**UNITED
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on Climate Change**

Report of the individual review of the greenhouse gas inventory of Latvia submitted in 2005[*]

CONTENTS

<u>Annex</u>

I. Overview

A. Introduction

1.   This report covers the centralized review of the 2005 greenhouse gas (GHG) inventory submission of Latvia, coordinated by the United Nations Framework Convention on Climate Change (UNFCCC) secretariat, in accordance with decision 19/CP.8. The review took place from 3 to 8 October 2005 in Bonn, Germany, and was conducted by the following team of nominated experts from the roster of experts: Generalists –Ms. Anke Herold (European Community) and Mr. Ruta Bubniene (Lithuania); Energy – Mr. Leif Hockstad (USA), Mr. Michael Strogies (Germany) and Mr. Steven Oliver (Australia); Industrial Processes – Ms. Sonia Petrie (New Zealand), Ms. Ionela Draghici (Romania) and Mr. Kiyoto Tanabe (Japan); Agriculture – Mr. Marcelo Rocha (Brazil) and Mr. Erda Lin (China); Land Use, Land-use Change and Forestry (LULUCF) – Mr. Justin Ford-Robertson (New Zealand) and Mr. Jozef Mindas (Slovakia); Waste – Mr. Ayite-Lo Ajavon (Togo) and Ms. Anke Herold. Ms. Anke Herold and Mr. Ayite-Lo Ajavon were the lead reviewers. The review was coordinated by Ms. Rocio Lichte (UNFCCC secretariat).

2.   In accordance with the "Guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention", a draft version of this report was communicated to the Government of Latvia, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Inventory submission and other sources of information

3.   In its 2005 submission, Latvia submitted a complete set of common reporting format (CRF) tables for the years 1990–2003 and a national inventory report (NIR). Latvia has not provided the tables of the CRF for LULUCF as required by decision 13/CP.9. Where needed, the expert review team (ERT) also used previous years' submissions, additional information provided during the review, and other information. The full list of materials used during the review is provided in the annex to this report.

C. Emission profiles and trends

4.   In 2003, the most important GHG in Latvia was carbon dioxide (CO_2), contributing 70.5 per cent to total[1] national GHG emissions expressed in CO_2 equivalent, followed by methane (CH_4), 18.1 per cent, and nitrous oxide (N_2O), 11.2 per cent. Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) taken together contributed 0.2 per cent of the overall GHG emissions in the country. The Energy sector accounted for 72.2 per cent of total GHG emissions, followed by Agriculture (15.4 per cent), Waste (8.9 per cent) and Industrial Processes (2.4 per cent). Total GHG emissions amounted to 10,529 Gg CO_2 equivalent and had decreased by 58.6 per cent from 1990 to 2003. The large decrease is mainly due to the economic restructuring process and the transition to a market economy in Latvia after 1990.

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[1] In this report, the term total emissions refers to the aggregated national GHG emissions expressed in terms of CO_2 equivalent excluding LULUCF, unless otherwise specified. Because Latvia has not provided estimates for LULUCF using the tables of the CRF for LULUCF but has reported estimates for the "old" Land-use Change and Forestry according to the tables contained in the CRF adopted by decision 18/CP.8, this report refers to Land-use Change and Forestry instead of LULUCF, as appropriate.

D. Key categories

5.   Latvia reports a key category tier 1 analysis, both level and trend assessment, as part of its 2005 submission. The key category analyses performed by the Party and the secretariat[2] produced very similar results. Latvia is encouraged to include the LULUCF estimates in its key category analysis in future.

E. Main findings

6.   The inventory submitted by Latvia is broadly in conformity with the UNFCCC "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories", the *Revised 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories* (hereinafter referred to as the Revised 1996 IPCC Guidelines) and the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (hereinafter referred to as the IPCC good practice guidance). The NIR includes information on key categories, methods, data sources and emission factors (EFs).

7.   The ERT commends Latvia for the considerable number of improvements made since the last (2004) submission and review, in particular the inclusion of additional gases and source categories. However, the uncertainty estimation and quality assurance/quality control (QA/QC) procedures are still not developed. There are still a number of key categories that are not yet estimated in line with the IPCC good practice guidance, and transparency can be further improved as indicated in the sectoral sections of this report below. Considerable improvements and revisions are still outstanding in the LULUCF sector, for which data have not been estimated and reported according to the land-use categories of the IPCC *Good Practice Guidance for Land Use, Land-use Change and Forestry* (hereinafter referred to as the IPCC good practice guidance for LULUCF).

F. Cross-cutting topics

1. Completeness

8.   Latvia has provided inventory data for the years 1990–2003 with full geographical coverage and included all the required tables. The notation keys are used in some tables but only in a limited way. As regards the fluorinated gases (F-gases), Latvia has not reported PFC emissions from consumption of halocarbons and SF_6 and only reported actual emissions of HFCs from refrigeration and air conditioning, fire extinguishers and aerosols, and SF_6 from electrical equipment; all other subcategories are not estimated. In the Waste sector, N_2O emissions from waste incineration are not estimated. The ERT encourages Latvia to estimate emissions from those categories that are not yet included in the inventory.

2. Transparency

9.   The transparency of the inventory has improved compared with the previous (2004) submission, and more information is included regarding data and methods. However, calculation methodologies, activity data (AD) and EFs should be better documented in the NIR, particularly for country-specific data, as indicated in the sectoral sections of this report. The notation keys are used to a limited extent and not all information is provided in the background tables. The Party is encouraged to improve the use of the notation keys, and to complete the missing information in the sectoral background data tables.

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[2] The secretariat identified, for each Party, those source categories which are key categories in terms of their absolute level of emissions, applying the tier 1 level assessment as described in the Intergovernmental Panel on Climate Change *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. Key categories according to the tier 1 trend assessment were also identified for those Parties that provided a full set of CRF tables for the year 1990. Where the Party has performed a 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.

3. Recalculations and time-series consistency

10.   The ERT noted that recalculations reported by the Party of the time series 1990–2002 had been undertaken to take into account changes to the methodologies used in some sectors, changes of EFs and updated AD. The major changes include: recalculations in Manufacturing Industries and Construction in the base year, and recalculations in the Transport sector due to the use of the COPERT III model. The rationales for the recalculations are provided in table 8(b) and in the sectoral descriptions of the NIR. However, more detailed information should be provided on the recalculations, for example, an evaluation on how they have affected specific source categories and their trend, and clarification as to the source categories for which AD and EF have been updated, or the gases for which EFs have been updated. The effect of the recalculations for the base year (1990), as reported in the CRF tables, is a decrease of 12.2 per cent in the estimates of total CO_2 equivalent emissions, and a decrease of 31.9 per cent including Land-Use Change and Forestry (LUCF). The ERT commends Latvia for these improvements to the inventory.

4. Uncertainties

11.   Latvia has not provided a quantitative uncertainty assessment. The ERT recommends that Latvia perform an uncertainty analysis for its next inventory submission. In its response to the review, Latvia explained that it had started to prepare an uncertainty assessment which will be included in the 2006 inventory submission.

5. Verification and quality assurance/quality control approaches

12.   As with Latvia's last inventory submission, QA/QC procedures have not yet been implemented because of lack of financial and human resources. Latvia plans to implement and report them in its future inventory submissions.

6. Follow-up to previous reviews

13.   Latvia has made a number of improvements suggested by previous reviews, in particular:

(a)   The provision of additional explanations and information in the NIR;

(b)   The inclusion of HFCs from consumption of halocarbons and SF_6;

(c)   The use of the COPERT III model in the Transport sector;

(d)   The use of country-specific EFs for key categories;

(e)   The provision of more information on the country-specific EFs and assumptions made in the Agriculture sector.

G. Areas for further improvement

1. Identified by the Party

14.   The NIR identifies several areas for improvements:

(a)   The estimation of quantitative uncertainties;

(b)   The establishment of a QA/QC programme and QA/QC procedures;

(c)   The establishment of a national inventory system;

(d)   An updated estimation of emissions and removals in the LULUCF sector in accordance with the IPCC good practice guidance for LULUCF and the new CRF tables for LULUCF;

(e)   Improved time-series consistency of the AD in the Energy sector;

(f)   Revision of the estimation of emissions from metal production;

(g)   An evaluation of the area of cultivated histosols.

2. Identified by the ERT

15.   The ERT acknowledges that Latvia has already identified most of the important improvements. It further recommends the following improvements:

(a)   Enhanced transparency of the information reported on recalculations performed;

(b)   The use of higher-tier methods for key categories;

(c)   More complete reporting on the F-gases, in particular PFCs and SF_6 from consumption of halocarbons and SF_6;

(d)   An improved description of feedstocks and non-energy uses of fuels.

16.   Recommended improvements relating to specific source/sink categories are presented in the relevant sector sections of this report.

II. Energy

A. Sector overview

17.   In 2003, the Energy sector was the largest source of GHG emissions in Latvia, accounting for 72 per cent of total national emissions. Emissions from the Energy sector totalled 7,606 Gg CO_2 equivalent, a decrease of 11,151 Gg CO_2 equivalent, or approximately 59 per cent, from the base year (1990). Within the Energy sector, the largest contributions were from Transport (35 per cent) and Energy Industries (32 per cent). The major sources included electricity generation and road transport. Fugitive emissions are of minor importance (they made up only 2 per cent of the Energy total in 2003), and emissions from oil and natural gas production are accounted for in this sector.

18.   The reporting of the Energy sector is mostly complete, consistent and comparable. The ERT recommends Latvia to improve its documentation of the notation keys used in the CRF tables and to better cross-reference the data provided in the CRF tables with the discussions in the NIR. Regarding transparency, the discussion of recalculations in the NIR and the CRF tables is not sufficiently precise and it was not easy for the ERT to ascertain why certain emissions and fuel consumption data have been recalculated. The ERT recommends that Latvia expand its recalculations section on the Energy sector in the NIR.

19.   The NIR states that a tier 1 methodology is used in Latvia, including for most key categories, with IPCC default EFs being used in conjunction with national energy statistics. According to the NIR, some country-specific EFs are used, but these are not specified in the NIR. Annex 1 to the NIR presents EFs and oxidation factors by fuel, but no references are provided, and, for natural gas and peat, unreferenced research by a local expert was used to determine the EF. The ERT recommends that Latvia improve the transparency of its reporting by noting the specific EFs used, with references, in its future inventory submissions.

B. Reference and sectoral approaches

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

20.   Latvia has calculated CO_2 emissions from fuel combustion using the reference approach and the sectoral approach, and provides data in CRF table 1.A(c) for the entire time series. For the year 2003, there is a difference of 3.5 per cent in the CO_2 emissions estimates and a difference of 2.1 per cent in the fuel consumption estimates between the reference and the sectoral approach. The differences fluctuate over the time series, and explanations provided in the documentation boxes in the CRF tables point to statistical differences as the cause. Activity data are not provided in the NIR for either approach, and the ERT recommends Latvia to include this information in its future submissions to facilitate a better understanding of the differences.

2. International bunker fuels

21.   Latvia has calculated consumption and emissions from international bunker fuels for the entire time series. Jet kerosene is the only fuel accounted for under international aviation bunker fuels, and the ERT recommends that the exclusion of aviation gasoline should be better explained in the NIR, e.g. as being due either to lack of AD or to the fact that consumption of this fuel is irrelevant in international operations. In its response to the review, Latvia stated that this recommendation would be taken into account in its 2006 submission. The ERT also believes that the quality of the reporting of international bunker fuels has declined since the 2004 submission. Latvia explained that for the 2005 submission officially published data (from the Central Statistical Bureau) for national and international navigation has been used, whereas for earlier submissions estimations were based on research by local experts, which may have had an impact on the quality of reporting. The ERT recommends Latvia to provide more information about the time series consistency in future submissions.

3. Feedstocks and non-energy use of fuels

22.   Latvia reports the carbon stored in bitumen in CRF table 1.A(d), although other feedstocks and possible non-energy uses of fuels are not presented, and the NIR does not provide a further description of feedstocks and non-energy uses of fuels (non-methane volatile organic compound (NMVOC) emissions from road paving and asphalt roofing are described). The ERT encourages Latvia to continue pursuing the AD needed for analysing these possible fuel uses.

4. Country-specific issues

23.   As previous review reports have noted, due to national circumstances, Latvia uses two fuel consumption data sets for the time series – one for 1990 and 1995–2003; and one for 1991–1994. This leads to fluctuations in the time series, and especially the trends between 1990 and 1991, and between 1994 and 1995. The NIR states that Latvia is working to correct the data sets. The ERT encourages this effort, and especially recommends that Latvia focus on better explaining the 1990 data set and how it links in with subsequent years.

C. Key categories

1. Manufacturing industries and construction

24.   The fuel consumption AD presented by Latvia in the CRF tables show a general downward trend through the time series for the combustion of fuels for energy purposes in Manufacturing Industries, but in the Industrial Processes chapter of the NIR, figure 4.1 presents data showing increased manufacturing output since 1995 in Latvia. These trends, in different sectors, seem to contradict each other, and the ERT recommends that Latvia investigate and explain these seemingly contradictory trends. In response to questions from the ERT, Latvia stated that fluctuations in CO_2 emissions could be explained with fuel switching operations, when industry started to use natural gas instead of residual fuel oil and coal or

other liquid or solid fuels. In the 2005 submission, fuel consumption from manufacturing industries and construction for the time period 1995–1997 were not separated for subsectors, and only total fuel consumption for the sector as a whole was given. The fuel consumption data is being reassessed by the Central Statistical Bureau of Latvia, and Latvia plans to separate the subsectors in the 2006 submission, as well as to recalculate all sectors. Latvia further stated that the Central Statistical Bureau of Latvia reassesses fuel consumption data almost every year because the enterprises often change the information reported, which also results in changes in the emissions estimates.

2. Other sectors: Liquid and solid fuels – CO_2

25.   The AD in Latvia show a large deviation in fuel consumption and corresponding emissions in 1992 in category 1.A.4.a Other Sectors: Commercial/Institutional, compared to the rest of the time series. The ERT recommends that Latvia re-examine the 1992 data to make sure that a transcription error has not occurred. In 1.A.4.b Other Sectors: Residential, the 2003 CO_2 emissions from solid fuels seem extremely low considering the level of fuel consumption provided in the CRF tables (the CO_2 implied emission factor (IEF) for 2003 is 75 per cent lower than in the rest of the time series). In its response to questions from the ERT, Latvia stated that its Central Statistical Bureau is still working on data improvements, including better details on fuel consumption, for the 1992–1993 time period, and so it is difficult for Latvia to comment on data for the year 1992 in the category 1.A.4.a Other Sectors: Commercial/Institutional. Latvia further stated that a general jump in emissions occurred due to large fuel consumption for off-roads in the sector (in Latvia, off-road fuel consumption has a different EF than stationary fuel combustion). For 1.A.4.b, the fuel consumption data are appreciably higher in 2003 than in the immediately preceding years, which leads the ERT to believe that there is a transcription error for the fuel data in the CRF tables. The ERT recommends that Latvia correct the 2003 fuel data for this sector for its next inventory submission. In response to being notified of this issue by the ERT, Latvia could not establish a fluctuation in consumption for this sector, and stated that the data would be reassessed and recalculated for the 2006 inventory submission. Additionally, the ERT recommends that Latvia expand on the discussion of 1.A.5 Other Sectors in the NIR, as only few details are currently provided in addition to what has been entered in the CRF tables. In particular, it should explain the large fluctuations if they are substantiated.

3. Road transportation: Liquid fuels – CO_2, N_2O

26.   The IEFs generated in the CRF tables indicate that apparently identical EFs have been used for gasoline, diesel and liquefied petroleum gas (LPG). Additionally, the NIR does not contain information about the fleet composition which has been applied in the COPERT model. The ERT recommends that Latvia provide more information on this model and the input data and basic assumptions in its next submission. In its response to this review, Latvia stated that in the 2006 submission the use of EFs would be corrected and further information on the model be provided.

27.   There are unexplained inter-annual variations in the fuel use within this source category, and the same values appear to have been used for LPG in 1997 and 1999–2003. It seems that updated AD for the most recent inventory years are not available, and this should be explained in the relevant NIR chapters. The ERT recommends that Latvia provide a better explanation and discussion of the AD used for the entire time series for this key category. In its response to this review, Latvia stated that the observed variations in the trend would be explained in the 2006 submission.

4. Fugitive emissions: All fuels – CO_2, CH_4, N_2O

28.   The previous (2004) review report noted that there was a general lack of completeness in many Oil and Gas subcategories. The ERT again encourages Latvia to improve the completeness of the inventory and to provide a discussion in the NIR as to why emissions within subcategories are not included or not estimated. In particular, priority should be given to reporting emissions from Natural Gas: Other Leakage (industrial plants and power stations). The ERT recommends Latvia to use the

IPCC default EFs for this purpose if equipment-specific factors cannot be obtained. If the emissions are reported elsewhere, than the appropriate notation keys and explanations should be provided. In addition, no AD are reported for Residential and Commercial Leakage, although an estimate of CH_4 emissions is provided. In its response to this review, Latvia explained that estimation of emissions is undertaken by the gas supplier according to a plant-specific methodology and EFs, at an aggregate level only. Latvia stated that the use of notation keys and corresponding explanations would be improved in the 2006 submission.

29.   For Natural Gas Transmission/Distribution no methodological description or information on EFs and AD are provided in the NIR. Latvia is recommended to provide more details on this subcategory in the NIR.

30. CH_4 emissions are reported for underground storage under the category Other (1.B.2.d). A short description of the methodology, EFs and AD used should be included in the NIR.

D. Non-key categories

1. Manufacturing industries and construction: Other fuels

31.   Latvia reports data under Other Fuels for 1.A.2.f in the CRF tables. However, no explanation is provided in the documentation boxes or the NIR as to what "other fuels" refers to. The IEFs are quite high (~85 t CO_2/TJ). The ERT encourages Latvia to include details on what the "other fuels" are in the CRF table documentation boxes. In response to questions from the ERT, Latvia stated that used tires are used in the manufacture of other non-metallic mineral products, and are included in the CRF tables under Other Fuels. Latvia explained that country-specific EFs were used to calculate the CO_2 EF for this type of fuel. Latvia further explained that a plant specific EF for used tires is given without oxidation factor, and that this factor will be corrected for the 2006 inventory submission.

2. Domestic navigation

32.   Latvia reports all fuel use and related emissions from marine navigation sources under International Bunkers. However, Latvia has a small but significant coast line with several ports where domestic marine navigation could be expected. The ERT encourages Latvia to investigate this issue further. In its response to the review, Latvia stated that at the end of the year 2005 research on domestic navigation had been undertaken and that for the 2006 submission fuel consumption and emissions estimates would be reassessed.

3. Other (military)

33.   Latvia currently uses the notation key "included elsewhere" ("IE") for this source category but does not note where the emissions are included in the documentation boxes of the CRF tables or the NIR. The ERT noted that military emissions should be included in this particular source category. The ERT recommends that Latvia provide estimates from this source, or document why they have not been estimated. In its response to this review Latvia, explained that fuel consumption from military is included under the Institutional/Commercial category and that emissions from this source would not be estimated separately. The ERT recommends that Latvia provide in the next submission an explanation for the reasons (e.g. confidential, negligible) for this approach.

4. Solid fuel transformation – CO_2, CH_4

34.   Latvia notes that fugitive emissions from this source are not estimated due to lack of capacity. For Latvia, the production of peat which is used for fuel combustion may be a significant emission source. However, no discussion is included in the NIR, and Solid Fuel Transformation is reported as "not estimated" ("NE"). Latvia may wish to investigate recent studies undertaken by other countries that estimate emissions from peat, for example, Finland.

III. Industrial Processes and Solvent and Other Product Use

A. Sector overview

35.   In 2003, the Industrial Processes and Solvent and Other Product Use sectors in Latvia accounted for 3.5 per cent of total national GHG emissions. CO_2 represented 93.5 per cent of the sectors' emissions (predominantly from cement production and from Solvent and Other Product Use). Actual emissions of F-gases contributed 4.7 per cent to sectoral emissions (predominantly HFCs from refrigeration and air conditioning equipment, and SF_6 from electrical equipment). N_2O contributed 1.7 per cent (from use of N_2O as anaesthesia). From 1990 to 2003 emissions from these sectors decreased by 40.4 per cent, mainly due to decreases in CO_2 emissions from cement production (a reduction of 60.5 per cent) and from lime production (a reduction of 97.3 per cent).

36.   Estimates or notation keys, where required, are provided for most categories. However, for some categories Latvia has provided neither estimates nor notation keys, for example, for CO_2 emissions from limestone and dolomite use as well as from soda ash use. Instead, it has provided estimates for these sources under category 2.A.7 Other Mineral Products, which are specified as glass production, etc. During the review, Latvia explained that reporting under a single category, i.e. under 2.A.3 Limestone and Dolomite Use is not possible because different EFs were used to estimate emissions from different types of production. The ERT recommends Latvia to report aggregate emissions from limestone and dolomite use in different types of production under the category 2.A.3 Limestone and Dolomite Use in the CRF of its next submission, because this is considered to be consistent with the Revised 1996 IPCC Guidelines. For the same reason, the ERT recommends Latvia to report CO_2 emissions from soda ash use in glass production under the category 2.A.4 in the CRF of its next submission. The ERT also recommends Latvia to add in its next NIR the information on different types of production and EFs.

37.   With regard to the F-gases, numerous information gaps were identified in CRF table 2(II): in the interests of completeness, the Party should provide either an estimate or the appropriate notation key. The ERT also noted that the notation keys are not always used correctly or consistently: for example, in the category Consumption of Halocarbons and SF_6 (in CRF table 2(II)F) the notation key "not occurring" ("NO") has frequently been used for individual F-gases when, according to the explanations provided by Latvia during the review, "NE" would have been more appropriate. The ERT recommends Latvia to address these reporting issues in its next submission.

38.   The ERT encourages Latvia in its intention to make further improvements in a number of source categories such as Iron and Steel Production.

B. Key categories

1. Cement production – CO_2

39.   Latvia has used the tier 2 method to estimate CO_2 emissions from this source category. Activity data (clinker production) were obtained directly from the production plants. For the EF, Latvia has applied 0.525 t CO_2/t clinker, which is higher than the IPCC default value. However, the NIR indicates that the IPCC default value was used. For transparency, the ERT recommends Latvia to document the source of the EF and include information on the cement kiln dust (CKD) correction factor used in the calculations.

40. CO_2 emissions from this source category decreased by 60.5 per cent from 1990 to 2003. During the 2004 review, Latvia explained that this was due to changes in general economic circumstances. However, the NIR does not include any information in this regard. The ERT recommends Latvia to include such an explanation in its next NIR.

2. Lime production – CO$_2$

41.   Latvia states in the NIR that it has estimated CO$_2$ emissions using a method that is consistent with the Revised 1996 IPCC Guidelines and the IPCC good practice guidance. The ERT noted, however, that the plant-specific EF applied (0.484 t CO$_2$/t lime) is much lower than the IPCC default value (0.59–0.86). During the review, Latvia stated that for the 2006 submission emissions from lime production would be estimated based on emissions from dolomite use in lime production and its EF would be 0.3095, which is a plant-specific EF calculated by plant experts using all characteristics of raw materials. For the sake of transparency the ERT recommends Latvia to provide in its next NIR more information on the EF, including on its unit.

42.   CO$_2$ emissions from this source category decreased by 97.3 per cent from 1990 to 2003. There is no information in the NIR that would explain this trend. During the review, Latvia explained that this was due to a decrease in total production of lime which was caused by the economical situation in the country and a decreased demand for lime. The ERT recommends Latvia to explain the causes for such large decrease in emissions in its next NIR.

3. Solvent and Other Product Use – CO$_2$

43.   Latvia reports CO$_2$ emissions arising from oxidation of NMVOCs in the atmosphere and this has been identified as a key category. The method used to estimate these emissions is well documented in the NIR and the ERT commends Latvia for this transparency. As this is a key category, the ERT encourages Latvia to estimate and provide information on the associated uncertainties in its next submission.

C. Non-key categories

1. Asphalt roofing, and Road paving with asphalt – CO$_2$

44.   Latvia reports CO$_2$ emissions arising from oxidation of NMVOCs in the atmosphere from these source categories. However, the method used to estimate these emissions is not explained in the NIR. During the review, Latvia explained the method used to the ERT. The ERT recommends Latvia to include this explanation on the method used in its next NIR.

2. Iron and steel production – CO$_2$

45.   Latvia has recalculated CO$_2$ emissions from this source category due to changes in AD and in the EF for coke use. CO$_2$ emissions from crude iron as input material (which probably means steel production) have been estimated for the first time. The ERT was not able to review the emissions estimates for this category fully due to lack of information, for example, on the types of furnace used for steel production (in particular, whether electric arc furnaces are used or not) and on the allocation of coke use between the Energy sector and this category. During the review, Latvia provided the ERT with some additional information on these aspects, however, some aspects still remained unclear. The ERT recommends Latvia to provide more information in its next submission in order to improve transparency. Latvia stated that it intends to further improve the AD and the methodology used for this source category. The ERT encourages Latvia to undertake these efforts.

3. Consumption of halocarbons and SF$_6$

46.   In its 2004 submission Latvia reported only SF$_6$ emissions from electrical equipment. Following the recommendations of the 2004 review, Latvia has made efforts to develop an F-gases inventory. As a result, it has included estimates of emissions of HFCs from refrigeration and air conditioning for the first time. Further, Latvia is planning to provide more information on the estimation of F-gas emissions in its next NIR. The ERT welcomes these improvements, both implemented and planned, and encourages Latvia to continue its efforts. The ERT noted that the recalculations associated with the inclusion of

HFCs are not explained in either the NIR or CRF table 8(b). The ERT recommends Latvia to provide an explanation on any recalculations both in the NIR and in the CRF in its next submission to improve the transparency of its reporting.

47.   Latvia reports only actual emissions of HFCs and SF_6, and does not report potential emissions of those gases. For PFCs, neither potential nor actual emissions have been reported. The ERT encourages Latvia to make efforts to report these emissions in its next submission.

IV. Agriculture

A. Sector overview

48.   In 2003, emissions from the Agriculture sector in Latvia amounted to 1,622 Gg CO_2 equivalent, or 15.4 per cent of total national GHG emissions. Since the base year (1990), emissions have decreased by 68.6 per cent, mainly due to reductions in the number of livestock and in the use of nitrogenous fertilizers. The decrease of AD was a consequence of the economic crisis of 1991–1995, as the NIR explains. The emissions estimates show large inter-annual variations which follow the fluctuations of the AD over time.

49.   During the previous (2004) review Latvia provided additional information on its livestock data collection, the allocation of livestock to animal waste management systems (AWMS), and the derivation of country-specific nitrogen excretion (Nex) rates. This information has only been partially incorporated in the 2005 NIR. The ERT welcomes the effort made by Latvia and encourages it to improve the transparency of its reporting further by incorporating more information in its future submissions, as explained below under the section on manure management.

B. Key categories

1. Enteric fermentation – CH_4

50.   Latvia has applied a tier 1 method with the IPCC default EF for this key category. However, as this is a key category, the IPCC good practice guidance requires the use of a higher-tier method. Latvia is encouraged to develop the necessary arrangements in order to apply a tier 2 method for significant livestock species.

2. Manure management – N_2O

51.   Latvia has applied a tier 1 method with IPCC default EF and country-specific values for Nex. The Nex rates are explained and a reference is provided. Latvia is encouraged to develop the necessary arrangements in order to apply the tier 2 method for significant animal types, to give more information on Nex rates (in English) in the NIR, and to provide references in English, so that at least the type of materials referenced can be checked by the ERT.

52.   As suggested by the previous review, Latvia explains the distribution of animals between AWMS for the years 1990–2002 in the NIR in a more transparent way and provides references on AWMS.

3. Direct N_2O emissions from agricultural soils – N_2O

53.   The area of cultivated histosols has been estimated by one national expert as only 1.5 per cent of the arable land in Latvia. However, the methods used by the expert to produce the area of cultivated histosols are not transparently documented, and the ERT recommends Latvia to provide supporting information in the NIR and to involve more experts in the evaluation of the AD for this category. In its response to this review, Latvia explained that the area of cultivated histosols has been reassessed for the 1990–2004 period in the 2006 submissions as recommended by previous ERTs.

C. Non-key categories

1. Manure management – CH$_4$

54.   This was identified as a key category by the secretariat's key category assessment but not by Latvia for two years in succession. For the estimation Latvia uses a tier 1 methodology with IPCC default EFs. To improve the accuracy of the emissions estimates, the ERT encourages Latvia to consider developing country-specific EFs.

2. Field burning of agricultural residues – CH$_4$, N$_2$O

55.   The NIR states that burning of agricultural residues occurs on a small scale and emissions are not estimated. Emissions from tubers and roots are estimated but are not reported in the CRF. The NIR also states that emissions from "last year grassland" burning have not been estimated due to time constraints. Like the 2004 review report, the ERT again encourages Latvia to continue to improve the completeness of the inventory and to include these emissions in its next inventory.

V. Land Use, Land-use Change and Forestry

A. Sector overview

56.   Latvia has not provided the LULUCF reporting tables as required by decision 13/CP.9 and following the land-use categories of the IPCC good practice guidance for LULUCF. Instead, it continues to report according to the tables for LUCF as contained in the CRF adopted by decision 18/CP.8, which are based on the categories of the Revised 1996 IPCC Guidelines.

57.   In 2003, the LUCF sector constituted a net sink of 8,187 Gg CO$_2$ equivalent, which, when included in the national total, offset total national GHG emissions of that year by 78 per cent. Net removals from LUCF decreased by 45 per cent from 1990 to 2003 as a result of regulations introduced in 1990 which increased harvesting as well as a shift towards more intensive forest management methods on private land. Estimates for the LUCF categories are calculated using IPCC tier 1 methods, IPCC defaults and country-specific factors. Given its magnitude, forest biomass is considered likely to be a key category, and the ERT therefore encourages Latvia to give priority to improving the methodology used in this sector towards higher-tier approaches, particularly for forest land.

58.   Latvia has reported data for categories 5.A Changes in Forest and Other Woody Biomass Stocks, 5.C Abandonment of Managed Lands and 5.D CO$_2$ Emissions and Removals from Soil. Category 5.B Forest and Grassland Conversion is reported as "not occurring" because slash burning has been prohibited since 2000. All tables have been completed, using notation keys where required.

B. Sink and source categories

1. Changes in forest and other woody biomass stocks – CO$_2$

59.   As noted by previous reviews, the NIR should explain the rationale for the country-defined subcategories and the choice of emission/removal factors. For example, Latvian experts (NIR, page 58) have estimated only one expansion factor which is higher than the IPCC default values. This value has been applied to determine total biomass (growth rate) for broadleaved and coniferous species and possibly also to harvested volume. The ERT encourages Latvia to clarify how the biomass expansion factor was determined and used. In its response to the review, Latvia indicated that the same expansion factor has been used throughout, but that the expansion rate used for harvested volume will be corrected in the 2006 submission.

60.   It is not clear whether the increment data for forests include harvesting. If the data are net increment harvested, carbon should not be used for further calculations. The ERT encourages Latvia to

ensure that there is no underestimation or double counting. In its response to the review, Latvia indicated that calculations were made using the Revised 1996 IPCC Guidelines but that consultations with local experts showed the need for additional research on this topic.

61. The ERT was not able to replicate the values of carbon uptake shown in table 5.A using the factors and AD provided in the NIR, and recommends Latvia to provide all the relevant data and explain the calculations in the NIR.

62. The ERT encourages Latvia to provide more information on the composition and location of non-forest trees and bushes in its next inventory submission. Since these areas are described as "non-forest", the Party should consider in which land-use category they are most appropriately reported in the new CRF for LULUCF. In responding to this review, Latvia indicated that in the 2006 submission, estimates from bushes and abandonment of managed lands would be included under the category Grassland in the new CRF for LULUCF.

2. Forest and grassland conversion – Non-CO$_2$ gases

63. The NIR states that "it is determined that slash cannot be burned since 2000". The ERT requests Latvia to clarify this statement by indicating what the fate of slash from cleared forests has been since 2000, and hence how or where GHG emissions are captured in the inventory. In responding to this review, Latvia explained that according to the latest information from the Ministry of Agriculture the slash is burned from the year 2000. Emissions from slash burning in forests will be included in the 2006 submission.

3. Abandonment of managed lands – CO$_2$

64. The values for the average annual growth rate used for this category are consistent with the IPCC default values. The ERT encourages Latvia to document the assumptions used to select this rate. Some indication of why the area is increasing would also be welcomed.

4. Emissions and removals from soils – CO$_2$

65. The ERT reiterates the recommendations of the previous (2004) review that Latvia should provide estimates for CO$_2$ emissions from mineral soils, using IPCC default values if national data are not available.

66. The area of cultivated organic soils reported in CRF table 5.D differs from that reported in table 4.D (Direct Soil Emissions: Histosols). The ERT encourages Latvia to clarify in the NIR the relationship between these two values.

67. The quantity of lime applied (t/ha) has increased significantly over the time series. The ERT recommends Latvia to explain the reasons for this increase. In its response to the review, Latvia explained that it used data officially published by the Central Statistical Bureau and that the increased lime implication could be due to the fact that in recent years farmers used lime for improvement of arable land.

VI. Waste

A. Sector overview

68. In 2003, the Waste sector in Latvia contributed approximately 8.9 per cent of total national GHG emissions. CH$_4$ from landfills is the most important GHG emitted in the sector, contributing 70.9 per cent to total sectoral emissions. From 1990 to 2003 emissions in the sector increased by 13.9 per cent, which is explained by an increase in amounts of solid household waste. However, the data for the years 2001, 2002, 2003 were taken from Latvian Environment, Geology and Meteorology Agency

(LEGMA) database, while in the previous years data calculated by experts were used. This means that it is very likely that the time series in the sector is not fully consistent.

69.   The information presented in both the NIR and the CRF tables is transparent but not sufficient to allow for the emissions calculations to be replicated. The additional information in the CRF background data tables is not filled in: some important information, such as the fraction of degradable organic carbon (DOC) in municipal solid waste (MSW) or the CH_4 generation rate (k) are missing; and the references used for the different default factors have not been specified.

B. Key categories

Solid waste disposal on land – CH_4

70.   Latvia has used a tier 1 method for solid waste disposal. Given that this is a key category, the IPCC good practice guidance requires the use of a higher-tier method. The characteristics of the tier 1 method mean that its use results in a time series that generally overestimates base year emissions and underestimates emissions in the later years of the time series. The ERT strongly recommends Latvia to use a tier 2 method in future. The historical amounts of waste landfilled can be extrapolated based on population data.

C. Non-key categories

Waste incineration – N_2O

71.   Latvia has not estimated N_2O emissions from waste incineration. Latvia explained that this is due to lack of EFs and of information about the incinerator types used.

Annex

Documents and information used during the review

A. Reference documents

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

IPCC. Good practice guidance for land use, land-use change and forestry, 2003. Available at <http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.htm>.

IPCC/OECD/IEA. Revised 1996 IPCC Guidelines for national greenhouse gas inventories, volumes 1–3, 1997. Available at <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>.

UNFCCC. Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories. FCCC/SBSTA/2004/8. Available at <http://unfccc.int/resource/docs/2004/sbsta/08.pdf>.

UNFCCC. 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>.

UNFCCC secretariat. Status report for Latvia. 2005. Available at <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/inventory_review_reports/application/pdf/2005_stauts_report_latvia.pdf>.

UNFCCC secretariat. Synthesis and assessment report on the greenhouse gas inventories submitted in 2005. FCCC/WEB/SAI/2005. Available at <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/inventory_review_reports/application/pdf/sa_2005_part_i_final.pdf>.

UNFCCC secretariat. Latvia: Report of the individual review of the greenhouse gas inventory submitted in the year 2004. FCCC/WEB/IRI/2004/LVA. Available at <http://unfccc.int/files/national_reports/annex_i_ghg_inventories/inventory_review_reports/application/pdf/2004_irr_centralized_review_latvia.pdf>.

B. Additional information provided by the Party

Responses to questions raised during the review were received from Ms. Agita Gancone (Latvian Environment, Geology and Meteorology Agency) including additional material on the methodology and assumptions used.

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