	3.6%
2009	1,683	-14.8%	329	4.4%
2010	1,678	-0.3%	310	-5.8%

Source: CSO

- Rail usage increased in Ireland between 1996 and 2007, growing from almost 1.3 billion passenger-kilometres to just over 2 billion passenger-kilometres. However, it decreased to just under 1.7 billion passenger-kilometres in 2010.
- Bus and coach travel in Ireland increased by 22% in the period 2000 to 2008, from 255 million vehicle-kilometres in 2000 to 310 million vehicle-kilometres in 2008.
- The average kilometres per capita travelled by rail passengers in Ireland in 2009 was 378, compared with an EU average of 791. France, at 1,378 had the highest kilometres per capita travelled in 2009.

## 6.7 EU: Rail passenger traffic 2009



Note: Data for Greece, Italy and Luxembourg refers to 2008  
 Data for Netherlands and EU refers to 2007  
 No data available for Cyprus or Malta  
 Source: Eurostat

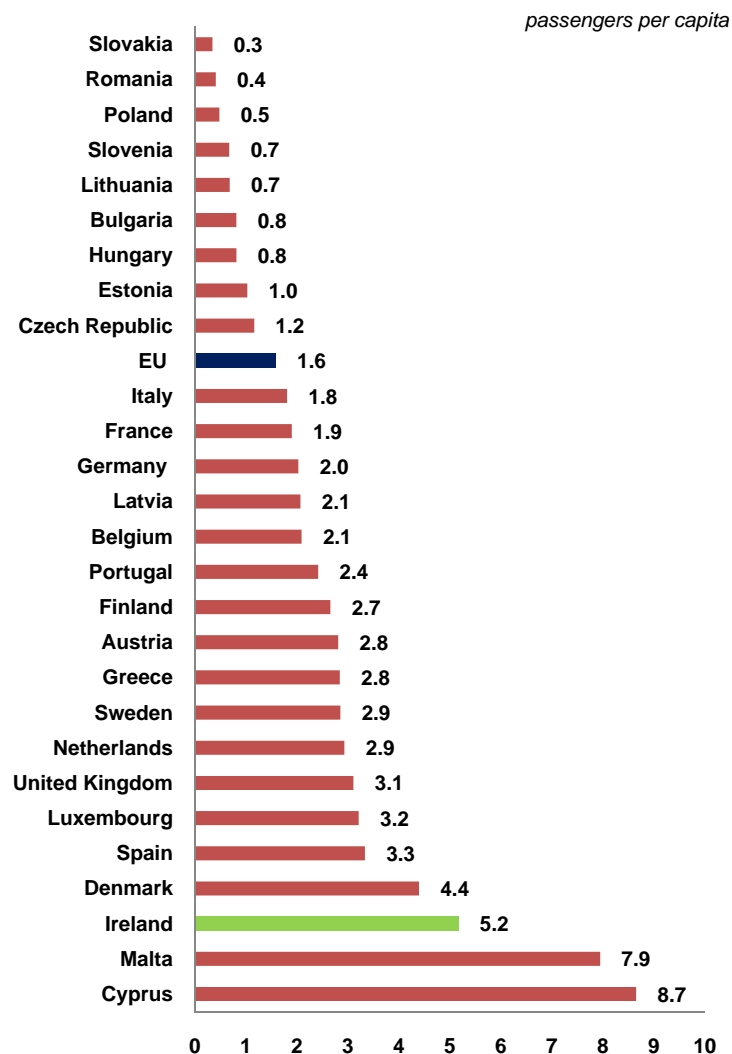
## 6.8 Ireland: International passengers through Irish ports 1995-2010

Year	Air passengers 000	Average annual % change	Sea passengers 000	Average annual % change
1995	9,560	:	4,244	:
2000	16,383	11.4%	4,507	1.2%
2001	17,029	3.9%	4,159	-7.7%
2002	18,004	5.7%	4,218	1.4%
2003	19,340	7.4%	4,095	-2.9%
2004	20,964	8.4%	3,942	-3.7%
2005	23,570	12.4%	3,268	-17.1%
2006	25,623	8.7%	3,004	-8.1%
2007	29,128	13.7%	3,067	2.1%
2008	29,240	0.4%	2,855	-6.9%
2009	25,712	-12.1%	2,790	-2.3%
2010	21,656	-15.8%	2,645	-5.2%

Source: CSO

- Air passengers travelling to and from Ireland increased by over 19.5 million, or 206% between 1995 and 2008 when there were over 29 million passengers. Passenger numbers have since fallen by 26% between 2008 and 2010.
- Passenger numbers travelling to and from Ireland by sea fell by 41% between 2000 and 2010, from 4.5 million to 2.6 million passengers.
- In 2010, Ireland had 5.2 air passengers per capita which was over three times the EU average of 1.6 passengers per capita. The highest were Cyprus and Malta (two other small islands) with 8.7 and 7.9 respectively air passengers per capita.

## 6.9 EU: International air passengers 2010



Source: Eurostat

## 6.10 Ireland: Means of travel to work 1986-2006

*% of total female population aged over 15 at work*

### Females

Year	1986	1991	1996	2002	2006
On foot	19%	17%	16%	15%	14%
Bicycle	6%	4%	3%	1%	1%
Bus, minibus or coach	15%	13%	12%	9%	8%
Train, DART or LUAS	2%	2%	2%	2%	3%
Motor cycle or scooter	1%	1%	0%	0%	0%
Motor car: Driver	27%	35%	44%	58%	62%
Motor car: Passenger	16%	14%	13%	8%	6%
Other means (incl. Lorry or van)	1%	1%	1%	0%	0%
Work mainly at or from home	8%	9%	6%	4%	5%
Not stated	6%	4%	3%	1%	1%

*% of total male population aged over 15 at work*

### Males

Year	1986	1991	1996	2002	2006
On foot	9%	8%	9%	9%	9%
Bicycle	5%	5%	4%	3%	3%
Bus, minibus or coach	6%	5%	5%	5%	5%
Train, DART or LUAS	1%	1%	1%	2%	3%
Motor cycle or scooter	2%	1%	1%	2%	1%
Motor car: Driver	42%	41%	48%	53%	54%
Motor car: Passenger	5%	4%	6%	6%	5%
Other means (incl. Lorry or van)	4%	6%	7%	12%	13%
Work mainly at or from home	22%	26%	16%	8%	6%
Not stated	4%	3%	3%	2%	2%

Source: CSO Census of Population

- Between 1986 and 2006, the proportion of females driving to work has increased from 27% to 62%. The proportion of females travelling to work as car passengers fell from 16% to 6% in the same period.
- The proportion of males driving to work rose from 42% to 54% between 1986 and 2006.
- The proportion of males working mainly at or from home has fallen from 22% in 1986 to 6% in 2006. The proportion of females working mainly at or from home fell from 8% to 5%.
- There were 14% of working women aged 15 or over who walked to work in 2006 compared with 9% of working men aged 15 or over.
- This data takes account only of people working, and does not include students, unemployed or retired people.

## 7. Waste



# Contents

- 7.1 Ireland: Municipal waste generated 2001-2010
- 7.2 EU: Municipal waste generated 2010
- 7.3 Ireland: Municipal waste sent to landfill 2001-2010
- 7.4 EU: Municipal waste sent to landfill 2010
- 7.5 Ireland: Recovery of packaging waste 2001-2010
- 7.6 EU: Recovery of packaging waste 2009
- 7.7 Ireland: Electrical waste collected 2007-2010
- 7.8 EU: Electrical waste collected from private households 2008
- 7.9 Ireland: Collection of construction and demolition waste 2004-2010

*Photographs: Baled steel and aluminium cans, paper recycling and mixed dry recycling process, courtesy of Thornton's recycling*

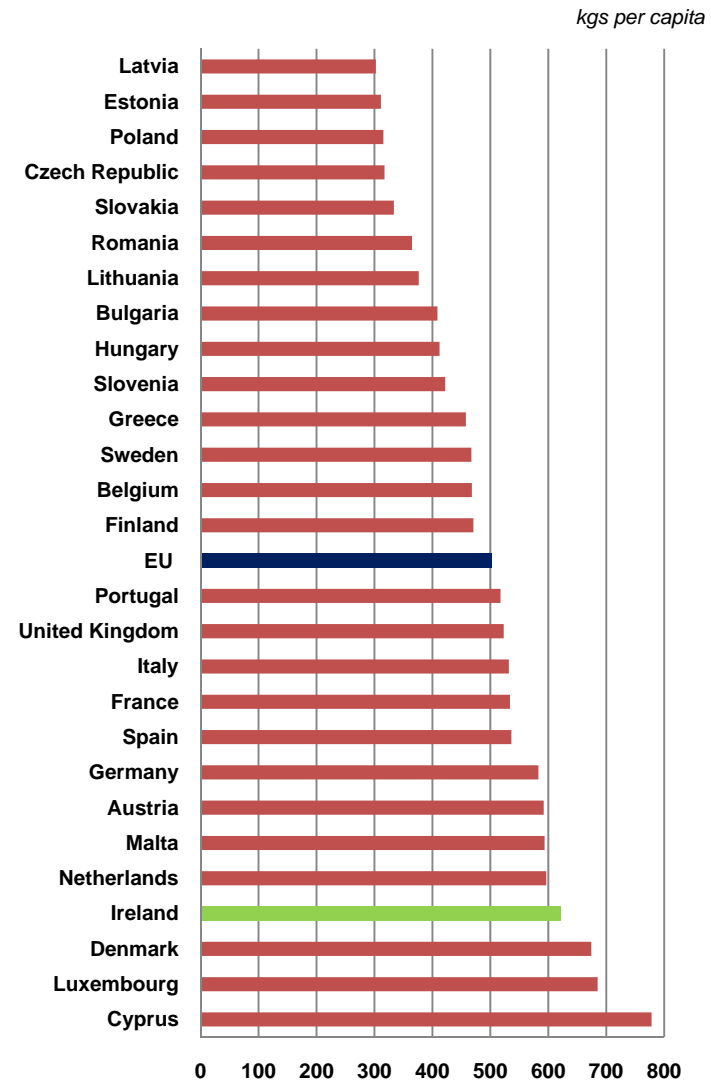
## 7.1 Ireland: Municipal waste generated 2001-2010

000 tonnes				
Year	Municipal waste	% change	kgs per capita	% change
2001	2,704	:	690	:
2002	2,720	0.6%	690	0.0%
2003	2,918	7.3%	750	8.7%
2004	3,001	2.8%	740	-1.3%
2005	3,041	1.3%	740	0.0%
2006	3,385	11.3%	800	8.1%
2007	3,398	0.4%	780	-2.5%
2008	3,224	-5.1%	730	-6.4%
2009	2,953	-8.4%	660	-9.6%
2010	2,846	-3.6%	620	-6.1%

Source: Environmental Protection Agency

- Municipal waste generated in Ireland was at its highest in 2007, when there were 3.4 million tonnes, compared with 2.7 million tonnes in 2001. It has fallen each year since 2007 and there were just over 2.8 million tonnes generated in 2010. Waste generated per capita declined by 180 kgs in the 2006-2010 period.
- Ireland had the fourth highest level of municipal waste per capita in 2010. The lowest level of waste generation per capita was in Latvia with 302 kgs, while Cyprus had the highest level at 778 kgs per capita. The EU average for municipal waste generated in 2010 was 503 kgs per capita.

## 7.2 EU: Municipal waste generated 2010



Source: Eurostat



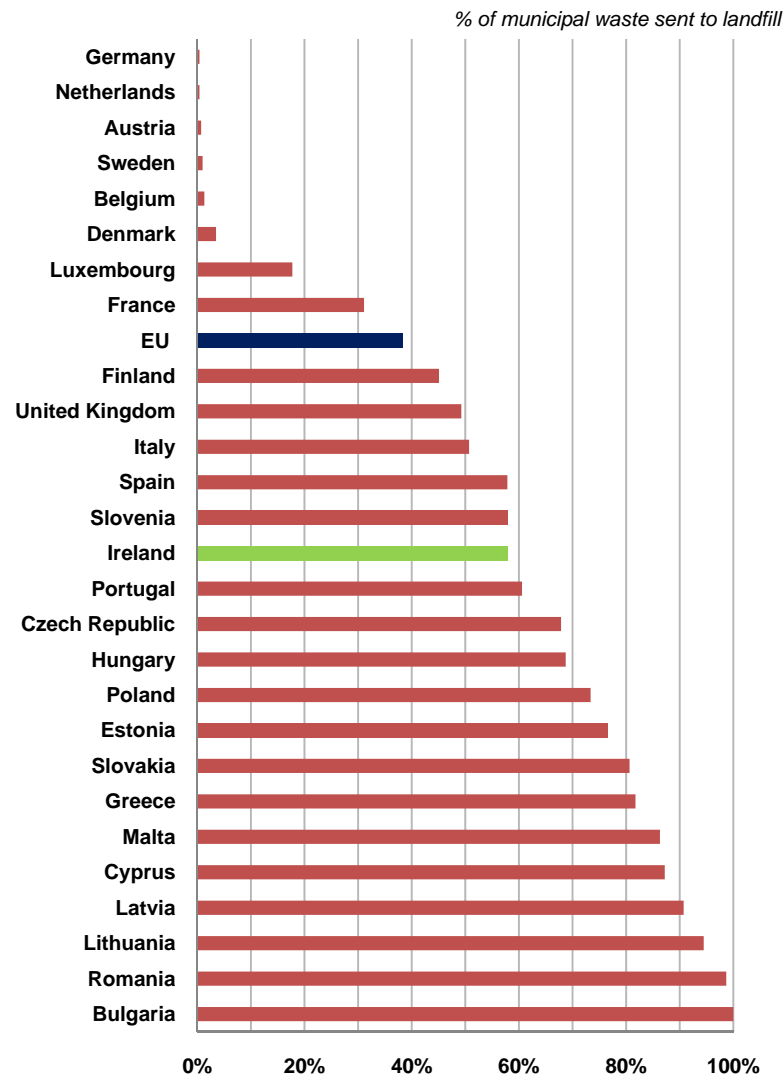
### 7.3 Ireland: Municipal waste sent to landfill 2001-2010

000 tonnes				
Year	Waste managed	Waste sent to landfill	% change	Municipal waste disposal rate
2001	2,390	1,992	:	87%
2002	2,559	1,902	-4.5%	80%
2003	2,559	1,833	-3.6%	72%
2004	2,704	1,819	-0.8%	67%
2005	2,779	1,833	0.8%	66%
2006	3,100	1,981	8.0%	64%
2007	3,175	2,015	1.7%	64%
2008	3,104	1,939	-3.8%	63%
2009	2,825	1,724	-11.1%	61%
2010	2,580	1,496	-13.2%	58%

Source: Environmental Protection Agency

- The amount of municipal waste sent to landfill was between 1.8 and 2 million tonnes between 2001 and 2008, but it fell sharply in both 2009 and 2010 to 1.5 million tonnes. The main reason for the fall is the overall reduction in waste generated due to the economic downturn.
- The disposal rate of municipal waste, which is the amount sent to landfill as a proportion of the amount of waste managed, has fallen every year since 2001. However, at 58%, Ireland was above the EU average of 38% for the municipal waste disposal rate in 2010.
- EU Member States such as Germany, Netherlands, Austria, and Sweden send little or no waste to landfill, as waste disposal in these countries is based almost entirely upon incineration.

### 7.4 EU: Municipal waste sent to landfill 2010



Source: Eurostat



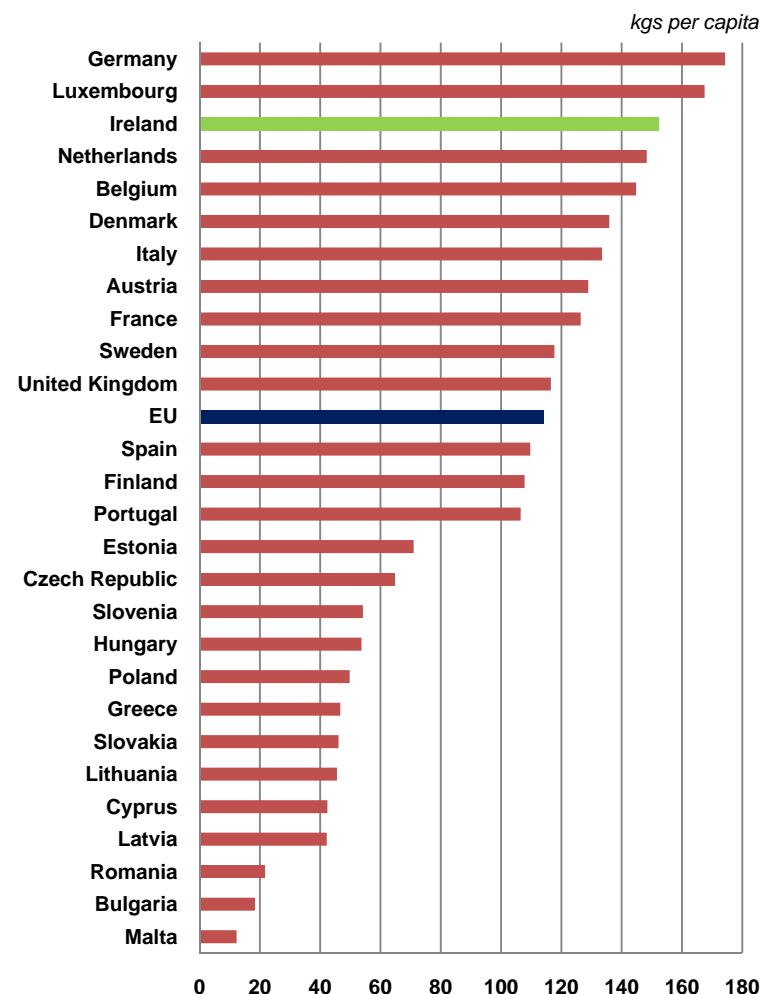
## 7.5 Ireland: Recovery of packaging waste 2001-2010

000 tonnes			
Year	Managed	Recovered	Recovery rate
2001	873	221	25%
2002	899	296	33%
2003	1,006	420	42%
2004	851	480	56%
2005	925	555	60%
2006	1,028	590	57%
2007	1,056	672	64%
2008	1,027	664	65%
2009	972	680	70%
2010	864	637	74%

Source: Environmental Protection Agency

- Over the past decade, Ireland has substantially increased its rate of recovery of packaging waste such as cardboard, paper, glass, plastic, steel, aluminium and wood. The Packaging Directive (94/62/EC) target of 50% set for 2005 was reached in 2004 and the 2011 target of 60% has been exceeded since 2007.
- By 2010, the recovery rate for packaging waste had reached 74%.
- In 2009, Ireland recovered 152 kgs of packaging waste per capita, which was the third highest level in the EU.

## 7.6 EU: Recovery of packaging waste 2009



Note: Malta data refers to 2007  
Source: Eurostat

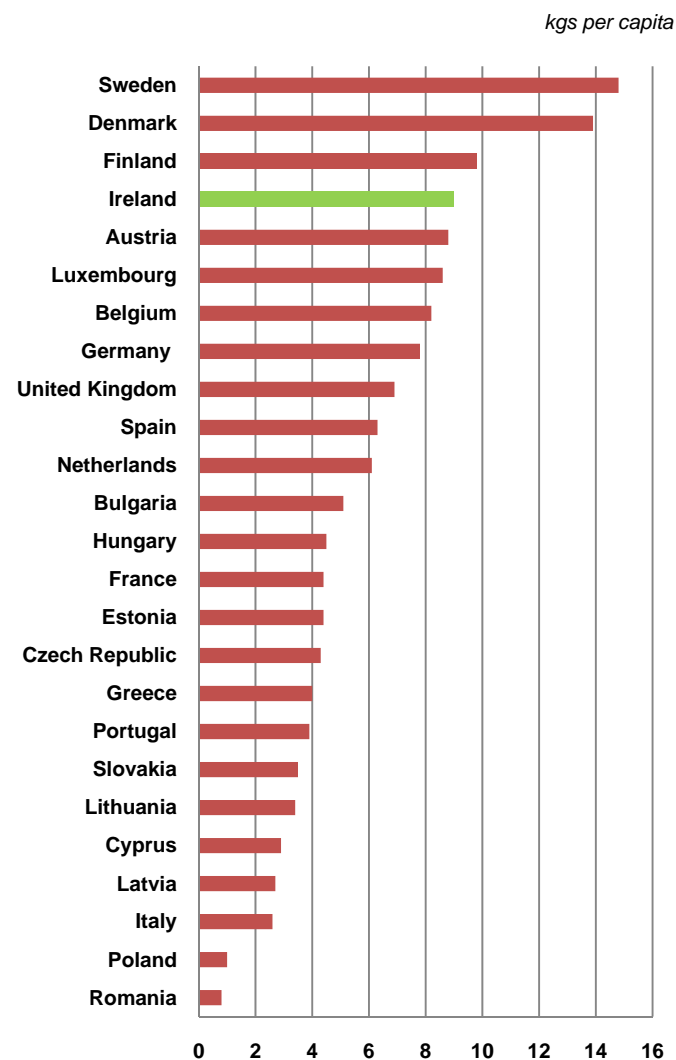
### 7.7 Ireland: Electrical waste collected 2007-2010

Year	% of total					tonnes
	Large household appliances	Fridges and freezers	TVs and monitors	Lighting equipment	Other WEEE	
2007	50%	13%	13%	1%	23%	51,294
2008	44%	13%	14%	1%	28%	51,965
2009	38%	14%	15%	1%	33%	45,327
2010	36%	14%	14%	2%	34%	45,012

Source: Environmental Protection Agency

- The proportion of fridges and freezers in the total Waste Electrical and Electronic Equipment (WEEE) has been steady at around 14% between 2007 and 2010, while large household appliances, such as washing machines and cookers have fallen from 50% of the total to 36% in the same period.
- There has been an increase in the proportion of other WEEE between 2007 and 2010 from 23% to 34%.
- Expressed in kgs per capita, Ireland had the fourth highest level of WEEE collected from private households in 2008, behind only the three Scandinavian Member States. At 9 kgs per capita, this is more than twice the 4 kgs per capita specified by the WEEE Directive.

### 7.8 EU: Electrical waste collected from private households 2008



Note: Data not available for Malta and Slovenia  
Source: Eurostat

## 7.9 Ireland: Collection of construction and demolition waste 2004-2010

000 tonnes				
Year	Soil and stones	Other construction and demolition waste	Total	% change
2004	8,492	2,676	11,168	:
2005	12,646	2,286	14,931	34%
2006	13,883	2,937	16,820	13%
2007	13,560	4,232	17,792	6%
2008	10,537	2,986	13,523	-24%
2009	3,771	1,323	5,094	-62%
2010	2,517	947	3,465	-32%

Source: Environmental Protection Agency

- The collection of construction and demolition waste increased from 11.2 million tonnes in 2004 to almost 17.8 million tonnes in 2007. The amount collected fell substantially between 2007 and 2010, when only 3.5 million tonnes were collected, reflecting the decline in the building industry over that period.



## 8. Biodiversity and Heritage

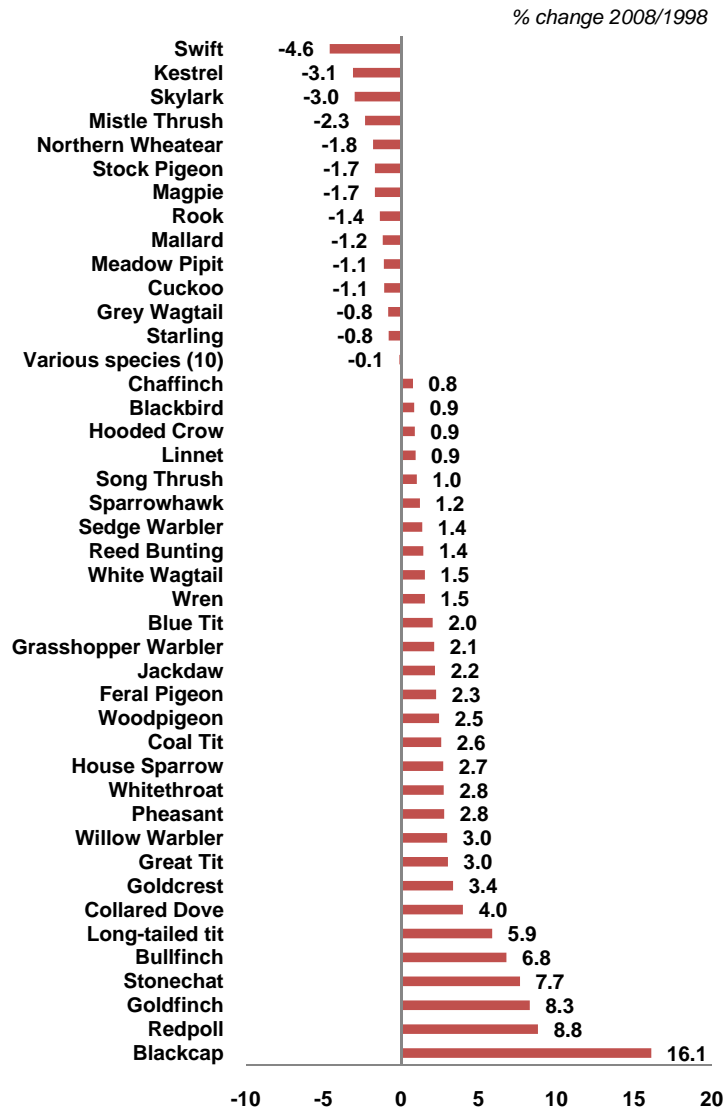


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- 8.1 Ireland: Countryside birds 1998-2008
- 8.2 EU: Common farmland birds 2008
- 8.3 EU: Protected areas under EU Birds Directive 2010
- 8.4 EU: Protected areas under EU Habitats Directive 2010
- 8.5 Ireland: National monuments 2010
- 8.6 Ireland: Record of protected structures 2011

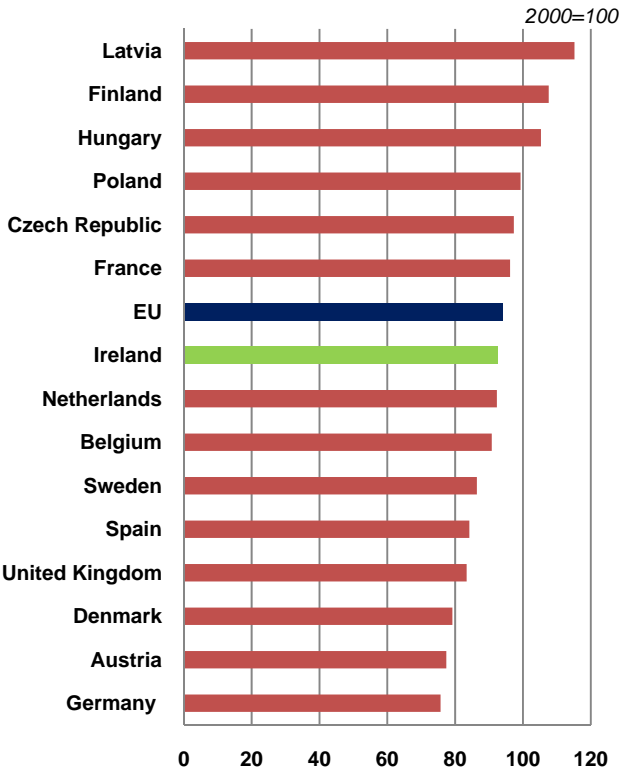
*Photographs: Cahir Abbey, courtesy of Gerry Brady; Sparrow hawk, courtesy of Paul Molony; Grey partridges at Lough Boora parklands complex, Co. Offaly, courtesy of Thomas Egan, Bord na Mona*

8.1 Ireland: Countryside birds 1998-2008



Source: Birdwatch Ireland

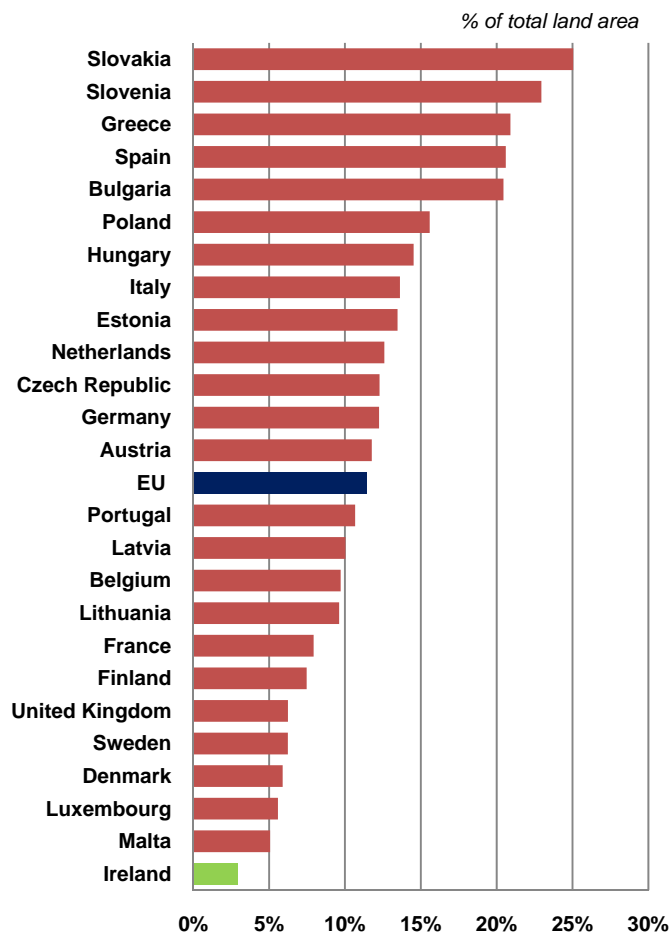
8.2 EU: Common farmland birds 2008



Note: Data available for 15 EU Member States  
Source: Eurostat

- Of a total of 52 bird species surveyed over the 1998-2008 period, of which 42 are shown in graph 8.1, eight were found to be in decline, 22 were increasing, and 22 were stable. The biggest increases were in blackcaps and redpolls, while swifts and kestrels showed the biggest declines.
- Of the 15 countries for which there were data available in 2008 on 36 species of common farmland birds, Ireland's index relative to 2000, at 92.4, was slightly lower than the average index for the EU of 94.

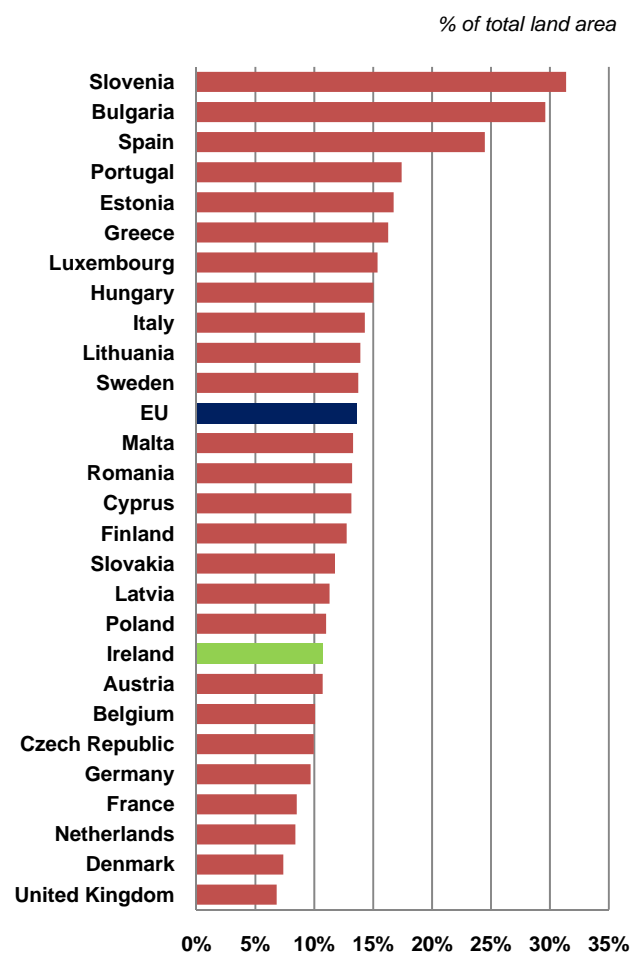
### 8.3 EU: Protected areas under EU Birds Directive 2010



Note: Data not available for Romania  
Source: European Commission

- Ireland, at 3%, had the smallest area designated as a Special Protected Area under the EU Birds Directive in 2010. The EU average was 11.4%.

### 8.4 EU: Protected areas under EU Habitats Directive 2010

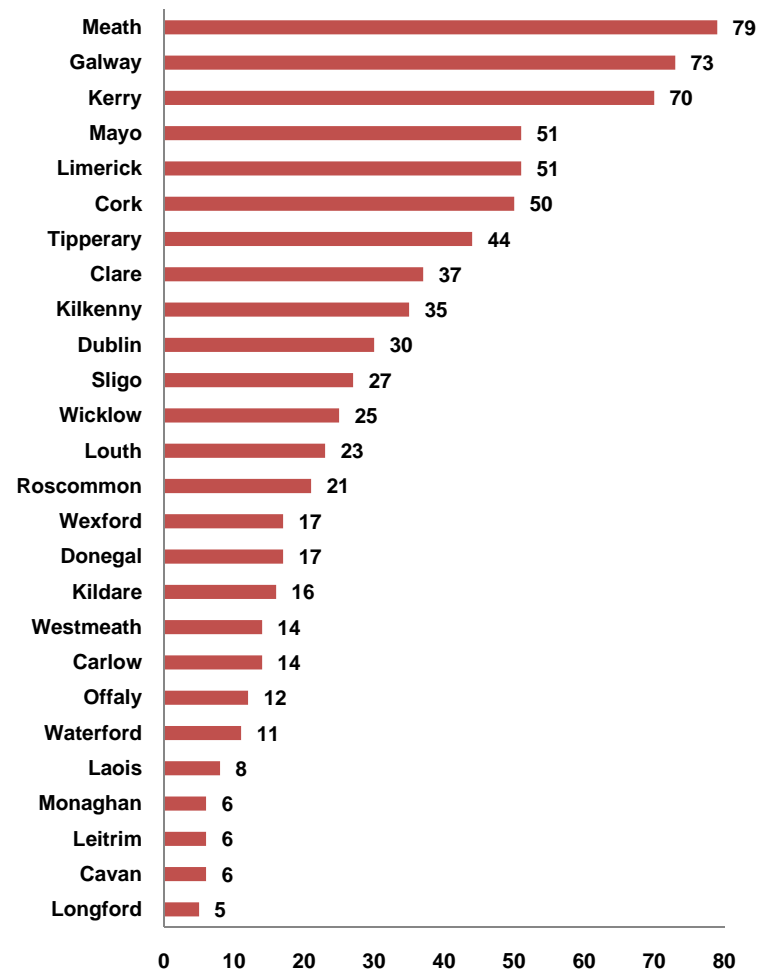


Source: European Commission

- In 2010, Ireland had 10.7% of its land area designated as a Special Protected Area under the EU Habitats Directive. This was the ninth smallest proportion of land area in the EU. The EU average was 13.7%.



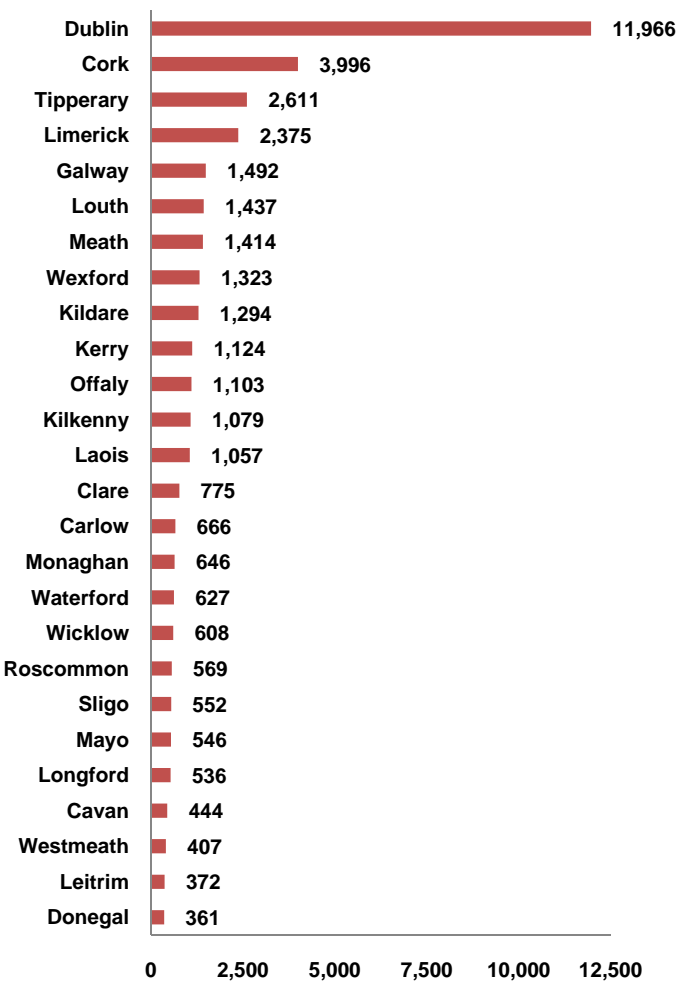
8.5 Ireland: National monuments 2010



Source: Office of Public Works

- Ireland had 749 national monuments in 2010. County Meath had the highest number with 79.

8.6 Ireland: Record of protected structures 2011



Source: Department of Arts, Heritage and the Gaeltacht (Heritage Ireland)

- There were 39,380 protected structures recorded in Ireland in May 2011. Of these 11,966 or 30% were in Dublin.



## 9. Environmental Economy



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- 9.4 Ireland: Wholesale price index for energy products 2000-2011
- 9.5 Ireland: Consumer price index for energy products 1980-2011
- 9.6 EU: Harmonised index of consumer prices for energy products 2011
- 9.7 Ireland: Resource productivity 1999-2008
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- 9.9 Ireland: Sea fishery landings 1990-2010
- 9.10 EU: Sea fishery landings 2009
- 9.11 Ireland: Imports and exports of fuels 2000-2011
- 9.12 EU: Imports of fuels 2010

*Photographs: Mussels and Sea fishing in Castletownbere, Co. Cork, courtesy of Eleanor Buckley, Sea Fisheries Protection Authority*

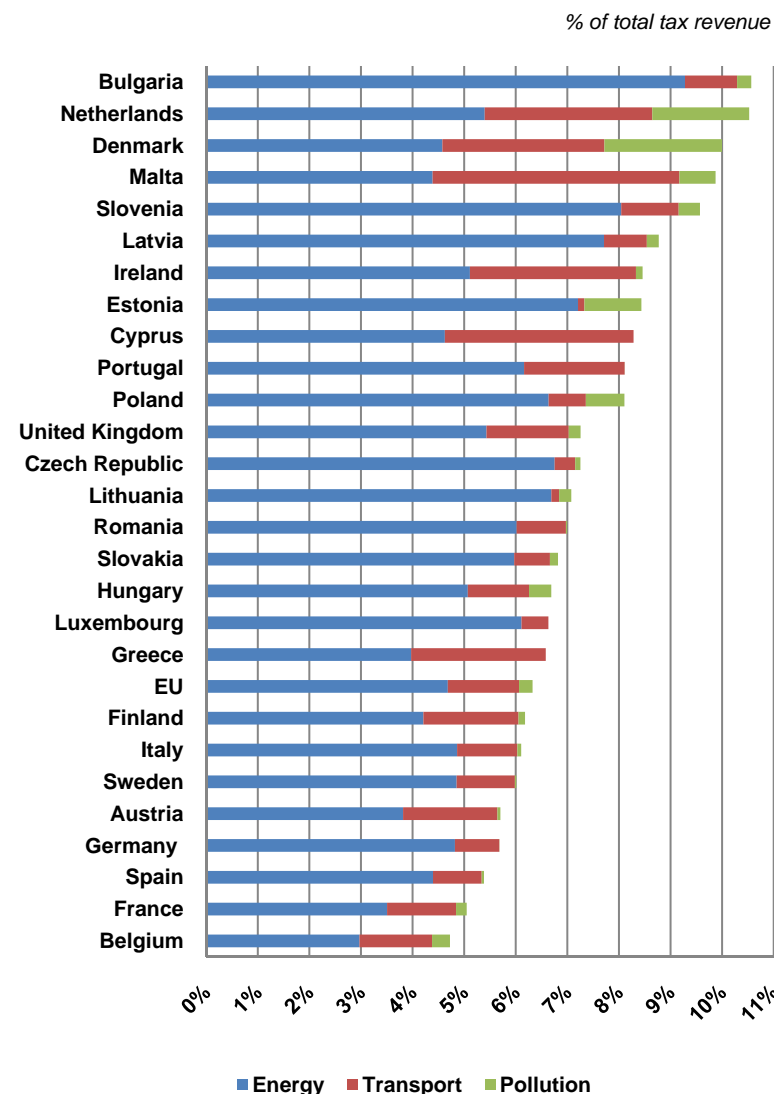
## 9.1 Ireland: Environmental tax revenue 2005-2010

	€ million					
Tax	2005	2006	2007	2008	2009	2010
Duty on imported mineral hydrocarbon light oil	701	699	701	683	778	644
Duty on other imported oil	725	755	742	744	767	745
Duty on mineral hydrocarbon light oil (home)	301	328	350	364	297	338
Duty on other oil (home)	321	363	411	379	350	348
Duty on motor vehicle parts & accessories (VRT)	1,149	1,287	1,406	1,121	375	383
NORA petroleum levy receipts	36	37	47	81	93	140
Motor vehicle duties	802	880	957	1,060	1,058	1,024
Environment fund levies	46	52	55	60	56	61
Levies under the petroleum & mineral development acts	5	12	5	10	2	3
Vehicle & driving licence expenses	5	5	5	5	5	5
Carbon tax	-	-	-	-	-	223
Air travel tax	-	-	-	-	84	105
<b>Total</b>	<b>4,090</b>	<b>4,417</b>	<b>4,678</b>	<b>4,507</b>	<b>3,866</b>	<b>4,018</b>
% change		8.0%	5.9%	-3.7%	-14.2%	3.9%

Sources: CSO, Revenue Commissioners

- Environmental taxation revenue rose between 2005 and 2007 before falling sharply in 2009. The fall was due in large part to the collapse in new car sales which coincided with the onset of the economic downturn in 2008 and significantly reduced revenue from Vehicle Registration Tax (VRT) following the change to the calculation of VRT based on the emission rating of the vehicle. Revenue increased by almost 4% in 2010, due to the introduction of the carbon tax which yielded €223 million.
- Environmental taxes accounted for 8.5% of Ireland's total tax revenues in 2009. This was the seventh highest percentage in the EU and is above the EU average of 6.3%.

## 9.2 EU: Environmental tax revenue 2009



Source: Eurostat

### 9.3 Ireland: General government environmental expenditure 2000-2010

€m			
Year	Subsidies	Capital transfers	Total
2000	61	0	61
2001	43	1	43
2002	20	8	27
2003	79	13	92
2004	64	26	91
2005	96	15	111
2006	134	18	152
2007	94	71	165
2008	157	18	175
2009	168	23	191
2010	153	49	202

Source: CSO

- Environmental subsidies in Ireland are entirely comprised of subsidies for the protection of the environment, also known as the Rural Environment Protection Scheme (REPS). These payments, mainly made to the agricultural sector, have increased from €61 million in 2000 to €153 million in 2010.

### 9.4 Ireland: Wholesale price index for energy products 2000-2011

2005=100

Year	Petrol	Auto-diesel	Gas oil	Fuel oil	Petroleum fuels	Electricity	Energy products
2000	80	78	73	77	78	69	73
2001	77	68	70	75	74	71	72
2002	80	72	66	76	74	78	77
2003	82	76	70	80	78	83	82
2004	91	86	78	79	82	90	88
2005	100	100	100	100	100	100	100
2006	108	106	111	115	112	107	109
2007	113	109	112	120	116	120	118
2008	122	127	140	149	141	122	128
2009	117	107	103	125	117	121	120
2010	133	125	125	152	141	115	123
2011	145	139	142	173	158	115	129

Source: CSO

- Wholesale prices of all fuel types increased substantially between 2000 and 2008 before falling in 2009. However, most prices increased again in 2010 and 2011. In particular, fuel oil has increased in price by over 100%. Electricity prices have shown the smallest overall increase since 2000 and fell by 4.5% between 2009 and 2010.

## 9.5 Ireland: Consumer price index for energy products 1980-2011

December 2006=100

Year	Electricity	Gas	Natural gas	Liquid fuels	Solid fuels	Heat energy	Petrol	Diesel	Motor oil
1980	38	33	54	33	32	33	33	35	31
1985	66	60	86	64	58	60	68	75	62
1990	64	64	77	53	62	60	65	67	61
1995	65	69	77	48	69	63	63	67	67
2000	68	75	77	75	78	71	87	83	80
2001	68	77	77	74	84	73	80	73	85
2002	74	77	77	68	87	75	83	76	87
2003	83	82	82	70	90	81	84	79	92
2004	88	86	86	78	93	86	92	87	95
2005	100	100	100	100	100	100	100	100	100
2006	104	126	128	110	108	110	107	105	106
2007	116	140	140	109	117	118	108	106	115
2008	119	141	139	138	128	128	116	122	120
2009	121	145	141	94	137	121	107	100	123
2010	116	129	122	123	134	123	126	120	125
2011	124	138	130	153	135	134	143	140	129

Source: CSO

- The consumer price index for petrol and diesel increased by 16% and 22% respectively between 2005 and 2008. Prices then fell in 2009, before increasing again in 2010 and 2011.
- The rate of price increase of electricity has slowed in recent years. Prices increased by 47% between 2000 and 2005, but have only risen by 24% between 2005 and 2011.
- In 2011, Ireland had the eleventh lowest increase of 39% in consumer prices of energy goods in the EU since 2005.

## 9.6 EU: Harmonised index of consumer prices for energy products 2011

2005=100

Country	Electricity	Gas	Liquid fuels	Solid fuels	Heat energy	Energy
Latvia	203	210	:	176	226	197
Lithuania	151	209	139	232	214	181
Hungary	148	228	:	165	150	170
Greece	133	160	179	125	:	170
Estonia	133	221	166	193	217	169
United Kingdom	166	200	196	169	:	168
Malta	203	248	:	:	:	165
Romania	134	174	150	137	202	159
Cyprus	166	167	137	101	:	151
Poland	148	166	140	163	131	146
Spain	149	143	146	:	:	146
Slovenia	146	168	161	142	166	145
Finland	163	:	184	:	160	143
Czech Republic	147	163	127	164	143	143
Belgium	140	154	165	118	:	143
EU	136	148	154	148	140	141
Bulgaria	123	155	158	153	152	140
Ireland	124	138	153	135	134	139
Portugal	129	134	157	108	:	136
Germany	140	124	152	122	132	133
Luxembourg	116	155	157	107	144	133
Austria	121	131	148	119	122	131
France	115	148	150	117	163	131
Slovakia	121	130	:	140	141	131
Denmark	127	115	152	125	120	130
Sweden	136	156	145	109	114	129
Italy	121	126	131	105	:	128
Netherlands	97	128	:	:	:	121

Source: Eurostat



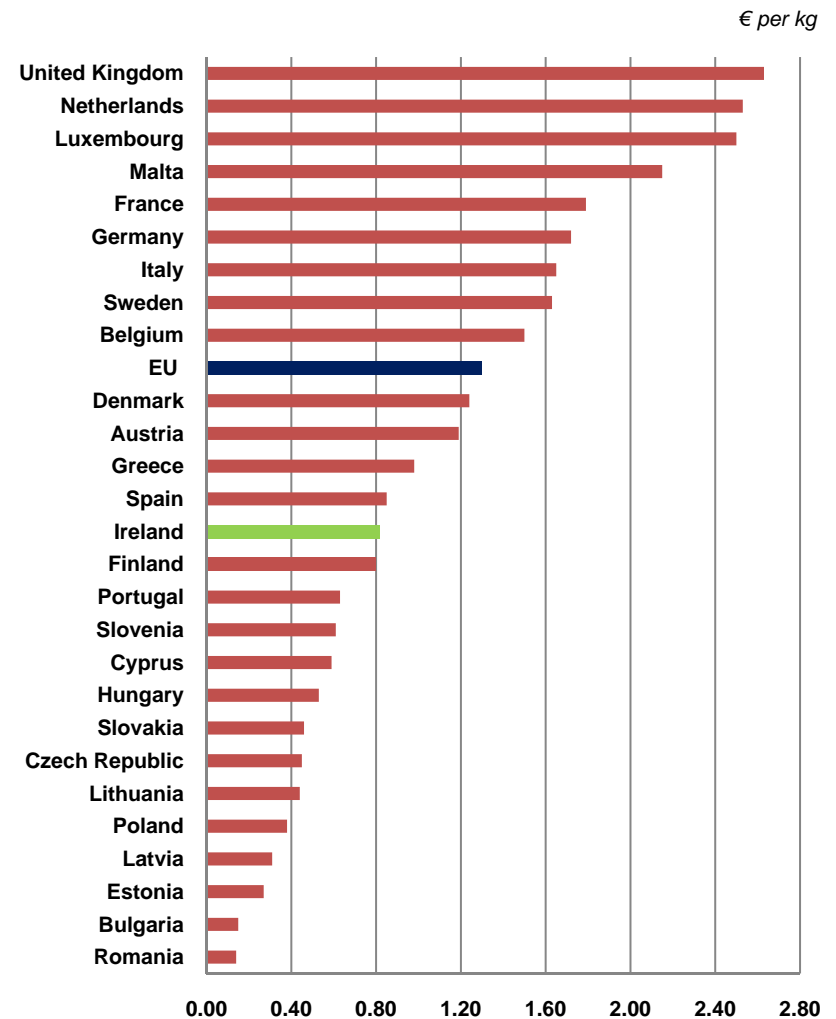
### 9.7 Ireland: Resource productivity 1999-2008

Year	Domestic material consumption <i>000 tonnes</i>	GDP at current market prices <i>€ billion</i>	Resource productivity <i>€ per kg</i>
1999	150,800	91.4	0.61
2000	165,700	105.9	0.64
2001	175,900	118.1	0.67
2002	175,400	131.3	0.75
2003	185,100	141.0	0.76
2004	191,100	150.6	0.79
2005	202,900	163.4	0.81
2006	219,800	178.3	0.81
2007	231,500	190.0	0.82
2008	147,000	180.0	1.22

Source: CSO

- Resource productivity has increased steadily between 1999 and 2007 in Ireland, but then grew by almost 50% between 2007 and 2008 as the level of building and construction activity decreased. While GDP fell by 5%, domestic material consumption dropped by 36.5%, thus leading to the large increase in resource productivity.
- Ireland's resource productivity in 2007 was below the EU average of €1.30 per kg.

### 9.8 EU: Resource productivity 2007



Source: Eurostat



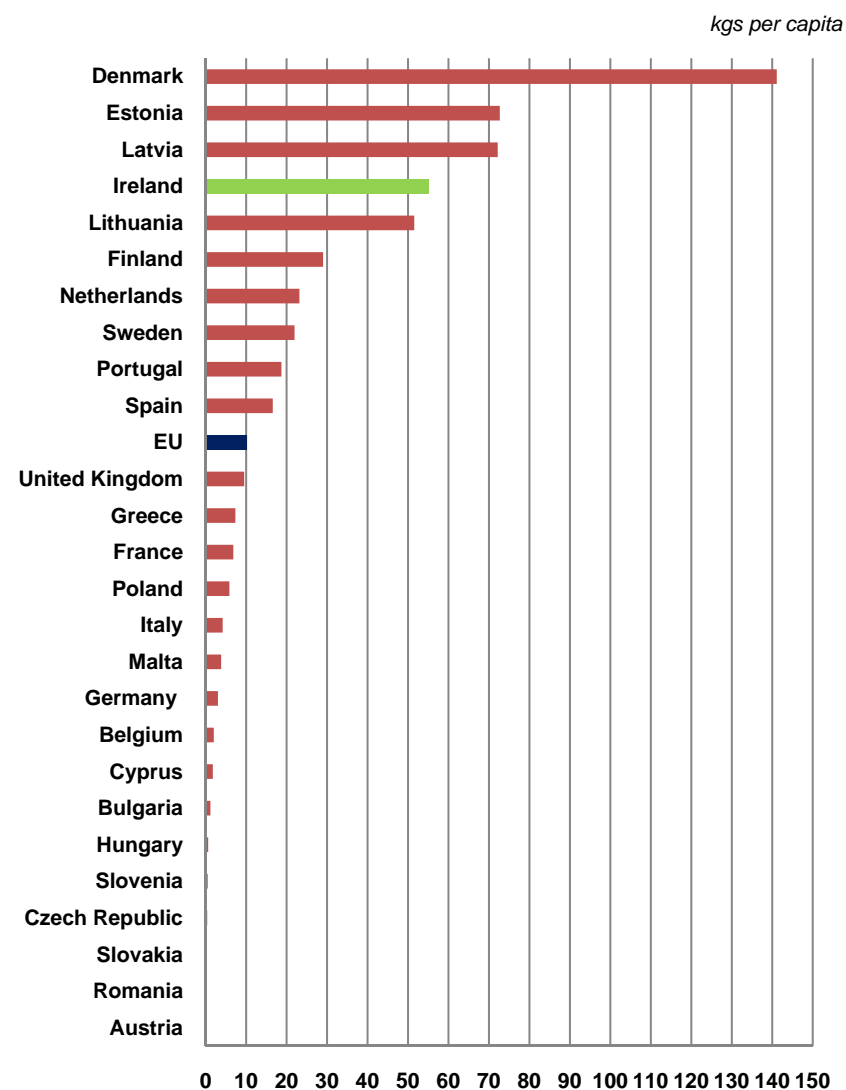
### 9.9 Ireland: Sea fishery landings 1990-2010

Year	live weight (000 tonnes)					Average annual % change
	Demersal	Deepwater	Pelagic	Shellfish	Total	
1990	28.4		109.7	28.4	166.5	:
1995	46.2		305.5	32.3	384.0	18.2%
2000	36.7		206.3	29.5	272.5	-6.6%
2001	35.8	6.3	214.2	64.3	320.6	17.7%
2002	31.7	8.2	180.4	62.4	282.8	-11.8%
2003	29.0	3.3	198.2	68.1	298.6	5.6%
2004	27.0	3.0	226.8	63.8	320.5	7.3%
2005	26.0	2.3	218.6	44.5	291.4	-9.1%
2006	25.9	1.7	192.3	52.0	271.9	-6.7%
2007	42.3	0.7	146.1	25.7	214.8	-21.0%
2008	37.0	0.7	162.3	22.7	222.7	3.7%
2009	50.2	0.8	149.1	22.3	222.3	-0.2%
2010	56.2	0.5	164.5	24.8	246.0	10.6%

Sources: 1990-2000 Department of Marine and Natural Resources,  
2001-2010 Sea Fisheries Protection Authority

- Sea fishery landings fell from a high in 1995 of 384,000 tonnes to 215,000 tonnes in 2007. There has been a recovery since 2007, with almost 246,000 tonnes landed in 2010.
- In 2009, Ireland's sea fishery landings were the fourth highest per capita in the EU, with 55.3 kgs of fish caught per head of population.

### 9.10 EU: Sea fishery landings 2009



Source: Eurostat

## 9.11 Ireland: Imports and exports of fuels 2000-2011

Year	Imports				€ million
	Coal, coke and briquettes	Petroleum	Gas	Electricity	
2000	4%	84%	12%	0%	2,300
2001	7%	78%	15%	0%	2,219
2002	7%	79%	13%	1%	1,932
2003	6%	81%	11%	1%	1,969
2004	7%	80%	11%	2%	2,814
2005	4%	82%	12%	1%	4,021
2006	4%	81%	14%	1%	4,720
2007	3%	78%	18%	1%	5,728
2008	3%	75%	21%	1%	6,594
2009	4%	74%	20%	1%	4,445
2010	3%	77%	20%	0%	5,601
2011	3%	76%	20%	1%	6,767

Exports					
2000	14%	85%	1%	0%	285
2001	18%	81%	1%	0%	297
2002	18%	80%	2%	0%	362
2003	30%	67%	1%	1%	202
2004	15%	81%	2%	3%	400
2005	10%	85%	2%	3%	616
2006	13%	78%	4%	6%	562
2007	9%	87%	1%	3%	686
2008	7%	91%	1%	1%	832
2009	9%	90%	1%	0%	595
2010	6%	92%	2%	0%	1,028
2011	5%	92%	3%	0%	1,351

Source: CSO and VIMA

- Ireland's imports of fuel have increased from €2.3 billion in 2000 to almost €6.8 billion in 2011.
- Imports of petroleum represented 76% of the total value of our fuel imports in 2010. This was the 15th highest proportion among EU countries.

## 9.12 EU: Imports of fuels 2010

% of total fuel imports value

Country	Coal, coke and briquettes	Petroleum	Gas	Electricity
Hungary	4%	52%	35%	10%
Slovakia	12%	53%	34%	1%
Czech Republic	5%	55%	30%	10%
Latvia	1%	58%	33%	8%
Italy	4%	62%	30%	4%
Austria	6%	64%	24%	7%
Germany	5%	66%	27%	2%
Slovenia	2%	71%	15%	12%
Belgium	3%	72%	23%	1%
France	4%	73%	22%	2%
Finland	7%	74%	12%	7%
EU	4%	74%	19%	2%
Bulgaria	6%	76%	18%	1%
Ireland	3%	76%	20%	0%
United Kingdom	5%	77%	17%	1%
Romania	7%	78%	14%	1%
Spain	3%	78%	19%	0%
Portugal	2%	79%	17%	2%
Lithuania	1%	81%	14%	5%
Poland	9%	82%	7%	2%
Sweden	4%	83%	7%	6%
Estonia	0%	86%	10%	3%
Denmark	2%	88%	1%	9%
Greece	1%	90%	8%	2%
Netherlands	5%	92%	1%	1%
Cyprus	0%	97%	3%	0%
Malta	0%	99%	1%	0%
Luxembourg	1%	99%	1%	0%

Source: Eurostat

# Appendices

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## Appendix 1 Definitions and notes

### Domain 1 – Air

#### Particulate matter (1.1 and 1.2)

There are many sources of **particulate matter** (dust) including vehicle exhaust emissions, soil and road surfaces, construction works and industrial emissions. Particulate matter can be formed from reactions between different pollutant gases. Small particles can penetrate the lungs and cause damage. These are known as PM<sub>10</sub> (diameter less than 10µm) and PM<sub>2.5</sub> (diameter less than 2.5µm). There are high levels of PM<sub>10</sub> in many cities and towns. In smokeless fuel zones, levels of particulate matter decreased after the ban on bituminous coal in Dublin in 1990 and extended to other parts of Ireland subsequently.

PM<sub>2.5</sub> has similar effects on health as PM<sub>10</sub>. However, PM<sub>2.5</sub> is a better indicator of anthropogenic (man-made) emissions than PM<sub>10</sub>. Fine particulate matter PM<sub>2.5</sub> is responsible for significant negative impacts on human health. Further, there is as yet no identifiable threshold below which PM<sub>2.5</sub> would not pose a risk.

#### National Emissions Ceiling 2010 Directive (1.3 to 1.10)

Directive 2001/81/EC of the European Parliament and the Council on National Emission Ceilings for certain pollutants (NEC Directive) sets upper limits for each Member State for the total emissions in 2010 of the four pollutants responsible for acidification, eutrophication and ground-level ozone pollution (sulphur dioxide, nitrogen oxides, volatile organic compounds and ammonia), but leaves it largely to the Member States to decide which measures – on top of Community legislation for specific source categories - to take in order to comply. Ireland's limits are as follows:

- Sulphur dioxide (SO<sub>2</sub>) 42 kilotonnes
- Nitrogen Oxides (NO<sub>x</sub>) 65 kilotonnes
- NMVOC's 55 kilotonnes
- Ammonia (NH<sub>3</sub>) 116 kilotonnes

#### Sulphur dioxide (1.3 and 1.4)

The main source of **sulphur dioxide** in Ireland is burning coal and oil to heat homes and industries and to produce electricity. It is an irritant gas which attacks the throat and lungs. Prolonged exposure can lead to increases in respiratory illnesses like chronic bronchitis. It contributes to the formation of acid rain which damages vegetation and buildings.

Levels have decreased over recent years due to increased use of low-sulphur "smokeless" coal, increased use of natural gas instead of solid fuels and reduced industrial emissions through Integrated Pollution Control (IPC) licensing.

#### Nitrogen oxides (1.5 and 1.6)

Emissions from traffic are the main source of **nitrogen oxides** in Ireland along with electricity generating stations and industry. Nitrogen dioxide can affect the throat and lungs. The main effects are emphysema and cellular damage. It is also aesthetically unpleasant as it has a brown colour and gives rise to a brown haze. Oxides of nitrogen contribute to the formation of acid rain and of ozone. Levels in Ireland are moderate but are increasing due to growth in traffic numbers.

#### Ammonia (1.7 and 1.8)

**Ammonia** (NH<sub>3</sub>) emissions are associated with acid deposition and the formation of secondary particulate matter. The agriculture sector accounts for virtually all ammonia emissions in Ireland. Grasslands ultimately receive the bulk of the 40 million tonnes of animal manures produced annually in Ireland along with over 300,000 tonnes of nitrogen in fertilisers. A proportion of the nitrogen in these inputs is volatilised into the air as ammonia.

## Non-methane volatile organic compounds (1.9 and 1.10)

**Non-methane volatile organic compounds** (NMVOC's) are emitted as gases from the use of a wide array of products including paints, paint strippers, glues, adhesives and cleaning agents. Several constituents of gasoline are important NMVOCs, which are emitted by combustion and evaporation. NMVOCs also arise as a product of incomplete combustion of other fuels, especially solid fuels and as such there are significant emissions from residential fuel combustion. The principal environmental problem associated with NMVOC is their contribution to the formation of ground level ozone. Fugitive emissions are intentional or unintentional releases of gases from anthropogenic activities. Intentional or unintentional release of greenhouse gases may also occur during the extraction, processing and delivery of fossil fuels to the point of final use.

## Atmospheric deposition rates (1.11)

**Concentration** reflects the amount of the substance measured in rainfall. **Deposition** is an estimate of the amount that fell to earth; this is the amount that ecosystems receive. In a closed system, emissions of NO<sub>x</sub>, SO<sub>2</sub> and NH<sub>3</sub> in Ireland would combine with rainfall and fall back (deposit) on Irish soil. In reality, some travel long-distances and fall in other regions, similarly we receive some from other regions. However, the changes in emissions follow pan-European legislation so in general emissions of SO<sub>2</sub> and deposition of sulphate should follow a similar pattern. Knowing the concentration in rainwater and the rainfall volume provides an estimate of the total amount deposited (deposition). However, there is not 100% efficiency, i.e., not all air concentrations are dissolved into water.

## Ozone threshold exceedances (1.12 and 1.13)

The **ozone** layer is the Earth's natural sunscreen, filtering out harmful ultraviolet (UV) rays from the sun. UV rays can cause damage to humans and other forms of life.

Although the ozone layer is high up in the atmosphere, chemical substances used at the surface of the planet can damage it. If the ozone layer is damaged, UV rays can get through and cause damage to humans and other forms of life.

## Domain 2 – Greenhouse Gases and Climate Change

### Greenhouse gas emissions (2.1 to 2.7)

**Climate change** refers to significant change in the measures of climate, such as temperature, rainfall, or wind over a long period of time. Climate change is a natural phenomenon. However, the current phase of climate change is being accelerated by human activities that result in the emission of greenhouse gases. Greenhouse gases are those gases which contribute to the greenhouse effect. There are six greenhouse gases as follows:

- Carbon dioxide (CO<sub>2</sub>)
- Methane (CH<sub>4</sub>)
- Nitrous Oxide (N<sub>2</sub>O)
- Hydrofluorocarbons (HFC)
- Perfluorocarbons (PFC)
- Sulphur Hexafluoride (SF<sub>6</sub>)

Each of these gases is controlled by the global environmental agreement known as the Kyoto Protocol. Hydrofluorocarbons (HFC), Perfluorocarbons (PFC) and Sulphur Hexafluoride (SF<sub>6</sub>) are collectively known as fluorinated greenhouse gases and are further controlled by specific EU legislation.

Carbon dioxide is the most important of the greenhouse gases as it is currently responsible for just over 60% of the 'enhanced greenhouse effect'.

## Ireland's Kyoto Limit (2.1)

The baseline emissions total for Ireland is calculated as the sum of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions in 1990 and the contribution from fluorinated gases in 1995. The baseline value was established at 55.607 Mt CO<sub>2</sub> eq. following an in-depth review of Ireland's 2007 submission to the United Nations Framework Convention on Climate Change (UNFCCC) and results in total allowable emissions of 314.18 Mt CO<sub>2</sub> eq. in the commitment period 2008-2012 under the **Kyoto Protocol**. This equates to an average of 62.84 Mt CO<sub>2</sub> eq. per annum. Compliance with the Kyoto Protocol limit is achieved by ensuring that Ireland's total greenhouse gas emissions in the period 2008-2012, adjusted for any offsets from approved forest sinks as well as any surrender of purchased Kyoto Protocol credits, are below 314.18 Mt CO<sub>2</sub> eq. at the end of the five-years period.

## Average annual temperature and annual rainfall (2.8 and 2.9)

The thirty-years moving average shows the average temperature for a thirty year period. For example, the figure plotted at 1975 is the average temperature in the period 1961 to 1990, while the figure plotted at 1995 is the average temperature in the period 1981 to 2010.

## Domain 3 - Water

### Bathing water quality (3.1 and 3.2)

**Bathing water** assessment and classification according to EU Bathing Water Directive 2006/7

Bathing waters are classified as poor quality when microbiological enumerations are worse than the "sufficient" values set out in the directive.

#### For inland waters

Parameter	Excellent quality	Good quality	Sufficient
Intestinal enterococci (cfu/100 ml)	200 (*)	400 (*)	330 (**)
Escherichia coli (cfu/100 ml)	500 (*)	1 000 (*)	900 (**)

(\*) Based upon a 95 percentile evaluation.

(\*\*) Based upon a 90 percentile evaluation.

#### For coastal waters and transitional waters

Parameter	Excellent quality	Good quality	Sufficient
Intestinal enterococci (cfu/100 ml)	100 (*)	200 (*)	185 (**)
Escherichia coli (cfu/100 ml)	250 (*)	500 (*)	500 (**)

(\*) Based upon a 95 percentile evaluation

(\*\*) Based upon a 90 percentile evaluation

### Drinking water quality (3.3)

Escherichia coli (**E. coli**) are a bacteria that is an indicator of whether human or animal waste has entered a water supply.

Trihalomethanes (**THM**'s) are formed in drinking-water primarily as a result of chlorination of organic matter present naturally in raw water supplies. The rate and degree of THM formation increase as a function of the chlorine and humic acid concentration, temperature, pH and bromide ion concentration

### Urban waste water treatment (3.4)

The Urban Waste Water (UWW) regulations define an agglomeration as 'an area where the population and/or economic activities are sufficiently concentrated for urban waste water to be collected and conducted to an urban waste water treatment plant or to a final discharge point'. Normally there is one agglomeration with a waste water collection system treated by one waste water treatment plant. In the UWW report, the EPA report on villages, towns and cities with 500 people or more.

The Urban Waste Water Treatment Regulations 2001-2010 and the 1991 Urban Waste Water Treatment

Directive (UWWTD) set requirements on the provision of **waste water** collection systems and treatment plants, provide for the monitoring of waste water discharges and specify limits for certain parameters in the discharges.

The Regulations and UWWTD specify monitoring requirements and set limits on the concentration of biochemical oxygen demand, chemical oxygen demand and total suspended solids in waste water discharges from the larger urban areas. 57% (99 of the 174 larger urban areas) met all of the effluent quality standards and monitoring requirements in 2009. When all urban areas with secondary treatment plants are included, this figure reduces to 54%. If effluent from the areas with no treatment is included the compliance rate is 42%. Although 93% of urban waste water received secondary treatment or better, over one half of waste water treatment plants are not achieving the strict standards and guidelines set for effluent quality in the UWWTD.

In the 2006-2007 reporting period, almost 70% of secondary waste water treatment plants did not achieve the standards

### **River water quality (3.5)**

**River water** is the principal source of drinking water in Ireland. The Environmental Protection Agency (EPA) conducts an assessment of river water quality every three years on behalf of Local Authorities. Samples are taken from over 3,000 locations around Ireland. These biological surveys began in 1971. River water quality is classified into four quality classes based on a scheme of biotic indices, which codify the characteristic changes induced in flora and fauna of rivers and streams in the presence of pollution. Unpolluted waters include pristine waters and also waters of a less high but acceptable standard. Slightly polluted and moderately polluted waters are mainly characterised by eutrophication and may not be able to support fish survival. Seriously polluted waters are characterised by the presence of high concentrations of biodegradable organic waste. These waters are of very little beneficial use.

### **Nitrates in groundwater (3.6)**

**Nitrates** can cause serious problems when they end up in groundwater or surface water by causing increased growth of algae and eutrophication of water systems. The drop in oxygen that comes with the presence of nitrates can lead to fish kills. The problem stems from the practice of spreading animal wastes – which contain nitrates in high concentrations – on land to improve crops and pastures.

These pollutants can also affect humans. For example, when nitrates in our drinking water are metabolised in the stomach this can lead to the formation of nitrous amines, which are thought to be carcinogenic.

### **Chemical status of groundwater bodies (3.7)**

Groundwater monitoring programmes are required to provide a coherent and comprehensive overview of water status within each river basin, to detect the presence of long-term anthropogenically induced trends in pollutant concentrations and ensure compliance with Protected Area objectives. As stressed in the daughter Groundwater Directive, reliable and comparable methods for groundwater monitoring are an important tool for assessment of groundwater quality (and this is applicable to quantity as well). A groundwater body will be at good chemical status if the following criteria are satisfied:

- *General water quality*: The concentrations of pollutants should not exceed the quality standards applicable under other relevant Community legislation;
- *Impacts on ecosystems*: The concentration of pollutants should not be such as would result in failure to achieve the environmental objectives specified for associated surface waters nor any significant diminution of the ecological or chemical quality of such bodies nor in any significant damage to terrestrial ecosystems which depend directly on the groundwater body;
- *Saline intrusion*: The concentrations of pollutants should not exhibit the effects of saline or other intrusions as measured by changes in conductivity.

The Water Framework Directive (WFD) requires both surveillance and operational programmes to be established to provide the information needed to support the assessment of chemical status and identification and monitoring of pollutant trends.

The data on water bodies by count shows total numbers of all water bodies (including all horizons) assigned to a particular class of chemical status (either at country level or RBD level).

## **Domain 4 – Land Use**

### **Land use categories (4.1)**

#### **Forest Land**

Forest land is an area greater than one hectare which has a closed canopy of trees or where afforestation has been grant aided (though the canopy may not as yet be fully developed). It does not include Orchards or Hedgerows.

#### **Cropland**

Cropland is the CSO's annual estimate of crop areas based on survey returns.

#### **Grassland**

Grassland is the CSO's annual estimate of utilised agricultural areas based on survey returns, including pasture, silage, hay and rough grazing. It excludes grassland areas not reported as grazed.

#### **Exploited peatland**

Exploited peatland is based on Bord na Mona's assessment of their own land management practices extrapolated across the commercial peat extraction sector. It also includes an estimate of sod peat cutting based on Household Energy Consumption.

#### **Unexploited wetland**

Unexploited wetland is based on an extrapolation of the 1990 CORINE area of peatlands and wetlands adjusted to account for afforestation and other demands for land. There has also been some managed and unmanaged rewetting of exploited peatland.

Corine Land Cover (CLC) is a map of the European environmental landscape based on interpretation of satellite images. It provides comparable digital maps of land cover for each country for much of Europe. This is useful for environmental analysis and for policy makers.

Corine stands for *Coordination of Information on the Environment*. The EU established Corine in 1985 to create pan-European databases on land cover, biotopes (habitats), soil maps and acid rain.

#### **Settlement**

Settlement area is extrapolated from the 1990 CORINE area for urban and suburban land covers. Extrapolation is based on road completions, housing and other construction statistics. The original CORINE figure includes urban green areas (e.g. parks and leisure facilities). These are not included in the estimated of land use change.

#### **Other Land**

Other land is the residual area when all other land use types have been estimated. It is assumed to include rock and sand areas, natural grasslands and hedgerows (unless already reported under agricultural areas).



## Forest cover (4.2)

This is defined as land with a minimum area of 0.1 hectare, a minimum width of 20 metres, trees higher than 5 metres and a canopy cover of more than 20% within the forest boundary, or trees able to reach these thresholds *in situ*.

1. A tree is a woody perennial of a species forming a single main stem or several stems and having a definitive crown.
2. It includes windbreaks, shelterbelts and corridors of trees with an area of more than 0.1 hectares and minimum width of 20 metres.
3. Forest is determined both by the presence of trees/stumps and the absence of other predominant land-uses. Areas under reforestation that have not yet reached but are expected to reach a canopy cover of 20% and a minimum tree height of 5 metres are included, as are temporarily unstocked areas, resulting from human intervention or natural causes, which are expected to be restocked.
4. The forest area is determined by the forest boundary. The term forest boundary is defined by any man-made boundary enclosing the forest area or, in the absence of such boundary features; the boundary of the forest is determined by extending out 1 metre from the position of the pith-line of the outermost trees.
5. The forest area includes forest roads, firebreaks and other small open areas on forest land; forest in national parks, nature reserves and other protected areas such as those of specific scientific, historical, cultural or spiritual interest.
6. The forest area excludes tree stands in agricultural production systems, for example in fruit plantations and Christmas tree plantations.
7. The term also includes trees in urban parks and gardens, provided these areas satisfy the forest definition.

## Forest cover (4.3)

This is defined as land spanning more than 0.5 hectares with trees higher than 5 metres and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ*. It does not include land that is predominantly under agricultural or urban land use.

1. Forest is determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 metres *in situ*.
2. Includes areas with young trees that have not yet reached but which are expected to reach a canopy cover of 10 percent and tree height of 5 metres. It also includes areas that are temporarily unstocked due to clear-cutting as part of a forest management practice or natural disasters and which are expected to be regenerated within 5 years. Local conditions may, in exceptional cases, justify that a longer time frame is used.
3. Includes forest roads, firebreaks and other small open areas; forest in national parks, nature reserves and other protected areas such as those of specific environmental, scientific, historical, cultural or spiritual interest.
4. Includes windbreaks, shelterbelts and corridors of trees with an area of more than 0.5 hectares and width of more than 20 metres.
5. Includes abandoned shifting cultivation land with a regeneration of trees that have, or is expected to reach, a canopy cover of 10 percent and tree height of 5 metres.
6. Includes areas with mangroves in tidal zones, regardless of whether this area is classified as land area or not.
7. Includes rubber-wood, cork oak, energy wood and Christmas tree plantations.

8. Includes areas with bamboo and palms provided that land use, height and canopy cover criteria are met.
9. Excludes tree stands in agricultural production systems, such as fruit tree plantations (incl. olive orchards) and agro-forestry systems when crops are grown under tree cover.

#### **Public forest (4.4 and 4.5)**

Afforestation is land planted for the first time with trees – this is mainly Farm Partners. Reforestation is land planted for the 2nd or 3rd time with trees. The area clearfelled in any given year will not be reforested for up to 4 years after clearfelling. Therefore the area felled in 2010 is not the same land that was reforested in 2010. Clearfelling started towards the end of one year may continue into the following year. The category "Temporarily Unstocked/Being Restocked" refers to land that is felled and in the process of being reforested but the details of the restocking has not been captured by our inventory system.

Farm partners means that a farmer owns the land and Coillte manages the tree crop and shares in the profit.

The difference between the Forest Service reported public forest area of 400,334 hectares, and Coillte's reported 387,212 hectares is accounted for by bare land within the forest estate which has never been planted, but is still considered forest area.

#### **Organic agricultural land (4.6 and 4.7)**

**Organic farming** is a system of farming which avoids the use of soluble fertilisers, pesticides, growth regulators, feed additives and other chemicals. The organic farmer relies on the use of crop rotations, animal manure, clover, low stocking rates and good animal husbandry for producing outputs.

#### **Fertilisers (4.8 and 4.9)**

Well-structured soils that are rich in nutrients are said to be highly fertile. Given sufficient light, warmth and water, they will produce abundant crops. However, the nutrients removed by crops or feeding animals must be replaced or soil fertility will be run down.

Nutrients can be replaced by returning to the soil, plant, animal or human waste, such as sewage sludge, or by adding mineral fertilizers. To grow well, crops need a balanced supply of essential nutrients. The main nutrients are nitrogen, phosphorus and potassium. These and most other nutrients are normally dissolved in water in the soil.

#### **Livestock numbers (4.10)**

The data for cattle are obtained by the CSO from Department of Agriculture Food and the Marine's Animal Identification and Movement (AIM) system, formerly known as the Cattle Movement Monitoring System (CMMS). This system was introduced at the beginning of 2000 and involves electronically recording data on animal movements. Information on cattle numbers and on flows into and out of the cattle population has been available from this system since December 2002.

#### **House completions (4.12 and 4.13)**

**House completions** data series are based on the number of new dwellings, including apartments, connected by ESB Networks to the electricity supply. These represent the number of homes completed and available and do not reflect any work-in progress. ESB Networks have indicated that there was a higher backlog in work-in-progress in 2005 than usual (estimated as being in the region of 5,200 units). This backlog was cleared through the connection of an additional 2,000 houses in Quarter 1 2006 and 3,000 houses in Quarter 2 2006.

Local authority house completions do not include second-hand houses acquired by them. New units acquired under Part V, Planning & Development Acts 2000-2006 for local authority rental purposes are included.

Voluntary & co-operative housing consists of housing provided under the capital loan & subsidy and capital assistance schemes.

## Domain 5 – Energy

### Primary energy requirement and final energy consumption (5.1 to 5.3)

Total Primary Energy Requirement (TPER) is a measure of all energy consumed, including that consumed and/or lost in transformation and transmission/distribution processes (e.g. electricity generation transmission and distribution; oil refining).  $TPER = \text{Indigenous Production} + \text{Imports} - \text{Exports} - \text{Marine Bunkers} - \text{Stock Change}$ .

Total Final Consumption (TFC) represents the amount of energy consumed by the different sectors of the economy after all transformations have been completed. It also excludes any losses that may occur in this process or in the transmission of these secondary sources of energy. The processes are the generation of electricity, oil refining and the production of briquettes (production of secondary energies).

Derived heat covers the total heat production in heating plants and in combined heat and power plants. It includes the heat used by the auxiliaries of the installation which use hot fluid (space heating, liquid fuel heating, etc.) and losses in the installation/network heat exchanges. For auto-producing entities (entities generating electricity and/or heat wholly or partially for their own use as an activity which supports their primary activity) the heat used by the undertaking for its own processes is not included.

### Energy intensity (5.4)

**Energy intensity** of the economy is the ratio between the total primary energy requirement and the Gross Domestic Product. It measures the energy consumption of an economy and its overall energy efficiency.

**Gross Domestic Product (GDP)** is the central aggregate of National Accounts. GDP represents the total value added (output) in the production of goods and services in the country. GDP at market prices is the final result of the production activity of resident producer units. GDP is compiled both in constant prices and in current prices. Constant price data indicate the development of volumes, while current price data reflect volume and price movements.

The total primary energy requirement is calculated as the sum of the total primary energy requirement of the five types of energy: coal, electricity, oil, natural gas and renewable energy sources. In addition, each of these figures is calculated as an aggregation of different data on production, storage, trade (imports/exports) and consumption/use of energy. The GDP figures are taken at chain-linked volumes, reference year 2000 (at 2000 exchange rates).

The energy intensity ratio is the result of dividing the total primary energy requirement by the GDP. Since total primary energy requirement is measured in kgsoe (kilogram of oil equivalent) and GDP in 1000 EUR, this ratio is measured in kgsoe per 1000 EUR.

### Primary energy production and renewable energy (5.5 to 5.10)

**Production** refers to the quantities of fuels extracted or produced, calculated after any operation for removal of inert matter or impurities (e.g. sulphur from natural gas). It refers only to indigenous production of fuels in Ireland.

**Peat** is a combustible soft, porous or compressed, fossil sedimentary deposit of plant origin with high water content (up to 90% in the raw state), easily cut, of light to dark brown colour.

**Natural gas** comprises gases, occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane. It includes both "non-associated" gas originating from fields producing only hydrocarbons in gaseous form and "associated" gas produced in association with crude oil as well as methane recovered from coal mines (colliery gas).

**Hydro-power:** Potential and kinetic energy of water converted into electricity in hydroelectric plants. Pumped storage is treated separately in the balance.

**Wind energy:** Kinetic energy of wind exploited for electricity generation in wind turbines.

**Solid biomass:** This covers organic, non-fossil material of biological origin which may be used as fuel for heat production or electricity generation. It comprises: **Charcoal:** covers the solid residue of the destructive distillation and pyrolysis of wood and other vegetal material and **Wood, wood wastes, other solid wastes:** Covers purpose-grown energy crops (poplar, willow etc.), a multitude of woody materials generated by an industrial process (wood/paper industry in particular) or provided directly by forestry and agriculture (firewood, wood chips, bark, sawdust, shavings, chips, black liquor etc.) as well as wastes such as tallow, straw, rice husks, nut shells, poultry litter, crushed grape dregs etc. Combustion is the preferred technology for these solid wastes. The quantity of fuel used is reported on a net calorific value basis.

**Landfill gas:** A gas composed principally of methane and carbon dioxide produced by anaerobic digestion landfill wastes.

**Biogas:** A gas composed principally of methane and carbon dioxide produced by anaerobic digestion of biomass, comprising: Sewage sludge gas, produced from the anaerobic fermentation of sewage sludge and other biogas, such as biogas produced from the anaerobic fermentation of animal slurries and of wastes in abattoirs, breweries and other agro-food industries.

**Liquid biofuel:** This covers the following fuels: Bioethanol: ethanol produced from biomass and/or biodegradable fraction of waste; **Biodiesel:** a diesel quality liquid fuel produced from biomass or used fried oils; **Biomethanol:** methanol produced from biomass and/or the biodegradable fraction of waste; **Biodimethylether:** a diesel quality fuel produced from biomass and/or the biodegradable fraction of waste; **Other Liquid Biofuel:** liquid biofuels, used directly as a fuel, not included in biogasoline or biodiesels.

**Solar energy:** Solar radiation exploited for hot water production and electricity generation, by: flat plate collectors, for domestic hot water or for the seasonal heating of swimming pools; photovoltaic cells; solar thermal-electric plants. Passive solar energy for the direct heating, cooling and lighting of dwellings or other buildings is not included.

**Geothermal energy:** Energy available as heat emitted from within the earth's crust, usually in the form of hot water or steam. It is exploited at suitable sites: for electricity generation using dry steam or high enthalpy brine after flashing or directly as heat for district heating, agriculture etc. Ground source geothermal energy is also included in the category.

In calculating the contribution of hydro and wind energy the effects of weather fluctuation are smoothed through normalisation. The normalised figures are what will be reported to Europe as progress towards renewable electricity targets and are required by the Renewable Energy Directive (2009/28/EC).

## **Energy dependency (5.11 and 5.12)**

**Energy dependency** shows the extent to which an economy relies upon imports in order to meet its energy needs. The indicator is calculated as net imports divided by the sum of gross inland energy consumption plus bunkers.

## **Domain 6 – Transport**

### **Vehicles under current license (6.1)**

Vehicles under license include private cars, goods vehicles, motor cycles, tractors, dumpers, excavators, public service vehicles, exempt vehicles and other vehicles.

### **New private vehicles licensed by emission class (6.3)**

New vehicles registered after 1<sup>st</sup> July 2008 are subject to motor vehicle duty based on CO<sub>2</sub> emissions rather than on engine size, as was previously the case. The table below sets out the seven separate band classes.

Band	CO <sub>2</sub> emissions – grams per km
A	0 – 120 g
B	More than 120 g/km up to and including 140 g/km
C	More than 140 g/km up to and including 155 g/km
D	More than 155 g/km up to and including 170 g/km
E	More than 170 g/km up to and including 190 g/km
F	More than 190 g/km up to and including 225 g/km
G	More than 225 g/km

## Road freight transport (6.4 and 6.5)

**Tonne-Kilometres:** For end-to-end journeys this is the result of multiplying the weight of goods carried by the distance they were carried

**Tonnes Carried** is the weight of goods (including empties) carried inclusive of packaging etc. but excluding the weight of demountable containers (if any) in which the goods are carried.

## Rail and bus transport (6.6)

Bus transport refers to large public service vehicles (PSVs) which cover all buses and coaches except those in private use, school buses and youth community buses.

## Domain 7 - Waste

### Municipal waste (7.1 to 7.4)

**Municipal waste** means household waste as well as commercial and other waste that, because of its nature or composition, is similar to household waste. It excludes municipal sludges and effluents. Municipal waste consists of three main elements - household, commercial (including non-process industrial waste) and street cleansing waste (street sweepings, street bins, municipal parks and cemeteries maintenance, waste, litter campaign material).

**Waste management** means the collection, transport, recovery and disposal of waste, including the supervision of such operations and the after-care of disposal sites and including actions taken as a dealer or broker.

**Disposal** means any operation which is not recovery even where the operation involves, as a secondary consequence, the reclamation of substances or energy.

### Recovery of packaging waste (7.5 and 7.6)

**Packaging** is used to contain, protect and present goods. Virtually all packaging eventually becomes waste. Packaging is made from such materials as cardboard, paper, glass, plastic, steel, aluminium, wood and composite materials such as those used in milk and juice cartons.

**Recovery** means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.

### Collection of WEEE (7.7 and 7.8)

Large household appliances include dishwashers, washing machines and cookers. Other WEEE includes stereos, telephones, toys, vacuum cleaners, toasters and computers.

Collection of construction and demolition waste (7.9)

**Construction and demolition (C&D) waste** is all waste that arises from construction, renovation and demolition activities and all wastes mentioned in Chapter 17 of the European Waste Catalogue (EWC).

The bulk of the tonnage is made up of soil and stones, while the remainder mainly comprises rubble, metals, timber, plastic and wood.

There has been between a 98% and 99% recovery rate in construction and demolition waste in 2009 and 2010. However, the Environmental Protection Agency point out that there is a discrepancy in the data between the quantity of C & D reported as collected and the quantity treated (recovered or disposed). This amounted to 0.8 million tonnes of soil and stones and 0.1 million tonnes of other C & D waste in 2010 and therefore, the figures for recovery rates need to be treated with some caution.

Domain 8 – Biodiversity and Heritage

Countryside birds (8.1)

The countryside bird survey is based on a random approach stratified by region and the survey design and field methodology closely follows that of the UK Breeding Bird Survey (BBS) which is undertaken in Britain and Northern Ireland. The Republic of Ireland was divided into eight regions, based on the administrative divisions of the National Parks and Wildlife Service at that time. These regions varied in size and each contained between three and four counties.

Bird counts were undertaken during two visits. The first was in the early part of the breeding season (April to mid-May) and the second at least four weeks later (from mid-May to the end of June). This reflects the abundance of residents and early migrants which tend to be more easily detected during the first visit and later migrants which are more abundant during the second visit.

A total of 144 species were recorded in the period 1998 to 2008; 71 species were recorded in the south region and 91 in the west region. A total of 52 species were sufficiently widely distributed for trend analyses at national level. This group included 12 species which are of conservation concern in Ireland, including 1 red-listed species, Yellowhammer and a further 11 which were amber-listed.

Of the 52 species, 42 are shown in Graph 8.1 for presentation purposes. The ten species not shown, along with their respective rates of change between 1998 and 2008 are:

Species	2008/1998
Hedge Accentor	0.6%
Moorhen	0.5%
Raven	0.4%
House Martin	0.4%
Swallow	0.0%
Chiffchaff	-0.4%
Yellowhammer	-0.5%
Robin	-0.6%
Grey Heron	-0.7%
Greenfinch	-0.7%

Red and Amber lists have been created using seven quantitative criteria in an attempt to identify conservation priorities on the island. Species that are Red-listed are globally threatened, are declining rapidly in number or range, or have declined historically and not shown recent recovery. Amber-listed species have an unfavourable status in Europe, a very small population size, a population which has declined moderately in recent years, has a localised distribution, or occurs in internationally important numbers.

## Common farmland birds (8.2)

The indicator is an aggregated index of population trend estimates of a selected group of breeding bird species dependent on agricultural land for nesting or feeding. Indices are calculated for each species independently and are weighted equally when combined in the aggregate index using a geometric mean. Aggregated EU indices are calculated using population-weighted factors for each country and species.

## Protected areas (8.3 and 8.4)

The **Habitats Directive** 92/43/EEC was adopted in 1992. The main aim of this Directive is to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. While the Directive makes a contribution to the general objective of sustainable development; it ensures the conservation of a wide range of rare, threatened or endemic species, including around 450 animals and 500 plants. Some 200 rare and characteristic habitat types are also targeted for conservation in their own right.

Member States are required to designate **Special Protection Areas** (SPAs) for 194 particularly threatened species and all migratory bird species. SPAs are scientifically identified areas critical for the survival of the targeted species, such as wetlands. They are part of the Natura 2000 ecological network set up under the Habitats Directive 92/43/EEC.

Progress has been made in the designation of **Special Areas of Conservation** and of **Special Protection Areas** under the EU Birds Directive in Ireland but the EU Commission views Ireland's list as incomplete.

## Record of protected structures (8.6)

The definition in the legislation of the Record of Protected Structures is given as:

For the purpose of protecting structures, or parts of structures, which form part of the architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest, every development plan shall include in that record every structure which is, in the opinion of the planning authority, of such interest within its functional area.

## Domain 9 – Environmental Economy

### Environmental taxes (9.1)

A carbon tax was introduced by the government in 2010, which placed a tax upon auto diesel, petrol, aviation gasoline, kerosene, marked gas oil, fuel oil, LPG (Other), Auto LPG, and natural gas.

### Environmental subsidies (9.3)

REPS (Rural Environment Protection Scheme), is a scheme designed to reward farmers for carrying out their farming activities in an environmentally friendly manner and to bring about environmental improvement on existing farms. The objectives of the scheme are to:

- Establish farming practices and production methods which reflect the increasing concern for conservation, landscape protection and wider environmental problems;
- Protect wildlife habitats and endangered species of flora and fauna;
- Produce quality food in an extensive and environmentally friendly manner.

### Wholesale and Producer price indices (9.4)

The industrial producer price index for a sector measures, in index form, changes in prices received by Irish manufacturers for goods fully or partially produced in Ireland and sold to the home and export markets by that sector. The other three wholesale price index series incorporate imported and home produced goods sold by manufacturers and wholesale outlets. All constituent series are compiled using a Laspeyres type



index formula. Identical items are priced each month so that changes in the cost of this constant basket reflect price changes only.

### **Consumer prices and Harmonized index of consumer prices (9.5 and 9.6)**

The **Consumer Price Index** is designed to measure the change in the average level of prices (inclusive of all indirect taxes) paid for consumer goods and services by all private households in the country and by foreign tourists holidaying in Ireland. Over 50,000 prices are collected for a representative basket consisting of 632 item headings in a fixed panel of retail and service outlets throughout the country during the week containing the second Tuesday of each month up to and including the third Tuesday of each month.

**Harmonised indices of consumer prices** (HICPs) give comparable measures of inflation for the countries and country groups where they are produced. They are economic indicators that measure the change over time of the prices of consumer goods and services acquired by households. In other words they are a set of consumer price indices (CPIs) calculated according to a harmonised approach and a single set of definitions. In particular, HICPs provide the official measure of consumer price inflation in the euro area for the purposes of monetary policy and the assessment of inflation convergence as required under the Maastricht criteria.

### **Resource productivity (9.7 and 9.8)**

Domestic material consumption (DMC) equals domestic extraction plus imports minus exports. DMC measures the annual amount of raw materials extracted from the domestic territory of the national economic area, plus all physical imports minus all physical exports.

Domestic extraction covers the annual amount of solid, liquid and gaseous raw materials (except for water and air) extracted from the national territory to be used as material factor inputs in economic processing i.e. acquiring value within the economic system. These materials consist of biomass, construction and industrial minerals, gross ores and fossil fuels. Concerning the water content of the raw materials, the convention is to account for all raw materials in fresh weight, with the exception of grass harvest, fodder directly taken up by ruminants and timber harvest.

**Resource productivity** is calculated as nominal GDP divided by domestic material consumption.

### **Sea fishery landings (9.9 and 9.10)**

Boarfish figures are reported separately to the four main species classes from 2009, because though often demersal in habits they are landed in very large quantities and have relatively low value by weight.

Fish which spend most of their time on or close to the seabed are classified as demersal. By contrast, pelagic species spend most of their time somewhere in the water column off the bottom.

It should be noted that aquaculture and farmed fish are excluded from these figures.

### **Imports and exports of fuels (9.11 and 9.12)**

The estimates of external trade provided in this publication are a combination of Customs-based non-EU trade statistics and estimates from the Intrastat survey of Irish traders involved in trade with other EU member states. Imports and exports are classified according to the United Nations' Standard Trade Classification, Revision 4 (SITC Rev 4). The SITC has been developed by the United Nations for the advancement of the international comparability of statistics on external trade.



## Appendix 2 Data sources

Domain	Indicator	Data source
<b>1. Air</b>		
	1.1 Ireland: Particulate matter (PM <sub>2.5</sub> ) emissions 1990-2010	Environmental Protection Agency
	1.2 EU: Particulate matter (PM <sub>2.5</sub> ) emissions 2009	European Environment Agency: <a href="http://dataservice.eea.europa.eu/PivotApp/">http://dataservice.eea.europa.eu/PivotApp/</a>
	1.3 Ireland: Sulphur dioxide emissions 1990-2010	Environmental Protection Agency: <a href="http://www.epa.ie/environment/air/emissions/sulphurdioxide/">http://www.epa.ie/environment/air/emissions/sulphurdioxide/</a>
	1.4 EU: Sulphur dioxide emissions 2010 and NEC 2010 ceiling	European Environment Agency <a href="http://www.eea.europa.eu">www.eea.europa.eu</a>
	1.5 Ireland: Nitrogen oxides emissions 1990-2010	Environmental Protection Agency: <a href="http://www.epa.ie/environment/air/emissions/nitrogenoxides/">http://www.epa.ie/environment/air/emissions/nitrogenoxides/</a>
	1.6 EU: Nitrogen oxides emissions 2010 and NEC 2010 ceiling	European Environment Agency <a href="http://www.eea.europa.eu">www.eea.europa.eu</a>
	1.7 Ireland: Ammonia emissions 1990-2010	Environmental Protection Agency: <a href="http://www.epa.ie/environment/air/emissions/ammonia/">http://www.epa.ie/environment/air/emissions/ammonia/</a>
	1.8 EU: Ammonia emissions 2010 and NEC 2010 ceiling	European Environment Agency <a href="http://www.eea.europa.eu">www.eea.europa.eu</a>
	1.9 Ireland: NMVOC emissions 1990-2010	Environmental Protection Agency: <a href="http://www.epa.ie/environment/air/emissions/nmvocs/">http://www.epa.ie/environment/air/emissions/nmvocs/</a>
	1.10 EU: NMVOC emissions 2010 and NEC 2010 ceiling	European Environment Agency <a href="http://www.eea.europa.eu">www.eea.europa.eu</a>
	1.11 Ireland: Atmospheric deposition rates 1991-2010	Met Éireann, University College Dublin and Coillte
	1.12 Ireland: Ozone threshold exceedances 1998–2010	Environmental Protection Agency
	1.13 EU: Ozone threshold exceedances April–September 2010	European Environment Agency
<b>2. Greenhouse Gases and Climate Change</b>		
	2.1 Ireland: Greenhouse gas emissions 1990-2010	Environmental Protection Agency
	2.2 EU: Greenhouse gas emissions 2009	Eurostat Statistics\Environment\Greenhouse Gases/Air Pollution
	2.3 Ireland: Greenhouse gas emissions per capita 1990-2010	Environmental Protection Agency CSO: Population
	2.4 EU: Greenhouse gas emissions per capita 2009	European Environment Agency: <a href="http://dataservice.eea.europa.eu/PivotApp/">http://dataservice.eea.europa.eu/PivotApp/</a>
	2.5 Ireland: Greenhouse gas emissions by gas 1990-2010	Environmental Protection Agency
	2.6 EU: CO <sub>2</sub> emissions 2009	European Environment Agency: <a href="http://dataservice.eea.europa.eu/PivotApp/">http://dataservice.eea.europa.eu/PivotApp/</a>
	2.7 Ireland: Greenhouse gas emissions by sector 1990-2010	Environmental Protection Agency

Domain	Indicator	Data source
	2.8 Ireland: Average annual temperature 1961-2010	Met Éireann
	2.9 Ireland: Annual rainfall 1941-2010	Met Éireann
<b>3. Water</b>		
	3.1 Ireland: Bathing water quality 1998-2010	Environmental Protection Agency\Indicator Dashboard\Water
	3.2 EU: Bathing water quality 2010	European Environment Agency\European Bathing Water Quality 2010
	3.3 Ireland: Drinking water quality 1999-2010	Environmental Protection Agency
	3.4 Ireland: Urban waste water treatment 1998-2009	Environmental Protection Agency\Indicator Dashboard\Water
	3.5 Ireland: River water quality 1987-2009	Environmental Protection Agency\Water Quality in Ireland 2007-2009
	3.6 Ireland: Nitrates in groundwater 1995-2009	Environmental Protection Agency\Indicator Dashboard\Water
	3.7 EU: Chemical status of groundwater bodies 2009	European Environment Agency
<b>4. Land Use</b>		
	4.1 Ireland: Land use categories 1990-2009	Environmental Protection Agency
	4.2 Ireland: Forest cover 1980-2010	Department of Agriculture, Food and the Marine (Forest Service)
	4.3 EU: Forest cover 2010	Forest Europe/State of Europe's Forests 2011 Report
	4.4 Ireland: Planting period in public forestry 1920-2010	Coillte
	4.5 Ireland: Public forest 2004-2010	Coillte
	4.6 Ireland: Organic agricultural land 1997-2009	Department of Agriculture, Food and the Marine
	4.7 EU: Organic agricultural land 2009	Research Institute of Organic Agriculture FiBL <a href="http://www.organic-world.net">http://www.organic-world.net</a>
	4.8 Ireland: Fertiliser sales 1980-2011	Department of Agriculture, Food and the Marine
	4.9 EU: Fertiliser sales 2009	Eurostat (Fertiliser Europe)
	4.10 Ireland: Livestock numbers June 1980-June 2011	CSO Databank/StatBank Ireland/Agriculture Livestock and Farm Numbers
	4.11 EU: Share of total livestock numbers December 2010	Eurostat Statistics: Agriculture, Forestry and Fisheries\Agriculture\Structure of Agriculture Holdings\Livestock

Domain	Indicator	Data source
	4.12 Ireland: House completions 1970-2011	Department of the Environment, Community and Local Government\Housing Statistics
	4.13 EU: House completions 2006-2010	DKM Economic consultants and Euroconstruct, Eurostat Statistics: Population
<b>5. Energy</b>		
	5.1 Ireland: Primary energy requirement and final energy consumption 1990-2010	Sustainable Energy Authority of Ireland: Energy Policy Statistical Support Unit\Energy Balance Statistics
	5.2 EU: Final energy consumption by economic sector 2010	Eurostat Statistics: Energy\energy statistics – quantities\ Energy Statistics - supply, transformation, consumption
	5.3 EU: Final energy consumption by fuel type 2010	Eurostat Statistics: Energy\energy statistics – quantities\ Energy Statistics - supply, transformation, consumption
	5.4 EU: Energy intensity 2010	Eurostat Statistics: Energy\energy statistics – quantities\ Energy Statistics\Structural indicators in energy
	5.5 Ireland: Primary energy production 1990-2010	Sustainable Energy Authority of Ireland: Energy Policy Statistical Support Unit\Energy Balance Statistics
	5.6 Ireland: Renewable energy production 1990-2010	Sustainable Energy Authority of Ireland: Energy Policy Statistical Support Unit\Energy Balance Statistics
	5.7 Ireland: Electricity consumption from renewable sources 1990-2010	Sustainable Energy Authority of Ireland
	5.8 EU: Electricity consumption from renewable sources 2009	Eurostat Statistics: Energy\ Energy Statistics - Structural Indicators in energy - annual data
	5.9 Ireland: Heat consumption from renewable sources 1990-2010	Sustainable Energy Authority of Ireland
	5.10 Ireland: Transport use from renewable sources 2006-2010	Sustainable Energy Authority of Ireland
	5.11 Ireland: Imported energy dependency 1990-2010	Sustainable Energy Authority of Ireland\Energy in Ireland 1990-2010
	5.12 EU: Imported energy dependency 2009	Eurostat Statistics: Tables by themes\Energy\ Energy Statistics – quantities\ Energy dependence
	5.13 Ireland: Fuel imports 1990-2010	Sustainable Energy Authority of Ireland\Energy in Ireland 1990-2010
<b>6. Transport</b>		
	6.1 Ireland: Vehicles under current licence 1985-2010	Department of Transport, Tourism and Sport: Irish bulletin of Vehicle and Driver Statistics 2010\ Table1: Vehicle Statistics 1985-2010
	6.2 EU: Passenger cars 2009	Eurostat Statistics: Transport\Road transport equipment – stock of vehicles\stock of vehicles by category Eurostat Statistics: Population
	6.3 Ireland: New private vehicles licensed by emission class 2005-2011	CSO\Transport\Vehicle licensing statistics

Domain	Indicator	Data source
	6.4 Ireland: Road freight transport 1990-2010	CSO Road freight transport surveys
	6.5 EU: Road freight transport 2010	Eurostat Statistics: Transport\Road transport\Road freight transport measurement\National road freight transport
	6.6 Ireland: Rail and bus passenger and vehicle traffic 1996-2010	CSO, Transport\Rail Statistics
	6.7 EU: Rail passenger traffic 2009	Eurostat Statistics: Transport\Railway transport\Railway transport measurement\passengers
	6.8 Ireland: International passengers through Irish ports 1995-2010	CSO, Tourism and Travel\Passenger movement and Airport Pairing and \ International Movement of passengers by sea
	6.9 EU: International air passengers 2010	Eurostat Statistics: Transport\ Air transport\Air Transport measurement – passengers Eurostat Statistics: Population
	6.10 Ireland: Means of travel to work 1986-2006	CSO: Census.cso.ie

## 7. Waste

	7.1 Ireland: Municipal waste generated 2001-2010	Environmental Protection Agency\National Waste Report 2010\Appendix A - Indicators
	7.2 EU: Municipal waste generated 2010	Eurostat Statistics\Environment\Waste statistics\waste generation and treatment\treatment of waste
	7.3 Ireland: Municipal waste sent to landfill 2001-2010	Environmental Protection Agency\National Waste Report 2010\Appendix A - Indicators
	7.4 EU: Municipal waste sent to landfill 2010	Eurostat Statistics\Environment\Waste statistics\waste generation and treatment\generation of waste
	7.5 Ireland: Recovery of packaging waste 2001-2010	Environmental Protection Agency\National Waste Report 2010\Appendix A - Indicators
	7.6 EU: Recovery of packaging waste 2009	Eurostat Statistics\ Environment\Waste statistics\waste streams\packaging waste
	7.7 Ireland: Electrical waste collected 2007-2010	Environmental Protection Agency\National Waste Reports 2007-2010
	7.8 EU: Electrical waste collected from private households 2008	Eurostat Statistics\Environment\Waste statistics\waste streams\Waste Electrical and Electronic equipment
	7.9 Ireland: Collection of construction and demolition waste 2004-2010	Eurostat Statistics: Population Environmental Protection Agency\National Waste Reports 2004-2010

## 8. Biodiversity and Heritage

	8.1 Ireland: Countryside birds 1998-2008	Birdwatch Ireland
	8.2 EU: Common farmland birds 2008	Eurostat Statistics: Environment\Biodiversity\Common Bird index
	8.3 EU: Protected areas under EU Birds Directive 2010	European Commission

Domain	Indicator	Data source
	8.4 EU: Protected areas under EU Habitats Directive 2010	European Commission
	8.5 Ireland: National monuments 2010	Office of Public Works
	8.6 Ireland: Record of protected structures 2011	Department of Arts, Heritage and the Gaeltacht (Heritage Ireland)
<b>9. Environmental Economy</b>		
	9.1 Ireland: Environmental tax revenue 2005-2010	CSO National Accounts and Revenue Commissioners Statistical Report 2010
	9.2 EU: Environmental tax revenue 2009	Eurostat Statistics\Environment\Environmental Accounts\Monetary Flow Accounts\Environmental Tax Revenue
	9.3 Ireland: General government environmental expenditure 2000-2010	CSO: National Accounts
	9.4 Ireland: Wholesale price index for energy products 2000-2011	CSO: Wholesale price indices
	9.5 Ireland: Consumer price index for energy products 1980-2011	CSO: Consumer price indices
	9.6 EU: Harmonised index of consumer prices for energy products 2011	Eurostat
	9.7 Ireland: Resource productivity 1999-2008	CSO: Environmental Accounts Material Flow 2008 and National Income and Expenditure 2010
	9.8 EU: Resource productivity 2007	Eurostat Statistics\Environment\Environmental Accounts\Domestic Material Consumption
	9.9 Ireland: Sea fishery landings 1990-2010	Sea Fisheries Protection Authority <a href="http://www.sfpa.ie">www.sfpa.ie</a>
	9.10 EU: Sea fishery landings 2009	Eurostat Statistics\Agriculture, forestry and fisheries\fisheries\Catches in all fishing regions
	9.11 Ireland: Imports and exports of fuels 2000-2011	CSO: Trade statistics and VIMA
	9.12 EU: Imports of fuels 2010	Eurostat statistics\External trade detailed data