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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:**

**STAGE 3 REVIEW REPORT
BELARUS**

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INTRODUCTION

1. The mandate and overall objectives for the emission inventory review process under the LRTAP Convention is 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 SO₂, NO_x, NMVOC, NH₃, plus PM₁₀ & PM_{2.5} for the time series years 1990 – 2013 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 inventories of Belarus coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 22th June to 27th June 2015 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 – Charlotte Vanpoucke (Belgium), Energy - Garnt Jans Venhuis (Netherlands), Transport - Melanie Hobson (EU), Industry - David Kuntze (Germany), Solvents - Kees Peek (Netherlands), Agriculture + Nature - Hakam Al-Hanbali (Sweden), Waste - Dirk Wever (Netherlands).
4. Anne Misra (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 acknowledges the effort undertaken by Belarus for providing estimates of emissions for all sub-sectors and all pollutants reviewed.
6. The Belarusian emission inventory is partly in line with the *EMEP/EEA Inventory Guidebook* and UNECE Reporting Guidelines. Emissions are provided for all pollutants except black carbon (BC) and Se for the year 2013 in the NFR14 template. Data for other years are not reported.
7. The IIR provided was not detailed enough to enable the ERT to undertake a thorough review, especially on a sector level, because the structure of the IIR does not fully correspond to the template provided in the Reporting Guidelines 2014 (Annex II).
8. Recalculations were not performed and it is not clear as to when recalculations have been done in previous years. No uncertainty assessment was undertaken and also the implementation of QA/QC procedures is rather limited in Belarus.
9. Belarus participated in the Stage 3 review process providing further information and data when requested. However, responses were provided late in the review process and not all the information could be fully taken into account within the given time period. Nevertheless, based on the responses provided by the Party, the ERT was able to perform a review of the inventory and provide some recommendations for future submissions.

INVENTORY SUBMISSION

10. In the 2015 submission, Belarus reported 2013 emissions for all pollutants except BC and Se in the NFR14 format.
11. Activity data were provided late in the inventory week, but not for all sources.
12. The IIR submitted by Belarus does not fully follow the IIR structure as recommended in the Annex II of the revised Guidelines. Information is merely given per pollutant, so the assumptions, data sources and methodologies for each sector are not presented in a clear way and are difficult to find.
13. No projected emissions or associated socio-economic data were provided as part of the 2015 submission.
14. The ERT identifies the need for further improvements in transparency, completeness and consistency.
15. The quality of the Belarusian CLRTAP inventory submission needs to be further improved so that missing sources are provided, the use of notation keys is minimised and descriptions of methods, assumptions and data sources are included in the IIR for each emission source. Also, a QA/QC plan should be developed, recalculations performed and an improvement plan established.

KEY CATEGORIES

16. Belarus has performed a Key Category Analysis (KCA) (i.e. key category level assessment) consistent with the 2013 EMEP/EEA Guidebook for emissions of NO_x, SO₂, NMVOC, NH₃, PM_{2.5}, PM₁₀, TSP, Pb, Cd and Hg. However, the KCA was performed on 2011 data and therefore different to the CEIP analysis. The ERT encourages Belarus to perform a KCA yearly, to extend the analysis for all pollutants reported, to present the key sources also with a trend assessment and to use Tier 2 or 3 methods for all key sources in line with the latest EMEP/EEA Guidebook.

QUALITY

Transparency

17. The ERT recognises the effort made by Belarus to improve the description of the methodologies in the IIR. However, the IIR still lacks enough detail to be fully transparent and does not include sufficiently detailed sectoral methodology chapters for all sectors. The ERT recommends that Belarus follows the IIR template defined in the Revised Guidelines (Annex II²), includes more details in the description of the methods and assumptions and provides the activity data and emission factors used for the calculation of all emission sources. The documentation on QA/QC, trends for key categories and uncertainty analysis should also be extended.

18. The Belarusian inventory, which was provided late in the review week, contains a large number of notation keys, including 'IE - Included Elsewhere'. An explanation regarding the sectors to which the emissions have been allocated is available in the IIR. The ERT commends Belarus for providing this information and encourages the Party to use it to improve the inventory by disaggregating emissions and allocating them to the appropriate NFR category.

19. Only a limited set of activity data was provided late in the review week. This hampered a thorough review of the sectors. The ERT recommends that Belarus submits all of its activity data together with the emission data by the CEIP deadline.

20. The ERT notices an inconsistency between table 1.4.1. in the IIR on statistical data and the data provided in the NFR template. Total NO_x emissions from the statistical data are higher than the total NO_x emissions reported in the NFR tables, whereas in the latter additional emissions have been included. This issue was not resolved during the review week.

21. In the IIR it was mentioned that in addition to the statistical data and the different sources used for the emission calculations, data from testing results was also used. However, no more details were provided. In response to the review, Belarus stated that testing of HM, POPs and PM emissions and the emission factors developed for EECCA countries (some sectors) were included in the 2009 Guidebook and earlier versions. The ERT encourages Belarus to be more specific and include details in the IIR on the relevant sectors/pollutants and EF to which reference is made.

² http://www.ceip.at/fileadmin/inhalte/emep/2014_Guidelines/Annex_II_Informative_Inventory_Report.pdf

22. The ERT encourages Belarus to continue the work done on the inventory and the IIR and to implement additional recommendations as indicated below.

Completeness

23. Belarus provided emissions and a limited set of activity data for the calendar year 2013 in the NFR14 template for all pollutants except BC and Se. However, no emissions for earlier years are provided. The ERT encourages Belarus to include emission estimates for BC and Se in its next submission and provide emission estimates for the whole time series.

24. The Belarusian inventory, which was provided late in the review week, contains a large number of notation keys, including 'NE - Not Estimated'. An explanation about why emissions could not be estimated is available in the IIR. The ERT commends Belarus for providing this information and encourages the Party to investigate the possibility of estimating emissions from these source categories to reduce missing sources in the inventory.

25. Belarus mentions in its IIR that the contributions of some sources to particulate matter emissions currently not reported in the inventory are rather important and that for some sectors searches for information are underway. The ERT warmly welcomes Belarus's commitment to completing its inventory and encourages the Party to do the same for the other missing sources.

26. In response to the review, Belarus has indicated it has a system for compiling multi-scenarios projections for some substances. The ERT encourages Belarus to provide projections 'With Measures' and 'With Additional Measures' as part of the next inventory submission.

Consistency, including recalculations and time series

27. No recalculations are performed and it is not clear which is the last year when total (recalculated) time series were provided. . Therefore, the ERT is unable to comment on recalculations.

28. The Belarusian emission inventory submission does not include NFR tables for the previous years. There are only a few significant dips or jumps in the historic data, except for heavy metals between 2012 and 2013. Belarus mentions in its IIR that they are due to certain inconsistencies in previous years' emission assessments. Work on the improvement of heavy metals emissions data for earlier years will be made. The ERT welcomes this improvement plan.

29. In order to evaluate the consistency of the inventory and actual changes in emissions over time, the ERT encourages the Party to submit the full time series of emissions in the NFR tables and to provide information on justifications for changes in emissions over the years.

30. In response to a request for clarification of the upward trends in the mid-term (2000-2010) for most pollutants, Belarus indicated that the most reasonable explanations for these upward trends were growth (in physical terms) in key economic sectors and changes in the structure of the fuel used for combustion. The ERT recommends that Belarus verifies this and further develops the trend analysis by providing detailed information on which

legislation/measures and which sectors are responsible for the trends observed and how contributions of the key sectors evolve over time.

Comparability

31. The ERT notes that the inventory of Belarus is only partly comparable with those of other reporting parties. The allocation of source categories follows that of the EMEP/UNECE Reporting Guidelines for inventories; however, the frequent use of notation keys suggests there are missing sources in the inventory.

32. The IIR does not provide sufficient information on whether the inventory is consistent with the methodologies presented in the 2013 EMEP/EEA Inventory Guidebook.

CLRTAP/NECD comparability

33. Belarus does not report an inventory under the EU National Emissions Ceilings Directive (NECD) because it is not part of the European Union.

Accuracy and uncertainties

34. Belarus did not undertake an uncertainty analysis as part of the 2015 submission. The ERT encourages Belarus to provide a quantitative uncertainty analysis of the emission estimates in order to support the improvement process and to provide an indication of the reliability of the inventory data, at least for key categories.

Verification and quality assurance/quality control approaches

35. The quality control and quality assurance (QA/QC) procedures carried out by Belarus are very limited. No additional QA/QC is performed on the statistical data. However, a comparison is carried out with the calculated data and emission factors are verified against testing data. Belarus indicates in its IIR that a quality management system is currently being developed. The ERT commends Belarus on this plan and encourages them to implement it for the next submission. QA/QC procedures are important especially when various sources of AD and EFs are used at every step of data collection from operators and statistics.

36. The ERT encourages Belarus to provide information on sector-specific QA/QC procedures according to the 2013 EMEP/EEA Guidebook in future submissions.

FOLLOW-UP TO PREVIOUS REVIEWS

37. The current Stage 3 review has used outputs from the Stage 1 and Stage 2 review processes. ERT invites Belarus to also refer to these previous reviews when examining this review report and when updating its improvement plans.

38. The ERT encourages Belarus to continue improving its inventory by implementing the improvement plans and recommendations indicated below.

AREAS FOR IMPROVEMENTS IDENTIFIED BY BELARUS

39. The IIR includes some main improvements which the Party plans to carry out for the next submission. These include:

- (a) Trend analysis, gaps and jumps detection
- (b) Improvement of previously reported HM emission data
- (c) Improvement of VOC inventory - solvent balance improvement
- (d) Corrections of POP emission factors
- (e) Improvement of QA/QC systems

40. The ERT warmly welcomes these improvement plans and encourages Belarus to implement them for the next submission.

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS-CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

41. The ERT has identified the following cross-cutting issues for improvement:
42. To improve the transparency of the inventory, the ERT recommends that Belarus follows the IIR template (Annex II of the Revised Guidelines) and includes more details in the description of the methods, assumptions and activity data and emission factors used for each emission source, adds documentation on QA/QC, explanations for key trends and uncertainty assessments.
43. The ERT recommends that Belarus improves the inventory by ensuring the consistency of the methodologies with the 2013 EMEP/EEA Emission Inventory Guidebook.
44. The ERT recommends that Belarus provides full time series and performs recalculations throughout the full time series when needed. Furthermore, documentation on recalculations should be provided in the IIR.
45. The ERT recommends that Belarus examines the use of the notation key IE and investigates and reports whether it is possible in future submissions to include these emissions in the appropriate NFR categories.
46. The ERT recommends that Belarus examines the use of the notation key NE and identifies sources which have not been estimated and gives more information on whether there are plans to estimate them in the future.
47. The ERT encourages Belarus to further develop explanations for fluctuations and for dips and jumps in time series trends by providing detailed information on which legislation/measures and which sectors are responsible for those trends and how contributions of the key sectors evolve over time.
48. The ERT encourages Belarus to perform a Key Source Analysis every year and to extend the Key Source Analysis for all pollutants by performing a trend assessment.
49. The ERT recommends that Belarus fully develops its QA/QC process, applies it in the next inventory and documents the QA/QC system and sector-specific QA/QC procedures in the IIR.
50. ERT encourages Belarus to include emission estimates for BC and Se in its next submission.
51. The ERT recommends that Belarus provides qualitative uncertainty estimates, especially for key sources, in future submissions.

SECTOR SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

ENERGY

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , TSP, PM ₁₀ , PM _{2.5} , NMVOC, Pb, Cd, Hg		
Years		1990 – 2013		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
1A1a	Public electricity and heat production	X		X
1A1b	Petroleum refining		IE	X
1A1c	Manufacture of solid fuels and other energy industries		IE	X
1A2a	Iron and steel		NE, IE	X
1A2b	Non-ferrous metals		IE	X
1A2c	Chemicals		IE	X
1A2d	Pulp, Paper and Print		IE	X
1A2e	Food processing, beverages and tobacco		IE	X
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	X		X
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	X		X
1A3ei	Pipeline transport		NE, IE	X
1A3eii	Other (please specify in the IIR)		NE	X
1A4ai	Commercial/institutional: Stationary	X		X
1A4bi	Residential: Stationary	X		X
1A4ci	Agriculture/Forestry/Fishing: Stationary		IE	X
1A5a	Other stationary (including military)		IE	X
1B1a	Fugitive emission from solid fuels: Coal mining and handling		NE, IE	X
1B1b	Fugitive emission from solid fuels: Solid fuel transformation		NE, IE	X
1B1c	Other fugitive emissions from solid fuels		NE, IE	X
1B2ai	Fugitive emissions oil: Exploration, production, transport	X		X
1B2aiv	Fugitive emissions oil: Refining / storage		NE, IE	X
1B2av	Distribution of oil products		NE, IE	X
1B2b	Fugitive emissions from natural gas (exploration, production, processing, transmission, storage, distribution and other)	X		X
1B2c	Venting and flaring (oil, gas, combined oil and gas)		IE	X
1B2d	Other fugitive emissions from energy production		IE	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:

52. The ERT noticed that for key source categories and pollutants it is not clear if a Tier 2 (or Tier 3) methodology was used. The transparency of the Energy sector could be improved by using descriptions for each NFR code. Doing so, it would be clearer for key source categories and pollutants which specific activity data and emission factors were used and why. During the review week Belarus replied that they would be able to provide additional information about the methodology applied in the future. The ERT encourages Belarus to provide additional information about the methodology applied in future submissions, preferably in the descriptions for each sector.

53. Belarus states in paragraph 1.6 of the IIR (Key Categories) that 'the level assessment is performed for 2011'. Belarus did mention this also in the previous IIR 2014. The ERT encourages Belarus to update the analysis or use a correct reference in the next submission.

54. The ERT noticed that Annex 1 and IIR table 1.6.1 on 'Key categories of emission sources' show different emission data, whereas table 1.6.1 and the NFR are the same. The differences are not explained in the IIR. The ERT also noticed that in table 1.6.1 ktonnes are given, where % where expected. The ERT encourages Belarus to use % in the IIR table of the next submission, and to use the correct data in Annex 1 or explain the differences in the report.

55. In IIR table 1.8.1 'Sources considered as missing in the 2013 emission inventory' Belarus states for some sectors that the reason for Not Estimated (NE) is that emissions are negligible. The ERT encourages Belarus to develop emission estimates for all sources, even if negligible. The ERT encourages Belarus to make use of the proper notation keys in the next submission.

56. In IIR table 1.8.1 'Sources considered as missing in the 2013 emission inventory' Belarus states that for most sectors the reason for Not Estimated is that there are no statistics or emission factors. For most of the mentioned sub-sectors it is likely that for the mentioned pollutants emission factors are presented in the 2013 EMEP/EEA Guidebook. It should also be noted that Belarus has not taken into account sources labelled as 'Other'. The ERT encourages Belarus to improve the statistics on activity data for the next submission, to check for emission factors in the 2013 EMEP/EEA Guidebook, and to take into account sources labelled as 'Other'.

57. The ERT commends Belarus for providing extensive information on which emissions are included elsewhere (table 1.8.2 of the IIR). However, on the sectoral level it is not transparent how many emissions are included elsewhere and why. The ERT encourages Belarus to provide more detailed information in future submissions.

58. The Energy sector inventory is not transparent as Belarus has not provided activity data in the NFR tables, and has not provided information on the methodologies used in the IIR. Like in the previous review, the ERT strongly encourages Belarus to improve the transparency of its inventory for the next submission.

Completeness:

59. Due to the lack of proper documentation and the general poor transparency, the ERT could not make a proper assessment of the completeness of the Energy sector inventory.

60. Belarus has not provided a full time series of emissions. The ERT encourages the Party to provide preferably the full time series of emissions, or as a minimum emissions for the years 1990, 1995 and for the years from 2000 onwards.

Consistency including recalculation and time series:

61. The ERT noticed that there are still gaps in emission trend data for a large number of sectors and that other sectors only contain data for single years instead of a whole time series. The ERT encourages Belarus to verify their emission trends at the sectoral level and to provide more extensive explanations for those inconsistencies in the IIR.

62. The Belarus inventory still lacks sufficient information on recalculations. The ERT again encourages Belarus to provide more details on the recalculations carried out between the last submissions.

Comparability:

63. With the information provided in the IIR, it is not possible to conclude whether the methodologies used in the Energy sector inventory are in accordance with the 2013 EMEP/EEA Guidebook.

64. Belarus did not provide information on activity levels. Therefore, the ERT cannot check the IEFs.

Accuracy and uncertainties:

65. Belarus did not provide an uncertainty analysis. The ERT, like in the previous review, recommends that Belarus undertakes uncertainty analyses for the Energy sector in order to support the improvement process and provide proof of the reliability of the inventory data.

Improvement:

66. The ERT noticed that many of the recommendations made to Belarus in the previous review were not followed up in later submissions. The ERT also noticed that the planned improvements in the IIR 2015 are nearly identical to those of previous submissions. The ERT commends Belarus on its intentions, but encourages Belarus to improve its future submissions as planned.

Sub-sector Specific Recommendations.

Category issue 1: various (sub)sectors – various pollutants

67. The ERT noticed that Belarus uses dashes and zero values for emissions in the NFR, instead of notation keys. In the IIR, however, Belarus presents tables for emissions Included Elsewhere (IE) and Not Estimated (NE). During the review week Belarus provided the ERT with a complete version of emissions data for 2013 which includes the appropriate

notification keys. The ERT encourages Belarus to include such a complete version of emissions data in the next submission.

Category issue 2: sectors 1A2gviii, 1A3eii, 1A5a, 1B1c, 1B2b, 1B2d – various pollutants

68. The ERT noticed that for most (or all) of the pollutants of the NFR sector codes 1A2gviii, 1A3eii, 1A5a, 1B1c, 1B2b and 1B2d there are no descriptions in the IIR or in the NFR. Some pollutants are labelled as IE or NE, but for other pollutants this information is missing. During the review week Belarus replied that information about the use of notification keys could be provided if requested. The ERT encourages Belarus to include information about the use of notification keys in the next submission.

Category issue 3: sectors 1B1a, 1B1b, 2A5b, 2D3b – TSP, PM_{2.5}, PM₁₀

69. In paragraph 1.8 it is stated that: 'There is a probability that the contribution of some categories (1B1a, 1B1b, 2A5b, 2D3b) to TSP, PM_{2.5} and PM₁₀ emissions is rather important. But at the moment an exact assessment of the emissions in these categories is quite difficult.' The ERT asked Belarus if this was an issue they were planning to improve for the next submission. During the review week Belarus replied that data on TSP, PM₁₀ and PM_{2.5} emissions in sector 2A5b had already been assessed and submitted. For other categories, improvements were planned. The ERT encourages Belarus to carry out these improvements for the next submission.

Category issue 4: sectors 1A3ei – As

70. In the IIR the pollutant As of the NFR code 1A3ei is included in the table for IE as well as in the table for NE. During the review week Belarus replied that the notification key for As in 1A3e should be IE.

Category issue 5: labelling of IIR tables

71. In the IIR the table numbers and their references need to be updated and their new paragraph numbers need to be used: 1.5.1 to 1.6.1, 1.7.1 to 1.8.1, 1.7.2 to 1.8.2. The ERT encourages Belarus to check and use correct the table numbers in the next submission.

Category issue 6: usage of NFR coding

72. In the IIR (table 1.7.2/1.8.2) it is mentioned that some pollutants of 1A5a are included in sector 1A2fi. This is likely to be the sector 1A2f. The ERT encourages Belarus to check and use correct NFR sector coding in the next submission.

TRANSPORT

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5} , CO and HMs		
Years		2013		
NFR Code	NFR Name	Reviewed	Not Reviewed	Recommendation Provided
1A2gvii	Mobile Combustion in manufacturing industries and construction: (please specify in the IIR)		x	
1A3ai(i)	International aviation LTO (civil)	x		x
1A3ai(ii)	International aviation cruise (civil)	x		x
1A3aii(i)	Domestic aviation LTO (civil)	x		x
1A3aii(ii)	Domestic aviation cruise (civil)	x		x
1A3bi	Road transport: Passenger cars	x		x
1A3bii	Road transport: Light duty vehicles	x		x
1A3biii	Road transport: Heavy duty vehicles and buses	x		x
1A3biv	Road transport: Mopeds & motorcycles	x		x
1A3bv	Road transport: Gasoline evaporation	x		x
1A3bvi	Road transport: Automobile tyre and brake wear	x		x
1A3bvii	Road transport: Automobile road abrasion	x		x
1A3c	Railways	x		x
1A3di(ii)	International inland waterways		x	
1A3dii	National navigation (shipping)	x		x
1A4aii	Commercial/institutional: Mobile		x	
1A4bii	Residential: Household and gardening (mobile)		x	
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery		x	
1A4ciii	Agriculture/Forestry/Fishing: National fishing	x		x
1A5b	Other, Mobile (including military, land based and recreational boats)		x	
1A3di(i)	International maritime navigation		x	
1A3	Transport (fuel used)		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:

73. The 2015 IIR provided by Belarus includes only basic information on the methods applied. The ERT therefore encourages the Party to improve the transparency of its inventory by providing all the necessary information to enable the ERT to review the data in future submissions.

74. The ERT encourages Belarus to include as much information as possible on the methodologies used (the tier applied, the AD and EFs used), as well as the time series of emissions and information on recalculations.

75. The Party also uses zero values in the 2013 reporting tables. The ERT encourages Belarus to use the appropriate notation keys (e.g. NO where emissions are "Not Occurring", NE where emissions are "Not Estimated" and IE where emissions are "Included Elsewhere") to indicate where estimates are not available or necessary. Actual data should be used instead of zero values where emissions are negligible.

Completeness:

76. Belarus has only provided emission estimates for 2013 and provided emission estimates for 2012 in the previous year. The ERT encourages the Party to provide data every year for 1990, 1995 and for the years from 2000 onwards as a minimum.

77. The ERT cannot confirm the completeness of the Party's inventory for the most recent year due to the frequent and inconsistent use of zero values.

78. Belarus uses zero values in a number of areas in the 2013 inventory where emissions are likely to occur. The ERT encourages the Party to check all zero values and to correct them by i) estimating actual emissions or by ii) using an appropriate notation key instead (e.g. NO where emissions are "Not Occurring", NE where emissions are "Not Estimated" and IE where emissions are "Included Elsewhere").

Consistency including recalculation and time series:

79. The level of disaggregation follows the disaggregation of AD available from statistics; hence, emissions estimates are presented in an inconsistent way within the time series provided. The ERT encourages the Party to provide the entire time series in a consistent way as soon as new data are available.

80. The COPERT model is no longer used to estimate emissions arising from the road transport sector and different estimation methodologies are used across the 2000 to 2012 inventories. The ERT strongly encourages the Party to recalculate the previous year's emission estimates for each inventory version so that a time series of emission estimates can be provided using a consistent methodology and information on trends can be obtained. At the present time, as past data is not available, a bias may be introduced when comparing inventories because the estimated emission trend will

reflect not only real changes in emissions but also the pattern of methodological refinements. Please see the 2013 EMEP / EEA Guidebook for further information.

Comparability:

81. Due to the lack of transparency of the inventory, the ERT is unable to conclude whether the methods used for the calculation of Transport sector emissions are comparable with the 2013 EMEP/EEA Guidebook.

82. As information on data sources or methodologies applied is limited, the Transport sector inventory is not comparable with the data from other countries. The ERT encourages the Party to provide more detailed information in its future IIRs to improve transparency and comparability.

Accuracy and uncertainties:

83. No uncertainty analysis is provided for the Transport sector. The ERT encourages Belarus to carry out an uncertainty analysis which will feed into the improvement process and provide an indication of the reliability of the inventory data. The advice of the ERT is to refer to the default uncertainties provided in the IPCC Reporting Guidelines (rev1996 GL: Reporting Instructions, Annex 1, A 1,4; 2006 GL: Vol. 1, Chapter 3: 3.44ff). Information on uncertainty levels used in other countries' inventories might serve as a reference for uncertainty data as well.

84. Whilst some general text on QA/QC procedures is provided, no transport-specific description or information on internal reviews is provided. Therefore, the ERT encourages the Party to establish QA/QC procedures for the Transport sector and to provide all the necessary information on these procedures in the next IIR.

Improvement:

85. No information on planned improvements is provided. The ERT encourages the Party to include information on planned improvements in the future IIRs.

86. Furthermore, the ERT encourages the Party to produce an inventory improvement plan to schedule issues for further improvement as well as to monitor the progress of the improvements.

Sub-sector Specific Recommendations.

Category issue 1: 1.A.3b Road Transport – All pollutants

87. The Stage 2 review revealed that the PM₁₀ implied emission factors for road transport for the 2000-2012 time period were highly variable, relating to different inventory versions. Belarus responded that the reason for this was that different estimation methodologies had been used in this period. As stated previously, Belarus is strongly encouraged to provide emissions data for the previous years, using a consistent methodology.

Category issue 2: 1.A.3bv Gasoline evaporation, 1.A.3bv(i) road transport tyre and brake wear and 1.A.3bv(ii) road abrasion – All pollutants

88. The ERT notes that in the 2013 NFR tables, the Party uses zero values for sector / pollutant combinations that are not applicable (for example, NO_x emissions from tyre and brake wear). The ERT encourages the Party to use the notation key “NA” instead of zero values in this instance.

89. Neither the 2014 or 2015 IIR includes any information on how the emissions for road transport tyre and break wear, gasoline evaporation and road abrasion were estimated. Belarus provided some information during the review week. However, the Party is encouraged to provide further details in the next IIR.

90. Heavy metal emissions from road abrasion are zero in the 2013 inventory. In the previous review, Belarus stated that it was not possible to estimate heavy metal emissions from road abrasion. The reason given was that HM emissions from road abrasion did not belong to the well-studied processes in Belarus and that any estimates would be highly uncertain. Belarus explained further that the sector was not a key contributor to the total emissions of heavy metals, but that it would be included as a source of HM emissions in the future. However, this has not happened. HM emissions especially from abrasion are often a major source of emissions, depending on the country-specific circumstances. For further reference, default emission factors for heavy metals are available in the EMEP/EEA Guidebook as well as in the IIRs submitted by other countries.

Category issue 3: 1.A.3a i(i) International aviation LTO, 1.A.3a ii(i) Domestic aviation LTO, 1.A.3a i(ii) International aviation cruise and (i) 1.A.3a ii(ii) Domestic aviation cruise –All pollutants

91. In the 2013 inventory, the Party uses zero values for NH₃, NMVOCs and particulate matter in the NFR tables for international and domestic LTO. They also provide an SO₂ emission estimate for international LTO, but zero emissions of the same pollutant for domestic LTO. The ERT encourages the Party to provide emissions data for every pollutant requested, even if the values are low, instead of zero values.

92. In the 2013 inventory, the Party provides emission estimates for the main pollutants from Domestic Aviation Cruise, but for International Aviation Cruise, emission estimates are only provided for NO_x and other pollutants have zero emission values. The ERT recommends that emission estimates are provided where information is currently missing.

93. The 2015 IIR does not include any information on how the emissions have been estimated for the aviation sector. Belarus provided some information during the review week. However, the Party is encouraged to provide further details in the next IIR.

Category issue 4: 1.A.3.c Railways, 1.A.3.ii national navigation, 1A4.c.ii off road vehicles and other machinery - main pollutants

94. The 2015 IIR does not include any information on how emissions have been estimated for the rail, national navigation or off road vehicles and other machinery

sectors. Belarus provided some information during the review week. However, the Party is encouraged to provide further details in the next IIR.

Category issue 5: 1.A.4.ii residential household and gardening (mobile), 1.A.4.c.iii national fishing and 1A5b other mobile – all pollutants

95. The ERT notes that in the 2013 NFR table, blank cells are provided for the residential household and gardening (mobile) sector, as well as the national fishing and the other mobile sector. The Party is encouraged to provide estimates for these sectors or to use notation keys.

INDUSTRIAL PROCESSES

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5}		
Years		1990 – 2013 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
2A1	Cement production	X		
2A2	Lime production	X		
2A3	Glass production	X		
2A5a	Quarrying and mining of minerals other than coal	X		
2A5b	Construction and demolition	X		
2A5c	Storage, handling and transport of mineral products	X		
2A6	Other mineral products (please specify in the IIR)	X		
2B1	Ammonia production	X		
2B2	Nitric acid production	X		
2B3	Adipic acid production	X		
2B5	Carbide production	X		
2B6	Titanium dioxide production	X		
2B7	Soda ash production	X		
2B10a	Chemical industry: Other (please specify in the IIR)	X		
2B10b	Storage, handling and transport of chemical products (please specify in the IIR)	X		
2C1	Iron and steel production	X		
2C2	Ferroalloys production	X		
2C3	Aluminium production	X		
2C4	Magnesium production	X		
2C5	Lead production	X		
2C6	Zinc production	X		
2C7a	Copper production	X		
2C7b	Nickel production	X		
2C7c	Other metal production (please specify in the IIR)	X		
2C7d	Storage, handling and transport of metal products (please specify in the IIR)	X		
2H1	Pulp and paper industry	X		
2H2	Food and beverages industry	X		
2H3	Other industrial processes (please specify in the IIR)	X		
2I	Wood processing	X		
2J	Production of POPs	X		
2K	Consumption of POPs and heavy metals (e.g. electrical and scientific equipment)	X		
2L	Other production, consumption, storage, transportation or handling of bulk products (please specify in the IIR)	X		

General recommendations on cross-cutting issues

Transparency:

96. The IIR of Belarus is not differentiated enough in all sectors and sub-sectors. There is no chapter on the Industrial Processes sector. Therefore, the IIR lacks transparency for the Industrial Processes sector. ERT strongly recommends a restructuring of the IIR and the introduction of a specific chapter on the IP sector.

Completeness:

97. Belarus reports emissions only for a few sources. For these sources, the Party reports also zero values. For the other sectors, there is no information, not even a notation key. During the review, Belarus updated the NFR table. For all sectors, notation keys have now been reported and the zero values have been replaced. ERT commends Belarus for updating the NFR table with the correct notation keys. The Belarus inventory includes a large number of "IE" and "NE". The ERT encourages Belarus to collect data on the sources where NE has been used and to check if the notation key IE can be replaced with emissions data.

98. Consistency including recalculation and time series: Belarus delivered only emissions data for the year 2013.

Comparability:

99. It has not been possible to assess the comparability as the necessary information is missing in the IIR.

Accuracy and uncertainties:

100. It has not been possible to assess the accuracy and uncertainty of the IP sector as the necessary information is missing in the IIR.

Improvement:

101. There are no sector-specific planned improvements reported in the IIR.

Sub-sector Specific Recommendations.

102. As there is no chapter on the Industrial Processes sector in the IIR, it is not possible to make sub-sector specific recommendations.

SOLVENTS

Review Scope

Pollutants Reviewed		NMVOC		
Years		1990 – 2013 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
2D3a	Domestic solvent use including fungicides	X		X
2D3b	Road paving with asphalt	X		X
2D3c	Asphalt roofing	X		X
2D3d	Coating applications	X		X
2D3e	Degreasing	X		X
2D3f	Dry cleaning	X		X
2D3g	Chemical products	X		X
2D3h	Printing	X		X
2D3i	Other solvent use (please specify in the IIR)	X		X
2G	Other product use (please specify in the IIR)	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:

103. The Solvents and Other Product Use sector inventory of Belarus is not completely transparent.

104. In the previous Stage 3 Review Report (from 2011) the ERT encouraged Belarus to provide information on the methodologies used to estimate emissions. The ERT notes that in the current submission, information on the methodologies used to estimate emissions has improved a little. Despite this slight improvement, the ERT reiterates its encouragement to include more detailed information on the methodologies used to estimate emissions in the next submission.

105. The ERT notes that explanations for the use of the notation key NE are given in table 1.7.1 of the IIR and commends the Party for this. Despite this, the ERT encourages Belarus to be more explicit about the reason for not estimating emissions. Instead of “No statistics or emission factors” it would be more transparent to state either “No statistics” or “No emission factors”.

106. The ERT also notes that Belarus only uses figures and “-“ in the NFR tables for all the Solvents and other product use sectors. The ERT recommends that Belarus replaces “-“ with notation keys.

107. The ERT also notes that information on the tier method used to calculate emissions of the key source 2D3d is missing. During the review the Party replied to the

ERT that NMVOC emissions were estimated using a simple (Tier 1) methodology. The ERT recommends that Belarus includes this information in the next submission.

Completeness:

108. As already mentioned in the general section, Belarus has not included a chapter on the Solvent and Other Product Use sector in its IIR. The ERT strongly recommends that Belarus includes detailed information on Solvents and Other Product Use with all the necessary information in its IIR in the next submission:

109. Furthermore, the ERT notes that some activity data are missing. For more information about this see the relevant sector section.

110. In the previous Stage 3 Review Report (from 2011) the ERT encouraged Belarus to provide preferably the full time series of emissions, or as a minimum emissions for the years 1990, 1995 and for the years from 2000 onwards. The ERT notes that Belarus has still not provided the full time series of emissions and reiterates its encouragement to provide full time series in the next submission.

111. The ERT notes that according to table 1.7.1 a large number of sources are considered as NE (Not Estimated). To avoid under-estimations, the ERT recommends that Belarus includes plans to address the missing emissions (NE) in its IIR, either by obtaining data allowing for an emission estimate to be made, or by reporting the emissions as “Not Occurring” (NO).

Consistency including recalculation and time series:

112. The ERT notes that Belarus has not performed any recalculations for the source categories within the Solvents and Other Product Use sector. The ERT found no discrepancies between the 2012 and 2013 emissions time series for the various emission sources.

113. As already mentioned, the ERT notes that Belarus has not provided a full time series of emissions. Therefore, it is not possible to analyse the time series.

Comparability:

114. Belarus has provided its emissions inventory in accordance with the reporting requirements and submitted it in the requested NFR format.

Accuracy and uncertainties:

115. In the previous Stage 3 Review Report (from 2011), the ERT encouraged Belarus to provide information regarding QA/QC activities in their IIR and to establish a QA/QC plan. The ERT notes that a QA/QC system is under development and that some procedures for QA/QC have been used in this submission and encourages Belarus to continue with these developments in the future.

116. The ERT notes that the emissions of the key source have not been calculated based on a Tier 2 methodology and recommends that the Party calculates this key source based on a Tier 2 methodology.

Improvement:

117. In the previous Stage 3 Review Report (from 2011) the ERT encouraged Belarus to provide an inventory improvement plan. The ERT notes that Belarus has included planned improvements in its IIR, such as the improvement of solvent balances. The ERT encourages Belarus to continue with these improvements in the future.

Sub-sector Specific Recommendations.

Category issue 1: 2D3a, 2D3d, 2D3f, 2D3g and 2D3i - NMVOC

118. The ERT notes that in both the NFR tables and the IIR, no activity data are included for these sources. When consulted, the Party replied that only for category 2D3d, Coating applications, activity data are available. The value for paint application in 2013 was 163,6 kt. Paint and solvent consumption was assessed on the basis of the difference between produced and exported/imported paints during the year as shown in the IIR. For the other sectors, statistical emission data have been used to estimate the NMVOC emissions. When consulting the Party again about how "statistical emission data" are used to estimate NMVOC emissions from the other sectors, Belarus replied as follows: '*Emissions of NMVOCs for NFR sectors 1B2ai, 2B10a, 2D3i, 2D3g, 2D3h were derived from statistical emission data using correspondence table between NFR and OKED³ classifications as shown in the IIR report (see IIR table 1.4.4)*'.

119. The ERT encourages Belarus to include the following in the next submission:

- Activity data for 2D3d;
- A clear explanation on how the "statistical emission data" have been used to estimate NMVOC emissions for 2D3i, 2D3g, 2D3h;
- A description on how the NMVOC emissions for 2D3a and 2D3f have been estimated.

³ OKED -Statistical classification used in the country after 2008, corresponding to NACE as revised in 2002, which is usually treated as NACE Rev. 1.1 (before 2008 national statistics used Soviet classification OKONH)

AGRICULTURE

Review Scope:

Pollutants Reviewed		NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5} , TSP,		
Years		2013 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
3B1a	Dairy cattle	x		
3B1b	Non-dairy cattle	x		
3B2	Sheep	x		x
3B3	Swine	x		
3B4a	Buffalo	x		
3B4d	Goats	x		x
3B4e	Horses	x		x
3B4f	Mules and asses	x		
3B4gi	Laying hens	x		x
3B4gii	Broilers	x		
3B4giii	Turkeys	x		x
3B4giv	Other poultry	x		x
3B4h	Other animals (please specify in IIR)	x		x
3Da1	Inorganic N fertilisers (includes also urea application)	x		x
3Da2a	Animal manure applied to soils	x		
3Da2b	Sewage sludge applied to soils	x		
3Da2c	Other organic fertilisers applied to soils (including compost)	x		
3Da3	Urine and dung deposited by grazing animals	x		
3Da4	Crop residues applied to soils	x		
3Db	Indirect emissions from managed soils	x		
3Dc	Farm-level agricultural operations including storage, handling and transport of agricultural products	x		
3Dd	Off-farm storage, handling and transport of bulk agricultural products	x		
3De	Cultivated crops	x		
3Df	Use of pesticides	x		
3F	Field burning of agricultural residues	x		x
3I	Agriculture other (please specify in the IIR)			
11A	Volcanoes			
11B	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

120. For the Agriculture sector, the 2014 and 2015 submissions have been reviewed.

121. The transparency of reporting could be enhanced by providing justifications for sources that have not been reported. Moreover, notation keys could be used in the NFR

tables, instead of leaving the cells blank, especially for emission of NH₃ and particles from the different sub-categories in 3B Manure management.

Transparency:

122. The emission inventory of the Agricultural sector is not quite transparent. It could be improved by providing more information regarding emission trends. The ERT is unable to make a good assessment of the consistency of the time series for emissions because relevant AD for 2013 and other years (except for 2012) is lacking. The ERT recommends that Belarus enhances the transparency of its Agriculture sector by including AD, a trend analysis and other relevant information in the next submission.

Completeness:

123. In its 2015 submission, Belarus has not provided a full time series (1990-2013) of emission data for the Agriculture sector. In addition, there are blanks for emissions from many sources in the NFR submission 2015, although it would be possible to estimate the emissions from these sources as relevant activity data had been reported in the 2014 submission. Examples of such sources are: NO_x, NMVOC and particles; horses. The ERT recommends that the Party estimates the emissions of these pollutants in future submissions, in order to enhance the quality and completeness of the emission inventory. The ERT also recommends that Belarus provides the full time series (1990-2013) of pollutants emissions from the Agriculture sector in future submissions.

Consistency including recalculation and time series:

124. There is no reference to any recalculations of the emission inventory for the Agriculture sector in the country's IIR. The ERT recommends that Belarus undertakes recalculations using the methodologies provided in the 2013 EMEP/EEA Emission Inventory Guidebook, and includes the recalculated emissions in future submissions.

Comparability:

125. Belarus has provided its emissions inventory in accordance with the reporting requirements and submitted it in the updated NFR format.

Accuracy and uncertainties:

126. The IIR provides general information regarding the QA/QC procedures applied for the emission inventory of the Agriculture sector, especially the uncertainty analysis of the activity data on livestock. The ERT commends Belarus for undertaking QA/QC procedures for the Agriculture sector. The ERT encourages Belarus to enhance the QA/QC procedures in future submissions in order to promote the reliability of the inventory data.

Improvement:

127. The Party indicated in its IIR that it would make improvements to trend analysis, the VOC emission inventory and the QA/QC system, but did not specify whether the Agriculture sector was included or not in the planned improvements. The ERT encourages the Party to perform a detailed trend analysis and detailed QA/QC procedures for the Agriculture sector in future submissions.

Sub-sector Specific Recommendations.

Category issue 1: 4B3 (3B2) Sheep - NH₃

128. The ERT noted that the AD (number of sheep) in the 2014 submission had been reported as Not Applicable (“NA”), while emissions of NH₃ from this sub-category amount to 0.028 Mg. The ERT raised a question about this issue. The Party responded during the review week that there was a mistake in the activity data for sheep. The value should be 60 thousand heads. The ERT recommends that Belarus includes the AD on sheep in the next submission in order to enhance the accuracy of the emission inventory.

Category issue 2: 4D1a (3Da1) Inorganic N-fertilizers - AD

129. The ERT noted that the AD for 4D1a (3Da1) Inorganic N fertilisers reported in the NFR, submission 2014 (550 kg N/year), differed from the AD reported in the UNFCCC CRF tables, submission 2014 (501 480 000 kg N/year). The ERT raised a question about this issue. The Party responded during the review week that there was a typo in the activity data. The value should be 557 200 000 kg N/y of fertiliser used.

130. The ERT recommends that Belarus corrects this error in its next submission and harmonises emission and AD reporting under UNFCCC and CLRTAP in future submissions.

Category issue 3: 4B 13 (3B4h) Other animals - NH₃

131. The ERT noted that data for 4B 13 (3B4h) Other animals (fur animals and rabbits) had been reported under the UNFCCC’s CRF (table 4.A, Sectoral background data for agriculture, submission 2014). However, the activity data for these animals were reported using the notation key Not Applicable (“NA”) in the CLRTAP’s NFR tables, submission 2014. The ERT recommends that Belarus estimates the relevant pollutant emissions from these sub-categories using the EMEP/EEA Emission Inventory Guidebook 2013 and also explains the methodologies used for reporting emissions of SO₂ and CO from 3B4h in the NFR table, submission 2015. The ERT also recommends that the Party harmonises emission and AD reporting under UNFCCC and CLRTAP in future submissions.

Category issue 4: 4F (3F) Field burning of agricultural wastes - All relevant air pollutants

132. The ERT noted that for 4F (3F) Field burning of agricultural wastes, AD was reported (0.11 area burned k ha/y) but that emissions had not been not estimated (reported as Not Applicable “NA”) in the 2014 submission. The ERT recommends that Belarus enhances the QA/QC procedures for the Agriculture sector in general, and encourages the Party to estimate emissions of any relevant pollutants from field burning of agricultural wastes in future submissions, in order to promote the completeness and reliability of the inventory data.

Category issue 5: 4B4 (3B4d) Goats - NH₃, PM_{2.5} and PM₁₀

133. In the 2014 submission, Belarus reported the AD for goats as Not Estimated “NE” and the emissions of NH₃ and PM as Not Applicable “NA”. Belarus explained in the previous review (2011) that no statistics were available for the number of goats. The ERT encourages the Party to make efforts to find some reliable statistics on the animal population of goats and

other sub-categories as well (e.g. (3B4giii) Turkeys and (3B4giv) Other poultry) to estimate emissions of NH₃, PM_{2.5} and PM₁₀. The ERT also recommends that Belarus uses the correct notation keys for reporting AD and emissions in the next submission.

WASTE

Review Scope:

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM, heavy metals and POP's		
Years		1990 – 2013 + (Protocol Years)		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation on Provided
5A	Biological treatment of waste - Solid waste disposal on land	X		X
5B1	Biological treatment of waste - Composting		X	X
5B2	Biological treatment of waste - Anaerobic digestion at biogas facilities		X	
5C1a	Municipal waste incineration	X		X
5C1bi	Industrial waste incineration	X		X
5C1bii	Hazardous waste incineration	X		X
5C1biii	Clinical waste incineration	X		
5C1biv	Sewage sludge incineration	X		X
5C1bv	Cremation	X		X
5C1bvi	Other waste incineration (please specify in the IIR)		X	
5C2	Open burning of waste		X	
5D1	Domestic wastewater handling	X		X
5D2	Industrial wastewater handling	X		X
5D3	Other wastewater handling		X	
5E	Other waste (please specify in IIR)		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.

134. During the 2011 review Belarus informed the review team that they were making an effort to complete the IIR for the next inventory submissions. The ERT commends Belarus on the progress made.

Transparency:

135. NO_x, NMVOC, SO₂, NH₃ and CO emissions from several incineration sub-sectors are reported as zero values. In reply to a question raised by the ERT, Belarus responded that the emissions were included in 1A1a. The ERT reiterates its encouragement to Belarus to improve the explanations for the allocation of emission data in the sub-chapters of the IIR.

136. Belarus does not provide information in its IIR on the methodologies used to estimate emissions, the emission sources used and on the assumptions made. The ERT reiterates its recommendation from the 2011 review that Belarus should improve the descriptions of the methodologies, activity data and emission factors used in the Waste sector.

Completeness:

137. The ERT notes that in the NFR table zero values have been reported, and that no notation keys have been used. However, in the IIR there are tables that give information on non-estimated and negligible emissions (table 1.7.1) and on the sources Included Elsewhere (table 1.7.2). There are no further explanations in the IIR. In response to the questions raised by the ERT, Belarus explained that they had already made an effort to correct this discrepancy and that a new NFR table with appropriate notation keys was available. The ERT reiterates its previous recommendations, namely that Belarus should use the appropriate notation keys in the future inventories and provide explanations for the use of these notation keys in the IIR in future submissions.

138. The ERT notes that the Waste sector inventory is incomplete and not fully consistent with the Reporting Guidelines and the 2013 EMEP/EEA Emission Inventory Guidebook. The ERT reiterates its encouragement from the 2011 review to Belarus to improve the completeness of the inventory by including in its IIR a more detailed explanation about the methodology applied, and to provide a detailed description for NFR 6 (now NFR 5) Waste sector key sources.

139. The ERT notes that a considerable number of sources are reported as NE (table 1.7.1). The ERT notes that in some of these cases, emissions are calculated for a single pollutant and as such AD is available, default EFs for other pollutants are available from the 2013 EMEP/EEA Emission Inventory Guidebook. To avoid underestimations, the ERT reiterates its recommendation from the 2011 review, namely that Belarus should estimate emissions for those sources that are currently reported in the NFR tables as Not Estimated (NE). In addition, the ERT encourages Belarus to complete the necessary AD statistics for these sources.

Consistency, including recalculation and time series:

140. Belarus has taken up the recommendation from the 2011 review and made good progress in IIR reporting. However, the ERT notes that no consistent time series 1990-2013 in the NFR format is available. Belarus only reported an NFR table for its 2013 emissions and has made no recalculations of the complete time series. The ERT encourages Belarus to implement further improvements in IIR reporting in accordance with the Revised 2014 Reporting guidelines ((ECE/EB.AIR.125 and Annexes) and the 2013 EMEP/EEA Emission Inventory Guidebook. Furthermore, the ERT reiterates its recommendation from the 2011 review, namely that Belarus should recalculate the complete time series in the NFR format for future submissions.

141. Belarus does not provide explanations on recalculations. The ERT reiterates its encouragement from the 2011 review to Belarus to include detailed information on any recalculations that have been carried out as well as the reasons for these recalculations in the future IIRs.

Comparability:

142. The ERT recommends that Belarus uses the methods provided in the 2013 EMEP/EEA Emission Inventory Guidebook for the Waste sector inventory and provides completed NFR tables for the Waste sector with a minimal use of notation keys.

Accuracy and uncertainties:

143. Belarus describes some QA/QC in the IIR, but has not provided a detailed description of the QA/QC activities performed in the Waste sector. Also, it is not stated which tier level approach is used for the calculations in the Waste sector. The ERT reiterates its encouragement from the 2011 review to Belarus to implement sector-specific QA/QC procedures for the Waste sector and to describe the tier level of the chosen methodology.

144. Belarus has not provided an uncertainty analysis for the Waste sector. The ERT reiterates its encouragement from the 2011 review to Belarus to undertake an uncertainty analysis for the Waste sector in order to support the improvement process and to provide an indication of the reliability of the inventory data.

Improvement:

145. In response to the encouragement from the 2011 review (adding information on planned improvements to the IIR), Belarus has now included a paragraph on planned improvements. The ERT encourages Belarus to continue adding more sector-specific information.

Sub-sector Specific Recommendations.

Category issue 1: 5 Waste (NFR J_waste) – NO_x, SO₂, NH₃, and CO

146. The ERT notes that the totals for waste (J_Waste) in the NFR table differ from those in table 1.5.1 of the IIR. When consulted, Belarus explained that the data in the IIR was wrong and that this had been caused by an error in the computation table. The ERT encourages Belarus to implement QC measures to prevent such errors in future submissions and to describe these measures in the QA/QC chapter in the IIR.

Category issue 2: 5A Solid waste disposal on land - NH₃.

147. In category 5A only NH₃ emissions are reported. The NFR and IIR provide no information about the AD or the EFs or the methodology used for calculating emissions. In response to a question raised by the ERT, Belarus answered that the emissions of NH₃ were calculated using a Tier 1 method based on population, and an EF of 630 g/person. The ERT notes that no additional information has been given and that it is thus not clear whether this EF only reflects the total waste deposited or just the municipal waste fraction. The ERT encourages Belarus to include relevant information in the IIR in future submissions.

Category issue 3: 5A Solid waste disposal on land - NMVOC and particulate matter.

148. The ERT notes that in the IIR it is stated that emissions of NMVOC and particulate matter (PM) have not been estimated due to a lack of statistical data or EFs. The ERT notes that the 2013 EMEP/EEA Guidebook provides default EFs, and concludes that it is most likely that no AD is available. The ERT recommends that Belarus investigate the availability of (other) AD sources and includes in future submissions emission from all wastes (municipal, industrial etc.) deposited in solid waste disposal sites (SWDS) including also NMVOC and (PM). Furthermore, the ERT reiterates its recommendation from the 2011 review that Belarus should estimate NMVOC and PM emissions from SWDS using the methodology provided in the 2013 EMEP/EEA Inventory Guidebook.

Category issue 4: 5C1a Municipal waste incineration – All pollutants

149. The ERT notes that no emissions are reported. In the IIR it is stated that NMVOC, PM and HM emissions have not been calculated due to a lack of EFs or AD. Furthermore, in table 1.7.2 it is stated that OPS emissions are included in 5C1a. The ERT notes that no reference is made for the other main pollutants. Furthermore, there is no description of the sub-sources (methodology, process types [specific incineration or for instance waste used as fuel in the cement industry/energy], waste composition, abatement technology used etc.). The ERT reiterates its recommendation from the 2011 review that Belarus should provide a detailed description of the source and justify IEs and NAs, including for instance EFs, AD and the methodology used, in future submissions.

Category issue 5: 5C1bi Industrial waste incineration – SO₂

150. The ERT notes that Belarus, in the time series 1990-2013, reports SO₂ emissions from this source only for 2006. Belarus was not able to provide a satisfactory answer when asked for an explanation by the ERT. The ERT recommends that Belarus recalculates and reports the complete time series in future submission.

Category issue 6: 5C1bi and 5C1bii Industrial and hazardous waste incineration – all pollutants

151. The ERT notes that for 5C1bi only POP emissions are reported and that for 5C1bii no emissions are reported. In the IIR there is no information on the EFs and AD. Furthermore, there is no description of the sub-sources (methodology, process types [specific incineration or for instance waste used as fuel in the cement industry], waste composition, abatement technology used etc.). The ERT recommends that Belarus provides a detailed description of the sources, including for instance EFs, AD and the methodology used, in future submissions.

Category issue 7: 5C1biii Clinical waste incineration - Pb, Zn and POPs

152. Only Pb, Zn and POPs emissions are reported in this sub-source. The IIR does not provide appropriate information about EFs and the methodology applied for this sub-category. The ERT reiterates its recommendation that Belarus should provide more explanations for this sector and describe the methods used, including the EFs and AD, and that it should estimate emissions for future submissions.

Category issue 8: 5C1b All waste incineration – Main pollutants

153. During the review week Belarus explained that the emissions of the main pollutants from waste incineration were included mainly in the Energy sector because of missing specific statistical data on fuel combustion emissions. The ERT reiterates its encouragement to Belarus to calculate emissions for this category in accordance with the 2013 EMEP/EEA Emission Inventory Guidebook.

Category issue 9: 5C1bv Cremation – All pollutants

154. Belarus has covered the main pollutants, Hg and PCDD. The IIR does not provide appropriate information about the EFs, AD and the methodologies used. The ERT reiterates

its recommendation from the 2011 review that Belarus should provide more explanations for this source and describe the methodologies used for the estimation of emissions.

Category issue 10: 5D Wastewater handling – NH₃

155. Only emissions of NH₃ are reported for domestic waste water handling. The IIR does not provide information about sources/processes, AD, EFs, or justifications for IE, NE and NA, or information on the methodology used for the calculation of emissions. However, it is stated in the IIR that no statistics for calculating CO from domestic waste water handling were available. The ERT recommends that the Party provides more detailed explanations for this sector and describes the approach it uses for estimating emissions. Moreover, the ERT encourages Belarus to improve its inventories in the future in accordance with the 2013 EMEP/EEA Emission Inventory Guidebook.

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

1. 2015-06-24_AP_emission_report_2013_Belarus_with_notification keys.xlsm
2. emission_report_2013_Belarus.xlsm
3. Stage3_Belarus_responses_p1.xlsx
4. Stage3_Belarus_responses_p2.xlsx
5. Stage3_Belarus_responses_p3.xlsx
6. IIR_Belarus-2015_AP_rev.docx