# Ireland

Contents



Figures and tables

# 1. SUMMARY

Ireland is required to limit emissions in 2010 to no more than a 13% increase compared to the Kyoto base year. Considering the expected effects of currently implemented and planned policies only, Ireland projects that it will not deliver its Kyoto target with domestic measures alone – exceeding by 10 % points under the "with additional measures" scenario. Using flexible mechanisms and net carbon sequestration, from enhanced carbon sinks, the gap to target is expected to close such that Ireland would overachieve its Kyoto target by 1 % point. Compared with the 2006 report, the projections are around 4 $MtCO_2$-eq lower while the base year remains the same, meaning that Ireland is now predicted to be closer to delivering its Kyoto target on the basis of domestic measures alone.

The greatest reductions in absolute emissions over the 1990 - 2010 period are expected to occur in the agricultural sector. Emissions from all other sectors are expected to increase over the period, particularly emissions from energy used for power generation and in industry. The most significant increase is expected in the transport sector, despite a raft of policy measures addressing emissions here including measures to promote vehicle efficiency, modal shift, uptake of biofuels and fiscal incentives. Other significant reductions are expected to result from CAP reform in the agricultural sector, promotion of renewables and implementation of the EU Emissions Trading Scheme, inter alia, in the energy supply sector.

# 2. GHG PROJECTIONS AND PROGRESS TO KYOTO TARGETS

Table 1 shows, for all gases and main sectors:

- GHG emission projections for the two scenarios "with existing measures" (WEM) and "with additional measures" (WAM), as reported by Ireland;
- Historic emissions (in the "reference year") as reported together with projections.

For Ireland, the reference year is the Kyoto base-year: 1990 for $CO_2$, $CH_4$ and $N_2O$, and 1995 for fluorinated gases (F-gases).

**Table 1. Summary of reported projections by sector and by gas in 2010 (Mt $CO_2$–eq.)**

| | Carbon dioxide | | | Methane | | | Nitrous oxide | | | F-gases | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Reference year | 2010 WEM | 2010 WAM | Reference year | 2010 WEM | 2010 WAM | Reference year | 2010 WEM | 2010 WAM | Reference year | 2010 WEM | 2010 WAM | Reference year | 2010 WEM | 2010 WAM |
| **Energy (excl. transport)** | 25.3 | 32.8 | 32.7 | 0.3 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | NO | NO | NO | 26.5 | 32.8 | 32.7 |
| Energy supply | 11.2 | 16.0 | 16.0 | 0.2 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | NO | NO | NO | 11.8 | 16.0 | 16.0 |
| Energy – industry, construction | 4.1 | 5.9 | 5.9 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | NO | NO | NO | 4.3 | 5.9 | 5.9 |
| Energy – other (commercial, residential, agriculture) | 10.0 | 10.9 | 10.8 | 0.1 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | NO | NO | NO | 10.5 | 10.9 | 10.8 |
| **Transport (energy)** | 5.0 | 12.8 | 12.8 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | NO | NO | NO | 5.2 | 12.8 | 12.8 |
| **Industrial processes** | 2.1 | 3.3 | 3.3 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.2 | 0.7 | 0.7 | 3.3 | 4.0 | 4.0 |
| **Waste** | NO | NO | NO | 1.3 | 1.8 | 1.8 | 0.1 | 0.0 | 0.0 | NO | NO | NO | 1.5 | 1.8 | 1.8 |
| **Agriculture** | NO | NO | NO | 11.6 | 10.1 | 10.1 | 7.7 | 6.8 | 6.8 | NO | NO | NO | 19.2 | 16.9 | 16.9 |
| **Other** | 0.1 | 0.1 | 0.1 | NE | NE | NE | NE | NE | NE | NE | NE | NE | 0.1 | 0.1 | 0.1 |
| **Total (excl. LULUCF)** | 32.6 | 49.0 | 48.9 | 13.2 | 11.9 | 11.9 | 9.8 | 6.8 | 6.8 | 0.2 | 0.7 | 0.7 | 55.8 | 68.4 | 68.3 |

**Key:**
Reference year: base-year under the Kyoto Protocol (1990 for carbon dioxide, methane and nitrous oxide, and 1995 for F-gases).
WEM: 'with existing measures' projection
WAM: 'with additional measures' projection

**Source**: Ireland's national report submitted to the European Commission under Article 3(2) of the Monitoring Mechanism, Decision 280/2004/EC. Template dated 31 May.

Table 2 shows, for all gases and main sectors:

- 1990 GHG emissions as reported in the latest (2008) GHG emissions inventory (1990-2006);
- Adjusted GHG emission projections for the WEM and WAM scenarios. This adjustment of the projections reported in Table 1 is carried out to allow consistency and comparability between projections and the latest (2008) GHG inventory data[1].

## Table 2. Summary of projections by sector and by gas in 2010 compared to 1990 emissions ($MtCO_2$-eq.)

| | Carbon dioxide | | | Methane | | | Nitrous oxide | | | F-gases | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1990 | 2010 WEM | 2010 WAM | 1990 | 2010 WEM | 2010 WAM | 1990 | 2010 WEM | 2010 WAM | 1990 | 2010 WEM | 2010 WAM | 1990 | 2010 WEM | 2010 WAM |
| **Energy (excl. transport)** | 25.3 | 32.8 | 32.6 | 0.3 | NE | NE | 0.8 | NE | NE | NO | NO | NO | 26.4 | 32.8 | 32.6 |
| Energy supply | 11.3 | 16.0 | 16.0 | 0.1 | NE | NE | 0.4 | NE | NE | NO | NO | NO | 11.8 | 16.0 | 16.0 |
| Energy – industry, construction | 4.0 | 5.9 | 5.9 | 0.0 | NE | NE | 0.1 | NE | NE | NO | NO | NO | 4.1 | 5.9 | 5.9 |
| Energy – other (commercial, residential, agriculture) | 10.1 | 10.9 | 10.8 | 0.1 | NE | NE | 0.3 | NE | NE | NO | NO | NO | 10.5 | 10.9 | 10.8 |
| **Transport (energy)** | 5.0 | 12.7 | 12.7 | 0.0 | NE | NE | 0.1 | NE | NE | NO | NO | NO | 5.2 | 12.7 | 12.7 |
| **Industrial processes** | 2.1 | 3.3 | 3.3 | 0.0 | NO | NO | 1.0 | NE | NE | 0.0 | 0.7 | 0.7 | 3.2 | 4.0 | 4.0 |
| **Waste** | NO | NO | NO | 1.3 | 1.8 | 1.8 | 0.1 | NE | NE | NO | NO | NO | 1.5 | 1.8 | 1.8 |
| **Agriculture** | NO | NO | NO | 11.8 | 10.1 | 10.1 | 7.4 | 6.7 | 6.7 | NO | NO | NO | 19.2 | 16.8 | 16.8 |
| **Other** | 0.1 | 0.1 | 0.1 | NE | NE | NE | NE | NE | NE | NE | NE | NE | 0.1 | 0.1 | 0.1 |
| **Total (excl. LULUCF)** | 32.5 | 49.0 | 48.8 | 13.5 | 11.9 | 11.9 | 9.5 | 6.7 | 6.7 | 0.0 | 0.7 | 0.7 | 55.5 | 68.3 | 68.2 |

**Key:**
WEM: 'with existing measures' projection
WAM: 'with additional measures' projection

**Source**: Ireland's national report submitted to the European Commission under Article 3(2) of the Monitoring Mechanism, Decision 280/2004/EC. Template dated 31 May 2007. Annual greenhouse gas inventory 1990 - 2006 and inventory report, 11 April 2008.

[1] The adjustment consists in applying an adjustment factor to projections from Table 1. This factor is the ratio between total emissions in the reference year as reported in the 2008 GHG inventory report (or, if the reference year is the base-year under the Kyoto Protocol, in the report of the review of the initial report under the Kyoto Protocol) and total emissions in the reference year as reported by the country with projections (Table 1).

## Table 3. Summary of projections by sector and by gas in 2010 compared to 1990 emissions (index 100 = 1990)

| | Carbon dioxide | | | Methane | | | Nitrous oxide | | | F-gases | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1990 | 2010 WEM | 2010 WAM | 1990 | 2010 WEM | 2010 WAM | 1990 | 2010 WEM | 2010 WAM | 1990 | 2010 WEM | 2010 WAM | 1990 | 2010 WEM | 2010 WAM |
| **Energy (excl. transport)** | 100 | 129.3 | 128.9 | 100 | NE | NE | 100 | NE | NE | 100 | NO | NO | 100 | 124.0 | 123.6 |
| Energy supply | 100 | 141.4 | 141.4 | 100 | NE | NE | 100 | NE | NE | 100 | NO | NO | 100 | 134.8 | 134.8 |
| Energy – industry, construction | 100 | 148.3 | 148.3 | 100 | NE | NE | 100 | NE | NE | 100 | NO | NO | 100 | 143.3 | 143.3 |
| Energy – other (commercial, residential, agriculture) | 100 | 108.4 | 107.2 | 100 | NE | NE | 100 | NE | NE | 100 | NO | NO | 100 | 104.2 | 103.0 |
| **Transport (energy)** | 100 | 253.0 | 253.0 | 100 | NE | NE | 100 | NE | NE | 100 | NO | NO | 100 | 246.7 | 246.7 |
| **Industrial processes** | 100 | 159.4 | 159.4 | 100 | NO | NO | 100 | NE | NE | 100 | 1874.8 | 1874.8 | 100 | 126.8 | 126.8 |
| **Waste** | 100 | NO | NO | 100 | 135.7 | 135.7 | 100 | NE | NE | 100 | NO | NO | 100 | 125.1 | 125.1 |
| **Agriculture** | 100 | NO | NO | 100 | 85.4 | 85.4 | 100 | 91.1 | 91.1 | 100 | NO | NO | 100 | 87.6 | 87.6 |
| **Other** | 100 | 136.8 | 136.8 | 100 | NE | NE | 100 | NE | NE | 100 | NE | NE | 100 | 136.8 | 136.8 |
| **Total (excl. LULUCF)** | 100 | 150.4 | 150.1 | 100 | 88.5 | 88.5 | 100 | 71.2 | 71.2 | 100 | 1874.8 | 1874.8 | 100 | 123.0 | 122.8 |

**Key:**
WEM: 'with existing measures' projection
WAM: 'with additional measures' projection

**Source:** Ireland's national report submitted to the European Commission under Article 3(2) of the Monitoring Mechanism, Decision 280/2004/EC. Template dated 31 May 2007. Annual greenhouse gas inventory 1990 - 2006 and inventory report, 11 April 2008.

## Table 4. Summary of projections in 2010 compared to base year emissions under the Kyoto Protocol

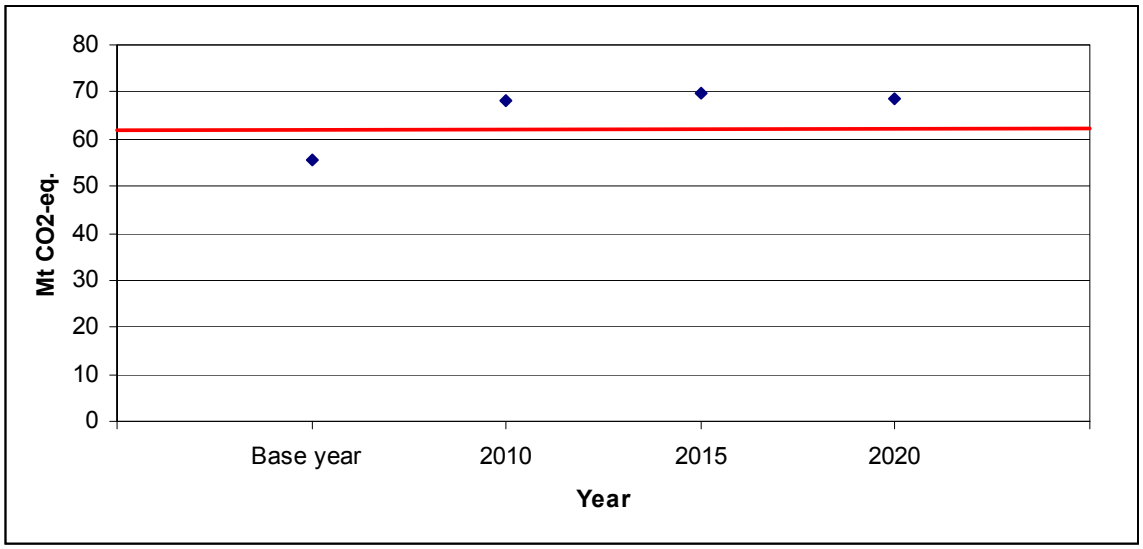
| | Unit | Base-year emissions under the Kyoto Protocol | 2010 projections 'with existing measures' | 2010 projections 'with additional measures' |
|---|---|---|---|---|
| Total GHG emissions (excluding LULUCF) | Mt $CO_2$-eq. | 55.5 | 68.3 | 68.2 |
| | Index (base-year emissions = 100) | 100 | 122.8 | 122.6 |

**Source:** Ireland's national report submitted to the European Commission under Article 3(2) of the Monitoring Mechanism, Decision 280/2004/EC. Template dated 31 May 2007. Annual greenhouse gas inventory 1990 - 2006 and inventory report, 11 April 2008.

In Figure 1, the same correction factor used in Table 2 has been applied to the projections for 2010, 2015 and 2020. Figure 1 presents the "with additional measures" scenario.

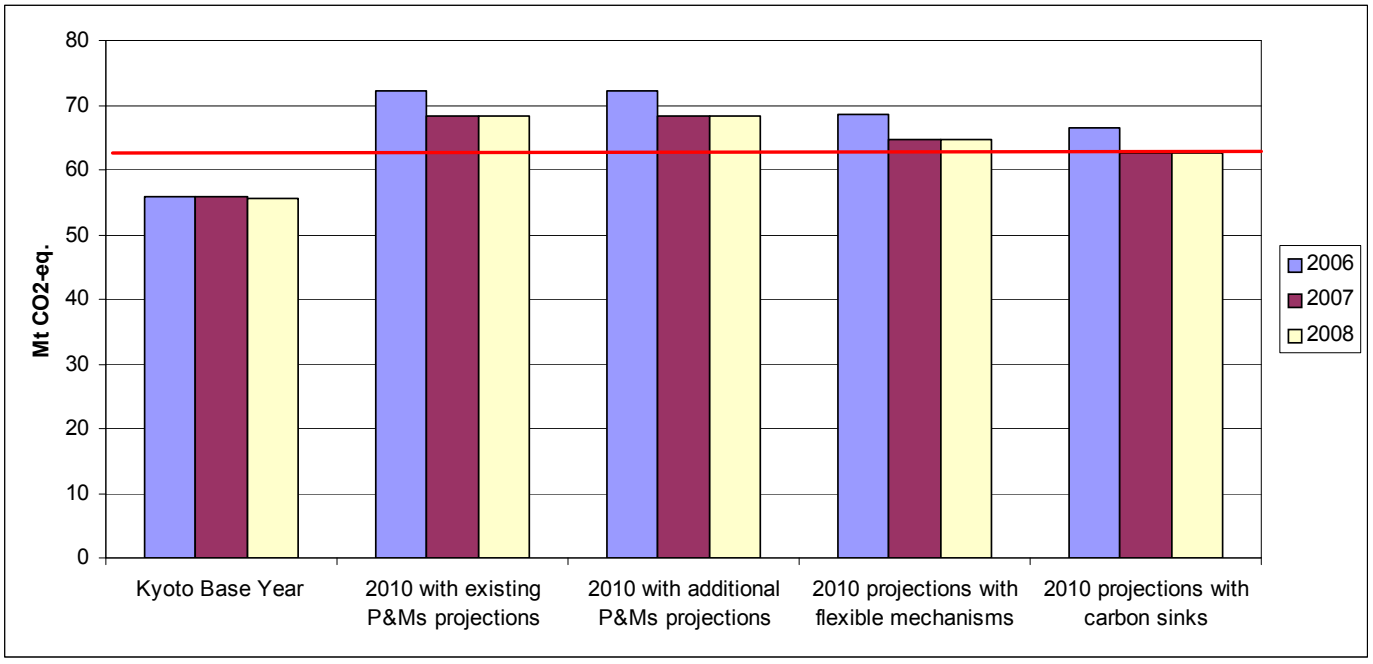
The red lines in Figure 1 and 2 indicate the Kyoto target of 62.8 Mt $CO_2$-eq., based on the revised Kyoto base year, 2008. The data points in Figure 1 indicate quantified domestic emissions and do not incorporate use of carbon sinks or the flexible mechanisms.

**Figure 1. Greenhouse gas projections for 2010, 2015 and 2020 (Mt CO2–eq.)**




**Source:** Ireland's national report submitted to the European Commission under Article 3(2) of the Monitoring Mechanism, Decision 280/2004/EC. Template dated 31 May 2007. Annual greenhouse gas inventory 1990 - 2006 and inventory report, 11 April 2008.

**Figure 2. Comparison of 2010 projections reported in 2006, 2007 and 2008 (Mt CO2–eq.)**



**Source:** Ireland's national report submitted to the European Commission under Article 3(2) of the Monitoring Mechanism, Decision 280/2004/EC. Template dated 31 May 2007. Annual greenhouse gas inventory 1990 - 2006 and inventory report, 11 April 2008. Source for 2006 data is 'Determining the Share of National Greenhouse Gas Emissions for Emissions Trading in Ireland 2008-2012' March 2006, ICF/BOC for the DEHLG.

# 3. CLIMATE CHANGE MITIGATION POLICIES AND MEASURES

A top down calculation of existing measures was not possible as a 'without measures' projection was not provided.

**Table 5. Summary of the effect of policies and measures included in the 2010 projections (Mt CO2–eq.)**

| | Top down calculation | | Bottom Up calculation | |
|---|---|---|---|---|
| | Existing Measures | Planned Measures | Existing Measures | Planned Measures |
| **Energy (total, excluding transport)** | NE | -0.1 | 2.6 | 0.1 |
| Energy supply | NE | 0.0 | 1.7 | 0.0 |
| Energy – industry, construction | NE | 0.0 | 0.2 | 0.0 |
| Energy – other (commercial, residential, agriculture) | NE | -0.1 | 0.7 | 0.1 |
| **Transport (energy)** | NE | 0.0 | 2.3 | 0.0 |
| **Industrial processes** | NE | 0.0 | 0.0 | 0.0 |
| **Waste** | NE | 0.0 | 1.2 | 0.0 |
| **Agriculture** | NE | 0.0 | 2.4 | 0.0 |
| **Cross-sectoral** | NE | 0.0 | 3.0 | 0.0 |
| Total (excluding LULUCF) | NE | -0.1 | 11.5 | 0.1 |

Note: The effects of measures detailed above are calculated firstly by determining the difference between total projections in each scenario ('top down calculation') and secondly by summing the reported effect of individual measures ('bottom up calculation').

**Source:** Öko Institut, (accessed 9th July 2008), ECCP Policies and Measures database, http://www.oeko.de/service/pam/index.php

## Table 6. Detailed information on Existing Policies and measures

| Sector | Name | Type | GHG | Status | Estimated savings [kt $CO_2$ eq. p.a.] 2005 | 2010 | 2020 | Costs [EUR/t] |
|---|---|---|---|---|---|---|---|---|
| Cross-cutting | EU Emissions Trading Scheme | Economic | $CO_2$ | implemented | | 3,020 | | |
| Energy consumption<br>Energy supply | Planning Exemptions for micro-renewables | Planning | $CO_2$ | implemented | | | | |
| Energy consumption<br>Energy supply | CHP Deployment Programme | Economic | $CO_2$ | implemented | | 162 | | |
| Energy supply | Renewable Energy Feed-In Tariff | Economic | $CO_2$ | implemented | | 1,470 | 3,260 | |
| Energy supply | Natural Gas Transmission and Distribution | Economic | $CH_4$ | implemented | | 60 | | |
| Energy supply | Electricity Infrastructure Development Programme | Economic | $CO_2$ | implemented | | | | |
| Energy supply | Electricity Demand Side Management Programmes | Economic<br>Education<br>Information | $CO_2$ | implemented | | | | |
| Energy consumption | Building Regulations 2002 and 2005 | Planning<br>Regulatory | $CO_2$ | implemented | | 405 | | |
| Energy consumption | Residential Density Guidelines | Information<br>Planning<br>Regulatory | $CO_2$ | implemented | | | | |
| Energy consumption | Building Energy Ratings | Information<br>Regulatory | $CO_2$ | implemented | | | | |
| Energy consumption | Greener Homes Scheme | Economic | $CO_2$ | implemented | | 37 | 52 | |
| Energy consumption | Planning Exemptions for micro-renewables | Planning | $CO_2$ | implemented | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Energy supply | | | | | | |
| Energy consumption | Power Of One | Information | $CO_2$ | implemented | | |
| Energy consumption | Large Industry Energy Network | Education<br>Information<br>Voluntary/ negotiated agreement | $CO_2$ | implemented | 145 | |
| Energy consumption | Energy Agreements Programme | Education<br>Information<br>Voluntary/ negotiated agreement | $CO_2$ | implemented | 37 | |
| Energy consumption | Commercial Bioheat Scheme | Economic | $CO_2$ | implemented | 160 | 224 |
| Energy consumption<br>Energy supply | CHP Deployment Programme | Economic | $CO_2$ | implemented | 162 | |
| Transport | Vehicle Efficiency | Voluntary/ negotiated agreement | $CO_2$ | implemented | 480 | |
| Transport | Mineral Oil Tax Relief for Biofuels | Fiscal | $CO_2$ | implemented | 270 | |
| Transport | Dublin Transport Infrastructure | Economic<br>Planning | $CO_2$ | implemented | 270 | |
| Transport | National Car Test | Regulatory | $CO_2$ | implemented | | |
| Transport | Changes to Motor Tax and Vehicle Registration Tax | Fiscal | $CO_2$ | implemented | 50 | |
| Transport | Modal Shift | Economic<br>Information<br>Planning | $CO_2$ | implemented | 510 | |
| Transport | Alignment of transport investment with spatial planning | Economic<br>Planning | $CO_2$ | implemented | 83 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Transport | Biofuels Obligation Scheme | Regulatory | $CO_2$ | implemented | 500 | 878 |
| Transport | Efficient Driving Awareness Campaign | Regulatory | $CO_2$ | implemented | 130 | |
| Industrial Processes | F-Gases Regulation | Regulatory | HFC<br>PFC<br>$SF_6$ | implemented | 24 | |
| Agriculture | Implementation of CAP Reform (Luxembourg Agreement) | Economic<br>Regulatory | $CH_4$<br>$N_2O$ | implemented | 2,400 | |
| Agriculture<br>Forestry | REPS 4 | | $CH_4$<br>$CO_2$<br>$N_2O$ | implemented | | |
| Waste | Diversion of biodegradable waste from landfill | Economic<br>Education<br>Information<br>Planning<br>Regulatory | $CH_4$ | implemented | 700 | |
| Waste | Landfill Gas Capture | Economic<br>Regulatory | $CH_4$ | implemented | 500 | |
| | | | | | 11,575 | because some are counted twice |

Source: Öko Institut, (accessed 9th July 2008), ECCP Policies and Measures database, http://www.oeko.de/service/pam/index.php

### Table 7. Detailed information on Planned Policies and measures

| Sector | Name | Type | GHG | Status | Estimated savings [kt $CO_2$ eq. p.a.] | Costs [EUR/t] |
|---|---|---|---|---|---|---|

| | | | | | 2005 | 2010 | 2020 |
|---|---|---|---|---|---|---|---|
| Cross-cutting | Climate Change Awareness Campaign | Education<br>Information | $CH_4$<br>$CO_2$<br>$N_2O$<br>PFC<br>$SF_6$ | planned | | | |
| Energy consumption | Levy on Incandescent light bulbs | Economic | $CO_2$ | planned | | | |
| Energy consumption | Building Regulations 2008 | Regulatory | $CO_2$ | planned | | 120 | |
| Energy consumption | Smart Metering | Economic<br>Information | $CO_2$ | planned | | | |
| Transport | Transport Demand-Side Management Measures | Economic<br>Planning<br>Regulatory | $CO_2$ | planned | | | |

Source: Öko Institut, (accessed 9th July 2008), ECCP Policies and Measures database, http://www.oeko.de/service/pam/index.php

**Table 8. Status of national policies and measures (PAM) in relation to European common and coordinated policies and measures (CCPM)**

| Status | CCPM | Sector |
|---|---|---|
| National policies and measures already in force **before** CCPM was adopted | Taxation of energy products 2003/96/EC | Energy supply |
| Existing national policies and measures **re-enforced** by CCPM | Integrated pollution prevention and control 96/61/EC | Cross-cutting |
| | Promotion of electricity from RE sources 2001/77/EC | Energy supply |
| | Directive on waste 2006/12/EC | Waste |
| **New** national policies and measures implemented after CCPM was adopted | Kyoto Protocol project mechanisms 2004/101/EC | Cross-cutting |
| | Emissions trading 2003/87/EC | Cross-cutting |
| | Promotion of cogeneration 2004/8/EC | Energy supply |
| | Internal electricity market 2003/54/EC | Energy supply |
| | Internal market in natural gas 98/30/EC | Energy supply |
| | Directives on energy labelling of appliances | Energy consumption |
| | Ecodesign requirements for energy-using products 2005/32/EC | Energy consumption |
| | Energy performance of buildings 2002/91/EC | Energy consumption |
| | End-use efficiency and energy services 2006/32/EC | Energy consumption |
| | Energy labelling for office equipment 2422/2001 | Energy consumption |
| | Efficiency fluorescent lighting 2000/55/EC | Energy consumption |
| | Efficiency of hot water boilers 92/42/EEC | Energy consumption |
| | Motor challenge, voluntary EC programme | Energy consumption |
| | Promotion of biofuels for transport 2003/30/EC | Transport |
| | Transport modal shift to rail 2001/12/EC etc. | Transport |
| | Consumer information on cars 1999/94/EC | Transport |
| | Support under CAP (1782/2003) | Agriculture |
| | Support under CAP - amendment (1783/2003) | Agriculture |
| | Rural development support and CAP(2603/1999, 1698/2005 and 1290/2005) | Agriculture |
| | Support for rural development from EAGGF (1257/1999) | Agriculture |
| | Nitrates directive 91/676/EEC | Agriculture |
| | Landfill directive 1999/31/EC | Waste |
| | Packaging and packaging waste (94/62/EC, 2004/12/EC, 2005/20/EC) | Waste |
| Status of national policy or measure **not reported** | Eco-management & audit scheme (EMAS) EC 761/2001 | Energy consumption |
| | Integrated European railway area (COM(2002)18 final) | Transport |
| | Agreement with car manufacturers ACEA etc. | Transport |
| | Marco Polo programme on freight transport | Transport |
| | HFCs in mobile air conditioning 2006/40/EC | Transport |
| | F-gas regulation (842/2006) | Industrial Process |
| | Support scheme for energy crops under CAP (795/2004) | Agriculture |
| | Pre-accession measures for agriculture and rural development (1268/1999) | Agriculture |

Source: MS responses to the CCPMs questionnaire, 2005. Personal communications.

# 4. METADATA

## Sources of information

Ireland's 4th National Communication submitted to the UNFCCC, April 2007.

Ireland's national report submitted to the European Commission under Article 3(2) of the Monitoring Mechanism, Decision 280/2004/EC. Template dated 31 May 2007.

Annual greenhouse gas inventory 1990 - 2006 and inventory report, 11 April 2008.

Base-year emissions from the UNFCCC website,
http://unfccc.int/ghg_data/kp_data_unfccc/base_year_data/items/4354.php

European Climate Change Programme (ECCP), Database on Policies and Measures in Europe http://www.oeko.de/service/pam/index.php

## Kyoto base-year emissions

Kyoto base-year emissions are presented throughout, except Table 1 which presents projections reference year emissions (see below). Kyoto base year emissions of greenhouse gases were calculated using 1990 emissions for carbon dioxide ($CO_2$), methane ($CH_4$) and nitrous oxide ($N_2O$) and 1995 emissions for fluorinated gases ($SF_6$, HFCs and PFCs).
These base-year emissions include emissions from LULUCF under Art. 3.7 of the Kyoto Protocol.
Kyoto base-year emissions have now been reviewed and set for all EEA countries.

## Projections reference year emissions

Projections reference year emissions are presented in Table 1.

Projections reference year emissions are defined as projections-consistent emissions data for a given historic year, as chosen by the Member State. Inventory recalculations from year to year may mean that latest inventory data cannot be compared with projections based on older inventory data. Where such an inconsistency has arisen, MS projections have been corrected by applying the following formula, in Table 2:

Corrected projection = reported projections * latest inventory total GHG emissions / Table 1 reported total GHG emissions for the same reference year

## Quality of Reporting

Member State reporting in the sources detailed above was assessed semi-qualitatively. Scoring was attributed according to the level of detail and clarity: from o (representing not reported) to +++ (representing very detailed and/or clear reporting). Guidance used for this assessment included the reporting requirements laid down in:

- EU legislation: Monitoring Mechanism (280/2004/EC) and Implementing Provisions (2005/166/EC)
- UNFCCC reporting guidelines for national communications available in English, French, Spanish ("Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications - FCCC/CP/1999/7")

The following tables detail reporting considered to be best practice for the purposes of this assessment.

| Information provided | Example of good practice |
|---|---|
| Policy names | Clear names and description provided with unique identifier. |
| Objectives of policies | Good description of objectives |
| Types of policies | Type of policy instrument specified e.g. regulatory, fiscal |
| Which greenhouse gases? | Specifies which gases each PAM affects |
| Status of Implementation | Clear for each PAM: planned, adopted, implemented, expired |
| Implementation body | Clear which authorities are responsible for implementation |
| Quantitative assessment of emission reduction effect and cost of policies | Almost all PAMs are actually quantified. Total effect of all PAMs specified. WOM projection provided. |
| Interaction with other national and EU level policies | Detailed discussion and analysis of policy interactions. |
| Measures implementing community legislation | Report details which national policies are implementing individual pieces of EU legislation. |
| Arrangements for flexible mechanisms | Details arrangements for use of flexible mechanisms. |
| Balance between domestic action and flexible mechanisms | Regarding reductions required to meet Kyoto target, details proportion to result from domestic action and flexible mechanisms. |

| Category of Information | Example of good practice |
|---|---|
| Projection scenarios | "With measures" and "with additional measures" projections required, "without measures projection" optional. |
| Policies included in each projection | Clear presentation of the policies included in each projections scenario. |
| Expressed relative to historic reference year data | Projections are presented alongside consistent historic emissions. |
| Starting year | Starting year and emissions used as basis for projections is detailed. |
| Split of projections | Projection split by all 6 gases (or F-gases together), all sectors and years |
| Presentation of results | Clear, both tables and graphs provided and/or used excel reporting template. |
| Description of methodologies | Description of approach, model and assumptions |
| Sensitivity analysis | Was an analysis carried out to determine the sensitivity of projections to variance in the input parameters? Are high medium and low scenarios presented? |
| Discussion of uncertainty | Is an uncertainty range for the projections provided? |
| Details of parameters and assumptions | Are parameters as required under Monitoring Mechanism 280/2004/EC reported? |

| Indicators for projections | Are indicators for projections as required under Monitoring Mechanism 280/2004/EC reported? |
|---|---|

Ireland's policies and measures and projections were clearly reported in the Excel Monitoring Mechanism submission. Reporting could be improved by providing a sensitivity analysis, uncertainty assessment, projection indicators and a more complete set of projection parameters.

**Table 9. Information provided on policies and Kyoto flexible mechanisms**

| Information provided | Level of information provided | Comments |
|---|---|---|
| Policy names | +++ | Clear description |
| Objectives of policies | +++ | Good description of objectives |
| Types of policies | +++ | |
| Which greenhouse gases? | +++ | Specifies which gases each PAM deals with |
| Status of Implementation | ++ | Status specified for each PAM, but inconsistent between Monitoring Mechanism Excel submission and NAP report. |
| Implementation body | +++ | Authorities specified for each PAM |
| Quantitative assessment of emission reduction effect and cost of policies | +++ | Nearly all PAMs quantified for 2010 and some for 2020. |
| Interaction with other national and EU level policies | + | CCPM linkages given. |
| Measures implementing community legislation | +++ | Very detailed information provided on measures implementing community legislation. |
| Arrangements for flexible mechanisms | +++ | |
| Balance between domestic action and flexible mechanisms | +++ | |

**Table 10. Information provided on projections**

| Category of Information | Level of information provided | Comments |
|---|---|---|
| Projection scenarios | +++ | With measures (WM) and with additional measures (WAM) |
| Policies included in each projection | +++ | |
| Expressed relative to base year | +++ | Relative to 1995 for F-gases, 1990 other gases. |
| Starting year | +++ | 2004 |
| Split of projections | +++ | Split by gases and full list of sectors. Base year is split across the 3 F-gases but projections are with F-gases together. CH4 and N20 are included in CO2 projections for the energy, transport and industrial processes sectors. |
| Presentation of results | +++ | Clearly presented in Monitoring Mechanism Excel submission as per |

| | | |
|---|---|---|
| | | template. |
| Description of methodologies (approach, model and assumptions) | ++ | Some description of models and assumptions. |
| Sensitivity analysis | +++ | Sensitivity analysis of five variables, including three scenarios (low, central, high) for the price of EU ETS Allowances. |
| Discussion of uncertainty | ++ | Discussed for most sectors. |
| Details of parameters and assumptions | + | Some provided |
| Indicators for projections | +++ | |

Parameters for projections are presented in Table 10. Mandatory parameters were reported relatively comprehensively for the economic, energy and waste sectors for the years 2005, 2010, 2015 and 2020. Beyond this, numbers of dwellings are reported for the buildings sector, livestock numbers are reported for agriculture and areas of managed forest are provided in forestry sector. Notes describing the methodologies used for the industry and transport sectors are provided.

No recommended parameters were reported.

## Table 11. Parameters for Projections

| 1. Mandatory parameters on projectionsAssumptions for general economic parameters | units | 2005 | 2010 | 2015 | 2020 | Member state notes |
|---|---|---|---|---|---|---|
| | | | | | | |
| GDP (value at given years) | Bio Euro 2000 basis | 108.8 | 143.3 | 155.5 | 181.9 | GDP at Market Prices (€bl) 1995 constant prices |
| GDP growth rate | | | | | | 5.3% pa until 2011. Source ESRI Medium Term Review November 2005 |
| Population growth | 1000 people | 4131 | 4423 | 4746 | 5021 | Source: Central Statistics Office (CSO) |
| Population growth rate and base year | % 2005 value | 100% | 107% | 115% | 122% | Source: CSO |
| International coal prices at given | € per GJ | 2.64 | 2.22 | | 2.22 | 2020 figure is average 2010-2020 figure. Source: ICF Consulting, 2005 constant prices |
| International oil prices at given | € per GJ | 10.06 | 7.65 | | 6.92 | 2020 figure is average 2010-2020 figure. Source: ICF Consulting, 2005 constant prices |
| International gas prices at given | € per GJ | 5.88 | 5.61 | | 4.72 | 2020 figure is average 2010-2020 figure. Source: ICF Consulting, 2005 constant prices |
| **Assumptions for the energy sector** | | | | | | ICF-BOC energy power sector emissions computations not estimated in this manner. ICF Integrated Power Model was used to determine emissions from energy sector (see model description in ICF-BOC report, which includes key assumptions. Electricity demand is used as an input to the IPM Model and the values are based on ESB Generation Adequacy Report 2005 to 2011. |
| Total gross inland consumption (PJ) | | | | | | |
| Total electricity production by fuel type | | 23.06 | 29.31 | 32.42 | 36.35 | |
| Oil (fossil) | TWh | 1.62 | 1.63 | 1.60 | 1.63 | Output from ICF's Integrated Planning Model (IPM). Figures in TWh. |
| Gas (fossil) | TWh | 13.01 | 16.86 | 19.19 | 22.11 | |
| coal | TWh | 6.43 | 6.43 | 6.43 | 6.43 | |
| Renewable | TWh | 1.995 | 4.379 | 5.194 | 6.171 | |
| Nuclear (IEA definition for | TWh | | | | | |

| 1. Mandatory parameters on projectionsAssumptions for general economic parameters | units | 2005 | 2010 | 2015 | 2020 | Member state notes |
|---|---|---|---|---|---|---|
| energy calc.) | | | | | | |
| Other | TWh | 3.24 | 3.14 | 3.24 | 3.02 | 'Other' includes electricty from pumped storage, peat, and from waste. Electricty imports from Northern Ireland are not estimated separately as the basis for emissions in ICF-BOC report. |
| Energy demand by sector | Ktoe | 8012.8 | 8835.9 | 9306.1 | 9898.6 | All figures for energy demand by sector are in Ktoe. Figures for Energy Industries from IPM. |
| Energy Industries | Ktoe | 4674.6 | 5289.4 | 5586.8 | 5944.6 | |
| Oil (fossil) | Ktoe | 415.8 | 415.8 | 415.8 | 415.8 | |
| Gas (fossil) | Ktoe | 2545.2 | 3132.4 | 3444.9 | 3805.2 | |
| coal | Ktoe | 1638 | 1670.7 | 1670.7 | 1670.7 | |
| Renewables | Ktoe | 75.6 | 70.5 | 55.4 | 52.9 | |
| Nuclear (IEA definition for energy calc.) | Ktoe | | | | | |
| Other | Ktoe | 856.8 | 839.1 | 844.2 | 834.1 | 'Other' includes electricty from electricity and peat |
| Industry | | 0 | 0 | 0 | 0 | Figures for industry not available |
| Oil (fossil) | | | | | | |
| Gas (fossil) | | | | | | |
| coal | | | | | | |
| Renewables | | | | | | |
| Other | | | | | | |
| Commercial (Tertiary) | Ktoe | 1254.5 | 1410.5 | 1505.4 | 1578.5 | Figures from ESRI November 2005 Mid-Term Review (High growth to 2012 Low growth 2012-20) |
| Oil (fossil) | Ktoe | 826.8 | 899.3 | 962.5 | 1011.2 | |
| Gas (fossil) | Ktoe | 389.7 | 473.4 | 505.2 | 529.7 | |
| coal | Ktoe | 36 | 36 | 36 | 36 | |
| Renewables | Ktoe | 2 | 1.8 | 1.7 | 1.6 | |
| Other | Ktoe | 782.1 | 975.1 | 1052.2 | 1097.6 | 'Other' includes electricty from electricity and peat |
| Residential | Ktoe | 2083.7 | 2136 | 2213.9 | 2375.5 | Figures from ESRI November 2005 Mid-Term Review (High growth to 2012 Low growth 2012-20) |
| Oil (fossil) | Ktoe | 1125.9 | 1028.7 | 995.6 | 1102.8 | |
| Gas (fossil) | Ktoe | 647.9 | 886.8 | 1053 | 1142.8 | |

| **1. Mandatory parameters on projectionsAssumptions for general economic parameters** | **units** | **2005** | **2010** | **2015** | **2020** | **Member state notes** |
|---|---|---|---|---|---|---|
| coal | Ktoe | 267.5 | 181.2 | 128.9 | 96.1 | |
| Renewables | Ktoe | 42.4 | 39.3 | 36.4 | 33.8 | |
| Other Please Specify in Column I | Ktoe | 925.9 | 979 | 1002.3 | 967.8 | 'Other' includes electricty from electricity and peat |
| Transport | Ktoe | 0 | 0 | 0 | 0 | |
| Oil (fossil) | | | | | | |
| Gas (fossil) | | | | | | |
| Renewables | | | | | | |
| Other Please Specify in Column I | | | | | | |
| Assumptions on weather parameters | | | | | | None specified |
| **Assumptions for the industry sector** | | | | | | |
| *For Member States using macroeconomic models:* | | | | | | This methodology was not used for industrial emissions for derivation of either energy-related or process emissions. Instead a bottom-up survey of major emitters was used and based on plant specific data – this bottom up methodology for industry when combined with the power sector modelling is considered to cover 97% of emissions from participants in ETS and includes both energy and process emissions from industry and the whole of the electricity generation sector. |
| The share of the industrial sector in GDP and growth rate | | | | | | |
| *For Member States using other models:* | | | | | | This methodology was not used to any significant extent. A bottom-up methodology was used for the most energy intensive plants at plant level. An emissions growth index of 2.4% per year from 2003 to 2012 was used for Food and Drinks sector whose emissions are ~ 1 MT CO2e. The sector has 33 sites in ETS in a variety of different subsectors dairies, brewing etc and the sector projects a 2.4 % per annum growth in energy related CO2 emissions before any additional measures. For smaller non-ETS |

| 1. Mandatory parameters on projectionsAssumptions for general economic parameters | units | 2005 | 2010 | 2015 | 2020 | Member state notes |
|---|---|---|---|---|---|---|
| | | | | | | industries (total CO2 emissions emissions in 2003 of ~ 0.9 MT) the annual growth rate of 3.5% was applied to 2003 emissions values from 2003 to 2012 in line with macro economic projectioions of energy emissions growth in services sector based on ESRI macroeconomic model. |
| The production index for industrial sector | | | | | | |
| **Assumptions for the transport sector** | | | | | | Neither of these indices were used as the basis of transport emissions. The National Roads Authority has published growth indices for total kms travelled by private cars (and LGVs in one index) and for total kms by HGVs in a separate index. These indices were published in 2003 for each year out to 2040 and these were used to provide projections of kms of passenger cars and HGV (i.e. kms travel distances) from 2002 to 2040. These indices were used to project transport emissions by a pro rata on the verified 2003 national emissions and they assume no change in the average number of kms travelled by private cars over the period. The resultant values for emissions from cars and HGVs were then adjusted to account for potential savings from engine efficiency gains in private cars and infrastructural improvements based inter alia on GHG reductions cited in the EIS's for major projects such as the new Dublin Port Tunnel due to be commissioned in 2006. With Measures emissions from road transport were also reduced by an additional 250 kt CO2 pa in the years 2008-2012 annum to account for savings due to mineral oil tax relief for biofuels. Estimates of emissions were subsequently revised upwards in line with European Commission Decision on Ireland's National Allocation Plan for 2008-2012 |
| *For Member States using macroeconomic models:* | | | | | | |
| The growth of transport relative to GDP | | | | | | |

| **1. Mandatory parameters on projectionsAssumptions for general economic parameters** | **units** | **2005** | **2010** | **2015** | **2020** | **Member state notes** |
|---|---|---|---|---|---|---|
| *For Member States using other models:* | | | | | | |
| The growth of passenger person kilometres | | | | | | |
| The growth of freight tonne kilometres | | | | | | |
| **Assumptions for buildings (in residential and commercial or tertiary sector)** | | | | | | |
| *For Member States using macroeconomic models:* | | | | | | |
| The level of private consumption (excluding private transport) | | | | | | |
| The share of the tertiary sector in GDP and the growth rate | | | | | | |
| *For Member States using other models:* | | | | | | |
| The rate of change of floor space for tertiary buildings and dwellings | | | | | | |
| The number of dwellings and number of employees in the tertiary sector | | | | | | |
| The number of dwellings | 1000 dwellings | 1435 | 1657 | 1859 | 1989 | |
| Number of employees in the tertiary sector | 1000 employees | | | | | |
| **Assumptions in the agriculture sector** | | | | | | |
| *For Member States using macroeconomic models:* | | | | | | |
| The share of the agriculture sector in GDP and relative | | | | | | |

| **1. Mandatory parameters on projectionsAssumptions for general economic parameters** | **units** | **2005** | **2010** | **2015** | **2020** | **Member state notes** |
|---|---|---|---|---|---|---|
| growth | | | | | | |
| *For Member States using other models:* | | | | | | |
| Livestock numbers by animal type | | | | | | |
| Total cattle | 1000 heads | 6999 | 6173 | 5876 | 5876 | |
| Dairy cattle | 1000 heads | 1357 | 1262 | 1192 | 1192 | |
| Non-dairy cattle | 1000 heads | 5642 | 4911 | 4684 | 4684 | |
| Sheep | 1000 heads | 6636 | 5960 | 5669 | 5669 | |
| Swine | 1000 heads | 1760 | 1618 | 1574 | 1574 | |
| Poultry | 1000 heads | 16328 | 16337 | 16345 | 16345 | |
| Other | 1000 heads | | | | | |
| The area of crops by crop type | | | | | | |
| Emissions factors by type of livestock for enteric fermentation and manure management (t) | | | | | | |
| **Assumptions in the waste sector** | | | | | | |
| Waste generation per head of population or tonnes of municipal solid waste | kt | 3267 | 3849 | 3743 | 3253 | |
| The organic fractions of municipal solid waste | % | 62 | 60 | 62 | 62 | |
| Municipal solid waste disposed to landfills | % | 35 | 18 | 5 | 1 | |
| Municipal solid waste disposed incinerated | % | 0 | 9 | 15 | 20 | |
| Municipal solid waste | % | 4 | 10 | 12 | 13 | |

| **1. Mandatory parameters on projectionsAssumptions for general economic parameters** | **units** | **2005** | **2010** | **2015** | **2020** | **Member state notes** |
|---|---|---|---|---|---|---|
| disposed composted | | | | | | |
| Municipal solid waste disposed to landfills | kt | 114345 | 69282 | 18715 | 3253 | |
| | | | | | | |
| **Assumptions in the forestry sector** | | | | | | |
| Forest definitions | | | | | | |
| Areas of: | | | | | | |
| managed forests | hectares | 252000 | 322000 | 392000 | 462000 | |
| unmanaged forests | | | | | | |

| 2. Recommended parameters on projections | 2005 | 2010 | 2015 | 2020 | Units |
|---|---|---|---|---|---|
| **Assumptions for general economic parameters** | | | | | |
| GDP growth rates split by industrial sectors in relation to 2000 | | | | | |
| Comparison projected data with official forecasts | | | | | |
| **Assumptions for the energy sector** | | | | | |
| National coal, oil and gas energy prices per sector (including taxes) | | | | | |
| National electricity prices per sector as above (may be model output) | | | | | |
| Total production of district heating by fuel type | | | | | |
| **Assumptions for the industry sector** | | | | | |
| Assumptions fluorinated gases: | | | | | |
| Aluminium production and emissions factors | | | | | |
| Magnesium production and emissions factors | | | | | |
| Foam production and emissions factors | | | | | |
| Stock of refrigerant and leakage rates | | | | | |
| *For Member States using macroeconomic models:* | | | | | |
| Share of GDP for different sectors and growth rates | | | | | |
| Rate of improvement of energy intensity (1990 = 100) | | | | | |
| *For Member States using other models:* | | | | | |
| Index of production for different sectors | | | | | |
| Rate of improvement or index of energy efficiency | | | | | |
| **Assumptions for buildings (in residential and commercial / tertiary sector)** | | | | | |
| *For Member States using macroeconomic models:* | | | | | |
| Share of tertiary and household sectors in GDP | | | | | |
| Rate of improvement of energy intensity | | | | | |
| *For Member States using other models:* | | | | | |
| Number of households | | | | | |
| Number of new buildings | | | | | |
| Rate of improvement of energy efficiency (1990 = 100) | | | | | |
| **Assumptions for the transport sector** | | | | | |
| *For Member States using econometric models:* | | | | | |
| Growth of transport relative to GDP split by passenger and freight | | | | | |
| Improvements in energy efficiency split by vehicle type | | | | | |
| Improvements in energy efficiency split by vehicle type, whole fleet/new cars | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Rate of change of modal split (passenger and freight) | | | | | |
| Growth of passenger road kilometres | | | | | |
| Growth of passenger rail kilometres | | | | | |
| Growth of passenger aviation kilometres | | | | | |
| Growth of freight tonne kilometres on road | | | | | |
| Growth of freight tonne kilometres by rail | | | | | |
| Growth of freight tonne kilometres by navigation | | | | | |
| **Assumptions for the agriculture sector** | | | | | |
| *For Member States using econometric models:* | | | | | |
| Agricultural trade (import/export) | | | | | |
| Domestic consumption (e.g. milk/beef consumption) | | | | | |
| *For Member States using other models:* | | | | | |
| Development of area of crops, grassland, arable, set-aside, conversion to forests etc | | | | | |
| Macroeconomic assumptions behind projections of agricultural activity | | | | | |
| Description of livestock (e.g. by nutrient balance, output/animal production, milk production) | | | | | |
| Development of farming types (e.g. intensive conventional, organic farming) | | | | | |
| Distribution of housing/grazing systems and housing/grazing period | | | | | |
| Parameters of fertiliser regime: | | | | | |
| Details of fertiliser use (type of fertiliser, timing of application, inorganic/organic ratio) | | | | | |
| Volatilisation rate of ammonia, following spreading of manure on the soil | | | | | |
| Efficiency of manure use | | | | | |
| Parameters of manure management system: | | | | | |
| Distribution of storage facilities (e.g. with or without cover): | | | | | |
| Nitrogen excretion rate of manures | | | | | |
| Methods of application of manure | | | | | |
| Extent of introduction of control measures (storage systems, manure application), use of best available techniques | | | | | |
| Parameters related to nitrous oxide emissions from agricultural soils | | | | | |
| Amount of manure treatment | | | | | |