Ministry of the Environment of Estonia

Report to facilitate the estimation of Estonia's assigned amount under the Kyoto Protocol

Final report

September, 2007

Foreword

Estonia's Ministry of the Environment has prepared this Draft report to the European Commission, pursuant to Article 8(1) (e) of Decision No 280/2004/EC, to facilitate the estimation of Estonia's assigned amount for the commitment period pursuant to Articles 3.7 and 3.8 of the Kyoto Protocol and to demonstrate Estonia's capacity to account for its emissions and assigned amount.

The Ministry of the Environment is responsible for providing National Greenhouse Gas Inventories and compilation of National Reports. Financial resources for this purpose are planned in the State Budget. Up to now the practical work has been done on the basis of single contracts. Up to the year 2004 the Institute of Ecology at Tallinn University has done the practical providing of the GHG inventories and National Communications. Starting from 2005 leading specialists from Tallinn University of Technology, have been involved in compilation of GHG inventory.

This report is divided into two parts in accordance with the Annex to the draft decision - 13/CMP.1 (Modalities for the accounting of the assigned amounts).

Part I contains following information on:

- inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for the years 1990 - 2004[1];
- identification of the selected base year for emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6);
- calculation of the assigned amount pursuant to Article 3.7 and 3.8 of the Kyoto Protocol.

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[1] All GHG inventories of the period 1990-2004 will be recalculated by the 31 December 2006.

Part II contains information on:

- calculation of the commitment period reserve pursuant to decision -13/CMP.1 (Article 17);
- identification of the minimum values for tree crown cover, land area and tree height for use in accounting of activities under Articles 3.3 and 3.4, with justification that the values are consistent with the information historically reported to the Food and Agriculture Organization of the United Nations; identification of elected activities under Article 3.4;
- identification how accounting of Article 3.3 and 3.4 accounting will be done, annually or for the whole commitment period. In addition, Part II contains descriptions of the National System (in accordance with Article 5.1 and the reporting guidelines under Article 7) and the National Registry (in accordance with reporting guidelines under Article 7).

The information provided in Part I and Part II is complemented with information in separate reports which are included in the submission:

- Greenhouse Gas Emissions in Estonia 1990 - 2004 (Estonia's national inventory report and the common reporting tables)
- National Greenhouse Gas Inventory System in Estonia (a detailed description of the National System).

This draft report has been reviewed by the ministries participating in the contact network on climate policy issues.

Contents

Part I

1. Greenhouse gas inventory for 1990 - 2004

1.1 National Inventory Report and CRF Tables

A complete inventory on greenhouse gas emissions and removals for the years 1990-2004 are provided in the report Greenhouse Gas Emissions in Estonia 1990 – 2004 (Estonia's national inventory report and the common reporting tables). This report is prepared in accordance with the UNFCCC Guidelines for the preparation of national communications by Parties included in Annex I to the Convention: Part I: UNFCCC reporting guidelines on annual inventories (following incorporation of the provisions of decision 13/CP.9).

Information on emission and removals from land-use, land-use change and forestry activities under Article 3.3 (or Article 3.4) is not included in the inventory report as the reporting on these activities will begin only during the commitment period of the Kyoto Protocol. Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol (Decision 22/CP.7) require that the emissions from sources listed in Annex A to the Protocol are clearly distinguished from estimates for Articles 3.3 and 3.4. Even if reporting under these Articles is not yet done, Estonia has clarified its reporting to facilitate this task in the future.

The methodologies used in the preparation of Estonia's greenhouse gas inventory are consistent with the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories as complemented by the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories and the IPCC Good Practice Guidance on Land Use, Land-Use Change and Forestry.

Estonia has made evaluation of the activity data and emission factors used in the 1990 (the base year) inventory. In the Industrial Processes, Agriculture and Waste sectors some changes have been implemented.

For the resubmission in 2007, Estonia made extensive quality checks and evaluation of the activity data and emission factors used in the inventory. This resulted in more consistent allocation of the emissions and increased the accuracy of the emissions and removals. The quality checks have involved, among others, applying the current fuel classification consistently to the whole time series, revision of some fuel characteristics, oxidation factors and emission factors to take into account new national data. In the Energy Sector some changes were implemented connected with the new elaborated carbon emission factor for oil shale ($CEF_{\text{oil Shale FBC}}$) because of fluidized Bed Combustion technology implemented in 2004 in some energy units of oil shale burning power stations.

1.2 Base year inventory and times series consistency

The greenhouse gas emissions in 1990 - 2004 are given in Table 1. by gas and in Figure 1. by sector.

Source of data is GHG 2006 resubmission v.3.1 (September 2007).

Table 1. Estonia's greenhouse gas emissions and removals in 1990-2004, Tg CO_2 equivalent.

GHG EMISSIONS	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CO_2	37.68	35.64	25.70	20.62	21.55	19.46	20.45	19.95	17.84	16.42	16.47	17.07	16.73	18.69	18.80
Fuel combustion	38.07	36.00	26.06	20.92	21.72	19.68	20.75	20.18	17.92	16.55	16.69	17.30	17.08	19.04	19.12
Industr. Processes	0.95	0.93	0.54	0.30	0.55	0.57	0.59	0.64	0.68	0.60	0.59	0.62	0.43	0.47	0.59
CH_4	3.12	3.11	2.60	1.85	2.10	2.14	2.23	2.25	2.09	1.96	2.02	1.83	1.71	1.76	1.89
N_2O	1.82	1.74	1.49	1.05	0.96	0.88	0.76	0.79	0.80	0.68	0.72	0.70	0.65	0.74	0.76
SF6, HFCs, PFCs	NO	NO	NO	NO	NO	0.000	0.001	0.002	0.003	0.004	0.006	0.007	0.009	0.011	0.012
Total GHG in CO_2 eq	**42.63**	**40.48**	**29.79**	**23.53**	**24.62**	**22.48**	**23.44**	**22.99**	**20.73**	**19.07**	**19.22**	**19.60**	**19.11**	**21.20**	**21.46**
Land-Use Change and Forestry	-9.36	-9.80	-10.48	-10.50	-9.02	-9.21	-10.04	-8.75	-8.48	-8.75	-8.80	-8.43	-7.49	-7.73	-7.99

(Remark: Due to rounding the sum of subtotals does not equal to total figures.)

TABLE 10 EMISSION TRENDS (SUMMARY) **Inventory 2004**

(Part 1 of 2) **Submission 2006 v3.1, Estonia**

GREENHOUSE GAS EMISSIONS	Base year (1990)	1991	1992	1993	1994	1995	1996	1997	1998	1999
	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)
CO_2 emissions including net CO_2 from LULUCF	28 309.91	25 835.41	15 208.24	10 122.42	12 521.73	10 241.25	10 405.93	11 192.99	9 349.56	7 668.86
CO_2 emissions excluding net CO_2 from LULUCF	37 680.62	35 635.57	25 698.00	20 624.72	21 547.74	19 457.72	20 446.83	19 948.79	17 836.44	16 424.66
CH_4 emissions including CH_4 from LULUCF	3 131.63	3 112.57	2 605.18	1 850.84	2 109.07	2 142.14	2 229.67	2 254.59	2 096.07	1 965.89
CH_4 emissions excluding CH_4 from LULUCF	3 124.54	3 112.48	2 598.19	1 849.60	2 104.72	2 139.98	2 227.31	2 250.85	2 093.25	1 962.88
N_2O emissions including N_2O from LULUCF	1 820.24	1 736.50	1 490.35	1 054.92	963.71	877.27	763.90	788.42	795.77	681.74
N_2O emissions excluding N_2O from LULUCF	1 819.52	1 736.49	1 489.64	1 054.80	963.27	877.05	763.66	788.04	795.48	681.43
HFCs	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	0.13	0.73	1.39	2.44	3.33
PFCs	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
SF_6	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	0.25	0.31	0.58	0.81	1.05
Total (including LULUCF)	**33 261.78**	**30 684.48**	**19 303.77**	**13 028.18**	**15 594.51**	**13 261.04**	**13 400.54**	**14 237.96**	**12 244.64**	**10 320.86**
Total (excluding LULUCF)	**42 624.69**	**40 484.54**	**29 785.84**	**23 529.12**	**24 615.73**	**22 475.12**	**23 438.85**	**22 989.65**	**20 728.43**	**19 073.36**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year (1990)	1991	1992	1993	1994	1995	1996	1997	1998	1999
	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)
1. Energy	38 068.98	35 996.35	26 059.96	20 917.14	21 715.76	19 684.39	20 746.22	20 179.17	17 924.14	16 548.74
2. Industrial Processes	948.34	928.41	539.47	304.81	546.58	570.58	589.22	637.44	675.42	603.41
3. Solvent and Other Product Use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4. Agriculture	3 031.30	2 859.54	2 439.58	1 784.08	1 632.92	1 465.71	1 293.83	1 315.33	1 311.57	1 101.74
5. Land Use, Land-Use Change and Forestry[5]	-9 362.90	-9 800.06	-10 482.07	-10 500.94	-9 021.21	-9 214.08	-10 038.31	-8 751.69	-8 483.79	-8 752.49
6. Waste	576.07	700.25	746.82	523.09	720.47	754.44	809.57	857.71	817.30	819.48
7. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (including LULUCF)[5]	**33 261.78**	**30 684.48**	**19 303.77**	**13 028.18**	**15 594.51**	**13 261.04**	**13 400.54**	**14 237.96**	**12 244.64**	**10 320.86**

(Part 2 of 2)

GREENHOUSE GAS EMISSIONS	2000	2001	2002	2003	2004
	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)
CO_2 emissions including net CO_2 from LULUCF	7 664.40	8 635.18	9 236.50	10 949.21	10 808.67
CO_2 emissions excluding net CO_2 from LULUCF	16 469.03	17 068.61	16 734.73	18 685.06	18 798.56
CH_4 emissions including CH_4 from LULUCF	2 026.53	1 826.72	1 723.52	1 764.10	1 893.18
CH_4 emissions excluding CH_4 from LULUCF	2 021.90	1 825.16	1 714.49	1 762.79	1 890.78
N_2O emissions including N_2O from LULUCF	721.86	697.30	648.48	743.23	755.26
N_2O emissions excluding N_2O from LULUCF	721.39	697.14	647.56	743.10	755.01
HFCs	4.19	4.89	5.68	6.59	7.21
PFCs	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
SF_6	1.43	2.24	3.68	4.75	5.28
Total (including LULUCF)	**10 418.41**	**11 166.32**	**11 617.86**	**13 467.88**	**13 469.59**
Total (excluding LULUCF)	**19 217.94**	**19 598.04**	**19 106.14**	**21 202.28**	**21 456.84**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2000	2001	2002	2003	2004
	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)	CO_2 equivalent (Gg)
1. Energy	16 692.88	17 295.57	17 075.44	19 035.56	19 119.45
2. Industrial Processes	591.80	618.88	425.40	470.84	586.00
3. Solvent and Other Product Use	NA	NA	NA	NA	NA
4. Agriculture	1 136.24	1 133.10	1 058.86	1 174.76	1 192.05
5. Land Use, Land-Use Change and Forestry[5]	-8 799.53	-8 431.72	-7 488.28	-7 734.40	-7 987.25
6. Waste	797.02	550.49	546.44	521.12	559.35
7. Other	NA	NA	NA	NA	NA
Total (including LULUCF)[5]	**10 418.41**	**11 166.32**	**11 617.86**	**13 467.88**	**13 469.59**

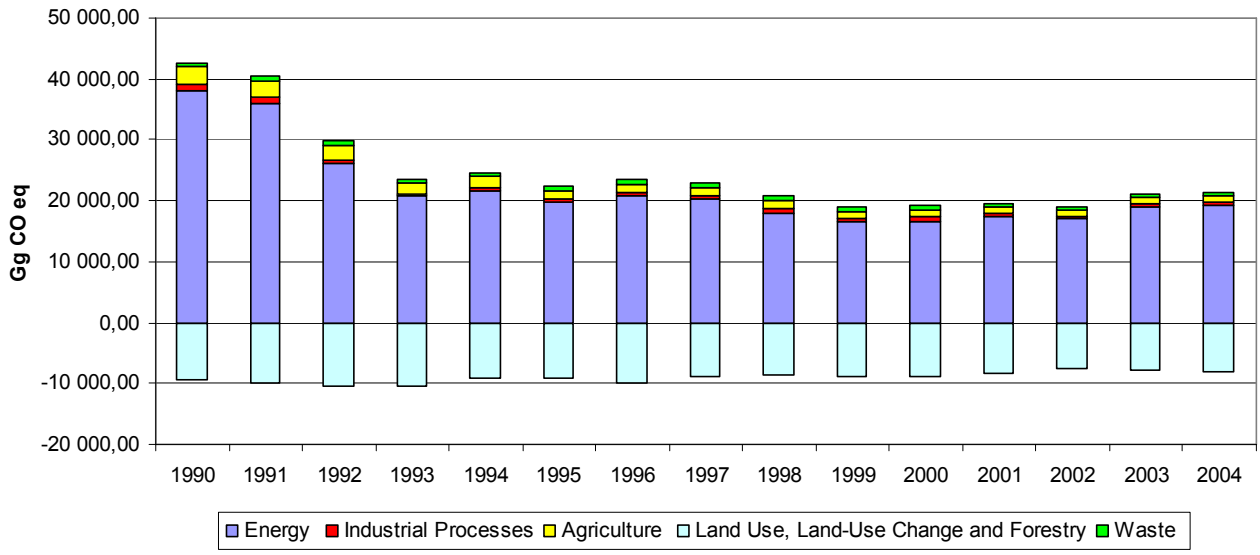

Figure 1. Greenhouse gas emissions in Estonia in 1990-2004 by reporting sectors (Gg CO_2 eq).

In the base year the most important source of emissions was the Energy sector, which contributed about 89.31% to the total emissions without LULUCF. Agriculture (7.11%), Industrial Processes (2.22%) and Waste (1.35%) were also important sources of emissions.

During 1990 to 2004 the Energy emissions have remained the most important category in the inventory, in 2000 - 2004 the share has increased from 86,9% to 89.1 %. In the other sectors the emissions have decreased. The total national emissions (without LULUCF) in 2004 are about 50% lower than in 1990.

The emissions in Energy sector have been calculated in accordance to the Intergovernmental Panel on Climate Change (IPCC) tier 1 methods and default emission factors (EFs). However, country-specific data is applied in the case of oil shale combustion, which is Estonia's main source of emissions, accounting for approximately two-thirds of the total in 2004. In June 2007 all emissions in Energy sector were recalculated because, a 2004 regulation of the Ministry of the Environment defined the carbon emission factor for oil shale used in pulverized combustion technology to be 27.85 tC/TJ (previous value was 29.1 tC/TJ). In previous inventory submission this new country specific emission factor for oil shale used in pulverized combustion technology was used only for the inventory year 2004, but not for the inventory years 1990-2003.

Emissions from international aviation and marine bunkers are estimated separately from domestic aviation and marine and reported as memo items. In previous inventory submission

for the years with lack of data on the distribution between domestic and international marine activities (i.e. 1990-1997), all fuel consumption was allocated to domestic activities instead of international bunkers.

In the Industrial Processes sector the GHG emissions for the years 1990 (base year) and 2004 were recalculated. The reason of recalculations was adding one important CO_2 key source – ammonia production (CRF Table 2(I).B.1). During the GHG inventory resubmission in 2007, recalculations were made also for the whole time series. The most important sources of CO_2 emissions in the sector are the cement industry and the lime industry, for which the process emissions have been allocated in the Industrial Processes sector. The emissions from these sectors have been calculated using plant-specific data.

The emissions from the Agriculture sector are calculated using Tier 1 and Tier 2 approaches and default emission factors (EFs). Activity data is mainly based on official Estonian statistics provided by the Statistical Office of Estonia. Livestock is the main contributor to greenhouse gas emissions from agriculture. Methane emission from enteric fermentation forms about 37%, CH_4 from manure management about 6%, N_2O from agricultural soils about 52% and N_2O from manure management only 4,5% of the total GHG emission from agriculture. Since 2003 Estonia uses in the agriculture sector only Western Europe and Developed countries emission factors because of joining the EU in May 2003. This causes a slight increase in the methane net emission form manure management in 2003. The decreasing number of animals, decreasing nitrogen fertiliser use and decreasing area of organic arable land has lead to an overall decreasing trend in the emissions from Agriculture. Total emissions in 2004 from Agriculture were about 61% lower than in 1990. In June 2007 N_2O emissions from synthetic fertilizers applied to agricultural soils and CH_4 emissions from cattle manure management were recalculated due to data-transfer error made in the estimates of the 2007 resubmission.

The emissions from the waste sector were calculated using the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories and the IPCC Good Practice Guidance. In the waste sector the reliability of activity data is not available for the years 1990-1991. The situation was the same with the data of wastewater treatment; therefore estimations were carried out based on expert judgment. In June 2007 CH_4 emissions of the base year and 2004 from Waste sector (solid municipal waste) were recalculated using the First Order Decay (the FOD) approach. Activity data for 1992 - 2004 were obtained from Estonian Environment Information Centre; activity data for 1950 – 1991 were extrapolated using a linear trend model. CH_4 emissions from sludge landfilled were recalculated using Tier 1 method. The CH_4

emission from solid waste landfilled in 2004 is 3% lower than in the base year.

The emissions from the LULUCF sector do not influence the estimation of the assigned amount for Estonia, as the sector was a sink in 1990, as also for the whole time series since. The LULUCF sector offsets about 22% in 1990) up to 37% (in 2004) of emission of the other sectors in Estonia.

In 2004 inventory submission, which reports carbon stock changes and greenhouse gas emissions from LULUCF Estonia has used the new UNFCCC reporting guidelines on annual inventories (FCCC/SBSTA/2004/8) and GPG LULUCF (IPCC 2003) for the first time. The earlier period (1990–2003) has been reported by using previous version of CRF tables (corresponding to 3/CP.5) and methods (IPCC 1997). The whole LULUCF-sector reporting is under ongoing development and will be more complete in forthcoming submissions.

Based on forest land data, the LULUCF sector acted as a carbon dioxide sink in Estonia in 2004. Emissions from the forestry sector (CO_2 and CH_4 emissions by biomass removals and burning) are smaller than removals (increase in C stock in tree biomass on forest land). In 2004 the LULUCF sector (which includes only forest land) was a sink of about –7987,25 Gg CO_2 eq.

Overall, the base year and the recent year estimates have been estimated with consistent methods, to the extent the available activity data and emission factors make it possible, taking the IPCC Good Practice Guidance on time series into account. For some sectors, the accuracy of the data has increased in recent inventory years due to improved data collection measures and improved knowledge on the emission levels based on measurements and other research. However, no evidence suggests that this would have resulted in overestimation of the base year emissions in comparison with the recent inventory years. Detailed descriptions of the methods, activity data collection and emission factors, as well as associated uncertainties can be found in the national inventory report and the CRF tables.

2. Selected base year for HFCs, PFCs and SF_6 in accordance with Article 3.8

Article 3.8 of the Kyoto Protocol reads "*any Party included in Annex I may use 1995 as its base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride"* for the purposes of calculating its assigned amount in accordance with Article 3.7. In accordance with this, Estonia has chosen the year 1995 as the base year for the emissions of the hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulphur hexafluoride (SF6).

Due the lack of activity data Estonia has not been able to calculate emissions from F-gases. The aggregated F-gases emissions presented in this report are the result of a gap-filling exercise made together with the European Commission in accordance with the Article 4(1) of Council Decision 280/2004/EC and Articles 13 and 14 of Commission Decision 2005/166/EC using a linear trend extrapolation method.

The time series for the emissions of the hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulphur hexafluoride (SF6) can be seen in Table 2.

Table 2. Actual emissions of HFCs, PFCs and SF6, 1990-2004 (CO_2 equivalent Gg).

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
HFCs	NO	NO	NO	NO	NO	0.130	0.730	1.390	2.440	3.330	4.190	4.890	5.680	6.590	7.210
PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
SF6	NO	NO	NO	NO	NO	0.250	0.310	0.580	0.810	1.050	1.430	2.240	3.680	4.750	5.280
Total F-gases	NO	NO	NO	NO	NO	0.380	1.040	1.970	3.250	4.380	5.620	7.130	9.360	11.340	12.490

3. Calculation of Estonia's assigned amount

The assigned amount is calculated according to Articles 3.7 and 3.8 of the Kyoto Protocol, on the basis of the base year inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol.

Estonia's assigned amount pursuant to Article 3.7 and 3.8 of the Kyoto Protocol is calculated in accordance with Draft Decision -13/CMP.1 (Modalities for the accounting of the assigned amounts) equal to the percentage corresponding to the emission reduction level according to the Kyoto Protocol (Annex B) of Estonia's aggregate anthropogenic CO_2 equivalent emissions of greenhouse gases in the base year (1990 except for emissions of HFCs, PFCs

and SF_6 1995), multiplied by five.

Land use, land-use change and forestry constituted a net sink in 1990, therefore the emissions and removals from this sector do not affect the calculation of Estonia's assigned amount.

Equation for the accounting of Estonia's assigned amount is:

Estonia's Assigned Amount = Base year emissions (1990, except 1995 for the F-gases) x 5 x the percentage corresponding to the emission reduction level according to the Kyoto Protocol Annex B (92%)

The estimation of the Estonia's assigned amount is illustrated in Table 3. The estimated assigned amount is **196075.322** G**g CO_2** equivalent.

Table 1. Estimation of Estonia's assigned amount.

Base year emission	Emissions in column 1 times five	Percentage corresponding to the emission reduction level according to the Kyoto Protocol Annex B	Estimated assigned amount
Gg CO_2 equivalent	Gg CO_2 equivalent	per cent	Gg CO_2 equivalent
Emission without HCFs, PFCs and SF6 and the LU-LUCF sector in 1990: **42624.69**	213123.45	92%	**196073.574**
Emissions of HCFs, PFCs and SF6 in 1995 **0.380**	1.900	92%	**1.748**
Total Base Year Emissions **42625.07**	213125.35	92%	**196075.322**

Part II

4. Calculation of Estonia's commitment period reserve

The commitment period reserve is calculated in accordance with decision -13/CMP.1 (Article 17) as 90% of the proposed assigned amount or 100% of its most recently reviewed inventory times five, whichever is lowest.

Estonia has interpreted the "most recently reviewed inventory" the inventory for the year 2004. This would mean that the five times the emissions from the total inventory of 2004 would be lower, than 90% of the assigned amount. This would give an estimated commitment period reserve of **107284.201Gg CO_2 equivalent**.

Table 4. Calculation of the commitment period reserve

	Calculation	Possible reserve, Gg $CO_{2\ eqv}$
100% of the most recently reviewed inventory (2004) times five	5 x 21456.840	**107284.201**
90% of the proposed assigned amount	0.9 x 196075.322	**176467.790**

5. Selection of threshold values for the forest definition to be used for reporting under Articles 3.3 and 3.4

Estonia has selected as threshold values for the forest definition for reporting under Article 3.3 (including activities afforestation, reforestation and deforestation) the following: forest land includes land with minimum tree crown cover of 30 % for trees with minimum height at last 1.3 m. The minimum area for forest land is 0.5 ha. Temporarily unstocked areas are included (forest regeneration areas). For linear formations, a minimum width of 20 m is applied. This definition would be applicable also for reporting, under Article 3.4 - however, Estonia has decided not to use Article 3.4 activities in meeting is commitments for the first commitment period.

Except for crown cover, which is 30% as defined in Forest Act, the selected threshold values are consistent with those values used in the reporting to the Food and Agriculture Organisation of the United Nations (the FAO TBFRA 2000 and FRA 2005 forest definition).

6. Selection of activities under Article 3.4

Estonia does not have reliable estimates of the GHG emissions/removals from activities under Article 3.4 for the first commitment period. In accounting for forest management, data reported by National Forest Inventory have been used.

7. Accounting of activities under Article 3.3

Estonia has chosen to account for the activities under Article 3.3 (afforestation, reforestation and deforestation) for the whole commitment period.

8. Estonia's national greenhouse gas inventory system

Estonia's National System under Article 5.1 of the Kyoto Protocol is described in accordance with the guidelines for the preparation of information under Article 7 in the report of National Greenhouse Gas Inventory System in Estonia, which is part of this submission.

9. Estonia's National Registry

Description of Estonia's national registry, in accordance with the guidelines under Article 7 of the Kyoto Protocol:

1. Name and contact information of the registry administrator designated by the Party to maintain the national registry:

   Estonian Environment Information Centre
   Mustamäe tee 33
   10 616
   Tallinn
   Estonia
   Tel. +372 6 737 577
   Fax: +372 6 737 599
   E-mail: info@ic.envir.ee

2. Any other Party with which the Party cooperates by maintaining their respective registries in a consolidated system:

   Estonia's national registry is currently linked to the other operational EU member states' National Registries by way of the European Commission CITL (Community Independent Transaction Log).

3. The description of the database structure used in the national registry:

   The GRETA registry system is implemented using a Microsoft SQL Server relational database management system with a dedicated data model for supporting registry operations.

   SQL Server database model is also scalable up to 2 processors (2xIntel Xeon 3.8 GHz/800MHz -2MB L2) with max 16 gigabytes of memory.

   The maximum size of a SQL Server 2000 database is 116 gigabytes.

   Currently Estonia's registry contains:

   a. 50 organizations;
   b. with 100 users;
   c. with 55 holding accounts;
   d. with 370 transactions having been performed;
   e. has a total size of database more than 65 megabytes.

   Applying a growth of 10 % in organizations, users and accounts we predict that this will result in annual growth in database storage max 10 megabytes per year.

4. A description of how the national registry conforms to the technical standards for the purpose of ensuring the accurate, transparent and efficient exchange of data between national registries, the clean development registry and the independent transaction log:

   To ensure the technical standards for purpose of ensuring the accurate, transparent and efficient exchange of data between national registries, daily automated checks and the data reconciliation process is being initiated by the CITL. The process is set in European Commission Regulation No. 2216/2004 for a standardized and secured system of registries pursuant to Directive 2003/87/EC of the European Parliament and of the Council and Decision 280/2004/EC of the European Parliament and the Council.

Estonia is using GRETA software which is supplied by DEFRA (Department for Environment Food and Rural Affairs of the United Kingdom).

The GRETA registry system has been developed for the EU Emissions Trading Scheme (EU ETS). Under EU ETS requirements its Member States registries have to be compliant with the Data Exchange Standards specified for the Kyoto Protocol.

Estonia's registry system has been tested successfully with the EU Commission and after the testing the Registry went live.

Security measures employed in the national registry to deter unauthorized manipulations and minimize operator error:

a. Access to the Registry is via Username and Password;
b. The actions that a user can perform are controlled by a permissions system, hence preventing unauthorised access to restricted actions;
c. All actions performed are recorded by audit;
d. Applies validation on all user inputs to ensure that only valid details are submitted for processing;
e. Database manipulations are only carried out by protected, internal stored procedures which are not accessible directly from the user interface and can only be invoked by our internal web-services.
f. And a dedicated Greta development team is available to make any further security enhancements as and when required.

5. A list of the information publicly accessible through the user interface to the national registry:

   The information publicly available is maintained in accordance with the Commission Regulation of 21 December 6 2004 for a standardized and secured system of registries pursuant to Directive 2003/87/EC of the European Parliament.

6. An explanation of how to access information through the user interface of the national registry:

   Open Internet Explorer (or similar) and browse to the following URL: http://khgregister.envir.ee/. Select the public reports link at the bottom of the page.