COMPLIANCE COMMITTEE

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Report of the centralized in-depth review of the fourth national communication of Iceland

Note by the secretariat

The report of the centralized in-depth review of the fourth national communication of Iceland was published on 29 January 2007. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2), the report is considered received by the secretariat on the same date. This report, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

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Report of the centralized in-depth review of the fourth national communication of Iceland

According to decision 4/CP.8, Parties included in Annex I to the Convention are requested to submit to the secretariat, in accordance with Article 12, paragraphs 1 and 2, of the Convention, a fourth national communication by 1 January 2006. This report reflects the results of the in-depth review of the fourth national communication of Iceland conducted by an expert review team in accordance with relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

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I. Introduction and summary

A. Introduction

1. Iceland has been a Party to the UNFCCC since 1993 and to its Kyoto Protocol since 2002. Under the Kyoto Protocol, Iceland committed itself to limiting the growth in its greenhouse gas (GHG) emissions to 10 per cent above the base year level during the first commitment period from 2008 to 2012. The base year for Iceland is 1990 for all GHGs.

2. This report covers the centralized in-depth review (IDR) of the fourth national communication (NC4) of Iceland, coordinated by the UNFCCC secretariat, in accordance with decision 7/CP.11. The review took place from 15 to 21 October 2006 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Imran Habib Ahmad (Pakistan), Mr. Mohamed El Raey (Egypt), Mr. Domenico Gaudioso (Italy), Mr. Niklas Höhne (Germany), Mr. Normand Tremblay (Canada) and Mr. Paulus Agus Winarso (Indonesia). Mr. El Raey and Mr. Gaudioso were the lead reviewers. The review was coordinated by Mr. Harald Diaz-Bone (UNFCCC secretariat).

3. During the IDR, the expert review team (ERT) examined each part of the NC4. The ERT also evaluated the information contained in Iceland's report demonstrating progress (RDP) in achieving its commitments under the Kyoto Protocol, and the supplementary information provided by Iceland under Article 7, paragraph 2, of the Kyoto Protocol.

4. In accordance with relevant provisions for review under the Convention and the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1), a draft version of this report was communicated to the Government of Iceland for comments prior to its publication.

B. Summary

5. The ERT noted that Iceland's NC4 broadly complies with the UNFCCC reporting guidelines.[1] The RDP provides clear information on the progress made by Iceland in achieving its commitments under the Kyoto Protocol. Supplementary information under Article 7, paragraph 2, of the Kyoto Protocol[2] is provided in both the NC4 and the RDP.

1. Completeness

6. The ERT noted that the NC4 covers all sections required by the UNFCCC reporting guidelines. The ERT also noted that Iceland's RDP contains all parts stipulated by decisions 22/CP.7 and 25/CP.8. Furthermore, the ERT noted that Iceland has provided all supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC4 and RDP, except for three elements (see section III.B).

2. Timeliness

7. The NC4 and the RDP were both submitted on 28 April 2006. Decision 4/CP.8 requested the submission of the NC4 by 1 January 2006, and decision 22/CP.7 set the same date for Parties to submit their RDPs.

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[1] "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications." Document FCCC/CP/1999/7, pages 80–100.

[2] Decision 15/CMP.1, annex, chapter II (FCCC/KP/CMP/2005/8/Add.2).

3. Transparency

8. The ERT acknowledged that Iceland's NC4 is well structured. The NC4 provides concise information on all aspects of implementation. It is structured following the outline contained in the annex to the UNFCCC reporting guidelines. In the course of the review, the ERT formulated a number of recommendations that could help Iceland to further increase the transparency of its reporting, for example by explaining in more detail the application of decision 14/CP.7 (see also section IV). The ERT noted that the information contained in the NC4 and RDP is consistent.

II. Technical assessment of the reviewed elements

A. National circumstances relevant to greenhouse gas emissions and removals

9. In its NC4, Iceland has provided a description of its national circumstances, how these circumstances affect GHG emissions and removals in Iceland, and how national circumstances and changes in these circumstances affect GHG emissions and removals over time. The ERT noted that the most important drivers of emission trends in Iceland include demographic developments (a strong increase in population and low population density), overall economic activity (it has the smallest economy in the Organisation for Economic Co-operation and Development (OECD) and strong growth in gross domestic product (GDP), and the role of fisheries is important), the structure of energy use (it has the highest per capita energy consumption of all the OECD countries, with a high share of hydro and geothermal energy, the use of fossil fuels being dominated by mobile sources) and a sharp increase in aluminium production. Table 1 illustrates the national circumstances of the country by providing some indicators relevant to GHG emissions and removals.

Table 1. Indicators relevant to greenhouse gas emissions and removals for Iceland

	1990	1995	2000	2004	Change 1990–2000 (%)	Change 2000–2004 (%)	Change 1990–2004 (%)
Population (million)	0.255	0.267	0.281	0.293	10.2	4.3	14.9
GDP (billion 2000 USD PPP)	6.129	6.292	8.035	9.014	31.1	12.2	47.1
TPES (Mtoe)	2.172	2.329	3.244	3.498	49.4	7.8	61.1
GDP per capita (thousand USD 2000 PPP)	24.0	23.6	28.6	30.8	19.0	7.6	28.0
TPES per capita (toe)	8.5	8.7	11.5	11.9	35.6	3.4	40.2
GHG emissions without LULUCF (Tg CO_2 eq)	3.3	3.1	3.6	3.6	8.7	1.8	10.6
GHG emissions with LULUCF (Tg CO_2 eq)	5.4	5.1	5.5	5.5	2.6	–0.6	1.9
CO_2 emissions per capita (Mg)	8.2	8.3	9.2	9.3	12.4	1.7	14.3
CO_2 emissions per GDP unit (kg per USD 2000 PPP)	0.34	0.35	0.32	0.30	–5.5	–5.5	–10.7
GHG emissions per capita (Mg CO_2 eq)	12.9	11.6	12.7	12.4	–1.3	–2.4	–3.7
GHG emissions per GDP unit (kg CO_2 eq per USD 2000 PPP)	0.54	0.49	0.44	0.40	–17.1	–9.3	–24.8

Sources: GHG emissions data are from Iceland's 2006 inventory submission; population, GDP and TPES data are from the IEA.
Note 1: 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.
Note 2: For the abbreviations used, see annex II.

10. Iceland provides summary information on GHG emission trends for the period 1990–2003. This information is consistent with that provided in its 2005 national GHG inventory submission. Summary tables, including trend tables for emissions in CO_2 equivalent (given in the common reporting format (CRF)), are also provided in an annex to the NC4.

11. Total GHG emissions excluding emissions and removals from land use, land-use change and forestry (LULUCF) increased by 10.6 per cent between 1990 and 2004, whereas total GHG emissions including net emissions/removals from LULUCF increased by 1.9 per cent (see table 2). This is mainly attributed to CO_2 emissions, which increased by 31.3 per cent over this period. Emissions of CH_4 also increased by 13.4 per cent, whereas emissions of N_2O decreased by 10.5 per cent. A major part of the increase in total GHG emissions was experienced prior to 1999 (emissions over the period 1994–1999 increased by 21.2 per cent); 1999 is the year in which total GHG emissions peaked, at 3,678.8 Gg CO_2

equivalent. Since 1999, total GHG emissions have remained slightly below this peak level (emissions over the period 1999–2004 increased by 1.3 per cent). Fluorinated gases accounted for about 12.9 per cent of total GHG emissions in 1990 and 2.8 per cent in 2004. According to Iceland's 2006 inventory submission, the LULUCF sector was a net source over the period 1990–2004. In 1990, GHG emissions from the LULUCF sector, mainly CO_2 from grassland remaining grassland, equalled 63.8 per cent of total GHG emissions from the other sectors. Table 2 provides an overview of GHG emissions by sector from 1990 to 2004 (see also the discussion of sectoral trends in section II.B).

Table 2. Greenhouse gas emissions by sector for Iceland, 1990–2004

	GHG emissions (Tg CO_2 equivalent)					Change (%)		Shares[a] by sector (%)	
	1990	1995	2000	2003	2004	1990–2004	2003–2004	1990	2004
1. Energy	1.704	1.819	1.873	1.861	1.960	15.0	5.3	51.9	54.0
A1. Energy industries	0.021	0.025	0.015	0.014	0.020	–4.9	37.9	0.6	0.5
A2. Manufacturing industries and construction	0.377	0.376	0.445	0.451	0.481	27.6	6.8	11.5	13.3
A3. Transport	0.608	0.615	0.659	0.698	0.710	16.7	1.7	18.5	19.6
A4–5. Other	0.698	0.803	0.753	0.698	0.749	7.3	7.2	21.3	20.6
B. Fugitive emissions	0.000	0.000	0.000	0.000	0.000			0.0	0.0
2. Industrial processes	0.867	0.559	0.936	0.960	0.949	9.5	–1.1	26.4	26.1
3. Solvent and other product use	0.006	0.005	0.005	0.004	0.003	–43.2	-8.3	0.2	0.1
4. Agriculture	0.571	0.523	0.529	0.489	0.500	–12.4	2.2	17.4	13.8
5. LULUCF	2.095	2.033	1.947	1.887	1.851	–11.6	–1.9	63.8	51.0
6. Waste	0.134	0.204	0.226	0.220	0.218	61.9	–0.9	4.1	6.0
GHG total with LULUCF	**5.377**	**5.143**	**5.515**	**5.421**	**5.482**	1.9	1.1	–	–
GHG total without LULUCF	**3.282**	**3.110**	**3.568**	**3.534**	**3.631**	10.6	2.7	–	–

Note 1: 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.

Note 2: For the abbreviations used, see annex II.

[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the values indicate the relation of GHG emissions from the LULUCF sector to those from the other sectors.

B. Policies and measures

12. In its NC4, Iceland has provided some information on its package of policies and measures implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol. Each sector has its own textual description of the principal policies and measures. However, the ERT noted that Iceland has not provided information on how it believes its policies and measures are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention (UNFCCC reporting guidelines, paragraph 25).

13. The ERT also noted that Iceland has provided neither summary tables on its policies and measures by sector following the structure as outlined in the UNFCCC reporting guidelines (paragraph 17 of the reporting guidelines and footnote a to table 1) nor a concise presentation of the policies and measures themselves, including information on each of the following subject headings: the GHG affected; the type or types of policy or measure; and the implementing entity or entities (paragraph 22 of the reporting guidelines). The ERT recommends that the Party follow the UNFCCC reporting guidelines more closely and provide these reporting elements in its next national communication.

14. Iceland has a unique emission profile, with a very low contribution from energy industries (0.5 per cent in 2004) to total GHG emissions. This low share is due to the abundant availability of renewable energy sources (RES), mainly hydro and geothermal power, which are widely used for the production of heat and electricity in Iceland. In 2004, energy use in transport (19.6 per cent of total GHG emissions) and energy use in other sectors, mainly fisheries (20.6 per cent), were the main sources of GHG emissions in the energy sector, as these subsectors depended on the use of mineral oil products. Among the non-energy sectors, industrial processes (mainly CO_2 from aluminium production) held the largest share (26.1 per cent) in total GHG emissions, followed by agriculture (13.8 per cent) and waste (6.0 per cent). Finally, net emissions from the LULUCF sector (1,851 Gg CO_2 equivalent), mainly from

grassland remaining grassland, broadly equalled the emissions from the energy sector (of 1,960 Gg CO_2 equivalent) in 2004.

15. Iceland's climate strategy focuses on the further deployment of RES in the stationary energy sector. However, given the dominant role of mobile sources (transport and fisheries) and industry (aluminium production) in Iceland's GHG profile, the ERT encourages the Party also to explore its options and the potential for climate change mitigation in these major contributing sectors. Table 3 provides a summary of the information reported on the policies and measures of Iceland.

Table 3. Summary information on policies and measures

Major policies and measures	Examples / comments
Framework policies and cross-sectoral measures	
Welfare for the Future	Integrated sustainable development strategy (adopted in 2002)
Climate Change Strategy	Adopted in 2002, aims at ensuring compliance with Kyoto Protocol target
Energy sector	
Increase energy efficiency in the fishing industry	Research funding and public procurement; development and introduction of a fuel-saving system; potential for saving of 10 per cent in fuel use and CO_2 emissions
Transport	
Change in the taxation system	System change from vehicle tax for diesel cars towards fuel taxation, resulting in incentives for the use of small diesel cars (9 Gg) Reduced import fees (by USD 3,000) on vehicles equipped with low-pollution engines (hybrid and methane engines) Exemption from import fees for zero-emission vehicles (electric and hydrogen-powered vehicles)
Promotion of public transport	Improve and rationalize the route network in the Reykjavik metropolitan area
Promotion of RES in transport	Introduce RES in transport as soon as technologically and economically feasible
Industrial processes	
Reduction of PFC emissions from aluminium smelters	Voluntary agreements with aluminium industry (161–187 Gg)
Waste management	
Collection (and use) of landfill gas	Environmentally sound landfill management practices (30 Gg)
Reducing organic waste disposal	Enactment of legislation limiting the amount of organic waste being disposed of to landfills
LULUCF	
Enhancement of biological carbon sequestration	Financial support (ISK 450 million) to a four-year revegetation and tree-planting programme in the period 1997–2000 (207 Gg)
Research on emissions from drained wetlands	Reclamation of wetlands as a future priority measure

Note 1: The GHG reduction estimates, given for some measures (in parentheses), are reductions in CO_2 or CO_2 equivalent for the year 2010.
Note 2: For the abbreviations used, see annex II.

1. Policy framework and cross-sectoral measures

16. In March 2002, the government adopted the Climate Change Strategy, aimed at ensuring compliance with Iceland's Kyoto Protocol target (see paragraph 1 above). This strategy was formulated by the Ministry for the Environment, in close collaboration with the ministries of Transport and Communication, Fisheries, Finance, Agriculture, Industry and Commerce, and Foreign Affairs, and the Prime Minister's Office. A review of the strategy was initiated in 2005 and was to be completed in 2006. The aim of the Climate Change Strategy is to:

(a) Curb growth in GHG emissions in order to meet the limits set under the Kyoto Protocol (an increase of 10 per cent over emissions in 1990 during the first commitment period (2008–2012; see paragraph 1 above); and

(b) Increase the level of carbon sequestration resulting from reforestation and revegetation programmes.

17. The Climate Change Strategy is an integral part of the Welfare for the Future sustainable development strategy, which was also adopted in 2002. This strategy puts forward a framework for sustainable development for the next 20 years and introduces 17 key long-term objectives, planned short-term measures to support these objectives, and a set of indicators to monitor success. One key objective of the strategy is to mitigate climate change as well as to further increase the share of RES in

total primary energy supply (TPES). The strategy is subject to a review at four-year intervals and to ongoing updating and revision.

18. Both central and local authorities are involved in the implementation of policies and measures to mitigate GHG emissions. In certain policy fields, such as waste management, local governments play a key role.

19. ***Emissions trading.*** In October 2002, Iceland notified the Conference of the Parties (COP) of its intention to avail itself of the provisions of decision 14/CP.7.[3] According to the NC4, this decision prevents Iceland from transferring assigned amount units to other Parties through international emissions trading. In response to a question on the impact of decision 14/CP.7 raised by the ERT during the IDR, Iceland clarified "its understanding that if Iceland takes advantage of Decision 14/CP.7, it will not be able to sell any emission permits, but can on the other hand buy emission permits". Furthermore, the Party informed the ERT that, for the time being, the implementation of a domestic emissions trading scheme in Iceland was not seen as an attractive option.

2. Policies and measures in the energy sector

20. Iceland has a unique energy profile compared with other developed countries. RES (hydro and geothermal energy) are the main primary energy sources used for heating and electricity production and account for approximately 70 per cent of TPES. Therefore, GHG emissions from the energy sector mainly result from mobile sources, which use mineral oil products. Between 1990 and 2004, GHG emissions from the energy sector increased by 15 per cent (from 1,704 Gg to 1,960 Gg), mainly driven by increases in emissions from energy use in transport and in fisheries.

21. In 2004, energy industries accounted for 0.5 per cent of total GHG emissions. Between 1990 and 2004, GHG emissions from this subsector decreased by 4.9 per cent (or 1.1 Gg). The ERT noted that this trend can be divided into two phases: a continuous decrease between 1990 and 2000, by 30.4 per cent (from 20.7 Gg to 14.4 Gg); and an increase between 2000 and 2004, by 34.0 per cent (from 14.4 Gg to 19.3 Gg).

22. In contrast, GHG emissions from energy use in transport and in other sectors (mainly fisheries) increased over the period 1990–2004, by 16.7 per cent (or 102 Gg) and 7.3 per cent (or 51 Gg), respectively. The growth in transport-related GHG emissions can be explained by an increase in emissions from road transport, which was driven by three factors: during the 1990s, the size of the vehicle fleet in Iceland almost doubled; the modal split shifted from public towards private passenger transport; and consumer preference has tended towards larger passenger cars in recent years. It is worthwhile noting that, since 1999, the average fuel consumption of newly registered passenger cars has increased by more than 6 per cent. Finally, with 612 passenger cars per 1,000 inhabitants, Iceland has the third highest level of motorization among the OECD countries.

23. In Iceland, fisheries is the largest source of GHG emissions under energy use in other sectors (Intergovernmental Panel on Climate Change (IPCC) category 1.A.4), contributing 20.6 per cent of total emissions and 38.2 per cent of energy-related emissions in 2004. It should be noted that emissions from energy use in fishery have increased by 8.4 per cent since 1990 (from 675 Gg in 1990 to 732 Gg CO_2 in 2004). During this period, emissions have fluctuated (between 97.5 and 126.3 per cent) around the 1990 value, largely reflecting the inherent nature of this industry.

24. Policies and measures in the energy sector can be divided into three categories: reduction of the share of fossil fuels; promotion of the use of more efficient cars; and promotion of more efficient ships.

[3] Decision 14/CP.7 and document FCCC/CP/2002/MISC.2.

25. *Reduction of the share of fossil fuels.* The 2002 Climate Change Strategy stipulates that, given its unique emission profile, Iceland's main GHG mitigation target is to further decrease the share of fossil fuels in TPES during the coming decades. It also indicates that transport will use RES as soon as it is technologically and economically feasible.

26. *Incentives for the use of efficient cars.* A key measure in this context is a change in the taxation system in order to promote the use of small diesel cars. Until recently, owners of diesel cars paid a special annual tax, depending on the curb weight of their vehicle. In July 2005, this vehicle tax was replaced by a fuel tax on diesel fuel. The new tax rate was set at a level that would lower the tax burden for owners of average diesel cars. The NC4 notes that this change in taxation is expected to result in a fuel shift of around 10 per cent of current gasoline consumption towards diesel fuel, resulting in a significant decrease in GHG emissions by 2010, due to the lower specific emissions (in CO_2 emitted per kilometre driven) of diesel cars.

27. *Reduction of import fees on vehicles using low-pollution engines.* Iceland charges a fee on the import of cars of approximately 45 per cent of the purchase value. However, since 2005, zero-emission vehicles, including electric and hydrogen cars, have been exempted from this import fee. This exemption is valid until the end of 2008 and can be renewed at that date. Furthermore, low-polluting cars, including hybrid cars and methane-powered vehicles, benefit from a reduced import fee (by USD 3,000), valid until the end of 2006. The NC4 notes that the mitigation effect of this measure has been negligible, as the number of such vehicles has not increased significantly. Nevertheless, this is seen as an important symbolic step, which could produce meaningful and measurable results in a few years.

28. *Support for more efficient ships*. The government of Iceland supports, through research funding and public procurement, the development and introduction of a fuel-saving system for fishing vessels and other ships that could result in a saving of 10 per cent in fuel consumption and emissions from fisheries. In general, the renewal of the fishing fleet leads to an increase in energy efficiency. The NC4 notes, however, that this trend is driven by economic concerns of the private sector rather than government measures.

29. The ERT noted that the unique emission and energy profile of Iceland presents a challenge to its emission mitigation plans, as most of its energy-related emissions (more than 80 per cent) stem from mobile sources (transport, mobile machinery and fishing vessels), for which mitigation effects are generally more difficult to achieve than they are for stationary energy sources. However, the ERT noted that the abundant availability of RES could prove to be an opportunity for Iceland to lower its GHG emissions from mobile sources as well, including road vehicles (electric vehicles equipped with electro-chemical batteries or fuel cells) and ships. The NC4 acknowledges this potential: a few hydrogen cars have been imported, but they are not yet competitive and their effect on current emissions is reported to be minimal. Because future developments in this field are highly uncertain and because it takes a conservative approach, the NC4 does not include the estimated effects on future emissions. The ERT encourages Iceland to explore the potential for using RES in mobile sources, particularly in the light of recently high oil prices, and to report estimated effects in its next national communication.

3. Policies and measures in other sectors

30. During the period 1990–2004, GHG emissions from industrial processes (including solvent and other product use) increased by 9.5 per cent (80.1 Gg), mainly resulting from an increase in aluminium production.[4] GHG emissions from agriculture decreased by 12.4 per cent (70.8 Gg) and emissions from waste increased by 61.9 per cent (83.2 Gg). The trend in emission from industrial processes is largely

[4] Without these emissions from a single project (construction of an aluminium production unit), emissions from industrial processes (including solvent and other product use) decreased by 42.9 per cent (374.6 Gg) between 1990 and 2004.

determined by the increase in metal production and by the relevant technological changes. Emissions from waste first increased due to an increase in the amount of waste disposed to landfills, and then decreased thanks to the recovery of landfill gas, whereas the decrease in agricultural emissions is the result of falling livestock numbers.

31. ***Industrial processes.*** Metal production dominates emissions from industrial processes. Emissions of CO_2 from the new aluminium and ferroalloy plants potentially covered by decision 14/CP.7 and are therefore not to be included in the national totals during the first commitment period. Improved technology and process control have reduced PFC emissions from aluminium smelters from 4.78 Mg CO_2 equivalent in 1990 to 0.22 Mg CO_2 equivalent in 2003, and these emissions are projected to decrease further, to 0.14 Mg CO_2 equivalent by 2010, according to the 2002 Climate Change Strategy.

32. As regards facilities for industrial processes potentially covered by decision 14/CP.7, the ERT noted that the NC4 provides detailed information on the reduction of PFC emissions from these plants, but no information on the corresponding CO_2 emissions. The ERT encourages the Party to include this information in its next national communication, in order to provide a comprehensive picture of any initiative aimed at limiting GHG emissions.

33. ***Agriculture.*** Agricultural emissions, overlooked in the past, have recently been recalculated; measures to reduce these emissions will be considered in the 2006 review of the Climate Change Strategy.

34. ***LULUCF.*** Iceland promoted biological carbon sequestration in the period 1997–2000 by allocating 450 million Icelandic kronur (ISK) to a four-year revegetation and tree-planting programme. A new Strategic Plan for Soil Conservation and Revegetation was adopted by the Icelandic Parliament in the spring of 2002; its implementation is expected to result in annual removals of 207 Gg CO_2 by 2010. In 2006, CO_2 emissions from grassland remaining grassland were included in the national inventory for the first time; these emissions constituted a major source (1,815 Gg, or 50.0 per cent of total GHG emissions from all other sectors in 2004). Reclamation of wetland is listed in the draft update of the national strategy on sustainable development as a priority measure for climate change mitigation over the four years 2006–2009.

35. ***Waste.*** The collection and use of landfill gas and the enactment of legislation limiting the amount of organic waste being disposed to landfills has already reduced CH_4 emissions from landfills (from 228.4 Gg CO_2 eq in 2001 to 217.6 Gg CO_2 eq in 2004) and is expected to reduce them further in future.

C. Projections and the total effect of policies and measures

1. Projections

36. The GHG emission projections provided by Iceland in the NC4 include a "with measures" scenario up to 2020, and are presented relative to actual inventory data for the period 1990–2004. Projections are presented on a sectoral basis but not using the same sectoral categories as are used in the policies and measures section. In addition, projections are provided in an aggregated format for each sector as well as for a national total, using global warming potential (GWP) values. However, the ERT noted that Iceland has not provided the following reporting elements required by the UNFCCC reporting guidelines: projections presented on a gas-by-gas basis for CO_2, CH_4, N_2O, PFCs, HFCs and SF_6 (treating PFCs and HFCs collectively in each case) (paragraph 35 of the reporting guidelines); and that emissions projections related to fuel sold to ships and aircraft engaged in international transport are reported separately and not included in the totals (paragraph 36 of the reporting guidelines). Projections for LULUCF are provided in the RDP. Table 4 and figure 1 provide a summary of the GHG emission projections for Iceland.

37. Iceland provides two variants of the "with measures" scenario. Scenario 1 assumes no additions to the energy-intensive industries and scenario 2 assumes that all energy-intensive projects which currently have a licence to operate will be built. Decision 14/CP.7 on the impact of single projects on emissions in the commitment period, adopted by the COP in 2001, stipulates a set of conditions under which CO_2 emissions from single projects could be excluded from accounting for the purposes of verification of Parties' compliance with their commitments under the Kyoto Protocol. Iceland reports future emissions both including and excluding such projects.

38. The ERT acknowledges that Iceland has described the main underlying assumptions, but the methods used to estimate projected emissions remained unclear to the ERT.

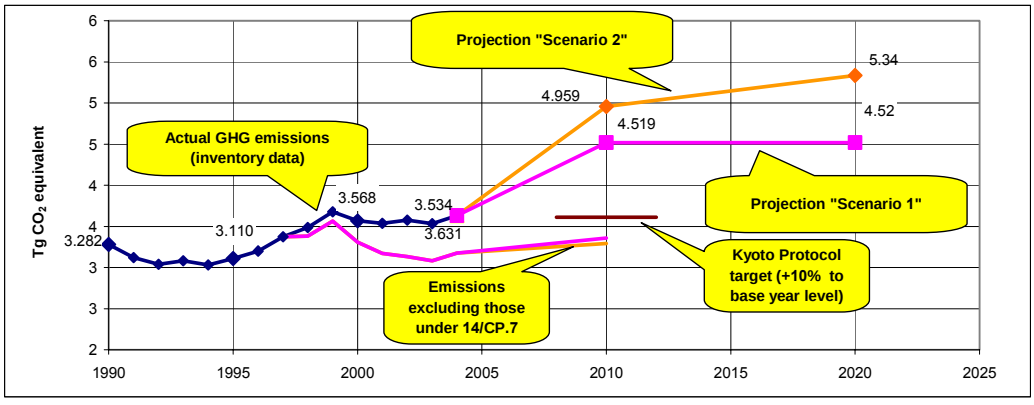
Table 4. Summary of greenhouse gas emission projections for Iceland

	GHG emissions (Tg CO_2 equivalent per year)	Changes compared to base year level (%)
Inventory data 1990[a]	3.282	0.0
Inventory data 2004[a]	3.631	10.6
Kyoto Protocol base year[b]	3.282	0.0
Kyoto Protocol target	3.610	10
Scenario 1 all emissions 2010[b]	4.519	37.7
Scenario 1 excluding single projects falling under 14/CP.7 2010[b]	3.294	0.4
Scenario 2 all emissions 2010[b]	4.959	51.1
Scenario 2 excluding single projects falling under 14/CP.7 2010[b]	3.360	2.4

[a] *Source*: Iceland's 2006 GHG inventory submission; the emissions are without LULUCF.
[b] *Source*: Iceland's NC4; the projections are for GHG emissions without LULUCF.
Note: For the abbreviations used, see annex II.

39. In 2010, GHG emissions in Iceland are projected to increase in a range from 37.7 per cent (under scenario 1) and 51.1 per cent (under scenario 2), compared to 1990 levels, depending on the extent to which projects involving energy-intensive industries are implemented. The NC4 notes that, with the application of decision 14/CP.7 and the exclusion of single projects falling under this decision, Iceland expects to be able to meet its Kyoto Protocol target.

Figure 1. Greenhouse gas emission projections for Iceland



Source: 2006 GHG inventory submission; Iceland's NC4; the projections are for GHG emissions without LULUCF.

40. The ERT recommends Iceland to provide, in its next national communication, data on projections in a tabular format as well, as required by the UNFCCC reporting guidelines, explaining in detail the application of decision 14/CP.7.

2. Total effect of policies and measures

41. In the NC4 and the RDP, Iceland presents the estimated and expected total effect of implemented and adopted policies and measures and an estimate of the total effect of its policies and measures, in accordance with the "with measures" definition, compared to a situation without such policies and measures, presented in terms of GHG emissions avoided or sequestered from 1990 to 2010. Table 5 provides an overview on the total effect of policies and measures as reported by Iceland.

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

	Effect of implemented and adopted measures (Tg CO_2 equivalent)	Relative value (% of base year emissions)	Effect of planned measures (Tg CO_2 equivalent)	Relative value (% of base year emissions)
Scenario 1	0.200	6.1%	–	–
Scenario 2	0.226	6.9%	–	–

Source: Iceland's NC4.

42. The ERT noted that Iceland expects to meet its Kyoto target with measures in the transport, industry and waste sectors. In its NC4, Iceland states that even if these measures fail it seems likely that the Kyoto Protocol target will be met.

D. Vulnerability assessment, climate change impacts and adaptation measures

43. In the NC4, Iceland largely fulfils the reporting requirements on expected impacts of climate change in the country and on adaptation options. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC4.

Table 6. Summary on adaptation to climate change

Vulnerable area	Examples / comments adaptation measures reported
Coastal zones	***Vulnerability***: Sea-level rise ***Adaptation***: Expected sea-level rise has been included in the design of new harbours
Fisheries	***Vulnerability***: Changes in fish stock availability next 50–100 years on GDP
Forests	***Vulnerability***: Increasing risks of plant diseases
Human health	***Vulnerability***: Possibly less impact

44. The ERT noted that the NC4 does not contain a section on vulnerability assessment. It recommends that Iceland, as an island country with a coastline that is vulnerable to sea-level rise, include such a section in its next national communication.

45. The ERT noted that the NC4 does not provide any information on ongoing adaptation assessments and actions taken to implement Article 4, paragraph 1(b) and (e), with regard to adaptation (paragraph 49 of the UNFCCC reporting guidelines). It recommends that the Party include this information in its next national communication.

E. Financial resources and transfer of technologies

1. Financial resources

46. In its NC4, Iceland provides detailed information on measures taken to give effect to its commitments under Article 4, paragraphs 3, 4 and 5. Iceland also provides detailed information on the assistance provided for the purpose of assisting developing country Parties that are particularly vulnerable to the adverse effects of climate change meet the costs of adaptation to those adverse effects. Furthermore, Iceland provides information on financial resources related to the implementation of the Convention provided through bilateral, regional and other multilateral channels. However, the ERT noted that Iceland has not provided the following reporting elements required by the UNFCCC reporting guidelines: an indication of what "new and additional" financial resources it has provided pursuant to

Article 4, paragraph 3; clarification of how it has determined such resources as being "new and additional"; and table 3 of the UNFCCC reporting guidelines (paragraph 51 of the reporting guidelines).

Table 7. Summary information on financial resources

Official development assistance (ODA)	USD 22,288,000 (2004)
Climate-related aid in bilateral ODA	Climate-related ODA not separately identified
Climate-related support programmes	Not provided
Contributions to GEF (USD million)	Not provided
Pledge for third GEF replenishment	Not provided
Activities implemented jointly (AIJ)	No AIJ activities
JI and CDM under the Kyoto Protocol	No JI or CDM activities
Other (bilateral/multilateral)	USD 3,175,000 in 2004 (included in total ODA)

47. According to the data provided in the NC4, Iceland's total official development assistance (ODA) increased from USD 10.162 million in 2000 to USD 22.288 million in 2004, amounting to 0.19 per cent of GDP. The ERT noted that only general ODA data are provided in the NC4, and in particular it noted that the NC4 does not include any details about Iceland's contribution to the Global Environment Facility (GEF) and the third replenishment of the GEF. The ERT recommends that Iceland report its financial assistance in greater detail in its future national communications.

2. Transfer of technology

48. In its NC4, but only in the general context of financing, Iceland provides information on measures related to the promotion, facilitation and financing of the transfer of, or access to, environmentally sound technologies, and distinguishes between activities undertaken by the public sector and those undertaken by the private sector. However, the ERT noted that Iceland has not reported its activities for financing access by developing countries to "hard" or "soft" environmentally sound technologies (required by paragraph 55 of the UNFCCC reporting guidelines).

49. In its NC4, Iceland does not specifically elaborate on its activities under the transfer of technology reporting provisions. Table 6 of the UNFCCC reporting guidelines has not been filled in. The ERT noted that Iceland's notable contribution in the field of technology transfer is the operation of the United Nations University Geothermal Training Programme and the United Nations University Fisheries Training Programme. The ERT recommends that Iceland specify its activities on technology transfer in its future national communications.

F. Research and systematic observation

50. In its NC4, Iceland provides information on its actions relating to research and systematic observation, and addresses both domestic and international activities, including the World Meteorological Organization programme. Furthermore, Iceland provides summary information on its Global Climate Observing System (GCOS) activities (in accordance with paragraph 64 of the UNFCCC reporting guidelines). The ERT noted, however, that the NC4 does not reflect action taken to support related capacity-building in developing countries.

51. Most of Iceland's research activities in the field of climate change focus on climate processes, climate systems and their impact. Efforts undertaken relate to the modelling or prediction of weather or climate and a project dealing with mitigation measures, but there has been less research on socio-economic analyses and funding of research for developing countries.

52. The ERT noted that Iceland does not report data on rise in sea level. It encourages the Party to report such data, and especially its database arrangements, for monitoring the sea level in one place for a longer period.

G. Education, training and public awareness

53. In its NC4, Iceland provides some information on its actions relating to education, training and public awareness, as required by the UNFCCC reporting guidelines (paragraph 65).

54. Environmental education has increased in the past decade, from nursery school to university level. The University of Iceland now offers a master's degree in environmental studies, and many secondary schools and professional colleges offer courses in the field of environmental studies, or place a special emphasis on environmental issues in their curriculum. However, the NC4 notes that environmental education as a separate subject is not a part of the primary school curriculum, according to the General Curriculum of 1999. Therefore environmental education in schools can be strengthened further and made more efficient.

55. The ERT noted that support for capacity-building for developing countries is not reported. It recommends the Party to report on its activities in this field in its next national communication.

III. Evaluation of information contained in the report demonstrating progress and of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

A. Information contained in the report demonstrating progress

56. Iceland's RDP includes four chapters which contain most of the information required by decisions 22/CP.7 and 25/CP.8. The ERT found the information contained in the RDP to be consistent to some extent with that provided in the NC4.

57. Information concerning legislative arrangements and enforcement and administrative procedures is available in the NC4 (chapter 1, National Circumstances, and chapter 3, Policies and Measures) rather than in the RDP.

58. In 2010, GHG emissions in Iceland are projected to increase in a range between 37.7 and 51.1 per cent, compared to 1990 levels, depending on the extent to which projects involving energy-intensive industries are implemented. However, when applying decision 14/CP.7, Iceland expects to be able to meet its Kyoto target (see paragraph 1) without accounting for LULUCF activities or using the Kyoto Protocol mechanisms. This explains the lack of any reference to the use of the Kyoto Protocol mechanisms, LULUCF activities and supplementarity.

B. Supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

59. Iceland has provided some supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC4 and RDP. This information reflects the steps taken by Iceland to implement the relevant provisions of the Kyoto Protocol. The available supplementary information is placed in different sections of the NC4 and RDP. Table 8 provides references to the NC4 and RDP chapters in which supplementary information is provided.

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

Supplementary information	Reference
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	not reported
Policies and measures in accordance with Article 2	NC4, pp. 27–32
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	NC4, p. 27; RDP, p. 55
Information under Article 10	RDP, pp. 62–63
Financial resources	NC4, pp. 40–43

Note: For the abbreviations used, see annex II.

60. The ERT noted that Iceland has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: (a) a description of the national registry; (b) information on what efforts Iceland is making to implement policies and measures in such a way as to minimize adverse effects, including the effects of climate change, effects on international trade, and social, environmental and economic impacts on other Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention; and (c) a description of national legislative arrangements and administrative procedures relating to the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. The ERT recommends that Iceland include these reporting elements in its next national communication.

IV. Conclusions

61. GHG emission trends in Iceland mainly depend on demographic developments (a strong increase in population and low population density), overall economic activity (Iceland has the smallest economy in the OECD and strong growth in GDP, and the role of fisheries is important), the structure of energy use (it has the highest per capita consumption of all the OECD countries, with a high share of hydro and geothermal energy, and oil use being dominated by mobile sources) and a sharp increase in aluminium production. Total GHG emissions excluding emissions and removals from LULUCF increased by 10.6 per cent between 1990 and 2004.

62. The ERT noted that the unique emission and energy profile of Iceland presents a challenge to its emission mitigation plans, as most of its energy-related emissions (more than 80 per cent) stem from mobile sources (transport, mobile machinery and fishing vessels), for which mitigation effects are generally more difficult to achieve than they are for stationary energy sources. Iceland expects to meet its Kyoto Protocol target with additional measures in the transport, industry and waste sectors.

63. The GHG emission projections provided by Iceland in the NC4 include two variants of the "with measures" scenario. Scenario 1 assumes no additions to the energy-intensive industries, whereas scenario 2 assumes that all energy-intensive projects which currently have a licence to operate will be implemented. Decision 14/CP.7 on the impact of single projects on emissions in the commitment period, adopted by the COP in 2001, stipulates a set of conditions under which CO_2 emissions from single projects could be excluded from accounting for the purposes of verification of compliance with a Party's commitments under the Kyoto Protocol. Iceland reports future emissions both including and excluding such projects.

64. In 2010, GHG emissions in Iceland are expected to increase in a range from 37.7 to 51.1 per cent, compared to 1990 levels, depending on the extent to which projects involving energy-intensive industries are implemented. But, with the application of decision 14/CP.7 and the exclusion of single projects, Iceland expects to be able to meet its Kyoto Protocol target. The ERT noted that Iceland expects to meet its Kyoto target with measures in the transport, industry and waste sectors. In its NC4, Iceland states that even if these measures fail it seems likely that the Kyoto Protocol target will be met.

65. In the course of the IDR, the ERT formulated a number of recommendations relating to the completeness and transparency of Iceland's reporting under the Convention and its Kyoto Protocol. The key recommendations[5] are that Iceland:

- Provide in its next national communication summary tables on its policies and measures by sector, following the structure laid out by the UNFCCC reporting guidelines (paragraph 17 and footnote a to table 1), as well as a concise presentation of its policies and measures, including information on each of the following subject headings: the GHG affected; the type or types of policy or measure; and the implementing entity or entities (paragraph 22 of the reporting guidelines);

- Include in its next submission information on the reduction of CO_2 emissions from industrial process facilities covered by decision 14/CP.7, since this information may be useful to provide a comprehensive picture of any initiative aiming at limiting GHG emissions, even those which will not be included in the national totals in the first commitment period;

- Provide in its future national communications more information on the potential for using RES in mobile sources;

- Provide GHG projections also in a tabular format, as required by the UNFCCC reporting guidelines, explaining the details of the application of decision 14/CP.7;

- Report in its next submission on sea-level rise measurements and vulnerability to sea-level rise;

- Include in its future submissions all the elements of the supplementary information as required under Article 7, paragraph 2, of the Kyoto Protocol.

[5] For a complete list of recommendations, the relevant sections of this report should be consulted.

Annex I

Documents and information used during the review

A. Reference documents

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

UNFCCC. Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol, decision 15/CMP.1. FCCC/KP/CMP/2005/8/Add.2. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

UNFCCC. Guidelines for review under Article 8 of the Kyoto Protocol, decision 22/CMP.1. FCCC/KP/CMP/2005/8/Add.3. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

UNFCCC. Report on the in-depth review of the third national communication of Iceland. FCCC/IDR.3/ISL. Available at <http://unfccc.int/resource/docs/idr/ISL03.pdf>.

UNFCCC. Synthesis of reports demonstrating progress in accordance with Article 3, paragraph 2, of the Kyoto Protocol. FCCC/SBI/2006/INF.2. Available at <http://unfccc.int/resource/docs/2006/sbi/eng/inf02.pdf>.

UNFCCC. Report of the individual review of the greenhouse gas inventory of Iceland submitted 2005. FCCC/ARR/2005/ISL. Available at <http://unfccc.int/resource/docs/2006/arr/ISL.pdf>.

Icelandic Ministry for the Environment. Iceland's fourth national communication under the United Nations Framework Convention on Climate Change. Available at <http://unfccc.int/resource/docs/natc/islnc4.pdf>.

Icelandic Ministry for the Environment. Iceland's report on demonstrable progress under the Kyoto Protocol. Available at <http://unfccc.int/resource/docs/natc/islnc4.pdf#page=54>.

The 2006 GHG inventory submission of Iceland. Available at <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/x-zip-compressed/isl_2006_crf_26jul.zip>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Ottar Freyr Gíslason (Ministry for the Environment) including additional information on the influence that reclamation of wetlands will have on the way Iceland intends to meet its Kyoto Protocol target.

Annex II

Acronyms and abbreviations

CDM	clean development mechanism
CH_4	methane
CHP	combined heat and power
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
COP	Conference of the Parties
CRF	common reporting format
EC	European Community
ERT	expert review team
ETS	emissions trading scheme
EU	European Union
GCOS	Global Climate Observing System
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the weighted sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
GWP	global warming potential
HFCs	hydrofluorocarbons
IDR	in-depth review
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
ISK	Icelandic krona/kronur
ISO	International Organization for Standardization
JI	joint implementation
kg	kilogram (1 kg = 1 thousand grams)
kWh	kilowatt hour
LULUCF	land use, land-use change and forestry
Mg	megagram (1 Mg = 1 tonne)
mg	milligram (1000 mg = 1 gram)
Mtoe	millions of tonnes of oil equivalent
N_2O	nitrous oxide
NC3	third national communication
NC4	fourth national communication
NGO	non-governmental organization
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
PFCs	perfluorocarbons
PPP	purchasing power parities
RDP	Report demonstrating progress under the Kyoto Protocol
RES	renewable energy sources
SF_6	sulphur hexafluoride
SO_2	sulphur dioxide
Tg	teragram (1 Tg = 1 million tonnes)
toe	tonnes of oil equivalent
TPES	total primary energy supply
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States dollar

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