Latvia's Initial Report under the Kyoto Protocol

Determination of Assigned Amount

Ministry of the Environment of the Republic of Latvia
Latvian Environment, Geology and Meteorology Agency

2006

Contents

1. Introduction

Decision 13/CMP.1 (*Modalities for the accounting of assigned amounts under Article 7, paragraph 4, of the Kyoto Protocol*, FCCC/KP/CMP/2005/8/Add.2) requires for each Party included in Annex I with a commitment inscribed in Annex B to submit to the secretariat, prior to 1 January 2007, a report to facilitate the calculation of its assigned amount pursuant to Article 3, paragraphs 7 and 8, for the commitment period and demonstrate its capacity to account for its emissions and assigned amount.

Latvia's Initial Report under the Kyoto Protocol was prepared by the Ministry of the Environment in cooperation with the Latvian Environment, Geology and Meteorology Agency (LEGMA). LEGMA, according to Ordinance No 220 of the Cabinet of Ministers of the Republic of Latvia of 6 April 2005, is responsible for annual greenhouse gas (GHG) emission inventory for Latvia.

According to decision 13/CMP.1 the Initial Report covers information on:

- Complete inventories of anthropogenic emissions by sources and removals by sinks of GHG not controlled by the Montreal Protocol for years 1990 to 2004;
- Identification of selected base year for hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride in accordance with Article 3.8 of the Kyoto Protocol;
- Calculation of assigned amount pursuant to Articled 3.7 and 3.8 of the Kyoto Protocol, on the basis of inventory of anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol;
- Calculation of commitment period reserve in accordance with decision 11/CMP.1 (*Modalities, rules and guidelines for emissions trading under Article 17 of the Kyoto Protocol*);
- Threshold values in forest definition for accounting of activities under Articles 3.3 and 3.4 of the Kyoto Protocol;
- Election of Land use, Land use change and Forestry (LULUCF) activities under Article 3.4 of the Kyoto Protocol;
- Reporting period for activities under Article 3.3 of the Kyoto Protocol;
- National system in accordance with Article 5.1 of the Kyoto Protocol;
- National registry.

2. Greenhouse gas inventory for 1990 - 2004

Overview of GHG emission inventory

A complete inventory of greenhouse gas emissions and removals for the years 1990 - 2004 is provided in Latvia's National Inventory Report 1990 – 2004 and in the common reporting tables for 1990 – 2004, which were sent to the UNFCCC on 15 April 2006.

This report is prepared according to 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).

The following documents were used in the preparation of GHG emission estimations:

- Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (Revised IPCC 1996 Guidelines),

- IPCC Good Practice Guidance and Uncertainty Management in National GHG Inventories (IPCC GPG 2000),

- IPCC Good Practice Guidance for Land Use, Land Use Change and Forestry (IPCC GPG LULUCF 2003) and

- EMEP/CORINAIR Emission Inventories Guidebook (EMEP/CORINAIR Guidebook).

For the submission 2006, recalculation was carried out for all years (1990-2003) to improve the quality of inventory. Generally activity data, emission factors and other parameters in Energy (including Transport), Solvent and Other Product Use, Agriculture, LULUCF and Waste sectors as well as some sub-sectors of Industrial Processes sector were evaluated. Detailed information regarding recalculation is given in the National Inventory Report.

Results of recalculation as differences between the 2005 and 2006 inventory submitted to UNFCCC are shown in Table 1.

Table 1   Recalculated emissions by sectors for submission 2005 and 2006, Gg CO_2 eq.

	2005 submission_1990	2006 submission_1990	Changes
1. Energy	18,757.257	18,690.267	0.36 %
2. Industrial Processes	503.745	525.290	-4.28 %
3. Solvent and Other Product Use	105.713	55.698	47.31 %
4. Agriculture	5,161.213	5,938.997	-15.07 %
5. Land-Use Change and Forestry	-18,389.704	-20,670.300	-12.40 %
6. Waste	822.599	682.763	17.00 %

For the 2006 submission Latvia started to implement the IPCC GPG LULUCF 2003 and for the first time GHG emissions and CO_2 removals from LULUCF were calculated by the Ministry of Agriculture according to the institutional set-up for the national system (see Chapter 9).

The GHG emissions in 1990 – 2004 are shown in the Table 2 by gas and in Table 3 and Figure 1 by sectors.

Table 2   GHG emissions by gas in 1990 – 2004, Gg CO_2 eq.

GREENHOUSE GAS	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
CO_2 emissions including net CO_2 from LULUCF	-2,093.5	-4,887.7	-8,386.1	-8,896.9	-9,844.4	-8,885.9	-9,824.2	-8,125.7	-7,350.1	-7,135.9	-7,264.8	-6,815.2	-5,838.3	-6,199.6	-6,456.5
CO_2 emissions excluding net CO_2 from LULUCF	18,597.5	16,372.8	13,201.5	11,850.0	9,983.4	8,802.4	9,081.1	8,535.0	8,156.7	7,549.8	6,907.0	7,410.2	7,330.8	7,476.6	7,485.2
CH_4	3,504.2	3,449.6	2,929.7	2,117.3	2,052.9	2,043.5	2,005.4	1,956.8	1,905.0	1,818.8	1,797.9	1,869.5	1,881.7	1,785.3	1,837.5
N_2O	3,812.0	3,544.3	2,758.5	2,004.0	1,759.5	1,375.8	1,409.3	1,422.3	1,366.2	1,261.8	1,275.9	1,406.6	1,396.1	1,467.4	1,439.6
HFCs	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	1.0	1.3	2.4	4.4	6.7	8.8	10.3	11.8	12.9	16.2
SF_6	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	0.3	0.3	0.5	0.7	1.0	1.3	2.0	3.4	4.4	4.8
Total (including net CO_2 from LULUCF)	**5,222.7**	**2,106.2**	**-2,697.9**	**-4,775.5**	**-6,032.1**	**-5,465.4**	**-6,407.8**	**-4,743.7**	**-4,073.7**	**-4,047.6**	**-4,181.0**	**-3,526.9**	**-2,545.2**	**-2,929.6**	**-3,158.4**
Total (excluding net CO_2 from LULUCF)	**25,913.8**	**23,366.7**	**18,889.7**	**15,971.3**	**13,795.8**	**12,222.9**	**12,497.5**	**11,917.1**	**11,433.0**	**10,638.1**	**9,990.8**	**10,698.5**	**10,623.9**	**10,746.6**	**10,783.3**

Table 3   GHG emissions by sector in 1990 – 2004, Gg CO_2 eq.

| SECTOR	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
1. Energy	18,690.3	16,643.7	13,505.7	12,239.5	10,338.6	9,195.9	9,467.6	8,876.2	8,485.4	7,823.6	7,206.2	7,725.5	7,636.9	7,739.7	7,778.1
2. Industrial Processes	525.3	359.2	161.2	61.9	202.2	167.9	184.0	207.1	213.4	254.7	202.3	221.6	238.3	247.2	265.9
3. Solvent and Other Product Use	55.7	51.5	49.1	46.2	45.3	46.2	48.3	48.9	48.3	49.5	49.0	55.2	53.4	54.1	55.3
4. Agriculture	5,939.0	5,590.1	4,451.0	2,983.9	2,550.4	2,129.3	2,092.8	2,046.8	1,921.9	1,726.8	1,728.1	1,868.8	1,864.6	1,906.9	1,859.4
5. Land Use, Land-Use Change and Forestry	-20,670.3	-21,235.9	-21,565.1	-20,720.2	-19,795.7	-17,649.6	-18,867.2	-16,610.6	-15,450.4	-14,625.0	-14,109.8	-14,186.9	-13,126.4	-13,634.7	-13,904.5
6. Waste	682.8	697.7	700.1	613.2	627.1	645.0	666.7	688.0	707.6	722.8	743.2	789.0	788.0	757.3	787.4
Total (including LULUCF)	**5,222.7**	**2,106.2**	**-2,697.9**	**-4,775.5**	**-6,032.1**	**-5,465.4**	**-6,407.8**	**-4,743.7**	**-4,073.7**	**-4,047.6**	**-4,181.0**	**-3,526.9**	**-2,545.2**	**-2,929.6**	**-3,158.4**
Total (excluding LULUCF)	**25,893.0**	**23,342.1**	**18,867.2**	**15,944.7**	**13,763.6**	**12,184.2**	**12,459.3**	**11,866.9**	**11,376.6**	**10,577.4**	**9,928.8**	**10,660.1**	**10,581.2**	**10,705.1**	**10,746.1**
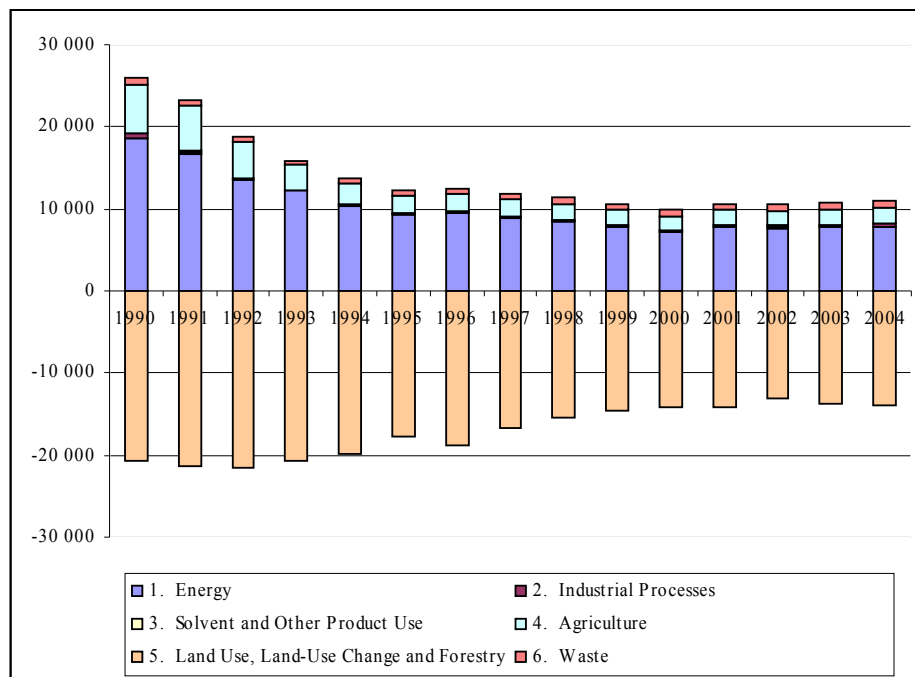
Figure 1   Latvia's GHG emission trends by sector, Gg CO_2 eq.

In the base year (1990) the most important source of emissions was the Energy sector, which contributed about 72% of the total emissions (Gg CO_2 eq.) without LULUCF. Significant sources of emissions were also Agriculture (23%), Waste (2.6%) and Industrial Processes (2%). Solvent and Other Product Use sector contributed only 0.2 % of total emissions (Gg CO_2 eq.) excluding LULUCF.

Generally, due to economic restructuring during 1990'ties GHG emissions have decreased considerably in all sectors since the 1990.

Latvia's total GHG emissions without LULUCF in 2004 showed a decrease of 58.4 % compared to the base year. They rose by about 0.34 % compared to the total GHG emissions in 2003.

Methodologies used for GHG emission inventory

This section provides information on methodologies used for GHG emission calculation. Detailed description can be found in the National Inventory Report.

Energy

The Energy sector includes emissions from stationary and mobile combustion. Emission calculation is done by LEGMA.

For stationary emission calculation the Revised IPCC 1996 Guidelines Tier 1 Sectoral approach and Reference approach are used. For calculations in the Transport sector both IPCC GPG 2000 and EMEP/CORINAIR Guidebook were used.

For emission calculation for stationary sources and off–road transportation mainly data from the CSB – Energy Balance for Latvia and Annual questionnaires sent to EUROSTAT by CSB are used.

Emissions from road transport are calculated using the "COmputer Programme to calculate Emissions from Road Transportation" (COPERT III) based on EMEP/CORINAIR Guidebook.

The main sources for emission factors are:
-   National studies for country specific parameters and emission factors;
-   Revised IPCC 1996 Guidelines;
-   EMEP/CORINAIR Guidebook.

Activity data related to road transport are obtained from the Road Traffic Safety Department (RTSD) about number of vehicles and data about fuel consumption for railway is taken from CSB. For air and water transport there was a national study "Fuel consumption in domestic navigation and aviation 1990-2004" carried out by national experts to gather data previously unavailable.

Industrial processes

Revised IPCC 1996 Guidelines Tier 2 and EMEP/CORINAIR Guidebook are used to calculate GHG emissions from the Industrial Processes. Emission calculation is done by LEGMA.

Emission estimates are based on the amounts of used raw materials and technology of production processes. For CH_4 emissions from steel production EMEP/CORINAIR Guidebook was used for the first time in submission 2006. There is one enterprise where a large amount of SF_6 is used in commutation and control installations. It has consumed small amount of SF_6 in electrical equipment since year 1992, but the amount increased radically since year 1995. Danish methodology was used to estimate emissions from shoe production.

The main sources for emission factors are:
- Plant specific emission factor for CO_2 emission estimations reported by facilities during development of the National Allocation Plan for 2005 – 2007 within the EU emission allowance trading scheme (EU-ETS);
- Revised IPCC 1996 Guidelines.

Activity data were taken from the CSB and enterprises. The implementation of EU-ETS in Latvia provided an opportunity to obtain more accurate and complete activity data and emission factors from enterprises involved in the trading system.

Information regarding F- gases is taken from completed questionnaires from enterprises, The Customs Service of Latvia as well as data from the Division of Chemicals Register within LEGMA.

Solvent and Other Product Use

CO_2 emissions were estimated based on EMEP/CORINAIR Guidebook. Activity data is obtained from a study carried out by a local expert, CSB and enterprises.

Data on the use of N_2O as anaesthetic are available since year 1995 and are obtained from enterprises.

Agriculture

Calculation of emissions is based on methods described in the Revised IPCC 1996 Guidelines and IPCC GPG 2000 and done by LEGMA.

Emission factors and other parameters are used according to IPCC and local experts' studies.

Activity data are obtained from the Statistical yearbooks of Latvia, CSB and studies carried out by local experts.

Land use, Land use change and Forestry

GHG emissions and removals are estimated by MoA according to IPCC GPG LULUCF 2003.

Emission factors and other parameters are used according to IPCC and studies carried out by local experts.

Activity data are derived from Forest statistics (collected by MoA), State Forest Register and State Firefighting and Rescue Service

<u>Waste</u>

Main data sources for GHG emissions calculations in the waste sector are "3-Waste" and "2-Water" data bases maintained by LEGMA.

- Data on waste disposal from year 2001 are taken from "3-Waste" data base, for 1990-2000 expert estimations are used. For methane emission calculation LEGMA used IPCC GPG 2000 Tier 2 method;

- Waste incineration data are taken from "3-Waste" data base since year 2001, for years 1999-2000 data are taken from hazardous waste data base. For previous years there are no reports on waste incineration without energy recovery. Default emissions factors are used in the calculations;

- Data on wastewater discharged are taken from "2-Water" data base. Emission calculations are based on the number of residents (for domestic wastewater and human sewage) or production volumes (for industrial sector) multiplied by default emission factors.

3. Selected base year for HFCs, PFCs and SF_6

In accordance with Article 3.8 of the Kyoto Protocol, Latvia has chosen the year 1995 as the base year for the emissions of the hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulphur hexafluoride (SF_6).

4. Calculation of Latvia's assigned amount

Calculation of Latvia's assigned amount is based on the 2006 submission to UNFCCC of GHG inventories for 1990 – 2004, and provisions of Articles 3.7 and 3.8 of the Kyoto Protocol.

Assigned amount for the commitment period from 2008 to 2012 is calculated as the percentage inscribed for Latvia in Annex B (92%) of the aggregate anthropogenic carbon dioxide equivalent emissions of greenhouse gases, and from the sources, listed in Annex A to the Kyoto Protocol (i.e. excluding LULUCF) in the base year (1990, for fluorinated gases – 1995), multiplied by five:

Assigned amount (Gg CO_2 eq.) = (GHG emissions in 1990 (Gg CO_2 eq.) + Emissions of fluorinated gases in 1995 (Gg CO_2 eq.)) * 0.92 * 5

GHG emissions in 1990 (excluding LULUCF[1]), Gg CO_2 eq.	25,893.01349
Emissions of fluorinated gases in 1995, Gg CO_2 eq.	1.20435
Total emissions, Gg CO_2 eq.	25,894.21784
Emissions limitation for Latvia	92%
Total emissions including limitation, Gg CO_2 eq.	23,822.6804
Assigned amount, Gg CO_2 eq.	119,113.402
Assigned amount, tonnes CO_2 eq.	**119,113,402**

GHG emissions for 1990 – 2004 and average assigned amount for 2008 – 2012 are presented in Figure 2.

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[1] Land-use change and forestry sector in 1990 constituted a net sink, therefore aggregate net GHG emissions from land-use change (deforestation) have <u>not</u> been included in the base year emissions.
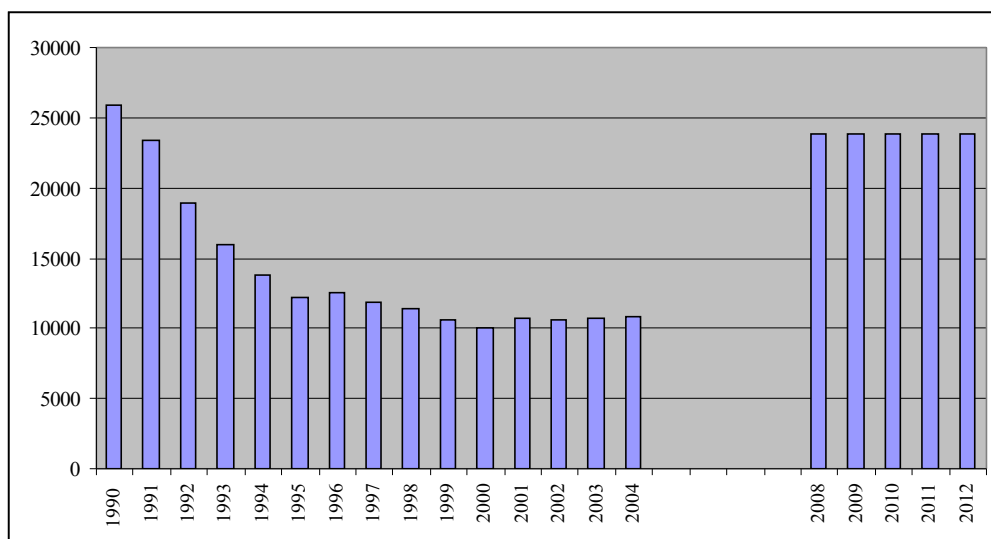
Figure 2   GHG emissions for 1990 – 2004 (excluding LULUCF, CO$_2$ eq.) and average assigned amount for 2008 – 2012.

5. Calculation of Latvia's commitment period reserve

The commitment period reserve for 2008-2012 is calculated in accordance with the provisions included in the Annex to Decision 11/CMP.1 as 100% of five times the most recently reviewed inventory, i.e. the 2004 GHG emissions (excluding LULUCF) according to 2006 submission.

The commitment period reserve is therefore 5 * 10,746.1286 = 53,730.643 Gg CO$_2$ eq. or **53,730,643 tonnes CO$_2$ eq**.

6. Selection of threshold values for the forest definition

Article 3 of the Forestry Law of the Republic of Latvia provides the following forest definition:

> "Forest is an ecosystem in all stages of development, dominated by trees that can reach the height of at least seven meters at this location and with a current or potential crown cover of at least 20 per cent of the area covered by the forest". The following are <u>not</u> considered forest: 1) areas separate from forest areas that match the criteria set in the definition of forest but are smaller than 0.1 hectares; 2) artificial or natural tree rows of width less than 20 metres; 3) fruit gardens, parks, graveyards and tree nurseries.

This definition is not fully consistent with the definition for forest given in the Annex to Decision 16/CMP.1 (*Land use, land-use change and forestry*), however it has been historically used in reporting under the UNFCCC, information reported to the Food and Agriculture Organisation of the United Nations and other international bodies.

Latvia is planning to amend the forest definition included in the Forestry Law to make it consistent with international reporting obligations, in particular, with respect to the minimum tree height. In view of this, the following minimum values for accounting for activities under Article 3.3 of the Kyoto Protocol will be used in reporting pursuant to decision 15/CMP1 (*Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol*):

Parameter	Selected minimum value
Tree crown cover	20 per cent
Land area	0.1 hectares
Tree height	5 metres

The change of forest definition does not affect the calculation of Latvia's assigned amount since net emissions from LULUCF activities are not included in the base year emissions.

A recalculation of the historic data on GHG emissions by sources and removals by sinks in the LULUCF sector using the above minimum values will be carried out in the 2008-2012 commitment period and submitted as part of the annual GHG inventory.

7. Election of activities under Article 3.4

For the commitment period 2008-2012 Latvia chooses to account Forest Management as activity under Article 3.4 of the Kyoto Protocol in accordance with the Annex to the Decision 16/CMP.1., but does not elect Cropland management, Grazing land management and Revegetation.

Latvian institutions led by Ministry of Agriculture are developing the necessary information collection and processing system.

Method for identification of land areas

Ministry of Agriculture according to Latvia's national system for GHG emission inventory is responsible for reporting regarding LULUCF activities.

The main source for land use data is State Land Service. Specific information about forest land is taken from State Forest Register and Forest Research Institute "Silava".

Forest areas will be identified within their geographic boundaries encompassing units larger than 0.1 ha. Forest management areas are determined statistically within squares of 4 km grid.

8. Accounting of activities under Article 3.3

Latvia will account for activities under Article 3.3 of the Kyoto Protocol for the entire commitment period 2008-2012.

9. Latvia's National Greenhouse Gas Inventory System

The institutions responsible for preparing the Latvian GHG inventory are designated by the Ordinance of the Cabinet of Ministers No 220 approving the Climate Change Mitigation Programme 2005 – 2010.

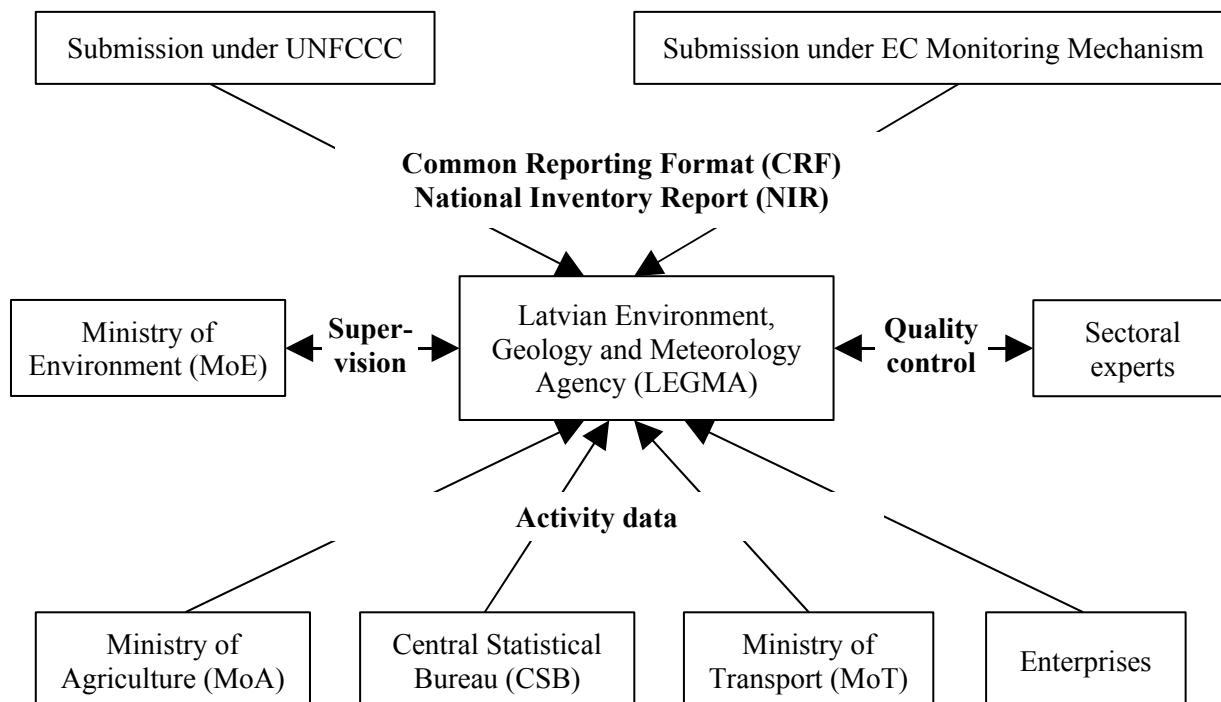A schematic model for the national system (NIS) is shown in Figure 3.

Figure 3 Latvian National Inventory Systems

LEGMA is a governmental institution under the supervision of the Ministry of Environment of the Republic of Latvia and is responsible for preparing the annual GHG inventory.

Activity data is mainly collected from other institutions and LEGMA uses it to calculate emissions. This is done at the Environment Quality Division of LEGMA (head Mr. Juris Fridmanis). According to the above mentioned Ordinance No 220, emission calculations for the LULUCF sector are performed by the Ministry of Agriculture (MoA).

The main data supplier for the Latvian air emission inventory is the Central Statistical Bureau of Latvia (CSB) with which LEGMA has signed a special agreement about supplying the necessary data.

The detailed responsibilities of the institutions involved in preparing activity data and calculating GHG emissions are summarised in the Table 4.

Table 4   Main institutions responsible for activity data and calculation of GHG emissions

CRF sectors	Data	Responsible institution
Table 1.A(a) - Fuel Combustion Activities (Sectoral Approach)	Activity data	CSB, MoT
	Calculations	LEGMA
Table 1.A(b) - CO_2 from Fuel Combustion Activities - Reference Approach	Activity data	CSB
	Calculations	LEGMA
Table 1.A(d) - Feedstock's and Non-Energy Use of Fuels	Activity data	CSB
	Calculations	LEGMA
Table 1.B.2. - Fugitive Emissions from Oil and Natural Gas	Activity data	CSB
	Calculations	LEGMA
Table 1.C - International Bunkers and Multilateral Operations	Activity data	CSB
	Calculations	LEGMA

CRF sectors	Data	Responsible institution
Table 2(I).A-G – Industrial processes	Activity data	CSB
	Calculations	LEGMA
Table 2(II) F - Industrial processes - HFCs, PFCs AND SF_6	Activity data	LEGMA
	Calculations	LEGMA
Table 3 – Solvent and other product use	Activity data	CSB
	Calculations	LEGMA
Table 4.A – Agriculture, Enteric fermentation	Activity data	CSB
	Calculations	LEGMA
Table 4.B(a) - Agriculture, CH_4 emissions from animal waste management system	Activity data	CSB
	Calculations	LEGMA
Table 4.B(b) - Agriculture, N_2O emissions from animal waste management system	Activity data	CSB
	Calculations	LEGMA
Table 4.D - Agriculture, Agricultural Soils	Activity data	CSB
	Calculations	LEGMA
Tables 5. LULUCF	Activity data	MoA
	Calculations	
Table 6 A - Waste, Solid Waste Disposal on Land	Activity data	LEGMA
	Calculations	
Table 6 B - Waste, Wastewater Handling	Activity data	LEGMA
	Calculations	
Table 6 C - Waste, Waste Incineration	Activity data	LEGMA
	Calculations	

The deadline for submitting to LEGMA activity data and description of activity data as well as the calculation of CO_2 removals and emissions from LULUCF for all institutions involved in NIS is 1st of November; with the exception of data regarding fuel consumption, for which the deadline according to an additional agreement is 30th of November to ensure consistency with CSB prepared Energy balances for EUROSTAT. For the 2006 submission this process was done for the first time.

During 2005 three workshops were organized for experts from the institutions involved in NIS, explaining the procedure for preparing and submitting the necessary activity data for each sector and sub-sector, as well as providing information about quality assurance and quality control issues.

Starting from spring 2006 information about activity data, emissions, emission factors and other parameters in the sectors covered by the EU Emission Trading Scheme will be obtained directly from the participating installations that have to submit annual emission reports verified by an independent accredited body. Therefore more precise data will be available using bottom – up method in these sectors.

In 2006 LEGMA plans to implement an internal quality management system.

According to the present NIS model the quality control function is covered by specially contracted independent sectoral experts. However, due to the lack of sufficiently qualified experts, in some sectors it is difficult to ensure that they have not been involved in the preparation of inventory.

10.Latvia's National Registry

Registry administrator

Name	Juris Fridmanis
Organization	Latvian Environment, Geology and Meteorology Agency
Address	Maskavas 165, Riga, LV-1019
Email	Juris.Fridmanis@lvgma.gov.lv
Phone	00371703015
Facsimile number	0037145154
Website	www.lvgma.gov.lv

Technical description

The Latvia 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).

Latvian Environment, Geology and Meteorology Agency is designated as the authority with the responsibility to develop and administer the National Registry. The National Registry under Article 7 of the Kyoto Protocol is not functional yet and the national as well EU decisions on how it will be implemented are not taken yet. However, Latvia is participating in the EU Emission Trading, and has developed its national ETR under this scheme. The National Registry under the Kyoto Protocol will build on the registry developed for the EU Emission Trading Scheme.

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

Hardware - Latvian ETR contains 4 IBM X series 346 servers with Intel Xeon CPU 3.20GHz and 1.00GB RAM each. There are 2 servers for production environment (ETRWEBT and ETRSQLT and 2 for the pre-production environment).
All 4 servers are with three 140GB hard disk drives, which are switched in RAID 5, so if one of the hard drives fails it can be replaced and data can be quickly restored.

Software - All 4 ETR servers and the backup environment (BACKUP) are operating system of Microsoft Windows 2003 Server.
As the database server for the emission registry software is used Microsoft SQL2000 relational database management system. The maximum size of database is 1048516 Tera bytes or 50 Terabytes per single file.
As WEB server for the ETR WEB site is used Microsoft Internet Information server 6, which is build-in Microsoft Windows 2003 Server.

Compliance with ITL data exchange standards - The Latvian registry has been developed for the EU Emissions Trading Scheme. This scheme requires its Member States' registries to be compliant with the UN Data Exchange Standards (DES) specified for the Kyoto Protocol.

The system contains the functionality to perform issuance, conversion, external transfer, (voluntary) cancellation, retirement and Reconciliation processes using XML messages and web-services as specified in draft #7 of the UN DES document.

In addition, it also contains: 24 Hour Clean-up, Transaction Status enquiry, Time Synchronisation, Data Logging requirements (including, Transaction Log, Reconciliation Log, Internal Audit Log and Message Archive) and the different identifier formats as specified in the UN DES document.

The registry development team has been in close contact with the ITL administrator and development team within the UNFCCC secretariat. Discussions have been held regarding the potential implementation timescales for the remaining functions. All functionality that has yet to be developed will be completed in line with the ITL timetable and the UNFCCC will be updated wherever necessary.

In order to minimise discrepancies between the Registry and the Transaction Log, the following approach has been adopted for the Registry system development for the EU Emissions Trading Scheme. The same approach will be adopted for the development of the remaining Kyoto functionality for the Registry software:

- Communications between the National Registry and the ITL will be via web-services using XML messages – as specified in the UN DES document. These web-services, XML message format and the processing sequence will be as per that specified in the UN DES document;
- As far as possible, the Registry shall validate data entries against the list of checks that are performed by the ITL – as documented in Annex E of the UN DES Annexes document – before forwarding the request to the ITL for processing. This will help to minimize sending incorrect information to the ITL for approval;
- All units that are involved in a transaction shall be earmarked internally within the Registry; thereby preventing the units from being involved in another transaction until a response has been received from the ITL and the current transaction has been completed;
- The web-service that sends the message to the ITL for processing will ensure that a message received acknowledgement is received from the ITL before completing the submission of the message. Where no acknowledgement message has been received following a number of retries, the web-service will terminate the submission and roll-back any changes made to the unit blocks that were involved;
- Where a 24 hour clean-up message is received from the ITL, the existing web-service will roll back any pending transactions and the units that were involved, thereby preventing any discrepancies in the unit blocks between the Registry and the ITL; and
- Finally, if an unforeseen failure were to occur, the data discrepancies between our Registry and the ITL can be corrected via a manual intervention function within our registry. Following this, reconciliation will be performed to validate that the data is in sync between the Registry and the ITL.

The Latvia Registry contains the following security measures:

- Access is via Username and Password, as set out in the EU Registry Regulations;
- The actions that a user can perform is controlled by a permissions system, hence preventing unauthorized access to restricted actions;

- All actions performed are recorded by audit;
- 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;

In order to prevent operator errors, the Registry software incorporates the following design:

- Validation is performed on all user inputs to ensure that only valid details are submitted for processing;
- Confirmation of user input is displayed to help the user to spot any errors that may have been made; and
- An internal approval process has been implemented for secondary approval for relevant operations before submitting the details to the ITL for processing.

All publicly accessible information is available to the following URL: **http://etrlv.lvgma.gov.lv**

Backup copies for the production environment are made with the Microsoft SQL2000 build-in backup tool. Backups for the production database are made every night at 2:00 AM. After the backup is made – it is automatically copied from the production database server (ETRSOLP) to the backup environment (BACKUP).
Weekly copying is made on all 4 ETR environment servers with Microsoft Windows 2003 Server build-in backup tool. All backups are weekly copied into DVD drives also.
In case if ETR production environment crashes all data from production daily SQL server backups are copied into the pre-production environment database server and configuration files on the pre-production WEB server can be changed so the pre-production environment can temporary replace the production environment.

Connections between clients and Emission Trading Registry are protected in three steps:
- firewall protection – only those connection channels are opened, which is required by the ETR software;
- SSL – connections via public network are encrypted, to ensure maximum data privacy;
- password system – Emission Trading Registry software passwords are changed every 30 days.

As there can be seen in scheme, the SQL servers are switched in separate switch with only internal addresses, so both – production and pre-production environment SQL servers can't bee seen from outside (public network).
A dedicated Greta development team is available to make any further security enhancements as and when required. The Latvian ETR conforms to the technical standards for data exchange between registry systems for the purpose of ensuring the accurate, transparent and efficient exchange of data between National Registries, the Clean development mechanism registry and the transaction log (decision 19/CP.7, paragraph 1) as follows:

1. The GRETA registry system used in Latvia has been developed for the EU Emissions Trading Scheme. This scheme requires its Member States. Registries to be compliant with the UN Data Exchange Standards specified for the Kyoto Protocol. Latvia has had the Registry systems tested successfully with the EU Commission and the ETR has since gone live.

2. As a part of the GRETA Registry development, functionality has been developed to perform issuance, conversion, external transfer, (voluntary) cancellation, retirement and reconciliation processes using XML messages and web-services.

3. In addition, 24 hour clean-up, transaction status enquiry, time synchronisation, data logging requirements (including, Transaction Log, Reconciliation Log, Internal Audit Log and Message Archive) and the different identifier formats as specified in the UN DES document have been different identifier formats as specified in the UN DES document have been implemented.

4. With regards to performing tests with the CDM Registry (external transfer for example) this can also be performed once the ITL test system becomes available.

5. The following additional Kyoto functionalities have been identified by Greta that would need to be developed for our Registry and tested against the ITL test system:
- Replacement of t-CER or l-CER,
- Carry-Over,
- Expiry Date Change (for t-CER and l-CER), and
- The whole area of functionality for ITL Notices (and the Notification Log)

LATVIAN EMISSION TRADING REGISTRY SHEME

INTERNET

FIIREWALL

SWITCH

ETRWEBT

BACKUP

ETRWEBP

SWITCH

ETRSQLT

ETRSQLP
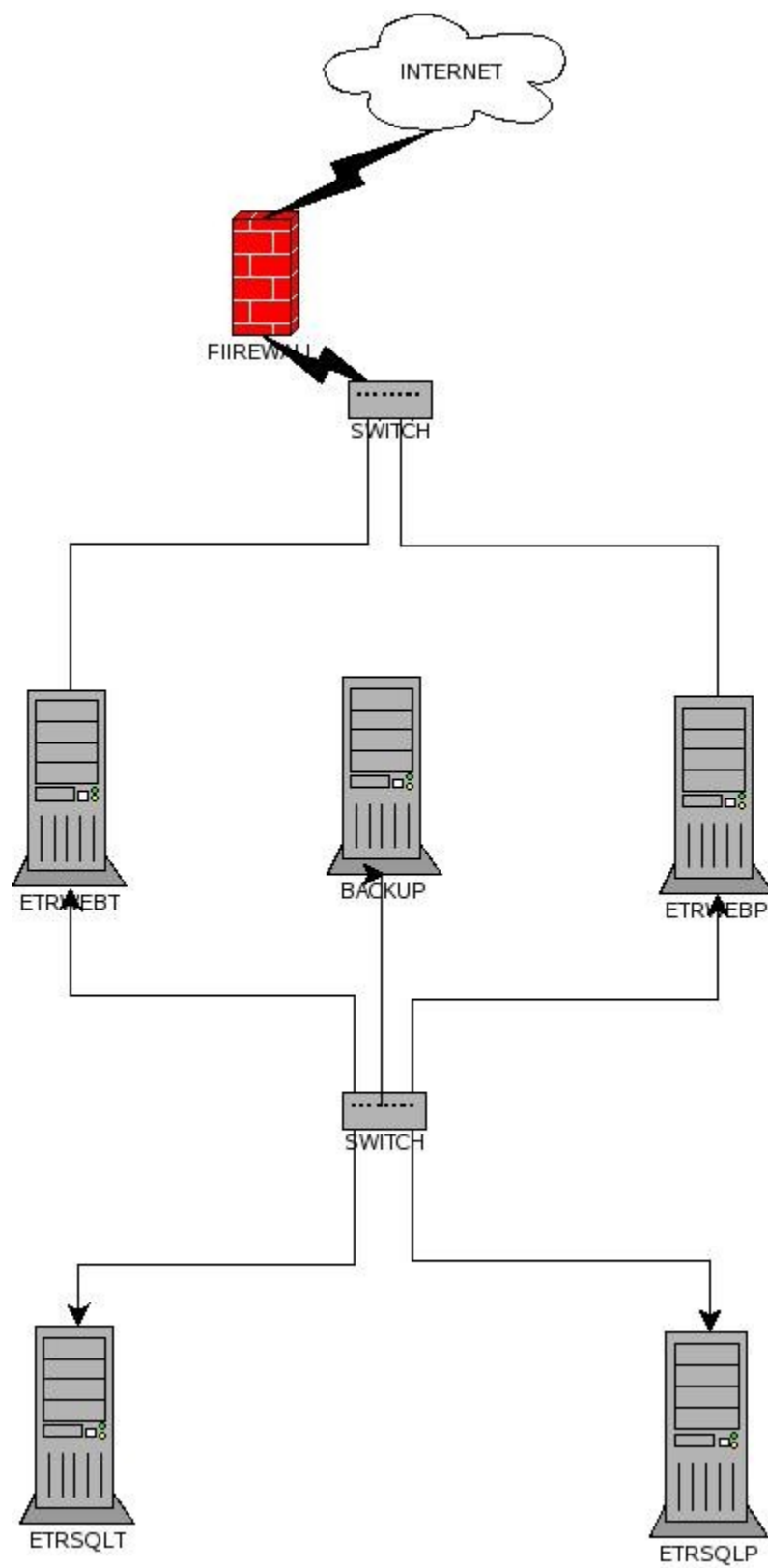
References and sources

1. The Kyoto Protocol to the Convention on Climate Change;
2. Decisions of United Nations Framework Convention on Climate Change;
3. Revised 1996 IPCC Guidelines for National Greenhouse inventories;
4. IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories;
5. IPCC Good Practice Guidance for LULUCF;
6. UNFCCC Guidelines on annual inventories FCCC/SBSTA/2004/8.
7. DECISION No 280/2004/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol
8. COMMISSION DECISION of 10 February 2005 laying down rules implementing Decision No 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol (2005/166/EC);
9. COUNCIL DECISION of 25 April 2002 concerning the approval, on behalf of the European Community, of the Kyoto Protocol to the United Nations Framework Convention on Climate Change and the joint fulfilment of commitments thereunder (2002/358/CE).