



**Report of the individual review of the annual submission of Iceland
submitted in 2010**

Note by the secretariat

The report of the individual review of the annual submission of Iceland submitted in 2010 was published on 20 April 2011. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decision 4/CMP.4), the report is considered received by the secretariat on the same date. This report, FCCC/ARR/2010/ISL, 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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Iceland submitted in 2010***

* In the symbol for this document, 2010 refers to the year in which the inventory was submitted, and not to the year of publication.

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I. Introduction and summary

A. Overview

1. This report covers the centralized review of the 2010 annual submission of Iceland, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 6 to 11 September 2010 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalists – Ms. Suvi Monni (Finland) and Mr. Dennis Rudov (Belarus); energy – Mr. Benon Bibbu (Malawi), Mr. Takeshi Enoki (Japan), Mr. Jongikhaya Witi (South Africa) and Mr. Alexander Zahar (Australia); industrial processes – Ms. Alice Au (Canada), Ms. Laura Elena Dawidowski (Argentina) and Ms. Natalya Parasyuk (Ukraine); agriculture – Ms. Yauheniya Bertosh (Belarus) and Mr. Donald Kamdonyo (Malawi); land use, land-use change and forestry (LULUCF) – Mr. Vladimir Korotkov (Russian Federation) and Ms. Naoko Tsukada (Japan); and waste – Ms. Mayra Rocha (Brazil) and Mr. Kai Skoglund (Finland). Ms. Monni and Mr. Witi were the lead reviewers. The review was coordinated by Mr. Javier Hanna and Ms. Inkar Kadyrzhanova (UNFCCC secretariat).

2. In accordance with 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, which provided comments that were considered and incorporated, as appropriate, into this final version of the report

B. Emission profiles and trends

3. In 2008, the main greenhouse gas (GHG) in Iceland was carbon dioxide (CO₂), accounting for 73.7 per cent of total GHG emissions¹ expressed in carbon dioxide equivalent (CO₂ eq), followed by methane (CH₄) (9.6 per cent) and nitrous oxide (N₂O) (8.1 per cent). Hydrofluorocarbons, perfluorocarbons (PFCs) and sulphur hexafluoride (SF₆) collectively accounted for 8.6 per cent of the overall GHG emissions in the country. The energy sector accounted for 42.9 per cent of total GHG emissions, followed by the industrial processes sector (40.8 per cent), the agriculture sector (11.6 per cent), the waste sector (4.5 per cent) and the solvent and other product use sector (0.2 per cent). Total GHG emissions amounted to 4,880.10 Gg CO₂ eq and increased by 42.9 per cent between the base year² and 2008.

4. Table 1 shows GHG emissions from Annex A sources, and emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol (KP-LULUCF), by gas. Table 2 shows GHG emissions from Annex A sources, emissions and removals from the LULUCF sector under the Convention and from KP-LULUCF activities, by sector and activity. In table 1, CO₂, CH₄ and N₂O emissions included in the rows under Annex A sources do not include emissions and removals from the LULUCF sector. Table 3 provides information on the most important emissions and removals and accounting parameters that will be included in the compilation and accounting database.

¹ In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF, unless otherwise specified.

² “Base year” refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year emissions include emissions from Annex A sources only.

Table 1
Greenhouse gas emissions from Annex A sources and emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, by gas, base year to 2008

| | | <i>Gg CO₂ eq</i> | | | | | | | | <i>Change</i> | | |
|-----------------|--------------------------|-----------------------------|------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|---------------|---------------------------|------|
| | | <i>Greenhouse gas</i> | <i>Base year^a</i> | <i>1990</i> | <i>1995</i> | <i>2000</i> | <i>2005</i> | <i>2006</i> | <i>2007</i> | <i>2008</i> | <i>Base year–2008 (%)</i> | |
| Annex A sources | | CO ₂ | 2 172.15 | 2 172.15 | 2 325.59 | 2 774.81 | 2 876.93 | 3 050.27 | 3 300.92 | 3 594.66 | 65.5 | |
| | | CH ₄ | 445.10 | 445.10 | 442.95 | 445.80 | 432.21 | 454.26 | 470.13 | 467.40 | 5.0 | |
| | | N ₂ O | 377.01 | 377.01 | 370.48 | 388.28 | 339.40 | 366.94 | 388.05 | 396.32 | 5.1 | |
| | | HFCs | NA, NE, NO | NA, NE, NO | 4.36 | 27.44 | 48.54 | 51.57 | 57.80 | 66.77 | NA | |
| | | PFCs | 419.63 | 419.63 | 58.84 | 127.16 | 26.09 | 333.22 | 281.13 | 349.00 | –16.8 | |
| | | SF ₆ | 1.05 | 1.05 | 1.38 | 2.97 | 3.39 | 6.98 | 9.86 | 5.94 | 468.2 | |
| KP-LULUCF | Article 3.3 ^b | CO ₂ | | | | | | | | –101.18 | | |
| | | CH ₄ | | | | | | | | NA | | |
| | | N ₂ O | | | | | | | | 0.00 | | |
| | Article 3.4 ^c | CO ₂ | –279.58 | | | | | | | | –548.49 | 51.0 |
| | | CH ₄ | NA | | | | | | | | NA | NA |
| | | N ₂ O | NA | | | | | | | | NA | NA |

Abbreviations: KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, NA = not applicable, NE = not estimated, NO = not occurring.

^a “Base year” for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The “base year” for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is 1990.

^b Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation. Only the inventory years of the commitment period must be reported.

^c Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation. For cropland management, grazing land management and revegetation, the base year and the inventory years of the commitment period must be reported.

Table 2

Greenhouse gas emissions by sector and activity, base year to 2008

| | Sector | Gg CO ₂ eq | | | | | | | | Change | |
|-----------|-------------------------------|-------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------------------|-------------|
| | | Base year ^a | 1990 | 1995 | 2000 | 2005 | 2006 | 2007 | 2008 | Base year–2008 (%) | |
| Annex A | Energy | 1 783.30 | 1 783.30 | 1 918.54 | 2 053.03 | 2 101.65 | 2 178.51 | 2 234.37 | 2 091.61 | 17.3 | |
| | Industrial processes | 862.91 | 862.91 | 534.98 | 945.95 | 916.76 | 1 333.60 | 1 484.15 | 1 992.15 | 130.9 | |
| | Solvent and other product use | 13.94 | 13.94 | 14.09 | 14.89 | 16.18 | 9.36 | 12.24 | 8.92 | –36.0 | |
| | Agriculture | 575.24 | 575.24 | 542.06 | 551.99 | 498.39 | 528.44 | 550.80 | 566.39 | –1.5 | |
| | Waste | 179.57 | 179.57 | 193.93 | 200.61 | 193.58 | 213.35 | 226.33 | 221.03 | 23.1 | |
| | Other | NA | NA | NA | NA | NA | NA | NA | NA | NA | |
| | LULUCF | NA | 2 356.15 | 2 292.49 | 2 184.62 | 2 066.39 | 2 037.69 | 2 021.33 | 1 996.50 | NA | |
| | Total (with LULUCF) | NA | 5 771.09 | 5 496.09 | 5 951.09 | 5 792.95 | 6 300.95 | 6 529.22 | 6 876.60 | 19.2 | |
| | Total (without LULUCF) | 3 414.94 | 3 414.94 | 3 203.60 | 3 766.47 | 3 726.56 | 4 263.26 | 4 507.89 | 4 880.10 | 42.9 | |
| KP-LULUCF | Article 3.3 ^b | Afforestation & reforestation | | | | | | | | –101.18 | |
| | | Deforestation | | | | | | | | NA | |
| | | Total (3.3) | | | | | | | | –101.18 | |
| | Article 3.4 ^c | Forest management | | | | | | | | NA | |
| | | Cropland management | NA | | | | | | | NA | NA |
| | | Grazing land management | NA | | | | | | | NA | NA |
| | | Revegetation | –279.58 | | | | | | | –548.49 | 51.0 |
| | | Total (3.4) | –279.58 | | | | | | | –548.49 | 51.0 |

Abbreviations: KP-LULUCF = land use, land-use change and forestry emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, NA = not applicable.

^a “Base year” for Annex A sources refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The “base year” for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is 1990.

^b Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation. Only the inventory years of the commitment period must be reported.

^c Elected activities under Article 3, paragraph 4, of the Kyoto Protocol, including forest management, cropland management, grazing land management and revegetation. For cropland management, grazing land management and revegetation, the base year and the inventory years of the commitment period must be reported.

Table 3
Information to be included in the compilation and accounting database, in tonnes of carbon dioxide equivalent

| | <i>As reported</i> | <i>Adjustment^a</i> | <i>Final^b</i> | <i>Accounting quantity^c</i> |
|---|--------------------|-------------------------------|--------------------------|--|
| Commitment period reserve | 16 675 073 | | 16 671 462 | |
| Annex A emissions for current inventory year | | | | |
| CO ₂ | 3 594 662 | | 3 594 662 | |
| CH ₄ | 467 396 | | 467 396 | |
| N ₂ O | 396 325 | | 396 325 | |
| HFCs | 66 773 | | 66 773 | |
| PFCs | 348 998 | | 348 998 | |
| SF ₆ | 5 944 | | 5 944 | |
| Total Annex A sources | 4 880 097 | | 4 880 097 | |
| Activities under Article 3, paragraph 3, for current inventory year | | | | |
| 3.3 Afforestation and reforestation on non-harvested land for current year of commitment period as reported | -102 346 | | -102 346 | |
| 3.3 Afforestation and reforestation on harvested land for current year of commitment period as reported | 1 167 | | 1 167 | |
| 3.3 Deforestation for current year of commitment period as reported | NA | | NA | |
| Activities under Article 3, paragraph 4, for current inventory year^d | | | | |
| 3.4 Forest management for current year of commitment period | | | | |
| 3.4 Cropland management for current year of commitment period | | | | |
| 3.4 Cropland management for base year | | | | |
| 3.4 Grazing land management for current year of commitment period | | | | |
| 3.4 Grazing land management for base year | | | | |
| 3.4 Revegetation for current year of commitment period | -548 488 | | -548 488 | |
| 3.4 Revegetation in base year | -279 575 | | -279 575 | |

Abbreviation: NA = not applicable.

^a "Adjustment" is relevant only for Parties for which the expert review team (ERT) has calculated one or several adjustment(s).

^b "Final" includes revised estimates, if any, and/or adjustments, if any.

^c "Accounting quantity" is included in this table only for Parties that chose annual accounting for activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, if any.

^d Activities under Article 3, paragraph 4, of the Kyoto Protocol are relevant only for Parties that elected one or more of these activities.

II. Technical assessment of the annual submission

A. Overview

1. Annual submission and other sources of information

5. The 2010 annual submission was submitted on 23 April 2010; it contains a complete set of common reporting format (CRF) tables for the period 1990–2008. Iceland submitted a national inventory report (NIR) on 27 May 2010 and resubmitted its NIR on 1 June 2010. Iceland also submitted information required under Article 7, paragraph 1, of the Kyoto Protocol, including information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol; accounting of Kyoto Protocol units; changes in the national system and in the national registry; and minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol. The standard electronic format (SEF) tables were not submitted, owing to the fact that Iceland's national registry is not yet connected to the international transaction log (ITL) and, therefore, no Kyoto Protocol units have been acquired or transferred. The annual submission was submitted in accordance with decision 15/CMP.1.

6. However, the expert review team (ERT) noted that since 2004 Iceland has not submitted its annual submission by the deadline of 15 April. Although, under decision 15/CMP.1, there is a six-week period before any consequences resulting from a late submission come into effect, the ERT recommends that Iceland submit its next annual inventory by 15 April 2011. Further, the ERT recommends that Iceland review and strengthen the elements of its national system that would enable the timely submission of its annual inventory.

7. The ERT used the standard independent assessment report (SIAR), parts I and II, to review information on the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and on the national registry.³ Where necessary, the ERT also used the previous years' submissions during the review.

8. During the review, Iceland provided the ERT with additional information and documents which are not part of the annual submission. The full list of information and documents used during the review is provided in annex I to this report.

Completeness of inventory

9. The inventory is complete in terms of geographical coverage, years and sectors, and generally complete in terms of categories and gases. The exception is the LULUCF sector, for which the emissions and removals for the mandatory categories were reported using the notation keys: for example, emissions/removals from grassland remaining grassland were reported as included elsewhere ("IE") and not estimated ("NE"), and those from land converted to settlements and land converted to other land were also reported as "NE" (see para. 74 below).

10. The following gaps in the Party's reporting have been identified: CO₂ and CH₄ emissions from distribution of oil products in the energy sector (see para. 38 below); and CO₂ emissions from road paving with asphalt and from food and drink in the industrial

³ The SIAR, parts I and II, is prepared by an independent assessor in line with decision 16/CP.10 (paras. 5(a), 6(c) and 6(k)), under the auspices of the ITL administrator using procedures agreed in the Registry System Administrators Forum. Part I is a completeness check of the submitted information relating to the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and to national registries. Part II contains a substantive assessment of the submitted information and identifies any potential problem regarding information on the accounting of Kyoto Protocol units and the national registry.

processes sector (see para. 51 below). The ERT encourages Iceland to consider the possibility of estimating emissions for those categories currently reported as “NE” for which estimation methods are not available in the materials prepared by the Intergovernmental Panel on Climate Change (IPCC), such as the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), the *IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance) and the *IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF).

11. Iceland did not include the LULUCF sector in its uncertainty analysis, but it included a chapter on quality assurance/quality control (QA/QC) procedures and activities in the NIR. The ERT noted that some explanatory information is missing from the CRF tables. This relates to CRF table 8(b), where limited explanatory information on recalculations is provided, and CRF table 9(a), where explanatory information on the use of the notation key “NE” is given only for the LULUCF sector. The ERT recommends that Iceland provide explanatory information in the aforementioned tables in its next annual submission to improve the completeness of its reporting.

2. A description of the institutional arrangements for inventory preparation, including the legal and procedural arrangements for inventory planning, preparation and management

Overview

12. The ERT concluded that the national system continued to perform its required functions. The Party has reported no changes in the national system since the previous annual submission. The ERT agrees with this. However, during the review, the ERT identified a gap in the cooperation between the Environment Agency of Iceland (EA), responsible for the preparation of the national inventory, and the National Energy Authority (NEA), the main energy statistics provider (see para. 14 below).

Inventory planning

13. The NIR described the national system for the preparation of the inventory. EA, under the supervision of the Ministry for the Environment (MFE), has overall responsibility for the national inventory. EA compiles and manages the whole inventory, except for the inventory for the LULUCF sector, which is compiled by the Agricultural University of Iceland (AUI). EA collects and processes activity data (AD), selects methodologies and appropriate emission factors (EFs), ensures quality management activities, manages and implements the QA/QC plan and runs the archiving system. The inventory, after scrutiny by the coordinating team, is sent by EA to the secretariat. Other agencies, ministries and organizations, such as NEA, the Farmers Association of Iceland (FAI), Statistics Iceland, the Soil Conservation Service of Iceland (SCSI) and the Iceland Forest Service, are also involved in the inventory preparation process, mainly through the provision of AD. Iceland has described its national system in the NIR and elaborated on the flow of information and allocation of responsibilities. The ERT encourages Iceland to continue maintaining the integrity of its national system and to report any changes in its next annual submission.

14. According to paragraph 3.7.1 of the NIR, despite the existence of a formal agreement, NEA has not fulfilled its obligation to provide the national energy balance. Currently, NEA collects annual information on fuel sales from the oil companies and provides it to EA. In addition, EA collects additional AD on fuel imports and exports and the use of feedstocks from Statistics Iceland and major industrial producers. The national energy balance is the main source of AD for the energy sector, and its provision

significantly increases the accuracy and completeness of the reporting. Iceland reported in the NIR that the compilation of the national energy balance is planned to start in the near future, and, during the review, the ERT was informed by the Party that a new formal agreement with NEA needs to be established in order to ensure that NEA will supply EA with the national energy balance in the future. The ERT reiterates the previous review recommendation that Iceland ensure that future annual national energy balances are of a sufficiently high quality and are prepared regularly and on time.

15. Iceland reported that a QA/QC plan has been elaborated and implemented since the previous annual submission. During the review, the Party provided the ERT with the weblink⁴ to the recently developed QA/QC manual, which contains an overall description of the Party's QA/QC activities. The ERT noted that the overall description of the QA/QC activities performed by the Party, as provided in the NIR, is general and rather limited, and that information on certain sector-specific QA/QC procedures is missing. Corresponding recommendations of the ERT are given in paragraphs 26 and 27 below.

16. Iceland reported the establishment of a coordinating team in 2008, consisting of representatives of MFE, EA and AUI. Its main roles are: to review the inventory before the official submission to the secretariat; to plan the inventory cycle; and to formulate proposals on the further development of and improvements to the national inventory system. Three meetings of the coordinating team were organized during the 2010 inventory preparation process. The ERT welcomes this improvement in the inventory preparation process and encourages the Party to continue its efforts in strengthening its QA/QC activities in the future.

Inventory preparation

Key categories

17. Iceland has reported a tier 1 key category analysis, both level and trend assessments, as part of its 2010 annual submission. The key category analysis performed by the Party and that performed by the secretariat⁵ produced different results across all sectors, owing to the different levels of aggregation used by the Party and by the secretariat as well as to some errors in the analysis. Iceland included the LULUCF sector in its key category analysis, which was performed in accordance with the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. During the review, some minor errors were found in the Party's key category analysis presented in table A3 of annex I to the NIR. For instance, CO₂ emissions were reported only for the residential subcategory and were not reported for the commercial/institutional subcategory in the combined residential and commercial/institutional category of the energy sector; N₂O emissions from manure management were reported without conversion to CO₂ eq in the agriculture sector; and the total emissions from the waste sector were reported in place of CH₄ emissions from solid waste disposal on land. The ERT concludes that the key category analysis reported by the Party is not fully in line with the IPCC good practice guidance. The ERT recommends that Iceland revise its key category analysis and encourages the Party to expand the tables currently provided by listing all the categories and their input into the national totals,

⁴ <http://www.ust.is/media/fraedsluefni/pdf-skjol/Iceland_QAQC_plan.pdf>.

⁵ The secretariat identified, for each Party, the categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC good practice guidance for LULUCF. Key categories according to the tier 1 trend assessment were also identified for Parties that provided a full set of CRF tables for the base year or period. Where the Party performed a key category analysis, the key categories presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

including the non-key categories, in order to enhance the transparency of the reporting. Furthermore, the ERT encourages Iceland to use a qualitative approach to identify key categories for its next annual submission.

18. It is not clear from the NIR whether the results of the key category analysis are used as a driving factor for prioritizing future improvements to the inventory. The ERT recommends that Iceland include this information in the NIR of its next annual submission.

19. Iceland identified afforestation/reforestation and revegetation as key categories for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Uncertainties

20. In annex II to the NIR, Iceland has reported that the quantitative uncertainty is estimated at 6.6 per cent using a tier 1 method in line with the IPCC good practice guidance. The LULUCF sector was not included in the quantitative uncertainty analysis, which was performed at a summary level. The updated uncertainty estimate is 0.8 per cent lower than the one in the previous annual submission. The ERT noted that the uncertainty estimate presented in annex II to the NIR (6.6 per cent) differs from the estimate reported in section 1.7 of the NIR (7.4 per cent). The ERT recommends that Iceland improve the consistency between the information reported in the main body of the NIR and in the annexes to the NIR in its next annual submission.

21. In the previous review report, the Party was encouraged to update its uncertainty estimates and include the LULUCF sector in the analysis. Following this recommendation, Iceland updated the uncertainty analysis, but it has not included the LULUCF sector. Quantitative uncertainty estimates have been reported for key categories and for some non-key categories. For the LULUCF sector, only qualitative uncertainty estimates have been reported. The ERT reiterates the recommendation made in the previous review report that Iceland expand the uncertainty analysis by including the LULUCF sector for its next annual submission. The ERT also recommends that Iceland provide a more detailed description of the uncertainty analysis in the appropriate section of the NIR.

Recalculations and time-series consistency

22. Recalculations for the period 1990–2007 have been performed and reported in accordance with the IPCC good practice guidance, although only limited explanatory information has been provided by the Party. The ERT noted that, in CRF table 8(b) for 2007, explanatory information has been given only for the recalculation of carbon tetrafluoride (CF₄) emissions from aluminium production. The explanatory information for other recalculations has not been reported in CRF table 8(b). The ERT noted that, in the NIR, the Party has included a new chapter on recalculations and improvements and has provided sufficient explanatory information on recalculations. However, the recalculation for the cropland category, which led to a significant increase in the estimate of emissions (by 20,671 per cent) for this category, has not been explained in the appropriate chapter. From the text of the NIR, it was understood that this recalculation was caused by a disaggregation of the wetlands category and accounting for the wetlands converted to cropland category. The ERT recommends that Iceland fill in the cells for explanation information in CRF table 8(b) and provide complete and clear sector-specific information on the recalculations performed, in accordance with the outline of the NIR provided in the “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories” (hereinafter referred to as the UNFCCC reporting guidelines), in its next annual submission.

23. The major changes as a result of the recalculations, and the magnitude of the impact, include an increase in the estimate of total GHG emissions of 0.4 per cent for 1990 and of 0.6 per cent for 2007. The overall emission trend has not been significantly affected by the recalculations. The recalculations have been undertaken to take into account: the revision of the calculation sheets and the correction of the errors identified in the energy sector; the estimation of country-specific CO₂ EFs; and the use of the appropriate IPCC default EFs for gasoline and diesel oil in road transportation. The recalculations were performed following the recommendations made in the previous review report, which included: the correction of and changes to AD in the industrial processes, LULUCF and waste sectors; the revision of the statistics on the livestock population; and the shift to an IPCC tier 2 method for the estimation of emissions from enteric fermentation in the agriculture sector. The ERT noted that the aforementioned recalculations led to improvements in the accuracy and consistency of the time series.

Verification and quality assurance/quality control approaches

24. Iceland reported that a QA/QC plan has been elaborated and implemented, although a description of the plan was not provided in the NIR. However, during the review, Iceland provided the ERT with the weblink for its QA/QC plan and the Party recently developed a QA/QC manual, which contains an overall description of its QA/QC procedures.

25. In the NIR, Iceland has reported only general QA/QC checks and procedures for the energy and waste sectors. The ERT noted that Iceland has reported sufficient information on the sector-specific QA/QC activities undertaken for the industrial processes and LULUCF sectors. However, Iceland has not reported the QA/QC activities for the agriculture sector and the solvent and other product use sector. In addition, the ERT noted that Iceland has reported that the established coordinating team is responsible for the identification and prioritization of categories for external review, and that the external reviewers conducted an unbiased review of the inventory as a whole or of some parts of it. However, no further information on the results of the QA activities has been reported in the NIR.

26. Taking into account the fact that Iceland has not reported any planned improvements to its QA/QC activities, the ERT recommends that Iceland further improve the description of the sector-specific QA/QC procedures for the energy and waste sectors in its next annual submission. It also recommends that Iceland include a description of the sector-specific QA/QC procedures for the agriculture sector and the solvent and other product use sector, and that the Party provide an extensive description of its QA procedures. The ERT encourages Iceland to plan and implement category-specific IPCC tier 2 QA/QC procedures for the key categories.

27. The ERT noted that, despite the availability of the elaborated QA/QC plan and the performed QC checks, there were some errors and mistakes in the NIR, such as: the incorrect calculation of the commitment period reserve; errors in the key category analysis; and misprints in annex I to the NIR (the 2008 tables were reported as being for 2007). The ERT recommends that the Party further strengthen its general and sector-specific QA/QC efforts to avoid such errors in the future.

Transparency

28. Several improvements in the NIR have increased the transparency of the Party's reporting since the previous annual submission. Specifically, the improvements include the incorporation of the additional chapter on recalculations and improvements, and the enhanced transparency of the reporting on emissions from the energy and industrial processes sectors. For example, Iceland has reported the carbon storage factors for bitumen and lubricants under feedstocks and non-energy use of fuels (see para. 43 below) and has

provided information under decision 14/CP.7 (see paras.58 and 59 below). The ERT commends the Party for these improvements.

29. The NIR generally follows the outline set out in the UNFCCC reporting guidelines. However, there is a need for further improvements, especially in the energy, solvent and other product use, agriculture and waste sectors. In particular, the NIR did not include sufficient information on the methodologies, assumptions, EFs and AD used to estimate emissions. Furthermore, it was not clear to the ERT whether the additional sources of information referenced in the NIR were used in the inventory preparation process. The ERT recommends that Iceland further improve the transparency of its reporting by making the following improvements in its next annual submission:

(a) Provide more detailed information on the choice of all methodologies, assumptions, EFs and AD used;

(b) Incorporate references to the external information sources used in the inventory preparation process in the text of the NIR;

(c) Use a national energy balance;

(d) Provide additional information to explain the emission trends and AD used for all sectors and key categories, especially in the case of fluctuations in emission trends.

30. In addition, the ERT encourages Iceland to provide explanatory information on the use of each notation key in the CRF tables, in particular in CRF table 9(a).

Inventory management

31. Iceland did not provide a description of the national archiving system in the NIR. However, information on responsibilities related to the archiving system was provided in the QA/QC manual referenced in section 1.6 of the NIR. All documentation on QA/QC activities, AD, CRF files, calculation sheets, official annual submissions, etc. is stored electronically on the server of EA. However, the geographical database used to compile the LULUCF inventory is stored on the server of AUI. The ERT recommends that Iceland include in the NIR of its next annual submission the description of the archiving system provided in the QA/QC manual. Furthermore, the ERT encourages Iceland to have EA archive the outputs from the calculations and some background data and information used for the compilation of the LULUCF inventory upon receipt from AUI, so that the whole archiving system is in one single location.

3. Follow-up to previous reviews

32. The ERT noted that some of the recommendations made in the previous review report have been taken into account in the inventory preparation process. Improvements include: the incorporation of additional chapters in the NIR to fulfil the reporting requirements under the Kyoto Protocol; the update of the uncertainty analysis; and the improvement of the QA/QC procedures. However, some recommendations have not been addressed in the 2010 annual submission, such as: the inclusion of the LULUCF sector in the uncertainty analysis; and the provision in the NIR of detailed information on archiving procedures. The ERT recommends that Iceland implement all the recommendations from the previous review report. The ERT encourages the Party to provide in the NIR of its next annual submission transparent documentation on the implementation of these recommendations, in order to facilitate the review process and increase the overall transparency of the reporting.

4. Areas for further improvement

Identified by the Party

33. In the 2010 NIR, Iceland identified several areas for improvement:

- (a) The use of the annual national energy balance, to be prepared by NEA under the current formal agreement, to estimate emissions from the energy sector;
- (b) The division of land use into subcategories, and improvements in time and spatial resolution of the land-use information based on the ongoing work at AUI;
- (c) The completion of the new national forest inventory (NNFI), currently under development, and using it to improve estimates of both forest land area and carbon stock changes;
- (d) The finalization of the development of the revegetation inventory, which is similar to the NNFI and was started in 2007, and using it to provide improved data on the area of revegetated land and carbon stock changes in the next two years (2011–2012).

Identified by the expert review team

34. The ERT identified the following cross-cutting areas for improvement:

- (a) The strengthening of the elements of the national system relating to timeliness of reporting;
- (b) The full implementation of the agreement between NEA and EA regarding the provision of the national energy balance to ensure a sustainable system for calculating the emissions from the energy sector and to ensure the QA/QC of the data it contains (see para. 14 above);
- (c) The reporting of emission estimates for activities that occur in the country but are currently reported as “NE” as relevant IPCC methodologies are not available, and the provision of full explanatory information in CRF tables 8(b) and 9(a) (see paras. 10 and 11 above);
- (d) The revision of the key category analysis and the listing of all the categories in the tables currently provided, in order to enhance the transparency of the reporting (see para. 17 above);
- (e) The expansion of the current uncertainty analysis by including the LULUCF sector (see para. 21 above);
- (f) The provision of sector-specific information on recalculations in accordance with the outline of the NIR provided in the UNFCCC reporting guidelines (see para. 22 above);
- (g) The further strengthening of the QA/QC procedures, the inclusion of descriptions of sector-specific QA/QC procedures for the agriculture sector and the solvent and other product use sector, the further improvement of the description of the sector-specific QA/QC procedures for the energy and waste sectors, and the provision of descriptions of the QA procedures and their results (see paras. 26 and 27 above);
- (h) The documentation and transparent explanation in the NIR of the methods, AD and EFs used and the emission trends (see para. 29 above);
- (i) The provision of a sufficiently transparent description of the national system in the NIR, including the roles, responsibilities and capacities of all collaborating entities, and a description of the archiving system (see paras. 13 and 31 above).

35. Recommended improvements relating to specific categories are presented in the relevant sector chapters of this report.

B. Energy

1. Sector overview

36. The energy sector is the main sector in the GHG inventory of Iceland. In 2008, emissions from the energy sector amounted to 2,091.61 Gg CO₂ eq, or 42.9 per cent of total GHG emissions. Since 1990, emissions have increased by 17.3 per cent. The key drivers for the rise in emissions are the expansion of the construction industry, the increase in geothermal energy utilization, the growth in the fishmeal industry and the increase in the vehicle fleet. Within the sector, 46.6 per cent of the emissions were from transport, followed by 26.3 per cent from the category other sectors (mainly fishing), 17.6 per cent from manufacturing industries and construction, and 8.9 per cent were fugitive emissions (from geothermal energy exploitation). The remaining 0.7 per cent were from energy industries.

37. In the 2010 annual submission, recalculations for the energy sector were performed for the years 1990–2007, resulting in an increase in estimated sectoral emissions of 0.3 per cent for 1990 and of 0.3 per cent for 2007. The recalculations were performed following the recommendation made in the previous review report that Iceland estimate and substantiate country-specific CO₂ EFs and use the appropriate IPCC default EFs for gasoline and diesel oil in road transportation. The ERT reiterates the recommendation of the previous review report that Iceland continue to improve the quality and availability of its data, improve the collection and use of country-specific fuel data, and apply higher-tier estimation methods for key categories, in accordance with the IPCC good practice guidance.

38. The reporting on the energy sector is generally complete in terms of gases, years and geographical coverage, and is almost complete in terms of categories, with some exceptions, namely CO₂ and CH₄ emissions from the distribution of oil products and CH₄ emissions from geothermal electricity production reported as “NE”. The ERT noted that there are no methods to estimate these emissions in either the Revised 1996 IPCC Guidelines or in the IPCC good practice guidance. The ERT encourages Iceland to continue to develop methodologies for the estimation of emissions for the above-mentioned categories.

39. In the 2010 annual submission, Iceland improved the transparency of its reporting on the energy sector. Following the recommendation of the previous review report, the transparency of the reporting on feedstocks and non-energy use of fuels was improved by the reporting of the carbon storage factors for bitumen and lubricants. Iceland reported high uncertainties for both AD and EFs in the energy sector, resulting in a high level of uncertainty for some source categories. For example, Iceland reported an N₂O EF uncertainty of 200 per cent for road transportation. Iceland has yet to develop and implement category-specific QA/QC procedures, especially for the key categories. The ERT encourages Iceland to develop category-specific QA/QC procedures with an emphasis on and a prioritization of the key categories.

2. Reference and sectoral approaches

Comparison of the reference approach with the sectoral approach and international statistics

40. Estimates of CO₂ emissions from fuel combustion were calculated using the reference approach and the sectoral approach. The comparison of the estimates of CO₂ emissions between the reference approach and the sectoral approach results in a difference

of –2.5 per cent for 1990 and –1.7 per cent for 2008. In the 2010 NIR, Iceland did not provide sufficiently transparent information to explain these differences, including the fluctuations in the time series, even though this had been recommended in the previous review report. The ERT noted that Iceland used data on the import and export of fuels, fuel sales statistics and assumptions regarding fuel stock changes to estimate emissions using the reference approach. The ERT recommends that EA work closely with NEA to obtain the national energy balance and that Iceland use it as the main source of information for the reference approach, as recommended in the previous review report.

41. For 2008, the estimate of apparent fuel consumption calculated using the reference approach is 6.0 per cent higher than the value in the data reported to the International Energy Agency (IEA). For example, the figures for liquid fuel imports reported in the CRF tables are about 1.5 per cent higher than the IEA figures (except for 2008), because of the different net calorific values used. Small quantities of white spirit imports were reported to IEA but not in the CRF tables. Small quantities of petroleum coke (previously called “electrodes” in the CRF tables) were reported as exports in the CRF tables but not to IEA. Also, carbon stock changes for solid fuels were reported in the CRF tables but not to IEA. In response to a question raised by the ERT, Iceland indicated that a more accurate comparison will be available once NEA has provided the national energy balance. The ERT reiterates the recommendation of the previous review report that Iceland improve data collection for the energy sector, reconcile the data in the CRF tables with the IEA data and provide an explanation for such differences in its next annual submission.

International bunker fuels

42. The methodology used by Iceland to determine the split in fuel consumption between water-borne navigation and marine bunkers has not been transparently documented in the NIR. Iceland relies on fuel suppliers to report the information on the split between the two uses, but it is not clear how the fuel suppliers determine the split. The ERT recommends that Iceland provide information in the NIR on the methodology used by the Party to split fuel consumption between water-borne navigation and marine bunkers and that it apply QA/QC procedures in relation to the data and report thereon in its next annual submission. Iceland has reported on how it split fuel consumption between aviation and aviation bunkers. However, the ERT noted that Iceland can improve its reporting on aviation bunkers by quantifying the fraction of international flights that depart from and arrive at Reykjavik airport as well as the fraction of domestic flights that depart from and arrive at Keflavik airport.

Feedstocks and non-energy use of fuels

43. Following the recommendation of the previous review report, Iceland has provided transparent information in the NIR on its calculations of the carbon stored. In the CRF tables, Iceland has used, as the fraction of carbon stored, a default value of 1 for bitumen and 0.5 for lubricants for non-energy use of fuels in the reference approach. The ERT commends Iceland for improving the transparency of its reporting on feedstocks and non-energy use of fuels and the assumptions regarding the carbon storage factors for bitumen and lubricants.

Country-specific issues

44. As a follow-up to the recommendation of the previous review report, Iceland has provided a description of the methodology used to estimate CO₂ emissions from production of geothermal power in the NIR of its 2010 annual submission. The ERT commends Iceland for improving transparency by reporting the methodology it has applied. The ERT noted that, in the description of the methodology used, Iceland has reported that the

emission estimates are based on direct measurements taken at each well, with the steam fraction of the fluid and its CO₂ concentration at the wellhead and the geothermal plant inlet pressure calculated for each well. The ERT encourages Iceland to report the results of these direct measurements as well as the algorithms used to estimate the emissions in its next annual submission.

3. Key categories

Stationary combustion: liquid fuels – CO₂

45. In its 2010 annual submission, Iceland has reported that data on fuel consumption in the fishmeal industry prior to 2003 were estimated on the basis of production statistics using a ratio of fuel consumption per kg of raw material. For 2003 onwards, fuel consumption data were taken from industry statistics (the Green Accounts). This represents an issue of inconsistency in the time series of CO₂ emissions from the fishmeal industry, as different data collection methods have been used. The ERT recommends that Iceland improve the transparency of its reporting by clearly describing in the NIR of its next annual submission the assumptions used to estimate emissions for prior to 2003 related to fuel consumption in the fishmeal industry and that it ensure the consistency of the time series.

46. Iceland has reported in the CRF tables, for the commercial/institutional category, a fluctuating CO₂ implied emission factor (IEF) for liquid fuels, ranging from 77.99 t/TJ (1990) to 71.90 t/TJ (2008), with high inter-annual variations in the value of the IEF, such as –9.2 per cent (1993/1994) and –4.8 per cent (2005/2006). The CO₂ IEF decreased by 7.8 per cent between 1990 and 2008. Iceland did not provide an explanation in the NIR for the changes in the trend. In response to a question raised by the ERT during the review, Iceland explained that the inter-annual changes were due to the incineration of waste to produce heat (for swimming pools and for melting snow) since 2004. The IEF for waste is considerably higher than that for liquid fuels. Further, waste oil was used in the sector from 1990 to 1993. These reasons combined explain the rise in the IEF for the whole sector. The ERT noted that it cannot be the reduction in liquid fuel use that is causing the fluctuations in the IEF, as the IEF is based on the carbon (C) content of the fuel. However, the fluctuations might be explained by a change in the liquid fuel mix caused by the use of energy from waste incineration for the heating of swimming pools and for melting snow. The ERT recommends that Iceland verify this IEF and transparently report its findings in its next annual submission.

Road transportation: liquid fuels – CO₂

47. To estimate CO₂ emissions from mobile combustion in the construction industry, Iceland used a tier 1 methodology and default EFs from the Revised 1996 IPCC Guidelines and AD from NEA data. In section 3.3.2 of the NIR, Iceland reported that estimated CO₂ emissions from oil used for mobile combustion in the construction industry are inconsistently reported between vehicle usage and machinery usage. This could lead to a discrepancy in the actual estimated emissions, as the CO₂ EFs for vehicle usage and for machinery usage differ. The ERT recommends that Iceland ensure the correct allocation of CO₂ emissions related to vehicle usage and those related to machinery usage under the manufacturing industries and construction category, and that the Party use country-specific EFs, and describe how the AD are generated and report the AD and EFs in the next annual submission.

Road transportation: liquid fuels – N₂O

48. In the NIR, Iceland has reported, without providing any further explanation, that the AD and EFs used to estimate N₂O emissions from road transportation were highly

uncertain. The total uncertainty of the estimate of N₂O emissions from road transportation reported by Iceland is 206 per cent. However, the ERT noted that Iceland used the IPCC default EFs, for both gasoline and diesel, and that the same AD were used to estimate CO₂ and CH₄ emissions from road transportation, which were not as highly uncertain. The ERT recommends that Iceland revise its uncertainty estimate for N₂O emissions from road transportation and clearly describe how the AD were collected in the NIR of its next annual submission.

4. Non-key categories

Oil and natural gas: liquid fuels – CH₄

49. Iceland has reported CH₄ emissions from the distribution of oil products as “NE”, owing to a lack of AD and/or time constraints on additional data collection in the preparation of the 2010 annual submission. The ERT encourages Iceland to explore means to estimate CH₄ emissions from the distribution of oil products and to report the results in its next annual submission.

C. Industrial processes and solvent and other product use

1. Sector overview

50. In 2008, emissions from the industrial processes sector amounted to 1,992.15 Gg CO₂ eq, or 40.8 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 8.92 Gg CO₂ eq, or 0.2 per cent of total GHG emissions. Since 1990, emissions have increased by 130.9 per cent in the industrial processes sector and decreased by 36.0 per cent in the solvent and other product use sector. The key driver for the increase in emissions in the industrial processes sector is the expansion of energy-intensive industries, in particular aluminium and ferroalloys production. Within the industrial processes sector, 93.2 per cent of the emissions were from metal production, followed by 3.7 per cent from consumption of halocarbons and SF₆ and 3.1 per cent from mineral products.

51. The CRF tables include emission estimates for all gases and almost all categories in the industrial processes sector, in accordance with the Revised 1996 IPCC Guidelines. The inventory is complete in terms of geographical coverage and years. The ERT noted that Iceland has reported the emissions for some categories for which there is no guidance in the Revised 1996 IPCC Guidelines or the IPCC good practice guidance as “NE”, such as CO₂ emissions from road paving with asphalt, and from food and drink. The ERT encourages Iceland to estimate emissions for these categories and to report thereon in its next annual submission.

52. The ERT noted that descriptions of the AD, EFs and methodologies used were not provided for the limestone and dolomite use category or for the solvent and other product use sector. The ERT recommends that Iceland increase the completeness and transparency of the NIR by including, in its next annual submission, complete descriptions of the methodologies used to quantify emissions as well as the EFs used, especially where plant-specific data are used and category-specific QA/QC procedures are undertaken.

2. Key categories

Ferroalloys production – CO₂

53. Only one plant produces ferroalloys in Iceland. The AD used in the calculations were plant-specific. However, a default CO₂ EF (3.9 t/t), taken from table 2.15 of the

reference manual of the Revised 1996 IPCC Guidelines, was used to estimate the emissions. The ERT noted that Iceland also used the CO₂ IEF (3.52 t/t) for 2008 in the description of calculations to fulfil the requirements of decision 14/CP.7. Further, EFs for CH₄ as well as for nitrogen oxide and non-methane volatile organic compound (NMVOC) emissions (though these are non-key categories) were also taken from the Revised 1996 IPCC Guidelines. The ERT recommends that Iceland use not only AD but also EFs directly collected by the plant. In addition, the ERT recommends that Iceland provide a detailed description of the AD and EFs used, in order to improve the transparency of its reporting, in the next annual submission.

54. During the review, the ERT raised a question regarding the emissions from iron as part of ferrosilicon. Iceland responded that the iron ore contains traces of carbon, as does the final product; however, this was not reported in the 2010 annual submission. To clarify this issue, Iceland informed the ERT that it would organize a meeting with the owner of Elkem Iceland in October 2010 to review the emission calculations. The ERT welcomes this initiative to review the emission calculations and recommends that Iceland include any improvements that could potentially result from this meeting and also report on the outcome of the meeting in its next annual submission.

Aluminium production – CO₂ and PFCs

55. Three plants produce aluminium in Iceland. Estimated CO₂ emissions were calculated using a tier 1 method based on the quantity of electrodes used in the process and using the EFs from the Revised 1996 IPCC Guidelines. The ERT noted that Iceland used similar CO₂ EFs to those used in the description of the calculation of estimated process-related emissions to fulfil the requirements of decision 14/CP.7. The EFs for PFCs were calculated using a tier 2 slope method. Default coefficients were taken from the IPCC good practice guidance for centre-worked prebaked technology. AD were collected annually from the plants. The ERT recommends that Iceland use not only the AD but also the EFs and other parameters directly collected by the plants. In addition, the ERT recommends that Iceland provide a detailed description of the AD and EFs used, in order to improve the transparency of its reporting, in the next annual submission.

3. Non-key categories

Limestone and dolomite use – CO₂

56. Iceland reported CO₂ emissions from limestone and dolomite use in the CRF tables, but did not provide a description of the estimation methodology, AD and EFs used or the emission trends in the NIR. The ERT recommends that Iceland include a complete description with regard to the emission estimates, methodology, AD and EFs used and the emission trends, in order to improve the transparency of its reporting, in the next annual submission.

Solvent and other product use – CO₂, N₂O and NMVOCs

57. Iceland reported CO₂, N₂O and NMVOC emissions from the solvent and other product use sector in the CRF tables, but did not provide a description of the estimation methodologies, AD and EFs used in the NIR. The ERT recommends that Iceland provide more detailed and transparent information in the NIR with regard to the emission estimates, and methodologies, AD and EFs used, in order to improve the transparency of its reporting, in the next annual submission.

4. Information provided under decision 14/CP.7

58. Iceland provided information in the NIR to fulfil the requirements of decision 14/CP.7 on the “Impact of single projects on emissions in the commitment period”. Four projects under ferroalloys production and aluminium production are reported by Iceland to fulfill the provisions of decision 14/CP.7 in 2008. Electricity produced from renewable energy resources are used in all heavy industry and total CO₂ emissions from these projects amounted to 1,163.00 Gg CO₂ eq. The total emission savings from the projects are estimated by Iceland to be 9,439.00 Gg CO₂ eq compared with using electricity from coal fired power plants. The ERT noted that the estimate of emission savings is based on a hypothetical case of electricity production being entirely coal based compared with energy production being entirely based on renewable energy resources. Following the recommendation of the previous review report, Iceland provided structured information on production AD and EFs used, a description of the industrial process facility, and estimates of CO₂ emissions for each project, thereby improving the transparency of the NIR.

59. The ERT noted that Iceland did not fully demonstrate the use of the best environmental technology, namely by the comparison of the EFs of other technologies with the EFs of the technologies currently used for all projects. The ERT further noted that AD and EFs used to fulfil the requirements of decision 14/CP.7 for process-related emissions under ferroalloys and aluminium production were consistent with the data presented in the CRF tables. The ERT recommends that Iceland undertake a comparison of the EFs of the technologies used in the four projects with the EFs of the best environmental technology and provide a clear description of this comparison as well as the actual EFs used for the projects in its next annual submission

D. Agriculture

1. Sector overview

60. In 2008, emissions from the agriculture sector amounted to 566.39 Gg CO₂ eq, or 11.6 per cent of total GHG emissions. Since 1990, emissions have decreased by 1.5 per cent. The key driver for the fall in emissions is a decrease in the livestock population, such as cattle and sheep. However, since 2006, the emission level has begun to increase, owing to a rise in synthetic fertilizer use. Within the sector, 50.7 per cent of the emissions were from agricultural soils, followed by 40.7 per cent from enteric fermentation. The remaining 8.6 per cent were from manure management.

61. For 2008, the emission estimates for the agriculture sector are complete in terms of geographical coverage, categories and gases, as recommended by the Revised 1996 IPCC Guidelines. To estimate emissions from the agriculture sector, the IPCC tier 1 method and default EFs were applied for most of the key categories, except for the category enteric fermentation for cattle and sheep, for which country-specific EFs have been developed since the 2009 annual submission. The ERT welcomes these efforts and recommends that Iceland use higher-tier methods and country-specific EFs to estimate emissions for the key categories.

62. The transparency of the reporting on the agriculture sector has improved slightly since the 2009 annual submission. However, in the 2010 NIR, Iceland did not provide sufficient information on AD collection and methodologies and EFs used to enable the assessment of the accuracy of the emission estimates. The ERT recommends that Iceland include detailed descriptions of the AD and methodologies used and justifications for the EFs used, to improve the transparency of the reporting, in the NIR of its next annual submission.

63. In the 2010 annual submission, Iceland has included information on recalculations in the agriculture chapter of the NIR, as recommended in the previous review report. The ERT noted that the NIR did not contain information on the implementation of QA/QC activities and planned improvements for the agriculture sector. The ERT recommends that Iceland follow the requirements of the UNFCCC reporting guidelines regarding the structure of the inventory and that it include in the NIR information on the implementation of QA/QC activities and planned improvements. The ERT also noted that the uncertainty estimates for EFs have not been revised, despite the development of country-specific EFs for the 2010 annual submission. The ERT therefore recommends that Iceland revise the uncertainty analysis for the agriculture sector in its next annual submission.

64. In the 2010 annual submission, the most significant improvements in the NIR relate to the explanation of the method used for the revision of the average livestock population. Iceland revised the average livestock population by including young animals, which are mostly excluded from the official statistics of Iceland. In addition, Iceland implemented the recommendations of the previous review report by developing country-specific CH₄ EFs to estimate emissions from enteric fermentation for cattle and sheep, and by reporting the estimates of emissions from the cultivation of organic soils under the agriculture sector.

65. The emission estimates for enteric fermentation, manure management and agricultural soils were recalculated for the entire time series to take these improvements into account. The impact of these recalculations was an increase in the estimated sectoral emissions of 0.4 per cent for 1990 and of 3.4 per cent for 2007.

2. Key categories

Enteric fermentation – CH₄

66. Following the recommendation of the previous review report, Iceland developed country-specific EFs for cattle and sheep, based on the IPCC tier 2 approach. The ERT commends Iceland for this improvement. For other livestock species, Iceland used the IPCC default method and EFs, except for fur animals, for which Iceland used the EF from the 2007 NIR of Norway. The ERT noted that the approach taken by the Party is not fully in line with the IPCC good practice guidance but is in accordance with UNFCCC reporting guidelines, according to which Parties should ensure the completeness of their inventory. The ERT recommends that the Party improve the transparency of its inventory by providing more information on the CH₄ EF for fur animals and the rationale behind the choice of the EF. The IEF for dairy cattle has changed from 83.87 kg CH₄/head/year for 1990 to 82.10 kg CH₄/head/year for 2008. However, Iceland did not provide sufficient information in the NIR and the CRF tables on the country-specific EFs used and on productivity data in order to enable the assessment of the accuracy of the feed intake estimates. The ERT recommends that Iceland include all relevant information on the CH₄ EFs and feed intake estimates in the NIR and the CRF tables and provide explanations for the changes in the IEFs for cattle across the time series in its next annual submission.

67. Iceland revised the method of calculation of the livestock population and accounted for young animals, which were mostly excluded from the official statistical data collected by FAI. FAI assisted EA in collecting data on the young animal population for the 2010 annual submission. However, Iceland did not provide, in the NIR, a transparent description of the method used to estimate the average livestock population. In addition, there are significant discrepancies between the official statistical data and the corrected population data for swine and poultry. The data used in the emission calculations are higher than the official statistical data for swine and poultry. For example, for poultry the total population of young animals was estimated on the basis of poultry consumption by the Icelandic nation in 2002 and the same ratio was used for all years from 1990. The ERT concludes that this

method for the estimation of AD is not accurate because import data could be included in the data on poultry consumption. The ERT recommends that Iceland include sufficient information on the collection of AD and that it revise, if needed, the annual livestock population estimates in its next annual submission.

Manure management – N₂O

68. In the 2010 annual submission, Iceland reported revised nitrogen (N) excretion rates for cattle and swine. The N excretion rates for cattle were estimated for the entire time series on the basis of research carried out in 1991 and 1998. Iceland reported in the NIR that there have been some changes in the management practices for cattle over the time series. Iceland therefore made an assumption that the N excretion rate for dairy cattle grows linearly over the course of the time series, reaching the final value in 2000, which has been used for the period 2000–2008. The ERT concludes that an increase in the N excretion rate for cattle contradicts the data on feed intake provided in CRF table 4.A, as the feed intake decreased between 1990 and 2000 and began to increase from 2001 onwards. The ERT recommends that Iceland re-evaluate the N excretion rates for all animal species on the basis of data on feeding and production in the country, in order to improve the accuracy of the estimates for this category and the consistency of the emission estimates across the categories in the agriculture sector.

Direct soil emissions – N₂O

69. In Iceland, N₂O emissions from crop residues include emissions from potatoes and barley only. In the previous review report, the ERT recommended that Iceland review the national information sources and demonstrate that indeed only potatoes and barley are cultivated in Iceland. However, the issue was not transparently addressed in the 2010 NIR and the ERT therefore reiterates this recommendation.

70. In the 2010 annual submission, Iceland reported emissions from the cultivation of drained organic soils on grassland under the agriculture sector, following the recommendation of the previous review report. To estimate N₂O direct soil emissions, Iceland used a country-specific EF (0.99 kg N₂O–N/ha), which is the lowest value reported among all reporting Parties, for the entire time series (the IPCC default value is 8 kg N₂O–N/ha). In addition, Iceland did not provide sufficient explanation in the NIR for the use of this EF. In response to a question raised by the ERT during the review, Iceland explained that the country-specific N₂O EF was based on 231 measurements carried out for hayfields on drained organic soils. The measurements were conducted within the framework of a project⁶ and the results were reported to the Icelandic Centre for Research (Guðmundsson, 2009). The ERT recommends that Iceland provide further information on the research carried out to obtain this country-specific EF and an explanation of the appropriateness of its use, in order to improve the transparency of its reporting, in its next annual submission.

3. Non-key categories

Manure management – CH₄

71. Iceland estimated CH₄ emissions from manure management using a tier 1 method and default EFs for the Western European cool climate region taken from the Revised 1996 IPCC Guidelines. Iceland reported in the NIR that the use of these EFs may have led to an overestimation of emissions for native Icelandic livestock, in particular for cows, sheep and

⁶ Losun hláturgass og annarra gróðurhúsalofttegunda úr lífrænum jarðvegi við mismunandi landnotkun [in English: “Emissions of nitrous oxides and other greenhouse gases from organic soils under different land uses”].

horses, which are smaller than animals in Western Europe. The ERT encourages Iceland to explore the possibility of applying higher-tier estimation methods for the most significant animal types in order to improve the accuracy of the emission estimates in its next annual submission.

E. Land use, land-use change and forestry

1. Sector overview

72. In 2008, net emissions from the LULUCF sector amounted to 1,996.50 Gg CO₂ eq. Since 1990, net emissions have decreased by 15.3 per cent. The key driver for the fall in emissions is the increase in removals from revegetation activities. Within the sector, 997.24 Gg CO₂ eq of net emissions were from cropland, followed by 804.78 Gg CO₂ eq from grassland and 16.18 Gg CO₂ eq from wetlands, and the remaining 298.74 Gg CO₂ eq from the category other. Emissions were offset by 135.21 Gg CO₂ eq of net removals from forest land.

73. For reporting on the LULUCF sector, the land use and land-use change categories were determined on the basis of the Icelandic Geographic Land-Use Database (IGLUD). AD on afforestation and deforestation were obtained from the Icelandic Forest Research and AD on revegetation were obtained from SCSI. The information was well documented in the 2010 annual submission. The IPCC higher-tier (tier 2/3) methods and country-specific parameters were used to estimate the reported emissions by sources and removals by sinks. The ERT noted that Iceland collected accurate information on land use and land-use change and on the geographical identification of lands, but did not provide a correct land transition matrix in its 2010 annual submission. The ERT recommends that Iceland develop a land-use conversion matrix and provide detailed explanatory information on how the land-use conversion matrix has been developed in the NIR of its next annual submission.

74. For 2008, Iceland reported net CO₂ emission/removal estimates for the mandatory categories, such as forest land remaining forest land, land converted to forest land, cropland remaining cropland, land converted to cropland, land converted to grassland and land converted to wetlands. Iceland reported emissions/removals using notation keys for the mandatory categories, such as grassland remaining grassland (“IE” and “NE”), land converted to settlements (“NE”) and land converted to other land (“NE”). In addition, for the optional categories, such as wetlands remaining wetlands and settlements remaining settlements, Iceland reported the emissions/removals as “NE”. Direct N₂O emissions from N fertilization, non-CO₂ emissions from the drainage of soils and wetlands and CO₂ emissions from agricultural lime application are reported. N₂O emissions from disturbance associated with land-use conversion to cropland are reported as “NE”. CO₂ emissions from agricultural lime application are reported for cropland only, while for grassland they are reported as not occurring (“NO”). The AD for and CO₂, CH₄ and N₂O emissions from biomass burning are reported as “NE”.

75. The ERT noted that the reporting on the LULUCF sector is generally not complete. The ERT therefore recommends that Iceland make the necessary efforts to include estimates for the mandatory categories and pools and encourages Iceland to make efforts to include estimates for the missing optional categories (i.e. grassland remaining grassland, settlements and harvested wood products), which are likely to be relevant for the country, in its next annual submission.

76. Tier 1 QC procedures were applied for the LULUCF sector. A quantitative uncertainty analysis was not conducted for the sector. Recalculations were performed for the years 1990–2007, resulting in an increase in total estimated emissions from the

LULUCF sector of 56.6 per cent for 1990 and of 67.6 per cent for 2007. The two main causes of the increase in the estimated emissions from the LULUCF sector are the separation of drained organic soils into “wetlands converted to cropland” and “wetlands converted to grassland” and the use of an EF for cropland higher than the one for grassland. The ERT welcomes this improvement and reiterates the recommendation made in the previous review report that Iceland develop and implement sector-specific QA/QC procedures and conduct a quantitative uncertainty analysis for the sector for its next annual submission.

77. In the 2010 annual submission, Iceland made a significant improvement on the previous annual submission by implementing a more detailed land-use classification. The subcategories of forest land have been disaggregated. Forest land remaining forest land is now divided into: “natural birch forest”, “afforestation older than 50 years” and “plantations in natural birch forest”. Land converted to forest land is now reported as “afforestation 1–50 years old”. The subcategories of cropland have also been disaggregated. In the previous annual submissions, all emissions from drained wetlands were reported in an aggregate form; for example, carbon stock changes and N₂O emissions were reported under wetlands converted to grassland. In the 2010 annual submission, carbon stock changes in drained wetlands are reported under wetlands converted to cropland and wetlands converted to grassland. N₂O emissions from wetlands converted to grassland are still reported under wetlands converted to grassland, whereas N₂O emissions from drained cropland are reported under the agriculture sector. The ERT welcomes Iceland’s initiative to use a more detailed land-use classification according to the country-specific conditions and in line with the IPCC good practice guidance for LULUCF.

78. Iceland is planning the following inventory improvements for the LULUCF sector: an update of the IGLUD using the new data obtained through remote sensing, geographic information system mapping and field surveys; the improvement of emission/removal factors; and the implementation of QC procedures for different land-use activities. There are several ongoing projects related to individual land-use categories, which are designed to improve the quality of land-area estimates. The approach aims to confirm that the areas subject to afforestation and revegetation are correctly identified and to monitor changes in carbon stocks. The ERT welcomes these planned improvements.

2. Key categories

Forest land – CO₂

79. In 2008, forest land remaining forest land and land converted to forest land contributed net removals of 11.60 Gg CO₂ eq and 123.61 Gg CO₂ eq, respectively. Iceland used a more detailed classification for forest land in the 2010 annual submission than in the previous annual submissions. The conversion period for land converted to forest land has been changed from the default value of 20 years to 50 years on the basis of country-specific studies. Forest land remaining forest land is divided into “natural birch forest”, “afforestation older than 50 years” and “plantations in natural birch forest”. Land converted to forest land is reported as “afforestation 1–50 years old”. The ERT recommends that Iceland also subdivide the afforestation activity before and after 1990 in order to improve the transparency of its reporting under Article 3, paragraph 3, of the Kyoto Protocol.

80. The carbon stock change for natural birch forests in forest land remaining forest land was reported as “NE”. Carbon stock changes in living biomass in “afforestation older than 50 years” and “plantations in natural birch forest” were estimated on the basis of the field sampling of the NNFI. Iceland used the IPCC tier 1 method and a default EF (0.16 t C/ha/year) to estimate CO₂ emissions from organic soils. The Party reported CO₂ emissions/removals from mineral soils and dead organic matter as “NE” and provided

information indicating that these pools are not net sources of emissions. The ERT noted that Iceland plans to estimate carbon stock changes in natural birch forests as well as in mineral soils and dead organic matter. The ERT welcomes this planned improvement and recommends that Iceland report on the effect of the increase in the carbon stock change in the litter pool for afforestation in its next annual submission.

Land converted to cropland – CO₂

81. In 2008, net emissions from land converted to cropland amounted to 991.72 Gg CO₂ eq. The emissions are mainly CO₂ from drained organic soils of wetlands converted to cropland. Estimated CO₂ emissions from wetlands converted to cropland due to changes in soil organic carbon are calculated applying a tier 1 methodology using an EF equal to 5.0 t C/ha/year from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines). Emissions from drained organic soils of cropland are reported separately for the first time in the 2010 annual submission. The ERT welcomes this improvement.

82. Net carbon stock changes in mineral soils of cropland are reported as “NE”. The ERT recommends that Iceland estimate carbon stock changes in this pool for its next annual submission.

Land converted to grassland – CO₂

83. In 2008, net emissions from land converted to grassland amounted to 804.78 Gg CO₂ eq. Within the category, 1,353.27 Gg CO₂ eq emissions were from organic soils of wetlands converted to grassland and removals of 548.49 Gg CO₂ eq were from revegetation activities (other land converted to grassland). The IPCC tier 2 method was used to estimate CO₂ emissions from drained organic soils, but the IPCC default EF value (1.1 t C/ha/year) for peat extraction was chosen instead of the default value for grassland (0.25 t C/ha/year), which may have caused an overestimation of emissions. The ERT reiterates the recommendation of the previous review report that Iceland reconsider the choice of default EF for drained organic soils or include clear additional explanatory information in its next annual submission.

84. An IPCC tier 2 method and country-specific parameters were used to estimate carbon stock changes in living biomass and mineral soils for other land converted to grassland. Iceland reported separately carbon stock changes for those lands revegetated before 1990 and after 1990, which facilitated the reporting of revegetation activities elected by Iceland under Article 3, paragraph 4, of the Kyoto Protocol. The ERT welcomes Iceland’s initiative to use an IPCC tier 2 method and country-specific parameters for this subcategory in line with the IPCC good practice guidance for LULUCF.

F. Waste

1. Sector overview

85. In 2008, emissions from the waste sector amounted to 221.03 Gg CO₂ eq, or 4.5 per cent of total GHG emissions. Since 1990, emissions have increased by 23.1 per cent. The key driver for the rise in emissions is the increase in the total amount of waste disposed of in solid waste disposal sites (SWDS). Within the sector, 88.6 per cent of the emissions were from solid waste disposal on land, followed by 10.2 per cent from wastewater handling, 0.8 per cent from other (compost production) and the remaining 0.4 per cent from waste incineration.

86. The inventory for the waste sector is complete in terms of gases, years and categories. Iceland has calculated and reported emission estimates for all required

categories in the waste sector. The methods and EFs used are in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance.

87. The documentation on the industrial activities included in the emission estimates for the industrial wastewater category was not sufficiently transparent to enable a full understanding of the rationale behind the method used to identify the industrial activities with the greatest potential for emitting CH₄ in the country (see para. 95 below). The ERT encourages the Party to further improve the transparency of its reporting by including information on the AD used for the categories solid waste disposal on land, wastewater handling and waste incineration.

88. An uncertainty analysis was performed only for the key categories. In response to a question raised by the ERT during the review, the Party provided the ERT with information confirming that an uncertainty analysis would be performed for all categories and would be included in the next annual submission. The only recalculation for the waste sector reported in the 2010 annual submission was related to the estimates of emissions from solid waste disposal on land for 2006 and 2007 and was due to the availability of new and revised AD. Iceland did not include in the NIR information on QA/QC procedures or planned improvements for the waste sector. The ERT recommends that Iceland include information on QA/QC procedures and category-specific planned improvements for the waste sector in the next annual submission.

2. Key categories

Solid waste disposal on land – CH₄

89. CH₄ emissions from solid waste disposal on land increased by 46.2 per cent during the period 1990–2008. The key driver for the increase in CH₄ emissions from landfills is an increase in the amount of waste disposed of in landfills. The Party used a tier 2 IPCC first order decay method to estimate CH₄ emissions from SWDS. The method and EFs used are in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. The ERT recommends that Iceland improve the transparency of the inventory by including information in the NIR on the AD used (e.g. the time series of waste amounts between 1950 and 2008) in its next annual submission.

90. Iceland recalculated the estimates of emissions from solid waste disposal on land for 2006 and 2007 owing to the availability of new and revised AD. The ERT noted that this was due mainly to a revision of the amounts of industrial waste, and that a larger part of industrial waste was recycled rather than placed in landfill and should therefore not be included in the estimates as it was in the previous annual submission. The ERT noted that the recalculation is in line with the IPCC good practice guidance, and encourages the Party to recalculate emission estimates whenever more accurate AD become available. Nevertheless, it is important to pay attention to the consistency of the entire time series when recalculating only a part of it. The ERT encourages Iceland to further study the time-series consistency of the AD and to report its findings in its next annual submission.

91. The ERT noted that a constant value for waste composition was used for the emission estimates for the period 1950–2008, which is not realistic as consumption patterns have changed throughout the time series. Since 1990, waste management practices have changed; for example, open pit burning of waste has decreased and the recycling of waste has increased in Iceland. The IPCC good practice guidance encourages countries to use country-specific values for waste composition, if available. The Revised 1996 IPCC Guidelines recommend reflecting changes in waste management practices when compiling historical data. Waste composition is one of the main factors influencing emissions from SWDS. The ERT recommends that Iceland explore the possibility of using time-dependent data on waste composition to further improve the accuracy of the inventory. This may be

achieved by using information on waste composition from countries with similar circumstances.

92. The ERT noted that additional information on the fraction of degradable organic carbon in municipal solid waste and CH₄ generation constant values were not provided in the CRF tables. The ERT recommends that Iceland include this information in its next annual submission to further improve the transparency of its reporting.

3. Non-key categories

Wastewater handling – CH₄ and N₂O

93. CH₄ emissions from wastewater handling increased by 12.2 per cent during the period 1990–2008, owing mainly to an increased amount of treated wastewater. The methods and EFs used to estimate emissions are in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance.

94. The ERT noted that a constant value of 31.76 kg/person/year (based on a study done in 2003) for protein intake was used to estimate N₂O emissions from human sewage. In most European countries protein consumption increased during the period 1990–2008, and this should be reflected in the parameters used for the emission estimates. To improve the accuracy of the reporting, the ERT reiterates the recommendation of the previous review report that Iceland further study the possibility of using annual protein intake values from the nutrition statistics of the Food and Agriculture Organization of the United Nations (FAO) if no country-specific data are available. In response to a question raised by the ERT during the review, Iceland informed the ERT that it is planning to utilize the FAO data in the future. The ERT encourages the Party to further study the possibility of producing time-dependent country-specific values for protein intake or to utilize the FAO data.

95. The coverage of industrial activities in the estimates of emissions from industrial wastewater was not documented transparently. For the estimation of these emissions, the Revised 1996 IPCC Guidelines advise reporting Parties to include emission estimates for industries with the largest potential for emitting CH₄ from wastewater treatment. The Revised 1996 IPCC Guidelines and the IPCC good practice guidance provide EFs for a range of industrial activities. In response to a question raised by the ERT during the review, Iceland did not provide totally transparent information on the industrial activities with a high potential for emitting CH₄ that were included in the inventory. There are significant differences in the potential for emitting CH₄ of different types of industrial wastewater. To further improve the transparency of the inventory, the ERT recommends that Iceland document more transparently the method used to identify the industrial activities with the greatest potential for emitting CH₄ in the country and that it report thereon in its next annual submission.

96. The ERT noted that Iceland reported the CH₄ emissions from domestic and commercial sludge as “NE” in the CRF tables. In response to a question raised by the ERT during the review, Iceland informed the ERT that the notation key will be changed from “NE” to “NO” in its next annual submission, owing to the fact that sludge is disposed to SWDS and included in the emission estimates for SWDS. The ERT recommends that Iceland use the appropriate notation keys, in order to improve the transparency of its reporting, in the next annual submission.

Waste incineration – CO₂

97. CO₂ emissions from waste incineration fluctuated and decreased by 85.5 per cent during the period 1990–2008. The reasons for this trend have not been transparently explained in the NIR. The methods and EFs used to estimate the emissions are in line with

the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. In response to a question raised by the ERT during the review, the Party provided the ERT with information showing that waste incineration without energy recovery has decreased dramatically since 1990. However, this does not explain the use of the exact same value for the incinerated amount of waste reported for 2006 and 2007. To further improve the transparency of the inventory, the ERT recommends that Iceland include information on the AD used and the reasons behind the fluctuating trend in the time series in its next annual submission.

Other (compost production) – CH₄ and N₂O

98. In Iceland, the composting of waste started in 1995. Since then, emissions from compost production have increased by around 400 per cent, owing mainly to the introduction of new composting facilities. The methods and EFs used to estimate the emissions are in line with the 2006 IPCC Guidelines and the IPCC good practice guidance. The ERT noted that uncertainties were reported as “NE” for this category. According to the IPCC good practice guidance, it is good practice to estimate uncertainties for all categories. The ERT therefore recommends that Iceland estimate and report uncertainties for this category in its next annual submission.

G. Supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol

1. Information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Overview

99. The information reported by Iceland on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol is generally in line with the requirements outlined in paragraphs 5–9 of the annex to decision 15/CMP.1. However, in its 2010 annual submission, Iceland has provided incorrect information on land areas subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in KP-LULUCF table NIR-2 on land transitions. During the review, the ERT noted and communicated to the Party that the national system has to ensure that land areas subject to LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol⁷ are identifiable, and that information on these areas should be provided by all Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol in their national inventories in accordance with Article 7 of the Kyoto Protocol. The ERT recommends that Iceland provide correct information on land areas subject to KP-LULUCF activities in the land transition matrix in its next annual submission.

100. Iceland reported on afforestation/reforestation activities for 2008 and revegetation activities for 1990 and 2008 in the CRF tables. Deforestation was not detected through the systematic sampling of permanent plots and was therefore reported as “NO”. For 2008, Iceland reported the changes in the carbon pool for litter and deadwood as “NE” for afforestation activities under Article 3, paragraph 3, of the Kyoto Protocol. The Party provided additional information in the NIR that demonstrated that litter and deadwood are not a net source of anthropogenic emissions for afforestation. Iceland reported emissions from below-ground biomass and litter as “IE” for revegetation under Article 3, paragraph 4, of the Kyoto Protocol for 1990 and 2008. The ERT recommends that Iceland estimate emissions from these pools separately for its next annual submission.

⁷ Decision 16/CMP.1.

Activities under Article 3, paragraph 3, of the Kyoto Protocol*Afforestation and reforestation – CO₂*

101. In 2008, net removals from afforestation and reforestation activities amounted to 101.18 Gg CO₂ eq. This includes 102.45 Gg CO₂ eq of removals from units of land not harvested since the beginning of the commitment period, emissions of 1.17 Gg CO₂ eq from units of land harvested since 1990 and direct N₂O emissions of 0.10 Gg CO₂ eq from N fertilization.

102. Afforestation and reforestation activities since 1990 are estimated using systematic sampling of permanent plots. The plots of the cultivated forest will be re-measured at five-year intervals. Re-measurements of the cultivated forest will start in 2010. At each plot, the current land use is assessed and compared with the former land use. The ERT welcomes Iceland's efforts to report on afforestation/reforestation activities in line with the IPCC good practice guidance for LULUCF. The ERT recommends that Iceland improve the estimates of the deforested area and the estimates of emissions from deforestation in its next annual submission.

Activities under Article 3, paragraph 4, of the Kyoto Protocol*Revegetation – CO₂*

103. Record-keeping of land use until 1990 is fragmented, with the emphasis more on the revegetation activities and less on their spatial extent. The intensified need to report on revegetation activities since 1990 has improved spatial documentation, as aerial and satellite imagery has been used for the determination of boundaries. Since 2002 most revegetation activities have been recorded using the global positioning system. Data on post-1990 revegetation areas are kept in a database containing data on changes in carbon stocks of revegetation areas, and are estimated using systematic sampling on predefined grids measuring 1.0 by 1.0 km.

104. Iceland has reported on revegetation activities for 1990 and 2008. The removals due to revegetation are calculated using the net-net approach (i.e. the removals in 1990 should be subtracted from the removals in 2008). The removals reported for 1990 amount to 279.58 Gg CO₂ eq, including both the removals due to revegetation activities prior to 1990 and in 1990. The areas involved are 98.81 kha (prior to 1990) and 2.86 kha (in 1990), or a total of 101.67 kha. The removals reported for 2008 amount to 548.49 Gg CO₂ eq, resulting in net removals of 268.91 Gg CO₂ eq due to revegetation activities since 1990. During the review, the ERT received additional information from the Party clarifying the calculation method. The ERT welcomes Iceland's efforts to report on revegetation activities in line with the IPCC good practice guidance for LULUCF.

2. Information on Kyoto Protocol unitsStandard electronic format and reports from the national registry

105. Iceland has not reported information on its accounting of Kyoto Protocol units in the required SEF tables, as required by decisions 15/CMP.1 and 14/CMP.1. This is because Iceland has not yet transferred or acquired any Kyoto Protocol units and the national registry is not yet connected to the ITL in full operational live mode. The SIAR was forwarded to the ERT prior to the review, pursuant to decision 16/CP.10.

106. Although the national registry does not yet have a live connection with the ITL, the SIAR noted that the national registry continues to fulfil the requirements related to its reporting and accounting of information on Kyoto Protocol units, transaction procedures,

adherence to the technical standards for data exchange between registry systems, and security, data integrity, data safeguard and disaster recovery measures.

National registry

107. The ERT took note of the SIAR and its finding that the reported information on the national registry is complete and has been submitted in accordance with the annex to decision 15/CMP.1. The ERT also took note of the SIAR and its finding that the national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with decisions 16/CP.10 and 12/CMP.1. The national registry also has adequate security, data safeguard and disaster recovery measures in place. However, the SIAR identified that Iceland should make the required information publicly available as soon as a live connection with the ITL is in place. The ERT reiterates the recommendation of the previous review report that Iceland provide the public information referred to in paragraphs 45–48 of the annex to decision 13/CMP.1 and report on any changes to that information in its next annual submission.

Calculation of the commitment period reserve

108. Iceland has reported its commitment period reserve in its 2010 annual submission. Although the calculation is based on the assigned amount, the assigned amount used by the Party did not correspond to the value reported in the initial report review. In response to a question raised by the ERT during the review, Iceland reported its revised commitment period reserve as 16,671,462 t CO₂ eq. The ERT agrees with this figure.

3. Changes to the national system

109. Iceland reported that there have been no changes to its national system since the previous annual submission. The ERT concluded that the Party's national system continues to be in accordance with the requirements of national systems outlined in decision 19/CMP.1.

4. Changes to the national registry

110. Iceland reported that there have been no significant changes to its national registry since the previous annual submission. The ERT concluded that the Party's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

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

111. Iceland has reported information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, as requested in chapter I.H of the annex to decision 15/CMP.1, in its 2010 annual submission. The information is contained in chapter 14 of the NIR.

112. The reported information is considered complete and transparent. Iceland reported information on the following activities: the planning of economic instruments to limit emissions; cooperation with France and the United States of America on carbon dioxide capture and storage projects; and the provision of support to developing country Parties in the area of sustainable utilization of natural resources through the administration of the Geothermal Training Programme of the United Nations University. The ERT encourages

Iceland to report further information on activities to minimize adverse impacts, such as activities related to assisting developing country Parties, which are highly dependent on the export and consumption of fossil fuels, and on the engagement of research institutes and technological development centres in the development of non-energy uses of fossil fuels.

III. Conclusions and recommendations

113. Iceland submitted a complete set of CRF tables for the period 1990–2008 on 23 April 2010. The NIR was submitted on 27 May 2010 and resubmitted on 1 June 2010. Iceland also submitted supplementary information under Article 7, paragraph 1, of the Kyoto Protocol, including information on: activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol; accounting of Kyoto Protocol units; changes to the national system and the national registry; and minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. This is in line with decision 15/CMP.1.

114. The ERT concludes that the 2010 annual submission of Iceland has been prepared generally in line with the UNFCCC reporting guidelines. However, there is a need for further improvements, especially in the energy, solvent and other product use, agriculture and waste sectors. The 2010 annual submission is complete in terms of geographical coverage, years and sectors, and generally complete in terms of categories and gases. The exception is the LULUCF sector, for which the emissions/removals for the mandatory categories were reported using the notation keys: for example, emissions/removals from grassland remaining grassland were reported as “IE” and “NE”, and those from land converted to settlements and land converted to other land were also reported as “NE”. In addition, Iceland reported emissions for some categories as “NE”, in particular CO₂ and CH₄ emissions from the distribution of oil products in the energy sector, and CO₂ emissions from road paving with asphalt and from food and drink in the industrial processes sector, without sufficient explanation for the use of the notation keys “NE” and “IE”.

115. The information required under Article 7, paragraph 1, of the Kyoto Protocol has been prepared and reported in accordance with decision 15/CMP.1.

116. The CRF tables have been provided for all years of the time series. However, the ERT noted that some explanatory information is missing from the CRF tables. This relates to CRF table 8(b), where limited explanatory information on recalculations is provided, and CRF table 9(a), where explanatory information on the use of the notation key “NE” is given only for the LULUCF sector.

117. Iceland has not reported information on its accounting of Kyoto Protocol units in accordance with chapter I.E of the annex to decision 15/CMP.1, as it has not yet transferred or acquired any Kyoto Protocol units.

118. Iceland selected commitment period accounting for activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol and the reporting on most of the information is in line with the requirements outlined in paragraphs 5–9 of the annex to decision 15/CMP.1. The ERT noted that the information on land areas subject to KP-LULUCF activities in the land-transition matrix needs to be improved (see para. 99 above). The ERT further noted that changes in the carbon pool for litter and deadwood under afforestation/deforestation activities are reported as “NE” and emissions from below-ground biomass and litter for revegetation are reported as “IE”.

119. The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1. However, with regard to the cooperation between EA, the inventory compiler, and NEA, the main energy statistics supplier, the ERT found that,

despite the obligations stated in the formal agreement, NEA has still not compiled and provided EA with the annual national energy balance.

120. The national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the CMP.

121. Iceland has reported the information requested in chapter I.H of the annex to decision 15/CMP.1, "Minimization of adverse impacts in accordance with Article 3, paragraph 14", as part of the 2010 annual submission. The reported information is considered complete and transparent.

122. Iceland provided information in the NIR to fulfil the requirements of decision 14/CP.7 on the "Impact of single projects on emissions in the commitment period". Four projects under ferroalloys production and aluminium production are reported by Iceland to fulfill the provisions of decision 14/CP.7 in 2008. Electricity produced from renewable energy resources are used in all heavy industry and total CO₂ emissions from these projects amounted to 1,163.00 Gg CO₂ eq. The total emission savings from the projects are estimated by Iceland to be 9,439.00 Gg CO₂ eq compared with using electricity from coal fired power plants. The ERT noted that the estimate of emission savings is based on a hypothetical case of electricity production being entirely coal based compared with energy production being entirely based on renewable energy resources. Iceland will undertake the accounting with respect to decision 14/CP.7 at the end of the commitment period.

123. During the review, the ERT formulated a number of recommendations⁸ relating to the completeness and transparency of the 2010 annual submission. The key recommendations are that Iceland:

(a) Review and strengthen the elements of its national inventory system that would enable the timely submission of its inventory report, and submit its next report by 15 April 2011;

(b) Use a national energy balance for the 2011 annual submission and ensure that it is of a sufficiently high quality and is prepared on time;

(c) Improve the description of the national archiving system and archiving procedures in the NIR of the 2011 annual submission;

(d) Provide more transparent explanatory information on the choice of and describe the methodologies, EFs and AD used, and provide explanations of emission trends, especially in the case of fluctuations in emission trends, to improve the transparency of the reporting;

(e) Revise and improve the current key category analysis so that it can be performed at a more disaggregated level and use the results to prioritize future improvements to the inventory preparation process;

(f) Ensure inclusion in its next annual submission of estimates of emissions for the categories currently reported as "NE" or transparent explanations for the use of the notation key "NE", especially for mandatory categories in the LULUCF sector;

(g) Ensure inclusion in its next annual submission of estimates of emissions from all carbon pools for all activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol, and demonstrate by providing verifiable

⁸ For a complete list of recommendations, the relevant sector chapters of this report should be consulted.

information that the carbon pools that were not accounted were not net sources of anthropogenic GHG emissions;

(h) Fill in the necessary explanatory information on recalculations and the use of the notation keys in the CRF tables, to improve the completeness of the reporting;

(i) Improve the uncertainty analysis by including the LULUCF sector and using, if appropriate, national uncertainty values as presented for forest land;

(j) Further strengthen the QA/QC activities, include in the NIR a description of the sector-specific QA/QC procedures for the agriculture sector and the solvent and other product use sector, further improve the description of the sector-specific QA/QC procedures for the energy and waste sectors and plan and implement the category-specific tier 2 QC procedures for the key categories;

(k) Undertake a comparison of the EFs of the technologies used in the four single projects with the EFs of the best environmental technologies and provide a clear description of this comparison as well as the actual EFs used for the projects in its next annual submission;

(l) Provide the public information on the national registry referred to in paragraphs 45–48 of the annex to decision 13/CMP.1 and report on any changes to that information in its next annual submission.

IV. Questions of implementation

124. No questions of implementation were identified by the ERT during the review.

Annex I

Documents and information used during the review

A. Reference documents

Intergovernmental Panel on Climate Change. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*.

Available at <<http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*.

Available at <<http://www.ipcc-nggip.iges.or.jp/public/gp/english/>>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*.

Available at <<http://www.ipcc-nggip.iges.or.jp/public/gp/lulucf/gp/lulucf.htm>>.

“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/SBSTA/2006/9. Available at

<<http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>>.

“Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention”. FCCC/CP/2002/8. Available at

<<http://unfccc.int/resource/docs/cop8/08.pdf>>.

“Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol”.

Decision 19/CMP.1. Available at

<<http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>>.

“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>>.

Status report for Iceland 2010. Available at

<<http://unfccc.int/resource/docs/2010/asr/isl.pdf>>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2010.

Available at <<http://unfccc.int/resource/webdocs/sai/2010.pdf>>.

FCCC/ARR/2009/ISL. Report of the individual review of the annual submission of Iceland submitted in 2009. Available at <<http://unfccc.int/resource/docs/2009/arr/isl.pdf>>.

UNFCCC. *Standard independent assessment report*, parts I and II. Available at

<http://unfccc.int/kyoto_protocol/registry_systems/independent_assessment_reports/items/4061.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Birna Sigrún Hallsdóttir and Ms. Kristín Harðardóttir (Environment Agency of Iceland), including additional material on the methodologies and assumptions used. The following documents¹ were also provided by Iceland:

Guðmundsson. 2009. *Project report to the Icelandic Research Council*

¹ Reproduced as received from the Party.

Annex II

Acronyms and abbreviations

| | |
|--------------------|--|
| AD | activity data |
| AUI | Agricultural University of Iceland |
| C | carbon |
| CH ₄ | methane |
| CMP | Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol |
| CO ₂ | carbon dioxide |
| CO ₂ eq | carbon dioxide equivalent |
| CRF | common reporting format |
| EA | Environment Agency of Iceland |
| EF | emission factor |
| EU ETS | European Union emissions trading scheme |
| ERT | expert review team |
| FAI | Farmers Association of Iceland |
| FAO | Food and Agriculture Organization of the United Nations |
| GHG | greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs and SF ₆ without GHG emissions and removals from LULUCF |
| IEA | International Energy Agency |
| IE | included elsewhere |
| IEF | implied emission factor |
| IGLUD | Icelandic Geographic Land-Use Database |
| IPCC | Intergovernmental Panel on Climate Change |
| ITL | international transaction log |
| kg | kilogram (1 kg = 1,000 grams) |
| LULUCF | land use, land-use change and forestry |
| MFE | Ministry for the Environment |
| N | nitrogen |
| NA | not applicable |
| NE | not estimated |
| NEA | National Energy Authority |
| NMVO | non-methane volatile organic compounds |
| N ₂ O | nitrous oxide |
| NIR | national inventory report |
| NNFI | new national forest inventory |
| NO | not occurring |
| PFCs | perfluorocarbons |
| QA/QC | quality assurance/quality control |
| SCSI | Soil Conservation Service of Iceland |
| SEF | standard electronic format |
| SF ₆ | sulphur hexafluoride |
| SIAR | standard independent assessment report |
| SWDS | solid waste disposal sites |
| UNFCCC | United Nations Framework Convention on Climate Change |