Iceland's Initial Report under the Kyoto Protocol

- UPDATE

Calculation of Assigned Amount under Article 7, Paragraph 4,
of the Kyoto Protocol, in accordance with Decision 13/CMP.1

Ministry for the Environment

3. August 2007

Summary

The Report on Assigned Amount demonstrates that Iceland has implemented the requirements for accounting under the Kyoto Protocol and its capacity to account for emissions trading of Kyoto Protocol units through the national registry. The report adheres to the requirements as specified in Decision 13 of the first Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (CMP.1). The report contains a number of technical definitions, calculations and definitions required to participate in the Kyoto Protocol. These are summarized as:

- a complete inventory of anthropogenic emissions by source and removals by sinks of greenhouse gases (not controlled by the Montreal Protocol) for 1990 – 2004;
- the identification of 1990 as Iceland's selected base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride;
- calculation of Iceland's assigned amount as: 3 368 702 tonnes CO_2 equivalent × 110% × 5 = 18 527 859 tonnes CO_2 equivalent (or assigned amount units) ;
- decision 14/CP.7 allows Iceland to report certain industrial process carbon dioxide emissions separately and not include them in national totals, to the extent they would cause Iceland to exceed its assigned amount. The total amount that can be reported separately under this decision is set at 1.6 million tons of carbon dioxide per year;
- calculation of Iceland's commitment period reserve as: 0.9 × 18 527 859 tonnes CO_2 equivalent = 16 675 073 tonnes CO_2 equivalent;
- the identification of Iceland's selected single minimum values for use in accounting for its activities under Article 3.3:
    - tree crown cover: 10 percent
    - minimum land area: 0.5 hectare
    - tree height: 2 meters;
- Iceland's decision to elect only revegetation as an activity under Article 3, paragraph 4 during the first commitment period;
- credits issued by activities under Article 3, paragraph 3 and 4 of the Kyoto Protocol will be accounted for the entire commitment period;
- a description of Iceland's national system in accordance with Article 5.1 and Decision 19/CMP.1 detailing the legal, institutional and procedural arrangements established for the continued compilation of Iceland's greenhouse gas inventory;
- a technical description of Iceland's national registry in accordance with Article 7 and Decision 15/CMP.1.

Contents

1. Introduction

Iceland hereby submits its Initial Report under the Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) pursuant to the modalities for the accounting of assigned amounts under Article 7, paragraph 4 of the Kyoto Protocol.

At the first Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol (CMP.1), the Parties reconfirmed that Annex I Parties that have ratified the Kyoto Protocol are required to submit an Initial Report prior to 1 January 2007, or within one year of entry into force of the Kyoto Protocol for the Party, whichever is the later date (decision 13/CMP.1).

Iceland submitted its Initial Report on 11th of January 2007. As a result of the initial review under Article 8 of the Kyoto Protocol, that took place from 18th to 23rd of June 2007, minor correction of the underlying emission data took place. Accordingly the calculations of the assigned amount and the commitment period reserve have been revised in this updated report. In addition to that chapter 5 that describes the national registry has been modified to reflect recent changes.

In accordance with decision 13/CMP.1 the Initial Report must contain the following information or references to such information where it has been previously submitted to the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC):

I.

a) Complete inventories of anthropogenic emissions by source and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for all years from 1990, or another approved base year or period under Article 3, paragraph 5, to the most recent year available. Inventories should be prepared in accordance with Article 5, paragraph 2, and relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP.1), taking into account any relevant decisions of the Conference of the Parties.

b) Identification of the selected base year for hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) in accordance with Article 3, paragraph 8. Parties may choose 1990 or 1995 as the base year for HFCs, PFCs and SF_6.

c) The agreement under Article 4, where the Party has reached such an agreement to fulfil its commitments under Article 3 jointly with other Parties.

d) Calculation of the Party's assigned amount pursuant to Article 3, paragraphs 7 and 8, on the basis of its inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol.

II.

a) Calculation of its commitment period reserve in accordance with decision 11/CMP.1. The commitment period reserve is 90 per cent of the assigned amount or 100 percent of five times its most recently reviewed inventory, whichever is the lowest.

b) Identification of the single minimum values for tree crown cover, land area and tree height for use in accounting for activities under Article 3, paragraphs 3 and 4, together with a justification of the consistency of those values with the information that has been historically reported to the Food and Agriculture Organization of the United Nations or other international bodies, and in the case of difference, an explanation of why and how such values were chosen, in accordance with decision 16/CMP.1.

c) Identification of its elected activities under Article 3, paragraph 4, for inclusion in its accounting for the first commitment period, together with information on how its national system under Article 5, paragraph 1, will identify land areas associated with the activities, in accordance with decision 16/CMP.1.

d) The identification of whether, for each activity under Article 3, paragraph 3 and Article 3, paragraph 4, the Party intends to account annually or for the entire commitment period.

e) A description of the Party's national system in accordance with Article 5, paragraph 1, reported in accordance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol.

f) A description of the Party's national registry, reported in accordance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol.

2. Calculation of Iceland's assigned amount

2.1 Greenhouse gas inventory

Iceland's most recently submitted greenhouse gas inventory comprising the National Inventory Report (NIR), and Common Reporting Format (CRF) tables for the years 1990 – 2004 is attached to the Report on Assigned Amount. The inventory reports anthropogenic emissions by sources and removals by sinks of the greenhouse gases not controlled by the Montreal Protocol.

As a result of the initial review under Article 8 of the Kyoto Protocol, that took place from 18th to 23rd of June 2007, minor correction of the emission estimates took place. This has resulted in an increase of 16.48 Gg CO_2-eq. in the base year. On the other hand recalculations that were performed in Iceland's 2007 submission lowered the emissions, so the total increase amounts to 13.27 Gg. Revised CRF table Summary2 for the years 1990 and 2004 are in Annex B to this report. The recalculations that were done to Iceland's emission data in the 2007 submission are described in the National Inventory Report – Iceland 2007.

Table 2.1 below provides greenhouse gas emissions (according to Annex A of the Kyoto Protocol) for the base year, and in 2004 for Iceland. Emissions exclude all emissions and removals associated with land use, land use change and forestry (LULUCF) in accordance with Article 7.4 modalities for the accounting of assigned amounts. LULUCF emissions and removals enter the table only through rows labelled Article 3.3 and Article 3.4.

- Article 3.3 represents the net emissions or removals of Afforestation plus Reforestation minus Deforestation (ARD) since 1990
- Article 3.4 represents the net emissions or removals due to revegetation since 1990 (Iceland has only elected revegetation as an activity under Art 3.4 – see Chapter 3 of the present report).

Table 2.1 Greenhouse gas emissions, Gg CO_2-equivalent

GHGs	Base Year	2004	Base Year – 2004 % change
CO_2	2 158.6	2 869.6	
CH_4	417.9	413.0	
N_2O	367.2	304.6	
HFCs	0	58.4	
PFCs	419.6	38.6	
SF_6	5.4	5.4	
Total Annex A emissions	3 368.7	3 689.5	9.5%
Article 3.3	-4.8	-91.5	
Article 3.4	-3.1	-162.9	
Total net emission	3 360.8	3 435.1	2,2%

2.2 Selected base year for HFCs, PFCs, SF_6

Iceland has selected 1990 as the base year for the fluorinated gases in accordance with the choice under Article 3, paragraph 8 of the Kyoto Protocol.

2.3 Assigned amount

Taking into account the provisions of Article 3.7 and 3.8, Iceland's assigned amount for the first commitment period (2008 – 2012) is equal to the percentage inscribed for it in Annex B of its aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases, listed in Annex A in the base year, multiplied by five.

Iceland's assigned amount is estimated according to the formula:

Base Year Total from Table 2.1 × 110% (representing Iceland's 10% Kyoto emission increase target) × 5 (representing the 5 years of the first commitment period 2008-2012)

= 3 368 702 tonnes CO_2 equivalent × 110% × 5

=18 527 859 tonnes CO_2 equivalent

Or since 1 tonne of CO_2 equivalent equals one assigned amount unit

= 18 527 859 assigned amount units[1].

[1] Annex C contains an update of the calculation of the assigned amount and the commitment period reserve.

2.3.1 Decision 14/CP.7

Decision 14/CP.7 allows Iceland to report certain industrial process carbon dioxide emissions separately and not include them in national totals; to the extent they would cause Iceland to exceed its assigned amount. The total amount that can be reported separately under this decision is set at 1.6 million tons of carbon dioxide per year. This means that a maximum of 5 × 1 600 000 tonnes = 8 000 000 tonnes could fall under this decision in the first commitment period. Decision 14/CP.7 can be found in Annex A, and further discussion about the decision is to be found in the National Inventory Report.

2.4 Commitment period reserve

The Annex to Decision 11/CMP.1 specifies that: 'each Party included in Annex I shall maintain, in its national registry, a commitment period reserve which should not drop below 90 per cent of the Party's assigned amount calculated pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol, or 100 per cent of five times its most recently reviewed inventory, whichever is lowest'.

Therefore Iceland's commitment period reserve is calculated as:

Either,

90% of Iceland's assigned amount

= 0.9 × 18 527 859 tonnes CO_2 equivalent

= 16 675 073 tonnes CO_2 equivalent.

or,

100% of 5 × (the national total in the most recently reviewed inventory, i.e. 2004)

= 5 × 3 689 531 tonnes CO_2 equivalent

= 18 447 654 tonnes CO_2 equivalent

This means Iceland's Commitment Period Reserve is 16 675 073 tonnes CO_2 equivalent, calculated as 90% of Iceland's assigned amount[2].

2.5 Agreement under Article 4

Iceland has not signed a joint agreement to meet its commitment with any other Party.

[2] Annex C contains an update of the calculation of the assigned amount and the commitment period reserve.

3. Land use, land-use change and forestry (LULUCF)

This chapter describes the activities under Article 3, paragraph 3 and 4 of the Kyoto Protocol.

3.1 Definitions relating to land use, land-use change and forestry activities

The following definitions are in accordance with Decision 13/CMP.1 Annex paragraph 8(b).

3.1.1 Definitions of forest for activities under Article 3 and 3.4

Iceland's definitions of forest are identified as the following, in accordance with decision 16/CMP.1 adopted by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

Definitions of forest

Minimum value for forest area: 0.5 ha

Minimum value for tree crown cover: 10%

Minimum value for tree height: 2 m

3.1.2 Consistency of the definitions

Forest definitions are consistent with those historically reported to and subsequently published by the Food and Agriculture Organisation (FAO) of the United Nations, with the exception of tree height.

In the Global Forest Resources Assessment 2005 (coordinated by FAO), countries are requested to use a uniform forest definitions. Iceland uses these definitions for the minimum value for forest area and for tree crown cover.

Thresholds in forest definitions of the Marrakech Accord (MA), the UNEP Convention on Biological Diversity (CBD) and the Forest Resource Assessment (FAO/FRA) are listed in the table below.

Parameters	**MA**	**CBD**	**FAO/FRA**
Minimum area (ha)	0.05-1.0	0.5	0.5
Minimum height (m)	2-5	5	5
Crown cover (%)	10-30	10	10
Strip width (m)			20

The FAO definition will not be used for tree height in Iceland. Iceland will instead use 2 m as a minimum height at maturity. That is in agreement with the general perception in Iceland and the forest law who include all woodlands of native birch although only 12% of the native woodlands do reach 5 m height. To define bigger part of the native woodland as an ARD activity under the Kyoto Protocol will promote use of native species in afforestation and prevent deforestation of native woodlands.

3.2 Information on election of activities under Article 3.4

(*in accordance with Decision 13/CMP.1 Annex paragraph 8(c)*)

3.2.1 Election of activities under Article 3.4

Iceland elects Revegetation, defined by decision 16/CMP.1 annex paragraph 6 as "additional human activities related to changes in greenhouse gas by source and removals by sinks in the agricultural soils and the land-use change and forestry categories", defined by Article 3, paragraph 4 of the Kyoto Protocol.

3.2.2 Interpretation of elected activities under Article 3.4

Revegetation is defined by decision 16/CMP.1 annex paragraph 1(e) as "a direct human-induced activity to increase carbon stocks on sites through the establishment of vegetation that covers a minimum area of 0.05 hectares and does not meet the definitions of afforestation and reforestation".

Iceland interprets the definition of Revegetation as following, recalling the LULUCF-Good Practice Guidance:

- A direct human-induced activity to increase carbon stocks on eroding **or** eroded/desertified sites through the establishment of vegetation or the reinforcement of existing vegetation that covers a minimum area of 0.5 hectares and does not meet the definitions of afforestation and reforestation.

3.2.3 Hierarchy among the elected activities under Article 3.4

Revegetation is the only activity elected by Iceland under article 3.4, therefore hierarchy among activities is not applicable.

3.3 Lands identification method in accordance with Article 5.1

LULUCF-Good Practice Guidance, page 4.24, section 4.2.2.2 shows the two methods for identifying and reporting lands subject to Article 3.3 and Article 3.4 activities. Reporting Method 1 entails delineating areas that include multiple land units subject to Article 3.4 activities by using legal, administrative, or ecosystem boundaries. Reporting Method 2 is based on the spatially explicit and complete geographical identification of all lands subject to Article 3.3 activities and all land subject to Article 3.4 activities.

Iceland elects Reporting Method 1.

3.4 Information on accounting of credits

(*in accordance with Decision 13/CMP.1 Annex paragraph 8(d)*)

Credits issued by activities under Article 3, paragraph 3 and 4 of the Kyoto Protocol will be accounted for the entire commitment period.

4. Iceland's national system

Under Article 5.1 of the Kyoto Protocol, Annex I Parties must have a national system for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol by 1 January 2007. The description of Iceland's national system below is in accordance with the guidelines set down in Decision 19/CMP.1. The national system includes all the institutional, legal and procedural arrangements for estimating greenhouse gas emissions and removals and for reporting and archiving inventory information. The description details the methods used to calculate greenhouse gas emissions and removals, and the QA/QC system that has been established in order to meet the requirements of IPCC Good Practice Guidance (2000) and relevant decisions of the Conference of the Parties (COP).

4.1 Contact details

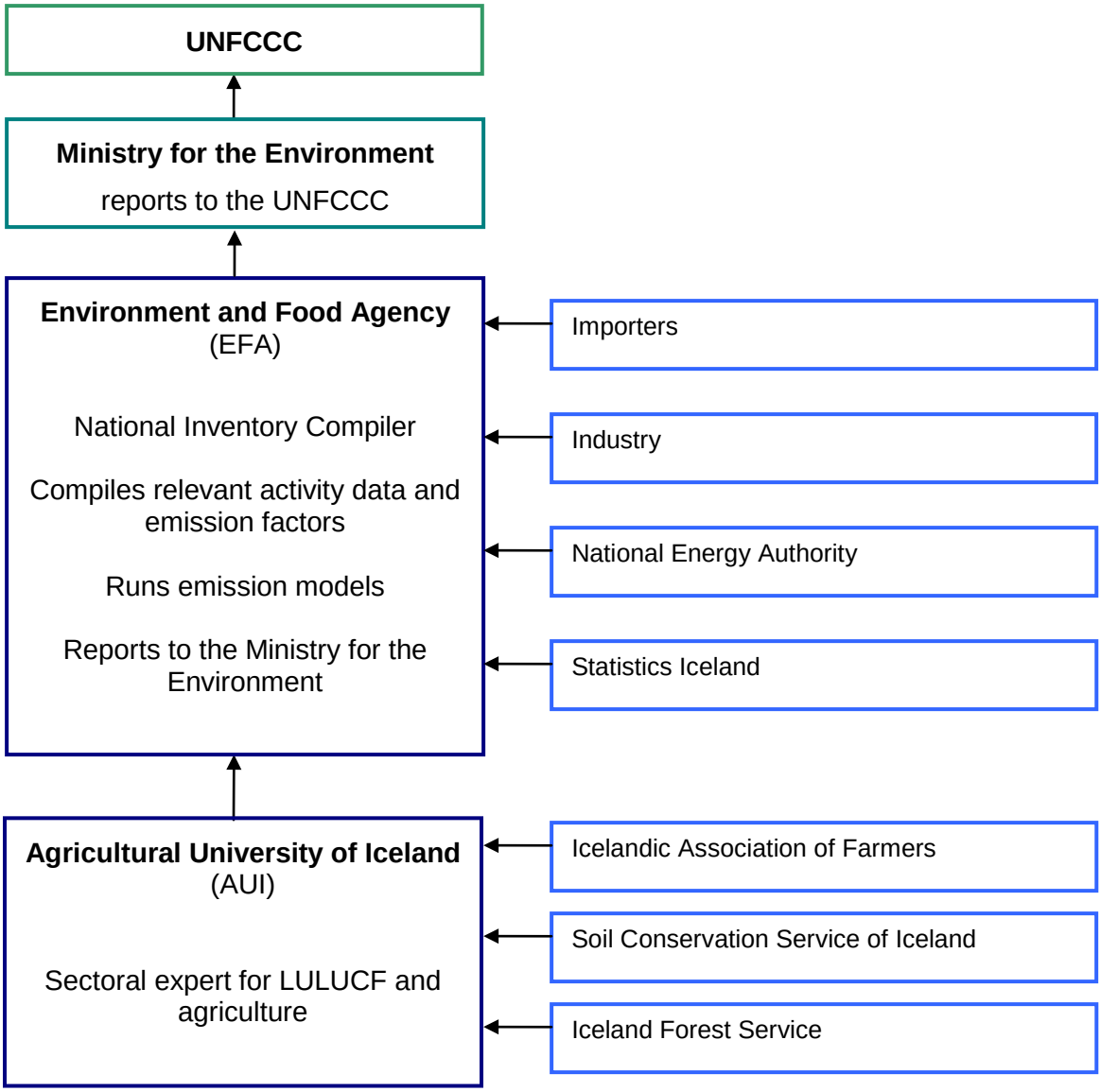
Institution	Environment and Food Agency
Contact	Environmental Supervision Division
Address	Sudurlandsbraut 24, IS-108 Reykjavik, Iceland
Telephone	+354 591 2000
Fax	+354 591 2020
National Inventory Compiler	Birna Hallsdottir (birna@ust.is)

4.2 Legal and institutional arrangements

A new law on the registration of greenhouse gas emissions and removals was passed by the Icelandic legislature, Althing, in June 2006. The stated purpose of the law is to create conditions for Icelandic authorities to comply with international obligations in limiting emissions of greenhouse gases. The law covers the national system for the estimation of greenhouse gas emissions and removals by sinks, the establishment of a national registry and the duty of companies to report relevant information to the authorities.

The law specifies that the Environment and Food Agency (EFA), an agency under the Ministry for the Environment, is the responsible authority for the national accounting as well as the inventory of emissions and removals of greenhouse gases, according to Iceland's international obligations in that regard (see Contact details, section 4.1). The EFA collects the bulk of data necessary to run the general emission model, i.e. activity data and emission factors. Activity data is collected from various institutions and companies, as well as by the EFA directly. The EFA shall, in accordance with the legislation, produce instructions on the preparation of data and other information for the national inventory in cooperation with the Agricultural University of Iceland (AUI) and the National Energy Authority (NEA). Figure 4.1 illustrates the flow of information and allocation of responsibilities.

Figure 4.1 Information flow and distribution of responsibilities in the Icelandic emission inventory system for reporting to the UNFCCC



The AUI is mandated to collect relevant information on land use, land use change and forestry, as well as other information on emissions in agriculture, and submit this information to the EFA. The AUI receives information on recultivated area from the Soil Conservation Service of Iceland and information on forests and forestation from the Iceland Forest Service. The Icelandic Association of Farmers assesses the size of the livestock population.

The AUI assesses other land use categories on basis of its own geographical database and available supplementary land use information.

Statistics Iceland provides information on imports of solvents, use of fertilizers in agriculture and imports/exports of fuels.

The NEA collects relevant activity data related to energy and submits the data to the EFA.

Importers of HFCs submit reports on their annual imports by different types of HFCs to the EFA.

All companies with operating permits, emitting annually 30 000 tonnes or more of carbon dioxide equivalents, must submit information on greenhouse gas emissions to the EFA. The EFA is to prepare written specifications on what information is needed, as well as deadlines for submission of information.

A Coordinating Team will be formally established, with representatives from the Ministry for the Environment, the EFA and the AUI. The team will have the role to officially review the emission inventory before submission to UNFCCC, as well as formulating proposals on further development and improvement of the national inventory system. After the Coordinating Team has reviewed the inventory, the greenhouse gas inventory and the NIR are submitted to UNFCCC by the Ministry for the Environment.

The EFA is to host the national registry, taking care of the holding, transfer and cancellations of Iceland's AAUs and other units.

4.3 Inventory compiling and submission

4.3.1 Compiling Iceland's emission inventory

Iceland prepares an inventory consistent with methods described in the 'Revised 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories' (1996) as elaborated by the 'Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories' (2000), Good Practice Guidance for Land Use, Land-Use Change and Forestry (2003) and the UNFCCC reporting guidelines (FCCC/SBSTA/2004/8).

Procedures from the IPCC, Good Practice Guidance are being implemented in stages with priority given to key source categories.

4.3.2 Submission to UNFCCC

Iceland submits its national inventory to the UNFCCC Secretariat by 15th of April each year. The inventory contains data from the base year (1990) until two years prior to the current calendar year.

4.4 Quality System

The EFA is in the process of implementing all Tier-1 QA/QC procedures, listed in chapter 8 of the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories (2000). Tier-2 procedures will be gradually implemented for

key source categories. EFA is working with data providers to ensure their compliance with the Tier-1 QA/QC procedures.

The AUI is in the process of implementing QA/QC procedures for LULUCF according to chapter 5 in the Good Practice Guidance for LULUCF.

4.4.1 The QA/QC plan

The QA/QC plan is twofold and is drafted and reviewed by the Coordinating Team:

The annual inventory cycle

The annual inventory cycle describes individual activities performed each year in preparation for next submission of the emission estimates. For the list of activities see section 4.12.

Schedule of development

The schedule of development is a prioritised schedule of areas in the National System in need of further improvement. The schedule denotes which parts are improved in the coming years and is decided on at the beginning of each inventory cycle during initial planning (see section 4.12).

4.4.2 Implementing quality control procedures

QA/QC procedures are documented for referral and reviewing. Results and reports of these procedures are documented and stored. The QA/QC procedures are reviewed by the Coordinating Team during initial planning at the start of each inventory cycle.

In section 4.12 an overview of the annual inventory cycle is given including brief descriptions of the main quality procedures performed at each step.

4.4.3 Document and data storage

All National System documents are stored electronically on the EFA's computer network. This includes quality system documents, reports, original data from data providers, the CRF Reporter database files, data submitted to the UNFCCC and spreadsheets of the emission inventory. After each submission to UNFCCC a complete copy is archived. This ensures easy access for expert review teams to old data and documents which give correct context for the data.

For easy access, hard-copies are made and updated as needed.

Backups of the National System documents are taken during regular backups of network drives on EFA's computer network.

4.4.4 Internal Reviews

A series of internal review activities are carried out annually to detect and rectify any anomalies in the estimates, e.g. time series variations, with priority given on emissions from key source categories and for those source categories where data and methodological changes have recently occurred. These reviews are performed according to the quality control procedures in chapter 8 of the IPCC, Good Practice Guidance (2000).

4.4.5 External QA reviews

Peer reviews

Peer reviews are useful for assessing the quality of emission estimates and should ideally be performed by individuals outside of the EFA/AUI or at the very least by staff members not directly related to the inventory process. The EFA and the AUI are planning an annual basic Tier-1 peer review to the extent possible on selected sources prior to submission to UNFCCC.

Expert peer reviews

No decisions have been taken on independent expert peer reviews of methods and emission factors. Where possible such reviews will be performed by local experts. However, in Iceland there are not many local experts available for extensive reviews so in many cases experts from abroad would have to be considered.

UNFCCC reviews

UNFCCC performs extensive reviews of each year's submission. Results from these reviews are considered annually and decisions are taken on how the recommendations will be taken forward in the development of the national system.

4.5 Data structure of the emission inventory

The emission inventory is compiled using Microsoft Excel spreadsheets. In parallel with work on standardising spreadsheets for collecting activity data (see section 4.7) the structure of the emission inventory is under consideration. The main goals of restructuring the spreadsheets are to:

- automate the process of importing activity data,
- simplify quality checks,
- make it easier to add new or historic sources and source categories
- simplify exporting data to the CRF Reporter software.

4.6 Preparation of emission estimates

The estimation methods of all greenhouse gases are harmonized with the IPCC Guidelines for National Greenhouse Gas Inventories and are, to the extent possible, in accordance with IPCC's Good Practice Guidance and IPCC's Good Practice Guidance for LULUCF.

The general emission model is based on the equation:

$$\text{Emission (E)} = \text{Activity level (A)} \times \text{Emission Factor (EF)}$$

Methods of emission estimates are mostly Tier-1 and Tier-2 methods as described in the IPCC Guidelines. Emission factors are in general default factors taken from the IPCC Guidelines. A detailed discussion is given in the NIR.

4.7 Activity data collection

Data providers send activity data to the EFA which imports them into the spreadsheets of the emission inventory. Quality checks are performed to ensure correct import of data.

Activity data is sent using spreadsheets, e-mails or phone calls as needed. The EFA is making standardised spreadsheets for receiving activity data in cooperation with data providers. This makes it easier to perform series of standard quality checks on the activity data and for the EFA to give instant feedback to data providers. Import of activity data into the emission inventory will become more automatic and therefore less error prone.

The EFA is currently in progress of making formal agreements with data providers to secure annual submission of activity data to in the future.

4.8 Emission estimates for LULUCF and agriculture

Agreements are being made with the AUI to become the sectoral expert for these sectors. Emission and removal estimates will be estimated by the AUI and sent to the EFA for direct import in the CRF Reporter Software.

4.9 Uncertainty estimates

Estimates of uncertainties are assessed according to Tier-1 procedures as outlined in Chapter 6 of the IPCC Good Practice Guidance (2000). Methods and result of the uncertainty analysis are reported in the NIR.

Uncertainty of LULUCF still is mostly qualitative. AUI is in the process of quantifying LULUCF uncertainties.

4.10 Key source categories

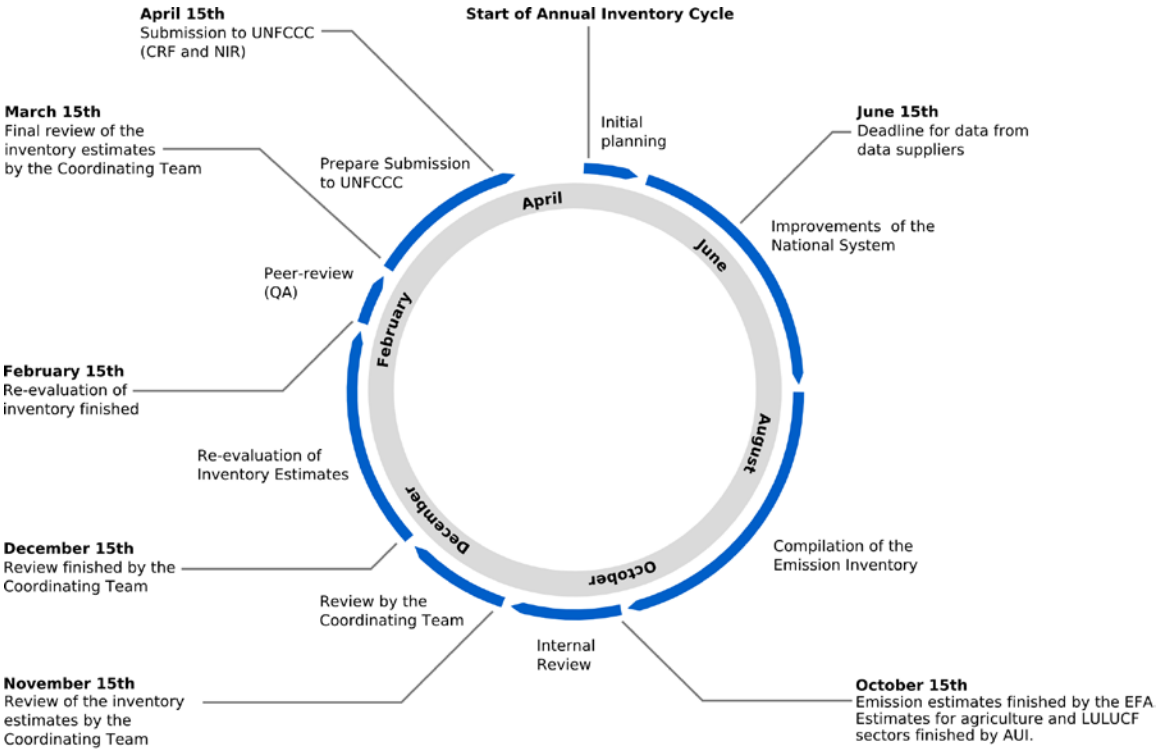
Key sources are sources which have significant influence on the absolute emission levels and/or the trends of the emission inventory. In the Icelandic Emission Inventory key source categories are identified according to the Tier-1 method described in section 7.2 in the IPCC Good Practice Guidance (2000).

List of key sources by sector and type of emission is given in the NIR.

4.11 Recalculations of previously submitted inventory data

Improvements of methods and emission factors, discovered errors or addition of new source categories can have significant impacts on both new and previously submitted estimates in the emission inventory. When that happens historic emissions are recalculated to ensure consistency in the time series. Recalculations are performed as recommended in chapter 7 in the IPCC Good Practice Guidance (2000).

4.12 The annual inventory cycle



The diagram above shows the main processing steps in the annual compilation cycle of the emission inventory. These are further explained below.

Initial planning

A new annual cycle begins with an initial planning of activities for the inventory cycle by the Coordinating Team, taking into account the recommendations from the UNFCCC review.

Improvements of the national system

This period is assigned for improvement of the National System. All changes are implemented into the spreadsheets of the emission inventory. Both electronic and hard-copy versions of the National System documentation are updated as necessary.

Collecting activity data

See section 4.7 for detail on how activity data is collected by the EFA.

Compilation of the emission inventory

Emission estimates and uncertainties are calculated and quality checks are performed to validate results. Emission data is received from the sectoral expert for LULUCF and agriculture, i.e. the AUI. All emission estimates are imported into the CRF Reporter software.

Internal review of the emission inventory

Internal reviews are carried out with focus on explaining trends, gaps in data series, uncertainties and changes in emission estimates since previous submission due to recalculations. For details see section 4.4.4.

Review by the Coordinating Team

Emission estimates and reports from quality control procedures are reviewed by the Coordinating Team. Emissions estimates are then re-evaluated, as needed, based on comments from the Coordinating Team.

Peer review

Parts of the National System are sent to peer reviewing on selected sources to assess the quality of the emission estimates. This is described in section 4.4.5.

Submission to UNFCCC

The emission inventory and the NIR are submitted to UNFCCC before April 15th by the Ministry for the Environment. Complete electronic copies of the emission inventory spreadsheets, documentation and submitted files are archived.

5. Iceland's national registry

5.1 Contact details of registry administrators

Institution	Environment and Food Agency
Contact	Environmental Supervision Division
Address	Sudurlandsbraut 24, IS-108 Reykjavik, Iceland
Telephone	+354 591 2000
Fax	+354 591 2020
Registry System Administrators	Birna Hallsdottir (birna@ust.is) Sigurdur Finnsson (sigurdurb@ust.is)

5.2 Implementing and running the registry system

The Environment and Food Agency (EFA) is responsible for the implementation and operation of Iceland's National Registry under the Kyoto Protocol. The software used for the Icelandic National Registry is GRETA (Greenhouse gases Registry for Emissions Trading Arrangements) which is licensed from Defra (Department of Environment, Food and Rural Affairs, United Kingdom).

The IT software supplier of GRETA is Siemens which works under a contract from Defra. Siemens currently develops and gives support to licensees of GRETA.

5.3 Technical description

This technical description of the Icelandic National Registry is presented in accordance with the reporting requirements in Annex II under decision 15/CMP.1.

5.3.1 Consolidated registry systems

The Icelandic National Registry is a stand alone registry, it is not operated together in a consolidated form with the registries of other nations.

5.3.2 Compliance with ITL data exchange standards

The GRETA registry software was originally developed for use in the European Union Greenhouse Gas Trading Scheme (EU ETS) which requires the registry to be compliant with the UN Data Exchange Standards (DES) for communication with UN's International Transaction Log (ITL).

Siemens currently works towards implementing in GRETA all functions defined in UN DES version 1.0 for connecting to the ITL. This includes issuance, conversion, external transfer, cancellation, retirement and reconciliation. A relational database (SQL) is used with a suitable data model for implementing this functionality.

The GRETA also contains, or will contain in the upcoming version a 24 Hour clean-up, transaction status enquiry, time synchronisation, different identifier formats as specified

in UN DES and data logging for e.g. transactions, reconciliation, internal audits and messages.

A release candidate version of GRETA implementing the UN DES specifications is scheduled for release in july, 2007. This version is used for performing tests against ITL as required. The GRETA developers keep the ITL administrators and development teams of the UNFCCC secretariat well informed on their progress.

The registry communicates with ITL using XML messages and web-services as specified in the UN DES. These methods are used to perform issuance, conversion, external transfer, cancellation, retirement and reconciliation processes.

5.3.3 Strategies employed to minimize discrepancies

The Icelandic national registry will fulfil all required processes to minimize discrepancies in issuance, transactions, cancellation and retirement of ERUs, CERs, AAUs or RMUs. UN DES specifications are followed at every step of the transactions to minimize risks of inconsistent data in the registry database and ITL. Before forwarding requests to ITL the registry validates data entries against a list of checks performed by ITL (see Annex E of UN DES). A transaction is not finalized until the transaction is registered on both registry servers. The transaction is cancelled if ITL sends an error code. The registry administrator has to contact the ITL administrator for instructions if the registry fails to terminate the transaction. It can be necessary to perform manual corrections in the registry database by the registry administrator.

Each unit is marked with unique codes internally in the registry database. This prevents units to be used in more than one transaction until confirmation of successful transaction has been received by ITL and the transaction is completed.

When sending a message, the registry waits for an acknowledgement of the message being received by ITL before completing submission of the message. If no acknowledgement is received after number of retries, the registry terminates the submissions and performs roll-back on any changes possibly made to the involved unit blocks.

Upon receiving the 24 hour clean-up message from ITL, the registry rolls back any pending transactions including units that were involved. This prevents discrepancies of unit blocks between the registry and ITL.

If all automatic roll-back functions of the registry fail to prevent discrepancies with ITL, a number of manual intervention functions exist in the registry software for the administrator to fix the problem. In worst cases a SQL script will be generated to directly fix problems in the registry SQL database.

After any problem, a reconciliation process is run to confirm that both the registry and ITL agree on all relevant data.

5.3.4 Database and registry server specifications

The registry software and the database share a single network server running on EFA's computer network. Listed below are specifications of the hardware and software:

- Database server is Microsoft SQL Server 2000 (32-bit) Standard Edition.

- Database software supports databases well over 1 000 000 Tb in size.
- 2 Gb is the maximum memory usable to the SQL Server.
- The operating system on the network server is Microsoft Windows 2003 with .NET 1.1 runtime and IIS6.

Since only light workloads are expected on the server the above specifications are considered sufficient for running the Icelandic national registry system.

5.3.5 Disaster prevention and recovery

The registry server is located at a dedicated IT hosting company in Iceland named Skyrr. The server is stored in a fire-proof, temperature controlled room with sensitive fire-detection systems. Currently only manual fire-extinguishers are used but automatic fire-extinguishing system will soon be installed. Access to the server room is only allowed by authorized people and all access is logged.

For immediate recovery after a hard-disk failure a RAID hard-disk mirroring system is used on the registry server.

For general data recovery or in the event of bigger disasters tape-backups are regularly taken of the registry server. The exact schedule is being negotiated but it will include differential and full backups taken at regular intervals. The tapes will be stored outside of the server room.

Critical software patches are applied when they become available.

The use of tape backups should allow recovery within few working days after a disaster, this is considered sufficient.

5.3.6 Testing of the Icelandic national registry

The current version of the GRETA registry system software has already proved its functionality against CITL (EU´s Community Independent Transaction Log). Testing of GRETA against CITL has been done in co-operation of the members of the GRETA working group (GRETA WG) and the current developers of the software, Siemens.

GRETA WG and Siemens will perform thorough testing of the GRETA registry system against the ITL when testing becomes possible.

Testing will be done by Iceland when the ITL gets online and the ITL compatible version becomes available to GRETA licensees.

5.3.7 Security of the Icelandic National Registry

Administrators and users are provided access through the web-services with usernames and passwords. Digital certificates are used to increase the strength of user authentication.

The web-services utilise the permissions of an authenticated user to determine his access to the procedures of the registry system. This prevents any unauthorized access to restricted procedures.

Audit logs are used to track actions.

No direct manipulations of the database are possible through the web-services. Changing the database through the web user-interface is only possible by running predefined procedures. This decreases greatly the risk of intentional or unintentional attacks on the integrity of the database through the web-services.

To minimize risks of incorrect actions due to user errors, the registry uses the following checks before submitting user input for processing:

- Validates all user input before processing.
- Users are asked for confirmation of their input.
- Internal approval process is implemented for secondary approval before submitting details to ITL.

5.4 Public information accessible through the web page

The registry software will at least allow public access to reports as required under 5/CMP.1, 13/CMP.1 and 14/CMP.1. These reports will be easily accessible through the web-based home page of the registry system.

5.5 Webpage of the registry system

The Icelandic national registry system will be accessible through the web address:

http://co2.ust.is

5.6 Performing functions as defined in 13/CMP.1

Functionality to deal with tCERS and lCERs and public reports as defined in 13/CMP.1 are currently being developed according to the UN timetable.

5.7 Performing functions as defined in 5/CMP.1

Issuance of ERUs, AAUs & RMUs

Information on these units will be transmitted to ITL according to UN DES version 1.0. This functionality is being developed according to the UN timetable.

Transfer, acquisition, cancellation, retirement & carry-over

Transfer of this information and acknowledgements will be according to the UN DES version 1.0. These functionalities are being developed according to the UN timetable.

Transaction procedures

These procedures will be according to UN DES version 1.0, implementation follows the UN timetable.

Public reports

These reports will be developed according to the UN timetable.

5.8 SEF, the Standard Electronic reporting Format (14/CMP.1)

The registry will be able to report information according to 14/CMP.1.

Annex A

Decision 14/CP.7

Impact of single projects on emissions in the commitment period

The Conference of the Parties, Recalling its decision 1/CP.3, paragraph 5 (d),

Recalling also, its decision 5/CP.6, containing the Bonn Agreements on the Implementation of the Buenos Aires Plan of Action,

Having considered the conclusions of the Subsidiary Body for Scientific and Technological Advice at its resumed thirteenth session FCCC/SBSTA/2000/14,

Recognizing the importance of renewable energy in meeting the objective of the Convention,

1. Decides that, for the purpose of this decision, a single project is defined as an industrial process facility at a single site that has come into operation since 1990 or an expansion of an industrial process facility at a single site in operation in 1990;

2. Decides that, for the first commitment period, industrial process carbon dioxide emissions from a single project which adds in any one year of that period more than 5 per cent to the total carbon dioxide emissions in 1990 of a

Party listed in Annex B to the Protocol shall be reported separately and shall not be included in national totals to the extent that it would cause the Party to exceed its assigned amount, provided that:

(a) The total carbon dioxide emissions of the Party were less than 0.05 per cent of the total carbon dioxide emissions

of Annex I Parties in 1990 calculated in accordance with the table contained in the annex to document FCCC/CP/1997/7/Add.1;

(b) Renewable energy is used, resulting in a reduction in greenhouse gas emissions per unit of production;

(c) Best environmental practice is followed and best available technology is used to minimize process emissions;

3. Decides that the total industrial process carbon dioxide emissions reported separately by a Party in accordance with paragraph 2 above shall not exceed 1.6 million tons carbon dioxide annually on the average during the first commitment period and cannot be transferred by that Party or acquired by another Party under Articles 6 and 17of the Kyoto Protocol;

4. Requests any Party that intends to avail itself of the provisions of this decision to notify the Conference of the Parties, prior to its eighth session, of its intention;

5. Requests any Party with projects which meet the requirements specified above, to report emission factors, total process emissions from these projects, and an estimate of the emission savings resulting from the use of renewable energy in these projects in their annual inventory submissions;

6. Requests the secretariat to compile the information submitted by Parties in accordance with paragraph 5 above, to provide comparisons with relevant emission factors reported by other Parties, and to report this information to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

Annex B

SUMMARY 2 SUMMARY REPORT FOR CO_2 EQUIVALENT EMISSIONS
(Sheet 1 of 1)

Inventory 1990
Submission August 07
ICELAND

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	CO_2 [1]	CH_4	N_2O	HFCs [2]	PFCs [2]	SF_6 [2]	Total
	CO_2 equivalent (Gg)						
Total (Net Emissions) [1]	**3.781,20**	**467,03**	**785,67**	**0,00**	**419,63**	**5,38**	**5.458,90**
1. Energy	**1.672,56**	**4,68**	**26,71**				**1.703,95**
A. Fuel Combustion (Sectoral Approach)	1.672,56	4,68	26,71				1.703,95
1. Energy Industries	20,70	0,02	0,04				20,76
2. Manufacturing Industries and Construction	361,05	0,25	15,92				377,22
3. Transport	600,13	3,08	5,16				608,38
4. Other Sectors	690,56	1,33	5,59				697,48
5. Other	0,12	0,00	0,00				0,12
B. Fugitive Emissions from Fuels	NA, NO	NA, NO	NA,NO				NA,NE,NO
1. Solid Fuels	NO	NO	NO				NA,NO
2. Oil and Natural Gas	NA, NO	NA, NO	NA,NO				NA,NE,NO
2. Industrial Processes	**392,66**	**0,61**	**48,36**	**0,00**	**419,63**	**5,38**	**866,64**
A. Mineral Products	52,34	NA,NE	NA,NE				52,34
B. Chemical Industry	0,36	NE,NO	48,36	NA	NA	NA	0,36
C. Metal Production	339,96	0,61	NA	NA	419,63	NA,NO	760,20
D. Other Production	NE						NE
E. Production of Halocarbons and SF_6				NA,NO	NA,NO	NA,NO	NA,NO
F. Consumption of Halocarbons and SF_6 [2]				0,00	NA,NE,NO	5,38	5,38
G. Other	NA	NA	NA	NA	NA	NA	NA
3. Solvent and Other Product Use	**7,94**		**6,00**				**13,94**
4. Agriculture		**294,15**	**278,72**				**572,87**
A. Enteric Fermentation		270,34					270,34
B. Manure Management		23,80	34,67				58,47
C. Rice Cultivation		NA,NO					NA,NO
D. Agricultural Soils[3]		NA,NE	244,05				244,05
E. Prescribed Burning of Savannas		NA	NA				NA
F. Field Burning of Agricultural Residues		NA,NO	NA,NO				NA,NO
G. Other		NA	NA				NA
5. Land Use, Land-Use Change and Forestry[1]	**1.622,56**	**49,14**	**418,50**				**2.090,20**
A. Forest Land	-33,30						-33,30
B. Cropland	IE, NA, NE, NO						IE, NA, NE, NO
C. Grassland	1.811,55						1.811,55
D. Wetlands	141,42	49,14	21,70				212,26
E. Settlements							
F. Other Land							
G. Other	-297,11		396,80				99,69
6. Waste	**18,84**	**118,46**	**7,38**				**144,68**
A. Solid Waste Disposal on Land	NE,NO	117,19					117,19
B. Waste-water Handling		1,27	6,33				7,60
C. Waste Incineration	18,84	NE	1,05				19,89
D. Other	NA	NA	NA				NA
7. Other *(as specified in Summary 1.A)*	**66,63**	**NA**	**NA**	**NA**	**NA**	**NA**	**66,63**

Memo Items: [4]							
International Bunkers	318,65	0,23	2,76				321,64
Aviation	219,65	0,03	1,92				221,61
Marine	99,00	0,20	0,84				100,03
Multilateral Operations	**NO**	**NO**	**NO**				**NO**
CO_2 Emissions from Biomass	**NA,NO**						**NA,NO**

Total CO_2 Equivalent Emissions without Land Use, Land-Use Change and Forestry [5]	3.368,70
Total CO_2 Equivalent Emissions with Land Use, Land-Use Change and Forestry [5]	5.458,90

Annex C

Assigned amount and CPR according to Iceland's 2006 GHG Inventory submitted on 11. September 2007.

Assigned amount

Taking into account the provisions of Article 3.7 and 3.8, Iceland's assigned amount for the first commitment period (2008 – 2012) is equal to the percentage inscribed for it in Annex B of its aggregate anthropogenic carbon dioxide equivalent emissions of the greenhouse gases, listed in Annex A in the base year, multiplied by five.

Iceland's assigned amount is estimated according to the formula:

Base Year Total × 110% (representing Iceland's 10% Kyoto emission increase target) × 5 (representing the 5 years of the first commitment period 2008-2012)

= 3 367 972 tonnes CO_2 equivalent × 110% × 5

=18 523 847 tonnes CO_2 equivalent

Or since 1 tonne of CO_2 equivalent equals one assigned amount unit

= 18 523 847 assigned amount units.

Commitment period reserve

The Annex to Decision 11/CMP.1 specifies that: 'each Party included in Annex I shall maintain, in its national registry, a commitment period reserve which should not drop below 90 per cent of the Party's assigned amount calculated pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol, or 100 per cent of five times its most recently reviewed inventory, whichever is lowest'.

Therefore Iceland's commitment period reserve is calculated as:

Either,

90% of Iceland's assigned amount

= 0.9 × 18 523 847 tonnes CO_2 equivalent

= 16 671 462 tonnes CO_2 equivalent.

or,

100% of 5 × (the national total in the most recently reviewed inventory, i.e. 2004)

= 5 × 3 716 842 tonnes CO_2 equivalent

= 18 584 210 tonnes CO_2 equivalent

This means Iceland's Commitment Period Reserve is 16 671 462 tonnes CO_2 equivalent, calculated as 90% of Iceland's assigned amount.