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**Report for the Stage 3 in-depth review of emission  
inventories submitted under the UNECE LRTAP  
Convention and EU National Emissions Ceilings Directive  
for:**

**LATVIA**

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## INTRODUCTION

1. The mandate and overall objectives for the emission inventory review process under the LRTAP Convention are given by the UNECE document 'Methods and Procedures for the Technical Review of Air Pollutant Emission Inventories reported under the Convention and its Protocols' (1) – hereafter referred to as the 'Methods and Procedures' document.

2. This annual review has concentrated on SO<sub>2</sub>, NO<sub>x</sub>, NMVOC, NH<sub>3</sub>, plus PM<sub>10</sub> & PM<sub>2.5</sub> with optional review of Cd, Pb and Hg for the time series years 1990 – 2007 reflecting current priorities from the EMEP Steering Body and the Task Force on Emission Inventories and Projections (TFEIP).

3. This report covers the stage 3 centralised review of the UNECE LRTAP Convention and EU NEC Directive inventories of Latvia, coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 22nd June 2009 to 25th June 2009 in Copenhagen, Denmark, and was hosted by the European Environment Agency (EEA).

4. The following team of nominated experts from the roster of experts performed the review:

Lead Reviewer – Chris Dore (UK)

Generalist – Jean-Pierre Chang (France)

Energy – Stephan Poupa (Austria)

Mobile – Michael Kotzulla (Germany)

Industrial Processes – Kees Peek (Netherlands)

Solvents – David Kuntze (Germany)

Agriculture & Nature – Hakam Al-Hanbali (Sweden)

Waste – Celine Gueguen (France)

5. The review was coordinated by Chris Dore (UK) and Katarina Marečková, (EMEP Centre on Emission Inventories and Projections - CEIP).

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<sup>1</sup> Methods and Procedures for the Technical Review of Air Pollutant Emission Inventories reported under the Convention and its Protocols. Note by the Task Force on Emission Inventories and Projections. ECE/EB.AIR/GE.1/2007/16  
<http://www.unece.org/env/documents/2007/eb/ge1/ece.eb.air.ge.1.2007.16.e.pdf>

## **PART A: KEY REVIEW FINDINGS**

### **INVENTORY SUBMISSION**

6. With the 2009 submission, Latvia has reported emissions for its Protocol base years. For pollutants under its Protocols as well as for CO the full time series 1990-2007 is submitted, and also a 2000-2007 time series for TSP, PM<sub>10</sub> and PM<sub>2.5</sub>.
7. Latvia submitted an IIR report including most of the information requested in the new IIR structure. However the IIR can be improved with more detail added. The ERT encourages Latvia to continue to improve the IIR, by following the recommended structure of the IIR explained in the Guidelines. For example, a general section on "Methods and data sources", restructuring the annexes, and taking into account the sector specific points mentioned in later sections of this report.
8. The CLRTAP inventory submitted by Latvia needs improvement in quality. The sections on QA/QC, Key Category Analysis (KCA) and time series consistency would all be improved by including more detail and the documentation of methods and procedures.

### **KEY CATEGORIES**

9. Latvia does not make its own Key Category Analysis (KCA), but uses the level assessment KCA from REPDAB. This is due to a lack of time and capacity. The ERT encourages Latvia to implement, as far as possible, its own KCA in both level and trend. Furthermore the ERT noted that for the components SO<sub>x</sub>, NO<sub>x</sub>, NMVOC and PM<sub>10</sub>, not all of the key sources are included in the Key Source Analysis 2007 table.

### **QUALITY**

#### ***Transparency***

10. The IIR report includes chapters for the different NFR sectors (NFR sectors 1 to 7) including information on EFs and activity data. However, all sector chapters require much more information on the detail of the methodologies, the data that has been used and references for the data. Specific areas for improvement are included in later sections of this report.
11. Latvia did not use zero-values in the reporting tables but notation keys, and the ERT commend Latvia on this aspect of their inventory submission.
12. Information explaining the used notation key IE (Included Elsewhere) is not provided in NFR tables IV 1F nor in IIR. The ERT strongly encourages Latvia to provide such information for improved transparency of the inventory.

### ***Completeness***

13. Latvia's inventory (for the pollutants reviewed) does not include many "NE" (Not Estimated) notation keys in the NRF tables (most occur in 2007 for NH<sub>3</sub>, where there are 11). However, explanations for the "Not Estimated" sources are not reported in NRF tables (tables IV 1F) nor in the IIR section on the completeness issue. The ERT encourages Latvia to provide explanations as to why these sources are not estimated and to report in the IIR, whether there are any plans to investigate whether data can be obtained to allow emission estimates to be made, or to report these sources as not occurring.

14. There are a number of significant sources which are not included in the inventory. For example there are no estimates from the Chemical Industry included in the emission estimates, and some sources are missing from the Waste sector. The ERT strongly advise Latvia to review these sources (detailed in later sections for this report), and include estimates in future submissions.

### ***Consistency, including recalculations and time-series***

15. Latvia has undertaken a recalculation of the complete time series since 1990 in their 2009 submission. For national level totals, recalculations are important (more than 10%) only for Pb, and for NO<sub>x</sub>, NMVOC, SO<sub>x</sub> and TSP for some limited years. Some information is included in the IIR, but the ERT encourage Latvia to include much more information on the recalculations. For example, the reason for the recalculation, the changes to the methodology or input data, and the resulting impact on the national total (both in terms of absolute total, and the trend with time).

16. There are several time series inconsistencies which appear within the Latvia inventory:

17. COPERT III is used before 2003, and COPERT IV after 2003.

18. There is data missing for some years.

19. There are some large jumps, dips or fluctuations flagged from S&A trend analysis.

20. During the review, Latvia explained that in future submissions COPERT IV will be implemented for all years, and that missing emissions are due to missing data statistics for some years. Latvia explained the largest dips, jumps and fluctuations, including a detected error for 1A3di(i) CO in 1990: 8.62 kt instead of 20.40 kt. The ERT recommends that the explanations on time series consistency provided during the review week should be included in the IIR, the identified mistake be corrected, and that steps be undertaken to improve issues concerning time series consistency.

21.

### ***Comparability***

22. Latvia has implemented the new NRF 2008 format including activity data, even though this had to be done over a very short timescale (Decision on Dec. 2008). The ERT recognises the effort undertaken by Latvia, and commends them for this work.

### ***CLRTAP / NECD comparability***

23. From the LRTAP versus NECD comparison in the S&A, no difference appears between those two last inventory submissions. The ERT are pleased to note this.

### ***Accuracy and uncertainties***

24. Some parts of the inventory need to be more accurate, and the ERT flagged some problems with time series consistency during the review, and included comments in this report. The ERT recommends that Latvia investigate and improve issues concerning time series consistency and accuracy.

25. Quantitative estimates of total uncertainties for the main pollutants are provided in the IIR. For illustrating the use of Tier 1 approach, a Tier 1 Excel uncertainty calculation file has been provided to the ERT. The ERT encourages Latvia to use the uncertainty analysis as a tool to focus planned improvements on the key categories. The ERT also suggest that Latvia consider whether it would be possible to undertake a Tier 2 uncertainty analysis.

### ***Verification and quality assurance/quality control approaches***

26. Latvia informed the ERT that they do not have a QA/QC plan yet, but plan to have one in the future. The ERT encourages Latvia to create and implement a QA/QC plan as soon as possible.

## **FOLLOW-UP TO PREVIOUS REVIEWS**

27. The inventory submission 2009 of Latvia (NFR tables and IIR) and Latvia's responsiveness enabled the ERT to implement the stage 3 review and to provide a number of detailed recommendations. The ERT would particularly like to thank Latvia for their responsiveness during the review, which allowed the ERT to resolve questions quickly.

## **AREAS FOR IMPROVEMENT IDENTIFIED BY LATVIA**

28.

29. The IIR includes information on planned improvements which identify general areas for improvement. Examples include: research to determine country specific EFs, the possible use of national plant data registers, obtaining data on the use of different fertiliser types to allow calculation of NH<sub>3</sub> emissions; improving the data that is used to calculate waste emission.

30. During the review, Latvia informed the ERT of some planned improvements: a QA/QC plan to be implemented in the future and the use of COPERT IV for all years. The ERT wish Latvia well for implementing these improvements.

## **PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY**

### **CROSS CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT**

31. The ERT identified the following cross-cutting issues for improvement:
32. Implementation as soon as possible of a QA/QC plan for the national inventory.
33. Within NFR format (table IV 1F) and IIR, include full explanations of notation keys (IE, NE, etc.) where they are used.
34. To apply, as closely as possible, the new recommended structure for the IIR. In particular, include a general section on "Methods and data sources", and review the structure of the annexes.
35. More explanations and detailed information to be included in the IIR. For example, detailed explanation of methodologies and the data used, explanations on time series consistency (as provided during the review), more information on recalculations and the impacts of recalculations on national totals and trends.
36. The ERT recommend that Latvia calculate their own Key Category Analysis for both level and trend assessment and include all of the key sources in the Key Source Analysis table.
37. The ERT recommend that the mistakes identified during the review should be corrected and that improvements relating to time series consistency issues be undertaken (e.g. COPERT IV implementation for the all time series).
38. To continue to incorporate high quality facility level data into the national estimates and to generate country specific EFs. This is particularly relevant for the Industrial Solvents sector where extensive data is readily available, and the Energy sector.
39. The ERT encourages Latvia to create a continuous improvement programme to check its inventory for possible areas of improvement. This would then allow planned improvements to be implemented as part of this continuous improvement programme. Improvements relating to specific source categories are presented in the relevant sector sections of this report.

## SECTOR SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

### ENERGY

#### Review Scope

<b>Pollutants Reviewed</b>		SO <sub>2</sub> , NO <sub>x</sub> , NMVOC, NH <sub>3</sub> , PM <sub>10</sub> & PM <sub>2.5</sub>		
<b>Years</b>		1990 – 2007		
<b>NFRCode</b>	<b>CRF_NFRName</b>	<b>Reviewed</b>	<b>Not Reviewed</b>	<b>Recommendation Provided</b>
1.A.1	Energy industries	x		x
1.A.2	Manufacturing industries and construction	x		x
1.A.4	Commercial, Residential, Agriculture & Forestry	x		x
1.A.5	Other	x		
1.B.1	Fugitive emissions from solid fuels		x	
1.B.2	Fugitive emissions from oil and natural gas		x	
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.				

#### General recommendations on cross cutting issues.

40. **Completeness:** The ERT consider the Energy sector to be complete and comprehensive in terms of methodology descriptions.

41. **Transparency:** Latvia does not use any zero-values in the reporting tables, and uses notation keys. However, the ERT encourages Latvia to use the “NA” notation key where the source and pollutant combination cannot result in an emission. Currently these are being reported as “NO”, which should only be used for a source and pollutant combination which could give rise to an emission, but where there is no activity covering this source in the country.

42. Latvia has provided a detailed inventory. Estimates are provided at the most detailed level for all energy sectors. Latvia’s emission factors in the IIR are considered by the ERT to be transparent and well described for the Energy Sector. However, the ERT encourages the Party to include more detail in the IIR including:

43. Describing for which years the point source emissions data are used in the respective sectors.

44. Providing a description of where emissions are included, when they are reported with the “IE” notation key.

45. Providing explanations at a technical level on aspects such as changes in sulphur content, the type of fuel used, changes in methodology etc. This is especially important for SO<sub>x</sub> emission trends by sector.



46. **Uncertainty:** The ERT encourages Latvia to undertake uncertainty analysis for the Energy Sector in order to help support the improvement process and to provide an indication of the reliability of the inventory data.

47. **QA/QC procedures:** Latvia has some basic QA/QC checks. The ERT encourages Latvia to implement sector specific QA/QC procedures and describe these in their IIR.

48. **Recalculations:** Latvia has recalculated its inventory for almost all sectors in the year 2006. The IIR includes explanations. However, the ERT encourages Latvia to provide more detailed explanation of recalculations in the IIR, including the rationale, the impact on the sector and implications for the trends in the Energy sector.

49. **Improvement:** The ERT commends Latvia for its improvements associated with the use of point source data. The ERT encourages Latvia to implement planned improvements, especially the research and use of country specific emission factors and point source data.

50.

#### Sub-Sector Specific Recommendations.

##### **1.A.1.a Public Electricity and Heat Production:- NO<sub>x</sub>, CO, NMVOC**

51. The ERT noted that Latvia uses IPCC96 default NO<sub>x</sub>, CO and NMVOC emission factors for the emission estimates of category 1.A.1.a. Latvia responded that the EMEP/CORINAIR Guidebook provides technology specific emission factors (although these are more appropriate for a top down approach). According to the IIR Latvia plans to use country specific emission factors in the future and the ERT welcome this significant development.

##### **1.A.1.a Public Electricity and Heat Production:- SO<sub>x</sub>**

52. The ERT noted that SO<sub>2</sub> emissions decreased from 36 Gg in 1990 to 1.1 Gg in 2007. The Party provided detailed activity data during the review week which shows a strong decline in consumption of coal and 'diesel oil' with high sulphur content. The ERT recommend that this explanation be added to the IIR.

##### **1.A.4.a Commercial/Institutional:- SO<sub>x</sub>**

53. The ERT noted that SO<sub>2</sub> emissions decreased from 26.3 Gg in 1990 to 0.4 Gg in 2007. The Party provided detailed activity data during the review week which shows a strong decline in consumption of coal and 'diesel oil' with high sulphur content. The ERT recommend that this explanation be added to the IIR.

##### **1.A.4.b Residential:- SO<sub>x</sub>**

54. The ERT noted that SO<sub>2</sub> emissions decreased from 8.4 Gg in 1990 to 0.3 Gg in 2007. The Party provided detailed activity data during the review week which shows a strong decline in consumption of coal and 'diesel oil' with high sulphur content. The ERT recommend that this explanation is added to the IIR.

##### **1.A.2 Manufacturing Industries:- NO<sub>x</sub>, SO<sub>x</sub>**

55. The ERT noted that large point source emissions from industrial plants, as provided in the IIR, were rather low. Latvia provided updated data and responded that this data was provided for the purpose of information only and not used within their inventory. The ERT suggest that Latvia consider removing these data from the IIR or making the relevant sections of the report clearer.

## MOBILE SOURCES

### Review Scope

Pollutants Reviewed		SO <sub>2</sub> , NO <sub>x</sub> , NMVOC, NH <sub>3</sub> , CO, TSP, PM <sub>10</sub> & PM <sub>2.5</sub>		
Years		1990 – 2007 + (Protocol Years)		
NFRCode	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
1.A.2	Manufacturing industries and construction Mobile Sources	x		1.A.2.f ii
1.A.3	Transport	x	1.A.3.e	1.A.3a, 1.A.3.b vi & vii, 1.A.3.di (i)
1.A.4	Commercial, Residential, Agriculture & Forestry Mobile Sources	x	1.A.4.a ii, bii	1.A.4.c ii
1.A.5	Other Mobile Sources	x		1.A.5.b

Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.

### General recommendations on cross cutting issues

56. **Completeness:** The ERT consider the Transport sector and the other sectors including mobile sources to be of good completeness, although with some gaps still to be filled (see sub-sector specific recommendations below). Likewise, the levels of detail in the methodology descriptions, the explanation of notation keys and recalculations, as well as QA/QC, need further improvement. These issues are explained in more detail in the following sections.

57. **Transparency:** Latvia provided a detailed and generally transparent emissions inventory. Estimates are provided at the most detailed level for all sectors including mobile sources. Nevertheless, the descriptions of methodologies as well as emission factors used need to be more transparent in the future. The ERT encourages Latvia to include more detail in the IIR including: methodologies and emission factors used for mobile sources and recalculations.

58. **Transparency / Consistency / Correctness:** The ERT noted some changes in the methodologies used within several time series (see sub-sector specific recommendations below) and wants to encourage Latvia to address this issue in order to improve the inventory.

59. **Transparency / Consistency:** The ERT noted that the use of notation keys needs to become more consistent and transparent. This is particularly true for the use of 'IE', which requires an explanation as to which NFR category the emission is allocated to, for both the NFR tables and the IIR. The ERT strongly encourages the Party to address this issue by including explanations in both the NFR tables and the IIR.

60. **Uncertainty:** Latvia has already estimated uncertainties based on the IPCC Tier 1 method. The ERT commends this but, nevertheless, encourages Latvia to further improve uncertainty analysis, for example by using the Tier 2 approach.

61. **QA/QC procedures:** The ERT welcomes Latvia's efforts to implement a QA/QC system to check and improve its inventory. The ERT encourages Latvia to implement

sector specific QA/QC procedures for the Transport Sector and all other sectors including mobile sources.

62. **Recalculations:** Many time series emissions for mobile sources have been recalculated against the 2008 submission. However, there is little information to be found in the IIR on the reasons for these recalculations. The ERT recommends that Latvia provide further detailed information, such as tables showing the main recalculations (absolute and percentage) against former submissions, as well as providing explanations about these recalculations in the IIR.

63. **Improvement:** The ERT commends Latvia for its improvements in reporting emissions from mobile sources, e.g. the continuous enhancements of the models used to estimate emissions from road transport. The ERT also commends Latvia for the improvements carried out regarding the allocation of emissions on the basis of the NFR nomenclature. Based on this, the ERT encourages Latvia to create a continuous improvement programme to check its inventory for possible points of improvement. This would then allow planned improvements to be implemented as part of this continuous improvement programme.

### Sub-Sector Specific Recommendations

#### **1.A.2.f ii Manufacturing industries and construction mobile – particle emissions**

64. The ERT noted that within the NFR tables similar values have been reported for all three particle fractions (PM<sub>2.5</sub>, PM<sub>10</sub>, TSP), and encouraged the Party to check this issue. The ERT welcomes Latvia's plan to revise the emission factors used for the next submission using EMEP/CORINAIR Guidelines.

#### **1.A.3.a Air Transport – particle emissions**

65. The ERT noted that under 1.A.3a the Party provides estimates for PM<sub>10</sub>, and 'IE' (included elsewhere) for emissions of PM<sub>2.5</sub> and TSP. The ERT warmly asks the Party to provide further explanations as to where these emissions are included and to check this issue, in order to keep the inventory consistent (see paragraph above).

#### **1.A.3.b Road transport – overall**

66. During the centralized review the ERT noted that within the Road Transport sector, emission estimations were carried out using different estimation models (COPERT III for 1990-2003 and COPERT IV for 2004-2007). The ERT therefore strongly recommend that this issue be checked and that one methodology or model be used for the whole time series.

#### **1.A.3.b i-iv Road transport– exhaust particle emissions**

67. During the centralized review the ERT noted that amounts of PM<sub>2.5</sub> given in the NFR tables are greater than those reported for PM<sub>10</sub>. As PM<sub>2.5</sub> particles are part of the PM<sub>10</sub> range, the amounts of PM<sub>10</sub> should always be greater (or at least of the same) as those given for PM<sub>2.5</sub>. The ERT welcomes the clarification provided by Latvia, and is looking forward to the mistake being corrected in next year's submission.

68. In addition, instead of 'NE' reported for TSP from 1.A.3.b i-iv, the Party could use the data used to calculate PM<sub>10</sub> emission estimates as a first step to estimating TSP emissions.

**1.A.3b vi automobile tyre and brake wear**

**& vii - automobile road abrasion - Heavy Metal emissions from abrasion/wear**

69. The ERT noted that under 1.A.3.b vi and vii all heavy metal emissions are referred to with 'NA'. However, these sources are (certainly for heavy metals such as Cu, Cr, Zn) quite important, or even the dominant source. The ERT therefore asked the Party to check this issue. Latvia referred to EMEP/CORINAIR Guidelines sector 1.A.3.b vi & vii underlining that no heavy metal emissions are generated in these processes. The ERT, in response, again warmly recommended that Latvia further check this issue, accepting that the situation of heavy metals reported by the parties for sub-sectors 1.A.3.b vi and vii is quite inhomogeneous (some countries do not report any HM emissions, giving 'NA' or 'NO' instead, whereas others do report at least some or even all HM mostly for 1.A.3.b vi).

**1.A.3.d i(i) international navigation - overall**

70. During the centralized review, the ERT noted that there is a lack of information on this sector in the IIR. The time series reported showed a huge fluctuation in values, especially between 1997 and 2000. The Party acknowledged the ERT's recommendation for checking this issue and expressed its intention to work with the data providers (Central Statistical Bureau CSB) to fully understand the reasons for the fluctuation, and then include explanations in its next submissions.

**1.A.3.e Other - overall**

71. The ERT noted that the whole sub-sector is reported as 'NA'. In accordance to the information about pipeline transport provided in the IIR, the ERT assumes activity data and emissions to be included in sub-sector 1.A.4.a. But as no further information is to be found in the IIR, the ERT wants to encourage the Party to provide some short explanation about this sub-sector with the next submission.

**1.A.4.c ii Off-road vehicles and other machinery - overall**

72. ERT noted that most of the data have been carried forward for several years in a row, and asked whether there is no annual statistical data available. Latvia acknowledged this and will request updated information from the CSB, and will include the information in its next submissions, along with an explanation. The ERT welcomes this improvement.

**1.A.5.b Other mobile – sources included**

73. For sub-sector 1.A.5b in the IIR, the Party quotes that only military aircraft are included. The ERT asked Latvia to clarify whether emissions from land based military vehicles are included elsewhere. The Party responded that the national energy statistics do not report any fuel consumption in this sector, so it is assumed that this fuel consumption is very small or included in the Road Transport sector. According to the information provided by the Party, the Central Statistical Bureau reports only jet fuel used in the military aircrafts. The ERT recommends that the Party work with the CSB to

fully understand whether the fuel consumption for land based military vehicles consumption is included in Road Transport or elsewhere in the national statistics. This should allow separate data on fuel consumption of land based military vehicles to be included in the calculation of emissions for 1.A.5.b. Even though this source may be small, the ERT commends the Party's will to further check this issue.

## INDUSTRIAL PROCESSES

### Review Scope

Pollutants Reviewed		SO <sub>2</sub> , NO <sub>x</sub> , NMVOC, NH <sub>3</sub> , PM <sub>10</sub> & PM <sub>2.5</sub>		
Years		1990 – 2007 + (Protocol Years)		
NFRCode	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
2.A.1	cement production	X		
2.A.2	lime production	X		X
2.A.3	limestone and dolomite use	X		X
2.A.4	soda ash production and use	X		X
2.A.5	asphalt roofing	X		X
2.A.6	road paving with asphalt	X		X
2.A.7	other including non fuel mining & construction			
2.A.7.a	other including non fuel mining & construction	X		X
2.A.7.b	Construction and demolition	X		X
2.A.7.c	Storage, handling and transport of mineral products	X		X
2.B.1	Ammonia production			X
2.B.2	nitric acid production			X
2.B.3	adipic acid production			X
2.B.4	carbide production			X
2.B.5	other (please specify in a covering note)			X
2.C.1	iron and steel production	X		
2.C.2	ferroalloys production			
2.C.3	aluminium production			
2.C.4	sf6 used in aluminium and magnesium foundries			
2.C.5	other (please specify)			
2.D.1	pulp and paper	X		
2.D.2	food and drink	X		
2.D.3	Wood processing			

Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.

### General recommendations on cross cutting issues

63. **Completeness:** The ERT noted that Latvia has not included the Chemical Industry in its industrial process inventory. Latvia informed the ERT that they will include this in the next submission. The ERT also noted good levels of detail in the methodology descriptions.

74. **QA/QC procedures:** The ERT encourages Latvia to include sector specific QA/QC paragraphs in their next submission. This would provide much more transparency.

75. **Recalculations:** The ERT noted that recalculations have been made for the Iron and Steel and the Food and drink sector. The amount of produced steel was

corrected for the year 2006, and as a result the emissions for submission 2009 are 17.5% lower than reported for submission 2008. The previously used emission factor for Spirits (unspecified sort) was changed to the emission factor for Other Spirits. This resulted in a lower emission level for the whole time series in the 2009 submission.

76. **Uncertainty:** The ERT encourages Latvia to include uncertainty analysis in the industrial processes chapter in order to help support the improvement process and to provide an indication of the reliability of the inventory data.

77. **Transparency** The paragraphs in the IIR of Latvia are generally transparent and well organised although some paragraphs are missing. The ERT encourages Latvia to include paragraphs about recalculations and planned improvements in the Industrial Processes chapter in the next submission.

78. The use of notation keys in a number of areas is not consistent with the descriptions in the IIR. Latvia informed the ERT that they would correct these inconsistencies in the next submission.

79. **Improvement:** The ERT noted that Latvia has planned to find out if it is possible to use plant specific data from the national database "2-AIR". The ERT compliments Latvia for this and encourages them to implement the planned improvements.

### Sector Specific Recommendations

#### **2 Industrial Processes Sectors - all**

80. The ERT noted that it was not clear which sectors, sub-sectors are not occurring, not estimated and negligible in Latvia. The ERT recommends that Latvia make this clear in the next submission.

#### **2 B Chemical industry**

81. Although the Chemical industry in Latvia is the seventh largest industry it is not included in the 2009 submission. The chemical industry mostly consists of the medicine preparation (drugs) production industry and paint and varnish manufacture. Latvia has informed the ERT that this sector will be included in the next submission. Latvia will perform this with the help of the EMEP/EEA air pollutant emission inventory guidebook-2009.

#### **2 C Metal production**

82. The ERT noted that Latvia can obtain more accurate and complete activity data and emission factors from the only steel producer in Latvia which participates in the EU ETS and the International ETS. Because iron and steel production is an important key source in the Industrial Processes sector, the ERT encourages Latvia to switch to the Tier 3 methodology for this source in the next submission.



## SOLVENTS

### Review Scope

Pollutants Reviewed		NMVOC, SO <sub>x</sub> , NO <sub>x</sub>		
Years		1990 – 2007		
NFRCode	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
3.A.1	Decorative coating application	NMVOC		x
3.A.2	Industrial coating application	NMVOC		x
3.A.3	Other coating application (Please specify the sources included/excluded in the notes column to the right)			x
3.B.1	Degreasing	NMVOC		x
3.B.2	Dry cleaning			x
3.C	Chemical Products, Manufacture & Processing	NMVOC, NO <sub>x</sub> , SO <sub>x</sub>		x
3.D.1	Printing	NMVOC		x
3.D.2	Domestic solvent use including fungicides	NMVOC		x
3.D.3	Other product use	NMVOC		x

Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.

### General recommendations on cross cutting issues

83. **Completeness:** Latvia provided the ERT with information on the database which is used for the activity data for 3.C. "The emissions from Chemical products, Manufacture and Processing come from the State statistical survey "2-air" on production of pharmaceutical formulations and perfumery products. "2-air" is the database where enterprises that do a pollution activity and have A, B or C category pollution permits report their emission data. There are approximately 3000 enterprises in total every year. From these approximately 3000 enterprises we select only those enterprises that produce pharmaceutical formulations and perfumery products. For example in 2007, data from eight enterprises were collected. Responsible for the quality of the data in this database is the State Environment Service. State Environment Service inspectors check statistical survey "2-air" for each enterprise. The ERT is impressed with the availability of the data from this database, but suggest that this information be reported in the IIR for more transparency.

84. The ERT consider the solvent sector not to be complete. Latvia has a key source for the NMVOC emissions in 3.A1-2, 3.B.1 and 3.D.2 but reports 3.A by using activity data from expert judgement. For other sources, population is used as the activity data. The ERT encourages Latvia to implement a detailed methodology for the reporting of these emission sources. Furthermore, the ERT encourages Latvia to report also emissions for 3.A.3 and 3.B.2.

85. Latvia reports NMVOC-emissions of 3.C only from 1997-2007 because the database delivers only data from 1997 onwards. The ERT encourages Latvia also to

report emissions for years prior to 1997. This will require a different data source, so that data before 1997 can be obtained.

86. **QA/QC procedures:** The ERT encourages Latvia to implement sector specific QA/QC procedures.

87. **Recalculations:** The Party reports the recalculations in a very transparent and good way.

88. **Uncertainty:** The ERT encourages Latvia to undertake uncertainty analysis for the solvent sector in order to help support the improvement process and to provide an indication of the reliability of the inventory data.

89. **Transparency:** The ERT encourages Latvia to report the emissions of NO<sub>x</sub> and SO<sub>x</sub> of 3C in the IIR and to report in the IIR information on the database which is used for estimating NMVOC emissions for 3 C.

90. **Improvement:** The ERT commends Latvia for its database in 3.C. The ERT encourages Latvia to check the methods of reporting for its key categories, to get data for 3.C before 1997 and to be more transparent in the IIR by including more explanations of calculation methodologies.

## AGRICULTURE

### Review Scope:

<b>Pollutants Reviewed</b>		SO <sub>2</sub> , NO <sub>x</sub> , NMVOC, NH <sub>3</sub> , PM <sub>10</sub> & PM <sub>2.5</sub>		
<b>Years</b>		1990 – 2007 + (Protocol Years)		
<b>NFRCode</b>	<b>CRF_NFRName</b>	<b>Reviewed</b>	<b>Not Reviewed</b>	<b>Recommendation Provided</b>
4.B	Manure Management	NH <sub>3</sub> ; PM10, Pm2.5		see below
4.D1	Direct Soil Emissions	NH <sub>3</sub> ;		see below
4.F	Field burning of agricultural wastes	NMVOC, CO, PM <sub>10</sub> , PM <sub>2.5</sub>		
5E	Other	NO <sub>x</sub> , CO, DIOX, PAH		
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.				

### General recommendations on cross cutting issues

91. **Completeness:** The agriculture inventory of Latvia includes the most important sources of emissions. Omissions are associated with minor sources.

92. **Transparency:** The information provided for Agriculture in the IIR is not presented with a high level of transparency. More background information and detail on the methodologies is needed to allow a full understanding of the calculation of the emission estimates. The ERT strongly recommends that Latvia expand the explanation of methodologies, provide more details on the data used for calculating the emission estimates and include additional country-specific information in the documentation boxes of the IIR in its next submission.

93. **QA/QC:** Latvia has QA/QC procedures in place. Uncertainties are estimated only for the main pollutants - NO<sub>x</sub>, CO, NMVOC, SO<sub>x</sub> and NH<sub>3</sub>. The calculation is made according to the Tier 1 method, which is based on emission estimates and uncertainty coefficients for activity data and emission factors presented by the IPCC GPG 2000. The uncertainties for these pollutants are high, due to the use of a Tier 1 methodology, and default emission factors. Latvia indicated their intention to improve the uncertainty assessment for future submissions, and the ERT welcomes this plan. The ERT strongly encourages Latvia to use a higher Tier level for the calculation of emissions, particularly for the key categories in this sector.

94. **Recalculations:** The ERT noted that recalculations were undertaken which include emissions of NH<sub>3</sub>, NMVOC and PM. In addition, emissions from grass burning in the previous version of the inventory have been recalculated across the time series according to the recommendations of UNFCCC ERT (Centralized review 2008) in which mass of burnt biomass was corrected. The ERT encourages Latvia to continue presenting information on recalculations in future IIR submissions.

95. **Consistency:** During the review week, the ERT identified different values of emissions of NH<sub>3</sub> from 4.B 9 (Laying Hens) presented in Table 6.1 and Table 6.2 in the

IIR and in NFR tables. Latvia has explained that the observed differences are due to the rounding of the emission factor which was used in the calculation. The ERT recommends that Latvia ensure consistent emission data in its reporting of these data.

96. The ERT welcomes initiatives taken by Latvia to make further improvements in emission estimates of NH<sub>3</sub> based on information from fertilizer types.

#### Sector specific recommendations

#### **4.B Manure management:- NH<sub>3</sub> and PM**

97. The ERT noted during the review week that the average NH<sub>3</sub> emission factors for 4.B.1a (Cattle Dairy), 4.B.8 (Swine) and some other animal categories used in calculation were significantly lower compared to the default values given in EMEP/CORNIAR guidelines. Latvia responded and indicated that these emission factors have been estimated based on local calculations of N excretion over a period of one year and are specific to animal categories and the distribution of manure management systems. The ERT recommends that for future reporting Latvia provide more detail on country-specific EFs, methodologies and assumptions, and on literature sources and references. The ERT also encourages Latvia to provide improved documentation on expert judgments used in the calculation methodologies.

#### **4.D.1 Agricultural Soils:- NH<sub>3</sub>, NO<sub>x</sub> and PM**

98. The ERT strongly encourages Latvia to provide detailed information on the breakdown of national fertilizer consumption into the relevant compounds of use, as this will allow a more detailed methodology to be used.

99. Latvia uses default emission factors from both IPCC and UNECE to calculate the emissions of NH<sub>3</sub> from fertilizers. This sector is a key source for NH<sub>3</sub>, and therefore the ERT strongly encourages Latvia to develop and use country-specific emission factors for different types of fertilizers, and to use them for future submissions.

## WASTE

### Review Scope:

<b>Pollutants Reviewed</b>		SO <sub>2</sub> , NO <sub>x</sub> , NMVOC, NH <sub>3</sub> , PM <sub>10</sub> & PM <sub>2.5</sub>		
<b>Years</b>		1990 – 2006 + (Protocol Years)		
<b>NFRCode</b>	<b>CRF_NFRName</b>	<b>Reviewed</b>	<b>Not Reviewed</b>	<b>Recommendation Provided</b>
6.A	solid waste disposal on land	x		x
6.B	waste-water handling	x		x
6.Ca	Hospital waste incineration	x		x
6.Cb	Hazardous waste incineration	x		x
6.Cc	Municipal waste incineration	x		
6.Cd	Cremation	x		x
6.Ce	Open burning	x		
6.D	other waste (e)	x		
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which have been reviewed and which have not in the respective columns.				

### General recommendations on cross cutting issues.

100. **Accuracy:** Latvia applies EFs from the 1996 EMEP/Corinair Guidebook. The ERT recommends that Latvia take as reference the most recent version of the EMEP/EEA Guidebook, to allow the use of the most up-to-date EFs and methodologies on a regular basis.

101. **Transparency:** For waste, the Latvian IIR has some aspects of transparency (methodological description, activity data and EFs are provided). To improve the transparency of the report, the ERT encourages Latvia to specify in its IIR the precise references of applied EFs and activity data (including a version for the EMEP/Corinair Guidebook).

102. **Transparency and completeness:** The ERT noted some problems concerning the notation keys reported in the data submission (systematic use of NA for PM&TSP, the use of NO and NA for 6Cc, the use of NA for NFR6D, the use of NE for 6Ce that does not occur in the opinion of Latvia). The ERT encourages Latvia to carefully check the notation keys in the next submission. The new 2009 EMEP/EEA Guidebook would help to choose whether to use NE or NA.

103. **Completeness:** the ERT encourages Latvia to review NFR 6, and to include missing sources in its inventory (i.e. sludge spreading, compost production, biogas production, waste disposal in landfills and wastewater treatment). If sources are not included, the ERT encourages Latvia to indicate the reasons for exclusion in the IIR.

### Sector Specific Recommendations

#### **6A - solid waste disposal on land NMVOC**

104. The ERT recommends that Latvia estimate air pollutants emitted from landfills (especially NMVOC) either by using 2009 EMEP/EEA NMVOC default EFs or

information concerning landfill gas composition if available (from field measurement data or bibliographic analysis). A pollutant/CH<sub>4</sub> ratio could be applied to CH<sub>4</sub> emission estimates available from UNFCCC.

#### **6B- Waste-water handling NH<sub>3</sub> & NMVOC**

105. Latvia does not estimate emissions from wastewater handling. The ERT encourages Latvia to estimate the fraction of the population using Latrines, and to estimate the associated NH<sub>3</sub> emissions. The ERT also encourages Latvia to investigate estimates of NH<sub>3</sub> emissions from wastewater treatment plant. Where it is not possible to make reliable estimates, the ERT encourages Latvia to explain the reasons for this exclusion in the IIR.

#### **6Ca – Hospital waste incineration - all pollutants**

106. The time series of activity data on incineration of hospital waste appears to be inconsistent. Latvia indicated that no activity data is considered in the inventory when information is not reported in the national waste database, which starts from 1999. The ERT recommends that Latvia investigate the amount of hospital waste which was incinerated before 1999 and, if there was none, to explain this clearly in the IIR.

107. The ERT recommends that Latvia apply EFs which are specifically applicable for the incineration of hospital waste, as specified in the 2006 and 2009 EMEP/Corinair and EEA Guidebooks.

108. Moreover, the ERT encourages Latvia to calculate these emissions for all of the pollutants for which EFs are available in the Guidebook.

#### **6Cb Hazardous waste incineration – all pollutants**

109. The time series of activity data on the incineration of hazardous waste appears to be inconsistent (no activity data is considered in the inventory when information is not reported in the waste database, which starts from 1999). The ERT recommends that Latvia investigate the amounts of industrial hazardous waste which was incinerated before 1999 and, if there was none, to explain this clearly in the IIR.

110. The ERT recommends that Latvia apply EFs which are specifically applicable for the incineration of hazardous waste, as specified in the 2006 and 2009 EMEP/Corinair and EEA Guidebooks.

111. Moreover, the ERT encourages Latvia to calculate these emissions for all of the pollutants for which EFs are available in the Guidebook.

#### **6Cd Cremation – all pollutants**

112. Latvia calculates emissions from cremation using EFs available in the 1996 EMEP/Corinair Guidebook. The ERT recommends that Latvia calculate emissions from cremation using the 2009 EMEP/EEA EFs. Moreover the ERT encourages Latvia to calculate emissions for all pollutants which are included in this version of the Guidebook.

113. Latvia indicated that it would be possible to obtain data from the only crematorium in the country, and therefore the ERT encourages Latvia to use the exact

time series of activity data instead of a constant value over the complete inventoried period.

**Miscellaneous**

114. As many sources of this NFR occur in Latvia, the ERT recommends that Latvia estimate emissions where an EF is available in the 2009 EMEP/EEA Guidebook. So, emissions from sludge spreading, compost and biogas production, if existing within the country, could be estimated and allocated in NFR 6D.

115. If plants incinerating tyres with energy recovery are not considered in the inventory as point sources, the ERT encourages Latvia to estimate associated emissions and to allocate them to the energy sector.

**LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW**

1. Response to preliminary question raised prior to the review:

- LV\_Ind\_Proc\_Initial\_Qns\_v1\_Oktosend\_LV answer\_150609.doc
- LV\_Ind\_Proc\_Initial\_Qns\_v2\_250609.doc
- Lv\_Waste\_Initial\_Qns\_v1\_OKtosend\_160609.doc
- Lv\_Mobile\_Initial\_Qns\_v1\_OKtosend\_LV answer\_HR.doc
- LV\_Gen\_Initial\_Qns\_Response\_cleared\_250609.doc

2. Response to questions raised during the review:

- LV\_Ind\_Proc\_Second\_v1\_24june\_2009-1\_250609.doc
- Lv\_Mobile\_Initial\_Qns\_v2\_OKtosend\_answers.doc

3 Additional materials provided by the Country during the Review

- EMEP uncertainties 2009.xls
- RepDab\_keysources.rar

IIR, data submission and data analysis transmitted by the CEIP  
Review Stage 2: Synthesis and Assessment Country report