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on Climate Change

Report of the individual review of the annual submission of Latvia submitted in 2009[*]

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[*] In the symbol for this document, 2009 refers to the year in which the inventory was submitted, and not to the year of publication.

CONTENTS

I. Executive summary

1.   This report covers the in-country review of the 2009 annual submission of Latvia, coordinated by the UNFCCC secretariat, in accordance with decision 22/CMP.1. The review took place from 12 to 17 October 2009 in Riga, Latvia, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: generalist – Mr. Kiyoto Tanabe (Japan); energy – Mr. Marc Schuman (Luxembourg); industrial processes – Ms. Sina Wartmann (Germany); agriculture – Mr. Jorge Alvarez (Peru); land use, land-use change and forestry (LULUCF) – Mr. Mikhail Gytarsky (Russian Federation); and waste – Mr. Amr Abdel-Aziz (Egypt). Mr. Abdel-Aziz and Mr. Tanabe were the lead reviewers. The review was coordinated by Mr. Tomoyuki Aizawa (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.

3.   In 2007, the main greenhouse gas (GHG) in Latvia was carbon dioxide (CO_2), accounting for 71.2 per cent of total GHG emissions[1] expressed in CO_2 eq, followed by methane (CH_4) (15.2 per cent) and nitrous oxide (N_2O) (13.1 per cent). Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) collectively accounted for 0.5 per cent of the overall GHG emissions in the country. In 2007, the energy sector accounted for 73.1 per cent of the total GHG emissions, followed by the agriculture sector (17.0 per cent), the waste sector (6.9 per cent), the industrial processes sector (2.6 per cent), and the solvent and other product use sector (0.5 per cent). Total GHG emissions amounted to 12,082.67 Gg CO_2 eq and decreased by 54.7 per cent between the base year[2] and 2007.

4.   Tables 1 and 2 show GHG emissions by gas and by sector, respectively. Table 1 includes emissions from Annex A sources only and excludes emissions and removals from the LULUCF sector.

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

[2]   "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions includes emissions from Annex A sources only.

Table 1. Total greenhouse gas emissions by gas, 1990–2007[a]

Greenhouse gas	Gg CO_2 eq							Change base year–2007 (%)
	Base year[b]	1990	1995	2000	2005	2006	2007	
CO_2	19 222.34	19 222.34	9 120.23	7 054.11	7 800.36	8 287.38	8 608.08	−55.2
CH_4	3 651.18	3 651.18	2 076.32	1 797.19	1 869.88	1 782.11	1 837.46	−49.7
N_2O	3 805.40	3 805.40	1 373.96	1 242.10	1 512.97	1 554.38	1 577.09	−58.6
HFCs	0.29	NA	0.29	7.87	22.46	40.49	51.34	17 910.5
PFCs	NA	NA	NA	NA	NA	NA	NA	NA
SF_6	0.25	NA	0.25	1.28	7.53	7.12	8.70	3 364.4

Abbreviation: NA = not applicable.

[a] "Total greenhouse gas emissions" includes emissions from Annex A sources only (excludes emissions/removals from the land use, land-use change and forestry sector).

[b] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions include emissions from Annex A sources only.

Table 2. Greenhouse gas emissions by sector, 1990–2007

Sector	Gg CO_2 eq							Change base year–2007 (%)
	Base year[a]	1990	1995	2000	2005	2006	2007	
Energy	19 341.83	19 341.83	9 555.74	7 388.90	8 110.76	8 546.26	8 826.76	−54.4
Industrial processes	510.94	510.41	144.54	148.11	233.88	254.99	308.83	−39.6
Solvent and other product use	55.70	55.70	46.17	49.11	54.20	64.08	55.06	−1.1
Agriculture	5 930.51	5 930.51	2 131.44	1 714.03	1 980.85	1 998.83	2 058.99	−65.3
LULUCF	NA	−21 418.03	−24 124.85	−24 392.30	−28 244.57	−32 545.17	−31 984.25	NA
Waste	840.48	840.48	693.16	802.39	833.51	807.32	833.03	−0.9
Other	NA	NO	NO	NO	NO	NO	NO	NA
Total (with LULUCF)	NA	5 260.88	−11 553.80	−14 289.76	−17 031.37	−20 873.69	−19 901.58	NA
Total (without LULUCF)	26 679.45	26 678.91	12 571.05	10 102.54	11 213.20	11 671.48	12 082.67	−54.7

Abbreviations: LULUCF = land use, land-use change and forestry, NA = not applicable, NO = not occurring.

[a] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O, and 1995 for HFCs, PFCs and SF_6. The base year emissions include emissions from Annex A sources only.

5.   The inventory is generally in line with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines), 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) and the IPCC *Good Practice Guidance for Land Use, Land-Use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF).

6.   The inventory covers almost all source and sink categories for the period 1990–2007. The 2009 inventory submission shows major improvements since the 2008 submission, such as the reinforcement of the national system, the enhancement of quality assurance/quality control (QA/QC) procedures, the reporting of the commitment period reserve in the national inventory report (NIR), and the reporting of emission/removal estimates for some categories that were not estimated ("NE") in the previous submissions (e.g. emissions from organic soils in forest land remaining forest land in the LULUCF sector). However, the expert review team (ERT) identified a need for further improvements in the following areas: more transparent documentation in the NIR of the methods, data and assumptions used to generate emission estimates (see para. 36); implementation of QA/QC procedures (see para. 33); development of country-specific parameters (e.g. cement kiln dust (CKD) correction factor to be used to estimate CO_2 emissions from cement production in the industrial processes sector (see para. 78), nitrogen excretion (Nex) rate to be used to estimate N_2O emissions from manure management in the agriculture sector (see para. 97) and parameters to be used in the first-order decay (FOD) model in the waste sector (see para. 136); provision of consistent representation of lands for the LULUCF sector (see para. 108); and ensuring consistency of the areas of lands reported in the agriculture and LULUCF sectors (see para. 91).

7.   The Party has submitted, in part, on a voluntary basis supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol in accordance with section I of the annex to decision 15/CMP.1. Latvia did not submit on a voluntary basis information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol and information on adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol.

8.   Latvia has reported information on its accounting of Kyoto Protocol units in accordance with section I.E of the annex to decision 15/CMP.1, and used the standard electronic format (SEF) tables as required by decision 14/CMP.1.

9.   The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1. However, the ERT noted with concern that Latvia needs to make a greater effort to ensure the capacity of the Latvian Environment, Geology and Meteorology Center (LEGMC) with regard to sufficient human and financial resources to correctly implement inventory preparation, including key category analysis and uncertainty analysis (see para. 20). The ERT also noted with concern Latvia's capacity to report activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol) which could not be confirmed in the absence of information on consistent representation of lands (see para. 108).

10.   The national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP).

11.   During the in-country review, the ERT formulated a number of recommendations relating to transparency (see para. 36), the capacity of LEGMC with regard to sufficient human and financial resources to correctly implement inventory preparation, including key category analysis and uncertainty analysis (see para. 20), completeness of the annual submission (see para. 20), key category analysis (see para. 23), QA/QC (see paras. 33 and 34), improvement of methods and data for key categories

(see para. 167 (h)) and reporting of information on activities under the Article 3, paragraphs 3 and 4, of the Kyoto Protocol (see para. 108).

12.   The ERT encourages Latvia to explore the possibility of structuring its reporting, in its next annual submission, following the annotated outline of the NIR, and the guidance contained therein, that can be found on the UNFCCC website.[3]

II. Overview

A. Annual submission and other sources of information

13.   The 2009 annual submission was submitted on 15 April 2009; it contains a complete set of common reporting format (CRF) tables for the period 1990–2007, and an NIR. Latvia also submitted information required under Article 7, paragraph 1, of the Kyoto Protocol, including information on: accounting of Kyoto Protocol units, and changes in the national system and in the national registry. The SEF tables were submitted on 15 April 2009. The annual submission was submitted in accordance with decision 15/CMP.1. The Party indicated that the 2009 submission is also its voluntary submission under the Kyoto Protocol.

14.   In addition, the ERT used the Standard Independent Assessment Report (SIAR), Parts I and II, to review information on the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and on the national registry.[4]

15.   During the review, Latvia provided the ERT with additional information. The documents concerned are not part of the annual submission but are in many cases referenced in the NIR. The full list of materials used during the review is provided in annex I to this report.

<u>Completeness of inventory</u>

16.   The inventory covers almost all source and sink categories for the period 1990–2007. The inventory is generally complete in terms of geographical coverage; however, the ERT noted with concern that the completeness of geographical coverage could not be confirmed for the LULUCF sector because of the absence of information on consistent representation of lands in the NIR (see para. 108). Latvia has reported as "NE": actual emissions of HFC-134a and HFC-23 for refrigeration and SF_6 for electrical equipment for the period 1990–1994, as well as some other HFC chemicals for the period 1990–2003; potential emissions of SF_6 for the period 1990–2007 and potential emissions of some HFC chemicals for the period 1990–2003 in the industrial processes sector; CO_2 emissions/removals from various subcategories and pools in the LULUCF sector; and CO_2, CH_4 and N_2O emissions from waste incineration in the waste sector. The ERT recommends that Latvia estimate and report these emissions and removals in its next annual submission, especially for those categories that are included in either the Revised 1996 IPCC Guidelines or the IPCC good practice guidance, and for which methods are prescribed therein.

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[3]   <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/reporting_requirements/application/pdf/ annotated_nir_outline.pdf>.

[4]   The SIAR, Parts I and II, is prepared by an independent assessor in line with decision 16/CP.10 (paras. 5(a), 6(c) and 6(k)), under the auspices of the international transaction log (ITL) administrator using procedures agreed in the Registry System Administrators Forum. Part I is a completeness check of the submitted information relating to the accounting of Kyoto Protocol units (including the SEF tables and their comparison report) and to national registries. Part II contains a substantive assessment of the submitted information and identifies any potential problem regarding information on the accounting of Kyoto Protocol units and the national registry. The SIAR is not publicly available.

17.   Almost all the CRF tables have been filled in appropriately. However, information gaps have been identified in CRF Summary 3, table 7 and table 8(b). The ERT also found that notation keys were not used appropriately in some categories (e.g. HFCs from foam blowing, as explained in para. 71). The ERT recommends that Latvia complete the CRF tables mentioned above as well as use notation keys appropriately in its next annual submission. The ERT noted that Latvia did not fully follow 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) in preparing the NIR, as annex 5 on "assessment of completeness and (potential) sources and sinks of GHG emissions and removals excluded" is missing in the NIR. During the in-country review, Latvia explained to the ERT that it would follow the annotated outline of the NIR under the Kyoto Protocol suggested by the UNFCCC secretariat. The ERT recommends that Latvia improve the NIR, in accordance with its explanation to the ERT, in its next annual submission.

B. A description of the institutional arrangements for inventory preparation, including the legal and procedural arrangements for inventory planning, preparation and management

1. Overview

18.   A description of the national system is provided in the NIR (chapter 1.2). This description is not sufficiently transparent; however, Latvia provided the ERT with additional explanation of the national system in more detail during the in-country review. Based on this explanation, the ERT concluded that the national system continued to perform its required functions as set out in the annex to decision 19/CMP.1.

19.   According to the explanation given by Latvia to the ERT during the in-country review, the new regulation (Cabinet Regulation No.157) on the national system was approved and adopted by the Cabinet of Ministers on 17 February 2009. Detailed functions, roles and responsibilities of institutions involved in the preparation of the national GHG inventory are prescribed in this new regulation. It should be noted that these functions, roles and responsibilities of institutions were already in effect during the preparation of the inventory submission in 2009, even though the new regulation had not been officially approved at that time. However, Latvia did not provide this information in the NIR of its 2009 submission as changes to the national system. The Latvian Ministry of the Environment (MoE), Climate and Renewable Energy Department, has the overall responsibility for the national GHG inventory. The LEGMC, which was called Latvian Environment, Geology and Meteorology Agency (LEGMA) during the preparation of the 2009 submission, is a government institution under the supervision of the MoE and is responsible for preparing the national GHG inventory. Other organizations are also involved in the preparation of the inventory as explained in paragraph 22 below. The ERT considers that changes in the national system under the new regulation are significant, therefore the ERT recommends that Latvia provide detailed information on the national system, including changes, in the NIR of its next annual submission, for example, referring to elements (a)–(f) in paragraph 30 of the annex to decision 15/CMP.1, although this is not a requirement for an annual submission under the Kyoto Protocol. Changes to the national system since the previous annual submission are also discussed further in chapter VIII of this report.

20.   The ERT welcomes the reinforcement of the national system brought on by this new regulation. However, the ERT noted with concern that Latvia needs to make a greater effort to ensure the capacity of LEGMC with regard to sufficient human and financial resources to correctly implement inventory preparation, judging from the fact that several errors were identified in the key category analysis (see para. 23) and uncertainty analysis (see para. 26) that could have easily been avoided. The ERT also noted with concern Latvia's capacity to report activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol which could not be confirmed in the absence of information on consistent representation of lands (see para. 108).

2. Inventory planning

21.   Specific responsibilities of institutions in the development of the 2009 submission are explained in section 1.2 of the NIR. The main data supplier for the Latvian GHG inventory was the Central Statistical Bureau of Latvia (CSB). The estimates for the LULUCF sector were prepared by the Latvian State Forest Research Institute (Silava) in collaboration with the Ministry of Agriculture. The estimated emissions from transport under the energy sector were prepared by the Institute of Physical Energetics (FEI) in accordance with an agreement between FEI and MoE. The estimates for most of the other categories were prepared by LEGMA which is now LEGMC. This definition and allocation of specific responsibilities was reconfirmed by the new regulation referred to in paragraph 19 above, and will remain in effect during the preparation of the 2010 and future inventories.

22.   Latvia prepared an inventory production plan which describes in detail the annual processes for inventory compilation including due dates for each step, and reported it in the NIR. The ERT commends Latvia for the preparation of this plan. In contrast, the ERT found that a QA/QC plan was not clearly explained in the NIR. The ERT recognized, from Latvia's explanation during the in-country review, that Latvia had prepared a QA/QC plan in accordance with the IPCC good practice guidance. The ERT recommends that Latvia produce an annex to the NIR in its next annual submission in order to explain the elements of its QA/QC plan, for example, quality objectives, examples of QC checklists, procedures for verification, and how to treat confidential information.

3. Inventory preparation

Key categories

23.   Latvia has reported a key category tier 1 analysis, both level and trend assessments, as part of its 2009 submission. Latvia has included the LULUCF sector in its key category analysis. The ERT found several errors in the key category analysis performed by Latvia, such as a failure to include certain categories, input of wrong figures, and mistakes in the use of the equation for key category analysis presented in the IPCC good practice guidance for LULUCF. The key category analysis performed by the Party and that performed by the secretariat[5] produced different results, mainly as a result of these errors. During the in-country review, Latvia successfully corrected these errors following the advice of the ERT. The result of the corrected key category analysis is similar to that of the secretariat. The ERT recommends that Latvia perform its key category analysis correctly in accordance with the IPCC good practice guidance for LULUCF in its next annual submission, making an effort to avoid errors similar to those detected during the in-country review.

24.   Latvia noted in the NIR that it is important to identify key categories in order to prioritize available resources for development of its inventory to generate accurate emission estimates for the most significant categories which could contribute to reduce total uncertainties of the inventory. However, it is not clearly described in the NIR how the results of the key category analysis were actually used in the inventory preparation. The ERT recommends that Latvia provide an explanation of this aspect by referring to examples of activities/procedures to improve estimates for specific key categories in the NIR of its next annual submission.

25.   Latvia did not use a qualitative approach in its key category analysis, although the previous review report encouraged it. The ERT recommends that Latvia use a qualitative approach in its next

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[5]   The secretariat identified, for each Party, the 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 LULUCF. Key categories according to the tier 1 trend assessment were also identified for Parties that provided a full set of CRF tables for the base year or period. 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.

annual submission following the IPCC good practice guidance. The ERT also encourages Latvia to perform a tier 2 key category analysis following the IPCC good practice guidance in future annual submissions.

Uncertainties

26. Latvia has conducted a tier 1 quantitative uncertainty analysis for 2007 and the trend. According to chapter 1.5 of the NIR, the overall uncertainty (excluding LULUCF) was calculated to be approximately 5 per cent and the trend uncertainty was 2.3 per cent. However, the ERT found that the information on uncertainties is not consistently reported in the NIR. For example, uncertainties for fluorinated gas (F-gas) emission estimates are not included in chapter 1.5 or annex 7 where the uncertainty information is summarized, although they are included in chapter 3 for the industrial processes sector. Additionally, not all of the uncertainties for the LULUCF categories are included in chapter 1.5 or annex 7, although they were estimated. The ERT recommends that Latvia report the results of the uncertainty analyses consistently and transparently in the overview chapter as well as in the relevant annex in the NIR in its next annual submission.

27. The previous review report encouraged Latvia to document the discussion supporting the uncertainty analysis (e.g. sources of uncertainty estimates) in a transparent way. In the NIR submitted in 2009, category-specific uncertainty information is provided in each of the category-level sections. The ERT found, however, that the explanation given on category-specific uncertainties was still insufficient as sources of uncertainty estimates were not clarified in many cases. For example, in response to a question from the ERT during the in-country review, Latvia explained that uncertainty was assumed to be 2 per cent for the activity data (AD) provided by CSB, based on a CSB assessment of errors in its statistical data; however, this was not explained in the NIR. During the in-country review, Latvia provided the ERT with the Statistical Office of the European Communities (EUROSTAT) documents, based on which the CSB performed its statistical quality assessment. The ERT recommends that Latvia provide a more transparent explanation of how the uncertainty estimates have been derived, for example by explaining the CSB data quality assessment, in its next annual submission.

28. According to the NIR, in many cases uncertainty values were estimated using expert judgement or default uncertainty estimates presented in the IPCC good practice guidance, due to a lack of information on the background data used in the calculation of emission estimates. Latvia explained to the ERT that the same default uncertainty values were used even in cases where methods, emission factors (EFs) or AD had been improved as compared to previous inventory submissions. The ERT believes that the use of improved EFs and methods should reduce the uncertainty estimates. The ERT recommends that Latvia review the impacts of the improvements on the uncertainty analysis and incorporate the results into inventory planning and preparation, as appropriate, in its next annual submission.

29. During the in-county review, the ERT found that some categories were missing in the spreadsheets that Latvia used for the uncertainty analysis (e.g. direct N_2O emissions from agricultural soils, a major source of emissions in the agriculture sector). The ERT recommends that Latvia include all categories in the uncertainty analysis in its next annual submission. The ERT also encourages Latvia to conduct a tier 2 uncertainty analysis in future submissions.

Recalculations and time-series consistency

30. Recalculations have been performed and reported in accordance with the IPCC good practice guidance. The ERT noted that recalculations reported by the Party for the time series 1990–2006 have been undertaken mostly to take into account changes and improvements in AD (for the energy, industrial processes, solvent and other product use, LULUCF, and waste sectors) that were made either because

new or updated data became available or because mistakes were detected in the previous submission. In the energy sector, recalculations were also performed because of changes in EFs for combustion of used tyres for energy use, as well as changes in methods used for road transportation. In the LULUCF sector, recalculations were also performed due to changes in methods that were made in response to recommendations from the previous review report.

31.   The effects of these recalculations for 2006 are a 0.4 per cent increase in the estimate of total emissions without LULUCF and a 237.0 per cent increase in the estimate of total net removals with LULUCF. The effects of these recalculations for 1990 are a 0.8 per cent increase in the estimate of total emissions without LULUCF and an 8.8 per cent decrease in the estimate of total net emissions with LULUCF. The major changes, and the magnitude of the impact, include: increased net removals of CO_2 in forest land (LULUCF sector) in 1990 (18.9 per cent of total net emissions with LULUCF) and increased net removals of CO_2 in forest land (LULUCF sector) in 2006 (71.5 per cent of total emissions with LULUCF). The rationale for most of the recalculations is provided in the NIR, but not in CRF table 8(b). The ERT recommends that Latvia document recalculations consistently in both the NIR and the CRF tables.

32.   The ERT noted that the inventory time series is generally consistent, except for some categories such as other (mineral products), where methods and sources of data used to estimate CO_2 emissions from production of bricks for the period from 2005 onward are different from those for the period from 1990 to 2004, and consumption of halocarbons and SF_6 where emission estimates for some HFC chemicals and SF_6 are not provided for some years (see para. 71). The ERT encourages Latvia to ensure time-series consistency by identifying potential sources of data for estimates or by making use of techniques to fill the gaps (e.g. extrapolation) as suggested in the IPCC good practice guidance.

Verification and quality assurance/quality control approaches

33.   Latvia explained in the NIR that all institutions involved in the inventory process are responsible for implementing QC procedures under Cabinet Regulation No. 157. However, as this regulation became valid only in February 2009, many of the actions determined in this regulation will be implemented during the preparation of the 2010 submission. For the 2009 submission, many of the QC procedures were implemented in accordance with the internal QA/QC programme prepared by LEGMC (previously LEGMA). MoE was designated as the institution overseeing QA/QC procedures, and LEGMC (previously LEGMA) was designated to have overall responsibility for implementing QC procedures under the supervision of MoE. Tier 1 QC procedures were applied to each category in accordance with the IPCC good practice guidance. The QC procedures implemented during the preparation of the 2009 submission are explained in chapter 1.6 of the NIR. In addition, Latvia included the "Category-specific QA/QC and verification" sub-section in each category-level section of the NIR following a recommendation from the previous review report. The ERT commends Latvia for this improvement.

34.   Latvia did not implement or clearly define QA procedures in the previous submission although it explained its plan of implementation of QA procedures to the previous ERT. During the in-country review this year, Latvia explained to the ERT five types of procedures that it considered to be QA procedures applicable to its inventory, namely: (1) UNFCCC review; (2) review by the European Commission; (3) review by relevant ministries/agencies; (4) public review (i.e. receiving comments from the general public); and (5) review by independent experts. Out of these five, the first three ((1)–(3) mentioned above) were already implemented, while the other two ((4) and (5) mentioned above) were not yet implemented. The ERT considers that the first two ((1) and (2) mentioned above) are not fully in conformity with the definition of QA according to the IPCC good practice guidance, but that the third (i.e. review by relevant ministries/agencies) can be regarded as QA procedures following the IPCC good practice guidance. The ERT was able to see the record of communication between the relevant ministries/agencies that was kept in the office of LEGMC, and confirmed that the QA procedures

(review by relevant ministries/agencies, as(3) mentioned above) were actually implemented. The ERT welcomes this progress, and recommends that Latvia carry out the public review and review by independent experts in addition to those QA procedures already implemented. The ERT also recommends that Latvia report the QA procedures and their outcomes in its next annual submission.

35.   While appreciating the improvements made by Latvia as mentioned in paragraphs 33 and 34 above, the ERT noted that transparency could be further improved in the explanation of verification and QA/QC procedures in the NIR. For example, little explanation is provided in chapter 1.6 of the NIR as to how verification was performed and therefore the ERT could not confirm that verification had actually been performed. Also, little explanation is provided in the NIR as to how the confidentiality issues were treated. In addition, the explanation of category-specific QA/QC and verification in each category-level section is general and not sufficiently transparent in many cases. The ERT recommends that Latvia further improve transparency on QA/QC procedures and verification in its next annual submission by providing more detailed information on tier 2 QC procedures applied and a clearer explanation of verification as well as treatment of confidentiality issues, in particular for key categories.

Transparency

36.   Latvia has improved transparency of the NIR to some extent since the previous inventory submission, for example by including the information on category-specific QA/QC and verification as mentioned in paragraph 35, and by reorganizing the annexes to the NIR in a way that is consistent with the structure outlined in the UNFCCC reporting guidelines. However, the ERT is of the view that transparency could generally be improved in all the chapters in the NIR. Details on how transparency could be improved in each sectoral chapter are discussed later in this report, but in general the ERT recommends that Latvia provide a clearer explanation of the methods used, a clearer reference to the sources of data used, and a clearer explanation as to how the uncertainty estimates for each category were derived. Transparency in reporting of QA/QC and verification activities could be also enhanced as explained in paragraph 35 above.

4. Inventory management

37.   Latvia has a centralized archiving system, which includes the archiving of disaggregated EFs and AD, and documentation on how these EFs and data have been generated and aggregated for the preparation of the inventory. The archived information also includes internal documentation on QA/QC procedures, external and internal reviews, documentation on procedure for annual key category analysis and planned inventory improvements. LEGMC (previously LEGMA) is storing all the archived information mentioned above in both hard copy and electronic format. In response to a request during the in-country review, the ERT was provided with the archived information.

C. Follow-up to previous reviews

38.   In annex 9 to the NIR, Latvia provided information on whether and how Latvia addressed some of the recommendations from the previous review reports. The ERT welcomes this documentation. The ERT considers it useful to make this documentation more comprehensive by including information related to all the recommendations from the previous review reports, and therefore encourages Latvia to do so in its next annual submission. Major improvements since the 2008 submission include the reinforcement of the national system by Cabinet Regulation No. 157 (see para. 20), the enhancement of QA/QC procedures and the provision of more information on QA/QC procedures (see paras. 34 and 35), the reporting of the commitment period reserve in the NIR (see para. 143), and the reporting of emission/removal estimates for some categories that were not estimated in the previous submissions (e.g. emissions from organic soils in forest land remaining forest land in the LULUCF sector; see para. 106). The major pending issues to be implemented in the future include: provision of more transparent

documentation in the NIR of the methods, data and assumptions used to generate emission estimates (see para. 37); implementation of QA/QC procedures (see para. 33); development of country-specific parameters (e.g. CKD) correction factor to be used to estimate CO_2 emissions from cement production in the industrial processes sector (see para. 78); Nex rate to be used to estimate N_2O emissions from manure management in the agriculture sector (see para. 97) and parameters to be used in the FOD model in the waste sector (see para. 136); provision of consistent representation of lands for the LULUCF sector (see para 108); and ensuring consistency of the areas of lands reported in the agriculture and LULUCF sectors (see para 91).

D. Areas for further improvement

1. Identified by the Party

39.   The 2009 NIR identifies areas for improvement in each sectoral chapter. However, planned improvements for cross-cutting issues are not included in the NIR except application of detailed tier methods for key categories. In response to questions raised by the ERT during the in-country review, Latvia indicated that it would try to perform a key category analysis using the qualitative approach, which could not be performed during the preparation of the 2009 submission due to a lack of human resources.

2. Identified by the expert review team

40.   The ERT identifies the following cross-cutting issues for improvement:

(a)   Provide a clearer explanation, in all chapters in the NIR, of the methods, EFs and other parameters used for estimates in each category, sources of uncertainty estimates, and category-specific QC procedures;

(b)   Ensure that the NIR transparently presents information on the national system as well as the QA/QC plan and its procedures;

(c)   Make the effort to ensure the capacity of LEGMC with regard to sufficient human and financial resources to correctly implement inventory preparation, including key category analysis and uncertainty analysis;

(d)   Review additional potential data sources, and develop and implement a data collection plan aimed at generating emission estimates for all non-estimated categories;

(e)   Complement its key category analysis with a qualitative approach;

(f)   Implement the QA/QC procedures in its QA/QC plan, in particular the QA procedures involving public review and review by independent experts;

(g)   Further improve the QA/QC plan where necessary (e.g. inclusion of tier 2 category-specific QC procedures for key categories);

(h)   Use higher tiers for key categories, where possible and considering national circumstances, in accordance with the IPCC good practice guidance;

(i)   Document transparently in the NIR how plant-specific data are incorporated to estimate emissions, in a way that demonstrates the completeness, accuracy and time-series consistency for each category;

(j)   Promote research studies aimed at improving emission estimates (e.g. research to ensure that national information on land classification conforms to international standards, and

research to develop country-specific parameters to be used in the FOD model in the waste sector);

(k) Undertake additional efforts to meet the requirements for reporting information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in terms of maintaining conformity with the IPCC good practice guidance for LULUCF and decisions 15/CMP.1 and 16/CMP.1.

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

III. Energy

A. Sector overview

42. The energy sector is the main sector in the GHG inventory of Latvia. In 2007, emissions from the energy sector amounted to 8,826.76 Gg CO_2 eq, or 73.1 per cent of total GHG emissions. Since the base year, emissions have decreased by 54.4 per cent. The key driver for the fall in emissions is the overall decrease in energy demand especially during the early 1990s, when dramatic political and economical changes occurred in Latvia. Within the sector, 43.4 per cent of the emissions were from transport followed by 22.4 per cent from energy industries, 18.9 per cent from other sectors and 14.1 per cent from manufacturing industries and construction. Fugitive emissions from fuels accounted for 1.2 per cent and other (1.A.5) accounted for 0.04 per cent. In the 2008 and the 2009 annual submissions, the shares of emissions from energy sector subcategories of the latest reported year were similar.

1. Completeness

43. The energy sector reporting is complete. The CRF tables include emission estimates for all categories, gases and fuel uses from the energy sector, as recommended by the Revised 1996 IPCC Guidelines. Emissions from the energy sector have been reported for all years of the inventory time series, and for all geographical locations. Emissions from two categories, namely solid fuel transformation and distribution of oil products, which were previously reported as "NE", are now reported as not applicable ("NA"). The ERT recommends that Latvia provide an explanation as to why these categories are considered as "NA" in its next annual submission.

2. Transparency

44. The description of the energy sector in the NIR is in some cases transparent. However, descriptions of categories and subcategories often lack details about country-specific situations. For example, the ERT was informed during the in-country review that manufacturing of solid fuels and other energy industries only includes industries extracting peat and producing peat briquettes, and that there is no coal mining in Latvia, but this is not clearly stated in the NIR. The methodological descriptions and the choice of EFs could be further elaborated by providing more details on assumptions, parameters used and references, especially when data is derived from some studies which were conducted in the country. In addition, it is necessary to provide an explanation of emission trends, and sudden changes in emissions and/or of implied emission factors (IEFs) due to country-specific situations or events in order to increase transparency of the inventory. The ERT recommends that Latvia increase the transparency of the energy sector by focusing on, and providing more detailed descriptions of, country-specific conditions in each category and corresponding subcategories in its next annual submission. The ERT also recommends that Latvia provide more information on the emission and fuel consumption trends in the NIR of its next annual submission.

3. Recalculations and time-series consistency

45.　The ERT noted that recalculations reported by the Party of the time series from 1990 to 2006 have been undertaken in the energy sector to take into account improvements in AD due to updated statistical information, error corrections or reallocations. For example, coke was reallocated from the feedstocks and non-energy use of fuels category to the manufacturing industries and construction category as recommended in the previous review report. Some minor changes in AD included the addition of biofuels combusted in the chemicals subcategory under manufacturing industries and construction. In addition, some country-specific EFs were developed (e.g. use of a plant-specific EF for combustion of used tyres for energy use). In the transport sector, the major change occurred in road transportation, where the COPERT IV model was applied to estimate the emissions from road transportation from 2004–2007. Another major change occurred in civil aviation where a tier 1 methodology was implemented for the period 2004–2006 instead of extrapolated data from a research study. The effect of these recalculations in 2006 is an increase in total GHG emissions by 0.02 per cent for the energy sector and 0.34 per cent for 1990. The rationale for these recalculations is provided in the NIR.

46.　The inventory time series is generally consistent. The CSB provides the annual energy balance to LEGMC (previously LEGMA). The agency disaggregates the energy balance, using the international questionnaires sent by CSB to the International Energy Agency (IEA) and EUROSTAT. However, in these international questionnaires the consumptions are reported in kt, allowing reporting as zero for the values below the unit. This results in minor time-series inconsistencies, where the consumption of certain specific fuel types and for certain years is reported as not occurring ("NO") although fuel combustion existed in those years. During the in-country review, it was acknowledged that CSB could provide more detailed data to LEGMC. The ERT recommends that the Party formally implement this activity and report emission estimates using these detailed data in its next annual submission.

4. Uncertainties

47.　Uncertainty values for AD are set as 2 per cent for all activities except fuel combustion of biomass fuels. These values were provided by the CSB. Uncertainty values for EFs are estimated based on expert judgement. The basis of these values for both AD and EFs is not well documented in the NIR. The ERT recommends that Latvia provide further explanation of the expert elicitation methods used to arrive at such estimates in its next annual submissions.

5. Verification and quality assurance/quality control approaches

48.　Latvia performed tier 1 QC procedures as detailed in its QA/QC plan, which is in line with the IPCC good practice guidance. However, some discrepancies or errors were found in the NIR which could have been avoided had there been stricter implementation of the planned QC procedures. In addition, the ERT could not confirm that verification other than comparison between the reference approach and the sectoral approach had been performed for this sector, because little information on verification is provided in the NIR. The ERT recommends that Latvia implement category-specific verification and tier 2 QC procedures and report on these procedures in the NIR of its next annual submission.

B. Reference and sectoral approaches

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

49.　The issue that the overall apparent fuel consumption in the CRF tables is higher than that reported by IEA was already reported in the previous review report. The reason for this difference lies mainly in the difference in stock change of gas/diesel oil as reported in CRF table 1.A(b) and that

reported by the IEA. The 2007 Latvian energy balance shows a substantial statistical difference for diesel oil, implying that the final consumption is, in reality, greater than the apparent consumption reported in the CRF tables. Latvia incorporates this statistical difference into the "stock change" in CRF table 1.A(b) but IEA does not. The criterion that Latvia follows reduces the difference between the sectoral approach and the reference approach but is not strictly in line with the Revised 1996 IPCC Guidelines and creates the difference between the reference approach reported in the CRF tables and the data reported by IEA. The ERT recommends that Latvia report the apparent consumption in the reference approach according to the Revised 1996 IPCC Guidelines. The ERT also reiterates the recommendation made in previous review reports that Latvia identify the reasons for this difference and provide thorough explanations in the NIR of its next annual submission.

50.   One minor discrepancy was identified in the reference approach, where the carbon content of peat is reported as 27.68 t C/TJ, whereas the value reported in the sectoral approach is 28.9 t C/TJ. The ERT recommends that Latvia use consistent carbon content values for both the sectoral and reference approaches in its next annual submission.

2. International bunker fuels

51.   In the previous inventory submission, Latvia estimated the fuel consumption for both national and international aviation and navigation using a research study for the years 1990–2006, whereas for this inventory submission the actual consumption figures for 2007 are derived from the Latvian energy balance. These figures are consistent with IEA's statistics. The ERT commends Latvia for these improvements. The ERT encourages Latvia to continue its efforts to improve estimation and reporting of emissions from international bunker fuels, taking into consideration the issue identified by the ERT with regard to domestic navigation as explained in para. 64.

3. Feedstocks and non-energy use of fuels

52.   Latvia reports lubricants, bitumen, paraffin wax and white spirit as feedstocks and estimates that all carbon is stored for bitumen, paraffin wax and white spirit. In the 2009 submission, Latvia revised the fraction of carbon stored for lubricants as 50 per cent; this was reported as 100 per cent in the previous annual submission. This factor for carbon stored follows the Revised 1996 IPCC Guidelines. However, the ERT found that CO_2 emissions from the remaining 50 per cent of lubricants (39.9 Gg CO_2 in 2007), which should be considered as being combusted, are not reported under any category. The ERT recommends that Latvia estimate and report these emissions in the most appropriate category in its next annual submission. For paraffin wax and white spirit, Latvia uses the carbon stored factors of Lithuania and Denmark, respectively. The ERT recommends that Latvia develop and use its country-specific carbon stored factors, or provide in its next annual submission an explanation of why the factors of Lithuania and Denmark are applicable to Latvia.

C. Key categories

1. Stationary combustion: all fuels – CO_2

53.   As a follow-up to a recommendation of the previous review report, the NIR indicates the use of country-specific CO_2 EFs for all fossil fuels (table 3.2.2 of the NIR); these are taken from a study undertaken in 2004, for which summarized information is included in annex 2 to the NIR. However, only the country-specific carbon content values for coal (other bituminous coal), coke and shale oil are different from the IPCC default values. In all other cases, the carbon contents reported in the NIR are either identical or very close to the IPCC default values presented in the Revised 1996 IPCC Guidelines. To improve transparency of the inventory, the ERT reiterates the recommendation of the previous review report that Latvia clearly specify which EFs are actually country-specific values based on measurements in the 2004 study, and which are the IPCC default values. The ERT also reiterates the recommendation

of the previous review report that Latvia provide more information on the analytical methods used to determine country-specific EFs, in the NIR of its next annual submission.

54. CO_2 emissions from stationary combustion of natural gas is a key category in Latvia's inventory. However, the Party uses the default CO_2 EF from the Revised 1996 IPCC Guidelines. According to the IPCC good practice guidance it is good practice to obtain, for traded fuels in common circulation, the carbon content of the fuel and net calorific value from fuel suppliers, and use local fuel values whenever possible. In Latvia, there is one single company that imports, stores and distributes natural gas. The ERT recommends that Latvia undertake the necessary steps to obtain an annual country-specific CO_2 EF for natural gas for the entire time series and provide detailed information on this in its next annual submission.

55.   Fuels reported under other liquid fuels are combusted in various categories (energy industries, manufacturing industries and construction, and other sectors) under stationary combustion. It is not clear which fuel types are included under other liquid fuels and no explanations are provided in the NIR. These fuels could potentially contain a certain fraction of carbon of biogenic origin. The ERT recommends that Latvia clarify the origin and nature of these fuels and improve the reporting to ensure greater transparency in its next annual submission.

2. Road transportation: liquid fuels – CO_2

56. CO_2 emissions from the combustion of liquid fuels (diesel oil and gasoline) in road transportation is a key category (in both the level and trend assessment). In the 2009 submission, the CO_2 EFs used are either the IPCC default value for gasoline or the COPERT default value for diesel oil. During the in-country review, the ERT was informed that Latvia intends to use country-specific CO_2 EFs for its next annual submission. The ERT encourages Latvia to use these country-specific CO_2 EFs in its estimates and report on them in the NIR of its next annual submission.

3. Railways: liquid fuels – CO_2

57.   Latvia uses the default CO_2 EF from the Revised 1996 IPCC Guidelines to estimate CO_2 emissions from diesel oil combustion in railways, although it is a key category according to the level assessment. The ERT recommends that Latvia make the necessary effort to determine a country-specific carbon content and net calorific value for diesel oil, as indicated in para. 56 above, and to apply them for its estimates in its next annual submission.

4. Oil and natural gas: natural gas – CH_4

58.   Latvia reports fugitive CH_4 emissions from natural gas transmission, distribution and other leakage in residential and commercial sectors. The emissions are estimated by the Latvian Gas Company, which is the only company operating natural gas transmission and distribution networks in Latvia, using an ISO-certified methodology. AD are reported as confidential. Some details of this methodology are given in the NIR; however, it is not clear what assumptions were made, and which EFs were used. The ERT recommends that Latvia provide further explanation in the NIR, and verify whether the methodology used is in line with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance, in its next annual submission.

D. Non-key categories

1. Stationary combustion: all fuels – CH_4 and N_2O

59.   During the in-country review, the ERT was informed of the existence of 2-Air, a database on air pollution where companies report their emissions, among other data. The ERT encourages Latvia to

investigate using plant-specific data from this database to develop and assess EFs further based on combustion technologies.

2. Road transportation: gaseous fuels – CO_2, CH_4 and N_2O

60. AD for natural gas combusted in road transportation were reported in the CRF tables; however, the corresponding GHG emissions were reported as "NA". Latvia did not provide sufficient explanation in the NIR as to why the emissions from this category were considered "NA". The ERT recommends that Latvia estimate and report these emissions in its next annual submission.

3. Road transportation: liquid fuels – CH_4 and N_2O

61. In the 2009 submission, Latvia estimated the emissions for CH_4 and N_2O for the period 1990–2002 using the COPERT III model, and for the period 2003–2007 using the COPERT IV model. The ERT commends Latvia for the effort it has made to improve the accuracy of emission estimates. However, because of differences between the COPERT III and COPERT IV models with regard to the EFs for CH_4 and N_2O, the ERT recommends that Latvia ensure consistency in its emission calculations by using the COPERT IV model for the entire time series.

4. Railways: liquid fuels – CH_4 and N_2O

62. To estimate CH_4 and N_2O emissions from diesel oil combustion, Latvia applied the default EFs from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the 2006 IPCC Guidelines) (CH_4 (4.15 kg/TJ), N_2O (28.6 kg/TJ)) instead of the default values from the Revised 1996 IPCC Guidelines (CH_4 (5 kg/TJ), N_2O (0.6 kg/TJ)) that were used in the previous submission. However, no justification is given as to why these EFs reflect Latvia's situation better than the values used previously. The ERT recommends that Latvia provide detailed justification on the use of these EFs in the NIR of its next annual submission.

5. Navigation: liquid fuels – CO_2, CH_4 and N_2O

63. Both diesel oil and gasoline are combusted in domestic navigation. The amount of gasoline combusted in leisure boats is estimated according to a national study, as these boats are not refuelled in the harbours; their mobile canisters are refuelled at road petrol stations, resulting in potential double counting. In fact, the Latvian energy balance does not report any consumption values for motor gasoline in domestic navigation, but these seem to be included in road transportation. The ERT recommends that Latvia ensure that the fuel consumption of gasoline in domestic navigation is not double counted under road transportation, and report the result of the assessment of this issue in its next annual submission.

64. In the 2009 submission, Latvia used a country-specific method, based on local research (LZA Fizikalas Energetikas Instituts (2006)), to estimate the fuel consumption of domestic navigation for 1990–2006. For 2007, the consumption of diesel oil was derived from the energy balance published by CSB. This switch in methodologies resulted in a decrease in the consumption of diesel oil by a factor of fourteen (–92.7 per cent) between 2006 and 2007. There is no information in the NIR which explains this dramatic drop in fuel consumption. The ERT recommends that Latvia provide transparent information on fuel consumption of domestic navigation to ensure time-series consistency for the entire time series. In addition, there is not enough information in the NIR to assess whether the approach followed by Latvia from 1990–2006 is in line with the IPCC good practice guidance. Therefore, the ERT also recommends that Latvia investigate whether both the local study (1990–2006) and the methodology used by CSB for 2007 to estimate fuel consumption from domestic navigation are accurate and in line with the IPCC good practice guidance, and further recommends Latvia report the result of this assessment in its next annual submission.

6. Other Sectors: liquid fuels – CH$_4$ and N$_2$O

65. Latvia reports emissions from both mobile and stationary sources from commercial, residential, agricultural and forestry sub-categories. However, from the NIR (table 3.4.3), it looks like the same EFs are applied for both stationary and mobile sources, although in the inventory Latvia used the correct default IPCC EFs for stationary and mobile sources, respectively. The ERT recommends that Latvia transparently differentiate between mobile and stationary combustion in the category other sectors, and revise its table with the EFs in the NIR accordingly.

7. Other (mobile): liquid fuels – CO$_2$, CH$_4$ and N$_2$O

66. Latvia reports emissions from jet kerosene combustion in military aircrafts under the category other (mobile (1.A.5b)). In response to a question raised by the ERT, Latvia explained that emissions from domestic military navigation and military off-road mobile combustion are currently reported in the categories navigation and road transportation, respectively. This is not strictly in line with the Revised 1996 IPCC Guidelines, as emissions from military fuel use should be reported under category other (1.A.5). The ERT encourages Latvia to consider reallocating emissions from domestic military navigation and military off-road mobile combustion to the category other (mobile (1.A.5b)).

E. Areas for further improvement

1. Identified by the Party

67. In the NIR and during the in-country review, Latvia reported on its planned improvements in various categories. These are as follows:

(a) Initiate new research studies for calculating country-specific EFs;

(b) Investigate the use of plant-specific data from the air pollution database 2-Air to develop and assess EFs further based on combustion technologies;

(c) Use the COPERT IV model for emission calculation across the time series;

(d) Revise the fractions of carbon stored in feedstocks and non-energy use of fuels.

2. Identified by the expert review team

68. The ERT recommends that Latvia make the following improvements:

(a) Increase transparency by providing information in the NIR on which EFs are actually country-specific values and which are the IPCC default values, and provide more information on the analytical methods used to determine country-specific EFs;

(b) Undertake the necessary steps to determine an annual country-specific CO$_2$ EF for natural gas, gasoline and diesel oil for the entire time series;

(c) Elaborate in the NIR on the various parameters and assumptions used to feed the COPERT IV model for the estimation of GHG emissions from road transportation (i.e. fuel parameters, vehicle parameters, etc.);

(d) Transparently differentiate between mobile and stationary combustion in the category other sectors, and revise NIR table 3.4.3 accordingly;

(e) Consider reallocating emissions from domestic military navigation and military off-road mobile combustion to the category other (mobile (1.A.5b)).

IV. Industrial processes and solvent and other product use

A. Sector overview

69.   In 2007, emissions from the industrial processes sector amounted to 308.83 Gg CO_2 eq, or 2.6 per cent of total GHG emissions, and emissions from the solvent and other product use sector amounted to 55.06 Gg CO_2 eq, or 0.5 per cent of total GHG emissions. Since the base year, emissions have decreased by 39.6 per cent in the industrial processes sector, and decreased by 1.1 per cent in the solvent and other product use sector. The key driver for the decrease in emissions in the industrial processes sector is a combination of opposing factors: while emissions from mineral products decreased by 261.57 Gg or 52.6 per cent between the base year and 2007, emissions from the consumption of halocarbons and SF_6 increased by 59.51 Gg or 11,197.0 per cent between the base year and 2007. Emissions from mineral products decreased considerably in the early 1990s, due to economic collapse of the former Soviet Union. From the mid-1990s onward, strengthened economic development in Latvia resulted in emissions from mineral products rising slowly again. With regard to the consumption of halocarbons and SF_6, a strong increase in emissions since the base year can be seen, which is associated with increasing installation of equipment containing F-gases along economic development. Within the industrial processes sector, 76.4 per cent of the emissions were from mineral products, followed by 19.4 per cent from consumption of halocarbons and SF_6 and 4.2 per cent from metal production. In the solvents and other product use sector, emissions are keeping almost the same level as in the base year. Within the solvents and other product use sector, 46.7 per cent of the emissions were from other (3.D), followed by 42.3 per cent from paint application and 11.0 per cent from degreasing and dry cleaning.

70.   As an improvement on the last submission, AD from a number of industrial processes categories such as cement production and lime production, which had been marked as confidential in the previous submission, are reported with figures in the current submission.

1. Completeness

71.   The CRF tables include estimates of most categories of emissions from the industrial processes and solvent and other product use sectors, as recommended by the Revised 1996 IPCC Guidelines. Actual HFC emissions from foam blowing are reported as "NO"; however, a survey of companies carrying out foam blowing indicated that foam blowing with HFCs does occur in the country, although no data could be provided. The ERT recommends that Latvia make the effort to explore further options for obtaining the relevant AD (e.g. through customs authorities) and report HFC emissions from this category in its next annual submission. Latvia has furthermore reported the following categories as "NE": actual emissions of HFC-134a and HFC-23 for refrigeration and SF_6 for electrical equipment for the period 1990–1994, as well as some other HFC chemicals for the period 1990–2003; potential emissions of SF_6 for the period 1990–2007; and potential emissions of some HFC chemicals for the period 1990–2003. The ERT recommends that Latvia make the effort to explore further options for obtaining the relevant AD and report actual emissions of these gases in its next annual submission. With regard to potential emissions, Latvia indicated that the data required for their estimation are not available. The ERT nevertheless encourages the Party to use the available data (e.g. data on stocks of F-gases), used for the estimation of actual emissions, for the estimation of potential emissions in its next annual submission, and to explore options to acquire import/export data for the categories in question.

2. Transparency

72.   The information provided in the NIR of the industrial processes sector is generally transparent, with the exception of the category consumption of halocarbons and SF_6, where the methodologies used are often described in a basic way without sufficient details. The ERT recommends that Latvia describe the methodologies used for the estimates in more detail, including AD, sources of AD and EFs, and any

relevant assumptions made, in the NIR of its next annual submission. With regard to the transparency of the description of the solvent and other product use sector, the ERT encourages the Party to provide more background information on data collection and assumptions made.

3. Recalculations and time-series consistency

73. Recalculations have been performed and reported in accordance with the IPCC good practice guidance. The ERT noted that recalculations reported by the Party for the industrial sector were due to corrected mistakes in data calculation for the year 2006 in the categories metal production and consumption of halocarbons and SF_6. These recalculations lead to an increase of 2.0 per cent or 5.05 Gg CO_2 eq of the industrial processes sector. Recalculations in the metal production category contributed –0.01 Gg CO_2 eq to this result, while consumption of halocarbon and SF_6 contributed +5.06 Gg CO_2 eq. Recalculation in the sector solvent and other product use was conducted for CO_2 and non-methane volatile organic compounds (NMVOC) emissions from paint application for 2005–2006. These recalculations were caused by the reallocation of incorrect AD input under categories degreasing and dry cleaning and other (3.D) for CO_2 and NMVOC emissions. Total emissions for 2006 were therefore increased by 0.1 per cent from the previous year's submission. The NIR provides transparent rationales for these recalculations. These corrections are welcomed by the ERT.

74. With regard to the category consumption of halocarbons and SF_6, the ERT noted that the data is incomplete for 1995–1999. AD was collected from industry organizations with the help of questionnaires in 2000; however, Latvia is aware of the fact that the data supplied is incomplete, that is, not all companies have reported. This leads to a potential underestimation of emissions in the base year for F-gases for 1995 and for the period 1996–2000. After 2000, direct information channels with industry were set up, which supplied considerably better data from 2000 onwards. Furthermore, emissions have not been estimated for the years 1990–1994. The ERT recommends that the Party estimate AD for the years that have not been estimated and, in cases where only sparse data is available, use extrapolation or use the data in neighbouring countries for obtaining estimates for this category in order to improve the time-series consistency in this category in its next annual submission.

75. The time series of CO_2 emissions from production of bricks (2.A.7.2) only covers the years 1993–2007, although a number of plants have been in operation since 1990. The ERT recommends that the Party complete the time series of emission estimates for this category, for example by using extrapolation.

4. Uncertainties

76. Uncertainty analysis is performed in line with the IPCC good practice guidance using a tier 1 approach. However, the explanation provided in the NIR is not sufficiently transparent. More information on assumptions made in establishing uncertainty values (e.g., source of uncertainty estimates for AD and EFs) should be added. While uncertainty values for AD and EFs have been determined for the category consumption of halocarbons and SF_6, overall uncertainty values for this category as a whole are not provided. The ERT recommends that the Party include overall uncertainty values for this category (as it has for the remaining categories in the industrial processes sector) in its next annual submission.

5. Verification and quality assurance/quality control approaches

77. Tier 1 QC procedures are implemented for all categories in the industrial processes sector and the solvent and other product use sector. Nevertheless, a number of smaller mistakes (e.g. overall uncertainty values not calculated for the category consumption of halocarbons and SF_6) in the NIR have been detected by the ERT, which could have been avoided through QC by a staff member with sufficient

expertise. The ERT therefore recommends that Latvia enhance the tier 1 QC procedures for all the categories and implement tier 2 QC procedures, at least, for key categories in its next annual submission.

B. Key categories

1. Cement production – CO_2

78.   During the in-country review, Latvia explained that emissions from the single existing cement producing plant are estimated using a tier 2 approach, which needs clinker production data as AD. However AD was obtained from a plant operator under the European Union emissions trading scheme (EU ETS), which uses a tier 1 approach for its estimates, allowing to calculate clinker production based on cement production using a cement/clinker-ratio, so data on clinker amounts are not available from the plant. The ERT therefore considers that the method used is not in line with the tier 2 method of the IPCC good practice guidance, but that a tier 1 approach in reality was used. CKD is considered in calculations, using plant-specific CKD rates. Although the rates reported by the plant are higher than 8 per cent for a number of years, the maximum value of 8 per cent, as stated in the IPCC good practice guidance, is used for these years. The ERT recommends that Latvia investigate the CKD rate in cooperation with the cement production plant to obtain a more accurate country-specific CKD correction factor, and use it to estimate CO_2 emissions from cement production using a tier 2 approach based on clinker production in its next annual submission.

2. Lime production – CO_2

79.   Emissions are estimated according to the methodology described in the IPCC good practice guidance, based on the amount of dolomite used in lime (CaO) production and a CO_2 EF for CaO production (0.30 t CO_2/t dolomite), and considering the calcium carbonate and magnesium carbonate content in the dolomite used. The same EF is used for the whole time series. The correction factor for hydraulic CaO provided in the IPCC good practice guidance is used. The ERT recommends that the Party check and, if necessary, update the EF from time to time to reflect potentially changing calcium carbonate and magnesium carbonate contents.

3. Consumption of halocarbons and SF_6 – HFCs

80.   With regard to HFC emissions from refrigeration and air conditioning equipment, the emissions in the subcategories domestic, commercial, industrial and transport refrigeration are currently calculated using the same approach (AD which is the number of equipment is multiplied by the EF which is the leakage rates) and the same aggregated AD submitted annually by the respective industry association, which are split up by using fixed shares for domestic and commercial/industrial equipment. Emissions from transport refrigeration are also calculated using this approach, but not calculated as a separate category. The methodology used seems rather suited to the calculation of potential emissions instead of actual emissions along the life-cycle of the equipment, and is thus likely to lead to an overestimation of emissions. The ERT recommends that Latvia use a methodology taking into account lifetime, emissions during operation, rates of equipment where HFCs are evacuated at the end of life, as well as emissions from evacuation. The ERT also recommends that Latvia seek out options to identify emissions from transport refrigeration separately, and encourages the Party to ensure that the ratio of domestic to commercial/industrial equipment appropriately reflects changes in market shares in these areas over time.

81.   Latvia explained in the NIR that HFC emissions from refrigeration and air conditioning equipment were both calculated with the top-down methodology using data for new equipment received by industry annually. However, the ERT found that the methods used by Latvia should be regarded as bottom-up approach rather than top-down approach according to the IPCC good practice guidance. The ERT recommends that Latvia improve the explanation of methods used for this category in its next annual submission. An annual EF for emissions during operation (30 per cent) is used for the estimates,

which can lead to an overestimation of emissions. At the same time, the assumption that only 20 per cent of new cars being equipped with air conditioning for all years might lead to an underestimation of emissions, as it is known that in some countries the share has risen considerably over recent years; in Germany, for example, it is currently at over 90 per cent. The EF for emissions at disposal (75 per cent) can lead to an overestimation of emissions, especially with a national law in place requiring the evacuation of equipment that could be source of emissions of F-gases used as refrigerant at the end of life. The ERT recommends that Latvia conduct surveys to develop country-specific values with regard to EFs, shares of new vehicles with air conditioning, lifetimes of cars and emission rates during disposal, accounting temporal variation in those factors.

82.   The methodology used to estimate HFC emissions from fire extinguishers is in line with the Revised 1996 IPCC Guidelines, but does not seem to take into account HFC's bank developments, unless related to newly imported equipment. The ERT strongly encourages the Party to use a methodology taking bank developments and lifetimes of fire extinguishers into account, for example based on equation 3.52 in the IPCC good practice guidance.

83.   For HFC-134a emissions from shoe production, it is assumed that annual emissions are 1.5 per cent of the amount of HFC-134a filled into shoes over an assumed three-year lifetime. Emissions at disposal are not considered, although emissions of the remaining amount of HFC-134a filled into shoes over the complete life cycle can be expected. This can lead to an underestimation of emissions. The ERT recommends that Latvia revise the emissions for the time series using a methodology that takes both the life cycle steps of operation as well as disposal into account, and report the results in its next annual submission.

C. Non-key categories

1. Other (mineral products) – CO_2

84.   Up to the year 2004, emissions from production of bricks (other (2.A.7)) are calculated using brick production and static plant-specific EFs. From 2005 onward, data obtained from the EU ETS are used, where the amount of carbonate in the input materials and input-specific EFs are used for four of five plants, and production amount and output-specific EFs are used in the remaining plant. This leads to a time-series inconsistency as the approach used in the period 1990–2004 is different from that used in 2005–2007. The ERT recommends that Latvia make efforts to ensure time-series consistency, for example by using techniques explained in chapter 7 of the IPCC good practice guidance. From 2005 onward, IEFs are considerably higher than in the previous years. This is due to a calculation error where total emissions were incorrectly divided by the total amount of input materials instead of the amount of carbonate input. The ERT recommends that Latvia revise the emission estimates for the complete time series using the correct AD, that is, the amount of carbonate materials rather than the amount of total input material.

2. Asphalt roofing – CO_2

85.   No information on the NMVOC to CO_2 conversion factor used for asphalt roofing estimates is included in the NIR. The ERT encourages the Party to include the NMVOC to CO_2 conversion factor in its next annual submission.

3. Other (solvent and other product use) – N_2O

86.   The N_2O emissions from use of N_2O for anaesthesia fluctuate between 2000 and 2001 by +164 per cent and between 2005 and 2006 by +282 per cent. However, no explanation of why these fluctuations occurred is provided in the NIR. The ERT encourages the Party to discuss the variation in

the time series with industry in order to understand the reasons for the variation or to detect and correct potential errors and to provide this information in the NIR of its next annual submission.

D. Areas for further improvement

1. Identified by the Party

87.   Latvia did not include any information in the NIR about planned improvements.

2. Identified by the expert review team

88.   The ERT identified the following areas for improvement:

(a)   Make the effort to explore further options for acquiring AD to estimate and report actual emissions of some HFC chemicals and SF_6 that are currently reported as "NE" (in particular HFC-134a and HFC-23 for refrigeration and SF_6 for electrical equipment);

(b)   Improve transparency by describing the methodologies used for the estimates in more detail, including AD, sources of AD and EFs, and any relevant assumptions made, in the NIR;

(c)   Enhance the tier 1 QC procedures for all the categories and implement tier 2 QC procedures, at least for key categories.

V. Agriculture

A. Sector overview

89.   In 2009, emissions from the agriculture sector amounted to 2,058.99 Gg CO_2 eq, or 17.0 per cent of total GHG emissions. Since the base year, emissions have decreased by 65.3 per cent. The key driver for the decrease in emissions is the economic crisis between 1991 and 1995, which is the reason for the decline in animal populations and nitrogen fertilizer use. Within the sector, 59.2 per cent of the emissions were from agricultural soils, followed by 28.8 per cent from enteric fermentation and 12.1 per cent from manure management.

1. Completeness

90.   The CRF tables include estimates of all gases and categories of emissions from the agriculture sector for the whole time series, as recommended by the Revised 1996 IPCC Guidelines. All relevant categories are covered except direct soil emissions of some cultivated crops (maize and crops used for silage) and some used land in agriculture (arable land).

2. Transparency

91.   The agriculture sector of Latvia's inventory is generally transparent, using tier 1 methods, default EFs and national AD in all the categories. However, there are some areas where improvement is needed. The Nex rates used by the Party for swine in the category manure management are lower than the IPCC default values but the reason is not clearly provided in the NIR. Some inconsistencies between the CRF tables and the NIR were found, for example, the data on the distribution of manure to animal waste management systems (AWMS). Some inconsistencies were found in the NIR with respect to cultivated land areas. Table 7.1.1 of the NIR states that the area of cropland in 2007 is 209.4 kha, while table 6.11 states that the cultivated area in 2007 is 1,237.28 kha. Similarly, data inconsistency between the agriculture sector and the LULUCF sector was noted by the ERT regarding area of histosols and areas of organic soil used for estimates (table 6.11 for the agriculture sector states that cultivated area of histosols in 2007 is 86.61 kha and the CRF table 5.B for LULUCF sector states that the area of organic soil of

cropland remaining cropland in 2007 is 78.82 kha; and table 6.11 states that the cultivated area in 2007 is 1,237.28 kha and CRF table 5.B for LULUCF sector states that cropland remaining cropland in 2007 is 1,839.20 kha). Inconsistent references in table 6.13 for dry matter fraction and nitrogen content of crops of the NIR were observed. For example, it was stated that all values shown in CRF table 6.13 are IPCC default values, while, in reality, some values are not the IPCC default values (e.g. dry matter for wheat default values of the IPCC good practice guidance range from 0.82 to 0.88 but the value in table 6.13 is 0.81; the IPCC good practice guidance does not have a default for rape but table 6.13 has value $Frac_{DM}$ as 0.75 and $Frac_{NCRBF}$ as 0.015 while the reference is indicated as "IPCC default"). The ERT recommends that Latvia clarify these issues in the NIR of its next annual submission.

3. Recalculations and time-series consistency

92.   The ERT noted that since the previous submission, a recalculation has been performed by Latvia. This recalculation was neither reported in the NIR nor in the CRF tables. The ERT noted that this recalculation, conducted for 1995 only and reported during the review week by the Party, was undertaken to take into account a mistake in the allocation of cattle population, affecting the estimation of N_2O emissions from manure management. The recalculation has been performed in accordance with the IPCC good practice guidance. The magnitude of the impact is a 0.8 per cent increase in sectoral emissions for 1995.

4. Uncertainties

93.   The uncertainty analysis was conducted using the default values for EFs described in the IPCC good practice guidance (30 per cent for manure management and agriculture soils and 30–50 per cent for enteric fermentation). Regarding the uncertainties for AD, information from CSB (2–3 per cent for all categories) was used for the analysis. The results of the uncertainty analysis presented in the 2009 submission are the same as those reported in the previous submission.

5. Verification and quality assurance/quality control approaches

94.   The Party presented a detailed internal QA/QC procedure for the agriculture sector, which includes cross-checking by experts of the Central Statistical Bureau and the Ministry of Agriculture and cross-checking by an expert from another sector, using the IPCC good practice guidance tier 1 method and a special checklist. Some inconsistencies were found, as described in paragraph 91; the ERT recommends that Latvia strengthen the application of the QA/QC procedures included in this plan in order to avoid mistakes such as these and to enhance the accuracy of the inventory.

B. Key categories

1. Enteric fermentation – CH_4

95.   The Party uses the default EF for Eastern Europe (81 kg/head/year) to estimate CH_4 emissions from enteric fermentation from dairy cattle for the whole time series. This EF was estimated based on an average annual milk yield of 2,550 kg/head/year. Nevertheless, the milk yield of Latvia in 2007 was 4,636 kg/head/year, according to national statistics. According to the ERT, the use of this default EF for 2007 results in an underestimation of CH_4 emissions from this category. During the in-country review, Latvia provided some background information and confirmed the underestimation noted by the ERT. The ERT noted that the relevant background information available in the country can be used to apply a higher-tier method for estimating emissions to this sub-category (dairy cattle) which is significant for this category. The ERT recommends that Latvia utilize the available information to estimate the country-specific EF that permits the use of a higher-tier method in order to improve the accuracy of the estimates in its next annual submission.

2. Manure management – CH_4 and N_2O

96.   Latvia estimated the amount of manure distributed to the AWMS for 2006 and 2007 using an extrapolation technique. During the in-country review, the Party mentioned that a new census is planned for 2010 that will include additional questions to obtain specific information for updating ratio of manure distributions and description of the properties of the AWMS. The ERT recommends that Latvia continue to make such improvements in order to obtain more accurate information on the AWMS.

97.   The Nex rates used by the Party for swine for all years (10 kg N/head/year) are lower than the IPCC default value (20 kg N/head/year), as the previous review report identified. The ERT reiterates the recommendation of the previous review report that Latvia develop a country-specific Nex rate, and consider using a higher-tier method for this key category in its planned improvements for its next annual submission.

3. Direct soil emissions – N_2O

98.   Regarding the method used, the NIR states that nitrogen inputs to soils for all sources were calculated using the IPCC tier 1a method. IPCC default EFs are applied for the estimation of all categories under agricultural soils; cultivation of histosols is the main subcategory with 44 per cent of all direct soil emissions from agricultural soils. As stated in annex 3 to the NIR, Latvia does not have reliable data on histosol areas in its territory. For the estimation of histosol areas, Latvia assumed that 7 per cent of arable land corresponds to managed histosols, based on several research studies (Busmanis, 1999; Shvangiradze, 2000; Nikodemus, 2003; Abolina, 2003). However, the area for histosols estimated using this assumption is inconsistent with area of organic soil for cropland remaining cropland in the LULUCF sector. To improve the accuracy of the inventory, the ERT recommends that Latvia conduct specific research to identify exact histosol areas in the country.

99.   Latvia did not include some arable lands as AD in the estimation of emissions from histosols or organic soils. This could lead to an underestimation of emissions from this category. According to CSB, Latvia used 1,188.1 kha of arable lands for agricultural activities; the NIR states that the cultivated area for 2007 is 1,237.28 kha; and the CRF table 5.B states that cropland remaining cropland for 2007 is 1,839.20 kha. The ERT considers that the Party should assess the approach to estimate total organic soil area and organic soil area for agriculture. The ERT recommends that Latvia revise its estimates for the cultivation of histosols subcategory in its next annual submission.

100.   Latvia did not include maize, and crops for green feed and silage, in the estimation of direct N_2O emissions from agricultural soils originating from nitrogen-fixing crops and crop residues, which can lead to an underestimation of N_2O emissions from crop residue in the category direct soil emissions. The Party did not provide clear reasons for this in the NIR. According to information from CSB, Latvia produced 148.6 kt of maize and 122.6 kt of crops for green feed and silage in 2007. The ERT recommends that Latvia improve the completeness of the emission estimates for this category in its next annual submission.

101.   Latvia is still using the former Soviet Union soil classification system, which generates inconsistencies with international definitions and unclear classification of soil in certain categories used in the estimations. Detailed soil research needs to be undertaken in the country in order to introduce the international soil classification system. The ERT recommends that Latvia consider undertaking appropriate research to produce high-quality national information on soil classification that conforms to international standards.

102.   The source of dry matter fraction ($Frac_{DM}$) used by Latvia for potatoes (0.75), rape (0.75) sugar beet (0.77) and vegetables (0.80) is based on expert opinion. However, in the NIR, there is no documentation to support such values. The ERT recommends that Latvia provide an explanation of the

selection of these values in the NIR of its next annual submission and justification that these values better reflect the country's local conditions than the IPCC default values.

103.   A mistake in the selection of the IPCC default values for $Frac_{DM}$ for wheat and barley was identified by the ERT, which generated an underestimation of 0.1795 Gg of CO_2 eq between reported value and correct value. Latvia used 0.81; the correct value, according to the IPCC good practice guidance, should be within the range 0.82–0.88. The ERT recommends that Latvia revise its estimates using the correct value in its next annual submission. The ERT also recommends that Latvia enhance its QC procedures to avoid such mistakes in future submissions.

C. Areas for further improvement

1. Identified by the Party

104.   During the in-country review, Latvia indicated that the following improvements are planned:

(a)   Use of a tier 2 method to estimate CH_4 emissions from enteric fermentation and N_2O emissions from manure management;

(b)   Detailed evaluation of uncertainties.

2. Identified by the expert review team

105.   In general, the quality of inventory for the agriculture sector has been improved from the previous submission. However, some issues have to be improved in future submissions, especially for key categories. The ERT recommends that Latvia:

(a)   Strengthen the application of the QA/QC procedures and undertake the necessary effort to increase transparency, consistency and accuracy of the inventory by including more information on country-specific methodologies and parameters used;

(b)   Develop steps for implementing a consistent method to obtain information on existing organic soils and those used in agriculture through appropriate research to provide quality national information on soil classifications in accordance with international standards.

VI. Land use, land-use change and forestry

A. Sector overview

106.   In 2007, net removals from the LULUCF sector amounted to 31,984.25 Gg CO_2 eq. Since 1990, net removals have increased by 49.3 per cent, mainly driven by the increase in carbon stocks of living biomass and offset by emissions from organic soils, wood harvest and biomass burning. Within the sector, 31,696.32 Gg CO_2 eq of the net removals are from forest land, followed by 393.25 Gg CO_2 eq from settlements, while wetlands, grassland and other land account for 47.19 Gg CO_2 eq, 38.81 Gg CO_2 eq and 18.09 Gg CO_2 eq respectively. The net emissions from cropland account for 209.41 Gg CO_2 eq, or 0.6 per cent of sector removals. The overall removal trend has been constantly increasing since 1990 with inter-annual fluctuations from 22.7 up to 30.0 per cent, mainly driven by a continuous increase in removals for forest land and settlements and a decrease in emissions from cropland.

107.   In its 2009 inventory submission, Latvia reports on emissions and removals for all land categories and human activities, such as agricultural liming and biomass burning. The emissions from nitrogen fertilization are reported as "NO", and those from drainage of soils and wetlands and disturbance associated with land-use conversion to cropland are reported as "NE". The sources of AD

include the National Forest Inventory for growing stock and harvest, CSB for land statistics and State Fire Fighting and Rescue Service for fire data. The inventory was prepared by the Latvian State Forest Research Institute in collaboration with the Ministry of Agriculture of Latvia and LEGMC (previously LEGMA).

108. The NIR does not contain information on consistent representation of lands, which is necessary to ensure that all lands are included in the reporting and that their areas are neither underestimated nor overestimated and do not overlap. The lack of consistent representation of lands may hamper Latvia's capability to report on direct human-induced LULUCF activities under Article 3.3 and forest management under Article 3.4 of the Kyoto Protocol. The definition of forest management and the distinction between managed and unmanaged lands are unclear. The ERT noted with concern that land-use categories used by Latvia differ from those in the IPCC good practice guidance for LULUCF. The ERT considers that this might result in reporting on CO_2 removals in wetlands and other land, which is not likely to occur when land-use categories are defined more consistently with the IPCC good practice guidance for LULUCF. The ERT further noted that the areas of organic soils differ between the LULUCF and agriculture sectors (the 2007 data in the NIR for the LULUCF (table 7.3.2) and agriculture (table 6.11) sectors are 78.82 and 86.61 kha correspondingly, see para. 91). The ERT reiterates the recommendation from the previous review report that Latvia document the identification of lands, cross-reference their areas and apply consistent land definition for its estimates in accordance with the IPCC good practice guidance for LULUCF. Furthermore, it is recommended that Latvia define forest management and clarify the distinction between managed and unmanaged lands in the NIR of its next annual submission.

109. During the review, the ERT learned that Latvia has an advanced data collection system for annual forest and perennial woody biomass stocks, which became fully operational in 2008. However, the recalculation of annual data on biomass stocks into annual removals still has to be tested, verified and elaborated, in particular to avoid any unusual increases over the previous year in removals for land converted to forest land, grassland and settlements. The ERT noted that for the estimation of CO_2 removals, Latvia applies a single set of IPCC default parameters, which does not account for species composition and age structure of its forests and perennial woody vegetation. This leads to a potential overestimation of removals in the national inventory. The ERT recommends that Latvia test and further elaborate its method for estimating annual removals from forest and perennial woody biomass. The ERT further recommends that Latvia explain and, if necessary, review the choice of parameters used for the estimation of removals in the LULUCF sector in its next annual submission.

1. Completeness

110. The CRF tables of the LULUCF sector include estimates for all gases and categories, as recommended by the IPCC good practice guidance for LULUCF. The emissions and removals have been reported for all years of the inventory time series. The ERT noted that information on non-CO_2 gases was not included in the NIR, while their emissions were reported in the CRF tables. The ERT further noted that Latvia did not estimate emissions and removals from land conversion for all land categories, except grassland conversion to forest land, and for all pools other than living biomass and organic soils. Subject to the availability of resources, the ERT recommends that Latvia continuously enhance reporting on these missing subcategories and pools in its future inventory submissions.

2. Transparency

111. The information in the NIR is not enough to review calculations for particular land categories and activities within the LULUCF sector. The methods, biomass expansion factors and assumptions used have been insufficiently documented. The ERT reiterates the recommendation from the previous review report that Latvia improve transparency of the NIR and CRF tables in its next annual submission,

through enhanced documentation of estimation methods, explanation of the choice of parameters (particularly for grassland) and supporting references.

3. Recalculations and time-series consistency

112.   The recalculations of emissions from biomass burning and removals for forest land remaining forest land have been undertaken in response to recommendations from the previous review report and owing to the availability of new AD. The time-series consistency has been maintained for all categories in line with the IPCC good practice guidance for LULUCF. Although the reasons for recalculations have been documented in the NIR, the ERT noted that the assessment of the recalculations was not provided in the NIR and that CRF table 8(b) has not been filled. The ERT also noted that an analysis of the recalculations performed by the secretariat indicated increases in CO_2 removals of 3.5 and 82.5 per cent in 1990 and 2006, respectively. The CH_4 and N_2O emissions increased correspondingly by 2.4 and 5.3 per cent in 1990 and by 15.3 and 14.0 per cent in 2006. The ERT encourages Latvia to undertake a quantitative assessment of the recalculations and document them in the relevant CRF tables in its next annual submission.

4. Uncertainties

113.   The NIR includes uncertainty estimates for all categories. However, the overall quantitative uncertainty assessment for the sector and the description of the uncertainty analysis were not provided in the NIR. In response to a question from the ERT during the in-country review, Latvia informed the ERT that the uncertainties have been developed through expert judgment and on the basis of statistical errors in the AD. But it was not clear how the uncertainty data were used to improve the national inventory estimates. For the next annual submission, the ERT encourages Latvia to undertake an overall quantitative uncertainty assessment for the sector and include the results in the NIR along with the description of how the uncertainty data are used to improve the inventory estimates.

5. Verification and quality assurance/quality control approaches

114.   The category-specific QA/QC procedures for the sector are adequate and have been appropriately described in the relevant chapter of the NIR. The verification procedures for the LULUCF sector have not been reported in the NIR. Additional information on QA/QC and archiving was provided to the ERT during the in-country review. The ERT encourages Latvia to undertake the verification procedures for the LULUCF sector inventory and document them in its next annual submission. The ERT acknowledges Latvia's effort to undertake QA/QC and archiving procedures and encourages their enhancement in future annual submissions.

B. Key categories

1. Forest land remaining forest land – CO_2

115.   In 2007, the net CO_2 removals for forest land remaining forest land amounted to 31,982.63 Gg CO_2, which is by 46.4 per cent higher than in 1990. For this category, Latvia reports on emissions from wood harvest and organic soils and removals in woody biomass and dead wood. Latvia applied the IPCC tier 1 method for its estimates, which implies country-specific AD and default IPCC parameters. The ERT noted that the use of tier 1 for this key category is not in line with the IPCC good practice guidance for LULUCF. The ERT reiterates the recommendation from the previous review report that Latvia develops country-specific parameters to shift to the IPCC tier 2 method for estimating emissions and removals for this category.

116.   Completeness and transparency of the inventory have improved since the previous submission. For example, the CO_2 emissions from organic soils that were reported as "NE" in the previous inventory

submissions are estimated and reported in the 2009 submission. However, the documentation of the estimation of emissions from organic soils in the NIR is still insufficient. The estimates of removals in dead wood are highly uncertain, as they are based on a few case studies (UNECE, 2006). During the in-country review, the ERT was informed that Latvia intends to improve estimates as soon as new national forest inventory data become available. The ERT recommends that Latvia enhance accuracy of its estimates of removals in dead wood in its future inventory submissions. The ERT further recommends that Latvia document the emissions from organic soils in its next annual submission.

2. Cropland remaining cropland – CO_2

117. Following the recommendations from the previous review report, in its 2009 submission, Latvia reports emissions from cultivated organic soils and removals in single trees and groups of trees under cropland remaining cropland. The emissions and removals for land converted to cropland and for mineral soils were not estimated. In 2007, the net emissions from this category were 204.70 Gg CO_2, which is by 49.0 per cent lower than in 1990. In 1994, they were by 52.3 per cent lower than in 1990, and from 2004 to 2007, they increased by 42.1 per cent. These trends were not discussed in the NIR. The ERT noted that Latvia applied the IPCC tier 1 method and default parameters for this key category, which is not in line with the IPCC good practice guidance for LULUCF. The ERT further noted that the rationale for the selection of specific parameters was not explained in the NIR. Moreover, it was not clear from the NIR whether single trees and groups of trees were below the thresholds used for the forest land category as required by the IPCC good practice guidance for LULUCF. The ERT reiterates the recommendation from the previous review report that Latvia document the estimates for cropland remaining cropland in its next annual submission. The ERT further recommends that Latvia develop country-specific parameters to apply the IPCC tier 2 method for estimating emissions and removals as well as document the thresholds for single trees and groups of trees as proposed in the IPCC good practice guidance for LULUCF. The ERT also recommends that Latvia undertake the estimates of emissions and removals for currently not estimated categories such as land converted to cropland and mineral soils.

3. Settlements – CO_2

118. In 2007, removals in perennial woody vegetation of settlements remaining settlements amounted to 393.25 Gg CO_2, which is by 168.0 per cent higher than in 1990. From 1990 to 2006, they gradually increased by 47.8 per cent, but from 2006 to 2007 they increased by 81.3 per cent. An explanation of the trend was not provided in the NIR. The emissions and removals for land converted to settlements and dead organic matter (DOM) were "NE". The ERT noted that for this category Latvia applied the IPCC tier 1 method and default IPCC parameters, which is not in line with the IPCC good practice guidance for LULUCF. The ERT recommends that Latvia explain the changes in the trend in its next annual submission. The ERT further recommends that Latvia develop country-specific parameters to apply the IPCC tier 2 method for estimating removals for this category. The ERT also recommends that Latvia undertake the estimates of emissions and removals for currently "NE" categories such as land converted to settlements and DOM.

C. Non-key categories

1. Land converted to forest land – CO_2

119. Latvia provides estimates of removals from cropland and grassland conversion to forest land under grassland converted to forest land. Cropland converted to forest land is reported as included elsewhere. For this category, Latvia reports removals in woody biomass and dead wood. The removals from cropland and grassland conversion to forest land amounted to 86.38 Gg CO_2 in 2007, which is by 273.1 per cent higher than in 1990 and by 18.8 per cent higher than in 2006. This increase between 2006

and 2007 is unusual and no explanation for the trend is provided in the NIR. The emissions and removals from conversion of other land categories to forest land were "NE". The ERT recommends that Latvia review the estimates for 2007 and document the trend in its next annual submission. The ERT further recommends that in its future inventory submissions Latvia undertake the estimates and report on emissions and removals for currently "NE" conversion of wetlands, settlements and other land to forest land.

2. Grassland – CO_2

120. Under grassland remaining grassland, Latvia reports removals from perennial woody vegetation and emissions from organic soil. Emissions from land converted to grassland are reported as "NE". In 2007, the net removals amounted to 46.44 Gg CO_2, which is by 871.7 per cent higher than in 1990. The ERT noted that after being relatively stable from 2001 to 2006, these emissions increased by 25.2 per cent from 2006 to 2007. The reasons for the increase are not explained in the NIR. The ERT recommends that Latvia review its inventory estimates for 2007 and document the trend in the next annual submission. The ERT further recommends that for its future inventory submissions Latvia undertake the estimates and report on emissions from currently "NE" land converted to grassland and from mineral soils.

3. Wetlands – CO_2

121. In 2007, removals from living biomass under wetlands remaining wetlands amounted to 47.19 Gg CO_2, which is by 67.7 per cent higher than in 1990. Removals were relatively stable from 1990 to 2006, but increased by 59.8 per cent from 2006 to 2007. The ERT noted that in accordance with the IPCC good practice guidance for LULUCF, the estimates for this category should only refer to carbon stock changes in organic soils managed for peat extraction and CO_2 emissions from flooded lands. Furthermore, the ERT learned that although peat extraction occurs in Latvia, the emissions from it were "NE". The ERT recommends that Latvia review its estimates and undertake reporting on wetlands in accordance with the IPCC good practice guidance for LULUCF in its next annual submission, including the necessary steps to collect the data for estimating the emissions from peat extraction.

4. Other land – CO_2

122. In 2007, removals from living biomass under land converted to other land (forest land converted to other land) amounted to 18.09 Gg CO_2, which is by 254.4 per cent higher than in 1990. These removals were relatively stable from 1990 to 2006; however, they increased by 222.6 per cent from 2006 to 2007. The ERT noted that it is unlikely that removals occur under conversion of forest land to other land, given the definition of other land and the default assumption that carbon stock after conversion is zero, which means that all carbon in biomass is released to the atmosphere as CO_2 emissions. Therefore the ERT recommends that Latvia review its estimates and report on other land category in accordance with the IPCC good practice guidance for LULUCF in its next annual submission.

5. Agricultural lime application – CO_2

123. In its 2009 submission, Latvia reports CO_2 emissions from limestone use. In 2007, the emissions from liming amounted to 4.71 Gg CO_2, which is by 1.9 per cent higher than in 1990. The ERT noted that the emissions were estimated on the basis of the specific amount of CaO used per hectare of agricultural land. The ERT further noted that the total area of agricultural land subject to liming was not provided in the NIR. To avoid a potential overestimation of the emissions, the ERT encourages Latvia to calculate emissions from liming on the basis of the total amount of CaO used in agriculture as recommended by the IPCC good practice guidance for LULUCF in its next annual submission.

6. Biomass burning – CO_2, CH_4 and N_2O

124.   Under the biomass burning category, Latvia reports emissions from the controlled burning of slash and wildfires for forest land remaining forest land, and burning of the previous year's dry grass for grassland remaining grassland. The emissions were estimated using the IPCC tier 1 method and default parameters provided in the IPCC good practice guidance for LULUCF. During the in-country review, the ERT learned that forest wildfire emissions were calculated based on remaining (post-fire) woody biomass instead of the initial (pre-fire) amount. The latter results in an underestimation of emissions from forest fires. The ERT recommends that Latvia use the initial (pre-fire) woody biomass data for the calculation of forest wildfire emissions and provide correct estimates in its next annual submission.

D. Areas for further improvement

1. Identified by the Party

125.   For its future inventory submissions, Latvia has identified in its NIR the following improvements:

(a)   Enhance the estimates of removals from DOM for forest land, cropland and settlements through improved AD collection;

(b)   Obtain the data and estimate emissions from mineral soils for forest land remaining forest land;

(c)   Improve the removal estimates in perennial woody biomass for cropland and settlements through enhanced AD collection.

2. Identified by the expert review team

126.   The ERT recommends the following improvements for the LULUCF sector inventory, for the next annual submission:

(a)   Document the identification of lands, provide information on consistent representation of lands and check the areas of lands reported in the agriculture and LULUCF sectors;

(b)   Review the national definitions of lands to ensure agreement with the IPCC good practice guidance for LULUCF, provide the definition of forest management and distinguish between managed and unmanaged lands;

(c)   Elaborate country-specific methods for estimating annual removals from living biomass and other pools, where possible and considering national circumstances, in accordance with the IPCC good practice guidance for LULUCF;

(d)   Develop country-specific parameters for the IPCC tier 2 method for key categories of the inventory, in accordance with the IPCC good practice guidance for LULUCF;

(e)   Subject to the availability of resources, undertake calculations of emissions and removals and report on categories and pools that are not currently estimated, in accordance with the IPCC good practice guidance for LULUCF.

VII. Waste

A. Sector overview

127.   In 2007, emissions from the waste sector amounted to 833.03 Gg CO_2 eq, or 6.9 per cent of total GHG emissions. Since the base year, emissions have decreased by 0.9 per cent. Within the sector, 64.0 per cent of the emissions were from solid waste disposal on land, followed by 35.7 per cent from wastewater handling and 0.3 per cent from waste incineration and other (composting).

1. Completeness

128.   The CRF tables include estimates for most gases and categories of emissions from the waste sector, as recommended by the Revised 1996 IPCC Guidelines. Categories and gases reported as "NE" by Latvia in its annual submission include CO_2 and N_2O emissions from biogenic waste incineration, and CH_4 and N_2O emissions from non-biogenic waste incineration.

2. Transparency

129.   Latvia did not provide an explanation of the sources of AD for solid waste during the period 1990–2000. The ERT recommends that Latvia provide in the NIR of its next annual submission further explanation of the sources of such AD. Moreover, a clear explanation of the methods used to arrive at uncertainty estimates should be provided and justification for any revisions to the FOD model should be clearly described in the NIR.

130.   The emission trends from different categories are not explained in the NIR. The ERT recommends that Latvia provide an explanation for such trends in the NIR of its next annual submission.

3. Recalculations and time-series consistency

131.   Recalculations have been performed and reported in accordance with the IPCC good practice guidance. The ERT noted that recalculations of emissions from wastewater handling have been reported by the Party for the time series 1990–2006, to take into account an update of the population data and correction of an error which was identified during the QA/QC process. The major changes, and the magnitude of the impacts, include an increase in total GHG emissions in 1990 (0.6 per cent) and in 2006 (0.4 per cent). Although the rationale for these recalculations is provided in the NIR and in CRF table 8(b), the information in CRF table 8(b) is not complete since it only refers to the update of the national population data and not to the error identified during the QA/QC process. The ERT recommends that Latvia provide a full explanation for any recalculations in table 8(b) its future annual submissions.

4. Uncertainties

132.   Uncertainty values for AD and EFs which are estimated based on expert judgement are not well documented in the NIR. The ERT recommends that Latvia further explain the expert elicitation methods used to arrive at such estimates in its next annual submission. Uncertainties for different categories from this sector were reported.

5. Verification and quality assurance/quality control approaches

133.   During the in-country review, the Party explained that general tier 1 QC procedures on the data provided by the waste management enterprises are done by the regional environmental board and the experts at LEGMC (previously LEGMA). The ERT recommends that Latvia describe the QC procedures in the NIR of its next annual submission and clearly explain the QC tier used.

B. Key categories

1. Solid waste disposal on land – CH$_4$

134.   During the in-country review, the Party explained that equal weights were used for gross domestic product (GDP) and population data from CSB to extrapolate the data on the amount of waste disposed of in landfills. Such procedures are not sufficiently described in the NIR. The ERT recommends that Latvia provide further explanation in the NIR of the exact procedures used for its estimates in its next annual submission. The Party did not provide an explanation of the sources of AD for the period between 1990 and 2000. The ERT also recommends that Latvia provide further explanation of the sources of AD for this period. Moreover, for the years when population and GDP data were not available, population and GDP were assumed to be constant without interpolation between the points where data is known. The ERT recommends that Latvia use interpolation instead of assuming constant values for population or GDP in the missing years, for example the period 1971–1978.

135.   Latvia for its estimates assumed that solid waste disposal sites (SWDS) between the years 1980 and 1989 were divided into 50 per cent of managed disposal sites and 50 per cent of unmanaged. No justification for such an assumption is provided in the NIR. The ERT recommends that Latvia justify this assumption in its next annual submission.

136.   The FOD model used for estimating emissions from this category is slightly different from the one provided in the IPCC good practice guidance (chapter 5, page 5.6), which results in different emission estimates. During the in-country review, the Party explained that the model used is the one provided in the 2006 IPCC Guidelines with some slight modifications. The ERT recommends that Latvia in its next annual submission either use the exact model given in the IPCC good practice guidance or explain that the model used is a country-specific one, thereby justifying its selection and/or any modifications made.

137.   The Party did not explain the rationale for the assumptions behind the parameters used in the FOD model, specifically degradable organic carbon (DOC), methane generation rate constant (k) and fraction of CH$_4$ in landfill gas (F). During the in-country review, the Party explained that due to a lack of research on country-specific parameters, the Party applied expert advice from European Union experts on the value of DOC while the default IPCC assumptions were used for the k and F parameters. The Party is recommended to conduct research in order to develop country-specific parameters that enable a more accurate emission estimation for this key category, especially since it is the largest in this sector.

138.   In CRF table 6.A, under managed solid waste disposal on land, the notation key "NE" is used for CO$_2$ emissions. CO$_2$ emissions from an SWDS are only estimated as long as combustion of solid waste is a management practice at the SWDS, which, according to its explanation during the in-country review, is not the case in Latvia. Therefore, the ERT recommends that Latvia change the notation key for CO$_2$ emissions from SWDS from "NE" to "NO".

2. Wastewater handling – CH$_4$

139.   In the previous review report the use of a higher-tier method was recommended to estimate emissions from wastewater handling since this is a key category, but Latvia still uses the "check method" provided in box 5.1 in the IPCC good practice guidance (chapter 5, page 5.16) to estimate CH$_4$ emissions from domestic wastewater handling. The ERT reiterates the recommendation from the previous review report and encourages the Party to utilize the data available in the2-water database, which contains information about the treatment technologies in wastewater treatment plants. This information can help the Party move to a higher-tier method for estimating emissions in its future submissions.

140.   In the previous review report, it was recommended that the Party investigate the potential for other industries to be sources of CH_4 emissions, other than the food industry. During the in-country review, Latvia explained that the estimation of CH_4 emissions from other industries is included in its plan for improvement for the next annual submission. The ERT welcomes Latvia's efforts in this regard and recommends that Latvia provide such estimates in its future annual submissions.

141.   The NIR does not transparently present information on the source of information or methodology for estimating CH_4 emissions from local anaerobic treatment plants in the industry sector. The ERT recommends that Latvia provide information on how such emissions are estimated in the NIR of its next annual submission.

142.   In CRF table 6.B, the notation key "NE" is used for category other – wastewater. This notation key should be changed to "NO".

C. Non-key categories

1. Waste incineration – CH_4 and N_2O

143.   It is mentioned in the NIR that N_2O emissions from the incineration of hazardous and hospital waste are "NE" since the appropriate EFs for the waste types and the incinerators used in Latvia are not available. The Party should provide further explanation as to why the EFs included in the Revised 1996 IPCC Guidelines are "NA" to the incinerators used in Latvia.

144.   The Party is encouraged to undertake research activities in order to develop country-specific EFs for CH_4 and N_2O from the incineration of hazardous and hospital waste, and CO_2, CH_4 and N_2O from cremation in Latvia. The Party is encouraged to use values from neighbouring countries, if available, until country-specific EFs are developed.

2. Wastewater handling – N_2O

145.   Latvia used a constant value for the annual protein consumption per capita for the complete time series. In the previous review report, it was recommended that the Party provide more information in the NIR on the source of information for the value of annual protein consumption per capita (27.375 kg/resident/year). The ERT reiterates this recommendation. In addition, the ERT recommends that Latvia investigate the possible change in such a value across the time series resulting from change in food consumption patterns.

3. Other (compost production) – CH_4 and N_2O

146.   Latvia continued to report on N_2O and CH_4 emissions from composting in its 2009 submission using a tier 1 method and default EFs provided in the 2006 IPCC Guidelines. The ERT commends the Party for its continuous effort to estimate CH_4 and N_2O emissions from this category.

D. Areas for further improvement

1. Identified by the Party

147.   The NIR did not include information about planned improvements by the Party. However, during the in-country review, Latvia stated that there are planned improvements related to the methodology to estimate CH_4 emissions from domestic wastewater, coverage of the full time series to estimate N_2O emissions from industrial wastewater and the improvement of uncertainty estimates. The ERT welcomes these efforts by the Party and recommends that the Party explain any planned improvements in the NIR of its next annual submission.

2. Identified by the expert review team

148.   The ERT identified the following areas for improvement:

(a)   Undertake research to develop country-specific parameters used in the FOD model, specifically DOC, k and F;

(b)   Conduct research to develop country-specific EFs for CO_2, CH_4 and N_2O from waste incineration.

VIII. Supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol

A. Information on Kyoto Protocol units

1. Standard electronic format and reports from the national registry

149.   Latvia has reported information on its accounting of Kyoto Protocol units in the required SEF tables, as required by decisions 15/CMP.1 and 14/CMP.1. The ERT took note of the findings included in the SIAR on the SEF tables and their comparison report.[6] The SIAR was forwarded to the ERT prior to the review, pursuant to decision 16/CP.10. The ERT reiterated the findings included in the SIAR.

150.   Information on the accounting of Kyoto Protocol units has been prepared and reported in accordance with section I.E of the annex to decision 15/CMP.1, and reported in accordance with decision 14/CMP.1 using the SEF tables. This information is consistent with that contained in the national registry and with the records of the international transaction log (ITL) and the clean development mechanism registry and meets the requirements set out in paragraphs 88(a) to (j) of the annex to decision 22/CMP.1. The transactions of Kyoto Protocol units initiated by the national registry are in accordance with the requirements of the annex to decision 5/CMP.1 and the annex to decision 13/CMP.1. No discrepancy has been identified by the ITL and no non-replacement has occurred. The national registry has adequate procedures in place to minimize discrepancies.

2. National registry

151.   The ERT took note of the SIAR and its finding that the national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with decisions 16/CP.10 and 12/CMP.1.

152.   The national registry has fulfilled requirements regarding the public availability of information in accordance with section II.E of the annex to decision 13/CMP.1, however the SIAR noted that the public page wrongly indicates that SEF tables are prepared by the IPCC. The ERT recommends that Latvia correct this mistake for its next annual submission.

3. Calculation of the commitment period reserve

153.   Latvia has reported its commitment period reserve in its 2009 annual submission. Latvia reported its commitment period reserve to be 60,413,329 t CO_2 eq, based on the total GHG emissions in its most recently reviewed inventory (12,082.666 Gg CO_2 eq). The ERT agrees with this figure.

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6   The SEF tables comparison report is prepared by the administrator of the ITL and provides information on the outcome of the comparison of data contained in the Party's SEF tables with corresponding records contained in the ITL.

B. Changes to the national system

154.   Latvia reported in the NIR that Cabinet Regulation No.157 was approved and adopted by the Cabinet of Ministers on 17 February 2009 (see para. 19). Detailed functions, roles and responsibilities of institutions involved in the preparation of the national GHG inventory are prescribed in this new regulation. As explained in the NIR, many of the determined actions under this regulation were not implemented in time for the 2009 submission but will be fully implemented in time for the 2010 submission. Latvia also reported in the NIR on the specific responsibilities of institutions during the development of the 2009 submission prior to the approval and adoption of the new regulation. However, the ERT could not find a clear explanation in the NIR of this or other specific changes in its national system since the previous annual submission. During the in-country review, Latvia explained that the responsibilities of institutions for the 2009 submission had changed. For example, the Latvian State Forest Research Institute so called "Silava" and FEI took part in the inventory preparation for the first time (see para. 22). Taking into account the confirmed changes to the national system, and having seen archived documentation on the preparation of the 2009 submission (e.g. records of communication between institutions), the ERT concluded that Latvia's national system continues to be in accordance with the requirements of national systems outlined in decision 19/CMP.1.

155.   The ERT recommends that Latvia, in its next annual submission, report any change(s) in its national system in accordance with section I.F of the annex to decision 15/CMP.1. In addition, Latvia should clarify specific changes caused by the approval and adoption of Cabinet Regulation No.157.

C. Changes to the national registry

156.   Latvia reported in the NIR the following change in its national registry since the previous annual submission: Latvia's registry has been active since October 2008 when the GRETA registry version 3.0.0.83 was used for the "Go-Live process". During the in-country review, Latvia provided access to information from its national registry that substantiated or clarified the information reported in its annual submission.

157.   The SIAR noted that Latvia had indicated that significant changes would be made to the infrastructure, software and database of its registry in 2009. If such changes to the national registry occurred, supporting information, including details on what was changed and the relevant test plans and test reports should be provided. The SIAR therefore strongly recommended that Latvia improve its next annual submission by providing definitive statements as to whether changes to its registry have occurred or not, for each of the items under paragraphs 32(a) to 32(j) of the annex to decision 15/CMP.1. The ERT reiterates this recommendation.

158.   The ERT concluded that, taking into account the confirmed change in the national registry as well as the findings presented in the SIAR, Latvia's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the CMP. The ERT recommends that the Party, in its next annual submission, report any change(s) in its national registry in accordance with section I.G of the annex to decision 15/CMP.1.

IX. Conclusions and recommendations

159.   Latvia made its annual submission on 15 April 2009. Latvia indicated that the 2009 annual submission is a voluntary submission under the Kyoto Protocol. The annual submission contains the GHG inventory (comprising CRF tables and an NIR) and supplementary information under Article 7, paragraph 1, of the Kyoto Protocol (information on Kyoto Protocol units and information on changes to the national system and the national registry). This is in line with decision 15/CMP.1.

160.   The ERT concludes that the inventory submission of Latvia has been generally prepared and reported in accordance with the UNFCCC reporting guidelines. The inventory submission is complete and the Party has submitted a complete set of CRF tables for the years 1990–2007 and an NIR; these are complete in terms of years, sectors and gases, as well as generally complete in terms of categories. The inventory is also complete in terms of geographical coverage; however, the ERT noted with concern that the completeness of geographical coverage could not be confirmed for the LULUCF sector because of the absence of information on consistent representation of lands in the NIR (see para. 108). Latvia has reported as "NE": actual emissions of HFC-134a and HFC-23 for refrigeration and SF_6 for electrical equipment for the period 1990–1994, as well as some other HFC chemicals for the period 1990–2003; potential emissions of SF_6 for the period 1990–2007 and potential emissions of some HFC chemicals for the period 1990–2003 in the industrial processes sector; CO_2 emissions/removals from various subcategories and pools in the LULUCF sector; and CO_2, CH_4 and N_2O emissions from waste incineration in the waste sector. In addition, during the in-country review Latvia informed the ERT that HFC emissions from foam blowing that were reported originally as "NO" should be reported as "NE" (see para. 71).

161.   The submission on a voluntary basis of information required under Article 7, paragraph 1, of the Kyoto Protocol has been generally prepared and reported in accordance with decision 15/CMP.1. Latvia did not report on a voluntary basis information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, and information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

162.   Latvia has reported information on its accounting of Kyoto Protocol units in accordance with section I.E of the annex to decision 15/CMP.1, and used the required reporting format tables as required by decision 14/CMP.1.

163.   Latvia's inventory is generally in line with the UNFCCC reporting guidelines, the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. However, the ERT notes that additional efforts are needed, especially regarding completeness of the categories estimated in the inventory, consistency in time series, provision of more transparent documentation on methods, data and assumptions used for the emission estimates, and development of country-specific parameters.

164.   In its 2009 inventory submission, Latvia did not provide documented information on consistent representation of lands in accordance with the IPCC good practice guidance for LULUCF. In addition, the ERT noted that land-use categories used by Latvia differ from those in the IPCC good practice guidance for LULUCF. According to the ERT, the absence of this information and inconsistency of land-use categories used by Latvia with those in the IPCC good practice guidance for LULUCF would make it difficult for Latvia to meet the requirements for geographical identification of lands under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. The ERT notes that additional efforts should be made in this regard.

165.   The national system continues to perform its required functions as set out in the annex to decision 19/CMP.1. However, the ERT concluded that Latvia needs to enhance the implementation of the QA/QC procedures in its QA/QC plan as it detected mistakes during the review that could have been avoided if the QA/QC procedures had been effectively implemented.

166.   The national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant decisions of the CMP.

167.   In the course of the review, the ERT formulated a number of recommendations relating to the completeness, transparency and time-series consistency of Latvia's annual submission and to the continuous improvement of the inventory. The key recommendations are that Latvia:

(a)   Provide a clearer explanation in all chapters in the NIR, of the methods, EFs and other parameters used for estimates in each category, sources of uncertainty estimates, and category-specific QC procedures;

(b)   Ensure that the NIR transparently presents information on the national system as well as the QA/QC plan and its procedures;

(c)   Make the effort to ensure capacity of LEGMC with regard to sufficient human and financial resources to correctly implement inventory preparation including key category analysis and uncertainty analysis;

(d)   Review additional potential data sources, and develop and implement a data collection plan aimed at generating emission estimates for all non-estimated categories;

(e)   Complement its key category analysis with a qualitative approach;

(f)   Implement the QA/QC procedures in its QA/QC plan, in particular the QA procedures involving public review and review by independent experts;

(g)   Further improve the QA/QC plan where necessary (e.g. inclusion of tier 2 category-specific QC procedures for key categories);

(h)   Use higher tiers for key categories, where possible and considering national circumstances, in accordance with the IPCC good practice guidance;

(i)   Document transparently in the NIR how plant-specific data are incorporated to estimate emissions, in a way that demonstrates the completeness, accuracy and time-series consistency for each category;

(j)   Promote research studies aimed at improving emission estimates (e.g. research to ensure that national information on land classifications conforms to international standards, and research to develop country-specific parameters to be used in the FOD model in the waste sector);

(k)   Undertake additional efforts to meet the requirements for reporting information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in terms of maintaining conformity with the IPCC good practice guidance for LULUCF and decisions 15/CMP.1 and 16/CMP.1.

X. Questions of implementation

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

<u>Annex I</u>

Documents and information used during the review

A. Reference documents

Intergovernmental Panel on Climate Change. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.html>.

Intergovernmental Panel on Climate Change. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

Intergovernmental Panel on Climate Change. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. Available at <http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/SBSTA/2006/9. Available at <http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf>.

"Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention". FCCC/CP/2002/8. Available at <http://unfccc.int/resource/docs/cop8/08.pdf>.

"Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol". Decision 19/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

Status report for Latvia 2009. Available at <http://unfccc.int/resource/docs/2008/asr/lva.pdf>.

Synthesis and assessment report on the greenhouse gas inventories submitted in 2009. Available at <http://unfccc.int/resource/webdocs/sai/2009.pdf>.

FCCC/ARR/2008/LVA. Report of the individual review of the greenhouse gas inventory of Latvia submitted in 2007 and 2008. Available at <http://unfccc.int/resource/docs/2009/arr/lva.pdf>.

UNFCCC. Standard independent assessment report, Parts I and II. Unpublished document.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Agita Gancone (Latvian Environment, Geology and Meteorology Agency) and Mr. Andis Lazdinš (Latvian State Forest Research

Institute "Silava"), including additional material on the methodology and assumptions used. The following documents were also provided by Latvia:

Central Statistical Bureau of Latvia. 2003. Agriculture Census in Latvia 2001. Collection of Statistical Data. Riga.

Central Statistical Bureau of Latvia. 2008. Agriculture Farms of Latvia 2007. Collection of Statistical Data. Riga.

Central Statistical Bureau of Latvia. 2008. The Structure of Agricultural Farms of Latvia in June 2007. Riga.

Central Statistical Bureau of Latvia. 2009. Agriculture Farms of Latvia 2008. A Brief Collection of Statistical Data. Riga.

Central Statistical Bureau of Latvia. 2009. Agriculture of Latvia 2008. A Brief Collection of Statistical Data. Riga.

Ministry of Environmental Protection and Regional Development. Climate Change Mitigation Policy Plan for Latvia 2008. Riga.

(Doc. ESTAT/B-1/Quality/2009/05C "ESS Quality and Performance Indicators – 2009 Progress Report", and ESS Standard for Quality Reports 2009 edition (ISSN 1977-0375)).

LZA Fizikalas Energetikas instituts, "Petijums par vietejas aviacijas un vietejo iekšzemes udenscelu degvielas paterinu no 1990-2004" (Research about fuel combustion in domestic navigationan aviation 1990–2004), Riga, 2006.

<u>Annex II</u>

Acronyms and abbreviations

AD	activity data	IEA	International Energy Agency
AWMS	animal waste management system	IEF	implied emission factor
CaO	lime	IPCC	Intergovernmental Panel on Climate Change
CH_4	methane		
CKD	cement kiln dust	ITL	international transaction log
CO_2	carbon dioxide	kg	kilogram (1 kg = 1 thousand grams)
CO_2 eq	carbon dioxide equivalent	LULUCF	land use, land-use change and forestry
CRF	common reporting format		
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol	NA	not applicable
		NE	not estimated
		Nex	nitrogen excretion
DOC	degradable organic carbon	NMVOC	non-methane volatile organic compounds
DOM	dead organic matter		
EF	emission factor	NO	not occurring
ERT	expert review team	N_2O	nitrous oxide
EU ETS	European Union emissions trading scheme	NIR	national inventory report
		PFCs	perfluorocarbons
F-gas	fluorinated gas	QA/QC	quality assurance/quality control
FOD	first-order decay	SEF	standard electronic format
GDP	gross domestic production	SF_6	sulphur hexafluoride
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	SIAR	Standard Independent Assessment Report
		SWDS	solid waste disposal sites
		TJ	terajoule (1 TJ = 10^{12} joule)
		UNFCCC	United Nations Framework Convention on Climate Change
HFCs	hydrofluorocarbons		

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