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Report of the technical review of the sixth national communication of Ireland

Parties included in Annex I to the Convention are requested, in accordance with decision 9/CP.16, to submit a sixth national communication to the secretariat by 1 January 2014. In accordance with decision 7/CMP.8, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their sixth national communication 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 technical review of the sixth national communication and supplementary information under the Kyoto Protocol of Ireland conducted by an expert review team in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" and the "Guidelines for review under 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 16 February 2005. Under the Convention, Ireland will, as a member State of the European Union (EU),[1] take on a quantified economy-wide emission reduction target jointly with all EU member States to reduce its greenhouse gas (GHG) emissions by 2020. The EU and its member States have communicated an independent quantified economy-wide emission reduction target of a 20 per cent emission reduction by 2020 compared with 1990 levels.[2]

2. Within the burden-sharing agreement of the EU for meeting commitments under the Kyoto Protocol, Ireland committed itself to limiting the growth in its GHG emissions to 13 per cent above the base year[3] level during the first commitment period from 2008 to 2012. For the second commitment period of the Kyoto Protocol from 2013 to 2020, Ireland will take on a quantified economy-wide emission reduction target jointly with all EU member States to reduce its GHG emissions by at least 20 per cent in relation to the base year level.

3. Under the EU climate and energy package, this target will be met by the EU and its member States through a 21 per cent reduction, compared with 2005 levels, in GHG emissions from installations under the European Union Emissions Trading System (EU ETS) and a 10 per cent reduction, compared with 2005 levels, in GHG emissions in the non-ETS sectors (primarily the transport sector, as well as some emissions in the industrial processes, agriculture and waste sectors). According to the EU effort-sharing decision regarding the non-ETS target (EU decision 406/2009/EC)", Ireland is to reduce its GHG emissions from the non-ETS sectors by 20 per cent by 2020 compared with the 2005 level.

4. This report covers the in-country technical review of the sixth national communication (NC6) of Ireland, coordinated by the secretariat, in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" (decision 23/CP.19) and the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1).

5. The review took place from 19 to 24 May 2014 in Dublin, Ireland, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Sangay Dorji (Bhutan), Ms. Violeta Hristova (Bulgaria), Ms. Balgis Osman-Elasha (Sudan) and Mr. Christophe Schramm (France). Ms. Hristova and Ms. Osman-Elasha were the lead reviewers. The review was coordinated by Mr. Bernd Hackmann (secretariat).

6. During the review, the expert review team (ERT) examined each section of the NC6. The ERT also reviewed the supplementary information provided by Ireland as a part of the

[1] Please note that the target under the Convention is taken by the EU and its 28 member States, while the target under the Kyoto Protocol for its second commitment period applies to the EU 28 member States and Iceland. A political statement on the fulfilment of the target under the Kyoto Protocol for the second commitment period by the EU-28 jointly with Iceland is contained in document FCCC/KP/CMP/2012/13, paragraph 45.

[2] FCCC/SB/2011/INF.1/Rev.1 and FCCC/AWGLCA/2012/MISC.1.

[3] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), and 1995 for perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF6). The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

NC6 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 2013 annual submission and previous submissions and elaborated further in its 2014 annual submission under Article 7, paragraph 1, of the Kyoto Protocol.

7. In accordance with decisions 23/CP.19 and 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, into this final version of the report.

B. Summary

8. The ERT conducted a technical review of the information reported in the NC6 of Ireland in accordance 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 on NCs). As required by decision 15/CMP.1, supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[4] is provided in the NC6 (see paras. 164 and 165 below). The supplementary information on the minimization of adverse impacts referred to in paragraph 6 above is not complete and mostly transparent. The ERT identified missing reporting elements related to the Party's plans to implement policies and measures (PaMs) under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects. Ireland considered most of the recommendations provided in the report of the in-depth review of the fifth national communication of Ireland.[5]

9. The ERT commended Ireland for its improved, coherent and consistent reporting, as well as for its openness and cooperation during the in-country review. During the review, Ireland provided further relevant information on the national circumstances (see paras. 14 and 20 below); PaMs (see paras. 27, 42 and 97 below); projections (see para. 103 below); the total effect of all implemented and adopted PaMs across all sectors (see para. 117 below); financial resources and the provision of financial support (see para. 125 below), technology transfer and the provision of technological support (see paras. 137 and 141 below); vulnerability and adaptation (see para 149 below); research and systematic observation (see para 153 below); education and public awareness (see para. 158 below); and the minimization of adverse effects on developing countries (see para. 166 below).

1. Completeness and transparency of reporting

10. Gaps and issues related to the reported information identified by the ERT are presented in table 1 below.

2. Timeliness

11. The NC6 was submitted on 7 March 2014, after the deadline of 1 January 2014 mandated by decision 9/CP.16. Ireland informed the secretariat about its difficulties with the timeliness of its NC6 on 23 December 2013 in accordance with paragraph 79 of the annex to decision 23/CP.19 and paragraph 139 of the annex to decision 22/CMP.1. As the NC6 was not submitted within six weeks after the due date (15 February 2014), the delay was brought to the attention of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) and the Compliance Committee and made public. The ERT noted with great concern the delay in the submission of the NC6.

[4] Decision 15/CMP.1, annex, chapter II.
[5] FCCC/IDR.5/IRL.

3. Adherence to the reporting guidelines

12. The information reported by Ireland in its NC6 is mostly in adherence to the UNFCCC reporting guidelines on NCs as per decision 4/CP.5 (see table 1 below).

Table 1
Assessment of completeness and transparency issues of reported information in the sixth national communication of Ireland[a]

Sections of national communication	*Completeness*	*Transparency*	*Reference to paragraphs*	*Supplementary information under the Kyoto Protocol*	*Completeness*	*Transparency*	*Reference to paragraphs*
Executive summary	Complete	Transparent		National systems	Complete	Transparent	
National circumstances	Complete	Transparent		National registries	Complete	Transparent	
Greenhouse gas inventory	Complete	Transparent		Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	
Policies and measures (PaMs)	Mostly complete	Mostly transparent	44, 52	PaMs in accordance with Article 2	Partially complete	Transparent	28, 98, 100
Projections and total effect of PaMs	Mostly complete	Mostly transparent	119, 120,121,	Domestic and regional programmes and/or arrangements and procedures	Complete	Transparent	
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Transparent		Information under Article 10[b]	Complete	Mostly transparent	138
Financial resources and transfer of technology	Mostly complete	Mostly transparent	128, 140	Financial resources	Complete	Mostly transparent	128
Research and systematic observation	Mostly complete	Transparent	154	Minimization of adverse impacts in accordance with Article 3, paragraph 14	Complete	Transparent	
Education, training and public awareness	Complete	Transparent					

[a] A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in the chapter on conclusions and recommendations.

[b] For the purposes of reporting information in this table, this assessment refers to information provided by the Party on the provisions contained in Article 4, paragraphs 3, 5 and 7, of the Convention reported under Article 10 of the Kyoto Protocol, which is relevant for developed country Parties and other developed Parties included in Annex II to the Convention only. Assessment of the information provided by the Party on the other provisions of Article 10 of the Kyoto Protocol is provided under the relevant substantive headings under the Convention, for example research and systematic observation.

II. Technical review of the reported information in the national communication and supplementary information under the Kyoto Protocol

A. Information on greenhouse gas emissions and national circumstances relevant to greenhouse gas emissions and removals, including other elements related to the Kyoto Protocol

1. Information on relevant national circumstances

13. In its NC6, Ireland has provided a concise description of the national circumstances and elaborated on the framework legislation and key policy documents on climate change. Further information on the review of the institutional and legislative arrangements for the coordination and implementation of PaMs is provided in chapter II.B below.

14. During the review, Ireland provided additional information on the national circumstances, including its position as a small but globalized economy which experienced unprecedented economic growth during the period 1997–2007. Owing to the economic recession in Europe, Ireland's gross domestic product (GDP) shrank by 7.3 per cent (2005 USD billion using purchasing power parity) between 2007 and 2011 and employment fell by approximately 14 per cent with subsequent reductions in total GHG emissions without land use, land-use change and forestry (LULUCF) from 68,370.74 kt carbon dioxide equivalent (CO_2 eq) in 2007 to 57,749.96 kt CO_2 eq in 2011. During the review, Ireland provided further information on its recovering economy since 2011, leading to an increase in total GHG emissions of 58,531.24 kt CO_2 eq in 2012.

15. The ERT noted that during the period 1990–2011, Ireland's population and GDP increased by 30.8 and 166.9 per cent, respectively, while GHG emissions per GDP and GHG emissions per capita decreased by 60.7 and 19.0 per cent, respectively. The ERT noted Ireland's efforts to decouple total GHG emissions from economic growth and encourages the Party to continue these efforts in the future.

16. Table 2 illustrates the national circumstances of Ireland by providing some indicators relevant to GHG emissions and removals.

Table 2
Indicators relevant to greenhouse gas emissions and removals for Ireland

	1990	*2000*	*2005*	*2010*	*2012*	*Change 1990–2012 (%)*	*Change 2011–2012 (%)*
Population (million)	3.51	3.80	4.16	4.56	4.59	30.8	0.2
GDP (2005 USD billion using PPP)	62.05	127.07	161.25	161.83	165.60	166.9	0.2
TPES (Mtoe)	9.91	13.67	14.35	14.28	13.25	33.7	0.3
GHG emissions without LULUCF (kt CO_2 eq)	55 246.27	68 216.34	69 655.66	61 894.90	58 531.24	5.9	1.4
GHG emissions with LULUCF (kt CO_2 eq)	52 933.69	67 378.49	67 441.84	58 037.12	55 386.39	4.6	2.4
GDP per capita (2005 USD thousand using PPP)	17.68	33.44	38.76	35.49	36.08	104.1	–0.1
TPES per capita (toe)	2.82	3.60	3.45	3.13	2.89	2.5	0.3

	1990	*2000*	*2005*	*2010*	*2012*	*Change 1990–2012 (%)*	*Change 2011–2012 (%)*
GHG emissions per capita (t CO_2 eq)	15.74	17.95	16.74	13.57	12.75	–19.0	1.1
GHG emissions per GDP unit (kg CO_2 eq per 2005 USD using PPP)	0.89	0.54	0.43	0.38	0.35	–60.7	0.0

Sources: (1) GHG emissions data: Ireland's 2014 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.

2. Information on the greenhouse gas inventory, emissions and trends

17. Ireland has provided a summary of information on GHG emission trends for the period 1990–2011. This information is fully consistent with the 2013 national GHG inventory submission. Summary tables, including trend tables for emissions in CO_2 eq (given in the common reporting format (CRF) tables), are provided in an annex to the NC6. During the review, the ERT took note of the 2014 annual submission. The relevant information therein is reflected in this report.

18. Total GHG emissions[6] excluding emissions and removals from LULUCF increased by 5.9 per cent between 1990 and 2012, whereas total GHG emissions including net emissions and removals from LULUCF increased by 4.6 per cent over the same period. This growth was mainly attributed to an increase of 17.2 per cent in CO_2 emissions. Emissions of methane (CH_4) and nitrous oxide (N_2O) decreased by 11.7 and 18.6 per cent, respectively. CO_2 emissions accounted for 58.7 per cent of total GHG emissions without LULUCF in 1990 and 64.9 per cent in 2012, while CH_4 emissions accounted for 24.8 per cent in 1990 and 20.6 per cent in 2012 and N_2O emissions accounted for 16.5 per cent in 1990 and 12.7 per cent in 2012. Emissions of fluorinated gases (F-gases) accounted for about 0.1 per cent of total GHG emissions without LULUCF in 1990 and 1.8 per cent in 2012. A major part of the increase in total GHG emissions without LULUCF occurred between 1990 and 2001, when emissions increased by 27.1 per cent from 55,246.27 to 70,207.50 kt CO_2 eq. Emissions started to decrease thereafter, but slightly peaked again in 2005. Overall, total GHG emissions were 16.6 per cent lower in 2012 than in 2001.

19. The increasing trend of total GHG emissions between 1990 and 2012 was mainly due to rising emissions from fuel combustion in the energy sector, with emissions from energy industries increasing by 13.8 per cent to account for 21.9 per cent of total GHG emissions in 2012, and emissions from transport increasing by 112.8 per cent to account for 18.6 per cent of total GHG emissions in 2012. The agriculture sector remained the largest source of emissions in 2012, accounting for 30.7 per cent of total GHG emissions; however, emissions from agriculture decreased by 8.5 per cent between 1990 and 2012.

20. During the review, Ireland provided additional information on the increase in emissions from the transport sector that are a direct result of the country's economic growth and associated demand for transport services, and its dispersed population. Ireland has a

[6] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding LULUCF, unless otherwise specified.

density level of 413 cars per 1,000 people, with road-based transport accounting for more than 95 per cent of passenger kilometres travelled and almost 99 per cent of land-based freight demand. The ERT noted that the recently observed reduction in car density is a direct result of reduced economic outputs and income levels and that the vehicle density and thus emissions from road transport are likely to rise with increasing economic performance.

21. An analysis of the drivers of GHG emission trends in each sector is provided in chapter II.B below. Table 3 provides an overview of GHG emissions by sector from 1990 to 2012.

Table 3
Greenhouse gas emissions by sector in Ireland, 1990–2012

	GHG emissions (kt CO2 eq)				*Change (%)*		*Share[a] by sector (%)*	
Sector	*1990*	*2000*	*2010*	*2012*	*1990–2012*	*2011–2012*	*1990*	*2012*
1. Energy	30 970.48	42 459.41	40 482.32	37 062.65	19.7	0.1	56.1	63.3
A1. Energy industries	11 238.54	16 140.48	13 333.17	12 793.84	13.8	7.1	20.3	21.9
A2. Manufacturing industries and construction	3 961.19	5 641.70	4 536.51	4 275.91	7.9	0.0	7.2	7.3
A3. Transport	51 21.45	10 771.72	11 605.30	10 900.42	112.8	–3.5	9.3	18.6
A4.–A5. Other	10 518.03	9 820.13	10 975.72	9 068.47	–13.8	–4.3	19.0	15.5
B. Fugitive emissions	131.26	85.38	31.62	24.00	–81.7	–13.6	0.2	0.0
2. Industrial processes	3 178.43	4 234.11	2 344.17	2 421.22	–23.8	9.0	5.8	4.1
3. Solvent and other product use	80.03	78.99	71.16	72.72	–9.1	0.9	0.1	0.1
4. Agriculture	19 634.06	19 970.38	18 004.52	17 967.39	–8.5	3.4	35.5	30.7
5. LULUCF	–2 312.58	–8 37.85	–3 857.78	–3 144.85	36.0	–13.6	NA	NA
6. Waste	1 383.27	1 473.45	992.73	1 007.26	–27.2	–5.7	2.5	1.7
GHG total with LULUCF	**52 933.69**	**67 378.49**	**58 037.12**	**55 386.39**	**4.6**	**2.4**	**NA**	**NA**
GHG total without LULUCF	**55 246.27**	**68 216.34**	**61 894.90**	**58 531.24**	**5.9**	**1.4**	**100.0**	**100.0**

Source: Ireland's 2014 GHG inventory submission.

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, NA= not applicable.

[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.

3. National system

22. Ireland has provided in its NC6 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 description includes all the elements mandated by decision 15/CMP.1. The NC6 also contains a reference to the description of a national system provided in the national inventory report of the 2013 annual submission. The ERT took note of the review of the changes to the

national system as reflected in the report of the individual review of the GHG inventory of Ireland submitted in 2013.

23. The ERT concluded that the national system continues to perform its required functions as set out in decision 19/CMP.1.

4. National registry

24. In its NC6, Ireland has provided information on the national registry in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1. The ERT took note of the review of the changes to the national registry as reflected in the report of the individual review of the GHG inventory of Ireland submitted in 2013.

25. Ireland described the changes, specifically due to the consolidation of the EU ETS operations into a single EU registry operated by the European Commission called the Consolidated System of European Union registries (CSEUR). The CSEUR is a consolidated platform which implements the national registries in a consolidated manner and was developed together with the new EU registry.

5. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

26. Ireland has reported in its NC6 comprehensive and well-organized information on domestic and regional programmes and legislative arrangements and procedures related to the Kyoto Protocol.

27. During the review, Ireland provided additional information, elaborating on relevant policies for the evolution of the energy mix, energy efficiency and GHG emission reductions in the transport, industry, forestry and waste management sectors.

28. To improve the completeness of its reporting, the ERT recommends that Ireland, in its next national communication, provide a description of its provisions to make information on domestic and regional arrangements, enforcement and administrative procedures publicly available.

29. Overall responsibility for climate change policymaking lies within the Department of Environment, Community and Local Government of the Government of Ireland. The Irish Environmental Protection Agency (EPA) has overall responsibility for the national GHG inventory in Ireland's national system. A large number of departments are involved in the implementation of climate change related policies in their respective fields of competency: the Department of Agriculture, Food and the Marine for the agriculture and forestry sectors; the Department of Communications, Energy and Natural Resources for the energy sector and energy efficiency; the Department of Transport, Tourism and Sport for the transport sector; the Department of Environment, Community and Local Government for energy efficiency in new buildings and the waste sector; the Department of Jobs, Enterprise and Innovation for energy efficiency in the industrial processes sector; and the Department of Finance and the Department of Public Expenditure and Reform for various cross-cutting PaMs.

30. The Cabinet Committee on Climate Change and the Green Economy, chaired by the Prime Minister (Taoiseach), is in charge of the overall policy coordination. The committee includes all relevant ministers (namely, for the environment, agriculture, energy, transport, jobs and enterprise, finance, public expenditure, foreign affairs and trade) and ministers of State (the NewEra project for key networks of the economy, research and innovation, and public and commuter transport), as well as the Attorney General. This committee is supported by a senior officials group, whose department membership reflects the composition of the Cabinet Committee. Various government bodies, the most important

among which are EPA, the Sustainable Energy Authority of Ireland (SEAI), the Agriculture and Food Development Agency, the Forest Service and the National Treasury Management Agency, are entrusted with policy implementation. Various not-for-profit and academic bodies, such as the Economic and Social Research Institute, University College Dublin and University College Cork, carry out policy research and analysis.

31. Implementation of the Kyoto Protocol is underpinned by the EU's legislative framework for climate and energy policies, including the EU burden-sharing agreement (EU decision 2002/358/EC), the EU ETS (EU directive 2003/87/EC), as well as the EU climate and energy package with its "20-20-20 in 2020" targets established in 2008 and its national implementation in Ireland.

32. At the domestic level, Ireland's policies have thus far been guided by the National Climate Change Strategy for the period 2007–2012, which set objectives that are aimed at the achievement of the target for the Kyoto Protocol first commitment period. In 2011, the "Review of National Climate Policy" was published, followed in early 2013 by the publication of a study by the secretariat of the National Economic and Social Council entitled "Ireland and the Climate Change Challenge – Connecting How Much with How To". In April 2014, the Irish Government published its National Policy Position on Climate Change as well as the general outline of its new Climate Action and Low-Carbon Development Bill, the adoption of which is planned for late 2014 or early 2015.

33. In its National Policy Position on Climate Change, Ireland recognizes the threat of climate change for humanity, as well as the challenges and opportunities arising from actions to address climate change. The bill aims at committing Ireland to achieving the transition towards a low-carbon, climate-resilient and environmentally sustainable economy by 2050, provides an institutional framework for the development of iterative national mitigation and adaptation plans and establishes an Expert Advisory Body to advise the Government and ministers on mitigation and adaptation matters. This body is tasked with disseminating information through the publication of annual reports.

34. The Climate Action and Low-Carbon Development Bill will set the stage for the National Low-Carbon Roadmap, which is currently being developed with a special focus on key identified sectors, namely electricity generation, the built environment, transport and agriculture. The Roadmap, to be adopted in 2015, sets a vision of an aggregate reduction in CO_2 emissions of at least 80 per cent by 2050 compared with the 1990 level across the built environment, electricity generation and transport sectors, and at an approach to achieving carbon neutrality in the agriculture, forestry and land-use sectors. With its ambitious long-term vision, the Roadmap aims, chiefly, at contributing to the achievement of the target for the Kyoto Protocol second commitment period. The bill also provides that a National Climate Change Adaptation Framework (NCCAF) will be submitted to the Government not later than 24 months after the passing of the Act.

35. The preparation of the Climate Action and Low-Carbon Development Bill was preceded by a period of extensive public consultation, notably following the publication of the 2011 review, and interaction with the main interest groups of the country. The outcome of the public consultations concerning electricity generation, the built environment, agriculture and transport was published in May 2014. Public involvement is planned to continue throughout the process of elaborating the National Low-Carbon Roadmap. During the compilation of the 2011 review, an exchange took place with representatives from the industry, agriculture and non-governmental organization (NGO) sectors, which highlighted the level of engagement and debate around climate policy in the country.

36. Ireland explained during the review that the proposed Climate Action and Low-Carbon Development Bill will contain no quantified emission reduction targets up to 2050

and no sectoral policy measures, but that more detailed PaMs are to be decided as part of the National Low-Carbon Roadmap.

37. As set out in the Party's National Policy Position published in April 2014, the evolution of climate policy in Ireland up to 2020 will follow an iterative process, based on the adoption by the Irish Government of a series of national plans during the period to 2050. GHG mitigation and adaptation to the impacts of climate change will be addressed in parallel through two plans: the five-yearly National Low-Carbon Roadmap and the NCCAF. These two plans will be reviewed on a structured basis, with authority set down in primary legislation, to ensure a coherent and comprehensive policy across all key sectors, to provide a clear mandate for Government departments, agencies and local authorities to develop sectoral and local policies, and to give maximum clarity and policy certainty for businesses and stakeholders generally.

38. The ERT encourages Ireland to continue reporting on the development and implementation of its National Low-Carbon Roadmap and its Climate Action and Low-Carbon Development Bill in its next national communication.

39. Ireland provided a description of the national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and the sustainable use of natural resources. These arrangements include: a "National Climate Change Vulnerability Scoping Study" undertaken in 2012, which identified, among others, biodiversity and water resources as priority sectors for further investigation; measures to ensure the multifunctional character of Irish agriculture in providing agricultural output, as well as other public goods such as biodiversity; and a long-term strategy, which is currently being developed by Bord na Móna, the partially State-owned company in charge of commercial industrial peat extraction, for the environmentally sensitive management of its resources.

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

40. Ireland has provided in its NC6 comprehensive and well-organized information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol.

1. Policies and measures related to implementation of commitments under the Convention

41. In its NC6, Ireland reported on its PaMs implemented, adopted and planned in achieving its commitments under the Convention. Ireland provided information on PaMs by sector and a detailed description of the principal PaMs. Ireland also provided some information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention. The NC6 contains, with a few exceptions, a similar set of PaMs to those in the fifth national communication (NC5).

42. During the review, Ireland provided additional comprehensive and well-organized information on the PaMs in the field of conventional electricity generation. The Party also elaborated on the PaMs for vehicle taxation, carbon taxation, renewable energy, energy efficiency in buildings and industry, forests and waste, including further information on quantitative estimates of emission reduction impacts for 2020 (see table 4 below). The ERT considered this information to be transparent and useful and commended Ireland for providing the updated information.

43. Following a recommendation made in the previous review report, Ireland has provided a summary table for all its PaMs, including information on the sector, the name, the objective, the GHG affected, the type of instrument, the implementation status and the mitigation potential of each PaM included.

44. The NC6 does not include the reporting of PaMs with a clear subdivision by gas for each sector, and summary tables of the PaMs were not provided for each individual sector as required by the UNFCCC reporting guidelines on NCs. The ERT recommends that Ireland improve the transparency of its reporting by providing, in its next national communication, a clear subdivision by gas for each sector. The ERT recommends that Ireland include summary tables of its PaMs for each individual sector.

45. In its NC6, Ireland has given priority to those PaMs adopted, implemented and planned that provide the most significant contribution to its emission reduction efforts, including those PaMs that were adopted and implemented at the national, state, provincial, regional and local levels. Ireland reported on its policy context and national targets and objectives set to implement its commitments under the Convention.

46. The ERT noted that the NC6 does not include information on some PaMs in the energy industries sector with significant emission reduction potential (concerning the planned evolution of the overall energy supply and installed capacities for electricity generation). The ERT encourages Ireland to improve the transparency of its reporting in the next national communication by providing more detailed information on the prioritization of PaMs in each sector or by clearly presenting all PaMs with significant emission reduction potential in the next national communication.

47. The NC6 does not include complete information regarding the costs of PaMs as required by the UNFCCC reporting guidelines on NCs. Therefore, the ERT encourages Ireland to include the missing information in its next national communication.

48. The ERT noted that in its NC6 Ireland did not provide information required by the UNFCCC reporting guidelines on NCs on quantitative estimates of emission reduction impacts for certain PaMs, in particular with regard to EU directives that are translated into national laws and regulations,[7] some of which (e.g. the EU ETS and the carbon tax, and the Common Agriculture Policy) are expected to have a major impact on emission reductions. However, the ERT further noted that the impact of the two main cross-sectoral measures, the EU ETS and the carbon tax, are included in Ireland's projections under its 'with measures' scenario.

49. Further, the ERT noted some inconsistencies between the data provided in the Party's NC6 and the updated data provided during the review on implemented, adopted and planned PaMs and the related quantitative estimates of emission reduction impacts.

50. The ERT therefore encourages Ireland to report in greater detail on the quantitative estimates of the impacts of individual PaMs or groups of PaMs, and to include a brief description of the methodology or methodologies used, in its future national estimates of

[7] For example, the regulations related to the Common Agricultural Policy; EU directive 2000/25/EC against the emission of gaseous and particulate pollutants by engines intended to power agricultural or forestry tractors; EU directives on energy labelling of household appliances (e.g. EU directive 92/75/EC); EU directive 2009/31/EC on the geological storage of carbon dioxide; EU directives on the internal electricity and gas markets; EU directive 2006/38/EC on the charging of heavy goods vehicles for the use of certain infrastructures; EU directives on the development and interoperability of the rail system; the EU directive on waste electrical and electronic equipment (EU directive Directive 2002/96/EC); EU directives on packaging and packaging waste; EU directive 2000/76/EC on the incineration of waste; EU regulation 510/2011 setting emission performance standards for new light commercial vehicles; EU directive 1999/13/EC on the limitation of emissions of volatile organic compounds due to the use of organic solvents; the EU ETS; and the carbon tax.

the impacts of individual PaMs or groups of PaMs in its national communications, in particular for all PaMs with a significant impact, such as the EU ETS and the carbon tax.

51. In its NC6, Ireland provides information on the longer-term impacts of its PaMs but the NC6 lacks transparency on how PaMs will modify the longer-term trends in anthropogenic GHG emissions and removals. The ERT noted that the Party's reporting could be improved through the provision of additional information on the PaMs planned or adopted in the context of the National Low-Carbon Roadmap, notably in the heat and electricity from renewable sources, transport, agriculture and industrial processes sectors, and on how Ireland anticipates that these PaMs will modify longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention.

52. The ERT recommends that Ireland improve the transparency of its reporting by describing in more detail on how it believes its PaMs are modifying the longer-term trends of its GHG emissions.

53. In its NC6, Ireland also reports on the PaMs that are no longer in place compared with those reported in the NC5 and explains that these were: planned to cease within a certain time frame from the outset; superseded by more ambitious or onerous PaMs; or replaced by similar schemes.

2. Policy framework and cross-sectoral measures

54. The NC6 provides a comprehensive description of the Party's overall climate change policy framework, which has been shaped by the EU's 1998 burden-sharing agreement, according to which Ireland must limit its GHG emissions growth to 13 per cent above the 1990 level during the Kyoto Protocol first commitment period (2008–2012), in order for the EU as a whole to reach its target of an 8 per cent reduction compared to 1990 levels. For the second commitment period, the EU committed itself in March 2012 to a 20 per cent emission reduction compared to 1990 levels – which could be increased to 30 per cent if other developed countries commit themselves to comparable emission reductions and developing countries contribute adequately according to their responsibilities and respective capabilities. Negotiations on the instrument of ratification of the amendment to the Kyoto Protocol for the second commitment period at the EU level are currently ongoing.

55. The 2008 EU climate and energy package with its legislation on GHG emissions is central in providing the legislative framework to enable Ireland to reach its targets at the EU and national levels.

56. Under the EU ETS, the EU as a whole has committed to reducing emissions from sectors falling under the EU ETS (namely, power generation and energy-intensive industries) by 21 per cent by 2020 compared to 2005 levels. Under the EU ETS, the overall emissions quota is falling each year by 1.74 per cent. Over 100 Irish installations are covered by the EU ETS and are collectively responsible for about 29 per cent of national emissions. After the first two phases from 2005 to 2007 and from 2008 to 2012, the EU ETS has entered into its third phase (2013–2020), which has seen the widespread introduction of auctioning of the emissions quota instead of free allocation. For subsectors considered to be exposed to the risk of CO_2 leakage, allocation has been based on the use of best available technology benchmarks.

57. Under the EU effort-sharing decision, the EU's emissions from sectors not covered under the EU ETS (namely, agriculture, transport, tertiary, small industry, waste and activities emitting F-gases) have to decrease by 10 per cent by 2020 compared with 2005 emission levels. For Ireland, where the sectors concerned represent about 71 per cent of national emissions, the target is a total GHG emission reduction of 20 per cent by 2020

compared with 2005 emission levels. While the decision sets an annual emission reduction trajectory, there are various provisions allowing EU member States to carry forward allowances to future years, borrow allowances from future years, trade them among each other or fulfil a certain share of their obligations through the use of Kyoto Protocol mechanisms.

58. At the national level, Ireland has in place a carbon tax since December 2009, first on motor fuels, then on liquid heating fuels and, since May 2013, also on solid heating fuels. The corresponding tax rate has increased from EUR 15/t CO_2 to EUR 20/t CO_2, with reductions applying to diesel used in agriculture and until recently on solid heating fuels (coal and peat). Since 1 May 2014 the carbon tax has applied at the full rate on solid heating fuels. The only sectors exempted are those covered by the EU ETS, in order to prevent double taxation. Ireland reported in its NC6 that the carbon tax is estimated to result in a decrease in emissions of 1.5 per cent per year and could further result in reduced energy demand depending on the way in which the carbon tax revenues are used.

59. The ERT noted that due to political leadership and effective implementation, the carbon tax was introduced with only a limited amount of exemptions, thereby generating economic and social co-benefits (EUR 350 million of tax revenues in 2012). The ERT considered this policy to be both highly effective and replicable.

60. Given Ireland's small population and the limited role of regional and local government in determining energy and environmental policy, almost all climate policy is determined on a national basis. Some PaMs are deferred to or executed in collaboration with a wide range of bodies at the local level, such as: regeneration projects for disadvantaged communities; the Local Authorities Housing Improvement Programme; the Energy Efficiency Stimulus Measure; the Remedial Works Scheme; local by-laws for agricultural activities; waste management; local climate change adaptation plans; local development plans for integrated coastal zone management; the Green Schools programme; the Local Authority Prevention Network to promote sustainability in local businesses and communities; the Local Agenda 21 Environmental Partnership Fund; the Tidy Towns Award Scheme; and the work of the Local Authority Environmental Awareness Officers.

61. The regional level plays a role through the development of regional planning guidelines for spatial policy, in particular to activate the potential for sustainable economic development and green infrastructure. Ireland provided comprehensive information on PaMs at the national and subnational levels. Table 4 provides a summary of the reported information on the PaMs of Ireland.

Table 4
Summary of information on policies and measures reported by Ireland

Sectors affected	*List of key policies and measures*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*
Policy framework and cross-sectoral measures		
	European Union Emissions Trading System (EU ETS)	
	European Union effort-sharing decision for non-ETS sectors	
	Carbon tax	
Energy		
Energy supply	Electricity generation efficiency improvements (since 2008)	960
	Electricity savings in the industry, services, residential	344

Sectors affected	*List of key policies and measures*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*
	and transport sectors (planned)	
Renewable energy	National Renewable Energy Plan	NA
	Renewable energy to contribute 23 per cent (planned 40 per cent) of gross electricity consumption (targets set in the Irish Government's Energy White Paper of 2007) (planned)[a]	1 975 (2 750)
Energy efficiency	National Energy Efficiency Action Plan	NA
	Reduced electricity demand	451
Residential, commercial and institutional sectors	Retrofit scheme (Better Energy Homes) (planned)	1 413
	Building regulations for dwellings (2002, 2008, 2011, nearly zero energy buildings for 2020)	759
	Efficient boiler standards (2008, 2011)	284
	Domestic lighting (2008)	179
	Better Energy Retrofit (public sector) (planned)	190
	Public sector energy efficiency target (planned)	177
	Building regulations for buildings other than dwellings (planned for 2015, 2018, nearly zero energy buildings for 2020)	133
Transport		
	Improved fuel economy of privately owned cars (2009)	783
	Renewables in transport: 10% by 2020 (planned)	641
	Vehicle registration tax and motor tax changes (2008)	237
	Electric vehicle deployment (planned)	125
Industrial sectors		
	Renewable heat measures (planned)	561
	Sustainable Energy Authority of Ireland – Large Industry Programme	417
	Combined heat and power efficiency	104
Agriculture		
	Food Harvest 2020 plan and abolition of the European Union milk quota	–
Forestry		
	National Forest Programme (Afforestation)	4 639[b]
Waste management		
	EU directive 1999/31/EC on the landfill of waste	378

Note: The greenhouse gas emission reduction estimates given in the right-hand column are reductions in carbon dioxide or carbon dioxide equivalent for 2020, based on data provided by Ireland during the review (unless otherwise indicated).

Abbreviation: NA = not applicable.

[a] The policies to achieve 23 per cent renewable energy contribution to gross electricity consumption in 2020 have been in operation for wind and hydro power since 2006, whereas the objective to achieve 40 per cent renewable energy contribution to gross electricity consumption in

2020 are planned and not yet implemented. The 40 per cent target is set in the Irish Government's Energy White Paper of 2007 and complements the Renewable Energy Directive (28/EC/2009).

[b] Data from Ireland's NC6.

3. Policies and measures in the energy sector

62. Between 1990 and 2012, GHG emissions from the energy sector increased by 19.7 per cent (6,092.17 kt CO_2 eq.), mainly owing to emissions from the transport sector (an increase of 112.8 per cent) and energy industries (an increase of 13.8 per cent).

63. ***Energy supply***. The evolution of Ireland's energy demand and supply has been marked by the economic crisis since 2008 and the corresponding decline in energy consumption. Overall (primary) energy use in 2012 fell by 4.6 per cent to 13.2 Mtoe compared to 2011 (similar to 1999 levels) and final energy demand decreased by 3.7 per cent to 10.8 Mtoe.

64. Ireland's energy import dependency reached around 84.8 per cent in 2012, down from a peak of 91 per cent in 2006, and 94.2 per cent of primary energy consumed in the country in 2012 was of fossil origin. Oil continues to be the dominant energy source, accounting for 47.8 per cent of primary energy consumption, followed by gas (29.0 per cent), coal (10.1 per cent) and renewable energies (5.8 per cent).

65. Natural gas remains the fuel of choice for electricity generation at 49.6 per cent in 2012 (down from 61.9 per cent in 2010), followed by coal at 29.3 per cent (up from 22.4 per cent in 2010). This gas-to-coal switch due to global oversupply of coal and declined prices induced an increase in CO_2 intensity between 2011 and 2012 (528 g CO_2/kWh against 489 g CO_2/kWh).

66. Ireland reported on the measures taken since 2008 to generate efficiency improvements and on the planned measures to save electricity in the industry, services, residential and transport sectors. Ireland did not report on the planned evolution of the overall energy supply and installed capacities for electricity generation. The ERT encourages Ireland to report in its next national communication on the longer-term evolution of the energy mix and its implications for GHG emissions.

67. ***Renewable energy sources***. The development of the renewable energy sector is central to the overall energy policy of Ireland for its domestic, EU and international targets. Under EU directive 2009/28/EC on the promotion of the use of energy from renewable sources (the RES directive) Ireland was assigned a target of 16 per cent of renewable energy in final energy consumption by 2020. According to its 2010 National Renewable Energy Action Plan, Ireland aims to achieve this target by reaching 40 per cent of energy from renewable sources in electricity generation, 12 per cent in heat production and 10 per cent in transport fuels. At the end of 2012, 7.1 per cent of Ireland's final energy consumption stemmed from renewable sources, up from around 2 per cent in 2002. Renewable electricity generation reached 19.6 per cent in 2012 and renewable heat production 5.2 per cent.

68. In its NC6, Ireland reported that the primary support mechanisms for renewable electricity are the Alternative Energy Requirement Programme and the Renewable Energy Feed-in Tariff schemes which were introduced to incentivize the development of renewable energy generation capacity necessary to allow Ireland to meet its renewable energy target.

69. The ERT noted that the target assigned to Ireland under the RES directive is ambitious and its achievement could become challenging due to the current development level of renewable energy sources. While renewable energy development has been impressive over the past 10 years, the evolution, notably of renewable heat and transport fuels, is below the planned trajectory. The Bioenergy Strategy, to be published shortly,

aims to increase the use of renewable heat, while the recently published Offshore Renewable Development Plan aims to build on Ireland's significant marine energy potential. During the review, Ireland elaborated on its decision to realize most of its renewable energy production with onshore wind installations and to not develop offshore wind installations in the short term because of their prohibitive cost.

70. ***Energy efficiency***. Under the 2013 National Energy Efficiency Action Plan, Ireland reaffirmed its commitment to achieve 20 per cent energy savings by 2020 compared with the levels during the period 2001–2005. Recognizing that the Irish Government must lead by example, Ireland also committed to achieving a 33 per cent reduction in public sector energy use. These objectives are in line with the provisions of EU directive 2012/27/EU on energy efficiency.

71. The first current policy priority includes the implementation of the 97 actions from the National Energy Efficiency Action Plan covering six areas (the public sector, residential, business, transport, energy supply and cross-sectoral) and of the EU directive on energy efficiency. Second, in line with the EU directive on energy efficiency, Ireland has chosen to achieve about 50 per cent of its annual energy savings objective via its energy supplier obligation scheme, which spreads across electricity, gas, solid fuel and oil importers; the first phase covering the period 2011–2013 has recently been completed, while the second phase will run from 2014 to 2016. Third, Ireland has set up a market-based approach to develop energy performance contracting through a common policy framework, technical support and kick-off financing through an energy efficiency fund. The ERT noted the innovative and replicable nature of this initiative. As of 2012, Ireland had achieved about 39 per cent of the overall savings necessary to achieve its 2020 target. The ERT noted that additional measures to those adopted and planned will be necessary to achieve the 2020 energy efficiency target.

72. ***Built environment***. The residential sector was responsible for just over a quarter (around 27 per cent) of Ireland's primary energy consumption and energy-related CO_2 emissions in 2012. Its role has significantly grown over the last two decades, as the number of households has increased from 1 million in 1990 to 1.65 million in 2012 and as dwelling sizes are more than a third larger than the average across the 27 other EU member States. Fossil fuels remain the dominant energy source for this sector, even if the role of electricity has increased.

73. Ireland is targeting the built environment through a series of policies, including the National Spatial Strategy and planning guidelines, efficient boiler standards and regularly updated building performance and design regulations for residential, commercial and institutional buildings. As part of these regulations, primary energy consumption in new dwellings is expected to reduce from 150 kWh/m^2/year in 2005 to 61 kWh/m^2/year for the period 2013–2016. A further planned upgrade of the regulations will bring primary energy consumption in new dwellings to 45 kWh/m^2/year by 2020. A mandatory requirement for the use of renewables amounting to 10kWh/m^2/yr thermal or equivalent was introduced into Building Regulations for dwellings in 2008. With regard to existing buildings, the Better Energy programme is providing significant support for a variety of energy efficiency measures, while the National Regeneration and Retrofit programmes are targeted at the renewal and refurbishment of social housing.

74. ***Transport sector***. The energy demand of the transport sector in Ireland accounts for about one third of total primary energy consumption. Between 1990 and 2012, transport emissions increased by 112.8 per cent (5,121.45 kt CO_2 eq), in line with a steep increase in car ownership (from 800,000 to 1.89 million). As a result, the transport sector represented 18.6 per cent of Ireland's total emissions and almost 27 per cent of its non-ETS emissions in 2012. However, the economic crisis has seen energy demand, and hence emissions from transport, decline significantly since 2007. Owing to the strong correlation between GDP

and transport growth, it is likely that emissions will begin to grow again in the case of an economic recovery.

75. To respond to the challenges of GHG emission mitigation in the transport sector, Ireland has developed the Smarter Travel – a Sustainable Transport Future policy for the period 2009–2020, which is aimed, notably, at reducing the use of privately owned cars and encouraging other modes of transport, introducing alternatives to conventional cars and increasing fuel efficiency.

76. In 2008, Ireland introduced a new system of assessing passenger cars based on their CO_2 emissions for vehicle registration tax and annual motor tax. In 2013, the Government increased the number of CO_2 emission bands to determine the relevant tax levels and created a zero emissions band for electric vehicles for motor tax purposes. This policy has proved successful in lowering the average specific emissions of new passenger cars purchased in Ireland: they amounted to 120.9 g CO_2/km in 2013, down from 164 g CO_2/km in 2007.

77. Since 2010, under the Biofuels Obligation Act, Irish fuel suppliers for road transport have been required to include an average of 4 per cent biofuels by volume in their sales. In 2013, this increased to 6 per cent in view of the objective of reaching the renewable energy target for the transport sector set down by the RES directive. However, biofuels accounted only for 3.8 per cent of fuel sold according to the calculation method defined by the RES directive. Biodiesel is the main biofuel of Ireland, more than three quarters of which is imported. The ERT noted that the Government anticipates major difficulties in achieving the 10 per cent blend necessary to achieve the 2020 renewable energy target for the transport sector (see para. 67 above).

78. Ireland has also put in place strong incentive schemes, including grant aid of up to EUR 5,000 since 2011 and vehicle registration tax relief, for the uptake of electric vehicles. Nevertheless, the ERT noted that the number of electric vehicles sold remains very modest. Having revised its projections downwards, the Government now assumes that the adoption rate of electric vehicles will rise from 0.5 per cent of all newly sold cars in 2014 to 15 per cent in 2020.

79. ***Industrial sector***. Industrial energy demand accounted for 23.3 per cent of total primary energy consumption in 2011. As a result of the economic downturn, primary energy consumption has decreased by around 17 per cent since 2007. However, over the period 1990–2012, industrial energy consumption increased by around 31 per cent while the value added by the sector increased by around 201 per cent, resulting in a reduction in energy intensity of some 56 per cent. Fossil fuels remain the dominant energy source, despite the increasing role of electricity and, to a lesser extent, renewables.

80. To reduce emissions in the industrial sector, Ireland currently runs the Advice Mentoring and Assessment Programme for small and medium-sized enterprises (SMEs) and the Large Industrial Energy Network. The first programme has already engaged 3,370 SMEs to save, on average, 10 per cent of their energy consumption, while the second programme has achieved around 15 per cent energy savings since 2000. The ERT also noted Ireland's ambitious decision to achieve most of the projected development of renewable heat generation in the industrial sector.

4. Policies and measures in other sectors

81. Between 1990 and 2012, GHG emissions from the industrial processes (including solvent and other product use), agriculture, forestry and waste sectors decreased by 16.6 per cent (3,639.47 kt CO_2 eq), mainly owing to reductions in the animal population, afforestation efforts and energy efficiency gains in industry.

82. ***Industrial processes***. Between 1990 and 2012, GHG emissions from the industrial processes sector decreased by 23.8 per cent (757.22 kt CO_2 eq), mainly driven by energy efficiency gains and the diminishing role of industrial activity during the economic crisis compared to the agriculture and services sectors.

83. In June 2012 Ireland decided to embed the "green growth" agenda across a range of policy areas as set out in the policy Our Sustainable Future: Framework for Sustainable Development. Under this framework, and in addition to the energy efficiency measures in the industry sector listed above, the Government applies a policy of "green" public procurement, supports the creation of jobs in the "green" economy and offers support to enterprises in the "cleantech" sector. The Government has also implemented the EU's ecodesign and labelling legislation on products to contribute to energy efficiency and GHG emission reductions. Ireland is also in the process of implementing the 2014 EU regulation on F-gases (regulation 517/2014) which aims to avoid these gases by introducing a phase down of F-gases and bans on certain products and equipment containing F-gases.

84. ***Agriculture***. Between 1990 and 2012, GHG emissions from the agriculture sector decreased by 8.5 per cent (1,666.67 kt CO_2 eq), mainly owing to reductions in the animal population.

85. With a share of 30.7 per cent of total emissions, the agriculture sector is the largest contributor to Ireland's GHG emissions, but is only a very small energy consumer (2.5 per cent of total primary energy consumption is attributed to the agriculture and fisheries sectors). As such, Ireland has the highest share of emissions from the agriculture sector in total national GHG emissions among all EU member States, where the average contribution was around 12 per cent in 2010. This is due to the important role played by agriculture in the national economy: with around 65 per cent of Ireland's land area dedicated to agriculture, the agri-food sector accounted for 7.1 per cent of national gross value added and 8.6 per cent of total employment in 2012. Emissions are mostly due to enteric fermentation in the beef sector and agricultural soils for dairy production, despite Irish production having among the lowest GHG footprint in the EU. The decreasing emissions trend over the period 1990–2012 is due to reductions in the number of dairy cattle (by approximately 18 per cent) and the sheep population (by approximately 40 per cent), while the number of pigs has increased by approximately 25 per cent.

86. Ireland's agriculture policy is determined by the Government's Food Harvest 2020 plan presented in July 2010, which aims to increase the value added from agri-food and fisheries and increase their exports by 42 per cent compared to the levels during the period 2007–2009. To achieve these objectives, dairy production is projected to grow by 50 per cent until 2020, due to a planned 19 per cent increase in dairy cattle numbers and a 27 per cent increase in fertilizer use. In the period up to 2030, dairy cattle numbers are projected to grow by a further 10 per cent. With respect to the beef, sheep and pig sectors, the plan foresees increases in output through efficiency gains. As a result, emissions are set to increase by 9 per cent between 2012 and 2020 before stabilizing up to 2030.

87. This policy will be accompanied by measures under the Rural Development Programme 2014–2020, targeted at delivering environmental, biodiversity and climate change benefits. The ERT noted that the overall effect of these PaMs will be an increase in emissions and that no alternative scenario was provided by Ireland. The ERT also noted the very slow development of the utilization of renewable heat in agriculture, despite the significant biomass potential offered by this sector. Additional support measures are planned under the upcoming national Bioenergy Strategy.

88. ***LULUCF***. The LULUCF sector accounted for net removals of 3,144.85 kt CO_2 eq in 2012 and net annual GHG emission removals have increased by 36 per cent (832.27 kt CO_2 eq) since 1990. This trend was mainly driven by afforestation measures.

89. Ireland's forests have been a net sink of carbon since 1990. Ninety per cent of the forests in Ireland are plantations established over the past century, notably from 1940 onwards, initially by the State and since the 1980s mainly by the private sector. However, forest cover amounts to 10.5 per cent of the total land area (around 732,000 ha), with 7,000 to 10,000 ha being added each year.

90. Ireland's National Forest Programme aims at an annual increase in forest cover through afforestation (under the responsibility of the Forest Service) of 10,000 ha/year, in order to push forest cover to 18 per cent by 2050. Together with measures to sustainably increase the harvest (from 3 million m^3 of roundwood today to 6–7 million m^3 in 2028) and transform it into wood products, the planned 320,000 ha increase in forest cover should contribute to further carbon removals by 2020 and beyond. The main policy instrument envisaged to reach this objective is State-funded grant aid to farmers who plant trees on their poorer grassland. The afforestation surface area gained in 2012 (around 7,000 ha) is, however, below the projected annual increase.

91. In the context of Ireland's long-term vision towards low-carbon transition, the Party reported on an approach towards achieving carbon neutrality in the agriculture and land-use sectors, including forestry, which does not compromise the capacity for sustainable food production (see para. 34 above). The ERT welcomes the initiative taken by Ireland and encourages the Party to provide further information and report on the progress made with regard to the implementation of this domestic policy.

92. The ERT noted that this afforestation policy could become a key instrument in achieving Ireland's objective of carbon neutrality in the agriculture and land-use sectors. If carbon neutrality were to be achieved by afforestation alone, an additional 640,000 ha of forest cover would be needed. The ERT also noted that no decision has been taken thus far on how to achieve this carbon neutrality.

93. ***Waste management***. Between 1990 and 2012, GHG emissions from the waste sector decreased by 27.2 per cent (376.01 kt CO_2 eq), mainly owing to improved management of landfill facilities, including increased recovery of landfill gas utilized for electricity generation and flaring, and a marked decrease in the amount of municipal solid waste (and biodegradable municipal waste) sent to landfill for disposal since 2006.

94. In line with its economic output, Ireland's waste generation has significantly increased from 1.75 Mt in 1990 to peak at 3.4 Mt in 2007 and decreased to about 2.75 Mt in 2012. Ireland's policy objectives with respect to waste management aim at the reduction of landfill use, waste prevention and the maximization of waste recovery as a resource. In line with the principles of the waste hierarchy established at the EU level by EU directive 2008/98/EC on waste, Ireland has reduced the share of waste sent to landfills from about 90 per cent in 2000 to under 50 per cent in 2012. National policy is to further increase the provision of source-segregated collection services with a view to the achievement of the ultimate goal of virtually eliminating landfills. Legislation to reform waste collection is scheduled to come into force in 2015. In addition, Ireland recently inaugurated its first waste-to-energy incineration plant with a capacity of 200,000 t/year and envisages the construction of a second plant with a capacity of 600,000 t/year, both of which will contribute to additional, though limited, GHG emissions.

5. Policies and measures related to implementation of commitments under the Kyoto Protocol

95. Ireland reported on its package of PaMs adopted, implemented and elaborated in achieving its commitment under the Kyoto Protocol.

96. The NC6 does not include information on how Ireland promotes and implements the International Civil Aviation Organization (ICAO) and International Maritime Organization (IMO) decisions to limit emissions from international aviation and marine bunker fuels.

97. During the review, Ireland provided additional information on how it strives to promote and implement the decisions of ICAO and IMO, elaborating on its views of including international aviation in the EU ETS and excluding international maritime transport from the EU ETS. Ireland also provided information on the development of a global market-based GHG emissions reduction scheme under ICAO by 2020 as well as on the CO_2 emission savings from the efficiency gains obtained through the United Kingdom–Ireland Functional Airspace Block. Ireland provided additional, albeit limited, information on the measures at the global level through IMO or at the EU level to reduce GHG emissions from marine bunker fuels.

98. The ERT welcomed this additional information and recommends that Ireland improve the completeness of its reporting by including information on how it promotes and implements the ICAO and IMO decisions to limit emissions from international aviation and marine bunker fuels in its next national communication.

99. In its NC6, Ireland did not provide 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, the effects on international trade and the social, environmental and economic impacts on other Parties, especially developing country Parties.

100. The ERT recommends that Ireland provide information in its next national communication on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention, in order to improve the completeness of its reporting.

101. Further information on how Ireland 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, as reported in the 2014 annual submission, is presented in chapter III.B below.

102. The NC6 underlines the development of technologies, the provision of assistance to developing country Parties that are highly dependent on the export of fossil fuels in diversifying their economies and conducting relevant research, the effects on international trade and the social, environmental and economic impacts on other Parties.

C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

103. In its NC6, Ireland has provided two emission projection scenarios until 2020: a ‘with measures’ and a ‘with additional measures’ scenario. During the review, Ireland provided the latest projection scenarios until 2030, prepared by EPA on an annual basis for all sectors of the economy; the models have been updated and calibrated based on the most recent available data. The ERT commends Ireland for updating the projections.

1. Projections overview, methodology and key assumptions

104. The GHG emission projections provided by Ireland in its NC6 include a ‘with measures’ and a ‘with additional measures’ scenario until 2020, presented relative to actual inventory data for the period 1990–2011. The projections are reported on a sectoral basis,

using the same sectoral categories as those used in the PaMs section. Following the recommendations made in the previous review report, the projections are presented on a gas-by-gas basis for all GHGs: CO_2, CH_4, N_2O, perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6) (treating PFCs and HFCs collectively in each case). Projections are also provided in an aggregated format for each sector, as well as for a national total, using global warming potential (GWP) values. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and not included in the totals.

105. The methodology used for the preparation of the projections is broadly the same as the one used for the NC5. The projections for the energy sector are prepared using a top-down macroeconomic model (HERMES), while those for the agriculture sector are prepared using a multisectoral approach, which comprises of econometrically estimated equations for all major variables in the Irish agriculture sector (the FAPRI-Ireland model). The dynamic national model (CARBWARE) was used for the projection of emissions and removals from the forestry sector. The projections of emissions from the waste sector are based on the assumption that Ireland will meet the relevant targets for the disposal of biodegradable municipal waste under EU directive 1999/31/EC on the landfill of waste.

106. Ireland provided information on the key underlying assumptions and values of variables such as GDP, gross national product, personal energy consumption, oil, coal, gas and peat prices, car stock and population growth for 2010, and the average annual growth for the periods 2012–2015 and 2016–2020. During the review, Ireland provided revised and updated information on the key underlying assumptions and values of variables on an annual basis, following the recent economic development, with reference to the updated projections.

107. In its NC6, Ireland presented a sensitivity analysis which examines the effect of a range of input variables (e.g. increased economic growth, high oil price, high carbon price) on projected emission levels under the 'with measures' scenario. According to these results, under the increased economic growth variable, emissions are projected to be 0.7 per cent higher in 2020; under the high oil price variable, emissions are projected to be 1.6 per cent higher; while under the high carbon price variable, emissions are projected to be 1 per cent lower.

2. Results of projections

108. Ireland's target under the Kyoto Protocol is, on average, 62,836.86 kt CO_2 eq/year over the Kyoto Protocol first commitment period (2008–2012), which represents a 13 per cent increase in GHG emissions compared with the base year level. According to the inventory data and projections presented in the NC6, the Party's total annual GHG emissions under the 'with measures' scenario were projected to be, on average, 61,546.92 kt CO_2 eq for the period 2008–2012, and thus around 2.1 per cent below the Kyoto Protocol target that equates to 62,836.86 kt CO_2 eq/year, on average. According to the data from the 2014 annual submission presented during the review, the Party's total annual GHG emissions were reported to be, on average, 61,701.77 kt CO_2 eq for the period 2008–2012, and thus around 2 per cent below the Kyoto Protocol target.

109. The ERT noted that Ireland is on track to meet its commitment under the first commitment period of the Kyoto Protocol. However, based on additional information provided during the review, the ERT noted that compliance with the Kyoto Protocol obligations needs to be assessed in the light of an adjustment to the figures based on the ETS emissions. The ERT further noted that although Ireland's gross emissions are below the target for the period 2008–2012 there seems to be a small requirement for the use of additional units totalling some 2,060 kt CO_2 eq.

110. For the second commitment period of the Kyoto Protocol until 2020, Ireland has committed, together with the EU and its member States, to achieving a joint emission reduction target of 20 per cent compared with 1990 levels. Under the EU effort-sharing decision, Ireland's GHG emissions in the non-ETS sectors (namely, transport, agriculture, heating in buildings, waste and small industry) are required to be 20 per cent below 2005 levels by 2020.

111. Based on Ireland's GHG emission estimates provided in the 2014 annual inventory submission, as well as on the projected emissions for 2020, both under the 'with measures' and the 'with additional measures' scenarios that suggest an increase in emissions up to 2020, the ERT notes that the challenge for Ireland will be to reduce its emissions significantly towards future emission reduction obligations such as its target under the EU effort-sharing decision to reduce GHG emissions in the non-ETS sectors (namely, transport, agriculture, heating in buildings, waste and small industry) by 20 per cent below 2005 levels by 2020, in particular since emissions from the agriculture sector are projected to remain almost constant until 2020 and emissions from the transport sector are projected to continue increasing between 2012 and 2020. Therefore, the ERT further noted that the separate reporting of projected emissions for the ETS and non-ETS sectors could improve the transparency of the information provided and enable an assessment by the ERT of the Party's progress towards its emission reduction targets for 2020 both under the Convention and under the Kyoto Protocol.

112. Under the 'with measures' scenario, Ireland's total GHG emissions excluding LULUCF are projected to amount to 62,832.80 kt CO_2 eq in 2020 and 67,058.41 kt CO_2 eq in 2030, which is an increase in total GHG emissions of 13.7 and 21.4 per cent respectively compared with the 1990 level and an increase of 9.3 and 16.6 per cent compared with 2011. For the 'with additional measures' scenario, Ireland's total GHG emissions excluding LULUCF are projected to amount to 57,997.40 kt CO_2 eq in 2020 and 56,169.76 kt CO_2 eq in 2030, which is an increase in total GHG emissions of 5.0 and 1.7 per cent respectively compared with the 1990 level and an increase of 0.8 per cent and a decrease of 2.4 per cent respectively compared with 2011.

113. Under the 'with measures' scenario CO_2 emissions are projected to account for 65.9 per cent of Ireland's total emissions in 2020 and for 68.2 per cent in 2030, with CH_4 emissions accounting for 19.5 and 18.8 per cent, respectively and N_2O emissions accounting for 13.5 and 12.7 per cent, respectively. F-gases are projected to account for around 1.1 per cent of total emissions in 2020 and 0.9 per cent in 2030.

114. The increasing trend in total GHG emissions is mainly owing to the increase in emissions from the transport sector, in particular road transport, emissions from which are projected to increase by 168.1 per cent and 147.8 per cent between 1990 and 2020 under the 'with measures' and 'with additional measures' scenarios, respectively. The single largest projected source of emissions in Ireland in 2020 remains the agriculture sector, with a projected share of 30.9 per cent and 33.5 per cent of total GHG emissions under the 'with measures' and 'with additional measures' scenarios, respectively. The second largest projected source of emissions in 2020 is the energy industries sector, accounting for 22.9 per cent and 22.8 per cent of total GHG emissions under the 'with measures' and 'with additional measures' scenarios, respectively, followed by the transport sector, accounting for 21.9 per cent of total GHG emissions under both the 'with measures' and the 'with additional measures' scenarios.

115. The Party's projected emission levels under different scenarios and information on the Kyoto Protocol targets and quantified economy-wide emission reduction target are presented in table 5 and the figure below.

Table 5
Summary of greenhouse gas emission projections for Ireland

	Greenhouse gas emissions (kt CO_2 eq per year)	*Changes in relation to the base year[a] level (%)*	*Changes in relation to the 1990 level (%)*
Kyoto Protocol base year[b]	55 607.84	NA	0.7
Kyoto Protocol target for the first commitment period (2008–2012)	62 836.86	13.0	13.7
Kyoto Protocol target for the second commitment period (2013–2020)[c]	Not available yet	NA	NA
Quantified economy-wide emission reduction target under the Convention[d]	Not available yet	NA	NA
Inventory data 1990[e]	55 246.27	–0.7	NA
Inventory data 2012[e]	58 531.24	5.3	5.9
Average annual emissions for 2008–2012[e]	61 701.77	11.0	11.7
Projections in the NC6[f]			
'With measures' projections for 2020[f]	62 832.80	13.0	13.7
'With additional measures' projections for 2020[f]	57 997.40	4.3	5.0
Updated projections: 2014[g]			
'With measures' projections for 2020[g]	61 206.41	10.1	10.8
'With additional measures' projections for 2020[g]	56 788.77	2.1	2.8

Abbreviation: NA = not applicable.

[a] "Base year" in this column refers to the base year used for the target under the Kyoto Protocol, while for the target under the Convention it refers to the base year used for that target.

[b] The Kyoto Protocol base year level of emissions is provided in the initial review report contained in document FCCC/IRR/2007/IRL.

[c] The Kyoto Protocol target for the second commitment period (2013–2020) is a joint target for the European Union and its 28 member States and Iceland. The target is to reduce emissions by 20 per cent by 2020 compared with the base year (1990) level. The target for sectors not covered by the European Union Emissions Trading System is 20 per cent for Ireland under the European Union effort-sharing decision.

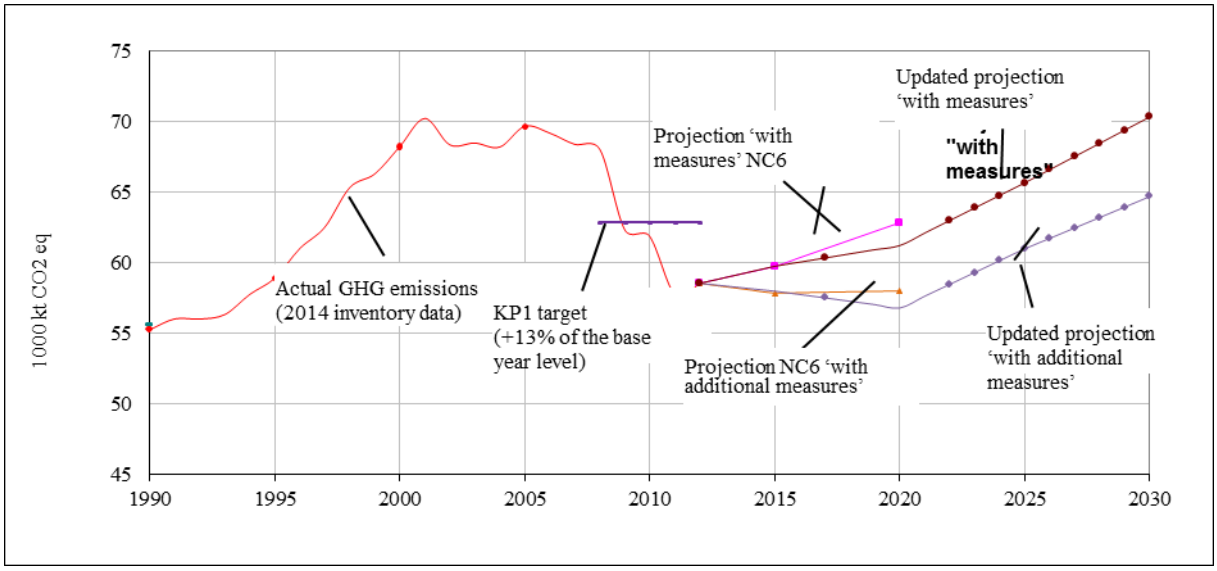
[d] The quantified economy-wide emission reduction target under the Convention is a joint target for the European Union and its 28 member States. The target is to reduce emissions by 20 per cent by 2020 compared with the base year (1990) level.

[e] Ireland's 2014 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry (LULUCF).

[f] Ireland's sixth national communication and/or first biennial report.

[g] Updated projections provided by the Party during the in-depth review; the projections are for GHG emissions without LULUCF.

Greenhouse gas emission projections



Sources: (1) Data for the years 1990–2012: Ireland's 2014 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry; (2) Data for the years 2012–2020: Ireland's sixth national communication and first biennial report; the emissions are without land use, land-use change and forestry; (3) Data for the years 2012–2030: updated projections provided by the Party during the review.

3. Total effect of policies and measures

116. In its NC6, Ireland presents the estimated and expected total effect of implemented and adopted PaMs and an estimate of the total effect of its PaMs per sector for the years 2010, 2015 and 2020 in accordance with the 'with measures' definition, compared with a situation without such PaMs. In addition, Ireland also presents the effect of additional PaMs under a 'with additional measures' scenario for 2015 and 2020. Ireland further presents the relevant information on factors and activities that are expected to be the key drivers for future emissions development for each sector until 2020. The total effect of planned, implemented and adopted PaMs is defined as the sum of the effects of individual measures, taking into account overlapping.

117. The ERT noted that Ireland did not provide information on the estimated and expected total effect of all implemented and adopted PaMs across all sectors. During the review, Ireland provided updated projections and information explaining that in 2020 the total estimated effect of implemented and adopted PaMs is 6,597.30 kt CO_2 eq and the effect of planned PaMs is 4,392.50 kt CO_2 eq, as presented in table 6 below. In 2020, the effect of the implemented and adopted PaMs is expected to amount to 11.9 per cent and the effect of the planned PaMs to amount to 8 per cent compared with the Party's total GHG emissions (without LULUCF) in 1990.

118. On the effects from PaMs by sector, the PaMs implemented in the energy sector (without transport) are expected to deliver the largest emission reductions (5,041.40 kt CO_2 eq), followed by the effect of the PaMs implemented in the transport sector (1,086.30 kt CO_2 eq) and the waste management sector (378.00 kt CO_2 eq). The most effective PaMs and the drivers behind the emission reductions are described in chapters II.B.1 and II.B.2 above. Table 6 below provides an overview of the total effect of PaMs as provided by Ireland during the review.

119. To enhance the transparency of its reporting, the ERT recommends that Ireland include the estimated and expected total effect of all implemented and adopted PaMs across all sectors in its next national communication.

120. The Party's NC6 does not include some of the information required by the UNFCCC reporting guidelines on NCs on the total effect of PaMs presented by gas (on a CO_2 eq basis) for all PaMs. The ERT recommends that Ireland enhance the completeness of its reporting by estimating the total effect of implemented and adopted PaMs by gas on a CO_2 eq basis in its next national communication.

121. The ERT noted that Ireland did not provide in its NC6 an ex-post analysis of the total effect of PaMs for historic years other than for 2010 as required by the UNFCCC reporting guidelines on NCs. The ERT therefore recommends that Ireland improve the completeness of its reporting by estimating the total effect of PaMs for historic years as well.

Table 6
Projected effects of planned, implemented and adopted policies and measures in 2020

Sector	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*[a]	*Effect of planned measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*[a]
Energy (without CO_2 emissions from transport)	5 041.40	19.5	3 442.90	13.3
Transport (CO_2 emissions)	1 086.30	21.2	889.50	17.4
Industrial processes	91.60	2.9	NA	NA
Agriculture	NE	NA	NA	NA
Land-use change and forestry	4 638.60	200.6	NA	NA
Waste management	378.00	27.3	60.1	4.3
Total without LULUCF	**6 597.30**	**11.9**	**4 392.50**	**8.0**

Source: Ireland's updated projections provided during the review.

Note: The total effect of planned, implemented and adopted policies and measures is defined as the difference between the 'without measures' and 'with measures' scenarios; the total effect of planned policies and measures is defined as the difference between the 'with measures' and 'with additional measures' scenarios.

Abbreviations: NA = not available, NE = not estimated.

[a] Based on Ireland's 2014 greenhouse gas inventory submission.

4. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

122. In its NC6, Ireland provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. The ERT noted that Ireland's gap towards reaching its target for the first commitment period is approximately 2,060 kt CO_2 eq, arising from the necessary adjustments for ETS and LULUCF under Article 3, paragraph 3, of the Kyoto Protocol. No decision has been made at this time as to the precise means by which this issue will be addressed. On the basis of the reported total estimated effect of adopted and implemented PaMs, the ERT estimated that the total effect of PaMs is accounting for more than 50 per cent of the total difference between the target and the reported annual total GHG emissions for the first commitment period, indicating that the use of market-based mechanisms under the Kyoto Protocol is supplemental to the domestic actions of Ireland in meeting its Kyoto Protocol target (see para. 109 above).

123. Ireland reported that in 2007 its National Treasury Management Agency set aside EUR 280 million in the National Development Plan in order to fund the purchase of credits for compliance under the first commitment period of the Kyoto Protocol and under the Carbon Fund Act 2007 a carbon fund was established for the management of these purchases. The National Treasury Management Agency was designated the purchasing agent for the State to administer and manage purchases of Kyoto Protocol units on behalf of the Government. In 2009 the Government Purchasing Programme was suspended, as a result of the deteriorating economic situation and the falling requirement for compliance units arising.

D. Provision of financial resources and technology transfer to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol

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

124. In its NC6, Ireland provided information on provision of support required under the Convention and its Kyoto Protocol. Ireland provided details on the 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 on NCs 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".

125. During the review, Ireland provided updated information on the financial resources related to the implementation of the Convention provided through bilateral, regional and other multilateral channels. The ERT welcomed this information.

126. In its NC6, Ireland indicated what "new and additional" financial resources it has provided pursuant to Article 4, paragraph 3, of the Convention and provided some information as to how it has determined such resources as being "new and additional". During the review, Ireland provided additional information, explaining that it considers all climate-related financial resources as being "new and additional", in particular since it has delivered and exceeded its political commitment to provide up to EUR 100 million in public funding for the period 2010–2012, despite its reduced national budget due to the economic recession. In addition, Ireland indicated during the review that it is in the process of developing a Climate Change and Development Learning Platform, which is intended to help the Party to integrated climate change into development programme planning, and a climate finance mapping approach to determine the level of climate finance provided in key partner countries.

127. The mapping entails the examination of expenditures for their climate relevance and subsequent validation against project documentation according to the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) Rio Marker definitions of mitigation and adaptation, as well as other funds for other multilateral environmental agreements (MEA) and disaster risk management (DRM) based on existing DAC Rio Marker definitions and the proposed definition for a DRM OECD DAC Marker. The final output will be a report on the total disbursements in these areas and individual reports on each of the key partner countries of Irish Aid. The projections of disbursements for 2014 and 2015 will also be included.

128. The ERT reiterates the recommendation from the previous review report that Ireland provide a clear definition of what "new and additional" financial resources it has provided, clarifying how it has determined such resources as being "new and additional" in its next

national communication, in order to improve the transparency of its reporting, and encourages the Party to report on the results of its climate finance mapping exercise.

129. Ireland has reported in its NC6 information on the assistance it has provided to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them to meet the costs of adaptation to those adverse effects. In particular, it has provided information on the financial resources related to the implementation of the Convention through bilateral (official development assistance (ODA) to Ireland's partner countries), regional and other multilateral channels (contributions to climate-relevant multilateral funds, such as the Global Environment Facility (GEF), the Global Climate Change Alliance and the Least Developed Countries Fund), as well as through other climate-relevant funding channels, such as the funding of climate-relevant projects through the Food and Agriculture Organization of the United Nations.

130. Ireland has prioritized nine focus countries among developing countries in Africa, namely Ethiopia, Lesotho, Malawi, Mozambique, South Africa, Uganda, the United Republic of Tanzania and Zambia, and in Asia, namely Viet Nam. The provision of development assistance is carried out in line with the priorities expressed by developing country partners in climate change adaptation. 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.

131. Ireland specified that all financial resources related to climate change between 2010 and 2012 are accounted for under the umbrella of the political commitment of the EU and its member States to provide fast-start finance in order to support actions by developing countries to strengthen their resilience to climate change and mitigate their GHG emissions, including those from deforestation. In this context, Ireland committed to provide EUR 100 million in exchequer-based public finance. The Party has exceeded its pledge, having reported contributions of EUR 110.2 million in fast-start finance. These resources consisted entirely of grant funding, with approximately 95 per cent going towards adaptation activities, mainly to Ireland's partner countries.

132. Between 2010 and 2012, Ireland provided financial resources related to climate change of EUR 67.2 million through bilateral and regional channels and EUR 44.6 million through multilateral channels to developing country Parties.

133. In its NC6 and during the review, Ireland provided information on its contributions under the fifth replenishment of the GEF Trust Fund, which is not included under its fast-start finance. During the period 2010–2013, Ireland committed itself to contributing EUR 5.73 million to the replenishment of the GEF Trust Fund, of which some EUR 4.3 million had been paid by the end of 2012.

134. With regard to the Green Climate Fund and future climate finance activities by developed country Parties to enhance the implementation of the Convention by developing countries, Ireland reported that it will continue to work constructively together with EU member States and other developed country Parties both under the EU and the UNFCCC.

135. Table 7 below summarizes the information provided by Ireland on financial resources and technology transfer.

Table 7
Summary of information on financial resources and technology transfer for 2010–2012
(Millions of euros)

	Years of disbursement		
Allocation channel of public financial support	*2010*	*2011*	*2012*
Contributions through multilateral channels	24.67	14.83	5.13
Contributions to the Global Environment Facility	1.47	1.42	1.42
Contributions through bilateral and regional channels	9.79	29.34	28.09
Fast-start finance	34.36	44.17	33.22

2. Technology transfer, including information under Article 10 of the Kyoto Protocol

136. In its NC6, Ireland has provided limited information on activities related to the transfer of technology and notable activities by the public and private sectors. Ireland describes some of the bilateral/regional projects on climate mitigation and adaptation that are aimed at facilitating technology transfer to developing countries. Ireland's support to technology transfer is mainly provided through multilateral channels and is also a major component of bilateral development projects. A detailed review of the reported information is provided in chapter II.D.3 of the report of the technical review of the first biennial report of Ireland (TRR/BR1).

137. During the review, Ireland provided additional information on activities related to technology transfer to developing countries. Ireland's ODA has proactively promoted research and development partnerships between Ireland and developing countries that are focused on addressing social and economic needs in developing countries, in particular its partner countries. Ireland supports a number of key organizations to provide technology transfer, including universities, research institutes, the United Nations, the World Bank and the Consultative Group on International Agricultural Research (CGIAR), and to promote linkages at the national and institutional levels with key partner country institutions, particularly with regard to agricultural crop and animal research, sustainable household energy systems and environmental conservation, based on equitable research partnerships with developing country individuals and institutions that focus research efforts on the needs defined by partner countries.

138. The ERT welcomes this information and recommends that Ireland report in greater detail in its next national communication on the steps taken by the Government to promote, facilitate and finance the transfer of technology, and to support the development and enhancement of endogenous capacities and technologies of developing countries, in order to improve the transparency of its reporting.

139. The ERT noted that Ireland did not report information on activities related to success and failure stories and activities aimed at financing access by developing countries to 'hard' or 'soft' environmentally sound technologies. During the review, Ireland presented the ERT with further information on some examples of success stories related to technology transfer and on how it seeks to provide access to developing countries to 'hard' and 'soft' technologies.

140. The ERT views this information and the examples provided as very useful, given that they can provide input for lesson-learning and experience-sharing between developing countries and therefore recommends that Ireland include this information in its next national communication.

141. In its NC6, Ireland reported some information on how it encourages private sector activities and on how these activities help to meet Ireland's commitments under the Convention. During the review, Ireland provided additional information on its approach to stimulating private climate-related investment in the nine priority developing country partners and showed that it provides support to technology transfer, mainly through multilateral channels such as the Renewable Energy and Energy Efficiency Partnership, which finances technologies in the areas of renewable energy and energy efficiency.

142. Ireland indicated that there is a wide range of funding sources for technology development within the private sector. The Party further reported that information on flows of private climate finance is not currently available, as the mechanisms for tracking such flows are not yet in place. Ireland also indicated its intention to develop and enhance tracking mechanisms for private climate finance flows. The ERT appreciated this information and encourages Ireland to report on these activities in its next national communication.

E. Vulnerability assessment, climate change impacts and adaptation measures

143. In its NC6, Ireland has provided the required information on the expected impacts of climate change in the country and on adaptation options, including the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention.

144. Ireland's NC6 focuses on both vulnerability and adaptation. The ERT noted that first-generation vulnerabilities based on sensitivity analyses across the key sectors were presented.

145. Ireland reported on its NCCAF, which constitutes a first step towards the development of a comprehensive national policy position to address the anticipated impacts of climate change through a structured approach. The framework provides a strategic policy focus with the aim of ensuring that an effective role is played by all stakeholders in putting in place an active and enduring adaptation policy regime.

146. During the first phase of development of the NCCAF, Ireland focused on identifying national vulnerability to climate change, based on potential impacts relative to current adaptive capacity. The second phase of development is ongoing and involves the development and implementation of sectoral and local adaptation plans which will form part of the comprehensive national response to the impacts of climate change.

147. The ERT welcomed the information provided by the Party and encourages Ireland to continue reporting on the further development and implementation of its NCCAF. Table 8 below summarizes the information on vulnerability and adaptation to climate change presented in Ireland's NC6.

Table 8
Summary of information on vulnerability and adaptation to climate change

Vulnerable area	*Examples/comments/adaptation measures reported*
Agriculture and food security	*Vulnerability*: pest survival and arrival of new pests; disappearance of traditional/indigenous plant and livestock varieties
	Adaptation: national gene banks; database for plant genetic resources; livestock gene bank
Forests and peatland	*Vulnerability*: increased evaporation and transpiration; extended growing season; increased pest threat; impact on timber quality
	Adaptation: species choice; information decision support systems and other

Vulnerable area	*Examples/comments/adaptation measures reported*
	decision-making tools; afforestation
Water resources and flood control	*Vulnerability*: increased pressures on water supply infrastructure in the Greater Dublin area; likelihood of increased flood frequency in particular in the west of the country and in coastal areas *Adaptation*: Office of Public Works appointed as the lead agency for flooding policy in Ireland, which includes a strategy to manage flood risk; programme of flood defence schemes; awareness-raising on flood preparation; integration of adaptation into development plans; and statutory guidance on planning and flood risk assessment published in 2009. 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

148. Ireland reported that adaptation-related research plays a major role in the development and implementation of its NCCAF. Progress under phase one of the NCCAF has been heavily dependent on scientific data, and research will continue to be an essential element for delivery of phase two of the NCCAF. The Party's National Adaptive Capacity Assessment concluded that while Ireland is in the early stages of the adaptation process, good-quality information and established processes and tools are in place to plan for the positive and negative impacts of climate change.

149. In its NC6, Ireland reported that in 2012, a National Climate Change Vulnerability study was undertaken. Also, Ireland reported information on the development of its flood defence sectoral adaptation plan and its integrated coastal zone management. Examples of agricultural adaptive measures were provided, which included livestock gene banks and a database for plant genetic resources. During the review, Ireland provided additional information identifying adaptation-related costs as a focus of current research in Ireland. The ERT welcomes this information and the initiative taken by Ireland in the areas of vulnerability assessment and adaptation, and is of the view that the Party's reporting thereon could be improved by including the information on adaptation-related costs provided during the review in the next national communication.

150. In its NC6, Ireland reported on its adaptation cooperation with developing countries and pointed out that its international cooperation focuses on the least developed countries, particularly those in sub-Saharan Africa. The ERT noted that, despite the constraints on its public finances in the context of the global financial crisis, Ireland has continued to contribute to the adaptation efforts of developing countries in the areas of sustainable food and nutrition security, particularly in relation to climate-resilient agriculture, improved natural resource management, disaster risk reduction, improving efficient and sustainable energy at the household level and gender equality.

151. The ERT further noted Ireland's new One World, One Future policy on international development, which aims to follow a 'whole-of-government' approach to international development with increased emphasis on climate change and sustainable development through the priority areas for action according to its Climate Change and Development policy.

F. Research and systematic observation

152. Ireland has provided comprehensive and well-organized information on its actions relating to research and systematic observation, and has addressed both domestic and international activities, including the International Geosphere-Biosphere Programme, the

World Climate Research Programme, contributions by Irish scientists to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) as well as the IPCC *Special Report on Renewable Energy Sources and Climate Change Mitigation*.[8] Ireland has also provided information on its support to the European Space Agency, the Global Monitoring for the Environment and Security programme and the Global Climate Observing System (GCOS), including summary information on its GCOS activities.

153. Ireland's NC6 did not include information on actions taken to support capacity-building related to research and systematic observation in developing countries. During the review, Ireland provided additional information to the ERT explaining that the support and contributions to the World Meteorological Organization are geared towards helping developing countries to establish and maintain observing systems to inform agricultural planning by making weather information available to smallholder farmers. The Party further clarified during the review that the nationally generated data sets are available on request by any interested party.

154. The ERT appreciated the information provided by the Party and commends Ireland for its transparent approach to disseminating meteorological data for climate change related research, either free of charge or at cost, for research purposes. The ERT noted that EPA has provided online access to its archive of non-meteorological climate change related data.[9] However, the ERT reiterates the recommendation from the previous review report that Ireland include this information in its next national communication.

155. Ireland reported in its NC6 on its Climate Change Research Programme, which sets out a structured approach to enhance the overall use and value of climate-related research activities in Ireland. The programme focuses Irish research activities on four main pillars: (i) GHG emissions and sinks; (ii) climate change impacts and adaptation; (iii) socio-economic analysis and technologies focused on mitigation and adaptation solutions; and (iv) transboundary air pollution and short-life climate forcers.

156. Funding for climate change research, systematic observation and related activities is provided through a number of State agencies and organizations. Ireland reported that under its current National Development Plan, funding by EPA is aimed at EUR 18 million over the period 2007–2013, with an equivalent sum being provided by other leading bodies on research in the areas of energy, agriculture, forestry and marine research.

G. Education, training and public awareness

157. In its NC6, Ireland has provided complete and transparent information on its actions relating to education, training and public awareness at the domestic level. Compared to the NC5, Ireland has provided more extensive information on its domestic education and public-awareness initiatives.

158. In addition to the reported information on education, training and public-awareness activities, Ireland provided additional information during the review, informing the ERT that environmental and climate change related government policies undergo extensive public consultation, whereby the public and NGOs have the opportunity to submit their views. Ireland has not provided information on the impact of public-awareness campaigns.

159. The ERT noted that education, training and public awareness feature prominently in Ireland's Our Sustainable Future framework for sustainable development and are assigned a crucial role in moving towards a more sustainable society. In this context, Ireland stated that education strengthens the capacity of individuals, communities, businesses and

[8] Accessible at <http://srren.ipcc-wg3.de/report>.
[9] Accessible at <www.safer.ie>.

governments to make judgements and decisions that take proper account of environmental protection. Further, Ireland reported that the Department of Education and Skills is currently finalizing the National Strategy on Education for Sustainable Development.

160. The ERT welcomed this information and encourages Ireland to report on the National Strategy on Education for Sustainable Development in its next national communication.

161. The ERT also noted various education and training initiatives undertaken by Ireland that are targeted towards children, including the Green Schools programme, the development of primary and secondary school education, making available information on the environment through its national website on environmental information and sustainable living (ENFO) and the Energy Usage education and awareness programmes.

162. In addition to the education initiatives, Ireland has also embarked on initiatives to raise public awareness, such as EPA's Climate Change Lecture Series, SEAI's Consumer Information Programme and the provision of support to environmental NGOs, the Local Agenda 21 Environment Partnership Fund and the Tidy Towns Competition, which includes a climate change award. The ERT further noted that Ireland has initiated a programme with local authority environment awareness officers aimed at promoting positive environmental action at the local level.

163. The ERT commends Ireland for its extensive range of activities implemented in the areas of education and public awareness, and encourages the Party to present additional information on formal and informal climate change related training activities, as presented to the ERT during the review, in its next national communication. The ERT also encourages Ireland to report on activities to train experts from developing countries.

III. Summary of reviewed supplementary information under the Kyoto Protocol

A. Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

164. Supplementary information provided by Ireland under Article 7, paragraph 2, of the Kyoto Protocol in its NC6 is mostly complete and mostly transparent. The supplementary information is placed in different sections of the NC6. Table 9 provides an overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, as well as references to the NC6 chapters in which this information is provided.

165. Ireland has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: the identification of steps taken to promote and/or implement any decisions by ICAO and IMO in order to limit or to reduce GHG emissions not included in the Montreal Protocol from aviation and marine bunker fuels; and information on what efforts Ireland is making to implement PaMs in such a way as to minimize adverse effects, including the effects of climate change, effects on international trade, and the social, environmental and economic impacts on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The technical assessment of the information reported under Article 7, paragraph 2, of the Kyoto Protocol is contained in the relevant sections of this report. The ERT recommends that Ireland include these reporting elements in its next national communication.

Table 9
Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

Supplementary information	*Reference to the sixth national communication*
National registry	Chapter 3.4
National system	Chapter 3.2
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Chapter 5.10
Policies and measures in accordance with Article 2	Chapter 4
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Chapters 2 and 4
Information under Article 10	Chapter 7
Financial resources	Chapter 7

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

166. Ireland reported the information requested in section H, "Minimization of adverse impacts in accordance with Article 3, paragraph 14", of the annex to decision 15/CMP.1 as a part of its 2013 annual submission. During the 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.

167. The 2013 and previous national inventory reports and the additional information provided during the review presented several initiatives of Ireland, mostly as collective actions of the EU aimed at minimizing adverse impacts, including cooperating in the development of technologies, assisting developing country Parties that are highly dependent on the export of fossil fuels in diversifying their economies and conducting relevant research.

168. The ERT considers the reported information to be complete and transparent. The ERT commends Ireland for the additional information provided and encourages the Party to continue exploring and reporting on the adverse impacts of the response measures, in order to improve the transparency of its reporting.

IV. Conclusions and recommendations

169. The ERT conducted a technical review of the information reported in the NC6 of Ireland according to the UNFCCC reporting guidelines on NCs. The ERT concludes that the NC6 provides a good overview of the national climate policy of Ireland. The information provided in the NC6 includes most elements of the supplementary information required under Article 7 of the Kyoto Protocol, with the exception of information on PaMs in accordance with Article 2 of the Kyoto Protocol.

170. The ERT commended Ireland for its improved, coherent and consistent reporting, as well as for its openness and cooperation during the in-country review. During the review, Ireland provided further relevant information on the national circumstances (see paras. 14

and 20 above); PaMs (see paras. 27, 42 and 97 above); projections (see para. 103 above); the total effect of all implemented and adopted PaMs across all sectors (see para. 117 above); financial resources and the provision of financial support (see para. 125 above), technology transfer and the provision of technological support (see paras. 137 and 141 above); vulnerability and adaptation (see para 149 above); research and systematic observation (see para 153 above); education and public awareness (see para. 158 above); and the minimization of adverse effects on developing countries (see para. 166 above).

171. Ireland's emissions for 2012 were estimated to be 5.9 per cent above its 1990 level excluding LULUCF and 4.6 per cent above including LULUCF. Emission increases were due to strong economic and population growth and resulting rise in CO_2 emissions by 17.2 per cent over the period 1990–2012, most of which are attributed to the energy sector, in particular the transport sector. These factors outweighed the impact on emissions stemming from improvements in fuel combustion and consequently emission reductions in the other sectors (namely, the residential, commercial/institutional and agriculture/forestry/fisheries sectors), the industrial processes sector and the agriculture sector of 13.8 per cent, 23.8 per cent and 8.5 per cent, respectively, between 1990 and 2012.

172. In its NC6, Ireland presents GHG projections for the period 2013–2020. Two scenarios are included: a 'with measures' and a 'with additional measures' scenario. Under the 'with measures' scenario, Ireland's total GHG emissions excluding LULUCF are projected to amount to 62,832.80 kt CO_2 eq in 2020 and 67,058.41 kt CO_2 eq in 2030, which is an increase in total GHG emissions of 13.7 and 21.4 per cent respectively compared with the 1990 level and an increase of 7.3 and 14.6 per cent compared with 2012. For the 'with additional measures' scenario, Ireland's total GHG emissions excluding LULUCF are projected to amount to 57,997.40 kt CO_2 eq in 2020 and 56,169.76 kt CO_2 eq in 2030, which is an increase in total GHG emissions of 5.0 and 1.7 per cent respectively compared with the 1990 level and a decrease of 0.9 and 4.0 per cent respectively compared with 2012.

173. Based on the comparison of the target and the average annual emissions for the first commitment period (2008–2012), Ireland is in a position to meet its Kyoto Protocol target for the first commitment period, which is an emission increase of a maximum of 13 per cent compared to the base year level. This target translates into 62,836.86 kt CO_2 eq/year on average. According to the data from the 2014 annual submission presented during the review, the Party's total annual GHG emissions were reported to be, on average, 61,701.77 kt CO_2 eq for the period 2008–2012, and thus around 2 per cent below the Kyoto Protocol target.

174. The ERT noted that Ireland is on track to meet this target with a likely use of additional units totalling some 2,060 kt CO_2 eq.

175. The NC6 contains information on how Ireland's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action.

176. The most important PaMs to meet the target for the first commitment period of the Kyoto Protocol encompass the EU ETS, the carbon tax, the RES directive, and their implementation at the national level. The effect of these key measures has been complemented by the effect of a number of other measures across all sectors, such as measures to promote energy efficiency in the residential, commercial and industrial sectors, and vehicle registration tax and motor tax changes in the transport sector.

177. Ireland is currently developing its National Low-Carbon Roadmap, with the primary objective of setting out the process through which the State will pursue and aim to achieve transition to a competitive, low-carbon and environmentally sustainable economy by 2050. The Roadmap will specify measures aimed at achieving this objective and complying with any climate-related existing obligations of the State under EU law or any international agreements.

178. Ireland's NC6 provides detailed information on the assistance provided to developing countries (by country) that are particularly vulnerable to climate change. The Party has provided detailed summary information on the multilateral, bilateral and regional financial contributions related to the implementation of the Convention during the period 2010–2012. Additionally, Ireland has included information on funding for mitigation and adaptation activities for developing countries, with a focus on adaptation in existing partner countries. Between 2010 and 2012, Ireland provided financial resources related to climate change of EUR 67.2 million through bilateral channels and EUR 44.6 million through multilateral channels to developing country Parties.

179. Ireland provided limited information on technology transfer in its NC6. Ireland's support to technology transfer is mainly provided through multilateral channels and is also a major component of bilateral development projects.

180. Ireland reported detailed information on vulnerability and adaptation, including information on a comprehensive national policy position to address the anticipated impacts of climate change through a structured approach, with its NCCAF forming the centrepiece of this approach.

181. Ireland has provided comprehensive information on its activities related to research and systematic observation. Ireland reported on its Climate Change Research Programme, which sets out a structured approach to enhance the overall use and value of climate-related research activities in Ireland and the funding thereof.

182. Ireland has provided complete and transparent information on its actions relating to education, training and public awareness, with a focus on its domestic education and public-awareness initiatives. Strengthening the knowledge and capacity of individuals, communities, businesses and governments regarding climate change allows Ireland to mainstream climate change across all its political decisions and is therefore fundamental to engage the public in debates and policymaking on climate change.

183. 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 is provided by the Party in its 2013 and 2014 annual submissions.

184. 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 key recommendations[10] are that Ireland:

(a) Improve the timeliness of its reporting by providing future national communications on time (see para. 11 above);

(b) Improve the completeness of its reporting by including the following information in the next national communication:

(i) A description of its provisions to make information on domestic and regional arrangements, enforcement and administrative procedures publicly available (see para. 28 above);

(ii) Summary tables of its PaMs for each individual sector (see para. 44 above);

(iii) Information on how it promotes and implements any decision by ICAO and IMO to limit emissions from international aviation and marine bunker fuels (see para. 98 above);

(iv) Information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects on other Parties,

[10] The recommendations are given in full in the relevant sections of this report.

particularly those identified in Article 4, paragraphs 8 and 9, of the Convention (see para. 100 above);

(v) Information on the total effects of implemented and adopted PaMs by gas on a CO_2 eq basis (see para. 120 above);

(vi) An ex-post analysis of the total effect of PaMs for historic years (see para. 121 above);

(vii) Information related to technology transfer, including success and failure stories and on activities for financing access for developing countries to 'hard' and 'soft' technologies (see para. 140 above);

(viii) Information on action taken to support capacity-building in the areas of research and systematic observation in developing countries (see para. 154 above);

(c) Improve the transparency of its reporting by including the following information in the next national communication:

(i) The reporting of PaMs with a clear subdivision by gas for each sector (see para. 44 above);

(ii) How Ireland believes its PaMs are modifying longer-term trends of its GHG emissions (see para. 52 above);

(iii) The estimated and expected total effect of all implemented and adopted PaMs across all sectors in its next national communication (see para. 119 above);

(iv) A definition of what "new and additional" financial resources it has provided, clarifying how it has determined such resources as being "new and additional" (see para. 128 above);

(v) More detailed information on the steps taken by the Government to promote, facilitate and finance the transfer of technology, and to support the development and enhancement of endogenous capacities and technologies of developing countries (see para. 138 above).

V. Questions of implementation

185. During the review, the ERT assessed the NC6, 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, transparency and adherence to the UNFCCC reporting guidelines on NCs. No question of implementation was raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

"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>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

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

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 23/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf#page=20>.

FCCC/SBI/2011/INF.1. Compilation and synthesis of fifth national communications. Executive summary. Note by the secretariat. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01.pdf>.

FCCC/SBI/2011/INF.1/Add.1. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Policies, measures, and past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a01.pdf>.

FCCC/SBI/2011/INF.1/Add.2. Compilation and synthesis of fifth national communications. Note by the secretariat. 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/2011/sbi/eng/inf01a02.pdf>.

FCCC/SBI/2011/INF.2. Compilation and synthesis of supplementary information incorporated in fifth national communications submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol. Note by the secretariat. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf02.pdf>.

FCCC/ARR/2013/IRL. Report of the individual review of the annual submission of Ireland submitted in 2013. Available at <http://unfccc.int/resource/docs/2014/arr/irl.pdf>.

FCCC/IRR/2007/IRL. Report of the review of the initial report of Ireland. Available at <http://unfccc.int/resource/docs/2007/irr/irl.pdf>.

FCCC/IDR.5/IRL. Report of the in-depth review of the fifth national communication of Ireland. Available at <http://unfccc.int/resource/docs/2010/idr/irl05.pdf>.

Sixth national communication of Ireland. Available at <http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/nc6_br1_ire.pdf>.

2013 GHG inventory submission of Ireland. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php>.

2014 GHG inventory submission of Ireland. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Steven Fadian (Department of the Environment), including additional material on updated policies and measures, greenhouse gas projections, the national registry and recent climate policy developments in Ireland. The following documents[1] were also provided by Ireland:

Convery, F. J., L. Dunne and D. Joyce. 2013. *Ireland's Carbon Tax and the Fiscal Crisis: Issues in Fiscal Adjustment, Environmental Effectiveness, Competitiveness, Leakage and Equity Implications*. OECD Environment Working Papers, No. 59, OECD Publishing. Available at <http://dx.doi.org/10.1787/5k3z11j3w0bw-en>.

EirGrid and SONI. 2013. *All-Island Generation Capacity Statement 2013-2022*. Dublin. EirGrid and SONI. Available at <http://www.eirgrid.com/media/All-Island_GCS_2013-2022.pdf>.

Department of the Environment, Community and Local Government. 2012. *TOWARDS NEARLY ZERO ENERGY BUILDINGS IN IRELAND - PLANNING FOR 2020 AND BEYOND. Dublin.* Available at <http://nzeb-opendoors.ie/sites/www.nzeb-opendoors.ie/files/page-files/Towards%20NZEBs%20in%20Ireland_Nov%202012.pdf>.

Markandya, A., González-Eguino, M., Escapa, M. 2013. *From shadow to green: Linking environmental fiscal reforms and the informal economy*. Energy Economics 40, pp. 108–118. Elsevier.

[1] Reproduced as received from the Party.