UNITED NATIONS

Distr.
GENERAL

CEIP/S3.RR/2013/ LITHUANIA
10/09/2013

ENGLISH ONLY

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

STAGE 3 REVIEW REPORT
LITHUANIA

CONTENT

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_2, NOx, NMVOC, NH_3, plus PM_{10} & $PM_{2.5}$ for the time series years 1990 – 2011 reflecting current priorities from the EMEP Steering Body and the Task Force on Emission Inventories and Projections (TFEIP). HMs and POPs have been reviewed to the extent possible.

3. This report covers the stage 3 centralised reviews of the UNECE LRTAP Convention and EU NEC Directive inventories of Lithuania coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 17th to 21st June 2013 in Copenhagen Denmark and was hosted by the European Environment Agency (EEA). The following team of nominated experts from the roster of experts performed the review: Generalist – Valentina Idrissova (Kazakhstan), Energy - Stephan Poupa (Austria) and Laetita Nicco (France), Transport - Michael Kotzula (Germany), Industry - Neil Passant (European Union), Agriculture +Nature - Hakam Al-Hanbali (Sweden), Waste - Intars Cakaras (Latvia). There was no expert available to review emissions from the Solvents sector.

4. Chris Dore (United Kingdom) was the lead reviewer. The review was coordinated by Katarina Marečková (EMEP Centre on Emission Inventories and Projections - CEIP).

[1] 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

5. The ERT consider that Lithuania's inventory is in line with the EMEP/EEA Emissions Inventory Guidebook and the UN/ECE Reporting Guidelines.

6. The 2013 submission shows that Lithuania has improved its inventory significantly since the last review (2009) and that the Party has implemented many of the recommendations made by the previous ERT (e.g. reporting complete timeseries, the introduction of QA/QC procedures). The ERT commends Lithuania for its efforts in improving the emissions inventory.

7. Nevertheless, the ERT has noted that some of the planned improvements (e.g. uncertainty assessment) have not been carried out so farand that Tier 1 methods are still applied to estimate the emissions of some key categories (e.g. in the energy sector). The ERT has concluded that substantial improvements are still required before Lithuania's annual inventory submission is of an acceptable level of quality. In this report, the ERT has prepared a number of recommendations and encouragements to help Lithuania to further improve the quality of its inventory.

INVENTORY SUBMISSION

8. Lithuania has reported emissions for all pollutants in the NFR09 format, but not for a complete time series. Emissions have been reported for only 1990, 1995, 2000, 2005 and 2007-2011. National totals are available for the Protocol base years. Lithuania has also provided an informative inventory report (IIR).

KEY CATEGORIES

9. Lithuania has presented a Tier 1 key category analysis (KCA) based on a level assessment in its IIR. Lithuania has explained that the KCA is used to prioritise its inventory improvement; however, the ERT did not find any evidence to support this. During the review Lithuania provided the ERT with a very general list of planned improvements (e.g. update AD and EF in all sectors) that did not include links to the KCA. The ERT recommends that Lithuania link its KCA to the source-specific improvements (e.g. move to Tier 2 or higher methodologies for estimating emissions from some key categories in the energy sector) and transparently report these in its IIR.

10. The ERT also encourages Lithuania to follow the information provided in the EMEP/EEA Guidebook, which indicates that the KCA analysis should be conducted on sources up to 80% of the emission total. The results of this analysis should be used to prioritise inventory improvement.

QUALITY

Transparency

11. Lithuania's IIR lacks important details (e.g. AD trends, methodological assumptions) for most sources, leading to numerous questions from the ERT before and during the review week. The ERT is sympathetic to the restrictions that result from limited

resources; nevertheless the ERT recommends that Lithuania provide a more in-depth description in its IIR (see issues included in the source-specific chapters of this report).

Completeness

12. Lithuania has reported NFR tables for 1990, 1995, 2000, 2005 and 2007-2011 only. During the review Lithuania informed the ERT that reporting of the full timeseries is planned for next year's submission. The ERT recommends that Lithuania undertake this improvement to enhance completeness of its inventory.

13. Lithuania has reported some sources as NE due to the lack of AD availability and has provided estimates for the contribution of the not estimated sources to the national totals (p. 13 of the IIR). The ERT noted that some sources reported as "NE" may make a significant contribution to the national total (e.g. direct NOx emissions from soils, TSP emissions from asphalt roofing). Also HCB emissions were reported as NE for 2011.

14. The ERT has also found some inconsistent/incorrect use of notation keys (NO instead of NA in the energy sector, and NA instead of NE in the transport sector). During the review Lithuania confirmed that the use of notation keys was incorrect, and provided some preliminary revised estimates to the ERT.

15. The ERT recommends that Lithuania reviews the use of notation keys in the inventory, and revises the incorrect occurrences of notation keys noted above, and to pay particular attention to POPs in order to comply with the POPs Protocol.

Consistency, including recalculations and time-series

16. Lithuania has performed recalculations for the whole time series but these are poorly documented in its IIR. The ERT encourages Lithuania to refer to the inventories of other Parties (e.g. Norway, Italy) for examples of good practice that can be used to improve the reporting of recalculations in future submissions from Lithuania.

17. The ERT has also noted that Lithuania uses both measured (if available) and calculated pollutant emissions for reporting emission estimates across the time series of a single source sector. This can result in an inconsistent time series. During the review week, Lithuania explained that large point-sources report measured emissions together with the AD, thus allowing consistency checks to be made. The ERT recommends that Lithuania include a more detailed description of the consistency checks in the IIR in time for its next submission.

18. Despite the limited time series reported, inconsistent use of some notation keys and a lack of transparency in the IIR (see para 12 above), the ERT has considered Lithuania's inventory to be generally consistent. Nevertheless, the ERT recommends that Lithuania improve its QA/QC procedures to ensure that the transparency and consistency of the inventory are at a sufficient level.

Comparability

19. Despite the lack of transparency and incomplete time series reported, the ERT considered Lithuania's inventory to be comparable to those of other Parties. The ERT

encourages Lithuania to follow the ERT's recommendations in the source-specific sections of this report, to ensure the submission of a comparable inventory in the future.

Accuracy and uncertainties

20. The ERT has noted that Lithuania applies a Tier 1 method to estimate emissions from some key categories (e.g. in the energy sector, see para 41). This does not follow good practice as presented in the EMEP/EEA Emissions Inventory Guidebook. The ERT recommends that Lithuania use the higher Tier methods to estimate emissions from key categories (based on the KCA).

21. The ERT has noted that Lithuania has not provided any information on uncertainties in their IIR (although some information on uncertainties is included in the QA/QC procedures). During the review, in response to questions raised by the ERT, Lithuania explained that an uncertainty evaluation exercise was applied to evaluate the uncertainty of emission factors and activity data in 1A1a. The results showed that the uncertainty of SO2, NOx, NMVOC emissions were <1%. The ERT recommends that Lithuania provide more detailed information in the IIR on this assessment, the methodology used, and the results.

22. Lithuania expressed its intention to develop and report the uncertainty assessment in its next submission for all sectors, as this is part of the the improvement plan. The ERT would like to stress the importance of the uncertainty assessment in providing information on the accuracy of the inventory, and remind Lithuania that it is also a useful tool for prioritising the inventory improvement tasks. The ERT recommends that Lithuania undertake an uncertainty assessment, report the results in its IIR, and use the results to help plan inventory improvements.

Verification and quality assurance/quality control approaches

23. Following the recommendations of the previous review in 2009, Lithuania has provided a description of inventory QA/QC procedures in its IIR, although the ERT has noted that the description is rather general. During the review week, the ERT has concluded that QA/QC procedures in the inventory are neither source-specific, nor particularly detailed. The ERT therefore recommends that Lithuania refine the current QA/QA procedures to improve the accuracy, completeness and consistency of its inventory.

FOLLOW-UP TO PREVIOUS REVIEWS

24. Lithuania provided some responses to the findings of the Stage 2 review annually, although several findings on IEF outliers are still awaiting answers from Lithuania. The ERT encourages Lithuania to cooperate more closely with the CEIP in order to solve the currently outstanding issues.

AREAS FOR IMPROVEMENTS IDENTIFIED BY LITHUANIA

25. In its IIR, Lithuania only reported an uncertainty assessment as a planned improvement for most categories. Based on the information provided during the review, the ERT concluded that the following general improvements were priorities for next year’s submission:

26. Reporting of the full time series (1990-2012) for all pollutants, including PMs, HMs, POPs in all sectors to improve completeness.

27. Compiling an uncertainty assessment, and using the results to prioritise further improvements.

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS-CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

28. The ERT noted that the planned improvement of compiling an uncertainty assessment has not been undertaken, and recommends that this is done in time for the next submission - Lithuania indicated their intention to so.

29. The ERT noted that Tier 1 methods are still used to estimate the emissions of some key categories. The ERT recommends that, where possible, higher tier methods are used to estimate key sources in time for the next submission. The ERT does appreciate that obtaining input data to allow the use of higher tier methods can take time, and therefore recommends that where it is not possible to achieve this in time for the next submission, Lithuania present in their next submission a clear and detailed plan of how this will be achieved in the future.

30. Lithuania did not report a complete time series of sectoral emissions. However, Lithuania has indicated its intention to address this in time for the next submission, and the ERT recommends that this is addressed.

31. Lithuania's IIR lacks detail and hence the ERT recommends that Lithuania provide more in-depth description in its IIR.

32. Lithuania’s current use of notation keys (particularly the extensive use of NE, and notation keys for POPs) has the potential to impact on completeness and therefore accuracy. The ERT considers that this needs improvement, and recommends that the current use of notation keys be improved in time for the next submission.

SECTOR SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

ENERGY

Review Scope

Pollutants Reviewed		NOx, NMVOC, SOx, PMs, CO, priority HMs, PCDD/PCDF, PAHs		
Years		1990, 1995, 2000, 2005, 2007-2011		
NFR Code	**CRF_NFR Name**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
1.A.1.a	public electricity and heat production	x		
1.A.1.b	petroleum refining	x		x
1.A.1.c	Manufacture of solid fuels and other energy industries	x		
1.A.2.a	iron and steel	NO		
1.A.2.b	non-ferrous metals	NO		
1.A.2.c	chemicals	x		x
1.A.2.d	pulp, paper and print	x		x
1.A.2.e	food processing, beverages and tobacco	x		
1.A.2.f.i	Stationary Combustion in Manufacturing Industries and Construction: Other (Please specify in your IIR)	x		x
1.A.2.f.ii	Mobile Combustion in Manufacturing Industries and Construction: (Please specify in your IIR)	x		x
1 A 3 e	Pipeline compressors ?		x	
1.A.4.a.i	commercial / institutional: stationary	x		
1.A.4.a.ii	commercial / institutional: mobile ?	x		x
1.A.4.b.i	residential plants	x		
1.A.4.b.ii	household and gardening (mobile)	x		
1.A.4.c.i	Agriculture/forestry/fishing. stationary	x		
1.A.4.c.ii	off-road vehicles and other machinery?	x		
1.A.4.c.iii	national fishing?	x		
1.A.5.a	other, stationary (including military)	x		
1.A.5.b	other, mobile (including military, land based and recreational boats)?	x		
1.B.1.a	coal mining and handling	x		
1.B.1.b	solid fuel transformation	x		
1.B.1.c	other fugitive emissions from solid fuels)	x		
1 B 2 a i	Exploration, production, transport	x		
1 B 2 a iv	Refining / storage	x		
1 B 2 a v	Distribution of oil products	x		
1 B 2 b	Natural gas		x	
1 B 2 c	Venting and flaring		x	
1 B 3	Other fugitive emissions from geothermal energy production , peat and other energy extraction not included in 1 B 2	NO		
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues.

Transparency:

33. The ERT commends Lithuania for having clearly identified 'NE', 'IE' and 'NO' sources in its IIR.

34. The ERT has noticed that there is a lack of methodological description for several NFR categories in the IIR (1A4a, 1A4b, 1A4c).

35. During the review week, Lithuania provided information on the methodologies used in the inventory.

36. The ERT recommends that Lithuania include in its IIR the explanations and graphs provided during the review week, and to continue improving the transparency of the IIR by including thorough and complete descriptions of methods, data sources and assumptions for all categories reported.

37. The ERT has noted that the methodology tiers that are used for estimating emissions from the Energy sector are not clearly presented in the IIR. During the review week, Lithuania provided information on the methodology tiers used for key categories, and indicated that this information would be included in the next IIR.

Completeness:

38. The ERT has noted that Lithuania reports some energy categories as 'NE' (1A4b ii) or 'IE' (1A4c iii and 1A5).

39. During the review week, Lithuania explained that energy balances provided by Statistics Lithuania present consumption aggregations for each energy sector. As a result, reliable data is not always available at a detailed sectoral level. In order to make emission estimates, Lithuania needs to make a number of assumptions regarding the fuel consumption for each source sector.

40. The ERT encourages Lithuania to closely work with Statistics Lithuania to gain a full understanding of what is included in each energy sector provided by Statistics Lithuania, and therefore to improve the accuracy of emissions for sectors which are currently reported with the notation keys NE and IE.

Completeness / Comparability:

41. The ERT has noted that Lithuania did not provide activity data for all of the reported years in the NFR tables (1990-2006 and 2011). As a result, the ERT could not assess the trends of the fuel consumption or trends of the IEFs for each sector.

42. During the review week, Lithuania confirmed that it will include activity data in NFR tables for its next submission (years 1990, 1995, 2000, 2005, 2007-2011). The ERT thanks the Party for having provided graphs of activity data during the review process, and encourages Lithuania to include these graphs and suitable explanations in its IIR in time for its next submission.

Consistency including recalculation and time series:

43. The ERT has noted that Lithuania uses NA for some sectors to report some fuel activity data in the NFR tables for combustion activities (1A). Where no fuel is consumed in a combustion source sector, the fuel use should be reported as NO. The ERT recommends that Lithuania report "NO" instead of "NA" where there is no fuel consumed in a combustion source category.

44. The ERT has also noted that for some categories Lithuania reports emissions as 'IE'. In these cases, activity data should also be reported as 'IE'. The ERT recommends that Lithuania correct the use of the notation key IE in the activity data tables to ensure consistency with the emissions from the same source sector.

Accuracy and uncertainties:

45. Upon request of the ERT, Lithuania provided information on method applied for the key categories in the energy sector during the review week. The ERT noted that Lithuania is using Tier 1 methodologies for most key categories (1A1c, 1A2f, 1A4a, 1A4b, 1A4c, 1B2a). The ERT recommends that Lithuania improve its methodology for key categories by implementing tier 2 methods.

Improvement:

46. The Lithuanian IIR does not indicate any improvements for the energy sectors.

47. The ERT encourages Lithuania to include the ERT's recommendations in its improvement plan.

Sub-sector Specific Recommendations.

Category issue 1: 1A1b Petroleum Refining – TSP, PM10, $PM_{2.5}$

48. The ERT has noted that Lithuania reports PM10 and PM2.5 emissions from combustion in petroleum refineries as "NE" over the time series, whereas figures for TSP emissions are reported in the NFR tables.

49. This is not consistent with the EMEP guidebook which offers EFs for PM10 and PM2.5 for all fuels used in refineries.

50. Lithuania provided the ERT with:

- reasons for the low TSP EF and for not estimating PM10 and PM2.5 (EF in EMEP Guidebook higher than current TSP IEF),
- recalculations for TSP, PM10, PM2.5 for NFR 1A1b.

51. The ERT thanks the Party for providing a quick response during the review process. The ERT recommends that Lithuania estimate PM10 and PM2.5 using either the ratios provided by the EMEP Guidebook or directly use the EMEP Guidebook EFs depending on the reliability of the industry data.

Category issue 2: 1A2c & 1A2d – PCDD/PCDF, PAHs

52. The ERT has noted that Lithuania reports PCDD/PCDF and PAHs emissions for combustion in 1A2c (chemicals) and 1A2d (pulp, paper and print) categories as “NO” over the time series in the NFR tables.

53. This is not consistent with the EMEP guidebook which provides EFs for each fuel used in combustion equipment. During the review week, Lithuania provided emission estimates for PAHs. The ERT recommends that Lithuania include these PAH emissions in the NFR tables in the next submission and complete its IIR by including EF values for “gaseous fuels” and “other fuels” in table 2.14.

54. The ERT also recommends that Lithuania estimate PCDD/PCDF emissions in its next submission using the EFs from the EMEP/EEA Guidebook.

Category issue 3: 1A2f i & 1A2f ii – activity data

55. The ERT has noted that Lithuania reports data from stationary equipment in NFR 1A2f ii and data from mobile equipments in NFR 1A2f i.

56. This is not consistent with the LRTAP reporting guidelines.

57. The ERT recommends that Lithuania report activity data and emissions:

- in NFR ‘1A2f i’ for stationary combustion in manufacturing industries & construction,
- in NFR ‘1A2f ii’ for mobile combustion in manufacturing industries & construction land based mobile machinery.

Category issue 4: 1A – PM

58. Following up on an issue raised in the previous centralised review (2009), the ERT has noted that in Annex 1 of the IIR, the PM EF for wood was the same for all of the sub-categories. In the previous review, the ERT had encouraged Lithuania to review these EFs and to take into account the characteristics of different equipment.

59. During the review week, Lithuania was not able to provide information on which measures had been undertaken and/or what was planned.

60. The ERT recommends that Lithuania review each of the wood combustion sources, and uses the most appropriate PM EF for each source, and not simply a single PM EF for all wood combustion sources. This will improve the accuracy of the inventory. The ERT recommends that this improvement is implemented in time for the Party’s next inventory submission.

Category issue 5: 1A2f ii & 1A4a ii - EF

61. The ERT has noted that the EFs for all pollutants used to estimate mobile sources in industry and in commercial and institutional activities are not clearly documented in the IIR.

62. During the review week, Lithuania provided the EFs that are used for mobiles sources in industry and EFs that are used in 1A4 - without making a distinction between mobile and stationary sources.

63. The ERT encourages Lithuania to include this information on EFs with their references in the IIR, and to include explanations about the choice of EFs in the IIR, in time for its next submission.

TRANSPORT

Review Scope

Pollutants Reviewed		NO_x, NMVOC, NH_3, SO_x, $PM_{2.5.}$, PM_{10}, TSP, CO, Main HM, PAH		
Years		1990, 2010, 2011		
NFR Code	**CRF_NFR Name**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
1.A.3.a.i.(i)	international aviation (LTO)	x		
1.A.3.a.i.(ii)	international aviation (cruise)	x		x
1.A.3.a.ii.(i)	civil aviation (domestic, LTO)		IE	x
1.A.3.a.ii.(ii)	civil aviation (domestic, cruise)	x		x
1.A.3.b.i	road transport, passenger cars	x		x
1.A.3.b.ii	road transport, light duty vehicles	x		x
1.A.3.b.iii	road transport, heavy duty vehicles	x		x
1.A.3.b.iv	road transport, mopeds & motorcycles	x		
1.A.3.b.v	road transport, gasoline evaporation	x		x
1.A.3.b.vi	road transport, automobile tyre and brake wear	x		x
1.A.3.b.vii	road transport, automobile road abrasion	x		x
1.A.3.c	railways		NO	
1.A.3.d.i (ii)	international inland navigation	x		x
1.A.3.d.ii	national navigation	x	1990: NE/NA	x
1.A.4.b.ii	household and gardening (mobile)	x	1990: IE	
1.A.4.c	agriculture / forestry / fishing	x		
1.A.4.c.ii	off-road vehicles and other machinery	x	IE (1990)	
1.A.4.c.iii	national fishing		x	
1.A.5.b	other, mobile (including military, land based and recreational boats)	x		x
1 A 3 d i (i)	International maritime navigation		IE	x
1 A 3	Transport (fuel used)	x		x
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues.

Transparency:

64. The ERT has noted a lack of information regarding activity data in the IIR, especially when it comes to explaining the trends in fuel consumption. The ERT recommends that Lithuania include consumption data time series and to provide more detailed information in the IIR - especially on the national circumstances that influence the fuel consumption and give rise to unusual features in the time series.

65. The ERT has also noted several problems regarding the consistent and transparent use of notation keys not only between comparable sources but also within the sub-sectors of a certain sector. The ERT recommends that Lithuania review and address these issues in order to improve the inventory's transparency.
Furthermore, the ERT has noted several problems regarding the use of notation keys in the reporting of PAH emissions (see Sub-Sector Specific Recommendations). Lithuania indicated that they recognised these issues and that they would make the necessary corrections.

66. The ERT has also noted problems regarding the consistent and transparent reporting of PAH emissions. Within several sectors, equal emission estimates have been provided for more than one of the four reported PAHs (see Sub-sector Specific Recommendations). Lithuania indicated that they recognised the issues and were willing to make the necessary corrections.

Completeness:

67. During the review the ERT found several sectors for which notation keys "NA" and/or "NE" were reported instead of emissions estimates, for example (list not exhaustive):

- 1.A.3.e - Pipeline compressors: emissions data from 2005 onwards
- 1.A.4.a ii - Commercial / institutional: Mobile: emission estimates from 2008 onwards

68. The ERT encourages Lithuania to check these issues and to provide a consistent time series. In case reporting is not possible at the individual NFR level, Lithuania should consider the use of "IE", and provide information on where activity data and emissions are included in both the NFR tables and in the IIR.

69. In addition, several problems have occurred regarding the reporting of the following pollutants with "NE" being reported for the entire time series:

(a) **Ammonia - NH_3** from
- 1.A.2.f ii - Mobile Combustion in manufacturing industries and construction,
- 1.A.3.a - Civil aviation sub-sectors,
- 1.A.3.c - Railways,
- 1.A.3.e - Pipeline compressors
- 1.A.3.d i (i) International maritime navigation

(b) **Total suspended particles - TSP** from 1.A.3.b vi - RT: Automobile tyre and brake wear,

(c) **Particulate matter (PM2.5, PM10, TSP)** from 1.A.3.b vii - RT: Automobile road abrasion,

(d) **Lead - Pb** from 1.A.3.a - Civil aviation sub-sectors, and

(e) **Mercury - Hg** from 1.A.3.b sub-sectors

70. The ERT encourages Lithuania to check these issues and to provide emission estimates in its future submissions. Where it is not possible to provide emission estimates, the ERT recommends that Lithuania explain why these estimates cannot be provided in the NFR and IIR to ensure a sufficient level of transparency.

71. Regarding the problems with reporting NH3 emissions (see Sub-Sector Specific Recommendations) the ERT asked Lithuania about the reason why these emissions were excluded from the inventory (e.g. were the emissions considered too small? or is it not possible to obtain the required data from emission estimates?). The ERT recommend that this issue be reviewed and addressed to improve the completeness and comparability of the inventory.

72. The ERT also proposed the use of emission factors from the 2009 EMEP/EEA Guidebook, which would allow Lithuania to estimate emissions for some of the sectors discussed during the review.

Consistency including recalculation and time series:

73. During the review, the ERT noted several outliers and trends especially in consumption data (see Sub-Sector Specific Recommendations), which also influence the resulting emission estimates. The ERT asked Lithuania to provide explanatory information on the listed outliers and trends.

74. Since Lithuania has not been able to fully clarify these issues, the ERT recommends that Lithuania further investigate the trends and outliers in the time series and carry out corrections wherever necessary and possible, and provide more detailed and comprehensive information on national circumstances in the IIR.

75. Regarding the recalculations, the ERT has noted that the IIR only contains very basic information at an overview level. Lithuania explained that data for NFR 1.A.3.b - Road transportation had been revised based upon the new COPERT IV version 10.0, including a correction of activity data and the sulphur and lead content in fuels.

76. In order to improve the consistency and transparency of the inventory, the ERT encourages Lithuania to transparently explain changes caused by the recalculations by providing a comparison of the previous submission with the current submission, as well as the absolute and relative changes. The ERT encourages Lithuania to not only do this at an aggregated level, but also at the subsector level as part of the IIR chapters.

Comparability:

77. As already mentioned under Transparency, the ERT has noted a lack of information regarding activity data and emission factors in the IIR. In order to improve the inventory's comparability, the ERT recommends that Lithuania include in all future IIRs time series and more detailed information on national circumstances that impact on the trends over time.

Accuracy and uncertainties:

78. As stated in the 2009 review report, there are no QA/QC procedures for the mobile sources described in the IIR.

79. The ERT reiterates its encouragement for Lithuania to develop QA/QC procedures/checks specifically for mobile sources and to describe them in the IIR.

Lithuania may find it useful to liaise with inventory compilers from other countries for support if needed.

80. The ERT has noted that no uncertainty analysis has been carried out for the entire transport sector. Lithuania states in the IIR that an uncertainty analysis is planned, and will be included in future submissions. As the missing of uncertainty estimates for mobile sources was already noted within the 2009 review report, the ERT has to reiterate the need for including the uncertainty analysis in the next submission.

Improvement:

81. Within the IIR, planned improvements for all reported mobile sources have been provided (see Accuracy above). The ERT welcomes Lithuania's willingness to further improve their inventory in the way stated. Nonetheless, given the number of sector-specific issues discussed during the review, the ERT assumes that some essential improvements need to be addressed as well.

Sub-sector Specific Recommendations.

Category issue 1: 1.A.2.f ii: NH3

82. The ERT has noted that the notation key "NE" has been provided instead of ammonia emissions. (see also: Completeness).

83. Lithuania holds that in the EMEP/EEA Guidebook no EF is provided. The ERT has pointed out that in the 2009 EMEP/EEA Guidebook, chapter "Non-road mobile sources and machinery", emission factors are provided for a broad variety of controlled and uncontrolled NRMM (table 3-10 on page 34 and the following tables), and therefore encourages Lithuania to address this issue, and improve completeness.

84. The ERT noted several problems regarding the correct use of notation keys not only between comparable sectors but also within sub-sectors of the same sector, and asked Lithuania to check these issues in order to improve the inventory's transparency and consistency. Lithuania has confirmed their readiness to make the corrections necessary to ensure consistency of the notation keys in sector 1A2fii.

Category issue 2: 1.A.3.a: PM, CO, HM, and PAHs

85. The ERT noted several problems regarding notation keys used throughout the sub-categories of NFR 1.A.3.a. Here, within the 1990 and 2011 NFRs, several "NA" have been provided where "NE" is considered the appropriate notation key (e.g. CO & PM from 1.A.3.a i(ii), priority HMs from 1.A.3.a ii(i) and 1.A.3.a i(i), PAH emissions from the cruise phase (1990 only) and 1.A.3.a i(i)). Lithuania expressed its readiness to review the use of notation keys in 1A3a to ensure consistency and improve transparency for all years.

Category issue 3: 1.A.3.a ii (i): Pb

86. The ERT noted that lead emissions might occur from the LTO phase in domestic civil aviation (1.A.3.a ii(i), and asked Lithuania to check whether there are small piston-engine aircraft involved at least in domestic civil aviation and whether these aircraft use

leaded avgas. Lithuania confirmed the use of leaded avgas in small aircraft operated in Lithuania without providing additional data. The ERT therefore recommends Lithuania to further check this issue and to provide emission estimates allocated to the correct 1.A.3.a sub-sector with the next submission.

Category issue 4: 1.A.3.a ii (i): 1.A.3.a i(i), 1.A.3.d ii, 1.A.3.d i(i): PAH

87. The ERT noted that within the listed sectors similar emission estimates have been provided for two or more PAHs:

- NFR 1.A.3.a i (i): similar estimates for B(a)P and B(b)F (whereas "NA" for B(k)F but "NE" for I(123cd)P; Here, in addition, 1-4 Total should be reported "NE", too.)
- NFR 1.A.3.d ii: similar estimates for all four PAHs
- NFR 1.A.3.d i(i): similar estimates for all four PAHs (but no 1-4 Total).

88. The ERT recommends that Lithuania further clarify this issue and address any mistakes identified in time for the next submission.

Category Issue 5: 1.A.3.a i(i), 1.A.3.c, 1.A.4.c ii: PAH

89. The ERT has noted that for these sectors estimates have been provided for B(a)P and B(b)F whereas "NE" has been reported for B(k)F and I(1,2,3-c,d)P, with the values given for "Total 1-4" equalling the corresponding sum of B(a)P and B(b)F. The ERT considers this approach acceptable, but notes that, as the NEs provided for B(k)F and I(1,2,3-c,d)P should stand for estimates different from zero, the Total 1-4 sum should be bigger than the sum of B(a)P and B(b)F alone.

Category Issue 6: 1.A.3.b i - v: PAH

90. During the review the ERT has noted that within the 1990 NFR table 1, zero values are provided for the emissions of B(a)P and PAH Total 1-4, whereas "NA" is included for all other PAHs - except 1.A.3.b ii, for which "IE" has been reported - whereas the 2011 table contains real data.

91. In order to improve the inventory's transparency, the ERT recommends that Lithuania replace the zero values by appropriate emissions data or notation keys and to harmonize the information provided within the NFR tables. The ERT commends Lithuania for providing corrected 1990 estimates during the review.

Category Issue 7: 1.A.3.b vii: PAH

92. The ERT noted that within the 1990 NFR table 1, "NA" is provided for emissions of B(a)P and B(b)f, whereas "NE" is given in the 2011 table. The ERT recommends that Lithuania check this issue for all reported years and carry out corrections where necessary to ensure correct use of notation keys and improve consistency. The ERT commends Lithuania for providing corrected data for the identified years during the review week.

Category Issue 8: 1.A.3.b iii: Pb

93. The ERT noted that in the IIR Lithuania states that leaded gasoline is currently being used in road transport, the latter being the only source of lead emissions from this sector, with other HM emissions arising from engine wear. As no specific consumption data is provided in the IIR, the ERT assumed that in Lithuania leaded gasoline is used in heavy duty vehicles and/or buses, too, and asked Lithuania to verify this assumption.

94. Lithuania explained that UAB ORLEN Lietuva (the only petroleum refining company operating in the Baltic States from the year 1996 onwards) produces high quality unleaded gasoline VENTUS with multifunctional additives. Lithuania further indicated that the exhaust emissions reported for all heavy metals result from trace contents in the fuels themselves, and also from HMs in the lubricants/additives as well as engine wear. Lithuania indicated that they would include explanatory information in the IIR of their next submission.

95. The ERT considered Lithuania's answer to explain the issue, and commends their plan to include explanatory information in IIRs of future submissions.

Category Issue 9: 1.A.3.b iv: SO2

96. The ERT noted that within the 2011 NFR a zero value has been provided. The ERT asked Lithuania to check whether this is a mistake or to provide information on this issue. Lithuania confirmed that this is a mistake, and provided a corrected estimate for 2011. The ERT thanks Lithuania for the correction carried out, and considers this issue resolved.

Category Issue 10: 1.A.3.c: NH_3

97. The ERT noted that notation key "NE" has been reported instead of ammonia emissions (see also: Completeness), and asked Lithuania to investigate reporting of emission estimates for all fuels used in this sector. Lithuania agreed to replacing the notation key by emission estimates for their next submission.

Category Issue 11: 1.A.4.a: NH_3 from mobile sources

98. The ERT noted that the notation key "NE" has been reported instead of ammonia emissions (see also: Completeness), and asked Lithuania to investigate reporting of emission estimates for all fuels used in this sector. Lithuania agreed to replacing the notation key by emission estimates in their next submission, for hard coal and biomass. The ERT has acknowledged the reply from Lithuania, and also encourages Lithuania to investigate estimating emissions from liquid fuel consumption in mobile sources which are expected to occur in this sector.

Category Issue 12: 1.A.3.b i: trend of fuel consumption

99. During the review the ERT asked the Party to provide background information on the reasons for the ever declining trend reported for fuel consumption in this sub-sector. The ERT recommends that Lithuania include explanatory information in their IIR.

Category Issue 13: 1.A.3.b ii: trend of fuel consumption

100. The ERT asked Lithuania to provide a reason for the extreme increase in fuel consumption between 2007 and 2008 as well as the rather high consumption in 2008. Lithuania stated that despite the latest economic recession the number of commercial light-duty vehicles did not decrease significantly. By contrast, the driven mileage increased substantially, leading to a jump in fuel consumption. The ERT acknowledged the answer provided, but pointed out that as fuel consumption nearly doubled from 2007 to 2008 the mentioned increase in mileage did not fully explain this issue. Therefore, the ERT asked Lithuania whether there had been problems with the allocation of overall fuel use to the different sub-sectors of Road Transportation, and encouraged Lithuania to further check this issue and provide a sufficiently detailed explanation in their IIR.

Category Issue 14: 1.A.3.b ii: trend of fuel consumption

101. The ERT asked Lithuania to explain the jump in fuel consumption reported for heavy duty vehicles occurring between 2007 and 2008. Lithuania replied that despite a decrease in vehicle numbers, the mileage greatly increased. The ERT thanked Lithuania for their reply, however, the ERT considers that this answer does not fully explain the observed trends. The ERT therefore asks Lithuania to further investigate this issue and to include explanatory information in the future IIRs.

INDUSTRIAL PROCESSES

Review Scope

Pollutants Reviewed		SOx, NOx, NMVOC, NH_3, PM_{10} & $PM_{2.5}$, Pb, Cd, Hg, POPs		
Years		1990 – 2011		
NFR Code	**CRF_NFR Name**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
2.A.1	cement production	x		x
2.A.2	lime production	x		x
2.A.3	limestone and dolomite use		NA, NE	
2.A.4	soda ash production and use		NA, NE	
2.A.5	asphalt roofing		x	
2.A.6	road paving with asphalt		x	
2.A.7.a	Quarrying and mining of minerals other than coa		NA, NE	
2.A.7.b	Construction and demolition		NA, NE	
2.A.7.c	Storage, handling and transport of mineral products		NA, NE	
2.A.7.d	Other Mineral products (Please specify the sources included/excluded in the notes column t the right)		NA, NE	
2.Bb.1	ammonia production		x	
2.B.2	nitric acid production		x	
2.B.3	adipic acid production		NO, NA	
2.B.4	carbide production		NO	
2.B.5.a	Other chemical industry (Please specify the sources included/excluded in the notes column t the right)	x		x
2.B.5.b	Storage, handling and transport of chemical products (Please specify the sources included/excluded in the notes column to the right)		NE	
2.C.1	iron and steel production		NO	
2.C.2	ferroalloys production		NO	
2.C.3	aluminium production		NO	
2.C.5.a	Copper Production		NO	
2.C.5.b	Lead Production		NO	
2.C.5.c	Nickel Production		NO	
2.C.5.d	Zinc Production		NO	
2.C.5.e	Other metal production (Please specify the sources included/excluded in the notes column t the right)		NO	
2.C.5.f	Storage, handling and transport of metal products (Please specify the sources included/excluded in the notes column to the right)		NO	
2.D.1	pulp and paper	x		x
2.D.2	food and drink	x		x
2.D.3	Wood processing		NA, NE	
2.E	production of POPs		NO, NA	
2.F	consumption of HM and POPs (e,g. Electrical ar dscientific equipment)		NA, NO	
2.G	Other production, consumption, storage,		NO	

	transportation or handling of bulk products (Please specify the sources included/excluded i the notes column to the right)			
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

Transparency:

102. The IIR only gives some general information on the structure and scale of the industrial sector in Lithuania, and very little or no information is provided for each sub-sector. The ERT recommends that Lithuania provide some background information on each sub-sector where emissions are reported in order to give some context to the emission estimates. Key source categories such as 2.D.2 would be a priority, but information on all sub-sectors where emissions are reported is required to ensure an adequate level of transparency.

103. Lithuania largely uses emission factors from the Guidebook, or else operator-supplied, site-specific emissions data, in order to generate emissions data for industrial processes. These methods can be described quite simply and the IIR does give adequate information on the nature of the methodology for each sub-sector to be understood by the ERT. The source of a) operator-reported emissions data and b) activity data are described in general terms in the report, but it would be preferable to have sector-specific information on these aspects in each sub-section of the report.

104. The IIR does not tabulate any activity data or provide any comment on any notable trends in the activity data. This would enhance the transparency of the Lithuanian submission. The ERT encourages Lithuania to tabulate the activity data used for each sub-sector, and recommends that the IIR include explanations for any dips or jumps in the activity data.

Completeness:

105. The LRTAP submission includes a large number of NEs, giving the impression of a low level of completeness for Lithuania's inventory. The ERT recommends that Lithuania include more information in the IIR on the reasons for not estimating emissions for each source where NE is used, and provide information that would allow a better understanding of the potential significance of these gaps in the Lithuanian inventory. For example, any general statements that can be made about the scale and/or type of industrial activities in Lithuania for each missing source, and their likelihood to be significant.

Consistency including recalculation and time series:

106. Lithuania does not provide a full time-series of estimates, having submitted data for 1990, 1995, 2000, 2005, and 2007-2011 instead. However, even for these years there is no full consistency with, for example, NOx emissions from 2.A.1 being reported for some years, NE for others, and NA for other cases again.

107. Where emissions data have been submitted, there is generally insufficient information to assess the consistency of the time-series since the IIR does not include any activity data, and the LRTAP submission contains only limited activity data.

Comparability:

108. As far as the methods are concerned, the Party has either used the Guidebook factors or submitted operator-reported site-specific emissions data. Descriptions of the use of site-specific data are needed and it would help to indicate the quality of the data and their potential impact on the consistency of the time-series. The ERT recommends that the Party provide more detailed information on methods for all sectors where country-specific methods are used.

Accuracy and uncertainties:

109. Lithuania has not carried out any uncertainty analysis for the industrial process sector, although analyses of uncertainty for the organic chemical and food production sectors were part of the planned improvements. The ERT encourages Lithuania to include these analyses in the next submission.

110. Lithuania has not reported any sector-specific QA/QC procedures, but the general QA/QC procedures should suffice for much of the industrial process emissions data where national activity statistics and Guidebook emission factors are used. More information would, however, be helpful on QA/QC for the facility-level data used for some sectors, and the ERT encourages Lithuania to include more details on the methods used by operators to generate emissions data, and to verify the procedures for these data.

Improvement

111. The ERT notes that Lithuania is planning to undertake an uncertainty analysis for two sub-sectors of the industrial process sector. The ERT encourages Lithuania to undertake a full uncertainty analysis for the sector.

112. Emission estimates for some industrial sectors rely upon Guidebook factors. The ERT encourages Lithuania to provide a plan for further improvements in the inventory methodology for industrial sources in future versions of the IIR, including the potential to incorporate more country-specific data in the place of default emission factors from the EMEP/EEA Guidebook.

Sub-sector Specific Recommendations.

Category issue 1: 2.A.1 Cement Production & 2.A.2 Lime Production

113. Lithuania currently reports TSP for both of these source categories, but not PM10 and PM2.5. The ERT recommends that Lithuania develop emission estimates for both PM10 and PM2.5 for cement and lime production for future submissions.

Category issue 2: 2.B.5 Other Chemical Industry

114. In response to a question from the ERT, Lithuania provided some updated emissions data for organic chemical production. The ERT thanks Lithuania for providing

emission estimates during the review week and recommends that these emissions data are incorporated into Lithuania's inventory for the next submission.

Category issue 3: 2.D.1 Paper & Pulp

115. In response to a question from the ERT, Lithuania confirmed that pulp was produced in Lithuania in 1990-1993 and provided emission estimates for SO2. The ERT thanks Lithuania for providing emission estimates during the review week and recommends that these emissions data are incorporated into Lithuania's inventory for the next submission.

Category Issue 4: 2.D.2 Food and Drink

116. In response to a question from the ERT during the review week, Lithuania explained that the emission factor used for spirits manufacture was g/m3 ethanol production, rather than g/m3 spirits production. The ERT recommends that Lithuania amend Table 3-40 in the IIR to clearly indicate the correct units before the next submission.

SOLVENTS

Review Scope

Pollutants Reviewed		SO_2, NOx, NMVOC, NH_3, PM_{10} & $PM_{2.5}$		
Years		1990 – 2006 + (Protocol Years)		
NFR Code	**CRF_NFR Name**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
3.A.1	Decorative coating application		x	
3.A.2	Industrial coating application		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		x	
3.B.2	Dry cleaning		x	
3.C	Chemical products,		x	
3.D.1	Printing		x	
3.D.2	Domestic solvent use including fungicides		x	
3.D.3	Other product use		x	
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which codes have been reviewed and which have not in the respective columns.				

No solvents experts were available for the review.

AGRICULTURE

Review Scope:

Pollutants Reviewed		NOx, SOx, NH_3, PM_{10} & $PM_{2.5}$		
Years		1990 – 2011		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
4 B 1 a	Cattle dairy	X		X
4 B 1 b	Cattle non-dairy	X		X
4 B 2	Buffalo	X		
4 B 3	Sheep	X		X
4 B 4	Goats	X		X
4 B 6	Horses	X		X
4 B 7	Mules and asses	X		X
4 B 8	Swine	X		X
4 B 9 a	Laying hens	X		X
4 B 9 b	Broilers	X		X
4 B 9 c	Turkeys	X		X
4 B 9 d	Other poultry	X		X
4 B 13	4 B 13 Other	X		X
4 D 1 a	Synthetic N-fertilisers	X		X
4 D 2 a	Farm-level agricultural operations including storage, handling and transport of agricultural products			
4 D 2 a	Off-farm storage, handling and transport of bulk agricultural products			
4 D 2 c	N-excretion on pasture range and paddock unspecified (Please specify the sources included/excluded in the notes column to the right)			
4 F	Field burning of agricultural wastes	X		
4 G	Agriculture other(c)	X		
11 A	(11 08 Volcanoes)			
11 B	Forest fires			
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

117. The agriculture inventory 2013 submitted by Lithuania includes emissions for the time series 1990 to 2011. Lithuania estimated agricultural emissions for manure management (4B) and agricultural soils (4D1). Emissions related to field burning of agricultural wastes (4F) and the use of pesticides (4G) have been reported as not occurring "NO".

118. An NH3 emission trend specifically for the agriculture sector has not been provided and no detailed information is presented in the IIR. However, the emission trend of NH3 for the national total (all sectors) is presented. The emissions inventory of Lithuania only includes NH3 emissions from agriculture. The ERT recommends that Lithuania provides detailed information and an analysis of the emission trends, and includes more diagrams of the different sub-categories in the IIR, in order to improve the

quality of reporting and enhance the transparency of the agricultural sector in the future submissions.

119. The ERT has noted that the activity data (4B number of livestock and 4D Synthetic N-fertilizer, for 2011) presented in the IIR (i.e. Table 4-41) differ significantly from the NFR tables. The ERT strongly recommends that the Party corrects this error in its next submission in order to ensure the consistency of the inventory. The ERT also recommends that Lithuania review and improve the current QA/QC procedures as necessary, to avoid this inconsistency in the future.

Transparency:

120. The IIR provided by Lithuania includes general descriptions of activity indicators, data sources and methodologies. The IIR is generally transparent and well-presented although some additional details would bring improvements. The ERT recommends that the Party provide more detailed information in the IIR in time for the next submission, specifically descriptions of methodologies and assumptions used for emission estimates. This should include information on aspects of livestock husbandry and manure management that have a significant impact on NH3 emissions - such as the ratio of the housing to the grazing period and whether manure is handled as liquid slurry or as solid manure. This would significantly enhance the transparency of the IIR.

121. The ERT is of the view that the use of notation keys in the NFR tables, especially for (4F) field burning of agricultural waste, can be further improved. The ERT noted that the Party indicated in the IIR that emissions of NH_3 and SOx for these sources were not estimated. However, in the NFR tables, the notation key not applicable “NA” is used for these pollutants. The ERT recommends that Lithuania change these notation keys from NA to NE, in order to enhance the transparency of the inventory.

Completeness:

122. Lithuania reported only NH_3 emission estimates for the agricultural sector. Lithuania currently does not provide estimates of emissions of PM_{10} and $PM_{2.5}$ from (4B) manure management and (4D) agricultural soils. The ERT recommends that Lithuania estimate PM and other relevant pollutant emissions from these sub-categories.

Consistency including recalculation and time series:

123. The NH3 emissions data from the agricultural sector is generally consistent over the time series. The ERT commends Lithuania for this consistency and encourages them to maintain this level of consistency for emissions of NH3 and other relevant pollutants.

Comparability:

124. Lithuania has prepared the agriculture inventory in accordance with the recommendations given in the EMEP/EEA Guidebook, 2009. Estimates of emissions from the application of mineral fertilizers are based largely on EFs from literature. Lithuania’s inventory is generally comparable to those of other reporting Parties. The ERT encourages Lithuania to continue with this approach of ensuring that the applied methodologies are, as far as possible, in line with the international guidelines.

Accuracy and uncertainties:

125. Lithuania indicated in its IIR that some quality control procedures were applied to compare new updated activity data and EFs with those used in previous submissions. However, Lithuania does not specify whether the agricultural sector was included in this procedure or not. Lithuania also indicated that an uncertainty assessment remained to be undertaken. The ERT recommends that Lithuania undertake quality control procedures and uncertainty analyses for the agricultural sector (particularly for emissions reported under 4B and 4D) in order to help support the improvement process and to provide an indication of the reliability of the inventory data and documents this in the IIR.

Improvement:

126. The ERT has noted that Lithuania did not specify plans for improvements in the IIR. The ERT encourages Lithuania to list the planned and desired improvements in its IIR to enhance the quality of the inventory.

Recalculations:

127. The ERT has noted that no recalculations were made for the agricultural sector. The ERT encourages Lithuania to undertake recalculations where needed in future submissions, and provide details in the IIR.

Sub-sector Specific Recommendations.

Category issue 1: 4B: Manure management and 4D Agricultural Soil – Activity data

128. The ERT noted that the reported activity data used in the agriculture sector is not consistent with the National Inventory Report/Common Reporting Format (NIR/CRF) for the GHG inventory. During the review week, the ERT requested Lithuania to clarify this issue. Lithuania indicated that this was an error, and explained that it will use the same dataset of activity data for both inventories in its next submission.
Lithuania recalculated NH_3 emissions from N-fertilizer used for the whole time series and provided the ERT with these estimates (presented below). The ERT recommends that Lithuania make this correction in order to have coherent and consistent inventories in the next submission. The ERT also encourages Lithuania to ensure that QA/QC procedures are in place to ensure an adequate level of consistency for calculations in the agricultural sector. The recalculated NH_3 emissions (Gg) are shown in the table below.

Year	NH_3 emission [Gg]	Year	NH_3 emission [Gg]
1990	18.5	2001	7.7
1991	15.4	2002	8.7
1992	7.1	2003	8.8
1993	4.4	2004	8.8
1994	3.1	2005	9
1995	3	2006	9.2
1996	6	2007	11.6
1997	6.1	2008	9.7

Year	NH_3 emission [Gg]	Year	NH_3 emission [Gg]
1998	6.3	2009	10.3
1999	7.1	2010	10.8
2000	7.4	2011	11.01

Category issue 2: 4B: Manure management and 4D1 Agricultural soils – NH_3

129. The ERT considered that the information on methodologies provided in the IIR was not sufficiently comprehensive nor did it contain enough detail. The ERT recommends that Lithuania provide in the IIR more detailed information on the data used for emission estimates and to include activity data for 4B manure management and 4D1 agricultural soils for the whole time series.

130. The ERT considered that the information on the trends of NH3 emissions and the amounts of synthetic N-fertilizer used were insufficient. The ERT recommends that Lithuania provide an explanation of the relationship between the trends of NH3 emissions and the numbers of cattle and the amounts of synthetic N-fertilizer in future submissions.

131. Lithuania currently uses a simple tier 1 approach for estimating emissions from (4B) manure management. As 4B is a key category of NH3 emissions, the ERT recommends that the Party adopt a higher tier methodology, such as a tier 2 approach described in the revised EMEP/EEA Emissions Inventory Guidebook.

WASTE

Review Scope:

Pollutants Reviewed		All pollutants		
Years		1990 – 2011		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
6.A	solid waste disposal on land	x		x
6.B	waste-water handling	x		x
6 C a	6 C a Clinical waste incineration (d)	x		
6 C b	Industrial waste incineration (d)	x		
6 C c	Municipal waste incineration (d)	x		x
6 C d	Cremation	x		x
6 C e	Small scale waste burning	x		x
6.D	other waste (e)	x		x
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues.

132. The ERT commends Lithuania for the transparency of the Informative Inventory Report but recommends that Lithuania improve the completeness and comparability of the waste sector. More details are provided in the sections below.

Transparency:

133. Lithuania has provided a partly transparent emissions inventory for the waste sector. Lithuania has reported emissions for the sectors 6B, 6Ca and 6Cb. In other sectors Lithuania provides notations keys - NO, NE, NA. The ERT recommends reviewing the use of the notation key “NE” and replacing it with other notation keys or calculated emissions where appropriate. No explanations about the use of EF are given. The IIR does not clearly explain which methodology is used, and which emission factors are used for incineration.

Completeness:

134. The ERT encourages Lithuania to review NFR 6 and to include the missing sources in its inventory (solid waste disposal, cremation, small scale waste burning). The ERT encourages Lithuania to calculate NH3 emissions for the sector 6B-wastewater handling. According to the “EMEP/EEA Emission Inventory Guidebook 2009”, data on the population who use latrines are needed to estimate these emissions. NMVOC emissions from solid waste disposal can be calculated if CH4 emissions are calculated under UNFCCC. No activity data is provided in the NFR tables, and the ERT therefore recommends that available activity data are reported in the NFR tables.

Consistency, including recalculation and time series:

135. Waste incineration emissions fluctuate from 1990, according to activity data changes. The ERT encourages Lithuania to explain in the IIR the observed sharp increases and decreases of the emissions from waste incineration.

Comparability:

136. Lithuania uses the most up to date NFR reporting templates, and in general, emissions are comparable with other countries' emissions. Information about the use of EFs is not included in the IIR to an adequate level of detail, and the ERT therefore recommends that this information is added to the IIR.

Accuracy and uncertainties:

137. The ERT considers that the submission from Lithuania has an acceptable level of accuracy. The ERT encourages Lithuania to undertake an uncertainty analysis for the waste sector in order to help inform the improvement process and to provide an indication of the reliability of the inventory data.

Improvement:

138. No source-specific improvements have been planned for Lithuania. The ERT encourages Lithuania to implement improvements in the inventory, and in particular to address the missing sources (see recommendations below).

Sub-sector Specific Recommendations.

Category issue 1: 6.A Solid waste disposal on land

139. Lithuania does not calculate NMVOC emissions from solid waste disposal. The ERT encourages Lithuania to use the information provided in the "EMEP/EEA inventory guidebook 2009".The EF for NMVOC calculation is given as 5.65 g NMVOC/m3 landfill gas.

Category Issue 2: 6.B Waste-water handling

140. Lithuania does not estimate NH_3 emissions from wastewater handling. The ERT encourages Lithuania to estimate the fraction of the population using latrines, and then estimate the associated NH_3 emissions. The ERT also encourages Lithuania to investigate estimating NMVOC emissions from waste-water treatment plants for the years where emissions are not currently calculated (1990 – 1999, 2001 – 2004 and 2006). Where it is not possible to make reliable estimates, the ERT encourages Lithuania to explain the reasons for this exclusion in the IIR.

Category Issue 3: 6.C.a Clinical waste incineration and 6.C.b Industrial waste incineration

141. The ERT encourages Lithuania to explain the fluctuations of incinerated amounts for clinical wastes. The ERT recommends that Lithuania describe in IIR the EFs that are used.

Category Issue 4: 6.C.c Municipal waste incineration

142. Lithuania reports NE for municipal waste incineration. The ERT recommends that Lithuania review this sector and replace NE with calculated emissions if possible, or another notation key if relevant (such as NO). The ERT recommends that Lithuania provide a description of the municipal waste incineration sector in its next IIR.

Category Issue 5: 6.C.d - Cremation

143. Lithuania reported “NE” for cremation emissions for the year 2011. For other years Lithuania reports “NO”. The ERT recommends that more detail is provided in the IIR to better explain the national situation for this sector, and addresses the suspected inconsistency in the current use of notation keys.

Category Issue 6: 6.C.e – Small scale waste burning

144. Lithuania reports “NE” for small scale waste burning. The ERT encourages Lithuania to investigate the situation in the country and provide more detailed information in the next IIR.

Category Issue 7: 6.D - Other waste

145. Lithuania reports “NE” for Other wastes. The ERT encourages Lithuania to estimate the amounts of waste composted, and then to calculate emissions according to the “EMEP/EEA inventory guidebook 2009”.

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

1. Energy: All additional materials received during the review week are available on the wiki (in the responses or as uploaded files).