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Report of the review of the initial report of Latvia

According to decision 13/CMP.1, each Annex I Party with a commitment inscribed in Annex B to the Kyoto Protocol shall submit to the secretariat, prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, whichever is later, a report (the 'initial report') to facilitate the calculation of the Party's assigned amount pursuant to Article 3, paragraphs 7 and 8, of the Kyoto Protocol, and to demonstrate its capacity to account for emissions and the assigned amount. This report reflects the results of the review of the initial report of Latvia conducted by an expert review team in accordance with Article 8 of the Kyoto Protocol.

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I. Introduction and summary

A. Introduction

1. This report covers the in-country review of the initial report of Latvia, coordinated by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The review took place from 21 to 26 May 2007 in Riga, Latvia, and was conducted by the following team of nominated experts from the roster of experts: generalist – Ms. Inga Konstantinaviciute (Lithuania); energy – Mr. Leif Hockstad (USA); industrial processes – Mr. Philip Acquah (Ghana); agriculture – Ms. Hongmin Dong (China); land use, land-use change and forestry (LULUCF) – Mr. Vreuls Harry (the Netherlands); waste – Mr. Sabin Guendehou (Benin). Mr. Leif Hockstad and Mr. Sabin Guendehou were the lead reviewers. In addition the expert review team (ERT) reviewed the national system, the national registry, and the calculations of Latvia's assigned amount and commitment period reserve (CPR), and took note of the LULUCF parameters and the elected Article 3, paragraph 4, activities. The review was coordinated by Ms. Keryn Oude-Egberink (UNFCCC secretariat).

2. In accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1), a draft version of this report was communicated to the Government of Latvia, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

B. Summary

1. Timeliness

3. Decision 13/CMP.1 requests Parties to submit their initial report prior to 1 January 2007 or one year after the entry into force of the Kyoto Protocol for that Party, whichever is later. The initial report of Latvia was submitted on 29 December 2006, which is in compliance with decision 13/CMP.1. In its initial report Latvia refers to its 2006 greenhouse gas (GHG) inventory submission of 24 May 2006. The Party submitted revised emission estimates on 18 September 2007 in response to questions raised by the ERT during the course of the in-country visit. This report is based on the revised estimates.

2. Completeness

4. Table 1 below provides information on the mandatory elements that have been included in the initial report and also reflects revised estimates, including the assigned amount and the commitment period reserve, resulting from the review process. The revised emission estimates are based on changes to the following: carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) from energy industries (1.A.1), manufacturing and construction (1.A.2), and other sectors (1.A.4) – all fuels (see paragraph 48); carbon dioxide (CO_2) from road transportation (1.A.3(b)) – gasoline (see paragraph 50); CO_2 from industrial processes – cement production (2.A.1) (see paragraph 63); and N_2O from direct soil emissions (4.D.1) (see paragraph 81). As a result of these revisions the value of the base year emissions identified by Latvia in the initial report and the 2006 GHG inventory submission changed from 25, 894.22 Gg CO_2 eq. to 25,909.16 Gg CO_2 eq.

Table 1. Summary of the reporting on mandatory elements in the initial report

Item	Provided	Value/year/comment
Complete GHG inventory from the base year (1990 and 1995) to the most recent year available (2004)	Yes	1990 is the base year for CO_2, CH_4, N_2O
Base year for HFCs, PFCs and SF_6	Yes	1995
Agreement under Article 4	No	Not applicable
LULUCF parameters	Yes	Minimum tree crown cover: 20% Minimum land area: 0.1 ha Minimum tree height: 5 m
Election of and accounting period for Article 3, paragraphs 3 and 4, activities	Yes	Latvia has elected commitment period accounting for activities under Article 3, paragraph 3. It has chosen to account for forest management as an activity under Article 3, paragraph 4. The initial report does not identify how it will account for this activity. During the in-country review process, Latvia informed the ERT that forest management will be accounted for the entire commitment period.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8	Yes	119,113,402 tonnes CO_2 eq.
Calculation of the assigned amount in accordance with Article 3, paragraphs 7 and 8, revised value	Yes	119,182,130 tonnes CO_2 eq.
Calculation of the commitment period reserve	Yes	53,730,643 tonnes CO_2 eq.
Calculation of the commitment period reserve, revised value	Yes	53,369,492 tonnes CO_2 eq.
Description of national system in accordance with the guidelines for national systems under Article 5, paragraph 1	Yes	The description of its national system provided by Latvia in the initial report covers in general all the mandatory elements for a national system. The ERT, however, considered that the information provided on the institutional and procedural arrangements required for inventory planning, preparation and management was incomplete. Following the in-country review, Latvia provided information on the planned institutional and procedural arrangements for the implementation of its national system and QA/QC procedures.
Description of national registry in accordance with the requirements contained in the annex to decision 13/CMP.1, the annex to decision 15/CMP.1 and the technical standards for data exchange between registry systems adopted by the CMP	Yes	

5. The information in the initial report covers, in general, all the elements required by decision 13/CMP.1, section I of decision 15/CMP.1, and relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol(CMP). However, the ERT noted that the presentation of some mandatory elements of the national system is not fully in line with Article 5.1 of the Kyoto Protocol and/or the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol. For example, in its initial report Latvia does not fully address certain institutional and procedural arrangements for inventory planning, preparation and management, as required under decision 19/CMP.1, and it does not provide the information required on quality assurance/quality control (QA/QC) procedures. During the in-country review process, Latvia did provide additional information on the national system and QA/QC procedures. A detailed discussion of the completeness of the national system and QA/QC procedures is provided in section II.A of this report.

6. Latvia's initial report does not fully address all the information on LULUCF activities under Article 3, paragraphs 3 and 4, required by decision 16/CMP.1. It has chosen to account for forest management. However, the report is not entirely transparent as to the accounting period selected for Latvia's elective activity under Article 3, paragraph 4. Moreover, Latvia has not provided information on how its national system will ensure that land areas for activities under Article 3, paragraphs 3 and 4, will be identifiable when it submits its national inventories in accordance with Article 7.

7. During the review Latvia clarified that it will be accounting for activities under Article 3, paragraph 4 for the entire commitment period. It also explained that a new methodology used for the

National Forest Inventory (NFI) will be used to identify land areas associated with the activities under Article 3, paragraphs 3 and 4.

3. Transparency

8. The ERT noted that the information on the mandatory elements in the initial report is generally transparent. However, during the review the ERT identified a lack of documentation on the implementation and maintenance plan for the national system. It noted that further information was also needed on the roles, responsibilities and minimum capacities of all the collaborating entities involved in the preparation of the inventory. In addition, QA/QC procedures for all the organizations involved in the national inventory system are not defined as required by decision 19/CMP.1. A detailed discussion of the transparency of the national system is provided in section II of this report. The ERT also raised a number of transparency issues relating to the 2006 GHG inventory. A detailed discussion of the inventory is provided in section II below.

4. Emission profile in the base year, trends and emission reduction target

9. In the base year under the Kyoto Protocol (1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6), the most important GHG in Latvia was CO_2, contributing 71.9 per cent to total[1] national GHG emissions expressed in CO_2 eq., followed by N_2O (14.6 per cent) and CH_4 (13.5 per cent) (see figure 1). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) taken together contributed 0.002 per cent of overall GHG emissions in the base year. In the base year, the energy sector accounted for 72.2 per cent of total GHG emissions, followed by agriculture (22.8 per cent), waste (2.6 per cent), industrial processes (2.1 per cent) and solvent and other product use (0.2 per cent) (see figure 2). Total GHG emissions (excluding LULUCF) amounted to 25,909.16 Gg CO_2 eq. and decreased by 58.8 per cent between the base year and 2004.

[1] In this report, the term total emissions refers to the aggregated national GHG emissions expressed in terms of CO_2 eq. excluding LULUCF, unless otherwise specified.

Figure 1. Shares of gases in total GHG emissions, base year

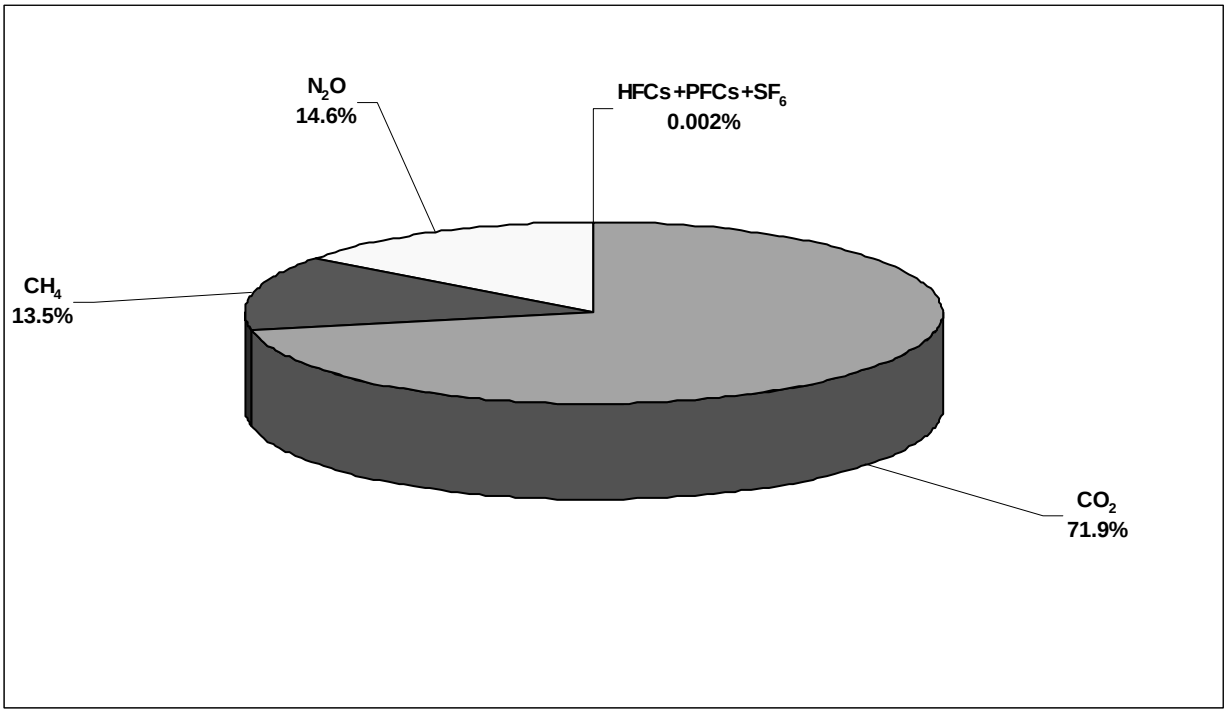
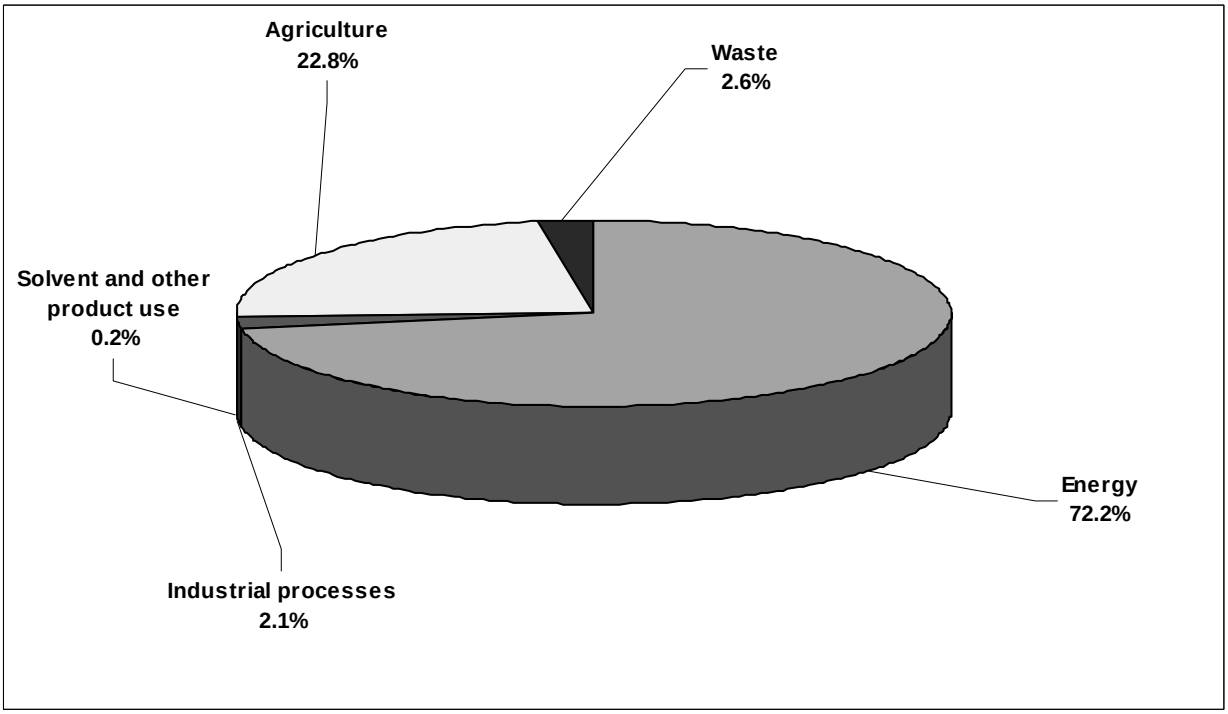


Figure 2. Shares of sectors in total GHG emissions, base year



10. Tables 2 and 3 show the GHG emissions by gas and by sector, respectively.

11. Latvia's quantified emission limitation is 92 per cent as included in Annex B to the Kyoto Protocol.

Table 2. Greenhouse gas emissions by gas, 1990–2004

GHG emissions (without LULUCF)	Gg CO_2 eq.								Change
	Base year Kyoto Protocol[a]	1990	1995	2000	2001	2002	2003	2004[a]	KP BY–2004 (%)
CO_2	18 622.93	18 622.93	8 814.62	6 955.73	7 426.52	7 354.33	7 495.67	7 426.64	–60.1
CH_4	3 497.31	3 497.31	2 038.52	1 756.87	1 850.83	1 862.19	1 768.88	1 803.77	–48.4
N_2O	3 788.38	3 788.38	1 348.39	1 246.14	1 378.93	1 365.98	1 434.35	1 421.88	–62.5
HFCs	0.29	NA	0.29	8.59	9.81	11.82	12.95	16.23	5 539.6
PFCs	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA, NO	NA
SF_6	0.25	NA, NO	0.25	1.28	1.98	3.38	4.41	5.37	2 037.8

Note: BY = Base year; LULUCF = Land use, land-use change and forestry; KP= Kyoto Protocol; NA = Not applicable; NO = Not occurring.

[a] The Party submitted revised estimates for 1990–2004, in the course of the initial review on 18 September 2007. These estimates differ from Latvia's GHG inventory submitted in 2006.

Table 3. Greenhouse gas emissions by sector, 1990–2004

Sectors	Gg CO_2 eq.								Change
	Base year Kyoto Protocol[a]	1990	1995	2000	2001	2002	2003	2004[a]	KP BY–2004 (%)
Energy	18 708.68	18 708.68	9 239.53	7 285.88	7 775.30	7 696.44	7 794.84	7 753.68	–58.6
Industrial processes	546.05	545.51	166.95	186.70	203.84	221.06	231.89	232.09	–57.5
Solvent and other product use	55.70	55.70	46.17	49.01	55.16	53.41	54.07	55.32	–0.7
Agriculture	5 915.97	5 915.97	2 104.45	1 703.81	1 844.74	1 838.79	1 878.12	1 845.41	–68.8
LULUCF	NA	–20 670.30	–17 649.61	–14 109.84	–14 186.94	–13 126.44	–13 634.68	–13 904.53	NA
Waste	682.76	682.76	644.97	743.19	789.03	788.00	757.33	787.40	15.3
Other	NO	NO	NO	NO	NO	NO	NO	NO	NA
Total (with LULUCF)	NA	5 238.32	–5 447.54	–4 141.24	–3 518.87	–2 528.74	–2 918.43	–3 230.63	NA
Total (without LULUCF)	25 909.16	25 908.62	12 202.06	9 968.60	10 668.07	10 597.70	10 716.25	10 673.90	–58.8

Note: BY = Base year; LULUCF = Land use, land-use change and forestry; KP= Kyoto Protocol; NA = Not applicable; NO = Not occurring.

[a] The Party submitted revised estimates for 1990–2004, in the course of the initial review on 18 September 2007. These estimates differ from Party's GHG inventory submitted in 2006.

II. Technical assessment of the elements reviewed

A. National system for the estimation of anthropogenic GHG emissions by sources and sinks

12. Latvia's national system is generally prepared in accordance with the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). The ERT, however, considered that some of the information provided on the institutional and procedural arrangements required to prepare the inventory is incomplete, in particular the description of the roles and responsibilities of the different agencies and entities in relation to the inventory development process and the provision of a QA/QC plan as required under the guidelines for national systems. Table 4 shows which of the specific functions of the national system are included and described in the initial report.

Table 4. Summary of reporting on the specific functions of the national system

Reporting element	Provided	Comments
Inventory planning		
Designated single national entity*	Yes	See section II.A.1
Defined/allocated specific responsibilities for inventory development process*	Partially	Latvia provided additional information following the review. See section II.A.1
Established process for approving the inventory*	Yes	See section II.A.1
Quality assurance/quality control plan*	No	Latvia provided additional information during and following the review. See section II.A.2
Ways to improve inventory quality	Yes	See section II.B.3
Inventory preparation		
Key category analysis*	Yes	See section II.B.1
Estimates prepared in line with the IPCC guidelines and IPCC good practice guidance*	Yes	See section II.B.2
Sufficient activity data and emission factor collected to support methodology*	Yes	See section II.B2
Quantitative uncertainty analysis*	Yes	See section II.B.2
Recalculations*	Yes	See section II.B.2
General QC (tier 1) procedures implemented*	Yes	Latvia provided additional information during the review. See section II.A.2
Source/sink category-specific QC (tier 2) procedures implemented	No	See section II.A.2
Basic review by experts not involved in inventory	Yes	See section II.A.2
Extensive review for key categories	Yes	See section II.A.2
Periodic internal review of inventory preparation	Yes	See section II.A.2
Inventory management		
Archive inventory information*	Yes	See section II.A.3
Archive at single location	Yes	See section II.A.3
Provide ERT with access to archived information*	Yes	See section II.A.3
Respond to requests for clarifying inventory information during review process*	Yes	See section II.A.1

* Mandatory elements of the national system.

1. Institutional, legal and procedural arrangements

13. According to Ordinance no. 220 of the Cabinet of Ministers of the Republic of Latvia, dated 6 April 2005, and with the approval of the Climate Change Mitigation Programme 2005–2010, the Latvian Environment, Geology and Meteorology Agency (LEGMA) has been identified as the designated

single national entity responsible for the preparation of the annual GHG inventory. Other organizations working with LEGMA in the preparation of the inventory have allocated specific responsibilities for the inventory development process. They include the Central Statistical Bureau (CSB); the Ministry of Agriculture; the Ministry of Transport (Road Traffic Safety Department); industrial companies; and other governmental organizations.

14. In Latvia there is an established process for the official consideration and approval of the inventory, including recalculations, prior to its submission and for responding to any issues raised by the inventory review. The responsible organization is the Ministry of Environment.

15. Latvia has established a legal framework for the institutional arrangements for the preparation and submission of a national inventory under Article 5, paragraph 2 of the Kyoto Protocol. However, the ERT noted a lack of documentation on a full implementation and maintenance plan for the national system in the following areas:

(a) The roles, responsibilities and minimum capacities of all the necessary collaborating entities;

(b) The formal agreements for coordination between the different bodies which collaborate in the preparation, planning and maintenance of the inventory, and the single national entity, LEGMA.

16. During the review the ERT recommended that Latvia provide a plan, including the timeline, for defining the roles, responsibilities and minimum capacities of the necessary collaborating entities, in particular the Road Traffic and Safety Department (RTSD) and the Ministry of Agriculture, and for their coordination with the designated single national entity, LEGMA.

17. After the in-country review and in response to the ERT's recommendations, Latvia provided information on current activities such as the institutions involved in the national system with regard to data collection, completion of the common reporting format (CRF) tables, and supervision of the inventory process. Latvia also provided information on future initiatives planned for the national system, including the introduction of a new law, the Law on the Participation of the Republic of Latvia in the Flexible Mechanisms under the Kyoto Protocol. The law – to be approved by the Latvian Parliament by the end of 2007 – will establish the legal basis, through the adoption of regulations, requirements regarding the national system (including its capacity). The regulations which will be introduced by mid-2008, will address the definition of the roles and responsibilities of the institutions involved in the preparation of the inventory, including the responsibilities for QA/QC procedures. The ERT acknowledged that the future activities to be implemented will improve the institutional and procedural arrangements needed to perform the functions of the national system.

2. Quality assurance/quality contro1

18. A QA/QC plan is not provided in Latvia's 2006 GHG inventory submission. During the in-country review, Latvia explained that several checks are routinely carried out to eliminate potential basic errors and presented a QA/QC plan, approved in April 2007 by the Director of LEGMA. The plan includes only tier 1 QC procedures which will be implemented internally by LEGMA for future inventories, and does not address QA procedures. Latvia further explained that the CSB and the companies involved in the European Union (EU) emissions trading scheme (ETS) have inbuilt, comprehensive QA/QC procedures. No further information was provided to the ERT on the QA/QC procedures in place with all the agencies and entities involved in the national inventory system of Latvia, as required by decision 19/CMP.1.

19. During the in-country review, the ERT recommended that Latvia provide an implementation plan describing the process and timing for the coordination of LEGMA's internal QA/QC plan with the external agencies and entities involved in the development of the inventory (specifically, with the Ministry of Agriculture in developing a QA/QC plan for the LULUCF sector).

20. Following the in-country review, Latvia provided a schedule for the implementation of QA/QC procedures and reported that all issues regarding QA/QC activities will be elaborated in the new regulations which will enter into force on 30 June 2008. The ERT recommends that the QA/QC plan to be implemented with the new regulations , should comply with the Intergovernmental Panel on Climate Change (IPCC) *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance). The ERT also recommends that Latvia include documentation on verification procedures in its next inventory submission.

3. Inventory management

21. Latvia has a centralized archiving system within which LEGMA is responsible for archiving the CRF tables and the national inventory report (NIR), as well as other materials including XML files, databases, background reports, and research literature and guidelines in electronic format and hard copies. The emission calculations are also archived mainly on individual Excel spreadsheets. Components of the archive which are not available electronically, such as scientific papers, are also kept in hard copy at LEGMA. The ERT recommends that Latvia improve its archiving system by working towards the use of a centralized database (with standardized input files) along with the archiving of internal documentation on QA/QC procedures. During the review, Latvia was able to provide archived documents requested by the ERT.

B. Greenhouse gas inventory

22. In conjunction with its initial report, Latvia has submitted a complete set of CRF tables for the years 1990–2004 and an NIR.

23. Where needed the ERT also used previous years' submissions, including the CRF tables. During the review Latvia provided additional sources of information including documents and websites as well as databases. The full list of materials used during the review is provided in annex I to this report.

1. Key categories

24. Latvia has reported a key category tier 1 analysis, both level and trend assessment, as part of its 2006 GHG inventory submission. Latvia carried out the key category analysis for 1990 and 2004 and included the LULUCF sector in the analysis for the first time in the 2006 GHG submission. The tier 1 key category analyses performed by Latvia and the secretariat[2] produced different results. For example, CO_2 emissions from land converted to forest land (5.A.2) and N_2O emissions from pasture, range and paddock manure (4.D.2), which were identified by the secretariat as key categories, are not reported as key categories by Latvia. The reason is that the key categories identified by Latvia are more aggregated (e.g. Latvia has reported as a key category CO_2 removals from forest land, which includes forest land remaining forest land (5.A.2) and land converted to forest land (5.A.2)).

[2] The secretariat identified, for each Party, those source categories that are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the IPCC *Good Practice Guidance for Land Use, Land-use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) for the base year or base year period as well as the latest inventory year. Key categories according to the tier 1 trend assessment were also identified. Where the Party performed a key category analysis, the key categories presented in this report follow the Party's analysis. However, they are presented at the level of aggregation corresponding to a tier 1 key category assessment conducted by the secretariat.

25. The ERT identified some inconsistencies between the key categories reported in the NIR and those reported in CRF table 7. For example, CO_2 removals from grassland (5.C) and CH_4 emissions from solid waste disposal (6.A) are not reported as key categories in the NIR but they are reported as key categories in the CRF tables. The ERT identified that Latvia has not used the results of the key category analysis to prioritize the development of its inventories and to identify the methodology to be applied to estimate key categories. The ERT recommends that Latvia continue to identify key categories including and excluding LULUCF, improve the consistency of its reporting of key categories between the NIR and the CRF tables, and use the results to prioritize the development of the inventory.

2. Cross-cutting topics

26. The inventory has in general been developed in line with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines) and the IPCC good practice guidance. However, the ERT identified some cases where the methods and emission factors (EFs) used are not fully in line with this guidance. These cases are identified in the respective sectoral sections of this report below. The ERT acknowledges that a number of these problems were corrected during the review. It recommends Latvia to reflect these improvements and changes in its next inventory submission.

27. The inventory is in general compiled in accordance with Article 7, paragraph 1, and decision 15/CMP.1. However, QA/QC procedures have still not been implemented (see paragraphs 18–20).

Completeness

28. The inventory is complete in terms of years and geographical coverage, and fairly complete for categories and gases. The CRF tables are completely filled in, but some categories are still reported using the notation key "not estimated" ("NE"), for example, land converted to cropland (5.A.2) and land converted to grassland (5.C.2). Latvia explained that these categories are mostly of very minor importance and are reported as "NE" due to lack of activity data (AD). The ERT recommends Latvia to improve the completeness of its inventory by estimating the categories currently reported as "NE" in its next inventory submission.

Transparency

29. The NIR includes information on key categories, methodologies, data sources and EFs. The transparency of the inventory has improved compared with the 2005 submission as Latvia has provided more information on the data and methodologies used. However, the information provided is not sufficient for the ERT to be able to assess the inventory. The ERT recommends Latvia to provide more complete information on country-specific EFs and on the methodologies and assumptions used; to provide literature sources to support the data; to improve the list of references; and to improve the documentation of expert judgements. The ERT further recommends Latvia to expand the discussion of methodologies in the NIR and for specific information to use the documentation boxes in the CRF tables, as well as making greater use of annexes to the NIR to document country-specific methods and EFs.

Consistency

30. The Latvian inventory is generally consistent in all its elements over the entire time series. The same methodologies are used for the base year and all subsequent years, and consistent data sets are used to estimate emissions and removals, except in the agriculture sector, where different data sources for arable land area and nitrogen excretion have been used. The ERT recommends Latvia to improve the time-series consistency of the activity data in its next inventory submission.

Comparability

31. The Latvian inventory is comparable with those of other Parties. The allocation of emission estimates to different categories is in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance.

Accuracy

32. Latvia's inventory is generally accurate as defined by the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories" (hereinafter referred to as the UNFCCC reporting guidelines) and the IPCC good practice guidance. The accuracy of the inventory has improved compared with the 2005 submission but could be improved further by preparing emission estimates for key categories using a higher-tier methodology, in line with the recommendations of the IPCC good practice guidance. The ERT recommends Latvia to use higher-tier methods for all key categories. During the in-country review the ERT identified a few categories where the AD, methods or EFs used are not in accordance with the IPCC good practice guidance (e.g. in the energy, industrial processes and agriculture sectors), which has resulted in inaccurate estimates (i.e. overestimation of the base year and underestimations in 2004). Following the in-country review, Latvia provided revised estimates for these categories for the base year and 2004 in accordance with the recommendations of the ERT. The ERT recommends Latvia to use the revised AD, methods or EFs to report emissions for these categories in its next inventory submission. Further details are provided in the discussion on the individual sectors below.

Recalculations

33. The ERT noted that recalculations from the base year to 2003 had been undertaken to take into account changes in the methodologies used in some sectors, changes in EFs and updated AD. The major changes include: the inclusion of emission estimates for the fluorinated gases (F-gases); the use of an improved methodology for estimating CH_4 emissions from landfills; a reassessment of the area of histosols in agriculture; and the revision of the AD for paint application, under solvent and other product use. The effect of the recalculations on the estimates of total national emissions in the base year (as reported in the original 2006 submission, excluding LULUCF) was an increase of 2.14 per cent. For 1990, the differences between the 2005 and 2006 submissions are the following: CO_2 from energy, –0.16 per cent; CO_2 from industrial processes, +4.19 per cent; CO_2 from solvent and other product use, –47.31 per cent; CH_4 from energy, –4.02 per cent; CH_4 from waste, –18.26 per cent; N_2O from energy, –10.04 per cent; and N_2O from agriculture, +27.54 per cent. The rationale for these recalculations is provided in the NIR, and they have resulted in improvements of the inventory.

34. In addition, the ERT recommends that Latvia should provide an explanation of the recalculations in CRF table 8(b) so as to improve consistency between the NIR and CRF tables.

Uncertainties

35. In the 2006 submission, Latvia has provided for the first time quantitative uncertainty estimates based on the IPCC good practice guidance tier 1 level and trend methods. Uncertainty analysis is done for all sectors except LULUCF. Latvia reports in the NIR that uncertainty estimates are mainly based on expert judgement or are default estimates from the IPCC good practice guidance, and that total inventory uncertainty is approximately 5 per cent. The overall uncertainty for CO_2 is the lowest (4 per cent), whereas the higher uncertainties for CH_4 (16 per cent) and N_2O (27 per cent) according to Latvia are due to the use of default EFs. During the review, Latvia informed the ERT that the LULUCF sector will be included in the uncertainty analysis in its next inventory submission.

36. Latvia reports separate uncertainty estimates for AD and EFs using the IPCC good practice guidance (table 6.1). In general, for both AD and EFs, the uncertainty values (2–5 per cent) assigned to the different categories are very low. The rationale for the selection of the uncertainty levels associated with the different categories is not explained sufficiently and the expert judgements used are not well documented. The ERT therefore recommends Latvia to include more information on the rationale for the selection of uncertainty levels in its next inventory submission.

3. Areas for further improvement identified by the Party

37. In the NIR, and during and following the in-country review, Latvia identified several areas for improvement, for example, the planned implementation of the new law, the Law on the Participation of the Republic of Latvia in the Flexible Mechanisms under the Kyoto Protocol and its regulations, which will provide the legal basis for requirements regarding the national system (including capacity); future implementation of the LEGMA QA/QC plan; further research on national EFs; the development and improvement of the data link between the GHG inventory and the EU ETS; the use of officially available revised AD for the energy sector (for the period 1990–1994); and cooperation with appropriate experts in industrial companies and other institutions to develop national methods and EFs and to improve the uncertainty estimates for the agriculture and LULUCF sectors.

4. Areas for further improvement identified by the ERT

38. The ERT identified the following cross-cutting issues for improvement. The Party should:

(a) Provide information in its next inventory submission on the roles, responsibilities and coordination of all the collaborating entities involved in inventory preparation, including the establishment of formal agreements with data collection agencies to reflect the provisions of the new regulations that will address the national system;

(b) Further develop, implement and document the QA/QC plan, including coordination with the external agencies and entities involved in the development of the inventory in its NIR; and develop and improve QA (e.g. by means of independent review) and verification procedures in its next inventory submission;

(c) Improve its documentation of country-specific methodologies, (e.g. for transportation categories); provide better documentation in the NIR of the AD values used in the calculations; make greater use of annexes to the NIR to document country-specific methods and EFs; and use the documentation boxes in the CRF tables;

(d) Improve the accuracy of its future inventory submissions by using higher-tier methods for estimating key categories in line with the recommendations of the IPCC good practice guidance;

(e) Improve completeness by addressing the calculation of categories that are currently reported as “NE”;

(f) Implement and document the new method of the National Forest Inventory which is to be used for the LULUCF sector in the next NIR and use it consistently throughout the time series for the identification of land areas, including land areas for Article 3, paragraphs 3 and 4, activities;

(g) Improve its uncertainty analysis and provide more detail about the rationale for the selection of uncertainty levels, and document expert judgement in its next inventory submission.

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

5. Energy

Sector overview

40. In the base year, emissions from the energy sector in Latvia amounted to 18,708.68 Gg CO_2 eq. Within the sector the largest contribution was from energy industries (1.A.1), with 34.0 per cent, followed by other sectors (1.A.4) with 30.9 per cent and manufacturing industries and construction (1.A.2) with 20.3 per cent. Fugitive emissions were of minor importance (they accounted for 1.5 per cent of the energy sector total in 1990); they arise from oil and natural gas production. The revised estimates provided by Latvia in response to the ERT's recommendations increased the estimate of total base year emissions from the energy sector by 18.41 Gg CO_2 eq., or 0.1 per cent, from the original 2006 submission (18,690.27 Gg CO_2 eq.).

41. The reporting of the energy sector in the NIR is mostly complete, consistent and comparable with that of other Parties. Transparency and accuracy remain the key areas on which Latvia should focus its future efforts, for example, details on the calculations for non-energy uses of fuels. Latvia has expanded its discussion of recalculations in the energy sector in response to the comments of previous reviews, and the ERT commends this improvement. As regards transparency, the ERT recommends Latvia to improve its documentation of country-specific methodologies, specifically for the transportation categories, and to provide better documentation in the NIR of the AD used in the calculations (e.g. transportation). Additional QA/QC steps beyond those already detailed in Latvia's QA/QC plan may be necessary to ensure accurate reporting for this important sector of the national inventory. The ERT also recommends Latvia to improve the uncertainty analysis in the energy sector.

42. Calculation and data-sharing agreements exist between LEGMA and the external agencies and entities. For example, the CSB provides official fuel consumption data and the RTSD provides AD for road transportation. However, these agreements need to be strengthened, for example, by formalizing agreements for data transfer and improving coordination of QA/QC activities. The ERT recommends that Latvia strengthen these arrangements to put in place a sustainable system for the inventory in the energy sector.

Reference and sectoral approaches

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

43. Latvia has calculated CO_2 emissions from fuel combustion using the IPCC reference approach and the sectoral approach, and provided data in CRF table 1.A(c) for the entire time series. For the year 1990, there is a difference of 4.2 per cent in the CO_2 emission estimates and a difference of 5.3 per cent in the fuel consumption estimates between the reference and sectoral approaches. Latvia notes in the CRF documentation boxes, and further explained during the in-country review, that the differences are due to statistical differences between the CSB's energy balance and the data available for calculating the sectoral approach. Latvia indicated during the in-country review that efforts are being explored with the CSB to reduce these statistical differences. The ERT encourages Latvia to pursue this for its next inventory submission. Differences with comparable international data were clarified during the in-country review.

International bunker fuels

44. Data on bunker fuels are based on surveys collected by the CSB for the energy balance. According to the explanation provided to the ERT during the in-country review, all jet fuel surveyed is

considered as bunker fuel, as there are no internal commercial flights using jet fuel from the Riga airport. Latvia commissioned a study of domestic aviation in Latvia, detailing flight information broken down by the International Civil Aviation Organization (ICAO) engine type and hours flown. For marine bunkers all fuels delivered to the ports are also considered to be for international bunker fuel uses. To differentiate bunker fuel use from domestic use, a study of domestic navigation was also carried out on seasonal watercraft use in Latvia. Both studies are only available in Latvian, making it difficult for the ERT to fully review them. It also remains unclear how the current use of the CSB surveys on the ports differentiates the potential uses for domestic navigation along the Daugava River from international bunker uses. The ERT recommends that the results of the surveys be further explained and investigated by the CSB, to verify that the assumption that all fuel deliveries to the ports are indeed only for international bunker fuel uses is correct. In response to the ERT's recommendations, Latvia advised the ERT that this will be clarified in the 2008 inventory submission.

Feedstocks and non-energy use of fuels

45. Latvia reports the carbon stored in bitumen and lubricants in CRF table 1.A(d). Details on the AD and storage factors are not provided in the NIR. No other feedstocks and no possible non-energy uses of fuels are reported. The ERT recommends that Latvia report details on the calculations for these non-energy uses of fuels in a more transparent way in the NIR in the next inventory submission.

Key categories

Stationary combustion: all fuels – CO_2, CH_4, N_2O

46. For the base year, because only limited data are provided by Latvia's CSB surveys (included in the 2006 national energy balance), most stationary combustion emissions are reported under energy industries (1.A.1). During the in-country review, Latvia presented new data for the years 1990–1993 from the CSB (included in the 2007 national energy balance), which provide more disaggregated consumption data within the stationary combustion sectors. In particular, the energy formerly consumed by "public heat plants" (and to a lesser extent, "public [combined heat and power] CHP") has been disaggregated into "autoproducer CHP" and "autoproducer heat plants" (i.e. it has been reallocated from energy industries to manufacturing industries and construction and other sectors). This revision of the consumption data applies mostly to residual fuel oil and natural gas.

47. Following the review the ERT recommended that Latvia pursue revisions of the emission estimates for stationary combustion for 1990 and incorporate the new, more disaggregated CSB data, which conforms better to the IPCC good practice guidance and the UNFCCC reporting guidelines and which have been included in the 2007 inventory submission, using the 2007 national energy balance. The ERT requested that Latvia provide revised emission estimates for the categories energy industries (1.A.1); manufacturing and construction industries (1.A.2); and other sectors (1.A.4).

48. In response to the ERT's recommendations, Latvia provided revised estimates for CO_2, CH_4 and N_2O emissions from these stationary categories using the fuel consumption data available from the CSB 2007 energy balance (i.e. the same data as were used for the 2007 submission). The revised estimates for 1990 resulted in a lower total (–26.3 per cent) for GHG emissions for energy industries (1.A.1) – of 6,352.44 Gg CO_2 eq., compared to the original value of 8,613.61 Gg CO_2 eq. reported in the 2006 submission – and higher totals for GHG emissions in manufacturing and construction industries (1.A.2) of 3,794.70 Gg CO_2 eq. (+1.7 per cent) and other sectors (1.A.4) of 5,786.83 Gg CO_2 eq. (+66.0 per cent). The original 2006 submission values for the categories 1.A.2 and 1.A.4 were 3,731.09 Gg CO_2 eq. and 3,486.63 Gg CO_2 eq., respectively. The revised estimates provided by Latvia in response to the ERT's recommendations increased the estimates for total base year emissions from these

categories (1.A.1, 1.A.2 and 1.A.4) by 102.64 Gg CO_2 eq., or 0.6 per cent, from the original 2006 submission total.

Road transportation: liquid fuels – CO_2

49. In its 2006 submission, Latvia estimates CO_2 emissions from motor gasoline combustion in road transportation using the COPERT III model, which uses EMEP/CORINAIR default EFs for European countries (which are not reported in the NIR). However, according to the NIR, a country-specific motor gasoline CO_2 EF was applied to the off-road combustion of gasoline. Using different EFs for the same fuel is not in line with the IPCC good practice guidance. Moreover, the ERT informed Latvia that the use of the higher EMEP/CORINAIR default CO_2 emission factor, rather than the lower country-specific CO_2 EF, appears to the ERT to result in an overestimation of the base year emissions.

50. The ERT recommended that Latvia either apply a consistent EF in its calculations for all motor gasoline combustion or provide additional documentation detailing why the EMEP/CORINAIR CO_2 EF is appropriate for road transportation combustion of motor gasoline, while the country-specific CO_2 EF is only appropriate for off-road combustion. In response to the ERT's recommendations, Latvia submitted revised estimates of CO_2 emissions from road transportation (1.A.3(b)) gasoline usage using the country-specific CO_2 EF for gasoline, which resulted in an estimate of 1,659.0 Gg CO_2 eq. in road transport (1.A.3(b)). The revised estimates reduces the estimate of base year CO_2 emissions for this category by 84.23 Gg CO_2 eq., or 3.3 per cent, compared with the original 2006 submission of 1,743.2 CO_2 eq. in road transport (1.A.3(b)).

51. Latvia estimates CO_2 emissions from diesel combustion in road transportation using the COPERT III model. The composition of the vehicle fleet in Latvia was provided by the RTSD. During the in-country review, Latvia explained that new data for 1990 on the existence of diesel vehicles were obtained from the RTSD. An examination of the CRF tables for 1990 and Latvia's energy balance showed that the 2006 inventory submission does not account for all the diesel fuel use by road transportation. The ERT recommends that Latvia carry out recalculations for road transportation for 1990 to integrate the new data on diesel vehicles supplied by the RTSD. Latvia informed the ERT that this was carried out for the 2007 inventory submission.

Railways: liquid fuels – CO_2

52. For the base year, CO_2 emissions from railways are considered a key category. The NIR states that an IPCC tier 1 method was used to calculate emissions from railways. This includes using the IPCC default CO_2 EF for diesel, rather than the country-specific CO_2 EF provided in the NIR (table 3.3.2). The ERT recommends that Latvia use country-specific CO_2 EFs for railway fuels in its next inventory submission.

Non-key categories

Navigation: liquid fuels – CO_2, CH_4, N_2O

53. The energy surveys from the CSB list all fuel deliveries to ports as being for international bunker fuel use. As reported in the NIR on international bunker fuels, a study was commissioned to examine fuel use for domestic waterborne navigation. The results of the study were used in the 2006 inventory and Latvia reports emissions from navigation. The ERT considers the study to have led to an improvement of the inventory. However, it is not clear on the extent to which the results of this study are applicable across the entire time series. The ERT recommends that Latvia clarify the applicability of the study.

Solid fuel transformation – CO_2, CH_4

54. In the base year, the combustion of peat was a significant source of emissions in the energy sector. Following the review, Latvia explained to the ERT that fugitive emissions from peat production are not estimated due to a lack of IPCC default methodology and emission factors. As this in a minor category, the ERT encourages Latvia to further examine the data and methods available in the literature for this calculation, focusing on the more recent export of peat as an agricultural product (which may not necessarily have to be calculated in the future in the energy sector).

6. Industrial processes and solvent and other product use

Sector overview

55. In the base year, emissions from the industrial processes and solvent and other product use sectors in Latvia amounted to 546.05 Gg CO_2 eq. and 55.70 Gg CO_2 eq., respectively. The contribution of F-gases (HFCs, PFCs, SF_6) to the total emissions from the industrial processes sector in 1995 was 0.54 Gg CO_2 eq., representing 0.0021 per cent of the national total in the base year under the Kyoto Protocol. The significant subcategory in the industrial processes and solvent and other product sectors in the base year was CO_2 emissions from mineral products (accounting for 83.3 per cent of sectoral emissions).

56. Latvia applies the IPCC tier 2 methodology and the EMEP/CORINAIR methodologies to several categories except for the key category cement production (2.A.1), where an approach equivalent to tier 1 is applied.

57. The ERT noted that Latvia mainly uses EFs mandated under the EU ETS. The ERT encourages Latvia to develop and implement an improvement plan, including the development of plant-specific EFs, to be used for the estimation of GHG emissions from the industrial processes and solvent and other product use sectors in its next inventory submission.

58. The completeness of the inventory has improved in the 2006 submission with Latvia's reporting non-methane volatile organic compounds (NMVOCs) and indirect CO_2 emissions from solvent and other product use using EMEP/CORINAIR methodologies, and NMVOC emissions from food and drink.

59. Latvia's participation in the EU ETS has enhanced the availability of more accurate plant-level AD for calculating emissions. Additional sources of information provided to the ERT during the review also demonstrated that the EU ETS has inbuilt, comprehensive QA/QC procedures which include external verification of AD at the plant level and ensure that uncertainty levels are well within +/– 5 per cent. The ERT recommends that Latvia integrate elements of the QA/QC under the EU ETS in the improvement plan for the national system for estimating emissions from the industrial processes and solvent and other product use sectors.

60. The ERT recommends that in its next inventory submission Latvia describe the non-energy-related industrial processes associated with production activities in accordance with the IPCC good practice guidance. This information would facilitate the identification of the sources of such emissions and the selection of appropriate methodologies in accordance with the IPCC good practice guidance. In addition, Latvia should provide explanations of the recalculations in CRF table 8(b) so as to improve consistency as between the NIR and the CRF tables.

Key categories

Cement production – CO_2

61. The NIR indicates that Latvia used the IPCC tier 2 method to estimate CO_2 emissions from cement production (2.A.1). During the in-country review, the ERT identified that the method was equivalent to the IPCC tier 1 methodology and concluded that the use of the tier 1 method is not in line with the IPCC good practice guidance, as this category was a key category in 1990. In addition, the ERT identified that the EF from the EU ETS used by Latvia to estimate CO_2 emissions from cement production appears high. The EF it uses – 0.525 (Gg CO_2/Gg cement) – is equivalent to that provided by the IPCC good practice guidance tier 2 default method, with 3 per cent cement kiln dust (CKD). Information provided to the ERT during the in-country review clearly indicates that Latvia has also reported additional CKD emissions in the base year. The ERT noted that the reporting of emissions from CKD in addition to the use of the EF from the EU ETS appears to overestimate CO_2 emissions from cement production in the base year.

62. The ERT recommended that Latvia revise its estimates of CO_2 emissions from cement production (2.A.1) using the IPCC tier 2 method with a correct emission factor that is based on plant-specific data, thus avoiding the separate calculation of additional emissions from CKD in the base year.

63. In response, Latvia provided revised estimates, using the IPCC tier 2 method, based on plant-specific conditions. The plant-specific data resulted in a higher CKD ratio (26.3 per cent) in 1990, while the CKD ratio in 2004 was much lower (5.8 per cent). In addition to the changes to the CKD ratio, the lime content in clinker decreased considerably, from 64.6 per cent in 1990 to 50.95 per cent in 2004. The EF (without the CKD) also changed, from 0.5071 to 0.4000, representing a 21.1 per cent decrease between 1990 and 2004. To ensure comparability, as required by the IPCC good practice guidance, and also to reflect the national circumstances of Latvia, the ERT recommended that where the plant-specific CKD ratio exceeds 8 per cent Latvia use the maximum permissible IPCC good practice guidance limit of CKD (6 to 8 per cent). Following the in-country review and in response to the ERT's recommendations, Latvia provided revised estimates based on a CKD ratio of 8 per cent. The revised estimate increased the estimate of CO_2 emissions from cement production by 5.8 per cent, from 345.91 Gg CO_2 eq. to 366.12 Gg CO_2 eq.

Non-key categories

Other (mineral products) – CO_2

64. Latvia reports limestone and dolomite use under the category other – mineral products (2.A.7), which is not in line with the IPCC good practice guidance. The ERT acknowledges the improvements made by Latvia, in response to the recommendations of the previous (2005) review, in the reporting of CO_2 emissions from the category limestone and dolomite use, as Latvia has disaggregated limestone and dolomite use in different mineral products (e.g. limestone, dolomite, potash, and fluorspar) and in metal production by end-use for the entire time series. However, the ERT reiterates the recommendation of the 2005 review that Latvia should report the aggregate of CO_2 emissions from all limestone and dolomite under limestone and dolomite use (2.A.3). It also recommends that Latvia recalculate the emissions from limestone and dolomite use (2.A.3) for the entire time series. Following the in-country review Latvia reported that emissions from limestone and dolomite use in glass and metal production are reported under limestone and dolomite use (2.A.3) in the 2007 inventory submission.

Iron and steel production – CO_2

65. Latvia reports in the NIR that the technology used for iron and steel production (2.C.1) is an open-hearth furnace (OHF) type. Additional information provided by Latvia during the in-country review confirmed that coke consumed is basically used in the OHF for the reduction of the carbon content in crude steel.

66. The ERT noted that the other non-energy process emissions from iron and steel production (2.C.1) using OHF (namely the oxidation of the carbon in crude iron) are reported as "NE".

67. The ERT recommends that for its next inventory submission Latvia collect and use plant-specific parameters on the reduction of the carbon content in crude iron steel and crude steel for the calculation of the entire time series in accordance with the IPCC good practice guidance. The ERT also recommends that for its next inventory submission Latvia recalculate the emissions from iron and steel production (2.C.1) for the entire time series based on the available AD from the EU ETS.

Consumption of halocarbons and SF_6 – HFCs, SF_6

68. Latvia reports actual emissions of HFCs and SF_6 for the years 1995–2004. Potential emissions are reported only for HFCs in 2004. The ERT recommends Latvia to report both actual and potential emissions for the whole time series 1990–2004.

69. The AD and EFs were derived from a country-specific study carried out in 2003. During and following the in-country review Latvia informed the ERT that a transcription error had occurred in the 2006 GHG inventory with the estimates for HFC-134a gas use in domestic refrigeration. Following the review, Latvia provided to the ERT corrected estimates for HFC-134a gas usage in domestic refrigeration for the years 1995–2004.

70. The ERT recommends that Latvia implement its improvement plan to build the capacity of the customs service and other identifiable institutions, and the private sector, to ensure appropriate reporting, reduce uncertainty and increase the coverage of the reporting of F-gases in Latvia.

7. Agriculture

Sector overview

71. In the base year, emissions from the agriculture sector in Latvia amounted to 5,915.97 Gg CO_2 eq., or 22.8 per cent of total national GHG emissions. The sector was the second-largest source of GHG emissions. Agricultural soils (4.D) was the main category, contributing 51.2 per cent of sectoral emissions, followed by enteric fermentation with 34.8 per cent. GHG emissions from agriculture decreased by 68.8 per cent between 1990 and 2004, mainly due to reductions in the number of livestock and in the use of nitrogenous fertilizers.

72. During the review process, the ERT identified an overestimation in the base year of N_2O for the category direct soil emissions (4.D.1), and recommended that Latvia provide revised estimates for this category. As a result, the estimate of total emissions for agriculture in the base year is 5,915.97 Gg CO_2 eq. This represents a decrease of 0.39 per cent compared to the original estimate in the 2006 inventory submission (5,939.00 Gg CO_2 eq.).

73. The inventory in the agriculture sector is in general complete with respect to categories, gases and years. Rice cultivation (4.C) and prescribed burning of savannas (4.E) are reported as not occurring ("NO") in the CRF tables and Latvia explained that these activities do not occur in the country. Emissions from field burning of agricultural residues (4.F) are reported as "NE" since they are negligible.

74. Latvia has carried out recalculations for N_2O emissions from manure management (4.B) and agricultural soils (4.D) for the years 1990–2003. N_2O emissions from manure management were recalculated to reflect new research results on nitrogen (N) excretion per animal. N_2O emissions from agricultural soils were recalculated to reflect the change in N excretion per animal and a reassessment of the area of histosols according to the recommendation of the previous (2005) review.

75. Latvia has improved the transparency and accuracy of its inventory by including the distribution of manure management in determining the country-specific factors. During the in-country review, Latvia provided the ERT with additional material on the assumptions used and the values of the calculation parameters used to derive country-specific nitrogen excretion rate (Nex) values. The ERT recommends Latvia to include this additional information in the NIR of its next inventory submission.

76. The ERT also identified a lack of sector-specific QA/QC procedures. It recommends Latvia to conduct an expert peer review on the agriculture sector according to the IPCC good practice guidance, with the review to include impartial reviewers such as agriculture experts not currently involved in the inventory compilation (e.g. university professors).

Key categories

Enteric fermentation – CH_4

77. Latvia has used the IPCC tier 1 method with default EFs to calculate emissions from this key category. This is not in line with the IPCC good practice guidance. However, during the review Latvia provided data on milk production which indicate that milk production per head of dairy cattle has continuously increased across the time series, which should result in changes to the EF values. The ERT recommends Latvia to apply a higher-tier method to estimate CH_4 emissions from enteric fermentation from significant livestock species, such as dairy cattle, in line with recommendations of the good practice guidance, in its future submissions.

Manure management – CH_4

78. CH_4 emissions from manure management have been estimated based on the IPCC tier 1 methodology and IPCC default EF values for Eastern Europe in cool regions. This is not in line with the IPCC good practice guidance since this is key category. Also, information on annual average temperature is not provided in the NIR to support the use of the default EFs. The ERT identified from the NIR that Latvia has allocated livestock according to animal waste management systems, which is already an important step towards the application of a tier 2 methodology. It recommends Latvia to apply the tier 2 methodology, together with country-specific data, in its future submissions. If data are not available, Latvia should explain how the IPCC default EFs that it has chosen correspond to the national circumstances.

Manure management – N_2O

79. For the period 1990–2004, Latvia has applied constant country-specific Nex values for all animal types except swine. Different Nex values for swine were applied for different parts of the time series: 10 kg/head/year was applied for the years 1990–2003 and 7.3 kg/head/year was applied for 2004. No information is provided in the NIR to explain the change in the Nex values for swine. During the review, Latvia explained that the values reflect the results of different studies and publications on Nex values for swine. However, no further explanation was given for the use of different values for different years. With no additional explanation for the reduction for the Nex values, such as feed change or other changes in animal husbandry, the ERT was not able to determine whether the lower value applied in 2004 is appropriate.

80. The ERT recommends that Latvia provide further information in its next inventory submission to explain the change in the selection of the Nex value for swine or revise the estimates of N_2O emissions from this category and related categories (i.e. direct soil emissions (4.D.1) and indirect emissions (4.D.3)) based on consistent time-series values for N excretion from swine, and document the values of the calculation parameters. The ERT also recommends that Latvia continue the research to develop country-specific parameters and apply the tier 2 methodology in its future submissions.

Agricultural soils: direct soil emissions – N_2O

81. Latvia states in the NIR that the area of cultivated histosols has been reassessed based on materials from the Ministry of Agriculture, the CSB, and foreign and Latvian publications. The area of cultivated histosols calculated by national experts was 7.0 per cent of the cultivated area in Latvia. However, the ERT noted that the information the NIR provides on the method used to arrive at this value is not sufficient. During the in-country review Latvia provided further information on the background to this calculation. However, the ERT considered that this value had resulted in an overestimation for 1990. During the in-country review the ERT recommended that Latvia provide revised estimates of these emissions based on values from a time-consistent data source, for example, the data on "sown area of agricultural crops; 1990–2005" from the CSB (if appropriate), and document all the parameters used in the revised calculations. In response, Latvia provided revised N_2O estimates from direct emissions from soils (4.D.1) which amounted to 5.28 Gg N_2O in 1990, 1.3 per cent lower than the original estimate (5.35 Gg N_2O) according to the 2006 inventory submission.

82. The ERT recommends that in its next inventory submission, to improve transparency, Latvia document the assumptions and methods used and the values of the parameters used to calculate area of cultivated histosols. Also, Latvia should take into account any changes in N excretion from animals (manure management (4.B.2) in calculating direct N_2O emissions from agricultural soils.

Agricultural soils: indirect emissions – N_2O

83. IPCC default EFs have been applied to estimate the indirect N_2O emissions from nitrogen used in agriculture, and there are large inter-annual fluctuations. Latvia explained that the emission profile for this category reflected inter-annual fluctuations in the AD, which are taken from national statistics. The ERT recommends that Latvia explain the trend in the AD in its next inventory submission. The ERT also recommends Latvia to take into account any changes in N excretion from animals (manure management (4.B.2)) in calculating indirect N_2O emissions from agricultural soils.

Non-key category

Field burning of agricultural crops – CH_4, N_2O

84. Field burning of agricultural residues is reported as "NE". During the in-country visit Latvia explained that it considers these emissions as negligible. The fraction of crop residues burned ($Frac_{BURN}$) reported under direct soil emissions is reported as 0.1 kg N/kg crop-N. The ERT recommends Latvia to maintain consistency in its reporting across the CRF tables with respect to field burning of agricultural residues and to ensure that the correct values and notation keys are used in the CRF tables of its next inventory submission.

8. Land use, land-use change and forestry

Sector overview

85. The LULUCF sector was a net sink in Latvia over the period 1990–2004. Total net CO_2 removals in the base year are estimated at 20,691.05 Gg CO_2 eq. Forest land remaining forest land (5.A.1) contributed to a total net removal of 18,530.03 Gg CO_2 eq. in the base year, the highest of all the

land-use categories under the LULUCF sector. Land converted to forest land (5.A.2) and grassland remaining grassland (5.C.1) are also net sinks. The ERT noted that net CO_2 removals decreased by 32.6 per cent between the base year and 2004, and recommends Latvia to provide an explanation for this in its next inventory submission. In response to the ERT's recommendations, Latvia advised the ERT that information on the basis for this decrease will be provided in the 2008 inventory submission.

86. In its 2006 submission, for the first time Latvia has provided the LULUCF reporting tables as required by decision 13/CP.9. However, some categories, including land converted to cropland (5.B.2) and land converted to grassland (5.C.2), are reported as "NE". The ERT recommends that Latvia improve the completeness of the inventory by reporting on these land-use categories in its next inventory submission.

87. The methodology used to estimate the LULUCF categories is the IPCC tier 1 method. The ERT recommends Latvia to progress to a higher-tier method, in line with recommendations of the IPCC good practice guidance for key categories in its next inventory submission. In response to the ERT's recommendations, Latvia advised the ERT that it will implement and document a higher-tier method in the 2008 inventory submission.

88. No description of category-specific QA/QC procedures for the LULUCF sector as required by the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF) is provided in the NIR. During the in-country visit, Latvia provided information on the comparison between land areas reported and the data given by other sources (e.g. the *Statistical Yearbook of Latvia 2006*). Latvia provided the ERT with information about the new law and regulations to be adopted by the government which will establish a legal basis for requirements regarding the national system (including its capacity). The new regulations include QA/QC procedures to be implemented in each institution involved in the development of the inventory, including those involved in the LULUCF sector.

89. The ERT identified that uncertainty estimates have not been provided for the LULUCF sector and recommends Latvia to include this sector in the uncertainty analysis in its next inventory submission.

90. The recalculations reported by Latvia in the LULUCF sector are mainly due to the fact that the change in carbon stock from forest land remaining forest land has been calculated for the three pools (i.e. above-ground biomass, below-ground biomass and dead wood); and the change in carbon stock from biomass in orchards, and CO_2 emissions from grass burning have been reported for the first time.

91. The NIR does not provide sufficient documentation on the representation of land areas in the 2006 submission. During the in-country review, the ERT identified that Latvia has used the IPCC approach 1 (i.e. basic land-use data presented in the IPCC good practice guidance for LULUCF) to represent land areas. Also, during the in-country review Latvia presented a new method by the Latvian State Forestry Research Institute, Silava, for the NFI. The ERT recommends Latvia to provide in its next inventory submission more documentation on the identification of land areas and to develop the land-use change matrix using this new method. In response to the ERT's recommendations, Latvia advised the ERT that it will implement and document the new method of National Forest Inventory in its 2008 inventory submission.

Key categories

Forest land remaining forest land – CO_2

92. As identified in the 2005 review, Latvia has applied the IPCC tier 1 method together with IPCC default parameters to estimate CO_2 emissions and removals from forest land remaining forest land (5.A.1). The ERT recommends that Latvia move to a higher-tier method in line with the

recommendations of the IPCC good practice guidance in its next inventory submission. During the in-country review, Latvia presented a new method and the results of the NFI, based on plots of 4 km grid and minimum tree height of 5 metres, for forest definition (the former method uses 7 metres for minimum tree height of forest). The ERT recommended that Latvia provide a detailed background document in English of the new method (i.e. that being used for the NFI), including the method used to estimate back to 1990, and provide its plan for implementing the method.

93. In response, Latvia provided further explanation and documentation of the method and the approaches to be applied to identify land areas for the whole time series, which indicated the capacity of Latvia to report on emissions and removals from the LULUCF sector. Latvia provided a description of the NFI (e.g. the establishment of permanent and temporary sample plots, measured every five years). Latvia also described how the 1990 determination of land-use categories will be organized, as well as the methods used to assess forest resources in the NFI's sample plots for the situation in 1990. The ERT recommends that Latvia use the country-specific parameters from the new method (the method used for the NFI) in its next inventory submission. This new method should be applied consistently from 1990 throughout the time series to identify land areas and to develop the land-use change matrix.

94. The ERT found that the inter-annual variations of CO_2 emissions are not well described in the NIR. To increase the transparency of the inventory, the ERT recommends that Latvia provide information on major changes associated with the volume of timber harvesting (e.g. resulting from natural causes such as storms, or from changes in policies or economic development).

95. In its 2006 GHG submission, Latvia reports on changes in carbon stocks in living biomass and dead organic matter. It reports that changes in carbon stocks in litter and soil organic matter are not estimated due to lack of data. The ERT recommends that Latvia collect data and estimate the changes in carbon stock in these two carbon pools in its next inventory submission.

Land converted to forest land – CO_2

96. For grassland converted to forest land (5.A.2.2), Latvia uses the IPCC tier 1 method together with the IPCC default parameters (e.g. basic wood density, biomass expansion factor, root-to-shoot ratio) to estimate the increase in carbon stock change in living biomass. Changes in carbon stock in dead organic matter and soils are reported as "NE". The ERT recommends Latvia to use country-specific parameters to estimate the change in carbon stock in living biomass and to report on the change in carbon stock in the soil organic matter pool (which could be a significant subcategory) in its next inventory submission. Latvia uses the notation key "included elsewhere" ("IE") for CO_2 removals from cropland converted to forest land (5.A.2.1) without providing an explanation of where these estimates are included. The ERT recommends that Latvia explain the use of this notation key in the CRF tables and the NIR of its next inventory submission.

Non-key categories

Cropland remaining cropland – CO_2

97. In estimating CO_2 emissions from cropland remaining cropland (5.B.1) has Latvia used the IPCC tier 1 method to calculate the carbon stock change in living biomass (which resulted in CO_2 removals from orchards) and in soils. CO_2 emissions from organic soils and agricultural lime application are together responsible for all the emissions from the category. Between 1994 and 1995, these CO_2 emissions decreased from 212.65 to 23.18 Gg CO_2. Latvia explained during the in-country review that this change was caused by a change in the source of AD for cropland – from the State Land Services (used for the years 1990–1994) to the CSB (used for the years 1995–2004). The ERT recommends Latvia to use the same source of data and the same method to estimate the area of cropland for the whole time series in its next inventory submission.

98. Following the in-country review Latvia provided to the ERT revised estimates of N_2O emissions from agricultural soils by area sown (based on CSB data). The ERT recommends that in its next inventory submission Latvia ensure that the LULUCF information in table 5.B is consistent with the data source used to estimate N_2O emissions from agricultural soils.

Grassland remaining grassland – CO_2

99. Latvia has used the IPCC tier 1 method to calculate CO_2 emissions from grassland remaining grassland (5.C.1). Latvia reports only change in carbon stock in living biomass and in soils. Grassland remaining grassland (5.C.1) is reported by Latvia as a net sink which is the result of the increase in carbon stock change in living biomass. Latvia reports that the greater part of the area of grassland is abandoned managed land which naturally becomes overgrown with trees and bushes.

100. The ERT recommends that Latvia explain in its next inventory submission why cultivated organic soils resulting in CO_2 emissions are reported in this category and not under cropland (5.B).

Biomass burning – CO_2, CH_4, N_2O

101. Emissions from wildfires are reported as "NE". However, a national study (Forest Fire Situation in Latvia, IFFN no. 24 April 2001, pp. 31–34) identifies that, in 1990, an average of over 500 ha forest land were burned. The ERT recommends Latvia to estimate the emissions from wildfires in its future submissions. Following the in-country review Latvia advised the ERT that the estimation of emissions from wildfires will be addressed in the 2008 inventory submission.

9. Waste

Sector overview

102. In the base year, the waste sector in Latvia accounted for 2.64 per cent of total national GHG emissions. Emissions from waste have increased from 682.76 Gg CO_2 eq. in the base year to 787.40 Gg CO_2 eq. in 2004, by 15.3 per cent. CH_4 emissions from solid waste disposal on land constituted the major category of sectoral emissions and the increase in emissions in the sector is mainly due to the increase in the amount of waste landfilled and to the low rate of landfill gas recovery.

103. The inventory in the waste sector is complete since it covers all categories and gases. All the required CRF tables are provided for all years from 1990 to 2004.

104. Latvia has made considerable improvements in both the methodology used and data preparation since its 2005 inventory submission. The methodologies applied to estimate emissions and to prepare the required data are transparent. Although additional information on the methodology used to estimate CH_4 and N_2O emissions from wastewater handling (6.B) was provided during the in-country review, further methodological improvements are needed if Latvia is to comply with the IPCC good practice guidance requirements for the estimation of these emissions. The ERT encourages Latvia to improve the transparency of its reporting by allocating emissions correctly between the waste and energy sectors when waste is incinerated for energy recovery. The ERT also recommends Latvia to improve the consistency between the CRF tables and the NIR with regard to the methodology used to estimate N_2O emissions from wastewater handling.

105. Recalculations for the whole time series (1990–2003) are reported in the 2006 submission. They are due to changes in methodology, the preparation and collection of new data, and changes in the allocation of amounts of landfilled waste between different types of landfill – managed, unmanaged and uncategorized. The ERT recommends Latvia to provide information on recalculations in its next inventory submission.

106. Latvia does not report category-specific QA/QC procedures, as recommended by the IPCC good practice guidance, for the waste sector. During the in-country review it presented QA/QC procedures that are planned to be implemented. The ERT commends Latvia for taking such steps and recommends it to commence the development of these QA/QC procedures in the preparation of its next inventory submission.

107. Only limited information on the uncertainties associated with AD and EFs is provided in the NIR. During the in-country visit, Latvia informed the ERT that the uncertainties related to the EFs are default uncertainties provided by the IPCC good practice guidance. The ERT recommends Latvia to increase the transparency of its reporting on uncertainties in the waste sector by documenting in its next NIR the methodology used for calculating the uncertainties associated with the AD and EFs. It also encourages Latvia to provide the uncertainties related to the emission estimates using at least the IPCC tier 1 method in its next inventory submission.

Key categories

Wastewater handling – CH_4

108. In its 2006 submission, Latvia has used the "check method" as described in the IPCC good practice guidance to estimate CH_4 emissions from municipal wastewater treatment. During the in-country review the ERT discussed with Latvia the availability of country-specific AD and EFs and the possibility of using a more rigorous method (tier 2). Latvia identified that during the preparation of the 2006 GHG inventory country-specific data were not available.

109. The ERT recommends that for its future submissions Latvia use surveys and thoroughly documented expert judgement to collect country-specific data on the amount of wastewater treated in anaerobic conditions in the different existing systems (e.g. latrine, septic tank, lagoon) in order to be able to move to a tier 2 methodology for estimating CH_4 emissions from wastewater handling (6.B.1). Latvia should also apply the appropriate parameters (e.g. methane conversion factor (MCF); methane producing capacity (Bo); and biochemical oxygen demand (BOD)) based on research. In addition, the ERT recommends that the method used by Latvia to estimate emissions from industrial wastewater be reported in both the NIR and the CRF tables in the next inventory submission, in order to improve consistency.

Non-key categories

Managed waste disposal on land – CH_4

110. This category was not a key category in 1990 but has been identified as key category in 2004. Following the recommendation of the previous (2005) review and in line with the IPCC good practice guidance, Latvia has moved from using the mass balance approach (IPCC tier 1) to the first order decay model (IPCC tier 2). The ERT commends Latvia for the consistent use of the method throughout the time series. The ERT concluded during the in-country review that the method adopted had been correctly applied even though some country-specific parameters were not available for the whole time series, as explained below. It recommends Latvia to continue applying the IPCC tier 2 method in its future submissions.

111. Latvia reports in its NIR both current and historic data on the quantities of waste deposited to landfills. To address the data gap on the amounts of waste disposed to landfills in the period 1970–1989, it used extrapolation based on population and gross domestic product (GDP). In the light of Latvia's national conditions and the availability of country-specific AD, the ERT accepts the extrapolation method used. Between 1990 and 2004, the Party collected data from research and existing databases (e.g. in LEGMA and the CSB). The ERT encourages Latvia to continue improving the collection of more appropriate national AD from relevant sources.

112. Latvia has used the IPCC default parameters (e.g. degradable organic carbon, decay rate constant, MCF and oxidation factor) to calculate the distribution of waste to different types of landfill (between uncategorized, unmanaged and managed waste). Latvia explained during the in-country review that the IPCC default parameters are used because national data are not available. The ERT encourages Latvia to develop country-specific EFs to be used in its future submissions.

Wastewater handling – N_2O

113. During the in-country review, the ERT noted from the CRF tables that N_2O emissions from wastewater handling have been calculated using the IPCC tier 1 method. Latvia explained during the review that the only available value for protein consumption has been used for the whole time series. To improve consistency, Latvia is encouraged to report on the use of the IPCC default methodology to estimate N_2O emissions from wastewater handling (6.B.2) in the NIR of its next inventory submission. The ERT recommends Latvia to further investigate the availability of annual values of protein consumption from relevant sources (e.g. the Food and Agriculture Organization of the United Nations (FAO)) or draw on documented judgement from national experts to derive the annual protein consumption for its next inventory submission.

Waste incineration – CO_2

114. Latvia has used the IPCC default method and IPCC default parameters (carbon content, fossil carbon content, combustion efficiency) provided in the IPCC good practice guidance to estimate CO_2 emissions from the incineration of hazardous and clinical wastes for the years 1999–2004. The Party explained that before 1999 incineration without energy recovery did not occur. The ERT recommends Latvia to increase the transparency of its reporting by explaining in its next inventory submission the rationale used for the allocation of emissions between the waste and energy sectors for the years 1999–2004.

115. Latvia also reports non-CO_2 emissions from cremation using appropriate emission factors from EMEP/CORINAIR. The ERT acknowledges Latvia's efforts in estimating non-CO_2 emissions from this category.

C. Calculation of the assigned amount

116. The assigned amount pursuant to Article 3, paragraphs 7 and 8, has been calculated in accordance with the annex to decision 13/CMP.1.

117. Latvia's base year is 1990 for CO_2, CH_4 and N_2O, and the Party has chosen 1995 as its base year for HFCs, PFCs and SF_6. Latvia's quantified emission limitation is 92 per cent as included in Annex B to the Kyoto Protocol.

118. Based on Latvia's base year emissions – 25,894.22 Gg CO_2 eq. (without LULUCF) as originally reported in the 2006 GHG inventory – and its Kyoto Protocol target (92 per cent), Latvia calculated its assigned amount to be 119,113,402 tonnes CO_2 eq.

119. In response to the inventory issues identified during the review Latvia submitted revised estimates of its base year inventory which resulted in a revision of its base year emissions and a recalculation of the assigned amount. Based on the revised emission estimates for the base year (25,909.16 Gg CO_2 eq.) forwarded to the ERT, Latvia calculates its assigned amount to be 119,182,130 tonnes CO_2 eq. The ERT agrees with this figure.

D. Calculation of the commitment period reserve

120. The calculation of the required level of the commitment period reserve is in accordance with paragraph 6 of the annex to decision 11/CMP.1.

121. Based on its originally reported base year emissions (without LULUCF) in the most recently reviewed (2004) inventory (10,746.13 Gg CO_2 eq.), Latvia calculated its commitment period reserve to be 53,730,643 tonnes CO_2 eq.

122. In response to the inventory issues identified during the review, Latvia submitted revised estimates of its most recently reviewed (2004) inventory, which resulted in a recalculation of the commitment period reserve. Based on the revised estimates, Latvia calculates its commitment period reserve to be 53,369,492 tonnes CO_2 eq. The ERT agrees with this figure.

E. National registry

123. Latvia has provided most of the information on the national registry system required by the reporting guidelines under Article 7, paragraphs 1 and 2, of the Kyoto Protocol (decision 15/CMP.1). The information provided is broadly transparent and in accordance with the requirements of the UNFCCC reporting guidelines. Table 5 summarizes the information on the mandatory reporting elements on the national registry system, as stipulated by decisions 13/CMP.1 and 15/CMP.1 and provided in Latvia's initial report or during the in-country visit.

Table 5. Summary of information on the national registry system

Reporting element	Provided in the initial report or during the in-country visit	Comments
Registry administrator		
Name and contact information	Yes	Juris Fridmanis, Latvian Environment, Geology and Meteorology Agency. Maskavas 165, Riga, LV–1019. Email: Juris.Fridmanis@lvgma.gov.lv
Cooperation with other Parties in a consolidated system		
Names of other Parties with which Latvia cooperates, or clarification that no such cooperation exists	Yes	No such cooperation exists.
Database structure and capacity of the national registry		
Description of the database structure	Yes	
Description of the capacity of the national registry	Yes	
Conformity with data exchange standards (DES)		
Description of how the national registry conforms to the technical DES between registry systems		Covered in the independent assessment report (IAR)[a]
Procedures for minimizing and handling of discrepancies	Yes	
Description of the procedures employed in the national registry to minimize discrepancies in the transaction of Kyoto Protocol units	Yes	
Description of the steps taken to terminate transactions where a discrepancy is notified and to correct problems in the event of a failure to terminate the transaction	Yes	
Prevention of unauthorized manipulations and operator error		
An overview of security measures employed in the national registry to prevent unauthorized manipulations and to prevent operator error	Yes	Covered in the IAR
An overview of how these measures are kept up to date	Yes	
User interface of the national registry		
A list of the information publicly accessible by means of the user interface to the national registry	Yes	Covered in the IAR
The Internet address of the interface to Latvia's national registry	Yes	<http://www.lvgma.gov.lv>
Integrity of data storage and recovery		
A description of measures taken to safeguard, maintain and recover data in order to ensure the integrity of data storage and the recovery of registry services in the event of a disaster	Yes	
Test results		
The results of any test procedures that might be available or developed with the aim of testing the performance, procedures and security measures of the national registry undertaken pursuant to the provisions of decision 19/CP.7 relating to the technical standards for data exchange between registry systems.	Yes	Covered in the IAR

[a] Pursuant to decision 16/CP.10, once registry systems become operational, the administrator of the international transaction log (ITL) is requested to facilitate an interactive exercise, including with experts from Parties to the Kyoto Protocol not included in Annex I to the Convention, demonstrating the functioning of the ITL with other registry systems. The results of this exercise will be included in an independent assessment report (IAR). They will be also included in its annual report to the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol.

124. Greta has been chosen as the software for the national registry system. During the in-country review, the ERT was informed that the developers of Greta are working on a new version of the registry (v3.0) which will meet all the technical requirements of the UNFCCC data exchange standards (DES). The new version of the software is expected to be available by October 2007.

125. Latvia indicated at the time of the in-country review that the initialization process was expected to be completed by 29 June 2007 and the registry is expected to be fully operational towards the end of 2007. Following the review, Latvia advised the ERT that the Latvian registry had successfully passed the connectivity and interoperability testing conducted between 29 October 2007 and 1 November 2007. Information on the registry is publicly available on the Internet at URL <http://etrlv.lvgma.gov.lv>.

126. Latvia has provided information on the procedures and security measures to minimize discrepancies, terminate transactions and correct problems, and minimize operator error. These procedures and security measures include the following: access is via user name and password; actions that a user can perform are controlled by a permissions system to prevent unauthorized access to restricted actions; all actions performed are recorded through an 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 the internal web services; 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; there are internal approval processes in place for secondary approval of relevant operations before details are submitted to the international transaction log (ITL) for processing; daily backups are made for the production validation of data entries against the list of checks performed by the ITL to avoid sending incorrect information to the ITL; and, finally, in the event of problems, Latvia's registry administrator contacts Innofactor in Finland (which is the technical administrator of Latvia's registry) who can correct the problem. If Innofactor is not able to correct the problem, the Greta help desk provides Innofactor with the corrected database or scripts to be imported into the registry database. The ERT acknowledged the effort made by Latvia to put in place these adequate procedures and security measures.

127. Latvia's emissions trading registry contains four IBM X series 346 servers with Intel Xeon CPU 3.20 GHz and 1.00 GB RAM each. The registry is composed of four servers containing three hard disk drives of 140 GB each, so that if one hard drive fails, it can be replaced quickly in order to restore data. Between the servers, two are for "production environment" (ETRWEBT and ERTSQLT) and two for the "pre-production environment". All the servers and the backup environment (BACKUP) use the "operating system of Microsoft Windows 2003 server". The database server uses the Microsoft SQL 2000 relational database management system with a maximum size of 1,048,516 terabytes or 50 terabytes per single file, while the web server for the registry website uses a Microsoft Internet information server 6 build in to the Microsoft Windows 2003 server.

128. The connections between clients and the registry are protected, for example, the registry software passwords are changed every 30 days. Latvia reports that the Greta development team will implement further security improvements as required. The ERT gained the overall impression that Latvia attached the appropriate level of importance to, and allocated adequate resources, including human resources, to the development, operation and maintenance of the registry.

129. The ERT took note of the results of the technical assessment of the national registry, including the results of standardized testing, as reported in the independent assessment report (IAR) that was forwarded to the ERT by the administrator of the international transaction log pursuant to decision 16/CP.10 on 13 November 2007.

130. The ERT reiterated the main findings of this report, including that the registry has fulfilled all of its obligations regarding conformity with the DES. These obligations include having adequate transaction procedures; adequate security measures to prevent and resolve unauthorized manipulations; and adequate measures for data storage and registry recovery. The registry is therefore deemed fully compliant with the registry requirements defined in decisions 13/CMP.1 and 5/CMP.1, noting that registries do not have obligations regarding operational performance or public availability of information prior to the operational phase.

131. Based on the results of the in-country review and the technical assessment, as reported in the IAR, the ERT concluded that Latvia's national registry is fully compliant with the registry requirements defined in decisions 13/CMP.1 and 5/CMP.1, noting that registries do not have obligations regarding operational performance or public availability of information prior to the operational phase.

F. Land use, land-use change and forestry parameters and election of activities

132. Table 6 shows the Party's choice of parameters for forest definition as well as its elections for Article 3, paragraphs 3 and 4, activities in accordance with decision 16/CMP.1.

Table 6. Selection of LULUCF parameters

Parameters for forest definition		
Minimum tree cover	20%	
Minimum land area	0.1 ha	
Minimum tree height	5 m	
Elections for Article 3, paragraphs 3 and 4, activities		
Article 3, paragraph 3, activities	**Election**	**Accounting period**
Afforestation and reforestation	Mandatory	Commitment period
Deforestation	Mandatory	Commitment period
Article 3, paragraph 4, activities		
Forest land management	Elected	Commitment period
Cropland management	Not elected	Not applicable
Grazing land management	Not elected	Not applicable
Revegetation	Not elected	Not applicable

133. The elected parameter values for the definition of forest are within the ranges prescribed in paragraph 1(a) of the annex to decision 16/CMP.1. During the in-country review, the ERT identified that the historical value of minimum tree height reported by Latvia in its forest definition is 7 metres, compared to the 5 metres used in its new definition. Although this is in line with decision 16/CMP.1, it is not consistent with the definition of forest Latvia has always reported to the FAO. After the in-country visit, Latvia informed the ERT that the forest law will be changed to include the minimum tree height of 5 metres.

134. During the review the ERT identified that Latvia had not reported in its initial report the accounting period for forest management as activity elected under Article 3, paragraph 4. During and after the in-country visit, Latvia informed the ERT that forest management will be accounted for the entire commitment period. Latvia also clarified that the single minimum values reported for the selected parameters for forest definition (see (table 6) will be used for the accounting for activities under Article 3, paragraphs 3 and 4.

135. The ERT noted that, in accordance with decision 16/CMP.1, national inventory systems under Article 5, paragraph 1, shall also ensure that areas of land subject to LULUCF activities under Article 3, paragraphs 3 and 4, are identifiable in Parties' national inventories submitted in accordance with Article 7 paragraph 1. The initial report does not include information on how Latvia's national system will ensure that such land areas are identifiable.

136. Latvia informed the ERT that the method presented in the NIR for the LULUCF sector using AD from forest statistics (collected by the Ministry of Agriculture) and the State Forest Registry will not be used for reporting of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. During the in-country review Latvia indicated that the new method (for the new National Forest Inventory) presented during the in-country review will be used consistently throughout the time series and for the reporting of these LULUCF activities (see section II.B.8 above).

137. The ERT recommended that as part of the development of the national system the Party should develop and document the new method based on the NFI as a proper methodology in accordance with decision 16/CMP.1, which will be used to identify land areas associated with the activities under Article 3, paragraphs 3 and 4, prior to 2010. Following the in-country review, Latvia provided a description of the NFI (e.g. the establishment of permanent and temporary sample plots, measured every five years). Latvia also described how the 1990 determination of land-use categories will be organized as well as the methods used to assess forest resources in the NFI's sample plots for the situation in 1990.

138. The ERT recommends that, as part of the development of the national system, Latvia adequately document in its next inventory submission the new NFI method to be used to identify land areas associated with the activities under Article 3, paragraphs 3 and 4.

III. Conclusions and recommendations

A. Conclusions

139. The ERT concluded that the information provided by Latvia is complete and submitted in accordance with the relevant provisions of paragraphs 5, 6, 7 and 8 of the annex to decision 13/CMP.1 and section I of the annex to decision 15/CMP.1, and relevant decisions of the CMP; that the assigned amount pursuant to Article 3, paragraphs 7 and 8, has been calculated in accordance with the annex to decision 13/CMP.1, and is consistent with the revised inventory estimates as submitted and reviewed; that the calculation of the required level of the commitment period reserve is in accordance with paragraph 6 of the annex to decision 11/CMP.1; and that the LULUCF definitions are within the agreed range. Additional information on a number of mandatory elements was provided by Latvia to the ERT during and following the in-country review.

140. Latvia's national system has generally been prepared in accordance with the guidelines for national systems under Article 5, paragraph 1 of the Kyoto Protocol (decision 19/CMP.1) and reported in accordance with the guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol (decision 15/CMP.1). However, some of the mandatory elements of the national system, as presented in the initial report, are not fully in line with Article 5, paragraph 1 of the Kyoto Protocol, including certain institutional and procedural arrangements for inventory planning, preparation and management, as required under decision 19/CMP.1. Also Latvia did not provide the required information on QA/QC procedures. During the in-country review process, and in response to the ERT's recommendations, Latvia provided additional information on the national system. The ERT concluded that Latvia's national system meets the Article 5, paragraph 1 guidelines for national systems.

141. The parameters selected for the LULUCF definitions and the elections of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol have been prepared in accordance with decision 16/CMP.1. Latvia has elected forest management as an activity under Article 3, paragraph 4, and decided to account for activities under Article 3, paragraphs 3 and 4, for the entire commitment period. It has identified the necessary arrangements which are in the process of being implemented to enable its national system to report on Article 3, paragraphs 3 and 4, activities. From the information provided by Latvia during and following the in-country review, the ERT concluded that the LULUCF parameters selected by Latvia, including the definitions, elections and accounting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, are in accordance with decision 16/CMP.1.

142. Latvia has provided GHG inventory data for the whole time series 1990–2004, and has included most of the information and data required on all relevant gases and categories. Latvia's GHG inventory is in general accurate, as defined in the UNFCCC reporting guidelines. During the in-country review the ERT identified some categories in the energy, industrial processes and agriculture sectors where methods or EFs used by Latvia are not fully in accordance with the IPCC good practice guidance and which lead

to inaccurate estimates (e.g. overestimation in the base year, underestimation in recent years). Latvia provided revised estimates for these categories in line with the IPCC good practice guidance (see paragraph 4). As a result of these revisions the value of the base year emissions identified by Latvia in the initial report and the 2006 GHG inventory submission changed from 25, 894.22 Gg CO_2 eq. to 25,909.16 Gg CO_2 eq. The ERT did not recommend any adjustments to Latvia's GHG inventory.

143. The assigned amount and commitment period reserve, as calculated to incorporate the revised estimates submitted by Latvia following the review, are in accordance with the modalities for the accounting of assigned amounts under Article 7, paragraph 4 of the Kyoto Protocol (decision 13/CMP.1) and decision 11/CMP.1.

144. Based on Latvia's base year emissions – 25,909.16 Gg CO_2 eq., including the revised estimates – and its Kyoto Protocol target – 92 per cent – the Party calculates its assigned amount to be 119,182,130 tonnes CO_2 eq. Latvia calculates its commitment period reserve to be 53,369,492 tonnes CO_2 eq. The ERT agrees with these figures.

145. Latvia has provided most of the information on the national registry system required by the reporting guidelines under Article 7, paragraphs 1 and 2, of the Kyoto Protocol (decision 15/CMP.1). During the initial review visit, the ERT was provided with further information on the national registry.

146. Based on the results of the in-country review and the technical assessment, as reported in the independent assessment report, the ERT concluded that Latvia's national registry is fully compliant with the registry requirements defined in decisions 13/CMP.1 and 5/CMP.1.

B. Recommendations

147. In the course of the review, the ERT formulated a number of recommendations relating to the completeness and transparency of the information presented by Latvia in its initial report, and the 2006 GHG inventory. Most of the recommendations were implemented following the review process, including those relating to the national system, and the potential overestimations of emissions in the base year and the underestimations in 2004 have been resolved. The key remaining recommendations[3] are that Latvia:

(a) Following the adoption of the regulations which will address the national system, include in its next inventory submission information on the roles and responsibilities of the institutions involved in the preparation of the national inventory – in particular the Road Traffic and Safety Department and the Ministry of Agriculture, and including the designation of an institution to be responsible for the coordination of QA/QC procedures and QA/QC procedures for every institution;

(b) Further develop, implement and document in its next inventory submission a QA/QC plan in accordance with the IPCC good practice guidance and include documentation on verification procedures;

(c) Demonstrate the capacity of the national system to report activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol and document properly as part of the development of its national system the new method of the NFI to be used to identify land areas associated with the activities under Article 3, paragraphs 3 and 4;

[3] For a complete list of recommendations, the relevant sections of this report should be consulted.

(d) Improve the completeness of its inventory by developing and implementing an improvement plan for data collection in order to address categories reported as not estimated;

(e) Increase the transparency of its reporting in the national inventory submission by: improved documentation of country-specific methodologies (e.g for transportation categories), EFs, and assumptions; use of the documentation boxes in the CRF tables; and greater use of annexes to the NIR to document country-specific methods and EFs;

(f) Improve the accuracy of the inventory by using a higher-tier methodology for key categories in line with the IPCC good practice guidance. For categories where data are not currently available a plan should be developed to enable Latvia to move to higher-tier methodologies in the future;

(g) Improve the time-series consistency for AD, for example, by using a consistent data source and method to estimate the area of cropland for the estimation of emissions from LULUCF and agriculture;

(h) Improve its uncertainty analysis by providing more detail on the rationale for the selection of uncertainty levels; documenting expert judgement; and including the LULUCF sector in the uncertainty analysis in the next inventory submission.

C. Questions of implementation

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

Annex I

Documents and information used during the review

A. Reference documents

IPCC. Good practice guidance and uncertainty management in national greenhouse gas inventories, 2000. Available at: <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

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B. Additional information provided by the Party

General

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Spreadsheets for the calculation of methane emissions from solid waste disposal sites using the first order decay model.

Annex II

Acronyms and abbreviations

AD	activity data
CH_4	methane
CKD	cement kiln dust
CMP	Conference of the Parties serving as the Meeting of the Parties
CO_2	carbon dioxide
CO_2 eq.	carbon dioxide equivalent
CRF	common reporting format
CSB	Central Statistical Bureau
DES	data exchange standards
EC	European Community
EIT	economy in transition
EF	emission factor
ERT	expert review team
ETS	emissions trading scheme
EU	European Union
F-gas	fluorinated gas
FAO	Food and Agriculture Organization of the United Nations
GHG	greenhouse gas; unless indicated otherwise, GHG emissions are the sum of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 without GHG emissions and removals from LULUCF
GJ	gigajoule (1 GJ = 10^9 joule)
GWP	global warming potential
HFCs	hydrofluorocarbons
IAR	independent assessment report
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
ITL	international transaction log
kg	kilogram (1 kg = 1 thousand grams)
kgoe	kilograms of oil equivalent
LEGMA	Latvian Environment, Geology and Meteorology Agency
LULUCF	land use, land-use change and forestry
m^3	cubic metre
MCF	methane conversion factor
Mg	megagram (1 Mg = 1 tonne)
MSW	municipal solid waste
Mt	million tonnes
Mtoe	millions of tonnes of oil equivalent.
N	nitrogen
N_2O	nitrous oxide
NA	not applicable
NE	not estimated
Nex	nitrogen excretion rate
NFI	national forest inventory
NIR	national inventory report
NMVOC	non-methane volatile organic compound
NO	not occurring
OHF	open-hearth furnace
PFCs	perfluorocarbons
PJ	petajoule (1 PJ = 10^{15} joule)
QA/QC	quality assurance/quality control
RTSD	Road Traffic and Safety Department
SF_6	sulphur hexafluoride
SO_2	sulphur dioxide
Tg	teragram (1 Tg = 1 million tonnes)
TJ	terajoule (1 TJ = 10^{12} joule
UNFCCC	United Nations Framework Convention on Climate Change

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