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Report of the in-depth review of the fifth national communication of Ireland

Parties included in Annex I to the Convention are requested, in accordance with decision 10/CP.13, to submit a fifth national communication to the secretariat by 1 January 2010. In accordance with decision 8/CMP.3, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their fifth national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. This report presents the results of the in-depth review of the fifth national communication of Ireland conducted by an expert review team in accordance with the relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

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I. Introduction and summary

A. Introduction

1. For Ireland the Convention entered into force on 19 July 1994 and the Kyoto Protocol on 15 February 2005. Within the burden-sharing agreement of the European Union (EU) for meeting commitments under the Kyoto Protocol, Ireland committed itself to limiting the growth in its greenhouse gas (GHG) emissions to 13 per cent above the 1990[1] level during the first commitment period from 2008 to 2012.

2. This report covers the in-country in-depth review (IDR) of the fifth national communication (NC5) of Ireland, coordinated by the UNFCCC secretariat, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The review took place from 21 to 26 June 2010 in Dublin, Ireland, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Tinus Pulles (Netherlands), Mr. Jaekyu Lim (Republic of Korea), Mr. Matjaž Česen (Slovenia) and Ms. Emily Ojoo-Massawa (Kenya). Messrs. Pulles and Lim were the lead reviewers. The review was coordinated by Ms. Ruta Bubniene and Ms. Inkar Kadyrzhanova (UNFCCC secretariat).

3. During the IDR, the expert review team (ERT) examined each section of the NC5. The ERT also evaluated the supplementary information provided by Ireland as a part of the NC5 in accordance with Article 7, paragraph 2, of the Kyoto Protocol. In addition, the ERT reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, which was provided by Ireland in its 2009 annual submission and elaborated further in its 2010 annual submission under Article 7, paragraph 1, of the Kyoto Protocol.

4. In accordance with decision 22/CMP.1, a draft version of this report was communicated to the Government of Ireland, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

5. The ERT noted that Ireland's NC5 complies in general with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines). As required by decision 15/CMP.1, supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[2] is provided in the NC5. Ireland considered a few of the recommendations provided in the report of the in-depth review of the fourth national communication (NC4)[3]. The ERT encourages Ireland to address the recommendations of this report and previous review report in its next national communication. The ERT commends Ireland for its openness and cooperation during the in-country review.

[1] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for carbon dioxide, methane and nitrous oxide and 1995 for perfluorocarbons, hydrofluorocarbons and sulphur hexafluoride. The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

[2] Decision 15/CMP.1, annex, chapter II.

[3] FCCC/IDR.4/IRL.

6. The supplementary information on the minimization of adverse impacts referred to in paragraph 3 above is mostly complete and transparent and was provided on time. During the review Ireland provided additional information on its efforts to integrate considerations regarding the minimization of the adverse impacts of climate change in planning its policies for the transport and agriculture sectors.

1. Completeness

7. The NC5 covers most of the mandatory information required by the UNFCCC reporting guidelines and most of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, except for information on policies and measures (PaMs) (see para. 25 below), emission projections (see para. 66 below), definition of "new and additional" financial resources (see para. 87 below) and technology transfer (see para. 91 below). In addition, the ERT noted that some mandatory reporting elements required by the UNFCCC reporting guidelines and information required under Article 7, paragraph 1, were not reported, namely information on how Ireland gives priority in implementing its commitments under Article 3, paragraph 14, of the Kyoto Protocol (see para. 102 below). This information missing from the NC5 was provided during the review in response to questions raised by the ERT. The ERT recommends that this information be included in the next national communication.

2. Transparency

8. The ERT acknowledged that Ireland's NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, is well structured and concise. The NC5 provides information on most aspects of the implementation of the Convention and its Kyoto Protocol. The NC5 is structured following the outline contained in the annex to the UNFCCC reporting guidelines, and supplementary information submitted under Article 7, paragraph 2, of the Kyoto Protocol is easily identifiable. In the course of the review Ireland provided a considerable amount of additional information, adding to the transparency of the NC5. In the course of the review, the ERT formulated a number of recommendations that could help Ireland to further enhance the transparency of its reporting by providing transparent information, namely on the coverage and presentation of projections (see para. 68 below) and on the GHG emission reduction effects of PaMs (see para. 78 below). The ERT encourages Ireland to further improve the transparency and consistency by providing additional information on climate change impacts and adaptation measures, including information on the climate change adaptation strategy once it is completed (see para. 84 below).

3. Timeliness

9. The NC5 was submitted on 12 February 2010 (and resubmitted on 13 March 2010), after the deadline of 1 January 2010 mandated by decision 10/CP.13. Ireland informed the secretariat about difficulties with the timeliness of its national communication submission on 8 February 2010 in accordance with paragraph 139 of decision 22/CMP.1.

II. Technical assessment of the reviewed elements

A. National circumstances relevant to greenhouse gas emissions and removals, including legislative arrangements and administrative procedures

10. In its NC5, Ireland has provided a concise description of the national circumstances, and has elaborated on the framework legislation and key policy documents on climate change. The NC5 also refers to the description of a national system provided in the national inventory report (NIR) of the 2009 annual submission. The ERT acknowledged that Ireland addressed the recommendation of the NC4 review and incorporated a description of its national inventory system in the NC5 in order to provide complete supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. Further technical assessment of the institutional and legislative arrangements for coordination and implementation of PaMs is provided in chapter II.B.I of this report.

1. National circumstances

11. In its NC5, Ireland has provided a description of its national circumstances and information on how these national circumstances affect GHG emissions and removals in Ireland and how changes in national circumstances affect GHG emissions and removals over time. Information was provided on the government structure, population, geography, climate, economy and on relevant economic sectors. The ERT noted that the main drivers of emission trends in Ireland include rapid economic growth in the 1990s and up to 2007, a significant population growth, a high proportion of young people, who tend to increase consumption, and increased road transportation. The impact of these drivers was partly outweighed by changes in the fuel mix towards less carbon-intensive fuels, such as natural gas use in the power generation sector, the closure of ammonia and nitric acid production plants and more efficient agricultural production, which has led to a reduction in livestock numbers. Table 1 illustrates the national circumstances of Ireland by providing some indicators relevant to GHG emissions and removals.

12. Ireland is a parliamentary democracy with two houses of parliament. The overall responsibility for climate change policymaking lies with the Department for the Environment, Heritage and Local Government, and a number of national institutions are involved in the implementation of this policy. In the current Government, both the Minister for the Environment, Heritage and Local Government and the Minister for Communications, Energy and Natural Resources are Green Party representatives, and both demonstrate a high level of commitment to climate change action. To promote climate change policy, in 2007 Ireland established two Committees on Climate Change and Energy Security within the Government and Parliament aimed at facilitating the decision-making process and at ensuring political involvement and financial support for climate change policy development and implementation at the highest political level. The government committee is supported by a senior officials group and a technical advisory steering group. Further legislative arrangements and administrative procedures, including those for the national system and the national registry, are presented in chapters II.A.2, II.A.3 and II.B below.

Table 1
Indicators relevant to greenhouse gas emissions and removals for Ireland

	1990	*1995*	*2000*	*2005*	*2008*	*Change 1990–2000 (%)*	*Change 2000–2008 (%)*	*Change 1990–2008 (%)*
Population (million)	3.51	3.60	3.80	4.15	4.44	8.3	16.8	26.5
GDP (2000 USD billion using PPP)	54.91	68.87	108.98	142.24	154.07	98.5	41.4	180.6
TPES (Mtoe)	10.00	10.63	13.70	14.39	14.98	37.0	9.3	54.0
GDP per capita (2000 USD thousand using PPP)	15.64	19.13	28.68	34.27	34.70	83.3	21.0	121.8
TPES per capita (toe)	2.85	2.95	3.61	3.47	3.37	26.6	–6.7	18.3
GHG emissions without LULUCF (Tg CO_2 eq)	54.81	58.48	67.76	68.82	67.44	23.6	–0.5	23.0
GHG emissions with LULUCF (Tg CO_2 eq)	55.06	58.77	67.90	68.35	65.97	23.3	–2.8	19.8
CO_2 emissions per capita (Mg)	9.22	9.78	11.75	11.45	10.67	27.4	–9.2	15.7
CO_2 emissions per GDP unit (kg per 2000 USD using PPP)	0.59	0.51	0.41	0.33	0.31	–30.5	–24.9	–47.5
GHG emissions per capita (Mg CO_2 eq)	15.62	16.24	17.83	16.58	15.19	14.2	–14.8	–2.8
GHG emissions per GDP unit (kg CO_2 eq per 2000 USD using PPP)	1.00	0.85	0.62	0.48	0.44	–37.7	–29.6	–56.0

Sources: (1) GHG emissions data: Ireland's 2010 GHG inventory submission; (2) Population, GDP and TPES data: International Energy Agency.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

13. In its NC5, Ireland has provided a summary of information on GHG emission trends for the period 1990–2007. This information is broadly consistent with the 2009 national GHG inventory submission. In the 2010 annual inventory submission, Ireland presented the recalculated data up to 2007. According to this submission, the total emissions without land use, land-use change and forestry (LULUCF) are 67.44 Tg carbon dioxide equivalent (CO_2 eq), or 2.3 per cent lower than in the previous annual submission. Summary tables, including trend tables for emissions in CO_2 eq (given in the common reporting format), are provided in an annex to the NC5. During the review the ERT assessed the recently submitted 2010 annual submission and reflected the findings in this report.

14. During the review, Ireland informed the ERT that between 1990 and 2008, total GHG emissions, excluding emissions and removals from LULUCF, increased by 23.0 per cent and the total primary energy supply (TPES) increased by 54.0 per cent, while the gross domestic product (GDP) grew by 180.6 per cent. This shows a much slower growth in energy supply and GHG emissions levels compared with economic growth. GHG emissions peaked in 2001 and remained relatively stable during the 2000s, chiefly as a result of a significant change in the fuel supply mix in favour of fuels with a lower carbon content, such as natural gas and renewable energy, a wider use of combined heat and power (CHP) and improved energy efficiency in the residential sector.

15. Total GHG emissions, excluding net emissions and removals from LULUCF, increased by 23.0 per cent between 1990 and 2008, whereas total GHG emissions, including net emissions and removals from LULUCF, increased by 19.8 per cent. This growth was mainly attributed to an increase of 46.4 per cent in CO_2 emissions over the period 1990–2008, when the CO_2 emissions share increased from 59.1 per cent to 70.3 per cent. Emissions of methane (CH_4) and nitrous oxide (N_2O) decreased by 10.4 and 18.5 per cent, respectively, between 1990 and 2008. CH_4 accounted for 24.8 per cent of the total GHG emissions without LULUCF in 1990 and 18.0 per cent in 2008, while N_2O accounted for 16.1 per cent in 1990 and 10.7 per cent in 2008. A major part of the increase in total GHG emissions without LULUCF occurred in 1990–2001, when emissions increased by 26.5 per cent from 54.81 to 69.60 Tg CO_2 eq. Emissions started to decrease thereafter, but slightly peaked again in 2005. Overall, in 2008 emissions were 3.2 per cent lower than in 2001. Emissions of fluorinated gases (F-gases) accounted for about 0.1 per cent of total GHG emissions without LULUCF in 1990 and 1.0 per cent in 2008.

16. Between 1990 and 2008, GHG emissions increased in the energy and solvent and other product use sectors. GHG emissions decreased in the agriculture, industrial processes and waste sectors. Within the energy sector, GHG emissions increased significantly in the transport sector, the share of which increased from 9.4 per cent of total GHG emissions in 1990 to 21.2 per cent in 2008. Analysis of drivers of the GHG emissions trends in each sector is provided in chapter II.B. Table 2 provides an overview of GHG emissions by sector from the base year to 2008.

Table 2
Greenhouse gas emissions by sector in Ireland, 1990–2008

Sector	*GHG emissions (Tg CO_2 eq)*						*Change (%)*		*Shares[a] by sector (%)*	
	1990	*1995*	*2000*	*2005*	*2007*	*2008*	*1990[b]–2008*	*2007–2008*	*1990*	*2008*
1. Energy	31.03	33.83	42.52	45.61	45.35	45.69	47.3	0.8	56.6	67.8
A1. Energy industries	11.24	13.40	16.14	15.77	14.53	14.53	30.3	0.7	20.5	21.7
A2. Manufacturing industries and construction	3.96	4.32	5.59	5.74	5.87	5.55	40.2	–5.5	7.2	8.2
A3. Transport	5.16	6.27	10.77	13.03	14.38	14.25	176.2	–0.8	9.4	21.1
A4–A5. Other	10.54	9.73	9.94	11.01	10.51	11.20	6.2	6.6	19.2	16.6
B. Fugitive emissions	0.13	0.11	0.09	0.06	0.06	0.05	–60.9	–14.0	0.2	0.1
2. Industrial processes	3.18	3.07	4.20	3.25	3.28	2.99	–5.9	–8.9	5.8	4.4

Sector	*GHG emissions (Tg CO_2 eq)*						*Change (%)*		*Shares[a] by sector (%)*	
3. Solvent and other product use	0.08	0.08	0.08	0.08	0.08	0.09	8.2	2.4	0.1	0.1
4. Agriculture	19.22	19.91	19.63	18.66	17.74	17.58	–8.6	–0.9	35.1	26.1
5. LULUCF	0.25	0.29	0.14	–0.48	–0.98	–1.47	–693.8	50.1	0.5	–2.2
6. Waste	1.30	1.58	1.33	1.22	1.19	1.09	–15.9	–8.0	2.4	1.6
GHG total with LULUCF	**55.06**	**58.77**	**67.90**	**68.35**	**66.67**	**65.97**	**19.8**	**–1.0**		
GHG total without LULUCF	**54.81**	**58.48**	**67.76**	**68.82**	**67.65**	**67.44**	**23.0**	**–0.3**	**100.0**	**100.0**

Source: Data as reported in Ireland's 2010 GHG inventory submission and to be reviewed under the 2010 annual review process.

Note: The changes in emissions and the shares by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

2. National system

17. In accordance with decision 15/CMP.1, Ireland has provided in its NC5 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). The Party also provided a reference to the 2009 annual submission, which contains a more detailed description of the national system. The description includes all elements as required in decision 15/CMP.1. During the review Ireland further explained its institutional arrangements.

18. Ireland did not provide information on national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, of the Kyoto Protocol also contribute to the conservation of biodiversity and sustainable use of natural resources.

19. During the review Ireland provided additional information on the national system, elaborating on the capacity of the national system, institutional and legislative arrangements and administrative procedures for GHG inventory planning, preparation and management (e.g. GHG inventory cycle, inventory planning and quality assurance/quality control (QA/QC)). Ireland provided information on its efforts to reduce uncertainty and improve the quality of data for the enteric fermentation and manure management categories by developing a tagging system for animals.

20. The ERT noted that Ireland addressed the recommendations of the report of the individual review of the 2009 annual submission of Ireland[4] (2009 ARR) with regard to improved information on uncertainty analysis and QA/QC activities and included this information in its NC5. However, during the in-country review Ireland further explained its

[4] Report of the individual review of the greenhouse gas inventory of Ireland submitted in 2009 (FCCC/ARR/2009/IRL).

institutional arrangements established to improve the inventory preparation. The ERT concluded that the national system continued to perform its required functions as set out in decision 19/CMP.1.

3. National registry

21. In its NC5, Ireland has provided information on the national registry, including a description on how its national registry performs its functions defined in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and how it complies with the requirements of the technical standard for data exchange between registry systems.

22. During the review, Ireland provided additional information on the measures put in place to safeguard, maintain and recover registry data, the security measures employed in the registry to prevent unauthorized manipulations of data, the measures put in place to protect the registry against security compromises, the test procedures related to the performance of the current version of the national registry and the recording of changes to and discrepancies in the national registry. In response to questions raised by the ERT, Ireland provided documents demonstrating how it records changes related to the national registry and how it maintains these records, following well-developed protocols and instructions. The ERT noted that updates of databases and applications, implemented security measures and changes to the national registry software are documented on a regular basis by nominated responsible staff.

23. The ERT took note of the conclusion of the 2010 standard independent assessment report. The ERT also took note of the recommendations in the 2009 ARR. The ERT noted the changes reported by Ireland with regard to the changes in contact information of the registry administrator, software updates, the data hosting provider, security measures employed, the list of publicly accessible information and the results of test procedures. During the review the ERT learned that Ireland has explicitly addressed all of the 2009 ARR recommendations and commissioned an independent administrative and technical audit by an external international auditing company to review the system's security. Ireland informed the ERT that all recommendations of the audit have been duly addressed.

24. The ERT concluded that Ireland's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and in the annex to decision 5/CMP.1 and continues to adhere to the technical standards for data exchange between registry systems in accordance with decisions 16/CP.10 and 12/CMP.1.

B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

25. In its NC5 Ireland has provided limited information that broadly follows the UNFCCC reporting guidelines on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol. Each sector has its own textual description of the principal PaMs; however, this narrative information is not supplemented by a summary table on the effects of PaMs by sector and by gas, as recommended by the previous review report. During the review, Ireland provided such a summary table containing information on each PaM, its objective, the affected GHGs, the type of instrument, the implementation status and the mitigation potential. The ERT recommends that Ireland provide such a summary table and that it organize information on PaMs in its next national communication by sector and by gas, including information on each PaM, its objective, the GHGs affected, the type of instrument, the implementation status and implementing entity. The ERT encourages Ireland to provide more detailed

information on the prioritization of PaMs in each sector in order to achieve the national goal of GHG emission reduction.

26. Ireland has also provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention. Its NC5 contains a set of PaMs similar to those in the NC4 and new information on PaMs. Some of the recommendations from the previous review report were taken into consideration in the NC5, specifically additional transparent information on further implementation of PaMs in the renewable energy, energy efficiency and transport sectors has been presented. The ERT encourages Ireland to provide in its next national communication a description of each PaM reported, including a quantitative estimate of the reduction potential of individual PaMs or collections of PaMs, estimation methods, information about the costs of PaMs, non-GHG mitigation benefits, and how PaMs interact and complement other PaMs at the national level.

27. Ireland provided information on PaMs at both the national and EU levels. Also, Ireland provided some information on the role played by regional and local governments in the implementation of PaMs in sectors such as the energy efficiency, waste management, residential and agriculture sectors. The ERT encourages Ireland to provide transparent information on PaMs that are implemented, adopted and/or planned by governments at the national and local levels in its next national communication.

28. According to the Party, a number of PaMs are effective, innovative and replicable. For example, in the energy sector Ireland developed a comprehensive policy framework that covers several energy use modes in a coordinated manner to promote the use of renewable energy in transport, space heating and electricity generation that has an estimated emission reduction effect of about 3,000 Gg CO_2 eq in 2020. In the waste sector, successful implementation of the plastic bag levy could be noted as a success, owing to the sectoral emission reduction and antilittering and environmental co-benefits. In addition, the ERT noted that setting periodic carbon budgets could be considered as an innovative and replicable approach to demonstrating progress in mainstreaming the emission reduction targets in the government budgeting and planning process. The carbon budget aims to increase public understanding of climate change and of the Government's response by setting a clear measure of the progress made each year towards meeting the Government's target of reducing emissions by an average of 3 per cent annually in the period 2008–2012. The carbon budgeting process will measure the effects of each PaM and its results in terms of achieved emission reductions.

29. Ireland has not provided information on the synergies and overlaps among the PaMs at the national and subnational levels or on actions to monitor policy implementation over time. Ireland has not reported on PaMs that potentially increase emissions, but it provided information on PaMs that are still in place but no longer listed as emission reduction measures, such as a national car test, or PaMs that have been superseded, such as the 2002 building regulations superseded by 2008 and 2010 building standards and a greener homes scheme superseded by other policies. Table 3 gives information about the PaMs by sector.

Table 3
Summary of information on policies and measures

Major policies and measures	*Examples/comments*
Policy framework and cross-sectoral measures	
Integrated climate programme	National Climate Change Strategy 2007–2012 Framework for Climate Change Bill 2010 with a target of an 80 per cent reduction in net GHG emissions by 2050 from the

Major policies and measures	*Examples/comments*
	1990 level
	EU climate and energy package with a target of a 20 per cent reduction of total GHG emissions from non-ETS sectors by 2020 from the 2005 level
Emissions trading	EU emissions trading directive: EU ETS first trading period 2005–2007, EU ETS second trading period 2008–2012 (expected to cover about a third of total GHG emissions)
Non-ETS sectors	Economy-wide and least-cost approach to policies and measures in non-ETS sectors; carbon budgeting
Policymaking process	Cabinet Committee on Climate Change and Energy Security assisted by Senior Officials Group and Technical Advisory Steering Group
Energy	
Renewables	National Renewable Energy Action Plan
	Renewables REFIT (2010: 1,329 kt; 2020: 1,999 kt)
	ReHeat programme (2010: 37 kt; 2020: 36 kt)
	RES-Energy, 40 per cent renewables by 2020 (2010: 7 kt; 2020: 971 kt)
	RES-Heat, 12 per cent renewables by 2020 (2010: 116 kt; 2020: 1,128 kt)
Energy efficiency	National Energy Efficiency Action Plan; energy efficiency measures aimed at reduced demand (2010: 202 kt; 2020: 994 kt)
Residential	SEAI home energy saving scheme (2010: 112 kt, 2020: 148 kt)
	Efficient boiler standard (2010: 96 kt; 2020: 570 kt)
	Greener homes scheme (2010: 69 kt; 2020: 62 kt)
	2010 building programme (2010: 0; 2020: 592 kt)
	Low-carbon homes (2010: 0; 2020: 94 kt)
	National Spatial Strategy, “Delivering Homes, Sustaining Communities”, and planning guidelines
Industry	SEAI energy agreements (2010: 114 kt; 2020: 279 kt)
	Large industry network (2010: 34 kt; 2020: 143 kt)
	Accelerated capital allowance (2010: 0; 2020: 4 kt)
	CHP deployment programme (2010: 64 kt; 2020: 112 kt)
Transport	Smarter Travel – a Sustainable Transport Future
	RES-Transport, 10 per cent renewables by 2020 (2010: 0; 2020: 861 kt)
	Vehicle registration tax/motor tax changes linked to CO_2 emissions (2010: 9 kt; 2020: 53 kt)
	Technology improvements (2010: 68 kt; 2020: 407 kt)
	Biofuels obligation (2010: 412 kt; 2020: 539 kt)
	Efficient driving campaign (2010: 29 kt; 2020: 172 kt)
	Mobility management and travel plans (2010: 48 kt; 2020: 287 kt)
	Sustainable public transport fleet (2010: 4 kt; 2020: 24 kt)
	E-working (2010: 7 kt; 2020: 39 kt)
	Electric vehicle deployment (2010: 42 kt; 2020: 251 kt)
Industrial processes	
	Fluorinated gas regulations (2010: 30 kt; 2020: 30 kt)

Major policies and measures	*Examples/comments*
	HFC emissions from air conditioning in cars (2010: 8 kt; 2020: 123 kt)
Agriculture	
	Technical mitigation options such as increasing length of grazing season, reduction of fertilizer use and reduction of slaughter age of cattle are under consideration. Decoupling emissions from production through improved efficiencies that reduce emissions per unit of output
	Provision of support to the advisory service to realize these and other efficiencies. CAP Reform Agreement (2010: 1,335 kt; 2020: 2,167 kt)
Forestry	
	Afforestation grant scheme
	Promotion of domestic forest energy market aimed at promoting renewable energy from biomass
Waste	
	Municipal waste incineration will start in 2011
	EU landfill directive and increased recycling (2010: 18 kt; 2020: 268 kt)
	Plastic bag levy

Note: The greenhouse gas reduction estimates given for some measures (in parentheses) are reductions in kt CO_2 or CO_2 eq for the years 2010 and 2020 as estimated in March 2010.

Abbreviations: GHG = greenhouse gas, ETS = emissions trading scheme, REFIT = Renewable Energy Feed In Tariff, RES = Renewable Energy Sources, SEAI = Sustainable Energy Authority of Ireland, CHP = combined heat and power, HFC = hydrofluorocarbons, CAP = Common Agricultural Policy.

1. Policy framework and cross-sectoral measures

30. The NC5 describes the overall climate change policy context well. The policy framework has been shaped by the EU burden-sharing agreement, according to which Ireland must limit GHG emissions growth to 13 per cent above the 1990 level during the Kyoto Protocol first commitment period. This target is enshrined in the EU agreement reached in 1998 to divide the burden of reaching the target of an 8 per cent reduction during the period 2008–2012 compared with the 1990 level unequally among the EU member States.

31. In 2007, Ireland published its National Climate Change Strategy for 2007–2012, which set the policy objectives for the first commitment period under the Kyoto Protocol (2008–2012) and indentified areas for further research and action to meet the EU-wide climate change commitments.

32. The current national climate change policy and legal framework will be further enhanced by the Climate Change Bill, which is expected to be adopted by the end of 2010. The bill sets a national long-term target for 2050 to achieve at least an 80 per cent reduction in net emissions and to reach a 3 per cent reduction on average per year until 2020. In addition to the targets, the bill identifies the following key priorities: extension of the National Climate Change Strategy to two more five-year cycles; legal enforcement of the annual carbon budget; legal backing for the newly established Climate Change Committees; preparation of the National Climate Change Adaptation Framework;

introduction of domestic measures for carbon offsetting or trading schemes, and monitoring, reporting and other legal obligations. The bill is expected to extend in the future the annual carbon budgeting process that was first introduced in 2007 to promote the integration of climate change considerations into the Government's budgetary policy and the decision-making process; it will inform decisions on expenditure and taxation in addition to decisions on the climate, financial and economic impacts.

33. Recent analysis of PaMs in Ireland has seen the incorporation of the monetary effects of co-benefits (such as air pollution prevention) into cost–benefit analysis. In addition, the climate change agenda in Ireland has been underpinned by the results of an analysis of options to reduce GHG emissions by 2030 based on marginal cost curves that show the scale of emissions reductions for each option and the associated societal saving or cost. The future policy development process will be informed by the results of such targeted economy-wide studies.

34. As an EU member State, Ireland is part of the EU Emission Trading System (EU ETS) that started operation in 2005 and covers large installations with a net thermal input exceeding 20 MW in the energy and industrial sectors. The EU ETS is regulated by the ETS Directive that set the trial phase or first trading period as 2005–2007, followed by a second trading period for 2008–2012 that corresponds to the Kyoto Protocol first commitment period, and subsequent post-2012 trading periods. The EU ETS covers about 100 installations in Ireland that account for about a third of Ireland's total GHG emissions per annum; the emissions from these installations are regulated at the EU level.

35. As for the sectors not included in the EU ETS, in 2008 an EU effort-sharing decision was taken to regulate emissions from sectors, such as the transport, housing, agriculture and waste beyond the first commitment period of the Kyoto Protocol. Under this decision each member State agreed to a binding national emissions limitation target for 2020. Ireland has set a target of a 20 per cent reduction in GHG emissions compared with 2005 by 2020 in the sectors not covered by the EU ETS.

36. The EU climate and energy package adopted in 2009 includes *inter alia* such complementary components as: the revised and strengthened EU ETS, the effort-sharing decision regulating emissions from the sectors not covered by the EU ETS, national targets for renewable energy and a legal framework to promote the development and safe use of carbon capture and storage. During the review, Ireland demonstrated its readiness to implement the EU climate and energy package of measures and prepare the measures aimed at contributing to the possible EU target of a 30 per cent reduction in emissions by 2020 compared with the 1990 level, in the event that the EU sets such a target under the condition of a global agreement reached on comparable reductions elsewhere.

2. Policies and measures in the energy sector

37. Between 1990 and 2008, GHG emissions from the energy sector increased by 47.3 per cent and its share of total emissions in Ireland increased from 56.6 per cent in 1990 to 67.8 per cent in 2008. This large increase in emissions was underpinned by the rapid expansion of the Irish economy between 1990 and 2006, when GDP increased almost threefold. However, this was followed by the economic downturn of recent years. The increase in emissions has been outweighed to some extent by a gradual shift from the use in the power generation sector of coal and oil to natural gas and renewable energy sources. The 1990–2008 trend in GHG emissions from fuel combustion showed notable increases in transport (176.2 per cent), energy use in manufacturing industry and construction (40.2 per cent) and the energy industry (30.3 per cent). The emission increases in these sectors were linked to the growth in economic activity.

38. Between 1990 and 2008, the number of registered passenger cars and light-duty vehicles increased by 144 per cent and 155 per cent, respectively. In the residential and services sector, the effect of thermal insulation and the use of solar energy on emission levels did not completely outweigh the effect of a growing number of dwellings, improved standards of living and increasing floor areas of residential and commercial buildings. The PaMs implemented in the renewable energy and transport sectors are among the most efficient as measured by the estimated potential to reduce emissions.

39. ***Energy supply***. Over the period 1990–2008, Ireland's annual total primary energy supply grew by 72.2 per cent. This growth was mostly attributed to an increase in fossil fuel supply. The primary energy intensity of the economy fell between 1990 and 2008, which would suggest that the Irish economy continues to become more energy efficient. In terms of energy consumption by sector, during the in-country review Ireland provided information on a significant increase in the transport and commercial/public sectors, of 177.6 per cent and 79.5 per cent, respectively, over the period 1990–2008.

40. One of the effective reported measures is a CHP deployment programme that started in 2010 and provides support in the form of grants to assist the deployment of small-scale (<1 MW) fossil fuel fired CHP and biomass and wood residue CHP systems. At present the CHP programme includes feasibility studies to assist investigation into the application of CHP across all size ranges and technologies.

41. ***Renewable energy sources***. Over the period 1990–2008, the total renewable energy increased by 246.5 per cent in absolute terms. The growth rates of renewable energy use continuously increased over 1990–2008, reaching 20.9 per cent rate in 2008. However, this growth started from a very low level. The development of the renewable energy sector is central to the overall energy policy in Ireland in the context of national, EU and international targets that are all encompassed by the EU climate and energy package.

42. The implementation framework developed by Ireland to reach the above-mentioned targets is outlined in the National Renewable Energy Action Plan, which sets out the Government's strategic approach and concrete measures required to deliver on Ireland's targets. To better monitor the policy implementation, Ireland has set national targets for 2020 for renewable energy sources – electricity consumption, heating and transport. For electricity consumption, the target is to reach 40 per cent of electricity consumption from renewable sources by 2020 (RES-E), with an interim target of 15 per cent by 2010. According to the 2009 data, Ireland expects to meet its interim target, as the share of renewables in electricity consumption has already reached 14.4 per cent. The significant growth in electricity generated by renewable sources in recent years is largely attributable to the development of onshore wind energy sources. Ireland is also looking beyond 2020 for opportunities to develop Ireland's abundant offshore renewable energy resources.

43. In the heating sector, Ireland has set a target of 12 per cent of thermal energy to come from renewable sources by 2020 (RES-H). According to 2009 data, the share of renewable energy in thermal energy grew to reach 3.9 per cent, which is still below the interim target of 5 per cent by 2010. This growth was mostly due to the introduction of a support scheme in the form of grants in the residential and services sectors. In the transport sector, Ireland has set a target of a 10 per cent share of renewables in petrol, diesel, biofuels and electricity consumed by 2020 (RES-T). The 2009 data show that biofuels accounted for 1.5 per cent of fuels used for road transport; this small share represents a significant challenge in meeting the 2010 interim target of a 3 per cent share.

44. ***Energy efficiency***. The National Energy Efficiency Action Plan 2009–2020 (NEEAP) published in 2009 sets out the Government's plans and actions to achieve its target of 20 per cent energy efficiency savings across the economy by 2020. Recognizing that the Government must lead by example, it is committed to achieving a 33 per cent

reduction in public-sector energy use. The NEEAP identified seven areas with a high energy saving potential, including the public, residential, transport and energy supply sectors, industry, R&D and cross-sectoral actions. The NEEAP builds upon the Energy Efficiency Action Plan that was submitted to the European Commission in September 2007, required as part of Ireland's obligations under the EU directive on energy end-use efficiency and energy services, which requires the delivery of energy savings of 9 per cent in nine years, starting in 2008. In 2008, the Irish government launched a tax incentive scheme enabling companies to write off 100 per cent of the cost of energy efficient equipment in 29 technology classes against corporation tax in the year of purchase. In implementing this measure, companies claim the tax relief in their corporation tax returns.

45. ***Residential sector***. Residential final energy consumption grew by 41.0 per cent over the period 1990–2008, to reach 2.9 Mtoe. The growth in final energy consumption is driven by the increase by 53.0 per cent in the number of households from approximately 1.0 million to 1.5 million in the period 1990–2008, as a result of population growth and decline in household size. The building rate in Ireland was five times higher than the EU average, and hence the new building regulations have had a major impact on energy consumption and related CO_2 emissions. The increase in average floor area (a 68 per cent increase in floor area in the period 1990–2008) has been offset by tighter standards for building insulation. These standards have had a sizeable impact, as about 38 per cent of the housing stock was built after the new building regulations were introduced in 1992; this proportion of new buildings will be significantly higher by 2012.

46. The significant growth in the residential sector and related building construction was one of the reasons for the increase in CO_2 emissions from cement and clinker production and from the heavy-duty vehicles widely used to transport construction materials across the country. Ireland introduced a number of policies targeting the residential sector, including the National Spatial Strategy, "Delivering Homes, Sustaining Communities", and revised planning guidelines, new building performance and design regulations, efficient boiler standards and standards in private and public buildings. Ireland introduced PaMs aimed at retrofitting and "greening" the less efficient existing building stock; these measures will result in smaller energy efficiency gains, but will nevertheless continue.

47. ***Transport sector***. Between 1990 and 2008, GHG emissions from transport increased by 176.2 per cent. The rise was steep during the 2000s, which is in contrast to other sectors, where the GHG emission trends have been stable or downward. The large increase in transport emissions was mainly due to the increase in road transport demand, the number of passenger cars and light-duty vehicles, and 'fuel tourism' in the north of the country, which is caused by price differences between the fuel markets of Ireland and the United Kingdom of Great Britain and Northern Ireland. Differing excise and value added tax rates, and fluctuations in exchange rates affect the price differences, although in recent years this effect has reduced greatly. It has been estimated that at the peak of the 'fuel tourism' around 10 per cent of petrol and more than 20 per cent of diesel sold in Ireland was consumed in the United Kingdom. In terms of prevalent transport modes, Ireland is characterized by large shares of passenger road transport and road freight transport, which are sensitive to the fuel price and to economic activity. Owing to the impacts of the economic downturn and to the sensitivity to fuel price and economic activity, the growth rates in these two largest transport modes have declined since 2008, resulting in 0 per cent and –7.6 per cent growth in the number of passenger cars and road freight, respectively.

48. In 2008, Ireland introduced a new system of assessing passenger cars for Vehicle Registration Tax and annual motor tax. It moved to a seven band CO_2 emission-based system that is accompanied by a new CO_2 labelling system that is in line with the EU labelling requirements.

49. To respond to the challenges of GHG emissions mitigation from the transport sector, Ireland developed a policy called Smarter Travel – a Sustainable Transport Future for 2009–2020, which contains a vision and key actions for sustainable transport and has an estimated implementation cost of EUR 4.5 billion. This policy package is aimed at reaching four overarching goals: reduction of the distance travelled by private cars and the encouragement of smarter travel; the introduction of alternatives to cars; fuel efficiency; and strengthening institutional implementation arrangements. Ireland encourages progress in cycling and walking policies through initiation of demonstration projects and enhancing existing schemes relating to travel to school, public-sector transport services and workplace mobility.

50. Promotion of biofuels is undertaken in the context of the broader goal for Ireland to decrease its dependence on imported oil in the transport sector. Biofuel penetration is expected to increase with the commencement of the national Biofuels Obligation Scheme in 2010, which obliges all fuel suppliers to ensure a certain percentage of biofuels in their annual fuel sales. In addition to this, Ireland has set a target of 10 per cent of all vehicles in the transport fleet to be powered by electricity by 2020. Ireland is taking a broad-ranging series of initiatives around electric vehicles, including signing memoranda of understanding with a number of motor manufacturers, committing to a large-scale national roll-out of electric vehicle infrastructure and appropriate customer support. Ireland has not provided information on the use of and emissions from aviation and marine bunker fuels. The ERT encourages Ireland to continue developing and implementing the package of PaMs for sustainable transport system development and to provide this information in a transparent way in its next national communication.

51. ***Industrial sector***. Ireland reported an increase in final energy consumption by industry of 45.1 per cent over the period 1990–2008. Within this period, in the industrial sector electricity, natural gas and renewable energy sources increased their share, while coal use declined. Electricity is the second most important energy form used in industry (with a 27.5 per cent share) after oil, which had a 38 per cent share of final energy consumption in 2008.

52. In its NC5, Ireland has provided little information on the PaMs implemented in the industrial sector. The major changes in the industrial structure include the phasing out of steel production in 2001 and of fertilizer production in late 2002. The Irish economy moved towards high value added sectors such as the electronics and pharmaceuticals sectors and towards the services sector, which are not highly energy intensive. Ireland reported on the Sustainable Energy Authority of Ireland Energy Agreements programme introduced in 2006 and which aims at reducing energy consumption by large industrial users. This programme intends to support a 1 per cent cut in annual energy consumption above the business-as-usual level from 2008, in line with the EU directive on energy end-use efficiency and energy services.

3. Policies and measures in other sectors

53. Between 1990 and 2008, GHG emissions from all non-energy sectors, except for those from the solvent and other product use sector, decreased. This decrease was mainly driven by emissions from the waste and industrial processes sectors, which went down by 15.9 and 6.0 per cent, respectively, between 1990 and 2008.

54. ***Industrial processes***. Most GHG emissions from industrial processes come from the cement industry (clinker production), the mineral industry and ammonia and nitric acid production. The share of the sector decreased from 5.8 per cent of the total GHG emissions of Ireland in 1990 to 4.4 per cent in 2008. The decrease of GHG emissions has mainly been driven by emission reductions from installations covered by the EU ETS. Emissions of F-gases (including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur

hexafluoride (SF_6)) steadily increased from 0.6 per cent in 1990 to 1.0 per cent in 2008 owing to an increased use of these gases in semiconductor production, refrigeration and air conditioning. The ongoing initiatives to reduce process emissions from the industrial sector include the implementation of the EU Integrated Pollution Prevention and Control (IPPC) scheme and initiatives to reduce the emissions of industrial gases. The key elements of the legislation to contain, prevent and reduce emissions of F-gases include a regulation on company certification, inspection of compliance and targeted sector-specific guidance on implementation of the IPPC regulations.

55. ***Agriculture***. Between 1990 and 2008, GHG emissions from the agriculture sector decreased by 8.6 per cent, and its share decreased from 35.1 per cent to 26.1 per cent. Agriculture is the second largest emitting sector after the energy sector and is the largest emission sector among the 27 member States of the EU (EU-27), when measured as a proportion of total national emissions, being three times above the EU-27 average. Emissions from agriculture account for 39 per cent of all emissions from sectors not covered by EU ETS. This is the largest share among EU-27 countries and more than two times above the EU-27 average. The decrease in emissions was mainly due to an improvement in production efficiency, which enabled a decrease in dairy cattle and sheep numbers, together with a reduction in the use of synthetic nitrogen fertilizers, while maintaining output levels. In 2008, CH_4 emissions represented 62.0 per cent of GHG emissions from agriculture, coming mainly from enteric fermentation.

56. The key objective of the climate policy in the agriculture sector is to reduce emissions, while maintaining productivity and product quality through improved production efficiency. There are three main policy areas to mitigate emissions: reduction of enteric CH_4 production; mitigation of N_2O production from agricultural soils; and carbon sequestration through land management. As the role of the sector is so prominent in the potential to reduce emissions, Ireland has to identify additional PaMs that could result in further GHG emission mitigation. Ireland has analysed a number of potential GHG mitigation policy options, including an increased length of the grazing season, reduction of fertilizer use, reduction of the slaughter age of cattle, changes in dietary oils, replacing forage with cereals and use of legumes and nitrification inhibitors. Ireland has undertaken a cost–benefit analysis of these policy options in order to select those that are technically feasible and cost-effective but that have not yet been reflected in the National Climate Change Strategy.

57. In addition to this, Ireland has improved its inventory data and financed a wide range of research on improvements in data quality and the reduction of uncertainties in emission estimates for the sector. The ERT encourages Ireland to continue the efforts aimed at the development of mitigation measures for further GHG emissions reduction in the agriculture sector.

58. ***LULUCF***. The LULUCF sector was a net source of emissions in the periods 1990–1997 and 2000–2001, but has become responsible for a net removal of emissions since 2002. In 2008 the LULUCF sector accounted for removals of 2.2 per cent of total GHG emissions (without LULUCF). The increase of carbon sequestration from the LULUCF sector was attributed to some extent to the introduction of the Afforestation Grant Scheme, which has contributed to an increase in forest area by 36.0 per cent since 1990. Ireland also has promoted domestic forest energy markets aimed at promoting renewable energy from biomass, which will help to process and recycle tree thinning and residues from both forestry and saw milling.

59. Ireland expects that carbon sequestration increases from 2.7 Mt CO_2 per year over the Kyoto Protocol first commitment period to 4.8 Mt CO_2 in 2020. The policy package focused on the following strategic areas: forest management; afforestation on pastureland; and domestic energy use. Ireland funded research on adaptation policy options, improved

understanding of climate change dynamics and impact on forestry. New web-based software for forest management that takes into consideration adaptation potentials and climatic variations will be launched in October 2010.

60. ***Waste management***. Emissions from the waste sector decreased by 15.9 per cent from 1990 to 2008 and contributed 1.6 per cent to the total GHG emissions in 2008. The main source of GHG emissions are solid waste disposal sites (SWDS). The decrease of GHG emissions from the waste sector was defined by a consistent decline in the number of municipal SWDS, as a result of the landfill levy, and the increase of methane recovery (63 per cent in 2008 and projected to be 75 per cent in 2020). Ireland will start to incinerate municipal waste in 2011. The Irish national policy framework promotes waste prevention, reuse and recycling and regards waste as a resource. One of the successful policy measures is a plastic bag levy introduced some 10 years ago, which has both an antilittering and a waste minimization effect and has resulted in modification of consumer behaviour.

61. Overall, Ireland provided limited information on the development of the PaMs framework in its NC5, but a lot of additional information was provided during the review that is generally in line with the UNFCCC reporting guidelines. The ERT encourages Ireland to improve the transparency of its next national communication by adhering more closely to the UNFCCC reporting guidelines when reporting on PaMs and their emission reduction effects and to present detailed information in a comprehensive and transparent way.

4. Minimization of adverse effects in accordance with Article 2, paragraph 3, of the Kyoto Protocol

62. In its NC5, Ireland has reported limited information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and the effects on international trade and social, environmental and economic impacts, on other Parties, especially developing country Parties. Further information on how Ireland strives to implement its commitments under Article 3, paragraph 1, in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, as reported in the 2010 NIR, is presented in chapter II.I of this report.

63. During the review, Ireland provided additional information on its actions aimed at addressing the adverse effects on climate change, effects on international trade, and social environmental and economic impacts on other Parties. The ERT learned that Ireland has chosen to reduce the biofuel target in the transport sector from a proposed 5.8 per cent to 4.0 per cent for 2010, as the higher target could lead to an increased export of biofuel to the EU from other parts of the world and could indirectly lead to negative economic, social and environmental impacts elsewhere.

64. In addition, Ireland provided the results of the 2008 study on the assessment of the impact of reduced beef production in Ireland on worldwide emissions. As most of the beef produced in Ireland is consumed in Europe, any drop in Irish beef production will lead to increased exports to Europe, which are likely to come from Brazil. According to this study, the associated expansion of beef production in Brazil could increase deforestation, leading to further increases in emissions. The study concludes that the environmental impact has to be taken into account in tackling global emissions related to food production, and existing agricultural land should be used to the maximum before new land is brought into production through deforestation. The study illustrates how Ireland gave consideration to the minimization of potentially adverse effects of climate policies, in particular, on the international beef market.

C. Projections and the total effect of policies and measures, and supplementarity relating to the Kyoto Protocol mechanisms

65. In its NC5, Ireland has provided two emission projection scenarios, 'with measures' and 'with additional measures', prepared in March 2009. During the review, Ireland provided the latest projection scenarios, prepared in April 2010. The emission projections are prepared by the Environmental Protection Agency (EPA) on an annual basis for all sectors of the economy, and the models are updated and calibrated based on the most recent available data. This process makes the Irish projections robust, consistent and informative for policymakers. The ERT commends Ireland for the transparent way of information-sharing with the general public on the emission projections.

1. Projections overview, methodology and key assumptions

66. The GHG emission projections provided by Ireland include the 'with measures' and 'with additional measures' scenarios until 2020, presented relative to actual inventory data for 2008. The projections are provided in an aggregated format for each sector as well as for a national total, using global warming potential values. The ERT noted that in its NC5 Ireland did not provide the following elements required by the UNFCCC reporting guidelines: projections presented on a gas-by-gas basis for CO_2, CH_4, N_2O, PFCs, HFCs and SF_6 (treating PFCs and HFCs collectively in each case) and emission projections related to fuel sold to ships and aircraft engaged in international transport. However, during the review Ireland provided detailed information on these reporting elements. The ERT noted that in the NC5 there is no clear description of the emission scenarios and the differences between them, and of the definition of implemented, adopted and planned PaMs. However, during the review this information was provided by Ireland. The ERT recommended that Ireland include the information mentioned above in its next national communication.

67. The EPA compiles GHG emissions projections based on the models, data and forecast scenarios prepared by relevant national institutions. The methodology used for the preparation of projections is broadly the same as in the NC4. Ireland uses **a set of models** to prepare its projections by sector and for national total emissions. Projections for the energy sector are prepared using a top-down macroeconomic model called HERMES. In its NC5, Ireland has provided a limited description of the HERMES model, but additional information was provided during the review. Agricultural projections are based on projections of production and activity prepared using the FAPRI model, an econometric model of agricultural outputs and inputs. Ireland uses a biological system model called CARBWARE for the projection of emissions and removals from the LULUCF sector. Projections that are used for the waste sector are based on the assumption that Ireland meets the relevant targets for the diversion of biodegradable municipal waste under the EU landfill directive[5]. The ERT noted that the methodology used for projections is broadly the same as that used for the NC4. The ERT encourages Ireland to include a more detailed description of the energy model and a description of the linkages between the models in its next national communication.

68. In its NC5, Ireland has not provided information on the **key assumptions** behind the projections, but information on these assumptions was provided during the review. This included information on GDP, gross national product, oil, coal, gas and CO_2 prices, personal consumption and the number of households and persons per household for 2010, 2015 and 2020. The ERT noted that assumptions are revised and updated on an annual basis and that detailed information on assumptions regarding projection parameters and

[5] Council directive 1999/31/EC.

approaches for policy appraisal is presented in a number of documents, which are publicly available on the EPA website and on other websites. The ERT encourages Ireland to include this information in its next national communication and to provide further information on assumptions, for example, exchange rate trends. The ERT acknowledges that the process to prepare the updates of GHG emission projections is well set up in Ireland owing to the designation of the EPA as a leading organization in this process. Each of the models are updated and calibrated on an annual basis using the most recent available data.

69. In its NC5, as part of its **sensitivity analysis** Ireland has reported a scenario called the Economic Shock scenario that took into account the effects of the economic downturn. During the review Ireland informed the ERT of the results of the sensitivity analysis, which looked into three scenarios: high oil price, high carbon price, and prolonged recession. According to these results, under the high oil price scenario in 2020 emissions are projected to be 3 per cent higher compared with the 'with measures' scenario, while under the high carbon price and prolonged recession scenarios emissions are projected to be 1 and 2 per cent lower, respectively, compared with the 'with measures' scenario.

2. Results of projections

70. According to the projections presented in its NC5 and during the review, Ireland is expected to meet its Kyoto Protocol target by a combination of domestic efforts, use of Kyoto Protocol mechanisms and use of accounting for activities under Article 3, paragraph 3, under both the 'with measures' and 'with additional measures' scenarios. The key results of the emission projections are shown in table 4 and the trends are illustrated in the figure below.

71. In its NC5, Ireland has reported that in 2010 under the 'with measures' and 'with additional measures' scenarios the projected emissions are expected to amount to 68.00 Tg CO_2 eq and 64.00 Tg CO_2 eq, respectively. The Kyoto Protocol target for Ireland is, on average, 62.84 Tg CO_2 eq per annum over the Kyoto Protocol first commitment period. In 2010 the 'gaps' between the projected emissions and Kyoto Protocol target were reported to be 5.16 Tg CO_2 eq and 1.16 Tg CO_2 eq, respectively, under the 'with measures' and 'with additional measures' scenarios. In its NC5, Ireland has not provided information on the contribution of different gases to Ireland's projected total GHG emissions but this information has been provided during the review (see para. 73).

Table 4
Summary of greenhouse gas emission projections for Ireland

	Greenhouse gas emissions (Tg CO_2 eq per year)	*Changes in relation to base year level under the Kyoto Protocol (%)*	*Changes in relation to 1990 level (%)*
Inventory data 1990[a]	54.81	–1.4	NA
Inventory data 2008[a]	67.44	+21.3	+23.0
Kyoto Protocol base year[b]	55.61	NA	+1.5
Kyoto Protocol target[b]	62.84	+13.0	+14.7
Projections in NC5			
'With measures' projections for 2010	68.00	+22.3	+24.1
'With additional measures' projections for 2010	64.00	+15.1	+16.8
'With measures' projections for 2020	75.12	+35.1	+37.1
'With additional measures'	61.01	+9.7	+11.3

	Greenhouse gas emissions (Tg CO_2 eq per year)	*Changes in relation to base year level under the Kyoto Protocol (%)*	*Changes in relation to 1990 level (%)*
projections for 2020			
Updated projections: 2010[c]			
'With measures' projections – annual average for 2008–2012	65.80	+18.3	+20.1
'With additional measures' projections – annual average for 2008–2012	65.00	+16.9	+18.6
'With measures' projections for 2020	65.29	+17.4	+19.1
'With additional measures' projections for 2020	60.06	+8.0	+9.6

[a] *Data source*: Ireland's 2010 greenhouse gas (GHG) inventory submission; the emissions are without land use, land-use change and forestry (LULUCF).

[b] *Data source*: Based on the Initial Review Report for Ireland contained in document FCCC/IRR/2007/IRL.

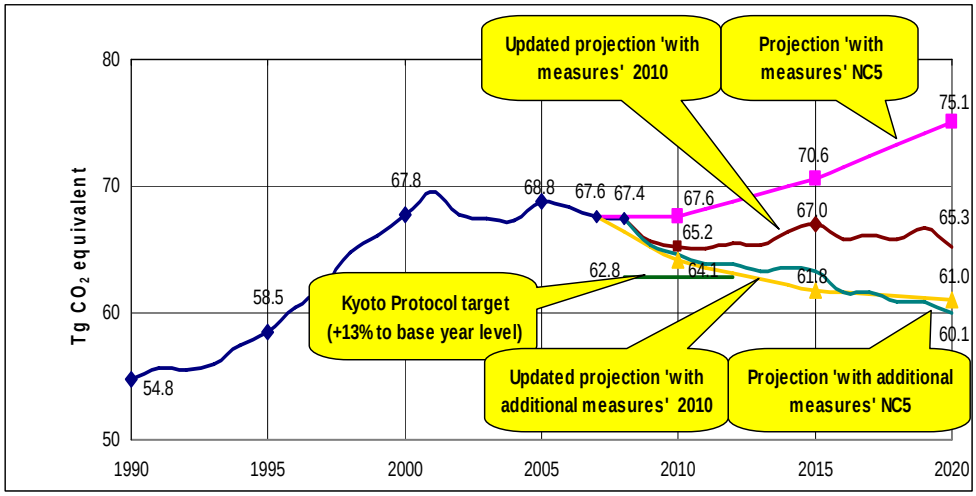
[c] *Data source*: Updated projections provided by Ireland during the in-depth review (Ireland's GHG Emissions Projections 2010–2020); the projections are for GHG emissions without carbon sinks.

Abbreviation: NA = not applicable.

72. During the review, Ireland provided the latest emission projections prepared in April 2010, whereby under the 'with measures' and 'with additional measures' scenarios the projected emissions are expected to amount, on average, to 65.8 Tg CO_2 eq per annum and 65.0 Tg CO_2 eq per annum (without carbon sinks), respectively, over the period 2008–2012. The ERT noted that these latest emission projections led to a downward revision of the 'gap' to the Kyoto Protocol target, which is estimated as 2.96 Tg CO_2 eq under the 'with measures' scenario, and to an increase of the 'gap' to 2.16 Tg CO_2 eq under the 'with additional measures' scenario.

73. During the review, Ireland reported that according to the latest 'with measures' scenario CO_2 emissions are projected to increase by 44.5 per cent between 1990 and 2010, while CH_4 and N_2O emissions are projected to decrease by 11.8 and 7.6 per cent, respectively, for the same period. The projections for CO_2, N_2O and CH_4 emissions are in accordance with the most recent inventory data. The projected emissions of F-gases are expected to increase by 240.8 per cent from 1995 to 2010.

Greenhouse gas emission projections



Sources: (1) Data for the years 1990–2008: Ireland's 2010 annual greenhouse gas (GHG) inventory submission; the emissions are without land use, land-use change and forestry (LULUCF). (2) Data for the years 2009–2020: Ireland's fifth national communication (NC5) and updated projections provided by Ireland during the in-depth review Ireland's GHG Emissions Projections 2010–2020; the emissions are without LULUCF.

74. During the review, Ireland pointed out that in order to take into account the implications of the EU ETS and calculate the 'gaps' between the projected emissions and Kyoto Protocol target, Ireland disaggregates the projected emissions between the EU ETS and non-ETS sectors. Ireland attributes the Kyoto Protocol target of 62.84 Tg CO_2 eq to the installations covered by the EU ETS (22.3 Tg CO_2 eq) and non-ETS sectors (40.6 Tg CO_2 eq). The projected emissions for the EU ETS and non-ETS sectors are then compared to the attributed amounts for the relevant sectors in order to assess the Government's carbon credits purchasing requirement and need for additional domestic action. According to the latest projections, the 'gaps' between the projections (including carbon sinks) and emissions attributed to the non-ETS sectors are estimated as 3.0 Tg CO_2 eq and 2.5 Tg CO_2 eq per annum, respectively, under the 'with measures' and 'with additional measures' scenarios.

75. To demonstrate how Ireland plans to meet the Kyoto Protocol target, Ireland stated in its second National Allocation Plan 2008–2012 for EU ETS that any allowances remaining unused in the new entrant set-aside will be retired for Kyoto Protocol compliance. The new entrant set-aside was established to cover new installations coming into the EU ETS and expansion of existing installations over 2008–2012. It is currently estimated that there will be around 5 million allowances to be used towards Kyoto Protocol compliance at the end of the first commitment period and this amount would be sufficient to cover the remaining 'gaps'.

76. During the review, Ireland provided information that under the EU climate and energy package a set of proposals was adopted to deliver a 20 per cent reduction in the total EU emissions by 2020 relative to 1990 levels. The total effect of emission reductions has been divided between the EU ETS and non-ETS sectors. The target for Ireland for non-ETS sectors is to reduce emissions by 20 per cent in 2020 relative to 2005 levels, or to 37.1 Tg CO_2 eq. In 2020, the emissions (without carbon sinks) from the non-ETS sectors are projected to amount to 49.5 Tg CO_2 eq and 44.8 Tg CO_2 eq, respectively, in the 'with measures' and 'with additional measures' scenarios. The 'gaps' to the 2020 target are projected as 12.4 Tg CO_2 eq and 7.6 Tg CO_2 eq, respectively, under the 'with measures'

and 'with additional measures' scenarios. If the EU agrees to allow the inclusion of sinks, that are projected to sequester about 4.8 Mt CO_2 eq in 2020, and the non-ETS target for Ireland is not changed, the 'gaps' to the 2020 target are projected to reduce to 7.6 Tg CO_2 eq and 2.8 Tg CO_2 eq, respectively, under the 'with measures' and 'with additional measures' scenarios.

77. The inclusion of the carbon sinks in emissions accounting is critically important for Ireland, as the carbon sinks will continue to play an increasingly important role in the first commitment period and in the emission accounting thereafter. The use of additional measures is critically important as well, especially because Ireland informed the ERT that it has not yet identified the PaMs that could deliver about 35 per cent of emission reductions in 2020. The ERT encourages Ireland to prepare an estimate of the effects of individual PaMs and to identify a long-term policy combination to reach the projected level of emissions.

3. Total effect of policies and measures

78. In its NC5, Ireland has presented information on expected impact of planned, implemented and adopted measures for the years 2008–2012, 2015 and 2020 by sector. However, Ireland has not provided the following reporting elements required by the UNFCCC reporting guidelines: estimated and expected total effect of implemented and adopted PaMs and an estimate of the total effect of PaMs, in accordance with the 'with measures' definition, compared with a situation without such PaMs. Ireland has not presented information in terms of GHG emissions avoided or sequestered by gas (on a CO_2 eq basis) and relevant information on driving factors and activities for each sector for the years 1990–2020. During the review the above-mentioned missing information was provided by Ireland. The ERT encourages Ireland to present the information on the estimated total effects of implemented and adopted PaMs and effects by gas in its next national communication in order to enhance the transparency of the reporting.

79. During the review, Ireland provided information showing that in 2010 the total estimated effect of implemented and adopted PaMs is 4.32 Tg CO_2 eq and the effect of planned PaMs is 0.59 Tg CO_2 eq, as presented in table 5 below. In 2010, the effect of the implemented and adopted measures is expected to amount to 7.9 per cent and the effect of planned measures - to 1.1 per cent as compared with the total 1990 emissions (without LULUCF). The PaMs implemented in the energy sector (without transport, ETS and cross-cutting energy and industrial processes PaMs) are expected to deliver the largest emission reductions (1.74 Tg CO_2 eq), followed by the effect of PaMs implemented in the agriculture (1.34 Tg CO_2 eq) and transport (0.49 Tg CO_2 eq) sectors. The most effective PaMs and the drivers behind the emission reductions are described in chapters II.B.1 and II.B.2 of this report. Table 5 provides an overview of the total effect of PaMs as provided by Ireland during the review.

Table 5
Projected effects of planned, implemented and adopted policies and measures in 2010 and 2020

Sector	*Effect of existing measures[a,b] (Tg CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of planned measures[a,b] (Tg CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of existing measures[a,b] (Tg CO_2 eq)*	*Relative value (% of 2005 emissions)*	*Effect of planned measures[a,b] (Tg CO_2 eq)*	*Relative value (% of 2005 emissions)*
	2010				2020			
Energy[c]	1.74	3.2	0.43	0.8	3.55	5.2	3.21	4.7
ETS and Energy/IP[d]	0.74	1.3	NA	NA	0.43	0.6	NA	NA

Sector	*Effect of existing measures[a,b] (Tg CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of planned measures[a,b] (Tg CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of existing measures[a,b] (Tg CO_2 eq)*	*Relative value (% of 2005 emissions)*	*Effect of planned measures[a,b] (Tg CO_2 eq)*	*Relative value (% of 2005 emissions)*
	2010				2020			
Transport[e]	0.49	1.0	0.13	0.2	1.00	1.5	1.82	2.6
IP (only F-gases)	NA	NA	0.04	0.1	NA	NA	0.15	0.2
Agriculture	1.33	2.4	NA	NA	2.17	3.1	NA	NA
Waste	0.02	0.0	NA	NA	0.27	0.4	NA	NA
Total	4.32	7.9	0.59	1.1	7.41	10.8	5.18	7.5

[a] *Data source*: Ireland's Greenhouse Gas Emissions Projections 2010–2020, Methodological Approach and data presented by Ireland during the in-depth review as estimated in March 2010.

[b] *Data source*: Based on Ireland's 2010 annual GHG inventory submission.

[c] The *energy* sector does not include projected effects of the ETS and PaMs in cross-cutting energy/IP and transport sectors.

[d] *Energy*/IP includes projected effects of cross-cutting PaMs implemented in energy and industrial processes sectors.

[e] *The transport* sector includes projected effects of EU biofuels directive.

Note: The total effect of planned, implemented and adopted policies and measures is defined as the sum of the effects of individual measures taking into account overlapping.

Abbreviations: GHG = greenhouse gas, EU = European Union, PaMs = policies and measures, NA = not available, IP = industrial processes, ETS = emissions trading scheme.

4. Supplementarity relating to mechanisms pursuant to Articles 6, 12 and 17

80. In its NC5, Ireland has provided some information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action, although it has not elaborated on supplementarity as such. The ERT noted that in its NC5 Ireland has not provided a definition of supplementarity or explanation on how its domestic action constitutes a significant element of the effort made to meet its quantified limitation and reduction commitments under Article 3, paragraph 1. Such information was provided during the review. The ERT recommends that Ireland present information on the use of Kyoto Protocol mechanisms that is supplemental to domestic action in a more transparent way in its next national communication.

81. As a way of showing that domestic action is supplemental to the use of Kyoto Protocol mechanisms, Ireland provided the following information to the ERT. First, Ireland considers that the projected 2010 emissions without the total effect of implemented and adopted PaMs and planned PaMs would be 70.07 Tg CO_2 eq[6]. This implies that in 2010 a projected 'gap' to the Kyoto Protocol target is equal to 7.23 Tg CO_2 eq. Second, to reach the Kyoto Protocol target, Ireland intends to use Kyoto Protocol mechanisms for, on average, 1.7 Tg CO_2 eq per annum (this represents 23.5 per cent of the 'gap' in 2010), to take into account the total effect of implemented, adopted and planned PaMs of 4.91 Tg CO_2 eq (67.9 per cent of the 'gap') and to use the unused allowances in the new entrant set-aside of the EU ETS (remaining 8.6 per cent of the 'gap').

[6] The projected 2010 emissions without existing and planned PaMs are estimated to be equal to 70.07 Tg CO_2 eq. This is calculated as a sum of emissions projected for 2010 under the 'with measures' scenario (65.16 Tg CO_2 eq according to the latest projections) and the total effect of implemented and adopted PaMs (4.32 Tg CO_2 eq) and planned PaMs (0.59 Tg CO_2 eq).

82. The initial objective of the Government's carbon credit purchasing programme in Ireland was to supplement emission reductions by purchasing up to 18 million carbon units (or 3.6 million units per annum in the period 2008–2012), costing EUR 270 million. Recently, Ireland reduced the purchasing programme to a provisional total amount equal to 12.7 Tg CO_2 eq in the period 2008–2012. Ireland has already purchased carbon credits equal to about 8.3 Tg CO_2 of units, or about 1.7 Tg CO_2 eq on average a year. Ireland has at present suspended its purchasing programme.

D. Vulnerability assessment, climate change impacts and adaptation measures

83. In its NC5, Ireland has provided the required information on the expected impacts of climate change and on activities undertaken to identify vulnerable areas and develop adaptation options. Ireland recognizes in its NC5 that vulnerability and adaptation are yet to receive sufficient attention in the context of overall national climate change policy. In 2007, Ireland adopted a two-phase approach, starting with information gathering, research and adaptive capacity assessment, risk assessment and awareness-raising and moving to the development of national and sectoral climate change adaptation action plans. At present Ireland is in the process of assessing its vulnerabilities and adaptation policy options and has initiated the development of a national adaptation strategy. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC5.

Table 6
Summary of information on vulnerability and adaptation to climate change

Vulnerable area	*Examples/comments/adaptation measures reported*
Agriculture	*Vulnerability*: Pest survival and arrival of new pests; autumn droughts may increase irrigation demand; increase in yields; benefits for animal husbandry *Adaptation:* Ireland is undertaking a review of the required adaptation measures in the agricultural sector
Water resources and flood control	*Vulnerability*: Increased pressures on water supply infrastructure in the Greater Dublin area; likelihood of increased flood frequency in the west of the country *Adaptation*: Office of Public Works appointed as the lead agency to implement flooding policy in Ireland; strategy to manage flood risk; programme of flood defence schemes; awareness-raising on flood preparation; integration of adaptation into development plans; statutory guidance on planning and flood risk assessment published in 2008. Section 30 of the Planning and Development (Amendment) Act 2010 provides for a wider definition of "public infrastructure and facilities" to reflect newer infrastructural requirements such as providing for flood relief works, thereby allowing development contributions to be levied and used to fund such works
Marine environment and coastal zone	*Vulnerability*: Undefined general impacts due to warmer waters; coastline threatened by higher sea levels; undefined general threats to ecosystems and biodiversity *Adaptation*: Integrated coastal zone management; Planning and Development Act 2000 (regulates, restricts and controls the development of coastal areas and development in the vicinity of inland waterways)

Vulnerable area	*Examples/comments/adaptation measures reported*
Forests and peatlands	*Vulnerability*: Increased evaporation and transpiration; extended growing season; increased pest threat; impact on timber quality *Adaptation*: Species choice, silviculture, information decision support systems and other decision-making tools

84. To identify and assess the degree of vulnerability, Ireland initiated a wide range of research projects. The Co-ordination, Communication and Adaptation for Climate Change in Ireland project identifies an effective integrated approach to vulnerability assessment and adaptation and assesses vulnerability and adaptation responses in key sectors, including biodiversity, water, tourism, the economy, construction industry and provision of information for local authorities. Adaptation planning is linked to developments made by the EU in line with the EU White Paper on Adaptation. By 2013 information systems will be compiled and analysis tools will be used to provide decision-making capacity at the sector levels. The ERT commends the Party for its well-organized and systematic approach to developing a climate change adaptation strategy based on a good understanding of vulnerabilities and encourages Ireland to complete the development of the strategy.

E. Financial resources and transfer of technology, including information under Articles 10 and 11 of the Kyoto Protocol

1. Provision of financial resources, including "new and additional" resources and resources under Article 11 of the Kyoto Protocol

85. The information provided in the NC5 covers most of the information required under the Convention and its Kyoto Protocol. In its NC5, Ireland has provided details on measures taken to give effect to its commitments under Article 4, paragraphs 3, 4 and 5, of the Convention as required by the UNFCCC reporting guidelines and under Article 11 of the Kyoto Protocol as required by the "Guidelines for the preparation of information required under Article 7 of the Kyoto Protocol".

86. Ireland continued to increase its official development assistance budget and plans to meet the United Nations target of allocating 0.7 per cent of gross national income (GNI) to development aid. Ireland supports climate change activities through multilateral programmes and through support to international development agencies. Funding administered through these channels has risen since the time of preparation of the third national communication. On a preliminary basis Ireland allocated EUR 100 million as fast-track financing for 2010–2012 following the Conference of the Parties held in Copenhagen, Denmark, in December 2009, subject to a decision at the EU level. In 2010, EUR 10 million of the fast-track financing will be allocated to cover adaptation needs in Africa. Table 7 summarizes information on financial resources.

87. During the review, Ireland provided information on its definition of the "new and additional" funding that encompasses its contributions under the 2001 Bonn Declaration, Global Environment Facility (GEF) replenishment and contribution under the EU commitment for fast-track financing support. The ERT recommends that Ireland include a definition on its "new and additional" funding in its next national communication.

Table 7
Summary of information on financial resources for 2006–2008

Channel of financial resources	*Years of disbursement*		
	2006	*2007*	*2008*
ODA (EUR million)	813.94	870.87	918.27
ODA/GNI (%)	0.54	0.55	0.58
Contributions to GEF (EUR million)	1.47	1.42	1.42
SCCF (USD million)	0.52	0.52	0.52
LDCF (USD million)	2.00	2.00	2.00
Trust Fund for Participation (USD million)	0.10	0.10	0.15
Multilateral development organizations (EUR million)	72.65	59.91	55.38
UNITAR (EUR million)	0.15	0.15	0.15
REEEP (USD million)	0.25	0.25	0.30
CGIAR (EUR million)	4.00	7.15	7.78

Abbreviations: ODI = official development assistance, GNI = gross national income, GEF = Global Environment Facility, UNITAR = United Nations Institute for Training and Research, REEEP = Renewable Energy and Energy Efficiency Partnership, CGIAR = Consultative Group on International Agricultural Research, SCCF = Special Climate Change Fund, LDCF = Least Developed Countries Fund.

88. Ireland has provided information on its assistance to the developing country Parties that are particularly vulnerable to the adverse effects of climate change. Ireland has prioritized nine focus countries among developing countries in Africa, namely Ethiopia, Lesotho, Malawi, Mozambique, Uganda, United Republic of Tanzania and Zambia, and Asia, namely Timor-Leste and Viet Nam. The provision of development assistance is carried out in line with the priorities expressed by developing country partners in climate change adaptation, although Ireland has only a limited number of bilateral climate change programmes to report. However, the number of bilateral projects is growing as a result of awareness-raising and capacity-building activities aimed at integrating and mainstreaming climate change priorities into the policymaking of the recipient countries. Ireland has been working towards a programmatic and harmonized approach and it has committed itself to the objectives of the Paris Declaration on Aid Effectiveness.

2. Activities related to transfer of technology, including information under Article 10 of the Kyoto Protocol

89. In its NC5, Ireland has provided limited information on technology transfer. Ireland provided additional information during the review about its approach to stimulating private climate-related investments in the nine priority developing country partners. Ireland provides support to technology transfer mainly through multilateral channels such as the Renewable Energy and Energy Efficiency Partnership (REEEP), which finances technologies in the areas of renewable energy and energy efficiency around the world. To date the requests for assistance in the area of technology are primarily in relation to the transport infrastructure and agriculture sectors. In 2009–2010, REEEP funded 49 new projects in 25 countries. Ireland jointly with Norway finances the operation of community-led energy and development centres in Mozambique.

90. Ireland indicated that there is a wide range of funding sources for technology development within the private sector; however, no aggregate figure of provided funding is available. Through the IDA Ireland, established under the Department of Enterprise, Trade and Innovation, Ireland attracts to the country direct foreign investment in clean technology. Through the Enterprise Ireland, a sister agency of the IDA Ireland, Ireland encourages technology transfer by clean technology companies in areas of technological advancement in Ireland, such as wind and wave resources, existing information and communication technologies and biotechnology. Ireland has advanced in technology innovations in the development and deployment of solar, tidal wave, wind, thermal and biomass energy production and in energy efficiency and is considered as one of the world leaders in these technologies.

91. Ireland has reported very limited information on activities related to success and failure stories and activities aimed at financing access by developing countries to 'hard' and 'soft' environmentally-friendly technologies. The ERT recommends that Ireland include this information in its next national communication.

F. Research and systematic observation

92. Ireland has provided information on its actions relating to research and systematic observation and has addressed both domestic and international activities, including those of the World Climate Programme, the International Geosphere–Biosphere Programme, the Global Climate Observing System (GCOS) and the Intergovernmental Panel on Climate Change. However, the ERT noted that Ireland did not provide information on action taken to support capacity-building in developing countries in its NC5. The ERT recommends that Ireland include information on research cooperation with developing countries.

93. Ireland has reported in its NC5 on the Climate Change Research Programme (CCRP), implemented by the EPA, the Research Stimulus Fund (RSF), managed by the Department of Agriculture, Fisheries and Food, and energy and related climate research programmes implemented by the Science Foundation Ireland (SFI). The CCRP aims to enhance the overall use and value of research in four areas: GHG emissions and sinks; climate change impacts and adaptation; socio-economic analysis and technologies; and transboundary air pollution. The CCRP focuses on improvements in the national emissions inventory and on projections of future emissions, with the aim of better assessing emissions levels from key source categories such as agriculture and LULUCF and quantifying the effects of carbon stock and land-use changes and management. The RSF provides funding, on a competitive basis, to Irish research institutes for research related to "the public good", agriculture and production. The SFI programmes finance fundamental and frontier research projects on the biosciences, information and communication technologies, and energy and energy efficiency technologies by independent researchers at higher education institutes in order to develop clean, efficient and low-carbon energy technologies. The ERT commends Ireland for this well-structured approach to government-funded research in the climate change area.

94. Ireland is committed to improving its climate change observation system. It reported on the results of Ireland's national assessment report on the state of the existing climate observational infrastructure, data accessibility and analysis capacity. This report sets out the strategic directions for climate monitoring and details an action plan for an integrated national climate observing system in the atmospheric, oceanic, terrestrial and hydrological domains.

95. During the review Ireland reported that Met Éireann is in the process of implementing a number of changes to the synoptic network; these include shifting to the

deployment of fully automatic weather stations and the replacement of human-operated stations across the entire observation system, which will result in an increase in the temporal resolution of data. The monitoring capacity will be improved through the introduction of new features in remote sensing for water vapour measurements, radiometer measurements, lightning detection and ranging measurements and the upgrading of the radar network. The network capacity is broadly compliant with the GCOS Climate Monitoring Principles. However, the ERT noted that Ireland has not reported on any action of assistance to develop observation capacities in developing countries and it recommends including this information in the next national communication.

G. Education, training and public awareness

96. In its NC5, Ireland has provided some information on its actions related to education, training and public awareness at the national and international levels. Compared with the NC4, Ireland provided more extensive information on public awareness campaigns, school programmes and training programmes that are administrated and organized by different stakeholders (ministries, agencies, local authorities, etc.) and for different interest groups (businesses, homeowners, schools, etc.). Additional information was provided during the review on initiatives integrated into general and vocation education systems and on extra-school activities. The use of a multitude of resources results in a high level of awareness and understanding of climate change theory, its consequences, impacts and actions to address it in all strata of society.

97. As part of its National Climate Change Strategy, Ireland developed a communication plan to provide expert, scientific and independent advice and information to policymakers, local governments, educators, businesses, non-governmental organizations and the general public. A number of awareness-raising campaigns, such as the Climate Change Awareness Campaign, the launch of a website <www.change.ie>, the national smart metering programme, consumer information programmes, etc., have been successfully implemented. With inputs from business and local authorities, a programme on waste prevention was organized in 13 regions and resulted in a reduction of water, energy and heat use and in financial savings. The Greening Communities programme was introduced with the aim of coordinating the activities of different stakeholders at the community level in order to avoid duplication, reach greater effect and provide consistent information. In raising public awareness, Ireland employs all information channels (TV, radio, blogs, social media, popular web resources such as YouTube, Twitter, etc.) to deliver information to the target audiences. In addition to this, professional programmes for mid-career capacity-building and retraining opportunities for energy managers and construction engineers are organized to assist in the implementation of energy efficiency grants schemes in the residential sector.

98. To ensure the participation and inclusion of different stakeholder groups, a sustainable development council called COMHAR has been set up to let the public and non-governmental organizations participate in policymaking. COMHAR provides a mechanism for the input of stakeholders into the policymaking process and acts as an important forum for dialogue on climate-related issues. Ireland reported on online education programmes and on public libraries as environmental information providers, with the technical content fully aligned to the curriculums of schools. The Environmental Information Service, managed by the Library Council, is the main educational resource for environmental information in Ireland.

99. The ERT commends the Party for an extensive range of activities implemented in this area and encourages the Party to present information in its next national communication in a more structured and transparent way.

H. Evaluation of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

100. Ireland has provided most of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC5 and during the in-depth review. This information reflects the steps taken by Ireland to implement the relevant provisions of the Kyoto Protocol. Table 8 provides references to the NC5, in which supplementary information is provided.

101. Ireland has not reported in its NC5 the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: information on steps taken to promote or implement any decisions by the International Maritime Organization in order to limit or reduce GHG emissions from marine bunker fuels; definition of "new and additional" financial resources, and information on the minimization of adverse social, economic and environmental effects of climate change and impacts on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. Most of the missing information was provided to the ERT during the review. The ERT recommends that Ireland include this information in its next national communication. The technical assessment of the information reported under Article 7, paragraph 2, is contained in the relevant chapters of this report.

Table 8
Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

Supplementary information	*Reference*
National registry	Annex 3 to NC5
National system	Chapter 2, section 2.2 and annex 2 to NC5
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Chapter 3, sections 3.1, 3.2.2 and 3.2.4 of NC5
Policies and measures in accordance with Article 2	Chapter 3 of NC5
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Chapter 3 of NC5
Information under Article 10	Chapters 3, 5, 6 and 7 of NC5
Financial resources	Chapter 6 of NC5

I. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

102. Ireland reported some information requested in chapter H of the annex to decision 15/CMP.1 as part of its 2010 annual submission. It did not report, however, how it gives priority to the actions taken in implementing its commitments under Article 3, paragraph 14. During the in-country review Ireland provided the ERT with additional information on how it strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT considers the reported information to be mostly complete and transparent and encourages Ireland to continue exploring and reporting on the adverse impacts of the response measures.

103. The NIR 2010 and additional information provided during the review presented several of Ireland's initiatives to minimize adverse impacts, including the removal of the levy on the use of peat for electricity generation, the removal of tax incentives for the development of gas fields, linking the coal price in the EU to world coal prices in developing countries, support to technological development and transfer through joint collaborations with developing countries, cooperation with non-Annex I Parties in carbon sequestration, capacity-building in the development of clean technologies and efficient fossil fuel use by developing countries, and assisting in the establishment of subregional electricity markets. The ERT recommends that Ireland continue exploring and reporting on the adverse impacts and that it include this information in its next national communication and annual submissions.

III. Conclusions and recommendations

104. The ERT concludes that the NC5 provides a good overview of the national climate policy of Ireland. The information provided in its NC5 includes most of the mandatory information required by the UNFCCC reporting guidelines and most elements of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. Ireland's NC5 does not include some information on PaMs, projections and financial resources; however, this missing information was provided during the review in response to questions raised by the ERT. With this, Ireland fully met most of the mandatory requirements of the UNFCCC reporting guidelines for the preparation of national communications. The ERT encourages Ireland to improve completeness and transparency by including all information required by the UNFCCC reporting guidelines in its next national communication.

105. Ireland's total GHG emissions for 2008 were estimated to be 23.0 per cent above their 1990 level, excluding LULUCF, and 19.8 per cent above, including LULUCF. The GHG emissions increase was mainly driven by an increase in CO_2 emissions by 46.4 per cent over the period 1990–2008, mostly coming from the energy sector. The effect of economic growth on energy consumption and related CO_2 emissions was partly off-set by a change in the fuel supply mix, an increase in the use of natural gas and renewable energy, efficiency gains resulting from a more widespread use of CHP and improved energy efficiency in the residential sector.

106. Ireland presented the GHG projections for the period 2008–2020. Two scenarios are included: (a) 'with measures' (including the effect of currently implemented and adopted PaMs); and (b) 'with additional measures' (including the effect of planned PaMs already included in the Government's programmes but not yet funded). Projections indicate that Ireland is likely to meet its Kyoto Protocol target of a 13 per cent increase relative to 1990 level, under both the 'with measures' and the 'with additional measures' scenarios, by domestic efforts, the use of mechanisms and the use of accounting under Article 3, paragraph 3, of the Kyoto Protocol.

107. The NC5 contains limited information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. To meet its Kyoto Protocol first commitment period target Ireland is planning to make use of the Kyoto Protocol mechanisms for about 1.7 Mt CO_2 eq a year, or a total of about 8.3 Mt CO_2 eq over 2008–2012. The use of the Kyoto Protocol mechanisms represents 23.5 per cent of the gap between the projected emission levels and the Kyoto Protocol target according to the provided information.

108. Ireland adopted a National Climate Change Strategy for 2007–2012 that aims at ensuring the achievement of the target of the Kyoto Protocol first commitment period and that set the ground for domestic mitigation action, supplemented as necessary by purchased

allowances and credits. As part of the EU effort sharing agreement on regulation of emissions from sectors, such as the transport, housing, agriculture and waste beyond the first commitment period of the Kyoto Protocol, Ireland has a target of a 20 per cent reduction in GHG emissions compared with 2005 by 2020. Currently, Ireland is in the process of adopting a new Climate Change Bill, which sets an ambitious target of an 80 per cent reduction in net GHG emissions by 2050 (compared with the 1990 level). Ireland is also developing an adaptation framework, which will be underpinned by the Climate Change Bill and will involve the development of national and sectoral climate change adaptation action plans.

109. Ireland continued to increase development assistance and plans to meet the target of developing countries spending 0.7 per cent of GNI on aid. During the review, Ireland provided information on its definition of "new and additional" funding, which encompasses contributions under the 2001 Bonn Declaration, GEF replenishments and allocations under fast-track financing. Ireland has provided information on the assistance it has made available to developing country Parties that are particularly vulnerable to the adverse effects of climate change.

110. In its NC5, Ireland has provided information on its actions relating to education, training and public awareness at both the national and international levels. Climate change and other environmental issues are well integrated into the primary, secondary and higher education systems. Ireland has developed a comprehensive communication plan to provide expertise and scientific and independent advice and information on climate change to policymakers, local governments, educators, businesses, non-governmental organizations and the general public.

111. Ireland has provided information on its actions relating to research and systematic observation and has addressed both national and international activities. Ireland has adopted a climate change research programme and has commissioned a report to identify areas for further improvement in its climate change observation system infrastructure, data accessibility and analysis capacity.

112. The ERT concluded that the Irish national system continues to perform the required functions as set out in decision 19/CMP.1 and that the national registry continues to perform the functions as set out in decision 13/CMP.1 and decision 5/CMP.1 and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol. Ireland regularly updates the database and software application and implements security measures; changes to the national registry are documented on a regular basis by nominated responsible staff.

113. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol provided by the Party in its 2010 annual submission is mostly complete and transparent. Supplementary information under Article 7, paragraph 2, of the Kyoto Protocol provided by the Party in its NC5 and during the review is mostly complete and transparent.

114. In the course of the review, the ERT formulated several recommendations relating to the completeness and transparency of Ireland's reporting under the Convention and its Kyoto Protocol. The ERT recommends improving the completeness and transparency of reporting by including all mandatory reporting information in the next national communication. The key recommendations[7] are that Ireland:

[7] The recommendations are given in full in the relevant chapters of this report.

(a) Organize information on PaMs by sector and by gas and include information on each PaM, its objective, GHGs affected, type, status of implementation and implementing entity in a summary table;

(b) Provide projections by sector and by gas for CO_2, CH_4, N_2O, PFCs, HFCs and SF_6 and provide projections related to fuel sold to ships and aircraft engaged in international transport;

(c) Provide information on the estimated and expected total effect of implemented and adopted PaMs, in accordance with the 'with measures' definition, compared with a situation without such PaMs, presented in terms of GHG emissions avoided or sequestered, by gas (on a CO_2 eq basis), and present relevant information on factors and activities for each sector's underlying emission trends in the period 1990–2020;

(d) Present information to explain in a more transparent way how the use of Kyoto Protocol mechanisms is supplemental to domestic action;

(e) Indicate how financial resources have been determined as being "new and additional" and what "new and additional" financial resources have been provided pursuant to Article 4, paragraph 3;

(f) Report activities related to technology transfer, including success and failure stories, and distinguish activities for financing access by developing countries to 'hard' and 'soft' environmentally-friendly technologies;

(g) Provide information on how it gives priority to the actions taken to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol on the minimization of adverse impacts of response measures to climate change.

115. The ERT encourages Ireland to further improve completeness and transparency of reporting by providing further information on:

(a) Planned, adopted and/or implemented PaMs by government at the national, regional and local level and prioritization of PaMs in each sector in order to achieve the national goal of GHG emission reduction;

(b) Each PaM reported, including a quantitative estimate of the impacts of an individual PaM or collections of PaMs, and a brief description of the estimation methods, costs of PaMs, non-GHG mitigation benefits and interaction and complementarity of the PaMs at the national level;

(c) The main differences in key assumptions, employed methods and achieved results between projections in the current national communication and those in earlier national communications, sensitivity of the projections to underlying assumptions, information on key underlying assumptions and values of the variables behind the projections;

(d) PaMs included in the projection scenarios and an explanation of how these PaMs affect emission trends in these scenarios;

(e) Action taken to minimize adverse effects of the implementation of activities under Article 3, paragraph 14, and Article 2, paragraph 3, of the Kyoto Protocol, including domestic policies on developing country Parties.

IV. Questions of implementation

116. During the review the ERT assessed the NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol and reviewed information on

the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol with regard to timeliness, completeness and transparency. No question of implementation was raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

FCCC/SBI/2007/INF.6. Compilation and synthesis of fourth national communications. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/ inf06.pdf>.

FCCC/SBI/2007/INF.6/Add.1. Compilation and synthesis of fourth national communications. Addendum. Policies, measures, past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf06a01.pdf>.

FCCC/SBI/2007/INF.6/Add.2. Compilation and synthesis of fourth national communications. Addendum. Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention by Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/ 2007/sbi/eng/inf06a02.pdf>.

"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. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

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"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/ resourcedocs/2005/ cmp1/eng/08a02.pdf#page=54>.

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B. Additional information provided by the Party

Responses to questions during the review were received from Mr. John McCarthy, Mr. Owen Ryan, Ms. Catherine Bannon, Ms. Niamh Gallagher, Ms. Shirley Groarke, Mr. Michael Young, Ms. Nuala Bannon, Mr. George Hussey, Mr. Ronan Mulhall, Mr. Brendan O'Neill, Ms. Jean Clarke, Mr. Martin Vaughan, Ms. Fiona Quinn, Mr. Noel Casserly, Ms. Yvonne Bulter, Ms. Odette Gormley, Ms. Petra Woods, Ms. Deirdre Mahony, Mr. George Burke, Mr. Dave Walsh, Mr. Brian Kenny (Department for the Environment, Heritage and Local Government), Mr. Ken Macken, Ms. Eimear Cotter, Mr. Bernard Hyde, Ms. Jacinta Ponzi, Mr. Frank McGovern, Mr. Paul Duffy, Mr. David Dodd (Environmental Protection Agency), Mr. Cillian Doyle (Department of the Taoiseach), Mr. John Burke, Ms. Georgina Hughes Elders (Department of Finance), Mr. Martin Finucane (Department of Communications, Energy and Natural Resources), Mr. Ken Jordan (Department of Transport), Ms. Lorraine Benson, Ms. Colette Reilly (Department of Enterprise, Trade and Innovation), Mr. Marina Donohoe (Enterprise Ireland), Mr. Mark Adamson (Office of Public Works), Mr. Matthew Kennedy (Sustainable Energy Authority of Ireland), Mr. Aidan Fitzpatrick (Department of Foreign Affairs), Mr. Paul Dillon, Mr. Liam Kinsella, Mr. Eugene Hendrick, Mr. Kevin Black, Mr. Bill Callanan (Department of Agriculture, Fisheries and Food), Mr. Ray McGrath (Met Éireann), Ms. Annette Kelly (An Chomhairle Leabharlanna (the Library Council)), Professor Fionn Murtagh (Science Foundation Ireland), Mr. Pat Finnegan, Ms. Molly Walsh, Mr. Feargal Duff, Ms. Niamh Garvey (environmental non-governmental organizations), Mr. Erik O'Donovan (business and industry non-governmental organizations), Mr. Thomas Ryan, Mr. Ger Bergin (Irish Farmers' Association) and Mr. Padraic McMahon (farmer).

The following documents were also provided by Ireland, including additional material on updated policies and measures, greenhouse gas projections, the national registry and recent climate policy developments in Ireland:[1]

An analysis of the Approach to Mitigating GHG Emissions in the Agricultural Sector in Ireland. Department of Agriculture, Fisheries and Food.

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[1] Reproduced as received from the Party.

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Maximising Ireland's Energy Efficiency. The National Energy Efficiency Action Plan 2009 –2020. Department of Communications, Energy and Natural Resources. Available at <http://www.dcenr.gov.ie/NR/rdonlyres/FC3D76AF-7FF1-483F-81CD-52DCB0C73097/0/NEEAP_full_launch_report.pdf>.

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Renewable energy in Ireland. 2010 Update. Prepapred by and Amanda Barriscale, May 2010. Sustainable Energy Authority of Ireland. Energy Policy Statistical Support Unit. Available at <http://www.seai.ie/Publications/Statistics_Publications/SEI_Renewable_Energy_2010_Update/RE_in_Ire_2010update.pdf>.

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Smarter Travel. A sustainable transport future. A new transport policy for Ireland 2009-2010. Department of Travel. Available at <http://www.smartertravel.ie/download/1/NS1264_Smarter_Travel _english_PN_WEB.pdf>.