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Climate Change

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Report on the individual review of the annual submission of Iceland submitted in 2022*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual inventory of emissions and removals of greenhouse gases for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual review of the 2022 annual submission of Iceland, conducted by an expert review team in accordance with the “Guidelines for review under Article 8 of the Kyoto Protocol”. The review took place from 19 to 24 September 2022 in Bonn.

* In the symbol for this document, 2022 refers to the year in which the inventory was submitted, not to the year of publication.



Contents

| | <i>Page</i> |
|---|-------------|
| Abbreviations and acronyms | 3 |
| I. Introduction | 5 |
| II. Summary and general assessment of the Party's 2022 annual submission | 6 |
| III. Status of implementation of recommendations included in the previous review report..... | 9 |
| IV. Issues and problems identified in three or more successive reviews and not addressed by the Party | 36 |
| V. Additional findings made during the individual review of the Party's 2022 annual submission | 39 |
| VI. Application of adjustments..... | 44 |
| VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol | 44 |
| VIII. Questions of implementation | 44 |
| Annexes | |
| I. Overview of greenhouse gas emissions and removals and data and information on activities under Article 3, paragraphs 3–4, of the Kyoto Protocol, as submitted by Iceland in its 2022 annual submission | 45 |
| II. Information to be included in the compilation and accounting database | 51 |
| III. Additional information to support findings in table 2 | 55 |
| IV. Reference documents | 56 |

Abbreviations and acronyms

| | |
|--------------------------------|---|
| 2006 IPCC Guidelines | <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i> |
| AAU | assigned amount unit |
| AD | activity data |
| Annex A source | source category included in Annex A to the Kyoto Protocol |
| AR | afforestation and reforestation |
| Article 8 review guidelines | “Guidelines for review under Article 8 of the Kyoto Protocol” |
| BOD | biochemical oxygen demand |
| C | carbon |
| CER | certified emission reduction |
| Cf_i | coefficient for calculating net energy for maintenance |
| CH ₄ | methane |
| CM | cropland management |
| CO | carbon monoxide |
| CO ₂ | carbon dioxide |
| CO ₂ eq | carbon dioxide equivalent |
| Convention reporting adherence | adherence to the “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories” |
| COPERT | software tool for calculating road transport emissions |
| CPR | commitment period reserve |
| CRF | common reporting format |
| CSC | carbon stock change |
| DC | degradable organic component |
| DOC | degradable organic carbon |
| EF | emission factor |
| ERT | expert review team |
| ERU | emission reduction unit |
| EU | European Union |
| EU ETS | European Union Emissions Trading System |
| FM | forest management |
| FMRL | forest management reference level |
| FMRL _{corr} | forest management reference level technical correction |
| Frac _{GASM} | fraction of applied organic nitrogen fertilizer materials and of urine and dung nitrogen deposited by grazing animals that volatilizes as ammonia and nitrogen oxides |
| GHG | greenhouse gas |
| GM | grazing land management |
| HFC | hydrofluorocarbon |
| HWP | harvested wood products |
| IE | included elsewhere |
| IEA | International Energy Agency |
| IEF | implied emission factor |
| IPCC | Intergovernmental Panel on Climate Change |
| IPPU | industrial processes and product use |
| KP-LULUCF | activities under Article 3, paragraphs 3–4, of the Kyoto Protocol |
| KP reporting adherence | adherence to the reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol |
| LULUCF | land use, land-use change and forestry |

| | |
|---|---|
| MSW | municipal solid waste |
| N | nitrogen |
| N ₂ O | nitrous oxide |
| NA | not applicable |
| NCV | net calorific value |
| NE | not estimated |
| NEA | National Energy Authority of Iceland |
| NEU | non-energy use |
| NF ₃ | nitrogen trifluoride |
| NFI | national forest inventory |
| NH ₃ | ammonia |
| NIR | national inventory report |
| NMVO | non-methane volatile organic compound |
| NO | not occurring |
| NO _x | nitrogen oxides |
| PFC | perfluorocarbon |
| QA/QC | quality assurance/quality control |
| RMU | removal unit |
| RV | revegetation |
| SEF | standard electronic format |
| SF ₆ | sulfur hexafluoride |
| SIAR | standard independent assessment report |
| SOC | soil organic carbon |
| SWDS | solid waste disposal site(s) |
| UNFCCC Annex I inventory reporting guidelines | “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories” |
| UNFCCC review guidelines | “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention” |
| WDR | wetland drainage and rewetting |
| Wetlands Supplement | <i>2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands</i> |

I. Introduction

1. This report covers the review of the 2022 annual submission of Iceland, organized by the secretariat in accordance with the Article 8 review guidelines (adopted by decision 22/CMP.1 and revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the “UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention” (annex to decision 13/CP.20). The review took place from 19 to 24 September 2022 in Bonn and was coordinated by Claudia do Valle, Javier Hanna and Rocio Lichte (secretariat). Table 1 provides information on the composition of the ERT that conducted the review for Iceland.

Table 1

Composition of the expert review team that conducted the review for Iceland

| <i>Area of expertise</i> | <i>Name</i> | <i>Party</i> |
|--------------------------|---------------------------|--------------|
| Generalist | Riccardo De Lauretis | Italy |
| | Robert Sturgiss | Australia |
| Energy | Sander Akkermans | Netherlands |
| | Ulrich Elsenberger | Germany |
| | Leonidas Osvaldo Girardin | Argentina |
| | Benon Bibbu Yassin | Malawi |
| IPPU | Menouer Boughedaoui | Algeria |
| | Mauro Santos | Brazil |
| | Jacek Skośkiewicz | Poland |
| | Erhan Unal | Türkiye |
| Agriculture | Kadir Aksakal | Türkiye |
| | Paulo Cornejo | Chile |
| | Yurii Pyrozhenko | Ukraine |
| LULUCF and KP-LULUCF | Savitri Garivait | Thailand |
| | Mattias Lundblad | Sweden |
| | Koki Okawa | Japan |
| Waste | Maryna Bereznytska | Ukraine |
| | Hlobsile Sikhosana | Eswatini |
| Lead reviewers | Menouer Boughedaoui | |
| | Robert Sturgiss | |

2. The basis of the findings in this report is the assessment by the ERT of the Party’s 2022 annual submission in accordance with the UNFCCC review guidelines and the Article 8 review guidelines.

3. The ERT has made recommendations that Iceland resolve identified findings, including issues¹ designated as problems.² Other findings, and, if applicable, the encouragements of the ERT to Iceland to resolve related issues, are also included in this report.

¹ Issues are defined in decision 13/CP.20, annex, para. 81.

² Problems are defined in decision 22/CMP.1, annex, paras. 68–69, as revised by decision 4/CMP.11.

4. 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.
5. Annex I presents the annual GHG emissions of Iceland, including totals excluding and including LULUCF, indirect CO₂ emissions, and emissions by gas and by sector, and contains background data on emissions and removals from KP-LULUCF, if elected by the Party, by gas, sector and activity.
6. Information to be included in the compilation and accounting database can be found in annex II.

II. Summary and general assessment of the Party’s 2022 annual submission

7. Table 2 provides the assessment by the ERT of the Party’s 2022 annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5.

Table 2

Summary of review results and general assessment of the 2022 annual submission of Iceland

| <i>Assessment</i> | <i>Issue/problem ID#(s) in table 3 or 5^a</i> | |
|--|---|---|
| Dates of submission | Original submission: NIR, 12 April 2022; CRF tables (version 1), 12 April 2022; SEF tables, 13 April 2022 Revised submissions: NIR, 21 and 23 September 2022; CRF tables (versions 2, 3 and 4) 6 May, 21 September and 23 September 2022 Unless otherwise specified, values from the most recent submission are included in this report | |
| Review format | Centralized | |
| Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and the Wetlands Supplement (if applicable) | Have any issues been identified in the following areas: | |
| | (a) Identification of key categories? | No |
| | (b) Selection and use of methodologies and assumptions? | Yes L.12, L.14, L.21, L.31 |
| | (c) Development and selection of EFs? | Yes E.7, E.12, A.4, L.18, L.20 |
| | (d) Collection and selection of AD? | Yes L.6, L.15, L.16, W.2, KL.8 |
| | (e) Reporting of recalculations? | No |
| | (f) Reporting of a consistent time series? | Yes E.13, E.15 |
| | (g) Reporting of uncertainties, including methodologies? | Yes L.6 |
| | (h) QA/QC? | QA/QC procedures were assessed in the context of the national system (see supplementary information under the Kyoto Protocol below) |
| | (i) Missing categories, or completeness? ^b | Yes E.17, L.9, L.17, L.24, W.4, W.8 |
| | (j) Application of corrections to the inventory? | No |
| Significance threshold | For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines? | Yes |
| Description of trends | Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable? | Yes |

| Assessment | Issue/problem ID#(s) in table 3 or 5 ^a |
|--|---|
| Supplementary information under the Kyoto Protocol | Have any issues been identified related to the following aspects of the national system: |
| | (a) Overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements? |
| | Yes G.9 |
| | (b) Performance of the national system functions? |
| | Yes G.5, L.3 |
| | Have any issues been identified related to the national registry: |
| | (a) Overall functioning of the national registry? |
| | No |
| | (b) Performance of the functions of the national registry and the adherence to technical standards for data exchange? |
| | No |
| | Have any issues been identified related to the reporting of information on AAUs, CERs, ERUs and RMUs and on discrepancies in accordance with decision 15/CMP.1, annex, chapter I.E, in conjunction with decision 3/CMP.11, taking into consideration any findings or recommendations contained in the SIAR? |
| | No |
| | Have any issues been identified in matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of the reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, in conjunction with decision 3/CMP.11, including any changes since the previous annual submission? |
| | No |
| | Have any issues been identified related to the following reporting requirements for KP-LULUCF: |
| | (a) Reporting requirements of decision 2/CMP.8, annex II, paragraphs 1–5? |
| | No |
| | (b) Demonstration of methodological consistency between the reference level and reporting on FM in accordance with decision 2/CMP.7, annex, paragraph 14? |
| | No |
| | (c) Reporting requirements of decision 6/CMP.9? |
| | No |
| | (d) Country-specific information to support provisions for natural disturbances in accordance with decision 2/CMP.7, annex, paragraphs 33–34? |
| | No |
| CPR | Was the CPR reported in accordance with decision 18/CP.7, annex; decision 11/CMP.1, annex; and decision 1/CMP.8, paragraph 18? |
| | No G.7 |
| Adjustments | Has the ERT applied any adjustments under Article 5, paragraph 2, of the Kyoto Protocol? |
| | No |
| | Has the Party submitted a revised estimate to replace a previously applied adjustment? |
| | NA Iceland does not have a previously applied adjustment |
| Response from the Party during the review | Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for assessing conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties? |
| | Yes |

| <i>Assessment</i> | | <i>Issue/problem ID#(s) in table 3 or 5^a</i> |
|---|--|---|
| Recommendation for an exceptional in-country review | On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review? | No |
| Questions of implementation | Did the ERT list any questions of implementation? | No |

^a Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5.

^b Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex III.

III. Status of implementation of recommendations included in the previous review report

8. Table 3 compiles the recommendations from previous review reports that were included in the most recent previous review report, published on 1 December 2022,³ and had not been resolved by the time of publication of the report on the review of the Party's 2021 annual submission. The ERT has specified whether it believes the Party had resolved, was addressing or had not resolved each issue or problem by the time of publication of this review report and has provided the rationale for its determination, which takes into consideration the publication date of the most recent previous review report and national circumstances.

Table 3
Status of implementation of recommendations included in the previous review report for Iceland

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
|------------|--|---|--|
| General | | | |
| G.1 | Article 3.14 (G.1, 2021) (G.10, 2019) KP reporting adherence | Report any changes in the information provided under Article 3, paragraph 14, of the Kyoto Protocol in accordance with decision 15/CMP.1 in conjunction with decision 3/CMP.11. | Resolved. Iceland reported in its NIR (section 15, p.375) information on minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol with the explanation that no changes have been made since the previous annual submission. |
| G.2 | National registry (G.2, 2021) (G.2, 2019) (G.3, 2017) (G.4, 2016) KP reporting adherence | Include in the national registry disaster recovery plan information on the roles and responsibilities of primary and alternate registry personnel in disaster recovery; a communication procedure for the contingency plan; documentation for registry operation in a crisis situation; a periodic testing strategy based on procedures agreed with the registry host; and the time frame in which the registry could resume operations following a disaster. | Resolved. Iceland clarified during the review that the responsibility for the management of the national registry rests with the EU under the terms of Commission regulation (EU) 389/2013, which established a Union Registry pursuant to the management of the EU ETS. Iceland joined the Registry subsequent to decision 146/2007 of the European Environment Agency Joint Committee. |
| G.3 | QA/QC and verification (G.6, 2021) (G.6, 2019) (G.7, 2017) Convention reporting adherence | Report in the NIR complete information on the tools and spreadsheets used for QA/QC and present a summary of the revised QA/QC plan and manual once they are finalized. | Addressing. Iceland added to its NIR more information on QA/QC tools and spreadsheets (section 1.5, p.13) and an ongoing improvement plan (section 1.5.5, p.18). During the review, the Party clarified that the revision of the QA/QC plan and manual will be finalized for the 2023 submission. |
| G.4 | QA/QC and verification (G.7, 2021) (G.11, 2019) | Use the 2006 IPCC Guidelines as the only guidelines for QA/QC procedures and for assessing completeness and remove all | Resolved. Iceland removed outdated references to earlier IPCC guidelines in NIR sections 1.3.1–1.3.2 and 1.6–1.7, as well as in the KP-LULUCF sections of the NIR |

³ FCCC/ARR/2021/ISL.

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
|------------|--|---|--|
| | Convention reporting adherence | outdated references to earlier IPCC guidelines from the NIR in order to improve its transparency and comparability. | (chap. 11) and confirmed during the review that it uses only the 2006 IPCC Guidelines for QA/QC procedures and assessments of completeness. |
| G.5 | Recalculations (G.9, 2021) (G.12, 2019) Convention reporting adherence | Improve the QC for the NIR to ensure that all changes affecting the recalculation of a given category are included in the description of the recalculations in the NIR and to ensure consistent reporting of the recalculations between the NIR and the CRF tables. | Addressing. Iceland clarified during the review that it has established a new procedure for documenting recalculations and has implemented this procedure for the energy, IPPU, agriculture and waste sectors, but has not yet implemented it for the LULUCF sector. This new documentation process is intended to improve the reporting of recalculations in the NIR and ensure consistent reporting between the CRF tables and the NIR. The ERT considers that the recommendation has not yet been fully addressed because the Party has not yet applied the updated procedures to the LULUCF sector. |
| Energy | | | |
| E.1 | 1. General (energy sector) (E.3, 2021) (E.5, 2019) (E.18, 2017) Convention reporting adherence | Correct the errors and omissions in the national inventory, such as...(f) Missing use of charcoal. | Resolved. This issue is considered under ID# E.17 below. |
| E.2 | Fuel combustion – reference approach – electrodes – CO ₂ (E.4, 2021) (E.22, 2019) Convention reporting adherence | Remove the separate entries for electrodes from the reference approach and report the correct apparent consumption for the reference approach, allowing for meaningful comparison between the estimated CO ₂ emissions resulting from the two approaches across the time series, and explain the planned recalculation for the reference approach in the next NIR. | Not resolved. Iceland continued to report electrodes in CRF table 1.A(b) as “NO” for the entire time series, with the rationale that all electrodes are used and reported in the IPPU sector. The Party reported in its NIR (section 3.5.2, p.79) information reiterating this interpretation. However, in accordance with the UNFCCC Annex I inventory reporting guidelines, data on the consumption of feedstocks and NEU of fuels is required to be reported in CRF table 1.A(b) (with the amount of carbon excluded entered in cell P37 of that table), and in CRF table 1.A(d), together with an indication of under which category these emissions have been included. |
| E.3 | Fuel combustion – reference approach – CO ₂ (E.5, 2021) (E.26, 2019) Accuracy | Report the results of the data analysis by NEA in the NIR and ensure the use of consistent AD for the inventory estimates across the time series. | Resolved. Iceland reported the results of the data analysis in its NIR (section 3.1.6, p.46). According to the Party, a comprehensive review was performed on how fuel sales data from NEA is attributed to IPCC sectors. The Party performed this analysis for the entire time series and harmonized methodologies for 1990 onward. |
| E.4 | Fuel combustion – reference approach – peat – CO ₂ (E.7, 2021) (E.28, 2019) Convention reporting adherence | Report on peat consistently between the sectoral and the reference approach. | Not resolved. Iceland continued to report peat consumption in CRF table 1.A(b) as “NO” for the entire time series with the rationale that all peat is used for non-energy purposes (mostly gardening), with no associated GHG emissions, and reported in its NIR (table 10.5, p.302) that this issue has been implemented. However, the ERT noted that in accordance with the UNFCCC Annex I inventory reporting guidelines, data on the consumption of peat used for non-energy purposes is required to be reported in CRF table 1.A(b) (with the amount of carbon excluded entered in the column “Carbon fraction excluded from reference approach”) and CRF table 1.A(d), |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
|------------|---|--|--|
| | | | together with an indication of under which category these emissions have been included. |
| E.5 | Fuel combustion – reference approach – solid, liquid and other fossil fuels – CO ₂ (E.8, 2021) (E.29, 2019) Convention reporting adherence | Enhance collaboration among NEA, IEA and relevant national authorities to resolve the errors detected in the data, and report correctly in CRF table 1.A(b) the stock changes for coke oven/gas coke between 2007 and 2012 and make corrections to the emission estimates. | Not resolved. The stock change values reported in CRF table 1.A(b) for coke oven/gas coke for 2007–2012 are related only to sub-bituminous coal while the IEA data include both sub-bituminous coal and coke oven/gas coke. During the review, the Party clarified that it will investigate this issue and check if the values for stock change under coke oven/gas coke reported in the inventory are correct. |
| E.6 | Feedstocks, reductants and other NEU of fuels – liquid fuels – CO ₂ (E.9, 2021) (E.30, 2019) Convention reporting adherence | Correctly fill in CRF table 1.A(d) for lubricants. Correctly estimate and consistently report the use of petroleum coke across the time series. | Addressing. Iceland continued to report “IE” for CO ₂ emissions under the column “CO ₂ emissions from the NEU reported in the inventory” in CRF table 1.A(d) for lubricants and petroleum coke (cells I22 and I23) rather than providing a value for these emissions (in kt CO ₂). For example, for petroleum coke, considering that the carbon fraction excluded from the reference approach is 100 per cent (cell H23) and the CO ₂ excluded is 23.56 kt CO ₂ (cell G23), the Party should report in cell I23 the value of 23.56 kt CO ₂ as CO ₂ emissions from NEU (cell I23); for lubricants, the Party should report in cell I22. The ERT also noted that a similar situation occurs for bitumen, for which the Party reported “NE” under the column “CO ₂ emissions from the NEU reported in the inventory”, but provided the carbon fraction excluded (100 per cent) and a value for CO ₂ excluded of 80.96 kt CO ₂ . Regarding the statement provided by the Party during the previous review on the double counting of petroleum coke between the energy and IPPU sectors, the Party improved the consistency of the reporting for petroleum coke and recalculated emissions under category 1.A.2.f (non-metallic minerals) for 2013–2019 by excluding petroleum coke. As a result, total emissions under category 1.A.2.f were reduced by 0.07–0.13 kt CO ₂ eq for 2013–2019. During the review, the Party clarified that petroleum coke was only accounted for under the energy sector for 2004–2007, when it was used by a cement plant, but since that plant closed in 2007 petroleum coke has not been used in the energy sector (see also ID# E.9 below). The ERT considers that this issue is still not resolved because the Party still reports “IE” for CO ₂ emissions under the column “CO ₂ emissions from the NEU reported in the inventory” in CRF table 1.A(d) for lubricants and petroleum coke. |
| E.7 | 1.A Fuel combustion – sectoral approach – all fuels – CO ₂ (E.10, 2021) (E.10, 2019) (E.21, 2017) Accuracy | Develop country-specific fuel properties (NCVs and carbon content of fuels) that would allow the tier 2 approach for key categories to be used in line with the 2006 IPCC Guidelines. | Addressing. Iceland did not apply country-specific fuel properties to all key categories under the energy sector (NIR tables 3.1–3.2, pp.42–43). Since the 2020 submission the Party has developed country-specific NCVs and carbon contents for gasoline and diesel oil and applied a tier 2 approach for estimating CO ₂ emissions under the key category 1.A.3.b (road transportation). In NIR table 3.40 (p.66), the Party explained how CO ₂ EFs were derived for gasoline and diesel oil: (1) for 2017–2020, both NCVs and carbon contents are based on annual measured data; (2) for |

| ID# | Issue/problem classification ^{a, b} | Recommendation from previous review report | ERT assessment and rationale |
|-----|--|--|--|
| E.8 | 1.A Fuel combustion – sectoral approach – liquid fuels – CO ₂ (E.11, 2021) (E.31, 2019) Convention reporting adherence | Report information on AD and emissions for the information item waste incineration with energy recovery in CRF table 1.A(a)s4. | <p>1990–2016, NCVs are default values and carbon contents are based on the data measured in 2020.</p> <p>For gasoline, the CO₂ EF for 1990–2016, although based on constant values of NCV and carbon content, shows a small variation along the period. This inconsistency is not clarified in the NIR (see also ID# E.12 below). For the categories 1.A.3.d (domestic navigation) and 1.A.4.c.iii (fishing), the Party applied a combined approach (for marine diesel oil) by using the default NCV for 1990–2016 and a measured NCV for 2017–2020 and default carbon content for the entire time series.</p> <p>The Party continued to use a tier 1 approach for the other key categories under the energy sector (NIR table 3.2, p.44) without providing an explanation, in accordance with paragraph 11 of the UNFCCC Annex I inventory reporting guidelines, as to why it was unable to use a higher-tier method. The ERT noted that Iceland used country-specific carbon contents (measured values) only for category 1.A.3.b (road transportation) and did not apply these country-specific values (for diesel and gasoline) to estimate CO₂ emissions for other categories such as in stationary combustion or under categories 1.A.2.g.vii (off-road vehicles and other machinery), 1.A.3.e.ii (other, other transportation) and 1.A.4.c.ii (off-road vehicles and other machinery).</p> <p>During the review, the Party acknowledged that the measured carbon contents for diesel and gasoline (for 2017–2020) could have been applied to categories 1.A.2.g.vii, 1.A.3.e.ii and 1.A.4.c.ii, and provided the ERT with a spreadsheet containing CO₂ emission estimates based on the same country-specific values of NCV and carbon content as applied for category 1.A.3.b. The revised values increased CO₂ emissions for 2020 by 0.17 kt CO₂ eq, which is below the threshold of significance (2.25 kt CO₂ eq) in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines. The Party indicated that it will update CO₂ estimates for categories 1.A.2.g.vii, 1.A.3.e.ii and 1.A.4.c.ii for the next annual submission.</p> |
| E.9 | 1.A.2 Manufacturing industries and construction – solid and liquid fuels – CO ₂ , CH ₄ and N ₂ O (E.12, 2021) (E.1, 2019) | Report information on (b) steam coal consumption and (c) petroleum coke consumption that provides justification for the significant inter-annual changes and gaps in the time series of fuel consumption | Resolved. Iceland reported in its NIR (p.46) the methodology used to harmonize AD (fuel consumption) from the sales statistics; and explained why zero consumption is applied for some years of the times series for some fuels and why inter-annual variation occurs. Further information was included in the NIR (p.52), where the Party explains that sales statistics do not fully specify which type of industry is purchasing |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
|------------|--|--|---|
| | (E.2, 2017) (E.2, 2016) (E.2, 2015) (21, 2014) Transparency | and associated emissions under category 1.A.2.f (non-metallic minerals). | <p>the fuel and that, in order to address this issue, major industrial plants report their fuel use to the Environment Agency of Iceland along with other relevant information on industrial processes. The difference in fuel use between the sales statistics and the sum of values reported by industrial facilities is reported under category 1.A.2.g.viii (other non-specified industry).</p> <p>In addition, the Party has updated some estimates since the original recommendation in 2014 that have, in turn, improved estimates for other bituminous coal and petroleum coke. For other bituminous coal (which, owing to a translation error, was reported as steam coal in the 2014 NIR, p.54), the Party applied an NCV (25.8 TJ/kt) and a carbon content (25.8 kg C/GJ) from the 2006 IPCC Guidelines, as shown in NIR table 3.11 (p.52).</p> <p>Regarding petroleum coke, the Party recalculated emissions under category 1.A.2.f (non-metallic minerals) to correct the double counting with the IPPU sector (see also ID# E.6 above). Petroleum coke is accounted for under the energy sector only for 2004–2007 when it was used by a cement plant (which closed in 2007).</p> |
| E.10 | 1.A.3.a Domestic aviation – jet kerosene – CO ₂ , CH ₄ and N ₂ O (E.25, 2021) Comparability | Correct the allocation of the AD reported for jet kerosene for 2014 between category 1.A.3.a (domestic aviation) and 1.D.1.a (international aviation). | Resolved. Iceland corrected the allocation of jet kerosene for 2014 between categories 1.A.3.a (domestic aviation) and 1.D.1.a (international aviation). The Party provided in its NIR (section 3.3.2.4, p.64) an explanation for the recalculation performed. The AD changed from 542.43 to 251.72 TJ for 2014 in CRF table 1.A(a)s3 as a result of the recalculation and is now consistent with the time series. The changes in the AD for 2014 is equivalent to the value indicated by the Party in the previous review (i.e. 6.7 kt). |
| E.11 | 1.A.3.b Road transportation – diesel oil – CH ₄ and N ₂ O (E.15, 2021) (E.15, 2019) (E.25, 2017) Transparency | Update the NIR with the CH ₄ and N ₂ O EFs used for estimating emissions from diesel oil in road transportation. | Resolved. The original recommendation in 2017 was that the Party recalculate CH ₄ and N ₂ O emissions using default EFs from the 2006 IPCC Guidelines (3.9 kg CH ₄ /TJ and 3.9 kg N ₂ O/TJ respectively) and resubmit emission estimates (in response to a “Saturday Paper”), which was implemented by the Party in subsequent submissions. In the 2020 submission, Iceland changed the reporting for road transport by using COPERT, which uses the tier 3 methodology to estimate N ₂ O and CH ₄ emissions. The ranges of the CH ₄ and N ₂ O IEF values are in accordance with those of other European countries using COPERT. The Party reported further information on the methodology applied in the NIR (p.65). |
| E.12 | 1.A.3.b Road transportation – gasoline – CO ₂ (E.26, 2021) Accuracy | Verify the measured carbon content value for gasoline and apply the correct value, based on the pure fossil fuel, for estimating CO ₂ emissions, and explain in the NIR how the CO ₂ EF was derived, including the values and assumptions for the NCV and carbon content, and how bioethanol is considered in the calculation of the CO ₂ EF. | Addressing. Iceland did not verify the measured carbon content for gasoline to ensure that the correct value (based on the pure fossil fuel) is applied to estimate CO ₂ emissions from road transportation. The Party applied a constant NCV and a constant measured carbon content for 1990–2016 but the CO ₂ EF varied from 69.96 to 70.15 t CO ₂ /TJ in this period. The Party reported in its NIR (section 3.3.3, p.65) that measurements of carbon content in gasoline used in road transport were made for fuel samples from 2019, and new measurements were conducted in 2020. However, during the 2021 review, the Party clarified that the measured carbon content for gasoline was for the fossil fuel blended with bioethanol. The ERT is of the view that |

| ID# | Issue/problem classification ^{a, b} | Recommendation from previous review report | ERT assessment and rationale |
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| E.13 | 1.A.3.b.i Cars – gasoline – CH ₄ and N ₂ O (E.17, 2021) (E.32, 2019) Transparency | Explain in the NIR any significant inter-annual and trend changes in the AD, emissions and IEFs for CH ₄ and N ₂ O emissions related to the use of gasoline for passenger cars. | CO ₂ EFs depend largely on the carbon content of a fuel, which can be different when bioethanol is blended into it. The ERT notes that the Party's calculated CO ₂ EF is for gasoline blended with bioethanol and this probably results in an overestimation of CO ₂ emissions for the energy sector. Addressing. Iceland used the COPERT model for road transport for the whole time series since its 2020 submission. As highlighted in the previous review report, the inter-annual variation in the CH ₄ and N ₂ O IEFs observed in the 2019 review no longer occurs; however, the recalculations led to an inter-annual variation in the N ₂ O EF between 2005 and 2006 (5.16 and 2.37 kg/TJ respectively) and in the related emissions (0.034 and 0.016 kt N ₂ O for 2005 and 2006 respectively) which is not explained in the NIR. |
| E.14 | 1.A.3.b.i Cars – biomass – CO ₂ , CH ₄ and N ₂ O (E.18, 2021) (E.33, 2019) Transparency | Explain any significant inter-annual changes in the AD used for biomass and provide information on the EFs used for biofuels to justify any significant inter-annual changes in the biomass IEFs. | Not resolved. Iceland has recalculated emissions for this category using the COPERT model since the 2020 submission. However, the CO ₂ , CH ₄ and N ₂ O EFs for biomass in the 2022 submission still show some inter-annual variation between 2012 and 2015, and the ERT could not identify in the NIR an explanation of the reasons for these annual changes or trends in AD and EFs or of how EFs were derived. The ERT notes that sales data from NEA are used as AD (NIR table 3.17, p.56). During the review, the Party clarified that this recommendation will be addressed for the next annual submission. |
| E.15 | 1.A.3.e Other transportation – liquid fuels – CO ₂ , CH ₄ and N ₂ O (E.20, 2021) (E.35, 2019) Comparability | Investigate the possibility of separately estimating and reporting fuel consumption by splitting it between ground activities at airports and harbours (category 1.A.3.e.ii), agriculture and forestry (category 1.A.4.c.ii) and manufacturing industries and construction (category 1.A.2) by developing institutional cooperation or by extending the reporting obligations included in Icelandic regulation 520/2017, which is expected to be updated soon. | Addressing. Iceland performed recalculations (see NIR, p.62) to correct the allocation of fuels used for off-road vehicles for 2019 and 2020 in categories 1.A.3.e.ii (other, other transportation), 1.A.4.c.ii (off-road vehicles and other machinery under agriculture/forestry/fishing) and 1.A.2.g.vii (other, off-road vehicles and other machinery), as follows: (a) Fuels used for off-road vehicles in ground activities at airports and harbours that were previously reported under category 1.A.2.g.vii are now reported under category 1.A.3.e.ii; (b) Fuels used for off-road vehicles under category 1.A.2 (manufacturing industries and construction) that were previously reported under category 1.A.2.g.v (other, construction) are now reported under category 1.A.2.g.vii; (c) Fuels consumed under category 1.A.4.c.ii were revised owing to a change in AD reported by NEA. For 1990–2018, emissions for categories 1.A.2.g.vii and 1.A.4.c.ii are reported as “IE” and are included under category 1.A.3.e.ii (see NIR table 3.27, p.60). During the review, the Party explained that sufficient data are not available to enable it to separate fuel consumption in categories 1.A.2.g.vii and 1.A.4.c.ii from category 1.A.3.e.ii for 1990–2018 and indicated that it will extrapolate data (from 2019 and 2020) back to 1990 for the next annual submission. |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| E.16 | 1.A.4 Other sectors – liquid fuels – CO ₂ , CH ₄ and N ₂ O (E.27, 2021) Comparability | Change the notation key from “NO” to “IE” in CRF table 1.A(a)s4 for other machinery used in the category 1.A.4.a.ii (off-road vehicles and other machinery under commercial/institutional) and include information in the NIR on where AD and emissions related to other machinery are reported. | Addressing. Iceland changed the notation key in CRF table 1.A(a)s4 and now reports “IE” for category 1.A.4.a.ii (off-road vehicles and other machinery under commercial/institutional) for the entire time series. However, the Party did not include in the NIR information regarding where AD and emissions related to other machinery are reported or indicate in CRF table 9 where the emissions have been included. The ERT considers that providing information in CRF table 9 (and not in the NIR) is sufficient to be in accordance with paragraph 37(d) of the UNFCCC Annex I inventory reporting guidelines, which states that “Parties should indicate, in the CRF completeness table (table 9), where in the inventory the emissions or removals for the displaced source/sink category that are reported as “IE” have been included.” |
| E.17 | 1.A.4 Other sectors – biomass – CO ₂ , CH ₄ and N ₂ O (E.21, 2021) (E.18, 2019) (E.27, 2017) Completeness | Collect AD on the consumption of charcoal, estimate emissions from charcoal consumption, report the corresponding CO ₂ emissions as a memo item and include the non-CO ₂ emissions in the corresponding CRF table and national totals. | Addressing. Iceland explained during the review that data on imports of charcoal for 2019–2021 were collected from Statistics Iceland and the amount of charcoal used in industry was excluded from these data. The Party estimated the GHG emissions for the charcoal imported and used in industry at approximately 0.03 kt CO ₂ eq per year, which is well below the significance threshold of approximately 2.25 kt CO ₂ eq and thus considered them insignificant in terms of the overall level and trend of national GHG emissions. The ERT noted the Party’s calculation, and that it is below the significance threshold for application of an adjustment in accordance with decision 22/CMP.1, annex, paragraph 80(b), in conjunction with decision 4/CMP.11 and therefore this issue was not included in the list of potential problems and further questions raised by the ERT. However, the ERT, while recognizing that the level of emissions from charcoal consumption is insignificant for the application of adjustments, notes that the emissions should be included in the inventory because justification for exclusion based on the likely level of emissions should be applied at the category level and not to parts of a category or a subcategory, in accordance with footnote 7 to paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines. |
| E.18 | 1.A.4.c.ii Off-road vehicles and other machinery – CO ₂ , CH ₄ and N ₂ O (E.28, 2021) Transparency | Create a separate section in the NIR containing information on off-road vehicles under category 1.A.4.c.ii (off-road vehicles and other machinery under agriculture/forestry/fishing). | Resolved. Iceland created a separate section in its NIR (3.3.1, p.60) that provides information on all categories related to mobile machinery, including 1.A.4.c.ii (off-road vehicles and other machinery under agriculture/forestry/fishing). The section covers mobile sources under categories 1.A.2 (manufacturing industries and construction), 1.A.3 (transport) and 1.A.4 (other sectors) which, for the Party, corresponds to categories 1.A.2.g.vii (where the Party reports off-road vehicles and other machinery in construction), 1.A.3.e.ii (where the Party reports off-road vehicles and other machinery) and 1.A.4.c.ii (where the Party reports off-road vehicles and other machinery under agriculture/forestry/fishing) (see NIR table 3.27, p.60). The section describes the AD, EFs, emissions, recalculations, planned improvements and uncertainties for these categories. |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| E.19 | 1.B.2.d Other (oil, natural gas and other emissions from energy production) – other fuels – CO ₂ and CH ₄ (E.22, 2021) (E.19, 2019) (E.28, 2017) Transparency | Improve the description provided in the NIR of the methodology used to estimate the emissions from geothermal power plants, as this is a key category accounting for 11.1 per cent of the GHG emissions of the energy sector, by providing the necessary details in order to facilitate the replication and assessment of the inventory. | Resolved. Iceland included in its NIR (section 3.4.2.3, p.77), more information on the methodology for direct measurements used for estimating CO ₂ and CH ₄ emissions from geothermal power plants related to the “Icelandic report on the emissions of geothermal power plants in Iceland in 1970–2009”, as indicated in the previous review report. |
| IPPU | | | |
| I.1 | 2. General (IPPU) – CO ₂ , HFCs, PFCs, SF ₆ and NF ₃ (I.1, 2021) (I.1, 2019) (I.1, 2017) (I.3, 2016) Transparency | Report in the CRF tables emission estimates or the relevant notation keys, as appropriate, for: (a) CO ₂ emissions for categories glass production (2.A.3), ammonia production (2.B.1), adipic acid production (2.B.3), soda ash production (2.B.7); (b) HFC, PFC, SF ₆ and NF ₃ emissions for electronics industry (2.E), foam blowing agents (2.F.2), fire protection (2.F.3), solvents (2.F.5) and other applications (2.F.6). | (a) Resolved. Iceland reported notation keys in CRF table 2(I).A-Hs1 for the categories glass production (2.A.3), ammonia production (2.B.1), adipic acid production (2.B.3) and soda ash production (2.B.7); (b) Not resolved. In CRF table 2(II), blank cells remain for the subcategories under electronics industry (2.E.1–2.E.4), and for foam blowing agents (2.F.2), fire protection (2.F.3), solvents (2.F.5) and other applications (2.F.6). During the review, the Party clarified that notations keys were not entered into CRF table 2(II) owing to a technical problem with CRF Reporter. Iceland indicated that this issue will be addressed for future annual submissions. |
| I.2 | 2.C.2 Ferroalloys production – CO ₂ (I.9, 2021) Convention reporting adherence | Correct NIR table 4.4 (p.78) to reflect the correct emissions, as reported in CRF table 2(I).A-Hs2. | Resolved. Iceland included in NIR table 4.4 (p.89) the correct emissions reported in CRF table 2(I).A-Hs2 for the time series. For example, for 2020, emissions from ferroalloys production were reported in the CRF table as 415.30 kt CO ₂ and 0.12 kt CH ₄ , which equates to a total of 418.35 kt CO ₂ eq. Consistent with this value, ferroalloys production emissions for 2020 were reported in NIR table 4.4 as 418 kt CO ₂ eq. |
| I.3 | 2.D.2 Paraffin wax use – CO ₂ (I.10, 2021) Transparency | Include in the NIR more detailed information on the methodology and assumptions used to estimate emissions from paraffin wax use, as explained during the review. | Resolved. Iceland included in its NIR (section 4.5.2, p.96) the required information, namely that paraffin wax consumption is calculated from the AD in tonnes multiplied by the NCV value of 40.2 TJ/k and that, since the AD cover candles and other paraffin, it calculates the emissions from paraffin from candles on the basis of net consumption of candles, and the emissions from paraffin (without candles) on the basis of net consumption of paraffin (without candles). To be able to add the two, the net consumption of candles is multiplied by the factor 0.66 since not all of the AD for candles are for paraffin. |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| Agriculture | | | |
| A.1 | 3. General (agriculture) – CH ₄ and N ₂ O (A.3, 2021) (A.3, 2019) (A.9, 2017) Transparency | Update productivity data, in particular the weight categories for cattle, poultry productivity (live weight and living age) and swine productivity (piglets per sow) and include in the improvement plan activities to update the productivity data at regular intervals. | <p>Addressing. Iceland updated animal characterization data for mature dairy cattle (for 2018–2020), lambs (for 2003–2020) and mature ewes (for 2018–2020), as follows:</p> <p>(a) Regarding weight categories, weights for mature dairy cattle and lambs have been updated since the previous review and show an increasing trend over the time series. Data for cattle and sheep are reported in NIR tables 5.9–5.10 (pp.135 and 137). During the review, the Party explained that another update of the data is planned for the 2023 submission. The Party also explained that weights of other animal categories are stable for the whole time series;</p> <p>(b) Regarding poultry productivity, the Party explained during the review that living age is used for estimating the average annual population from production data. Living age is mostly constant over time, but was updated in 2021 with new information from an expert, and thus changed slightly for 2018–2020. The live weight of poultry is constant over time. On the basis of expert information, the categorization of poultry was updated for the 2022 submission (see NIR sections 5.2.1, pp.132–133, and 5.2.4.1, p.143);</p> <p>(c) Regarding swine productivity, the Party reported the age of slaughter in NIR table 5.5 (on p.133), but information on productivity of sows (i.e. piglets per sow) was not reported in the NIR.</p> <p>During the review, the Party explained that this parameter (piglets per sow) has been updated since the 2021 submission with new information from an expert but this is not included in the NIR. The Party clarified that the average lifetime of piglets is 215 days for 1990 and 180 days for 1991–1994, and since 1995, has stayed the same, at 165 days. These values were confirmed by experts in 2005, 2012 and 2020. The number of piglets per sow has increased from 15 on average for 1990 to 26.5 on average for 2020. The number of piglets per sow was most recently changed from 25 to 26.5 on average for 2020. These values come from expert farmers who have many years of experience in this area. The Party provided to the ERT a spreadsheet with the productivity data for piglets per sow for 1990–2020 (in five-year intervals) as a matter of transparency.</p> <p>The ERT considers that the recommendation has not yet been fully addressed because the Party has not yet reported data on productivity of sows (piglets per sow) in the NIR.</p> |
| A.2 | 3. General (agriculture) (A.28, 2021) Transparency | Clarify in the NIR how the population of horses is estimated by adding an explanation of the methodology applied for the inclusion of foals. | Not resolved. Iceland did not include in its NIR an explanation to clarify the reasons for the difference in the population of horses between NIR table 5.8 (p.135) (e.g. 71,747 for 2020) and CRF tables 3.As1 and 3.B(a)s1 (e.g. 73,584 for 2020). During the review, the Party clarified that the horse population in NIR table 5.8 includes only mature horses, whereas in CRF tables 3.As.1, 3.B(a)s1 and 3.B(b), the total number of horses (mature horses and foals) is reported. The ERT considers that a |

| ID# | Issue/problem classification ^{a, b} | Recommendation from previous review report | ERT assessment and rationale |
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| A.3 | 3. General (agriculture) (A.29, 2021) Transparency | Provide in the NIR additional explanation of the calculations applied for estimating the population of young animals by indicating for each species the productivity (number of births per year), rate of pregnancy and early mortality considered. | footnote to NIR table 5.8 stating that foals are not included in the horse population value reported in that table would resolve this issue. Addressing. Iceland provided additional information in the NIR by adding table 5.6 (p.133) with the population of young animals. However, the Party did not describe clearly how calculations to estimate the population of young animals were implemented or indicate, for each species, the productivity (number of births per year), rate of pregnancy and early mortality considered. |
| A.4 | 3.A.1 Cattle – CH ₄ (A.8, 2021) (A.30, 2019) Accuracy | Justify the appropriateness of the current parameters and/or update the input parameters and consequently the CH ₄ EF for future annual submissions, as planned. | Addressing. Iceland did not provide a justification of the current parameters and did not update the input parameters for other mature cattle. The CH ₄ IEF in the current submission is 73.76 kg CH ₄ /head/year constant for the entire time series and the weight parameter continue to be 500 kg for other mature cattle. During the review, the Party indicated that no updates were available regarding livestock parameters for other mature cattle. The parameters will be updated when such data become available. The Party indicated that the Icelandic Agricultural Advisory Centre is currently collaborating with the Environment Agency of Iceland to update the parameters, which were last updated in 2020, for the 2023 submission. The ERT notes that this issue does not affect the accounting for the second commitment period of the Kyoto Protocol because any changes in emissions will be insignificant. Other mature cattle represent 4.6 per cent of the population and 4.9 per cent (0.24 t CH ₄ for 2020) of CH ₄ emissions of cattle in Iceland. Calculations made by the Party for mature cattle show the weight parameter ranging from 430 to 471 kg (below the 500 kg considered for other mature cattle). |
| A.5 | 3.A.1 Cattle – CH ₄ (A.11, 2021) (A.33, 2019) Transparency | Revise the explanation of CH ₄ estimates for mature dairy cattle in the NIR by indicating the use of the Cf _i value from the 2006 IPCC Guidelines and ensure that the approach is used consistently across the time series. | Resolved. Iceland revised in the NIR (section 5.22, p.135) the explanation of CH ₄ emission estimates for mature dairy cattle and indicated in NIR table 5.11 (p.138) the current Cf _i value used in the calculations (0.3755), which is in accordance with the 2006 IPCC Guidelines. The CH ₄ IEF is in the 2006 IPCC Guidelines default range (90–128 kg CH ₄ /head/year) for the entire time series. |
| A.6 | 3.D Direct and indirect N ₂ O emissions from agricultural soils – N ₂ O (A.30, 2021) Convention reporting adherence | Correct the reported value for Frac _{GASM} for the entire time series (e.g. from 0.158 to 0.132 for 2019) by adding NH ₃ and NO _x from other organic fertilizers, animal manure applied to soils, and urine and dung deposited from grazing animals. | Resolved. Iceland corrected the value for Frac _{GASM} for the entire time series by adding NH ₃ and NO _x from other organic fertilizers, animal manure applied to soils, and urine and dung deposited from grazing animals (NIR section 5.8.5.1, p.172). |
| A.7 | 3.D.b.1 Atmospheric deposition – N ₂ O (A.24, 2021) (A.23, 2019) (A.24, 2017) Accuracy | Make a thorough examination of N flow to estimate emissions from N volatilized from atmospheric deposition reported in CRF table 3.D and consider including in the NIR a table with the overall mass balance of N, | Resolved. Iceland provided in NIR figure 5.3 (p.155) the complete N flow for categories 3.B (manure management) and 3.D (direct and indirect N ₂ O emissions from agricultural soils) for 2020 (with mass balance of N, including information on N volatilized as NO _x , nitric oxide and N ₂ O). Regarding category 3.D.b.1 (atmospheric |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| A.8 | 3.F Field burning of agricultural residues – CH ₄ and N ₂ O (A.25, 2021) (A.24, 2019) (A.7, 2017) (A.5, 2016) (A.5, 2015) (54, 2014) Transparency | including information on N volatilized as NO _x , nitric oxide and N ₂ O. Include in the NIR additional information on the non-occurrence of the field burning of agricultural crop residues. | deposition), the Party included the overall N volatilized, including synthetic and other types of organic fertilizers. Addressing. Iceland did not include new information in the NIR to justify the non-occurrence of field burning of crop residues and, although “NO” is reported in CRF table 3.F, the Party stated in the NIR (p.173) that this category is reported as “NE” and that it is planning to improve its knowledge of this practice and provide an estimation for the next annual submission. During the review, however, the Party provided further clarification on the non-occurrence of field burning (in addition to the information on the regulatory framework already provided in the NIR, p.173). It explained that crop residues that are produced in Iceland are considered a valuable resource and straw is used for bedding and hay for feeding, since animals must be kept inside for a large part of the year over the winter months and during the summer time many livestock categories (including horses and sheep) are fed exclusively on hay harvested. The main crops grown in the country have traditionally been tubers – potatoes – and root crops. The first cereals (barley) were grown in Iceland in 1992 and this crop has been grown at a steadily increasing rate since then. The country has only one short outdoor growing season during the year, which is over the summer months and, therefore, farmers have no reason to burn crop residues quickly in order to be able to get the fields ready for a winter growing season; in addition, farming has been modernized in Iceland for many years and every farm has a tractor and ploughing machinery, which has been the main method for getting fields ready for the next growing season. The Party explained that it has researched countries where field burning is known to occur and for which crops, and it seems to be most common for cereals, fibres, oilseeds, pulses and sugarcane. In Norway and Denmark, field burning is only reported in very small amounts for cereals and hay. The Party further explained that it contacted the district offices in order to obtain data and they reported that “even though a landowner got a permit, it was not certain whether he managed to burn the land in question within the time frame given, since the time frame is short (one month), and the weather conditions have to be perfect for burning to be allowed. The fire marshal has to be contacted at least 6 hours before the burning is to take place and he can cancel the field burning if the weather conditions change.” The Party clarified that it also tried to confirm whether field burning is happening illegally and asked the district offices on this matter. The response was that “there are serious consequences for not getting a licence. The office had heard of an illegal field burning but was confident that it happened very seldom.” Regarding the information reported in NIR table 5.43 (p.174) where the Party shows the permits given for field burning of agricultural residues, it explained that, in accordance with the Ministry of Food, Agriculture and Fisheries, these permits refer to burning of straws that grew wild and had nothing to do with agricultural crops. |

| ID# | Issue/problem classification ^{a, b} | Recommendation from previous review report | ERT assessment and rationale |
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| A.9 | 3.G Liming – CO ₂ (A.26, 2021) (A.39, 2019) Comparability | Implement the planned checks of the AD for the category and update them as planned and report CO ₂ emissions from liming following the UNFCCC Annex I inventory reporting guidelines in future annual submissions, ensuring consistent reporting of the emissions across the entire time series under category 3.G. If the change is not made in the next annual submission, justify this in the NIR and include an explanation of the allocation in CRF table 9. | <p>Old fields that have not been in use for a considerable amount of time often grow thick vegetation in the form of straws over a few years. In these cases, the old fields have occasionally been burned if the farmer intended to start using the field again for farming.</p> <p>Finally, the Party clarified that it will change the content of NIR section 5.10 to report this activity clearly as “not occurring in Iceland”.</p> <p>The ERT notes that this recommendation is related to transparency and once the Party includes the information provided above, it can be considered resolved.</p> <p>Addressing. Iceland reported in CRF table 3.G-I the AD and emissions for limestone for the entire time series (1990–2020) thanks to an update in data collection by Statistics Iceland. However, for dolomite, AD for years before 2002 are not available and AD and emissions were thus reported in CRF table 3.G-I as “NE”. During the review, the Party indicated that it contacted experts at the Agricultural University of Iceland, who clarified that dolomite was not used in agriculture in 1990–2002 and its use became widespread only when one company started importing dolomite in 2003. Therefore, the appropriate notation key for dolomite for 1990–2002 is “NO” rather than “NE”.</p> <p>The ERT considers that the expert judgment, as well as the trend of low dolomite use observed for 2003–2020, justifies the reporting of “NO” for dolomite for 1990–2002 and that the recommendation has not yet been fully addressed because the Party has not yet corrected the notation key from “NE” to “NO” for dolomite for 1990–2002 in CRF table 3.G-I.</p> |
| A.10 | 3.I Other carbon-containing fertilizers – CO ₂ (A.27, 2021) (A.40, 2019) Consistency | Report CO ₂ emissions from other carbon-containing fertilizers consistently across the time series under category 3.I. If the change is not made in the next annual submission, justify this in the NIR and include an explanation of the allocation in CRF table 9. | <p>Resolved. Iceland reported in CRF table 3.G-I the AD and emissions for other carbon-containing fertilizers for 2003–2020. For 1990–2002, the emissions were reported as “NO”. The Party reported in its NIR (p.176) that, on the basis of expert judgment from specialists at the Agricultural University of Iceland and the Icelandic Agricultural Advisory Centre obtained in 2021, there was very little or no shell sand used as fertilizer during 1990–2002. Therefore, the Party reports these years as “NO”. The ERT considers that the expert judgment presented by Iceland justifies the use of “NO” for this category for 1990–2002.</p> |
| LULUCF | | | |
| L.1 | 4. General (LULUCF) (L.1, 2021) (L.1, 2019) (L.1, 2017) (L.2, 2016) (L.2, 2015) (67, 2014) Transparency | Enhance the transparency of the information in the NIR on the uncertainty analysis. | Resolved. Iceland reported in its NIR additional information about the uncertainty assessments related to forest land (pp.200, 205 and 243) and land converted to cropland (p.212). |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| L.2 | 4. General (LULUCF) – CO ₂ , CH ₄ and N ₂ O (L.2, 2021) (L.2, 2019) (L.14, 2017) Convention reporting adherence | Conduct an uncertainty assessment of all carbon pools and gases in the LULUCF sector in accordance with decision 24/CP.19, annex I, paragraph 15. | Resolved. Iceland reported in its NIR information about the uncertainty assessments related to forest land (pp.200, 205 and 243) and for all carbon pools and gases (p.243). |
| L.3 | 4. General (LULUCF) (L.4, 2021) (L.30, 2019) Convention reporting adherence | Improve the QA/QC plan to avoid discrepancies in cross references between NIR sections and to ensure that section numbering is correct. | Addressing. The ERT noted that Iceland improved cross-referencing between NIR sections but some discrepancies remain. The Party reported in the NIR (p.333) that the final checks of the report will be improved by (1) moving the deadlines for the individual chapters, (2) aggregating the text earlier and (3) allowing a quality check by authors at the final stage of editing. During the review, the Party indicated that a description of these steps will be included in the updated QA/QC plan, which should be ready for the 2023 submission. |
| L.4 | 4. General (LULUCF) (L.5, 2021) (L.31, 2019) Transparency | Provide transparent information in the NIR section discussing the land-transition matrix on the use of the notation key “IE” where areas have been accounted for elsewhere. | Not resolved. Iceland did not provide in its NIR an explanation of the land-transition matrix or the use of the notation key “IE”. The ERT noted that the Party reported as “IE” some land uses in CRF table 4.1 (cropland and wetlands (managed) converted to settlements, other land converted to cropland, other land converted to settlements). During the review, the Party clarified that information regarding the use of “IE” was included in the documentation box of CRF table 4.1 and indicated that it will improve transparency in the next NIR regarding the use of “IE” where areas have been accounted for elsewhere. |
| L.5 | Land representation (L.6, 2021) (L.4, 2019) (L.2, 2017) (L.3, 2016) (L.3, 2015) (68, 2014) Transparency | Select the required information and organize it in a manner that enables the reader to clearly understand the data sources and their quality and the methodology used to derive the land representation. | Addressing. Iceland added to its NIR a section (6.1.1, p.181) containing a description of the data sources and their quality and the methodology used to derive the land representation. However, the Party did not reorganize the information on land representation. The ERT considers that Iceland could improve the transparency of its reporting by providing the following information on land representation in an appropriate format (such as tabular) for each category: (1) the data sources; (2) the time series of raw data; (3) the methodology applied for filling in gaps in the raw data, if any; (4) the methodology applied, including assumptions and inferences, to derive the land category areas from the raw data; (5) the methodology applied for filling in gaps in the time series of areas, if any; (6) the transition time of the land category (for land in conversion categories); and (7) any other relevant information. During the review, the Party clarified that the organization of information in an appropriate format will be considered for future annual submissions. |
| L.6 | Land representation (L.7, 2021) (L.5, 2019) (L.16, 2017) Accuracy | Improve the land representation data used to report LULUCF emissions and removals under the Convention by reconciling all data on areas contained in databases and land-use maps, as well as data collected from observations, including an estimation | Addressing. Iceland improved some inconsistencies in land area detected between CRF table 4.1 (the land-transition matrix) and the corresponding CRF tables on carbon stocks (4.A, 4.B, 4.C, 4.D, 4.E and 4.F); however, some small inconsistencies remain. The ERT also considers that the information provided by Iceland in the NIR (sections 6.3, p.192, and 11.2.2, p.355) has not been improved in line with the previous recommendations. During the review, the Party clarified that |

| ID# | Issue/problem classification ^{a, b} | Recommendation from previous review report | ERT assessment and rationale |
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| | | of uncertainties related to AD once land matrices are improved and updated. | inconsistencies, which are very small in terms of area (kha), occur between final areas in CRF table 4.1 and the corresponding total areas in CRF tables, for example, on carbon stocks for grassland (CRF table 4.C) and other land (CRF table 4.F). In the case of grassland, area is inconsistent only for 2007: the final area in CRF table 4.1 is 0.50 kha larger than the total area in CRF table 4.C. In the case of other land, areas are inconsistent for 1991–2020 within a range from 0.03 kha (final area in CRF table 4.1 larger than CRF table 4.F) to –0.80 kha (final area in CRF table 4.1 smaller than CRF table 4.F). These inconsistencies can also be found in NIR table 6.6 (p.193). The Party informed the ERT that it is working to improve the estimation of uncertainties and the transparency of land representation for future annual submissions. |
| L.7 | Land representation – CO ₂ (L.8, 2021) (L.25, 2019) Transparency | Improve the transparency of the AD reporting by providing information on the uncertainties related to habitat type classification, especially in relation to separating wetlands from grassland and other land. | Not resolved. Iceland did not provide uncertainties related to habitat type. The ERT noted that the Party indicated in its NIR (p.185) increasing areas of grassland corresponding to areas of other land previously considered unmanaged where grazing activities now occur. The ERT also noted that the habitat type map is updated regularly, with the last update occurring in 2020. During the review, the Party clarified that it is working to resolve this issue for future annual submissions. |
| L.8 | 4.A Forest land – CO ₂ (L.10, 2021) (L.7, 2019) (L.3, 2017) (L.4, 2016) (L.4, 2015) (69, 2014) Transparency | Provide an additional description of the processes by which CSC and associated emissions and removals are estimated, including tables with raw data and intermediate outputs stratified by year and forest type. | Resolved. Iceland added to its NIR new tables showing area, CSC per area unit (ha) and total CSC for biomass, litter and soil separately by land-use categories (table 6.8, p.200 and table 6.10, p.205). Additionally, graphs showing change in age distribution for CSC or carbon stocks for the two main forest categories, cultivated forest and natural birch forest, and the area of age classes were added (NIR figure 6.7, p.197 and figure 6.8, p.203). |
| L.9 | 4.A Forest land – CO ₂ (L.11, 2021) (L.8, 2019) (L.17, 2017) Completeness | Improve the estimates of CSC under forest land, particularly by including estimates for the deadwood and litter carbon pools, or provide an explanation in the NIR and in CRF table 9 of why these pools could not be estimated. | Addressing. Iceland reported “NA” (instead of “NE”) for net carbon stock in litter for all land types under forest land remaining forest land in CRF table 4.A and included an explanation in its NIR (p.199) on the use of the tier 1 approach (pool in equilibrium) for estimating emissions under this category. Therefore, the ERT considers that the issue relating to the estimates of CSC for the litter carbon pool has been resolved. Regarding CSC in deadwood, the ERT noted that the original issue referred to the previous reporting of “NE” for “natural birch forest older than 50 years” (under forest land remaining forest land) and “IE” for “natural birch forest” (under grassland converted to forest land and other land converted to forest land). In subsequent submissions the Party changed the notation key from “NE” and “IE” to “NO” for the deadwood pool, referring to research papers stating that the deadwood pool is likely a sink (2019 NIR, section 6.5.1, pp.143–144). During the review the Party explained that for the land type “natural birch forests” under forest land remaining forest land, grassland converted to forest land and other land converted to forest land, it applies the stock-difference method from the 2006 IPCC Guidelines (vol. 4, chap. 2.3.1.1, equation 2.8), to measure CSC in carbon |

| ID# | Issue/problem classification ^{a, b} | Recommendation from previous review report | ERT assessment and rationale |
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| L.10 | 4.A Forest land – CO ₂ (L.12, 2021) (L.33, 2019) Comparability | Provide transparent information in CRF table 9 for reporting “IE” where GHG emissions have been accounted for elsewhere and correct the notation key from “NE” to “NA” for litter carbon stock in the forest land remaining forest land categories. | <p>pools. Deadwood meeting the definition of lying deadwood (minimum diameter 10 cm and minimum length 1 m) was not found on NFI plots in either the first (2005–2011) or the second (2015–2021) NFI. CSC for the deadwood pool of natural birch forests is therefore considered, and reported, as “NO”. The Party indicated that this information will be added to the NIR to improve the transparency.</p> <p>For the cases in which the Party reported “IE” for CSC in deadwood (cultivated forest under forest land remaining forest land and other land converted to forest land) indicating its reporting under grassland converted to forest land, the ERT considers that the issue related to CRF table 9 is considered in ID# L.10 below, noting however that the CSC in deadwood under grassland converted to forest land is reported as “NO” for the most years of the time series, except 2002, 2003, 2007 and 2010, and therefore the Party still needs to clarify whether the completeness issue for cultivated forest has been resolved or how it will be resolved (as it is still not certain if “NO” is the correct reporting for the other years of the time series).</p> <p>The ERT also noted that the Party reported in the NIR (p.199) that the estimates for the deadwood carbon pool is included in the inventory improvement plan, including biomass losses in deadwood in stumps, root stock of cut trees and standing dead trees, as well as continuous decomposition of all deadwood; and that the Party is considering to introduce and adapt a CSC simulation model such as the Canadian Forest Service Carbon Balance Model. The Party further explained that losses from living biomass, both as removed wood and deadwood, cannot be classified by different land categories or between forest land remaining forest land and land converted to forest land and therefore all losses from living biomass and the deadwood stock changes are only reported under grassland converted to forest land (Afforestation 1-50 years old – Cultivated forest), which is the biggest category of carbon fraction both in area and total C-stock changes.</p> <p>Addressing. Iceland corrected the notation key from “NE” to “NA” for net carbon stock in litter for all land types under forest land remaining forest land in CRF table 4.A, as it assumed this pool to be in equilibrium and therefore the ERT considered this issue as resolved. However, the Party reported “IE” in CRF table 4.A for some land types under forest land remaining forest land and other land converted to forest land, without providing transparent information in CRF table 9 on where these emissions are included. During the review, the Party clarified that the main source of deadwood is cutting activities and harvest activities that cannot be separated between forest land remaining forest land and other land converted to forest land, and for this reason all CSC in deadwood is included in grassland converted to forest land. However, the ERT noted that estimates of CSC in deadwood for grassland converted to forest land is reported only for 2002, 2003, 2007 and 2010; for the other years of the time series “NO” is reported and there is no clarification in the NIR on why this</p> |

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| L.11 | 4.A.2 Land converted to forest land – CO ₂ (L.13, 2021) (L.10, 2019) (L.18, 2017) Transparency | Include transparent information in the NIR on carbon stock for the land-use categories occurring in Iceland. | pool is not estimated for those years. The Party indicated that the issue related to CRF table 9 will be resolved for future annual submissions. Resolved. Iceland added to its NIR new tables showing area, CSC per area unit (ha) and total CSC for biomass, litter and soil separately by land-use categories (tables 6.8, p.200 and 6.10, p.205). |
| L.12 | 4.A.2 Land converted to forest land – CO ₂ (L.14, 2021) (L.11, 2019) (L.18, 2017) Accuracy | Implement the calculation methods in line with equations 2.15 and 2.16 of volume 4 of the 2006 IPCC Guidelines with instant oxidation of all amounts of living biomass and litter when making land-use conversions, unless Iceland can document that the carbon stock before land-use conversion is maintained in the land converted. | Addressing. Iceland provided some documentation to justify that the carbon stock before land-use conversion is maintained in the land converted. Specifically, the Party added to its NIR (p.204) a new reference to a study on carbon stocks over the time series (Sigurðsson et al., 2005), which explains that tree measurements in the NFI show increases in biomass stock when grassland is converted to forest land. However, the ERT noted that the Party stated in the NIR (pp.203–204) that the loss of carbon stock in biomass from the litter and deadwood pools has not yet been measured and that information on the decomposition process will only become available over time. During the review, the Party provided the ERT with additional information related to the loss of carbon stock and highlighted the results from two research projects described in the NIR (pp.203–204) indicating that the carbon stock in vegetation other than trees showed very small increases within 50 years after afforestation (based on experimental results from the most commonly used tree species in the country, Siberian larch) and that the variation during this period was considerable, indicating high uncertainty in the estimates. The ERT notes that, as new data become available, the Party will be able to provide in future annual submissions enhanced documentation to show that the carbon stock before land-use conversion is maintained in the land converted. |
| L.13 | 4.B.1 Cropland remaining cropland – CO ₂ (L.15, 2021) (L.34, 2019) Transparency | Provide information to justify the high EF for mineral soils in the next annual submission. | Resolved. Iceland provided in its NIR (section 6.6.1.2, p.208) more information to justify the high EF for mineral soils. The Party also corrected the annual change of SOC for mineral soils for cropland remaining cropland from 0.1708 to 0.1525 t C/ha/year after reviewing the original study on the effects of different N fertilizers on soil properties as mentioned by the Party in the previous review. |
| L.14 | 4.B.1 Cropland remaining cropland – CO ₂ (L.35, 2021) Accuracy | Apply the correct EF for CSC in mineral soils for “cropland active” (0.1525 t C/ha/year) and revise the EF for CSC in mineral soils for “cropland inactive (fallow)”, because “cropland inactive (fallow)” is not under cultivation and the carbon content in mineral soils should be different from the carbon content in mineral soils for “cropland active”. | Not resolved. Iceland explained during the review that the EF for CSC in mineral soils was estimated for the first time for the 2018 submission. The EF is based on only one study (Helgason, 1975) and consequently the current data on cropland are severely limited. Therefore, the Party decided to use the same EF for CSC in mineral soils for both “cropland active” and for “cropland inactive (fallow)”. The ERT noted that the Party reported in its NIR (p.208) an explanation as to why it used the same value of SOC and therefore the same CSC estimate for active and inactive cropland. The Party indicated that it will consider this issue further for future annual submissions. |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| L.15 | 4.B.2 Land converted to cropland (L.16, 2021) (L.13, 2019) (L.7, 2017) (L.11, 2016) (L.11, 2015) Accuracy | Estimate the area of forest land and other land that was converted to cropland before 1990 and report these values under the appropriate categories. | Addressing. Iceland did not report in its NIR new information about the estimation of the areas of forest land and other land that were converted to cropland before 1990. Regarding the use of “IE” for reporting the area of other land converted to cropland, the Party included an explanation in CRF table 9. During the review, the Party clarified that an analysis of the conversion of forest land to cropland for 1970–1989 has not been done but is planned to be conducted in the coming years. |
| L.16 | 4.B.2.2 Grassland converted to cropland – CO ₂ (L.18, 2021) (L.14, 2019) (L.8, 2017) (L.6, 2016) (L.6, 2015) (71, 2014) Accuracy | Ensure the equivalence of climatic, historical and edaphic conditions when analysing pairs of samples (i.e. in cropland and grassland) to determine the dynamic of the soil carbon stocks associated with conversion among the two land uses. | Not resolved. Iceland has not made improvements to ensure the equivalence of climatic, historical and edaphic conditions when analysing pairs of samples (i.e. in cropland and grassland) to determine the dynamics of the soil carbon stocks associated with conversion between the two land uses. During the review, the Party indicated that it is planning to make improvements relevant to resolving this issue for future annual submissions. |
| L.17 | 4.C Grassland – CO ₂ (L.19, 2021) (L.15, 2019) (L.9, 2017) (L.7, 2016) (L.7, 2015) (72, 2014) (67, 2013) Completeness | Prepare estimates for the emissions from degraded areas of grassland. | Addressing. Iceland did not provide in its NIR estimates for the emissions from degraded areas of grassland. During the review, the Party clarified that measurement and data collection in degraded grassland areas commenced in 2021 and that estimates of emissions from these areas will be included in future annual submissions. |
| L.18 | 4.C.1 Grassland remaining grassland – CO ₂ (L.21, 2021) (L.16, 2019) (L.10, 2017) (L.12, 2016) (L.12, 2015) Accuracy | (a) Estimate and report CSC in mineral soils under grassland remaining grassland for “natural birch shrubland – old”; (b) Estimate and report CSC in mineral soils under grassland remaining grassland for “revegetated land older than 60 years”. | (a) Resolved. Iceland reported “natural birch shrubland – old” as “NA” (rather than “NE”, as previously used) in CRF table 4.C for CSC in mineral soils under grassland remaining grassland. During the review the Party justified the use of “NA” by explaining that it assumed this pool is in equilibrium and, therefore, applied a tier 1 approach. According to the Party “natural birch shrubland – old” has more in common with natural birch forest than grassland according to the results of the NFI surveys and of various research studies, which show that cold temperate forests in general are adding carbon to soil; therefore, using a tier 1 approach is considered conservative. The ERT agrees with the Party and considers this issue as resolved; (b) Addressing. Iceland reported “revegetated land older than 60 years” as “NA” (rather than “NE”, as previously used) in CRF table 4.C for CSC in mineral soils under grassland remaining grassland. During the review, the Party explained that it assumed this pool is in equilibrium and, therefore, applied a tier 1 approach; however, it also clarified that current data are very limited and the extent is small. The Party explained that it has set up monitoring plots at selected sites within this land category with the aim of improving the reporting, and when the results are available, it will evaluate and update the estimates. |
| L.19 | 4.C.1 Grassland remaining grassland – CO ₂ (L.23, 2021) (L.37, 2019) Transparency | Improve the transparency of the reporting of CSC under grassland mineral soils for revegetated land older than 60 years by providing an explanation in the NIR and in CRF table 9 as to why estimates could not | Resolved. Iceland reported “revegetated land older than 60 years” as “NA” in CRF table 4.C for CSC in mineral soils under grassland remaining grassland for the complete time series (see ID# L.18(b) above). The Party improved the transparency of the reporting and provided additional information in the NIR (section 6.7.1.1, p.215), explaining the methodology used and the reasons why this pool is assumed to |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| | | be produced for this pool for 1990–2015 and by reporting “NA” where CSC is assumed to be in equilibrium (i.e. zero). | be in equilibrium and reported as “NA”. The Party also included correlated information in the documentation box of CRF table 4.C. |
| L.20 | 4.C.2 Land converted to grassland – CO ₂ (L.24, 2021) (L.17, 2019) (L.19, 2017) Accuracy | (a) Revise the CO ₂ estimates for land converted to grassland using updated data on carbon sequestration in soils, especially for other land converted to grassland; (b) Include in the NIR, in tabular format, the total estimates of CSC in living biomass, litter and soil, and the average CSC per area for the whole time series, in land converted to grassland and land converted to forest land. | (a) Not resolved. Iceland did not revise the CO ₂ estimates for land converted to grassland using updated data on carbon sequestration in soils, especially for other land converted to grassland. In the recalculation section of the NIR (p.225) there is no reference regarding this revision. However, when comparing the 2021 and 2022 submissions the ERT noted changes in CO ₂ emissions for cropland converted to grassland and other land converted to grassland, although it was not clear during the review if these changes refer to the revision mentioned above; (b) Addressing. Iceland did not include in the NIR information on the total estimates of CSC in living biomass, litter and soil; or the average CSC per area for the whole time series for land converted to grassland and land converted to forest land. The Party did, however, include in its NIR new tables showing area, CSC per area unit (ha) and total CSC of biomass, litter and soil for all land-use categories (pp.200, 205, 209, 212, 218, 224, 228, 230 and 235). |
| L.21 | 4.D.1 Wetlands remaining wetlands – CO ₂ (L.26, 2021) (L.38, 2019) Accuracy | Develop a country-specific methodology for managed wetlands that would allow it to use the tier 2 approach for key categories in line with the 2006 IPCC Guidelines. | Not resolved. Iceland did not develop a country-specific methodology for estimating CO ₂ emissions from managed wetlands, as recommended. During the review, the Party clarified that it is working to resolve this issue for future annual submissions. |
| L.22 | 4.D.1.2 Flooded land remaining flooded land – CO ₂ and CH ₄ (L.36, 2021) Accuracy | If reservoirs are defined as flooded land, use the methodology for flooded land provided in the 2006 IPCC Guidelines (vol. 4, chap. 7.3, p.7.19). If reservoirs are considered as rewetted organic soils, use the methodology provided in the Wetlands Supplement (chap. 3). To improve the transparency of the reporting, include more information on the characteristics of the reservoirs in the NIR. | Resolved. Iceland included in NIR section 6.8.1.1 (pp.226–228) more information on the characteristics of the reservoirs including a more detailed explanation on mires converted to reservoirs (p.227) to explain why inundated mires are reported under subcategory 4.D.1.2 (flooded land remaining flooded land) and thus using the methodology provided in the 2006 IPCC Guidelines. According to the Party, as CRF table 4.D does not allow land-use changes within the main category, inundated mires should not be reported as “other wetlands converted to flooded land”. The Party considered including inundated mires as remaining mires, but given that the inundation does change the functionality of mires through vegetation die off, it decided to categorize them as flooded land remaining flooded land when estimating GHG emissions. The ERT agrees with the approach adopted by the Party. |
| L.23 | 4.D.2 Land converted to wetlands – CO ₂ (L.25, 2021) (L.18, 2019) (L.11, 2017) (L.13, 2016) (L.13, 2015) Transparency | Estimate and report CSC in mineral soils under land converted to wetlands. | Resolved. Iceland included estimates for CSC in mineral soils for “rewetted wetland soils” in CRF table 4.D for the years for which AD are available (2016–2020) and, in accordance with the recommendation made in the previous review, the Party reported the CSC as “NO” instead of “IE” for 1990–2015. The Party also continued to report CSC in mineral soils under land converted to other wetlands (refilled lakes and ponds) as “NE” because the 2006 IPCC Guidelines do not provide a methodology for estimating CSC in mineral soils under land converted to flooded land. The Party included in the NIR information regarding the use of “NO” for reporting CSC in |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| | | | mineral soils for “rewetted wetland soils” for 1990–2015 and for the use of “NE” for “refilled lakes and ponds”. |
| L.24 | 4.E.2 Land converted to settlements – CO ₂ (L.28, 2021) (L.20, 2019) (L.12, 2017) (L.14, 2016) (L.14, 2015) Completeness | Estimate and report CSC in mineral soils under land converted to settlements. | Addressing. Iceland did not estimate and report CSC in mineral soils for land converted to settlements, with the exception of forest land converted to settlements, which was reported in the same way as in previous annual submissions. Iceland clarified during the review that it is working to resolve this issue for future annual submissions. |
| L.25 | 4(I) Direct N ₂ O emissions from N input to managed soils – N ₂ O (L.37, 2021) Convention reporting adherence | Report the correct AD for inorganic fertilizers in CRF table 3.D for the entire time series and correctly report the AD as “IE” in CRF table 4(I), explaining in the documentation box and in CRF table 9 where the emissions are reported. | Addressing. Iceland reported the correct AD for inorganic fertilizers for the entire time series in CRF table 3.D and reported “IE” for the N ₂ O emissions for inorganic fertilizers under land converted to forest land (category 4.A.2.1) in CRF table 4(I). In the documentation box of CRF table 4(I), the Party stated that “under the LULUCF chapter it was decided to include the fertilizers used in forestry under the total synthetic fertilizer in category 3.D.1. According to this decision use of inorganic fertilizers previously reported under land converted to forest land (grassland converted to forest land) have been replaced with IE.” However, the ERT did not find in CRF table 9 an explanation as to where those emissions are reported. |
| L.26 | 4(II) Emissions/removals from drainage and rewetting and other management of organic/mineral soils – CH ₄ (L.38, 2021) Convention reporting adherence | Correct in the NIR the proportion of ditches for drained organic soils (using the correct value of 2.5 per cent). | Resolved. Iceland corrected the value reported for the proportion of ditches for drained organic soils. The correct value (2.5 per cent) is now reported in its NIR (p.239). |
| L.27 | 4(III) Direct N ₂ O emissions from N mineralization/immobilization – N ₂ O (L.31, 2021) (L.40, 2019) Transparency | Report in the NIR the reasons for carbon accumulation in cropland soils, especially in mineral soils converted to cropland. | Resolved. Iceland explained in its NIR (section 6.6.1.2, pp.208–209) the reasons for carbon accumulation in cropland soils, especially in mineral soils converted to cropland. The Party clarified that the EF was estimated using the results of a study conducted in four different locations in the country that considered the effects of different N fertilizers on soil properties and how SOC accumulates on the basis of soil depth. The Party also indicated in the NIR (p.208) that the CSC factor for mineral soils in both “cropland active” and “cropland inactive (fallow)” was corrected from 0.1708 to 0.1525 t C/ha/year. |
| L.28 | 4(V) Biomass burning – CO ₂ , CH ₄ and N ₂ O (L.33, 2021) (L.24, 2019) (L.23, 2017) Convention reporting adherence | Correct the use of notation keys to report on emissions from biomass burning in CRF table 4(V). | Resolved. Iceland corrected the notation keys used for reporting the emissions from biomass burning in CRF table 4(V) (see ID# L.29 below for details). |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| L.29 | 4(V) Biomass burning – CO ₂ , CH ₄ and N ₂ O (L.34, 2021) (L.41, 2019) Convention reporting adherence | Include estimates of the emissions from biomass burning on cropland and grassland for the entire time series, or, if not, include information on the reporting of “NE” (both in the NIR and the CRF tables) and provide an explanation as to why these pools could not be estimated. | Addressing. Iceland included in the NIR (p.246) information on the use of “NE” for biomass burning (controlled burning) under categories 4.C.1 (grassland remaining grassland), 4.C.2 (land converted to grassland), 4.D.1 (wetlands remaining wetlands) and 4.D.2 (land converted to wetlands). For the other land-use categories, controlled burning was reported as “NO” as this activity does not occur in the country. The Party did not include in CRF table 9 an explanation as to why these pools could not be estimated. The ERT considers that the recommendation has not yet been fully addressed because the Party has not included an explanation in CRF table 9 for reporting “NE” for biomass burning (controlled burning) under categories 4.C.1 (grassland remaining grassland), 4.C.2 (land converted to grassland), 4.D.1 (wetlands remaining wetlands) and 4.D.2 (land converted to wetlands). |
| Waste | | | |
| W.1 | 5.A Solid waste disposal on land – CH ₄ (W.1, 2021) (W.12, 2019) Transparency | Document and provide in the NIR all the parameters used in the estimation of CH ₄ emissions from solid waste disposal and include the population data and waste generation rates used as input data in the IPCC solid waste disposal model. | Resolved. Iceland included in its NIR a new annex (annex 9, pp.430–434) containing input data on managed and unmanaged SWDS for the IPCC solid waste disposal model. One table shows the parameters applied in estimating CH ₄ emissions (e.g. DOC carbon, methane correction factor) and two tables show population data and the types of waste assigned to managed and unmanaged SWDS for the entire time series. Further data on waste generation and allocation can be found in NIR tables 7.5–7.8 (pp.258–260). |
| W.2 | 5.A Solid waste disposal on land – CH ₄ (W.2, 2021) (W.13, 2019) Accuracy | Investigate the composition of both MSW and industrial waste and reconsider estimating separately emissions from industrial waste. | Not resolved. Iceland continued to assume that MSW and industrial waste have a similar composition. The Party explained in its NIR (section 7.22, p.252) that the reason behind this assumption is that the existing data on waste amounts do not support a distinction between MSW and industrial waste. Waste amounts are reported to the Environment Agency of Iceland as either mixed or separated waste. Although questionnaires sent to operators in the waste industry contain the two categories (mixed household waste and mixed production waste), differentiation between the two on site is often neglected and, therefore, they are assumed to have a similar composition. The Party also explained that the data obtained from industrial operators in accordance with the EU regulation on waste statistics (2150/2002/EC) do not exactly match IPCC categorization but that aligning of the regulation with the IPCC categorization is in progress. Composition and corresponding waste amounts may, therefore, be revised for future annual submissions. The ERT notes that the assumption used by the Party regarding industrial waste does not affect the accounting for the second commitment period of the Kyoto Protocol and does not lead to an underestimation of emissions because composition of waste landfilled is based on random samples from the waste landfilled and DOC values (NIR, table 7.7) are similar to the default IPCC values for industrial waste (2006 IPCC Guidelines, vol. 5, chap. 2.3.3, table 2.5). In addition, the Party calculates a DOC value for industrial waste (non-hazardous residues from waste treatment and mixed construction and demolition waste) sent to managed landfills (0.1195); and in |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| | | | unmanaged landfills, only construction and demolition waste is landfilled and the DOC considered is the default IPCC value of 0.04. |
| W.3 | 5.A Solid waste disposal on land – CH ₄ (W.3, 2021) (W.13, 2019) Transparency | Report information on waste composition for MSW and industrial waste separately in order to enhance the transparency of the NIR. | Not resolved. Iceland did not report information on waste composition separately for MSW and industrial waste (see ID# W.2 above). |
| W.4 | 5.A.1 Managed waste disposal sites – CO ₂ , CH ₄ and N ₂ O (W.4, 2021) (W.11, 2019) Completeness | (a) Estimate emissions from the combustion of landfill gas for energy and transparently allocate them under the relevant categories in the energy sector (e.g. for electricity production in 2002–2006); (b) Improve the explanation of the allocation of emissions from landfill gas in the inventory (NIR section 7.2.4.1). | (a) Addressing. Iceland stated in the NIR (p.261) that between 2002 and 2006 landfill gas recovered was used for electricity production and that since 2007 it has been sold for use as fuel in vehicles (reported under category 1.A.3.b (road transportation)). For the 2021 submission the Party recalculated emissions under category 1.A.1.a.i (electricity generation) and included in the inventory emissions from landfill gas used for electricity generation (under biomass). However, these emissions were reported for 2003–2007 and 2017–2018 (and not 2002–2006). During the review, the Party clarified that discrepancies remain between the values reported under the energy sector, which are obtained from NEA, and the values reported under the waste sector, which are based on numbers reported from the waste management company. The Party reiterated, as reported in its NIR (p.261), that it will investigate the differences with the aim of harmonizing the values. The ERT notes the differences between the values are insignificant and below the threshold for application of an adjustment in accordance with decision 22/CMP.1, annex, paragraph 80(b), in conjunction with decision 4/CMP.11 and therefore this issue was not included in the list of potential problems and further questions raised by the ERT. The ERT notes that it seems the Party performed recalculations for methane energy recovery because its emissions across the time series increased from 2002 to 2020 but there is no explanation in the NIR on these recalculations; (b) Not resolved. The ERT considers that there is a lack of transparency on the allocation of landfill gas used for electricity for 2002–2006, for the reasons indicated in (a) above. In addition, NIR figure 7.7 (p.262) indicates that landfill gas was used for electricity production from 2002 to 2009. |
| W.5 | 5.B.1 Composting – CH ₄ and N ₂ O (W.8, 2021) Convention reporting adherence | (a) Report the amount of waste composted consistently between NIR table 7.13 and CRF table 5.B; (b) Correctly report in the NIR whether dry weight or wet weight is used as the basis for the estimation. | (a) Not resolved. Iceland did not report the amount of waste composted consistently between NIR table 7.10 (p.266) and CRF table 5.B. In CRF table 5.B, the amount of composted waste is 12.42 kt and in NIR table 7.10 it is 14 kt (both (expressed on a dry weight basis). The Party also continued to report the CH ₄ and N ₂ O EFs in wet weight in NIR table 7.12 (p.266), that is, 4 g CH ₄ /kg and 0.24 g N ₂ O/kg. During the review, the Party explained that the correct amount of waste composted in dry weight appears in CRF table 5.B and that it will correct the amount in NIR table 7.10; (b) Resolved. Iceland added to NIR table 7.10 (p.266) a row with the amount of waste composted in dry weight; this table now presents AD in both dry and wet |

| ID# | Issue/problem classification ^{a, b} | Recommendation from previous review report | ERT assessment and rationale |
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| W.6 | 5.D Wastewater treatment and discharge – CH ₄ and N ₂ O (W.6, 2021) (W.6, 2019) (W.8, 2017) (W.5, 2016) (W.5, 2015) (81, 2014) (74, 2013) Accuracy | Include in the NIR more background data on sludge removal (e.g. amount and N content), clearly indicating in which category the resulting emissions are accounted for. | weight. The Party added to the NIR the information that “the basis for the estimation of emissions from composting is wet weight”. Resolved. Iceland reported the amount of sewage sludge removed and the N effluent for relevant years of the time series; for example, for 2020, sludge removed accounted for 3.3 kt DC and N effluent for 2.6 kt N (NIR section 7.5.4.2 and table 7.21, p.282). The Party also indicated that emissions from sludge removed are accounted for under categories 5.A.1.a (managed waste disposal sites – anaerobic), 5.C.1.a.2.iv (waste incineration, biogenic, sewage sludge) and 3.D.a.2.b (organic N fertilizers, sewage sludge applied to soils). The amount of sewage sludge reported under these categories is deducted from the estimates of N ₂ O emissions for category 5.D.1 (domestic wastewater). |
| W.7 | 5.D Wastewater treatment and discharge – CH ₄ and N ₂ O (W.9, 2021) Transparency | Update the NIR to explain that a correction factor of 1 is applied to the discharge pathways “not known”, “septic tanks urban” and “septic tanks rural” and that a correction factor of 1.25 is applied to the discharge pathways in which commercial activities are likely to occur, namely, “not known into sea, river, lake”, “primary treatment”, “secondary treatment” and “tertiary treatment”. | Resolved. Iceland included in its NIR (section 7.5.2.1, pp.276–277) the required information, explaining that “the correction factor I is set to 1 for the pathways ‘not known, septic tanks urban and septic tanks rural’, while for ‘not known into sea, river, lake, no treatment, primary, secondary and tertiary treatment’ I is set to 1.25 to account for industrial wastewater discharge such as commercial activities, accommodation services, restaurants, shops which are commonly discharged in the same sewer system.” |
| W.8 | 5.D Wastewater treatment and discharge – CH ₄ and N ₂ O (W.9, 2021) Completeness | Verify whether emissions from overnight stays associated with foreign visitors to Iceland are included in the inventory (in the discharge pathways using a correction factor of 1.25) and, if not, include the emission estimates in the inventory, because justification for exclusion based on the likely level of emissions should be applied at the category level and not to parts of a category or subcategory, in accordance with the UNFCCC Annex I inventory reporting guidelines, paragraph 37(b), footnote 7. | Addressing. Iceland explaining during the review that it has estimated the additional emissions from overnight stays associated with foreign visitors to Iceland. According to the Party, for 2015–2019, this source represents annual emissions of between 1.0 and 1.4 kt CO ₂ eq, which is below the threshold of significance for the application of adjustments (2.25 kt CO ₂ eq for 2020). The ERT, while recognizing that the level of emissions from overnight stays is insignificant, considers the emissions should be included in the inventory because justification for exclusion based on the likely level of emissions should be applied at the category level and not to parts of a category or a subcategory, in accordance with footnote 7 to paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines. |
| W.9 | 5.D Wastewater treatment and discharge – NO _x , CO and NMVOCs (W.10, 2021) Transparency | (a) Update the notation key to “NA” for NO _x and CO in CRF table 5. Continue to report NMVOCs as “NE” until the Party is able to change the AD and obtain data on the volume of wastewater handled for calculating the GHG emissions, applying a | (a) Addressing. Iceland updated some of the notation keys in CRF table 5. For category 5.D.1 (domestic wastewater), the Party reported “NA”, correctly, for NO _x and CO emissions but continued to report “NE” for NMVOC emissions. For category 5.D.2 (industrial wastewater), the Party reported, correctly, “NE” for NMVOC emissions but continued to report “NE” (instead of “NO”) for NO _x and CO emissions. During the review, the Party clarified that an error occurred when |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| | | <p>tier 1 method and using BOD for the population;</p> <p>(b) Provide in CRF table 9 the reasons for reporting “NE” for NMVOCs under domestic and industrial wastewater.</p> | <p>updating CRF table 5 and that it will address this issue for the next annual submission;</p> <p>(b) Not resolved. The Party did not provide in CRF table 9 the reasons for reporting “NE” for NMVOC emissions from domestic and industrial wastewater treatment and discharge.</p> |
| KP-LULUCF | | | |
| KL.1 | <p>General (KP-LULUCF) – CO₂, CH₄ and N₂O (KL.1, 2021) (KL.2, 2019) (KL.2, 2017) (KL.4, 2016) (KL.4, 2015) Transparency</p> | <p>Include in the NIR country-specific information on the associated FM and AR and background levels of emissions associated with annual disturbances, as well as information on a margin and how to avoid the expectation of net credits or net debits during the commitment period, including through the use of a margin.</p> | <p>Resolved. Iceland reported in its NIR (p.363) country-specific information on the associated AR and FM and background levels of emissions associated with annual disturbances. As the amount of associated emissions is so small that a background level and a margin cannot be established, the Party now reports “NO” for these parameters under AR and FM in CRF tables 4(KP-I)A.1.1 and 4(KP-I)B.1.3. The ERT notes that no events qualifying for the natural disturbance mechanism occurred in Iceland during the second commitment period of the Kyoto Protocol.</p> |
| KL.2 | <p>General (KP-LULUCF) – CO₂, CH₄ and N₂O (KL.2, 2021) (KL.3, 2019) (KL.3, 2017) (KL.5, 2016) (KL.5, 2015) Transparency</p> | <p>Report information clearly demonstrating that emissions by sources and removals by sinks resulting from FM under Article 3, paragraph 4, and any elected activities under Article 3, paragraph 4, are not accounted for under activities under Article 3, paragraph 3.</p> | <p>Resolved. Iceland included in its NIR (section 11.5.5, p.363) information that demonstrates that emissions and removals resulting from elected activities under Article 3, paragraph 4, are not accounted for under activities under Article 3, paragraph 3. Section 11.5.5 has been updated with the required information described in the previous review report.</p> |
| KL.3 | <p>General (KP-LULUCF) – CO₂, CH₄ and N₂O (KL.3, 2021) (KL.4, 2019) (KL.7, 2017) Transparency</p> | <p>Provide in the NIR a description of the methodologies used for conducting an uncertainty analysis for KP-LULUCF activities (AR, deforestation, FM and HWP), including the methodology used in the uncertainty analysis of AD, EFs and emissions for each carbon pool.</p> | <p>Resolved. Iceland reported uncertainty estimates for HWP in NIR section 11.6 (p.364) and for AR and FM in NIR section 11.3.2.5 (p.358). During the review, the Party provided the ERT with additional information related to the uncertainty estimation for deforestation; namely, the Party explained that deforestation reporting in Iceland is built on data sampling of every deforestation event. The combined uncertainty of the estimated area and the CSC is judged to be 20 per cent of the reported net emissions from deforestation. With the information provided during the review, the ERT considers the issue resolved.</p> |
| KL.4 | <p>General (KP-LULUCF) – CO₂, CH₄ and N₂O (KL.4, 2021) (KL.5, 2019) (KL.8, 2017) Transparency</p> | <p>Provide information in the NIR on the approach used to develop background level and margin values for FM and AR and demonstrate how the approach taken avoids the expectation of net credits or net debits, in accordance with decision 2/CMP.7, annex, paragraph 33.</p> | <p>Resolved. See ID# KL.1 above.</p> |
| KL.5 | <p>AR – CO₂, CH₄ and N₂O (KL.5, 2021) (KL.6, 2019)</p> | <p>Provide an additional description of the process by which CSC and associated</p> | <p>Resolved. Iceland provided an additional description on the process by which CSC and associated emissions and removals are estimated. The Party reported in NIR</p> |

| ID# | Issue/problem classification ^{a, b} | Recommendation from previous review report | ERT assessment and rationale |
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| | (KL.4, 2017) (KL.1, 2016) (KL.1, 2015) (86, 2014) Transparency | emissions and removals are estimated, including tables with raw data and intermediate outputs stratified by year and forest type. | table 6.8 (p.200) the CSC per area unit and in NIR table 6.10 (p.205) the total CSC of biomass, litter and soil, separately. NIR figures 6.7 (p.197) and 6.8 (p.203) are graphs showing area as well as CSC and carbon stocks related to age for the two main forest categories: cultivated forest and natural birch forest. |
| KL.6 | AR – CO ₂ (KL.6, 2021) (KL.7, 2019) (KL.9, 2017) Comparability | Correct the use of notation keys by reporting CSC in the HWP pool under AR using the notation key “NO” for the whole time series and provide an explanation in the NIR that harvesting from afforestation lands has not yet occurred. | Addressing. Iceland reported in its NIR (section 11.4.5, p.359) on the use of the notation key “NO”, explaining that “afforestation since 1990 has not yet yielded wood removals as these forests are still too young for commercial thinning and therefore harvested wood products are reported as not occurring”. However, in CRF table 4(KP-I)A.1 and CRF table 4(KP-I)C, the Party continued to report “NA” for CSC in the HWP pool under AR. |
| KL.7 | AR – CO ₂ (KL.8, 2021) (KL.17, 2019) Transparency | Indicate in the NIR that the average EF obtained from the data from two research projects for litter on AR includes both natural birch forests and cultivated forests. | Not resolved. Iceland did not include in its NIR the required information. In response to the recommendation in the previous review report, the Party clarified that the lower EF for litter in cultivated forests under FM (0.09 t C/ha) compared with the EF for litter in cultivated forests under AR (0.14 t C/ha) can be explained by the age of afforestation under FM. Part of the forest under FM was afforested more than 50 years ago and reported with no removal to litter. The part of the forest under FM that is younger than 51 years was estimated using the same EF as the one used for AR. The average of these two groups results in a lower EF than the country-wide EF of 0.14 t C/ha. During the review, the Party explained that it consulted two research projects on estimating the country-specific average EF, and these include both introduced tree species and the native <i>Betula pubescens</i> , which is the predominant tree species of natural birch forests in Iceland. The Party indicated that more information related to this issue will be provided in the next NIR. |
| KL.8 | Deforestation – CO ₂ , CH ₄ and N ₂ O (KL.9, 2021) (KL.8, 2019) (KL.5, 2017) (KL.2, 2016) (KL.2, 2015) (87, 2014) Accuracy | Recalculate CSC in soil organic matter by ensuring symmetry among the pairs of land-use conversions (e.g. grassland converted to forest land, and forest land converted to grassland). | Not resolved. Iceland did not recalculate CSC in soil organic matter. The Party reported in CRF tables 4(KP-I)A.1 and 4(KP-I)A.2 the same CSC for SOC as reported in previous submissions. During the review, the Party clarified that recalculating CSC in soil organic matter using symmetrical EFs for deforestation and for afforestation would have a minimal effect on its accounting: the annual loss of carbon would change from –0.03 to –0.02 kt C for 2020. The ERT, noting that the current estimate for CSC in soil organic matter is conservative and does not create any additional credits, concludes that this potential problem of a mandatory nature does not influence the Party’s ability to fulfil its commitments for the second commitment period of the Kyoto Protocol and therefore this issue was not included in the list of potential problems and further questions raised by the ERT. |
| KL.9 | Deforestation – CO ₂ and N ₂ O (KL.10, 2021) (KL.18, 2019) Completeness | Report the AD, CSC and related N ₂ O emissions for this category to avoid underestimating the emissions. If this is not possible, provide information that justifies the reporting of “NE” for AD and CSC related to N ₂ O emissions from | Resolved. Iceland reported in CRF table 4(KP-II)3 N ₂ O emissions from mineralization and immobilization due to carbon loss after deforestation for the first time by using the default tier 1 method. However, the ERT noted that there is no description of the method in the NIR except in NIR table 10.8 (p.345), where the Party reported the status of implementation of relevant improvements for the LULUCF sector and for KP-LULUCF in response to the recommendations in |

| <i>ID#</i> | <i>Issue/problem classification^{a, b}</i> | <i>Recommendation from previous review report</i> | <i>ERT assessment and rationale</i> |
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| | | mineralization and immobilization due to carbon loss or gain associated with land-use conversion and management change in mineral soils on land subject to deforestation in the NIR in the next annual submission and consider providing information in the documentation box to CRF table 4(KP-II)3. | previous review reports. The ERT considers that the reporting of emissions is complete and, with the clarification provided by the Party in NIR table 10.8, considers this issue resolved. |
| KL.10 | FM – CO ₂ (KL.11, 2021) (KL.10, 2019) (KL.10, 2017) Completeness | Report information on CSC in below-ground biomass for FM or provide justification that the carbon pool is not a net source in accordance with decision 2/CMP.8, annex II, paragraph 2(e). | Resolved. Iceland did not include an estimate of losses from below-ground biomass for cultivated forests for 2013–2020, although losses from above-ground biomass were reported. In CRF table 4(KP-I)B.1, losses of carbon from below-ground biomass for cultivated forests under FM were reported as “NE”. The ERT included this issue in the list of potential problems and further questions raised by the ERT and, in response, the Party provided an official resubmission of the CRF tables (version 4) and a revised NIR during the review week. The revised estimates for losses of carbon from below-ground biomass for cultivated forests reported under FM covered the entire time series (2013–2020), making the reporting of FM complete. The revised estimates resulted in a decrease in net removals reported and accounted for under FM during the second commitment period of the Kyoto Protocol of 6.634 kt CO ₂ eq. The ERT checked the values in CRF table 4(KP-I)B.1 of the revised submission and concluded that the issue is resolved. |
| KL.11 | FM – CO ₂ (KL.12, 2021) (KL.13, 2019) Transparency | Report transparently in the NIR any recalculations for FM (including changes in CSC factors for the pools, e.g. mineral and organic soils). | Resolved. Iceland reported transparently the recalculations made for FM in its submission of 12 April 2022. The Party reported in its NIR (section 11.3.2.4, p.358) information on changes in data and methods since the previous annual submission for all activities and pools reported. |
| KL.12 | FM – CO ₂ (KL.13, 2021) (KL.14, 2019) Transparency | Provide information on any changes in data and methods from previous submissions, including those resulting from a detected error, in future annual submissions. | Resolved. Iceland reported in its NIR (pp.360–364) a detailed description of the changes in data and methods used in the recalculations for FM in its submission of 12 April 2022. See also ID# KL.11 above. |
| KL.13 | FM – CO ₂ (KL.14, 2021) (KL.19, 2019) Completeness | Report estimates for CSC in the litter of natural birch forests under FM or justify why the carbon pool is not a net source, in accordance with decision 2/CMP.8, annex II, paragraph 2(e). | Resolved. Iceland changed the notation key from “NE” to “NA” in CRF table 4(KP-I)B.1 for reporting CSC in litter for natural birch forests under FM for 2013–2020 and provided justification in the NIR (section 11.5.5, p.364) as to why the pool is not a net source of emissions. According to the Party, FM includes natural birch forests as estimated at the end of 1989, which are all defined as forest land remaining forest land and are not in a transitional state. In the NIR (section 11.3.1.1, p.356), the Party highlighted that there is no CSC for litter and mineral soil for the part of FM that is defined as forest land remaining forest land, leading to the reporting of “NA” for natural birch forest. The Party also explained that CSC in litter in FM follows the |

| ID# | Issue/problem classification ^{a, b} | Recommendation from previous review report | ERT assessment and rationale |
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| KL.14 | FM – CO ₂ (KL.16, 2021) (KL.21, 2019) Accuracy | Provide the revised technical correction to the FMRL, as planned, before the end of the commitment period. | <p>same pattern of variation as CSC in mineral soil (because CSC in litter is only reported for forests of 50 years old or younger under FM). Therefore, considering that all FM forests are defined as older than 50 years, CSC in litter and mineral soils is likely to be a sink rather than a source. The tier 1 approach is applicable and both the litter and mineral soil pools are assumed to be 0 (zero), as recommended in the 2006 IPCC Guidelines (vol. 4, chap. 2.3.2.1, p.2.21).</p> <p>Resolved. Iceland reported in its NIR (section 11.5.3, pp.360–363) an updated technical correction to the FMRL, including the calculations of the corrected FMRL and an explanation of the elements that changed in relation to the originally submitted FMRL (changes in area estimates, in carbon stock calculations and in EFs). However, the ERT noted that the Party made a post-calibration of the projected removals in living biomass using the reported values for the second commitment period of the Kyoto Protocol.</p> <p>During the review, discussions between the ERT and the Party clarified that only updates to the historical data (2009) as well as the updated model for projections could be used to revise the estimates for living biomass in the FMRL. The ERT included this issue in the list of potential problems and further questions raised by the ERT and in response, the Party provided an official resubmission of the CRF tables (version 4) and a revised NIR during the review week.</p> <p>The revised estimates consisted of an updated FMRL_{corr}, which was calculated following the advice of the ERT to not calibrate the FMRL using the reported removals for cultivated forests during the second commitment period. The updated FMRL_{corr} reported in the revised estimates was –156.107 kt CO₂ eq/year and the updated technical correction to the FMRL_{corr} was estimated to be –1.755 kt CO₂ eq/year, which was included in the revised CRF table 4(KP-I)B.1.1. The update of the FMRL_{corr} led to an increase in accounted net removals for FM of 146.240 kt CO₂ eq for the second commitment period. The ERT checked the values in CRF table 4(KP-I)B.1.1 of the revised submission and concluded that the issue is resolved.</p> |
| KL.15 | RV – CO ₂ (KL.18, 2021) (KL.11, 2019) (KL.11, 2017) Accuracy | Revise estimates of carbon stock in living and dead biomass as well as carbon stock in soils in revegetated areas and revise estimates of carbon sequestration in revegetated land for the whole time series. | <p>Not resolved. Iceland did not revise the estimates as requested in the recommendation. However, the Party reported in its NIR (section 11.3.1.2, p.357) that CSCs at RV sites were estimated using a country-specific EF covering all carbon pools. During the review, the Party clarified that the current estimates for CSC in living biomass, deadwood and soils are based on three peer-reviewed publications. The Party explained the studies used to estimate the CSC in living biomass and SOC, as follows:</p> <p>(a) Biomass: for RV for 2013–2020, Iceland used an implied CSC factor of 0.057 t C/ha/year for gains in above-ground biomass (CRF table 4(KP-I)B.4). According to one of the studies, the annual rate of sequestration in above-ground biomass ranges</p> |

| ID# | Issue/problem classification ^{a, b} | Recommendation from previous review report | ERT assessment and rationale |
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| KL.16 | HWP – CO ₂ (KL.19, 2021) (KL.12, 2019) (KL.12, 2017) Transparency | Provide in the NIR information on the calculation of emissions from HWP, including the AD and methodology used, including information on HWP from FM and deforestation, as well as information on how Iceland distinguishes between domestic and imported HWP, in accordance with the requirements in decision 2/CMP.8, annex II, paragraph 2(g)(i). | <p>from 0.01 to 0.5 t C/ha/year, the amount depending on the reclamation method used and site conditions;</p> <p>(b) Mineral soils: for RV for 2013–2020, Iceland used an implied CSC factor of 0.513 t C/ha/year for mineral soils (CRF table 4(KP-I).B.4). According to one of the studies, reclamation in desert areas of Iceland results in an average sequestration rate in soils of 0.6 t C ha/year, which is maintained for more than 50 years. In addition, the sequestration rate in above-ground or below-ground biomass is considered to be 0.01–0.5 t/ha/year. Moreover, another study found that “barren desert soils were sandy with unstable surface conditions subjected to intense cryoturbation and wind erosion; the initial carbon stocks in soils of eroded, untreated areas were 0.1–0.3 kg/m², largely consisting of inert metal–humus and/or clay–humus complex characteristic of andosols. Carbon content in the 5 cm surface layer increased from <0.3 to >0.7 per cent in some treated plots. Annual carbon accumulation of 0.04–0.063 kg C/m²/year was observed over the first seven years after initiation of restoration efforts, highest in treatments seeded with grasses and fertilized but no accumulation was observed in untreated controls. Carbon accumulation rate of >0.05 kg C/m²/year can potentially be maintained over >100 years due to the nature of andosols and a steady burial by an influx of eolian materials.”</p> <p>The Party provided information showing that its estimates are conservative, and that no underestimation of emissions occurs. The ERT considers that this issue has no impact on accounting and concludes that this potential problem of a mandatory nature does not influence the Party’s ability to fulfil its commitments for the second commitment period of the Kyoto Protocol and therefore this issue was not included in the list of potential problems and further questions raised by the ERT.</p> <p>Resolved. Iceland reported in its NIR (section 11.6, pp.364–365) new and improved information on the calculation of emissions from HWP, including information on how it distinguishes HWP from FM and deforestation, as well as information on how domestic and imported HWP are distinguished. Most of the deforestation events occur in either young afforested areas or natural birch forests that do not yield harvested wood to be utilized as HWP. In two deforestation events (2006, –4.3 ha and 2015, –3.0 ha) harvested wood was partially removed from the area and used for making wood chips and firewood.</p> |

^a References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) in which the issue or problem was raised. Issues are identified in accordance with paras. 80–83 of the UNFCCC review guidelines and classified as per para. 81 of the same guidelines. Problems are identified and classified as problems of transparency, accuracy, consistency, completeness or comparability in accordance with para. 69 of the Article 8 review guidelines in conjunction with decision 4/CMP.11.

^b The reports on the reviews of the 2018 and 2020 annual submissions of Iceland were not available at the time of this review. Therefore, 2018 and 2020 are excluded from the list of review years in which issues could have been identified.

IV. Issues and problems identified in three or more successive reviews and not addressed by the Party

9. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues and/or problems included in table 4 have been identified in three or more successive reviews, including the review of the 2022 annual submission of Iceland, and had not been addressed by the Party by the time of publication of this review report.

Table 4

Issues and/or problems identified in three or more successive reviews and not addressed by Iceland

| <i>ID#</i> | <i>Previous recommendation for issue</i> | <i>Number of successive reviews issue not addressed^a</i> |
|------------|--|---|
| General | | |
| G.3 | Report in the NIR complete information on the tools and spreadsheets used for QA/QC and present a summary of the revised QA/QC plan and manual once they are finalized. | 4 (2017–2022) |
| G.5 | Improve the QC for the NIR to ensure that all changes affecting the recalculation of a given category are included in the description of the recalculations in the NIR and to ensure consistent reporting of the recalculations between the NIR and the CRF tables. | 3 (2019–2022) |
| Energy | | |
| E.2 | Remove the separate entries for electrodes from the reference approach and report the correct apparent consumption for the reference approach, allowing for meaningful comparison between the estimated CO ₂ emissions resulting from the two approaches across the time series, and explain the planned recalculation for the reference approach in the next NIR. | 3 (2019–2022) |
| E.4 | Report on peat consistently between the sectoral and the reference approach. | 3 (2019–2022) |
| E.5 | Enhance collaboration among NEA, IEA and relevant national authorities to resolve the errors detected in the data, and report correctly in CRF table 1.A(b) the stock changes for coke oven/gas coke between 2007 and 2012 and make corrections to the emission estimates. | 3 (2019–2022) |
| E.6 | Correctly fill in CRF table 1.A(d) for lubricants and petroleum coke. | 3 (2019–2022) |
| E.7 | Develop country-specific fuel properties (NCVs and carbon content of fuels) that would allow the tier 2 approach for key categories to be used in line with the 2006 IPCC Guidelines. | 4 (2017–2022) |
| E.13 | Explain in the NIR any significant inter-annual and trend changes in the AD, emissions and IEFs for CH ₄ and N ₂ O emissions related to the use of gasoline for passenger cars. | 3 (2019–2022) |
| E.14 | Explain any significant inter-annual changes in the AD used for biomass and provide information on the EFs used for biofuels to justify any significant inter-annual changes in the biomass IEFs. | 3 (2019–2022) |
| E.15 | Investigate the possibility of separately estimating and reporting fuel consumption by splitting it between ground activities at airports and harbours (category 1.A.3.e.ii), agriculture and forestry (category 1.A.4.c.ii) and manufacturing industries and construction (category 1.A.2) by developing institutional cooperation or by extending the reporting obligations included in Icelandic regulation 520/2017, which is expected to be updated soon. | 3 (2019–2022) |

| <i>ID#</i> | <i>Previous recommendation for issue</i> | <i>Number of successive reviews issue not addressed^a</i> |
|--------------------|--|---|
| E.17 | Collect AD on the consumption of charcoal, estimate emissions from charcoal consumption, report the corresponding CO ₂ emissions as a memo item and include the non-CO ₂ emissions in the corresponding CRF table and national totals. | 4 (2017–2022) |
| IPPU | | |
| I.1 | Report in the CRF tables emission estimates or the relevant notation keys, as appropriate, for CO ₂ emissions for categories glass production (2.A.3), ammonia production (2.B.1), adipic acid production (2.B.3), soda ash production (2.B.7); and HFC, PFC, SF ₆ and NF ₃ emissions for electronics industry (2.E), foam blowing agents (2.F.2), fire protection (2.F.3), solvents (2.F.5) and other applications (2.F.6). | 5 (2016–2022) |
| Agriculture | | |
| A.1 | Update productivity data, in particular the weight categories for cattle, poultry productivity (live weight and living age) and swine productivity (piglets per sow) and include in the improvement plan activities to update the productivity data at regular intervals. | 4 (2017–2022) |
| A.4 | Justify the appropriateness of the current parameters and/or update the input parameters and consequently the CH ₄ EF for future annual submissions, as planned. | 3 (2019–2022) |
| A.8 | Include in the NIR additional information on the non-occurrence of the field burning of agricultural crop residues. | 6 (2014–2022) |
| A.9 | Implement the planned checks of the AD for the category and update them as planned and report CO ₂ emissions from liming following the UNFCCC Annex I inventory reporting guidelines in future annual submissions, ensuring consistent reporting of the emissions across the entire time series under category 3.G. If the change is not made in the next annual submission, justify this in the NIR and include an explanation of the allocation in CRF table 9. | 3 (2019–2022) |
| LULUCF | | |
| L.3 | Improve the QA/QC plan to avoid discrepancies in cross references between NIR sections and to ensure that section numbering is correct. | 3 (2019–2022) |
| L.4 | Provide transparent information in the NIR section discussing the land-transition matrix on the use of the notation key “IE” where areas have been accounted for elsewhere. | 3 (2019–2022) |
| L.5 | Select the required information and organize it in a manner that enables the reader to clearly understand the data sources and their quality and the methodology used to derive the land representation. | 6 (2014–2022) |
| L.6 | Improve the land representation data used to report LULUCF emissions and removals under the Convention by reconciling all data on areas contained in databases and land-use maps, as well as data collected from observations, including an estimation of uncertainties related to AD once land matrices are improved and updated. | 4 (2017–2022) |
| L.7 | Improve the transparency of the AD reporting by providing information on the uncertainties related to habitat type classification, especially in relation to separating wetlands from grassland and other land. | 3 (2019–2022) |
| L.9 | Improve the estimates of CSC under forest land, particularly by including estimates for the deadwood and litter carbon pools, or provide an explanation in the NIR and in CRF table 9 of why these pools could not be estimated. | 4 (2017–2022) |

| <i>ID#</i> | <i>Previous recommendation for issue</i> | <i>Number of successive reviews issue not addressed^a</i> |
|------------|--|---|
| L.10 | Provide transparent information in CRF table 9 for reporting “IE” where GHG emissions have been accounted for elsewhere and correct the notation key from “NE” to “NA” for litter carbon stock in the forest land remaining forest land categories. | 3 (2019–2022) |
| L.12 | Implement the calculation methods in line with equations 2.15 and 2.16 of volume 4 of the 2006 IPCC Guidelines with instant oxidation of all amounts of living biomass and litter when making land-use conversions, unless Iceland can document that the carbon stock before land-use conversion is maintained in the land converted. | 4 (2017–2022) |
| L.15 | Estimate the area of forest land and other land that was converted to cropland before 1990 and report these values under the appropriate categories. | 5 (2015/2016–2022) |
| L.16 | Ensure the equivalence of climatic, historical and edaphic conditions when analysing pairs of samples (i.e. in cropland and grassland) to determine the dynamic of the soil carbon stocks associated with conversion among the two land uses. | 6 (2014–2022) |
| L.17 | Prepare estimates for the emissions from degraded areas of grassland. | 7 (2013–2022) |
| L.18 | (b) Estimate and report CSC in mineral soils under grassland remaining grassland for “Revegetated land older than 60 years”. | 5 (2015/2016–2022) |
| L.20 | (a) Revise the CO ₂ estimates for land converted to grassland using updated data on carbon sequestration in soils, especially for other land converted to grassland; (b) include in the NIR, in tabular format, the total estimates of CSC in living biomass, litter and soil and the average CSC per area for the whole time series, in land converted to grassland and land converted to forest land. | 4 (2017–2022) |
| L.21 | Develop a country-specific methodology for managed wetlands that would allow it to use the tier 2 approach for key categories in line with the 2006 IPCC Guidelines. | 3 (2019–2022) |
| L.24 | Estimate and report CSC in mineral soils under land converted to settlements. | 5 (2015/2016–2022) |
| L.29 | Include estimates of the emissions from biomass burning on cropland and grassland for the entire time series, or, if not, include information on the reporting of “NE” (both in the NIR and the CRF tables) and provide an explanation as to why these pools could not be estimated. | 3 (2019–2022) |
| Waste | | |
| W.2 | Investigate the composition of both MSW and industrial waste and reconsider estimating separately emissions from industrial waste. | 3 (2019–2022) |
| W.3 | Report information on waste composition for MSW and industrial waste separately in order to enhance the transparency of the NIR. | 3 (2019–2022) |
| W.4 | (a) Estimate emissions from the combustion of landfill gas for energy and transparently allocate them under the relevant categories in the energy sector (e.g. for electricity production in 2002–2009); (b) improve the explanation of the allocation of emissions from landfill gas in the inventory (NIR section 7.2.4.1). | 3 (2019–2022) |

| <i>ID#</i> | <i>Previous recommendation for issue</i> | <i>Number of successive reviews issue not addressed^a</i> |
|------------|---|---|
| W.6 | Include in the NIR more background data on sludge removal (e.g. amount and N content), clearly indicating in which category the resulting emissions are accounted for. | 7 (2013–2022) |
| KP-LULUCF | | |
| KL.6 | Correct the use of notation keys by reporting CSC in the HWP pool under AR using the notation key “NO” for the whole time series and provide an explanation in the NIR that harvesting from afforestation lands has not yet occurred. | 4 (2017–2022) |
| KL.7 | Indicate in the NIR that the average EF obtained from the data from two research projects for litter on AR includes both natural birch forests and cultivated forests. | 3 (2019–2022) |
| KL.8 | Recalculate CSC in soil organic matter by ensuring symmetry among the pairs of land-use conversions (e.g. grassland converted to forest land, and forest land converted to grassland). | 6 (2014–2022) |
| KL.15 | Revise estimates of carbon stock in living and dead biomass as well as carbon stock in soils in revegetated areas and revise estimates of carbon sequestration in revegetated land for the whole time series. | 4 (2017–2022) |

^a Reports on the reviews of the 2018 and 2020 annual submissions of Iceland have not yet been published. Therefore, 2018 and 2020 were not included when counting the number of successive years for this table. In addition, as the reviews of the Party’s 2015 and 2016 annual submissions were conducted together, they are not considered successive reviews and 2015/2016 is counted as one year.

V. Additional findings made during the individual review of the Party’s 2022 annual submission

10. Table 5 presents findings made by the ERT during the individual review of the 2022 annual submission of Iceland that are additional to those identified in table 3.

Table 5
Additional findings made during the individual review of the 2022 annual submission of Iceland

| <i>ID#</i> | <i>Finding classification</i> | <i>Description of finding with recommendation or encouragement</i> | <i>Is finding an issue/problem?^a</i> |
|------------|-------------------------------|--|---|
| General | | | |
| G.6 | Annual submission | Iceland reported indirect CO ₂ emissions from the oxidation of NMVOCs under category 2.D.3 (other, non-energy products from fuels and solvent use) in CRF table 2(I)s2. In the NIR (p.286), the Party clarified that the indirect CO ₂ emissions reported under category 2.D.3 are those resulting from atmospheric oxidation of NMVOCs from road paving with asphalt and solvent use and that these emissions are reported as direct CO ₂ emissions in CRF tables 2(I)s2 and 2(I).A-Hs2 and not as indirect CO ₂ emissions in CRF table 6. The ERT noted that when indirect CO ₂ emissions are reported as direct CO ₂ emissions, these emissions are included in the national totals in the CRF summary tables. The ERT also noted that for Parties that decide to report indirect CO ₂ emissions, the national totals shall be presented with and without indirect CO ₂ emissions in the CRF summary tables (e.g. tables 10s1–10s6), in accordance with paragraph 29 of the UNFCCC Annex I inventory reporting guidelines. During the review, the | Yes. Convention reporting adherence |

| ID# | Finding classification | Description of finding with recommendation or encouragement | Is finding an issue/problem? ^a |
|-----|------------------------|--|---|
| G.7 | CPR | <p>Party provided the ERT with a spreadsheet showing the national total emissions with and without indirect CO₂ emissions. The ERT noted that these emissions were estimated in line with the 2006 IPCC Guidelines and the UNFCCC Annex I inventory reporting guidelines.</p> <p>The ERT recommends that Iceland report national total emissions with and without indirect CO₂ emissions in the CRF summary tables, noting that indirect CO₂ emissions cannot be identified separately in any of the CRF summary tables presenting the national totals if they are not reported in CRF table 6.</p> <p>Iceland calculated its CPR in NIR section 12.5. The Party compared its CPR (calculated as 90 per cent of its assigned amount) with 100 per cent of eight times the total emissions reported in its last published annual review report (2021 submission) and not the value in the most recently submitted inventory. According to the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18, Parties should demonstrate the CPR in the NIR by calculating its value considering (1) 90 per cent of the Party's assigned amount and (2) 100 per cent of eight times the total emissions of its most recently reviewed inventory (in the case of Iceland, the 2022 submission), and maintain in its national registry whichever is lowest.</p> <p>In accordance with the initial review report (FCCC/IRR/2016/ISL), the CPR calculated as 90 per cent of its assigned amount is 13,794,496 t CO₂ eq. The ERT compared this value with 100 per cent of eight times the total emissions from the 2022 submission (4,509.64 kt CO₂ eq in 2020) and found a value of 36,077,116 t CO₂ eq. Based on the results of the comparison, the CPR is 13,794,496 t CO₂ eq.</p> <p>In addition, the ERT noted that the Party reported in its NIR (p.371) a CPR of 13,794,495 t CO₂ eq instead of the correct one of 13,794,496 t CO₂ eq. The ERT recognizes that the incorrect reporting in the NIR is probably due to rounding rules, because reporting under the Kyoto Protocol requires the CPR to be rounded up in order to ensure the principle of environmental integrity. Therefore, the Party should correct the CPR value in the NIR in future submissions to reflect the CPR value as defined in the initial review report for the second commitment period of the Kyoto Protocol. The ERT concluded that this potential problem of a mandatory nature does not influence the Party's ability to fulfil its commitments for the second commitment period of the Kyoto Protocol and therefore this issue was not included in the list of potential problems and further questions raised by the ERT.</p> <p>The ERT recommends that Iceland improve its QA/QC procedures to review the calculation of the inputs for determining the CPR, including the assigned amount and the relevant modalities in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18.</p> | Yes. KP reporting adherence |
| G.8 | Inventory management | <p>Iceland reported in its NIR (section 1.2.3, p.5) that the Environment Agency of Iceland's ability to collect data for preparing the GHG inventory is intended to be clarified through a revision to Iceland's regulation 520/2017. The NIR states that the regulation will be revised to "include clearer definitions of responsibilities of the various institutions and other data providers involved, clearer deadlines and clearer provisions on what can be done if data providers fail to provide the data required as per the regulation." During the review, the Party informed the ERT that the planned revision to the regulation has been delayed.</p> <p>The ERT encourages Iceland to report, in the next NIR on whether the national inventory compiler (Environment Agency of Iceland) has experienced any difficulties in obtaining data from data providers and to provide an update</p> | Not an issue/problem |

| ID# | Finding classification | Description of finding with recommendation or encouragement | Is finding an issue/problem? ^a |
|------|--|---|---|
| | | on progress of the planned revision to Iceland’s regulation 520/2017 on data collection from institutions related to the GHG inventory. | |
| G.9 | Inventory management | <p>Iceland reported in its NIR (section 1.2.2, p.5) that the Environment Agency of Iceland is responsible for compiling the GHG inventory but that other agencies prepare estimates for certain categories in the inventory preparation phase. The ERT noted that, in some cases, there appears to have been insufficient coordination among agencies and/or insufficient QC checks by the coordinating agency, resulting in double counting, omissions or a lack of transparency in the allocation of emissions. This is evident, for example, in ID#s A.8 and L.29 in table 3, which comprise a case of lack of transparency regarding the allocation of emissions, because it is not clear from the information provided in the NIR and CRF tables whether emissions from biomass burning of agricultural residues were reported under the agriculture or the LULUCF sector, and in ID# KL.19 below, which is a case of double counting, because emissions from N fertilizer application were identified across the agriculture sector and RV under KP-LULUCF.</p> <p>The ERT recommends that Iceland take measures to improve coordination among agencies responsible for preparing estimates for the national GHG inventory and, specifically, improve QC cross checks between the agriculture and LULUCF sectors in order to avoid double counting and lack of transparency in the allocation of emissions.</p> | Yes. Convention reporting adherence |
| | Energy | No findings for the energy sector additional to those included in table 3 were made by the ERT during the review. | |
| | IPPU | No findings for the IPPU sector additional to those included in table 3 were made by the ERT during the review. | |
| | Agriculture | | |
| A.11 | 3.D.a.6 Cultivation of organic soils (i.e. histosols) – N ₂ O | <p>Iceland reported the area of cultivated organic soils (i.e. histosols) in CRF table 3.D as 323,583.75 ha for 2020. The ERT noted that the sum of the area of organic soils under cropland in CRF table 4.B (64,750.69 ha) and the area of organic soils under grassland in CRF table 4.C (283,093.49 ha) is 347,844.18 ha, which is 7.5 per cent greater than the value reported in CRF table 3.D. During the review, the Party clarified that in CRF table 3.D, the area of organic soils relates to natural birch shrubland that are recently expanded into other grassland and it does not include “natural birch shrubland – old”, because old shrublands are considered neither as cultivated/managed cropland nor as cultivated/managed grassland.</p> <p>The ERT recommends that Iceland indicate in the NIR the difference in the area reported for cultivated organic soils under category 3.D.a.6 (CRF table 3.D) and the sum of the areas of organic soils under cropland (CRF table 4.B) and grassland (CRF table 4.C) and explain that the reason for the difference in area, as provided during the review, is that “natural birch shrublands – old” are not considered under the agriculture sector as they are considered neither as cultivated/managed cropland nor as cultivated/managed grassland.</p> | Yes. Transparency |
| | LULUCF | | |
| L.30 | 4.A.1 Forest land remaining forest land – CO ₂ | Iceland reported in CRF table 4.A.1 net CSC for living biomass separately for “natural birch forest older than 50 years”, “afforestations older than 50 years” and “plantations in natural birch forest”. The ERT noted that loss of carbon from below-ground biomass for cultivated forest was reported as “NE” in CRF table 4(KP-I)B.1 (see #KL.10 in table 3) for the entire time series. During the review, the Party provided a revised submission that included updated values of losses from this carbon pool to complete the reporting under the second commitment | Yes. Accuracy |

| ID# | Finding classification | Description of finding with recommendation or encouragement | Is finding an issue/problem? ^a |
|-------|---|---|---|
| | | <p>period of the Kyoto Protocol. For example, in CRF table 4(KP-I)B.1, losses from below-ground biomass for cultivated forest for 2020 were previously reported as “NE” and were reported in the revised submission as –0.185 kt C. The ERT noted that the revised values could also lead to a recalculation of the net CSC for living biomass reported under forest land remaining forest land (category 4.A.1) (currently, losses in CSC in living biomass are reported as “IE” in CRF table 4.A).</p> <p>The ERT recommends that Iceland explore whether the revised estimates for losses of carbon from below-ground biomass for cultivated forest reported under FM should also be reflected in the net CSC for living biomass reported under forest land remaining forest land, and if so, report updated net CSC for living biomass under forest land remaining forest land in the next annual submission.</p> | |
| L.31 | 4.A.2 Land converted to forest land – CO ₂ | <p>Iceland reported in its NIR (section 6.5.2.2, pp.203–204) a description of the estimation of litter removals in land converted to forest land for categories 4.A.2.2 (grassland converted to forest land) and 4.A.2.5 (other land converted to forest land) and mentioned two research projects, the results of which were used to estimate a country-specific average CSC for litter (0.14 t C/ha). However, the Party did not clarify in the NIR the reasons for deriving the implied factor for the CSC for litter from these two studies, which is based on an arithmetic average of the two data sets rather than a weighted average (see also ID# KL.7 in table 3). During the review, the Party explained that the two research projects used for estimating the country-specific average CSC for litter include both introduced tree species and the native <i>Betula pubescens</i>, which is the predominant tree species of the natural birch forests in Iceland. The ERT noted that, in the same section of the NIR, the Party provided information about new data to be obtained from future research through the NFI that will increase the understanding of CSC in litter and indicated that information related to these ongoing projects will be included in the next annual submission.</p> <p>The ERT recommends that Iceland include in the NIR a thorough and clear explanation of how it derived the country-specific CSC factor for litter, including why the relevant research projects were consulted, and why use of the factor is appropriate for estimating litter removals from land converted to forest land. In addition, the ERT encourages Iceland to update the estimates for CSC in litter as soon as new data become available.</p> | Yes. Transparency |
| | Waste | No findings for the waste sector additional to those included in table 3 were made by the ERT during the review. | |
| | KP-LULUCF | | |
| KL.17 | General (KP-LULUCF) | <p>The ERT noted that some of the information required according to decision 2/CMP.8, annex II, paragraph 2, was not provided in the NIR, namely information related to (1) the geographical location of the boundaries of the areas that encompass KP-LULUCF and (2) the spatial assessment unit used for determining the area of accounting for AR and deforestation. During the review, the Party informed the ERT that the boundaries of the areas encompassing KP-LULUCF are the national boundaries of Iceland. The Party also informed the ERT that in the NIR (section 6.5, p.195), it described the systematic sampling grid of the NFI for cultivated forest and natural birch forest and explained that the sampling grid is used to separate AR and deforestation from FM. The spatial assessment unit is 50 ha in the case of cultivated forest and 450 ha in the case of natural birch forest.</p> <p>The information provided during the review addressed the ERT’s concern. The ERT concludes that this potential problem of a mandatory nature does not influence the Party’s ability to fulfil its commitments for the second commitment period of the Kyoto Protocol and therefore this issue was not included in the list of potential problems and further questions raised by the ERT.</p> | Yes. Transparency |

| ID# | Finding classification | Description of finding with recommendation or encouragement | Is finding an issue/problem? ^a |
|-------|--|--|---|
| KL.18 | FM – CO ₂ , N ₂ O and CH ₄ | <p>It is good practice, according to the <i>2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol</i> (p.2.97), to provide information in the NIR on the main factors generating the accounting quantity (i.e. the difference in net emissions between reporting of FM during the second commitment period of the Kyoto Protocol and the FMRL) and on whether the accounting quantity (equal to FM minus FMRL) is consistent with those factors, with the aim of showing that the accounting quantity can be explained as deviations in actual policies from the historical policies included in the FMRL rather than as differences in methodological elements such as factors and parameters, including increments, used in constructing the FMRL and in estimating the actual GHG emissions and removals.</p> <p>During the review, the Party provided information that explained that the accounting quantity (–19,941 kt CO₂ eq/year), that is, the difference between FM and FMRL_{corr}, was related to (1) a higher net removal in HWP due to an increase in harvest levels since 2010 (FMRL_{corr} considered the same harvest level as for 2010) and (2) an increase in forest growth during the second commitment period compared with the growth used for the FMRL. The ERT commends the Party for the explanation provided but considers that the specific causes of the increase in forest growth were not explained.</p> | Yes. Transparency |
| | Direct and indirect N ₂ O emissions from N fertilization – N ₂ O | <p>The ERT noted that N₂O emissions related to the application of organic fertilizers on land reported under RV were missing for 2013, 2014 and 2015. To complete the reporting under the Kyoto Protocol, the Party provided these estimates in a revised submission of the CRF tables during the review week (version 3). The official submission included not only estimates of N₂O emissions for these missing years but also revised estimates of N₂O emissions for the other years of the time series for RV because the Party had detected additional errors during the recalculation affecting the other years of the time series in addition to those for 2013–2015.</p> <p>In checking the revised estimates, the ERT noted that the area reported and accounted for under RV was also part of the area reported under grassland (in CRF table 4.C) and that N₂O emissions related to the application of organic fertilizers to grassland were reported under the agriculture sector in categories 3.D.a.1 (inorganic N fertilizers) and 3.D.a.2 (organic N fertilizers). Following discussions with the Party, the ERT concluded that the reporting of N₂O emissions related to the application of fertilizers under RV (CRF table 4(KP-II)1) constituted double counting of the emissions reported under the agriculture sector (in categories 3.D.a.1 and 3.D.a.2). Therefore, the Party resubmitted the CRF tables again and in this version (version 4) reported N₂O emissions related to the application of organic fertilizers under RV as “IE”. This revised submission led to an increase in the net removals for RV over the second commitment period of the Kyoto Protocol of 296.506 kt CO₂ eq and an increase in the accounted quantity for the second commitment period for this activity of 284.218 kt CO₂ eq.</p> <p>The Party also provided in its revised submission background information to demonstrate that there was a double counting of emissions, namely the way calculations were performed, the evidence that all N₂O emissions relating to the application of fertilizers were reported in the agriculture sector (CRF table 3.D) and an explanation as to why part of the emissions had been allocated previously to RV: “The calculations for estimating fertilizer use for RV were based on quantities of inorganic and organic fertilizers recorded in the database of the Soil Conservation Service of Iceland, which records fertilizers used for all RV projects, although these quantities were already captured in the estimates reported for the agriculture sector (CRF table 3.D).”</p> | Not a problem |

^a Recommendations made by the ERT during the review are related to issues as defined in para. 81 of the UNFCCC review guidelines or problems as defined in para. 69 of the Article 8 review guidelines.

VI. Application of adjustments

11. The ERT did not identify the need to apply any adjustments for the 2022 annual submission of Iceland.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

12. Table I.5 presents the accounting quantities for KP-LULUCF reported by Iceland and the final values agreed by the ERT. The final quantities of units to be issued and cancelled are presented in table I.6.

VIII. Questions of implementation

13. No questions of implementation were identified by the ERT during the individual review of the Party's 2022 annual submission.

Annex I

Overview of greenhouse gas emissions and removals and data and information on activities under Article 3, paragraphs 3–4, of the Kyoto Protocol, as submitted by Iceland in its 2022 annual submission

1. Tables I.1–I.4 provide an overview of the total GHG emissions and removals as submitted by Iceland.

Table I.1
Total greenhouse gas emissions and removals for Iceland, base year–2020
 (kt CO₂ eq)

| | <i>Total GHG emissions excluding indirect CO₂ emissions</i> | | <i>Total GHG emissions and removals including indirect CO₂ emissions^a</i> | | <i>Land-use change (Article 3.7 bis as contained in the Doha Amendment)^b</i> | <i>KP-LULUCF (Article 3.3 of the Kyoto Protocol)^c</i> | <i>KP-LULUCF (Article 3.4 of the Kyoto Protocol)</i> | |
|------------------------|--|-------------------------------|---|-------------------------------|---|--|--|-----------|
| | <i>Total including LULUCF</i> | <i>Total excluding LULUCF</i> | <i>Total including LULUCF</i> | <i>Total excluding LULUCF</i> | | | <i>CM, GM, RV, WDR^d</i> | <i>FM</i> |
| FMRL | | | | | | | | –154.00 |
| Base year ^e | 12 873.35 | 3 674.48 | NA | NA | NA | | –387.52 | |
| 1990 | 12 873.35 | 3 674.48 | NA | NA | | | | |
| 1995 | 12 681.30 | 3 506.18 | NA | NA | | | | |
| 2000 | 13 313.54 | 4 119.48 | NA | NA | | | | |
| 2010 | 14 061.03 | 4 864.92 | NA | NA | | | | |
| 2011 | 13 816.76 | 4 646.54 | NA | NA | | | | |
| 2012 | 13 817.72 | 4 653.19 | NA | NA | | | | |
| 2013 | 13 811.30 | 4 661.03 | NA | NA | | –183.57 | –610.28 | –167.05 |
| 2014 | 13 791.43 | 4 661.46 | NA | NA | | –204.19 | –616.81 | –170.29 |
| 2015 | 13 853.13 | 4 746.02 | NA | NA | | –224.38 | –624.26 | –174.23 |
| 2016 | 13 772.47 | 4 692.48 | NA | NA | | –244.36 | –633.36 | –178.04 |
| 2017 | 13 817.42 | 4 776.97 | NA | NA | | –280.89 | –649.21 | –179.63 |
| 2018 | 13 862.56 | 4 847.09 | NA | NA | | –308.77 | –663.59 | –180.16 |
| 2019 | 13 733.13 | 4 713.01 | NA | NA | | –309.60 | –672.14 | –179.92 |
| 2020 | 13 519.40 | 4 509.64 | NA | NA | | –336.77 | –681.13 | –172.65 |

Note: Emissions and removals reported for the sector other (sector 6) are not included in the total GHG emissions.

^a The Party did not report indirect CO₂ emissions in CRF table 6.

^b The value reported in this column relates to GHG emissions from conversion of forests (deforestation) in 1990 as contained in the report on the review of the Party's report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol.

^c Activities under Article 3, para. 3, of the Kyoto Protocol, namely AR and deforestation.

^d In accordance with decision 3/CMP.11, para. 8, the Party previously reported that it would report emissions from RV. The base year for this activity is 1990.

^e “Base year” refers to the base year under the Kyoto Protocol, which is 1990 for all gases except NF₃, for which the base year is 1995. The base year for RV under Article 3, para. 4, of the Kyoto Protocol is 1990. For activities under Article 3, para. 3, of the Kyoto Protocol and FM under Article 3, para. 4, only the inventory years of the commitment period must be reported.

Table I.2

Greenhouse gas emissions and removals by gas for Iceland, excluding land use, land-use change and forestry, 1990–2020(kt CO₂ eq)

| | CO ₂ ^a | CH ₄ | N ₂ O | HFCs | PFCs | Unspecified mix of HFCs and PFCs | SF ₆ | NF ₃ |
|---|------------------------------|-----------------|------------------|-----------------|--------------|-------------------------------------|-----------------|-----------------|
| 1990 | 2 215.86 | 606.42 | 356.12 | 0.34 | 494.64 | NO, NA | 1.10 | NO, NA |
| 1995 | 2 459.57 | 629.69 | 342.88 | 3.43 | 69.36 | NO, NA | 1.24 | NO, NA |
| 2000 | 2 923.14 | 658.89 | 342.29 | 43.96 | 149.89 | NO, NA | 1.31 | NO, NA |
| 2010 | 3 616.62 | 655.52 | 305.14 | 111.32 | 171.66 | NO | 4.66 | NO |
| 2011 | 3 494.16 | 636.68 | 301.87 | 136.25 | 74.52 | NO | 3.05 | NO |
| 2012 | 3 490.87 | 612.73 | 308.52 | 141.73 | 94.00 | NO | 5.35 | NO |
| 2013 | 3 480.08 | 614.89 | 302.35 | 172.32 | 88.17 | NO | 3.23 | NO |
| 2014 | 3 436.35 | 625.85 | 327.56 | 170.28 | 99.03 | NO | 2.39 | NO |
| 2015 | 3 533.85 | 631.29 | 312.27 | 163.33 | 103.69 | NO | 1.59 | NO |
| 2016 | 3 485.18 | 622.34 | 310.51 | 181.24 | 91.86 | NO | 1.34 | NO |
| 2017 | 3 601.62 | 610.40 | 321.45 | 172.78 | 67.99 | NO | 2.73 | NO |
| 2018 | 3 658.95 | 609.90 | 306.60 | 191.29 | 76.43 | NO | 3.91 | NO |
| 2019 | 3 546.26 | 570.25 | 294.54 | 202.64 | 97.05 | NO | 2.27 | NO |
| 2020 | 3 328.88 | 589.57 | 294.69 | 197.70 | 95.64 | NO | 3.15 | NO |
| Percentage change 1990– 2020 | 50.2 | –2.8 | –17.3 | 57 347.8 | –80.7 | NA | 187.7 | NA |

Note: Emissions and removals reported for the sector other (sector 6) are not included in this table.

^a Iceland did not report indirect CO₂ emissions in CRF table 6.

Table I.3

Greenhouse gas emissions and removals by sector for Iceland, 1990–2020(kt CO₂ eq)

| | Energy | IPPU | Agriculture | LULUCF | Waste | Other |
|------|----------|----------|-------------|----------|--------|-------|
| 1990 | 1 835.56 | 958.03 | 661.53 | 9 198.87 | 219.36 | NO |
| 1995 | 2 052.67 | 564.94 | 618.19 | 9 175.12 | 270.37 | NO |
| 2000 | 2 181.34 | 1 009.94 | 626.65 | 9 194.06 | 301.55 | NO |

| | <i>Energy</i> | <i>IPPU</i> | <i>Agriculture</i> | <i>LULUCF</i> | <i>Waste</i> | <i>Other</i> |
|------------------------------------|---------------|--------------|--------------------|---------------|--------------|--------------|
| 2010 | 2 019.66 | 1 917.39 | 631.43 | 9 196.11 | 296.45 | NO |
| 2011 | 1 898.03 | 1 838.24 | 631.95 | 9 170.22 | 278.32 | NO |
| 2012 | 1 849.36 | 1 908.61 | 635.05 | 9 164.53 | 260.17 | NO |
| 2013 | 1 813.99 | 1 956.83 | 620.19 | 9 150.27 | 270.02 | NO |
| 2014 | 1 802.92 | 1 932.75 | 665.83 | 9 129.97 | 259.96 | NO |
| 2015 | 1 847.82 | 1 982.53 | 654.79 | 9 107.11 | 260.89 | NO |
| 2016 | 1 823.23 | 1 964.42 | 656.59 | 9 079.99 | 248.24 | NO |
| 2017 | 1 865.42 | 2 008.80 | 657.84 | 9 040.45 | 244.90 | NO |
| 2018 | 1 906.69 | 2 051.48 | 634.10 | 9 015.48 | 254.82 | – |
| 2019 | 1 848.61 | 2 019.90 | 621.34 | 9 020.12 | 223.16 | – |
| 2020 | 1 658.63 | 1 986.15 | 618.31 | 9 009.76 | 246.54 | – |
| Percentage change 1990–2020 | –9.6 | 107.3 | –6.5 | –2.1 | 12.34 | NA |

Notes: (1) Iceland did not report emissions or removals for the sector other (sector 6); for 2018–2020 the corresponding cells in the CRF tables were left blank; (2) Iceland did not report indirect CO₂ emissions in CRF table 6.

Table I.4

Greenhouse gas emissions and removals from activities under Article 3, paragraphs 3–4, of the Kyoto Protocol by activity, base year–2020, for Iceland
(kt CO₂ eq)

| | <i>Article 3.7 bis as contained in the Doha Amendment^a</i> | <i>Activities under Article 3.3 of the Kyoto Protocol</i> | | <i>FM and elected activities under Article 3.4 of the Kyoto Protocol</i> | | | | |
|---|---|---|----------------------|--|-----------|-----------|-------------|------------|
| | <i>Land-use change</i> | <i>AR</i> | <i>Deforestation</i> | <i>FM</i> | <i>CM</i> | <i>GM</i> | <i>RV</i> | <i>WDR</i> |
| FMRL | | | | –154.00 | | | | |
| Technical correction | | | | –1.76 | | | | |
| Base year ^b | NA | | | | NA | NO, NA | –387.52 | NA |
| 2013 | | –183.73 | 0.16 | –167.05 | NA | NO, NA | –610.28 | NA |
| 2014 | | –204.31 | 0.12 | –170.29 | NA | NO, NA | –616.81 | NA |
| 2015 | | –225.04 | 0.66 | –174.23 | NA | NO, NA | –624.26 | NA |
| 2016 | | –244.62 | 0.26 | –178.04 | NA | NO, NA | –633.36 | NO, NA |
| 2017 | | –281.36 | 0.48 | –179.63 | NA | NO, NA | –649.21 | NA |
| 2018 | | –309.24 | 0.47 | –180.16 | NA | NO, NA | –663.59 | NA |
| 2019 | | –310.08 | 0.47 | –179.92 | NA | NO, NA | –672.14 | NA |
| 2020 | | –337.38 | 0.61 | –172.65 | NA | NO, NA | –681.13 | NO, NA |
| Percentage change base year–2019 | | | | | NA | NA | 75.8 | NA |

Note: Values in this table include emissions from land subject to natural disturbances, if applicable.

^a The value reported in this column relates to 1990.

^b The base year for RV under Article 3, para. 4, of the Kyoto Protocol is 1990. For activities under Article 3, para. 3, of the Kyoto Protocol and FM under Article 3, para. 4, only the inventory years of the commitment period must be reported.

2. Table I.5 provides information on the Party's accounting quantities for reporting under Article 3, paragraphs 3–4, of the Kyoto Protocol.

Table I.5

Accounting quantities for activities under Article 3, paragraph 3, and forest management and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol for Iceland

(kt CO₂ eq)

| GHG source/sink activity | Base year ^b | Net emissions/removals | | | | | | | | | Accounting parameters | Accounting quantities ^d |
|--|------------------------|------------------------|----------|----------|----------|----------|----------|----------|----------|--------------------|-----------------------|------------------------------------|
| | | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total ^c | | |
| A.1. AR | | -183.735 | -204.312 | -225.038 | -244.617 | -281.363 | -309.239 | -310.075 | -337.379 | -2 095.759 | | -2 095.758 |
| Excluded emissions from natural disturbances ^d | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Excluded subsequent removals from land subject to natural disturbances | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| A.2. Deforestation | | 0.163 | 0.119 | 0.655 | 0.256 | 0.475 | 0.470 | 0.470 | 0.607 | 3.216 | | 3.217 |
| B.1. FM | | | | | | | | | | -1 401.964 | | -155.924 |
| Net emissions/removals | | -167.048 | -170.291 | -174.226 | -178.043 | -179.628 | -180.160 | -179.922 | -172.646 | -1 401.964 | | |
| Excluded emissions from natural disturbances | | - | - | - | - | - | - | - | - | - | | - |
| Excluded subsequent removals from land subject to natural disturbances | | - | - | - | - | - | - | - | - | - | | - |
| Any debits from newly | | NA | NA | NA | NA | NA | NA | NA | NA | NA | | NA |

| GHG source/sink activity | Net emissions/removals | | | | | | | | | | Accounting parameters | Accounting quantities ^d | |
|-------------------------------|------------------------|----------|----------|----------|----------|----------|----------|----------|----------|--------------------|-----------------------|------------------------------------|------------|
| | Base year ^b | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | Total ^c | | | |
| established forest | | | | | | | | | | | | | |
| FMRL ^e | | | | | | | | | | | | -154.000 | |
| Technical corrections to FMRL | | | | | | | | | | | | -1.755 | |
| FM cap | | | | | | | | | | | | 1 017.396 | -155.924 |
| B.2. CM (if elected) | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | | NA |
| B.3. GM (if elected) | NO, NA | NO, NA | NO, NA | NO, NA | NO, NA | NO, NA | NO, NA | NO, NA | NO, NA | NO, NA | NO, NA | | NO, NA |
| B.4. RV (if elected) | – 387.516 | -610.285 | -616.806 | -624.259 | -633.364 | -649.213 | -663.594 | -672.135 | -681.132 | -5 150.789 | | | -2 050.661 |
| B.5. WDR (if elected) | NA | NA | NA | NA | NO, NA | NA | NA | NA | NA | NA | NO, NA | | NO, NA |

^a The accounting quantity is the total quantity of units to be issued or cancelled for a particular activity.

^b Net emissions and removals from CM, GM, RV and/or WDR, if elected, in the Party's base year as established in decision 9/CP.2.

^c Cumulative net emissions and removals for all years of the commitment period reported in the annual submission under review.

^d The Party indicated in its report to facilitate the calculation of the assigned amount for the second commitment period of the Kyoto Protocol its intention to apply the provisions from natural disturbances to its accounting of AR and FM at the end of the commitment period. The Party decided not to exclude emissions and subsequent removals from natural disturbances in its accounting for the 2022 annual submission.

^e As inscribed in the appendix to the annex to decision 2/CMP.7 in kt CO₂ eq per year.

3. Table I.6 provides an overview of key data from Iceland's reporting under Article 3, paragraphs 3–4, of the Kyoto Protocol.

Table I.6

Key data for Iceland under Article 3, paragraphs 3–4, of the Kyoto Protocol from its 2022 annual submission

| <i>Parameter</i> | <i>Data</i> |
|---|---|
| Periodicity of accounting | (a) AR: commitment period accounting (b) Deforestation: commitment period accounting (c) FM: commitment period accounting (d) CM: not elected (e) GM: not elected (f) RV: commitment period accounting (g) WDR: not elected |
| Elected activities under Article 3, paragraph 4, of the Kyoto Protocol | RV |
| Election of application of provisions for natural disturbances ^a | Yes, for AR and FM |
| 3.5% of total base-year GHG emissions, excluding LULUCF | 127.175 kt CO ₂ eq (1 017.396 kt CO ₂ eq for the duration of the commitment period) |
| Cancellation of AAUs, CERs and ERUs and/or issuance of RMUs in the national registry for: | |
| 1. AR | Issue 2 095 758 RMUs |
| 2. Deforestation | Cancel 3 217 RMUs |
| 3. FM | Issue 155 924 RMUs |
| 4. RV | Issue 2 050 661 RMUs |

Note: Values in this table reflect the difference in the accounting quantities for activities under Article 3, para. 3, and FM and any elected activities under Article 3, para. 4, of the Kyoto Protocol as reported in table I.5.

^a The Party decided not to exclude emissions and subsequent removals from natural disturbances in its accounting for the 2022 annual submission.

Annex II

Information to be included in the compilation and accounting database

Tables II.1–II.8 include the information to be included in the compilation and accounting database for Iceland. Data shown are from the Party's annual submission, including the latest revised estimates submitted, adjustments (if applicable) and the final data to be included in the compilation and accounting database.

Table II.1

Information to be included in the compilation and accounting database for 2020, including on the commitment period reserve, for Iceland

(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| CPR | 13 794 495 | 13 794 496 | – | 13 794 496 |
| Annex A emissions | | | | |
| CO ₂ | 3 328 876 | – | – | 3 328 876 |
| CH ₄ | 589 571 | – | – | 589 571 |
| N ₂ O | 294 689 | – | – | 294 689 |
| HFCs | 197 705 | – | – | 197 705 |
| PFCs | 95 644 | – | – | 95 644 |
| Unspecified mix of HFCs and PFCs | NO | – | – | NO |
| SF ₆ | 3 155 | – | – | 3 155 |
| NF ₃ | NO | – | – | NO |
| Total Annex A sources^a | 4 509 640 | – | – | 4 509 640 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –337 379 | – | – | –337 379 |
| Deforestation | 607 | – | – | 607 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –173 325 | –172 646 | – | –172 646 |
| RV | –600 391 | –681 132 | – | –681 132 |
| RV for the base year | –385 760 | –387 516 | – | –387 516 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.2

Information to be included in the compilation and accounting database for 2019 for Iceland

(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|---|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 3 546 263 | – | – | 3 546 263 |
| CH ₄ | 570 246 | – | – | 570 246 |
| N ₂ O | 294 536 | – | – | 294 536 |
| HFCs | 202 641 | – | – | 202 641 |
| PFCs | 97 048 | – | – | 97 048 |
| Unspecified mix of HFCs and PFCs | NO | – | – | NO |
| SF ₆ | 2 275 | – | – | 2 275 |
| NF ₃ | NO | – | – | NO |
| Total Annex A sources^a | 4 713 009 | – | – | 4 713 009 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –310 075 | – | – | –310 075 |

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Deforestation | 470 | – | – | 470 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –180 473 | –179 922 | – | –179 922 |
| RV | –602 126 | –672 135 | – | –672 135 |
| RV for the base year | –385 760 | –387 516 | – | –387 516 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.3

Information to be included in the compilation and accounting database for 2018 for Iceland(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 3 658 953 | – | – | 3 658 953 |
| CH ₄ | 609 902 | – | – | 609 902 |
| N ₂ O | 306 600 | – | – | 306 600 |
| HFCs | 191 294 | – | – | 191 294 |
| PFCs | 76 433 | – | – | 76 433 |
| Unspecified mix of HFCs and PFCs | NO | – | – | NO |
| SF ₆ | 3 905 | – | – | 3 905 |
| NF ₃ | NO | – | – | NO |
| Total Annex A sources^a | 4 847 089 | – | – | 4 847 089 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –309 239 | – | – | –309 239 |
| Deforestation | 470 | – | – | 470 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –180 776 | –180 160 | – | –180 160 |
| RV | –614 500 | –663 594 | – | –663 594 |
| RV for the base year | –385 760 | –387 516 | – | –387 516 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.4

Information to be included in the compilation and accounting database for 2017 for Iceland(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 3 601 620 | – | – | 3 601 620 |
| CH ₄ | 610 403 | – | – | 610 403 |
| N ₂ O | 321 448 | – | – | 321 448 |
| HFCs | 172 776 | – | – | 172 776 |
| PFCs | 67 993 | – | – | 67 993 |
| Unspecified mix of HFCs and PFCs | NO | – | – | NO |
| SF ₆ | 2 727 | – | – | 2 727 |
| NF ₃ | NO | – | – | NO |
| Total Annex A sources^a | 4 776 968 | – | – | 4 776 968 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –281 363 | – | – | –281 363 |
| Deforestation | 475 | – | – | 475 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –180 555 | –179 628 | – | –179 628 |
| RV | –597 639 | –649 213 | – | –649 213 |

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|----------------------|----------------------------|---------------------------|-------------------|--------------------|
| RV for the base year | -385 760 | -387 516 | - | -387 516 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.5

Information to be included in the compilation and accounting database for 2016 for Iceland(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 3 485 184 | - | - | 3 485 184 |
| CH ₄ | 622 335 | - | - | 622 335 |
| N ₂ O | 310 512 | - | - | 310 512 |
| HFCs | 181 242 | - | - | 181 242 |
| PFCs | 91 862 | - | - | 91 862 |
| Unspecified mix of HFCs and PFCs | NO | - | - | NO |
| SF ₆ | 1 345 | - | - | 1 345 |
| NF ₃ | NO | - | - | NO |
| Total Annex A sources^a | 4 692 481 | - | - | 4 692 481 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | -244 617 | - | - | -244 617 |
| Deforestation | 256 | - | - | 256 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | -178 845 | -178 043 | - | -178 043 |
| RV | -594 869 | -633 364 | - | -633 364 |
| RV for the base year | -385 760 | -387 516 | - | -387 516 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.6

Information to be included in the compilation and accounting database for 2015 for Iceland(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 3 533 853 | - | - | 3 533 853 |
| CH ₄ | 631 286 | - | - | 631 286 |
| N ₂ O | 312 274 | - | - | 312 274 |
| HFCs | 163 329 | - | - | 163 329 |
| PFCs | 103 695 | - | - | 103 695 |
| Unspecified mix of HFCs and PFCs | NO | - | - | NO |
| SF ₆ | 1 586 | - | - | 1 586 |
| NF ₃ | NO | - | - | NO |
| Total Annex A sources^a | 4 746 024 | - | - | 4 746 024 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | -225 038 | - | - | -225 038 |
| Deforestation | 655 | - | - | 655 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | -175 126 | -174 226 | - | -174 226 |
| RV | -621 367 | -624 259 | - | -624 259 |
| RV for the base year | -385 760 | -387 516 | - | -387 516 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.7

Information to be included in the compilation and accounting database for 2014 for Iceland(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 3 436 352 | – | – | 3 436 352 |
| CH ₄ | 625 854 | – | – | 625 854 |
| N ₂ O | 327 561 | – | – | 327 561 |
| HFCs | 170 279 | – | – | 170 279 |
| PFCs | 99 030 | – | – | 99 030 |
| Unspecified mix of HFCs and PFCs | NO | – | – | NO |
| SF ₆ | 2 385 | – | – | 2 385 |
| NF ₃ | NO | – | – | NO |
| Total Annex A sources^a | 4 661 462 | – | – | 4 661 462 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –204 312 | – | – | –204 312 |
| Deforestation | 119 | – | – | 119 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –171 409 | –170 291 | – | –170 291 |
| RV | –614 038 | –616 806 | – | –616 806 |
| RV for the base year | –385 760 | –387 516 | – | –387 516 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Table II.8

Information to be included in the compilation and accounting database for 2013 for Iceland(t CO₂ eq)

| | <i>Original submission</i> | <i>Revised submission</i> | <i>Adjustment</i> | <i>Final value</i> |
|--|----------------------------|---------------------------|-------------------|--------------------|
| Annex A emissions | | | | |
| CO ₂ | 3 480 080 | – | – | 3 480 080 |
| CH ₄ | 614 887 | – | – | 614 887 |
| N ₂ O | 302 351 | – | – | 302 351 |
| HFCs | 172 322 | – | – | 172 322 |
| PFCs | 88 165 | – | – | 88 165 |
| Unspecified mix of HFCs and PFCs | NO | – | – | NO |
| SF ₆ | 3 226 | – | – | 3 226 |
| NF ₃ | NO | – | – | NO |
| Total Annex A sources^a | 4 661 031 | – | – | 4 661 031 |
| Activities under Article 3, paragraph 3, of the Kyoto Protocol | | | | |
| AR | –183 735 | – | – | –183 735 |
| Deforestation | 163 | – | – | 163 |
| FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol | | | | |
| FM | –168 089 | –167 048 | – | –167 048 |
| RV | –607 598 | –610 285 | – | –610 285 |
| RV for the base year | –385 760 | –387 516 | – | –387 516 |

^a The sum of the values for the individual gases and groups of gases may not match the total owing to rounding.

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which estimation methods are included in the 2006 IPCC Guidelines that were reported as “NE” or for which the ERT otherwise determined that there may be an issue with the completeness of the reporting in the Party’s inventory are the following:

- (a) 1.A.4 other sectors – use of charcoal (CH₄ and N₂O) (see ID# E.17 in table 3);
- (b) 4.A forest land – CSC in the deadwood carbon pool for all years, except 2002, 2003, 2007 and 2010 (CO₂) (see ID# L.9 in table 3);
- (c) 4.C grassland – degraded areas (CO₂) (see ID# L.17 in table 3);
- (d) 4.E.2 land converted to settlements – CSC in mineral soils (CO₂) (see ID# L.24 in table 3);
- (e) 5.A.1 managed waste disposal sites – emissions from combustion of landfill gas for energy for 2003–2006 (CH₄ and N₂O) (see ID# W.4 in table 3);
- (f) 5.D wastewater treatment and discharge – emissions from overnight stays (CH₄ and N₂O) (see ID# W.8 in table 3).

Annex IV

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl>.

IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at <https://www.ipcc.ch/publication/2013-revised-supplementary-methods-and-good-practice-guidance-arising-from-the-kyoto-protocol/>.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC. Available at <https://www.ipcc.ch/publication/2013-supplement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories-wetlands/>.

B. UNFCCC documents

Annual review reports

Reports on the individual reviews of the 2013, 2014, 2015, 2016, 2017, 2019 and 2021 annual submissions of Iceland, contained in documents FCCC/ARR/2013/ISL, FCCC/ARR/2014/ISL, FCCC/ARR/2015/ISL, FCCC/ARR/2016/ISL, FCCC/ARR/2017/ISL, FCCC/ARR/2019/ISL and FCCC/ARR/2021/ISL respectively.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at <https://unfccc.int/documents/510888>.

Annual status report for Iceland for 2022. Available at https://unfccc.int/sites/default/files/resource/asr2022_ISL.pdf.

C. Other documents used during the review

Responses to questions during the review were received from Birgir Urbancic Ásgeirsson (Environment Agency of Iceland), including additional material on the methodology and assumptions used. The following references may not conform to UNFCCC editorial style as some have been reproduced as received:

Commission Regulation (EU) No 389/2013 of 2 May 2013 establishing a Union Registry pursuant to Directive 2003/87/EC of the European Parliament and of the Council, Decisions No 280/2004/EC and No 406/2009/EC of the European Parliament and of the Council and repealing Commission Regulations (EU) No 920/2010 and No 1193/2011 Text with EEA relevance (europa.eu).

European Environment Agency. 2022. Final Review Report, 2022 annual review of national greenhouse gas inventory data pursuant to Article 19(2) of Regulation (EU) No 525/2013, Iceland, 20 April 2022.

Helgason, B. (1975). Breytingar á jarðvegi af völdum ólíkra tegunda köfnunarefnisáburðar. Samanburður þriggja tegunda köfnunarefnisáburðar. Íslenskar landbúnaðarrannsóknir (*Soil changes caused by different types of nitrogen fertilizers. Comparison of three types of nitrogen fertilizers. Icelandic agricultural research*), 7(1-2), 11.

Sigurðsson, B., Magnússon, B., Elmarsdóttir, A., & Bjarnadóttir, B. (2005). Biomass and composition of understory vegetation and the forest floor carbon stock across Siberian larch and mountain birch chronosequences in Iceland. *Annals of Forest Sciences*, 62(8), 881-888.
