UNITED NATIONS

Distr.
GENERAL

CEIP/S3.RR/2013/Bulgaria
2/10/2013

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:

BULGARIA

CONTENT

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 SO_x, NO_x, NMVOC, NH_3, plus PM_{10} & $PM_{2.5}$ for the time series years 1990 – 2011 reflecting current priorities from 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 Bulgaria coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 17th June 2013 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 – Kristina Saarinen (Finland), Energy – Ole-Kenneth Nielson (Denmark), Transport – Nina Holmengen (Norway), Industry – Kees Peek (Netherlands), Solvents – Ardi Link (Estonia), Agriculture & Nature – Michael Anderl (Austria), Waste – Katja Hjelgaard (Denmark).

4. Kevin Hausmann 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. Bulgaria's inventory is generally in line with the EMEP EEA inventory Guidebook and the UNECE Reporting Guidelines. Emissions reported under the CLRTAP and the NECD mainly consistent and the latest submission included improvements related to most of the recommendations from the previous review. The ERT acknowledges the effort Bulgaria has taken to provide the inventory and commends the Party for the work carried out thus far.

6. The ERT notes that the transparency of the inventory could be greatly improved by including more detailed descriptions of the methodologies used to estimate emissions as well as the factors affecting the emission trends. Bulgaria also reports a number of sources as "included elsewhere", which decreases the transparency of the inventory.

7. The ERT notes that Bulgaria continues reporting of emissions for a number of categories as NE. As the completeness of the inventory is essential for reviewing compliance under the conventions, emission values or at least an assessment of the quantitative importance of the sources currently not estimated is needed.

8. Bulgaria uses tier 1 methods for many key sources, which is not according to the Guidelines. The ERT recommends that Bulgaria moves to higher tier levels for these sources.

9. The ERT notes that Bulgaria applied a number of methods and emission factors from the 2007 version of the EMEP/Corinair Guidebook. The ERT strongly recommends that Bulgaria updates its estimates to take into account the latest available version of the Guidebook.

10. Bulgaria has carried out recalculations in the transport, industrial processes and solvent use sectors for part of the time series, but does not provide information on the justification of the recalculations nor on their impact on emission levels and consistency of the time series.

11. The ERT notes substantial improvements in the inventory since the last review in 2009 and commends Bulgaria for the work.

INVENTORY SUBMISSION

12. Bulgaria submitted the inventory under the NECD on 28.12.2012 and under the CLRTAP on 15.02.2013, both within the deadlines of 31.12.2012 and of 15.2.2013, respectively.

13. The NECD submission included a NFR table for 2010 emissions for the NECD pollutants NOx, SO_2, NH_3, NMVOC (final emissions) but no preliminary data for 2011 nor projections and no IIR.

14. The CLRTAP submission included NFR tables from 1990 to 2011 (the latest year) for the main pollutants NOx, SOx, NH_3, NMVOC, for the following heavy metals

As, Cd, Cu, Hg, Ni, Pb, Se and Zn, and for POPs: HCB, PCDD/F, PAH-4 (as well as for the four individual PAHs) and PCBs, in the current NFR format.

15. Bulgaria also submitted the IIR on 15 March 2013, within the deadline.

16. The ERT finds Bulgaria's inventory to be in general of good quality and well documented in the informative inventory report (IIR). Due to the availability of the IIR and the Party's responsiveness, the ERT was able to review the inventory in detail and provide a number of detailed recommendations.

KEY CATEGORIES

17. Bulgaria has compiled a level Key Category Analysis for the latest inventory year and for the trend for the following pollutants: SO_x, NO_x, NMVOC, NH_3, plus PM_{10} & $PM_{2.5}$, As, Cd, Cr, Cu, Hg, Ni, Pb, Se, Zn, PCDD/F, HCB, PCB and PAH-4 including all sectors. The analysis was made at tier 1 and tier 2 levels for both emission levels and emission trends. The KCA by the Party and the CEIP produced similar results.

18. According to the UNECE Reporting Guidelines, Parties should identify national key categories as described in the Guidebook for the base year and the latest inventory year in their IIR. Bulgaria has, however, not presented a KCA for the base years of the pollutants. The ERT recommends that Bulgaria adds the KCA for the base years of the pollutants in the IIR of the next submission.

19. In the IIR, Bulgaria states that its key category analysis is used to prioritize improvements in the inventory. The ERT commends Bulgaria for taking this approach in the inventory.

QUALITY

Transparency

20. The ERT recognises the level of effort undertaken by Bulgaria in providing a detailed inventory and documentation in the IIR to enable an in-depth review. In general, the ERT found the inventory and the IIR to be much improved since the last review.

21. To further improve the transparency of the inventory, the ERT recommends that Bulgaria provides additional descriptions in the next IIR, such as details of the methodologies used in the preparation of the inventory in the energy, transport, industrial processes and agriculture sectors. The ERT also recommends that Bulgaria provides more details on inventory improvement plan as well as explanations of the impacts of recalculations on emission levels. The current documentation of emission trends in the IIR is not considered transparent and the ERT recommends that Bulgaria adds information on factors affecting the emission trends, such as technical and economic development, to enable better understanding of the development of emissions.

22. The ERT commends Bulgaria for providing information of where the sources reported as “included elsewhere” (IE) are included in the NFR table’s “Additional info” sheet. The ERT encourages Bulgaria to try to find ways to report these emissions separately under their proper NFR categories.

Completeness

23. The ERT acknowledges the effort which Bulgaria has taken to provide estimates of emissions for all sectors and all pollutants reviewed. Bulgaria’s inventory is in general complete for the pollutants reviewed, for years submitted and for geographical coverage. However, the ERT found some issues related to sources currently reported as NE as well as other further needs for improvement listed below.

24. The ERT notes that Bulgaria uses the notation key NE for several pollutants and source categories, while no explanation is provided in the IIR on why emissions are not estimated:

a. Emissions from NFR categories 1 A 2 f ii, 1 A 3 d i (ii), 1 A 4 a ii, 1 A 4 b ii, 1 A 4 c ii, 1A 4 c iii, 1 A 5 b, 2 C 5 f, 2 D 3, 2 E, 2 G, 6 C d, 6 C e and 7 A, in addition to many pollutants reported as NE under other NFR categories. The ERT recommends that Bulgaria investigates these sources and prepares emissions estimates for sources where emissions occur, or change the reporting code to NA for sources where emissions are not expected to result from the activity.

b. The ERT commends Bulgaria for presenting information on sources not estimated under Chapter 1.8 (General assessment of Completeness) and for providing explanations for why emissions were not estimated. This information greatly helps to provide an overview of the completeness of emissions. To complete this excellent work, the ERT encourages Bulgaria to add an assessment of the quantitative importance of the sources currently not estimated and provide a plan when the estimates would be prepared. Completeness of the inventory is essential for reviewing compliance under the NECD and the relevant CLRTAP Protocols.

25. In 2012 Bulgaria provided data on large point sources (LPS) as well as gridded data.

26. Bulgaria has carried out recalculations in the transport and industrial processes sectors for 2011 and for the solvent use sector in 2010. The IIR provides information on the justifications of the recalculations but there is no analysis of their impact on emission levels. It was not clear for the ERT how the consistency of the time series including the base year and all other years were affected. The ERT recommends that Bulgaria therefore checks the consistency of the time series and provides information on the impacts of recalculations on the time series. This information should preferably be provided in an IIR Chapter 10 (as in the

recommended outline for the IIR[2]), which is not included in the current IIR, and updated this information each year.

Comparability

27. The ERT notes that the inventory of Bulgaria is comparable with those of other reporting parties. The allocation of source categories follows that of the EMEP/UNECE reporting Guidelines. The ERT encourages Bulgaria to continue with this approach to national inventory calculation.

CLRTAP/NECD comparability

28. The ERT notes that there are some differences between the estimates provided by Bulgaria under LRTAP and NECD. To the question raised by the ERT Bulgaria replied that for 2010 these are mainly due recalculations (in NFR 3B2 and 1A3bi-v) not yet included in both inventories, and for 2011, due to different activity data used in these inventories when different national institutes report to the conventions. In its reply Bulgaria acknowledges to be aware of the differences and promises to correct the discrepancies during the next reporting round. The ERT recommends that Bulgaria checks the correctness of the data and reports consistent data to both conventions.

Accuracy and uncertainties

29. At the moment, the Bulgarian IIR does not include information on uncertainties in the inventory. To the question raised by the ERT, Bulgaria replied that this work will be carried out and reported in the next submissions when there is enough reliable information to complete the analysis. Preliminary work to support this has been done in connection with the greenhouse gas inventory where a quantitative uncertainty analysis at Tier 1 level has already been prepared. The ERT recommends that Bulgaria performs the uncertainty analysis as soon as possible.

30. As Bulgaria reports many sources as not estimated (NE) there may be additional emissions not included in the current estimates as discussed under “Completeness” sector of this report. These sources further impact the uncertainty of the current total emissions and make it difficult to compare Bulgaria’s performance against the reduction targets. The ERT recommends that Bulgaria checks the impact of the not estimated (NE) emissions on the uncertainties.

Verification and quality assurance/quality control approaches

31. Bulgaria has elaborated and implemented a quality assurance/quality control (QA/QC) plan which follows the IPCC Good Practice Guidelines 2000 and is thus in accordance with the EMEP/CORINAR Guidebook (Inventory Management Chapter). The source category specific QA/QC operations have been documented in the respective sub-chapters in the IIR. The ERT commends Bulgaria for this work. According to the IIR, the inventory is peer reviewed and approved before official submission.

[2] Annex VI of the UNECE Reporting Guidelines

32. The ERT acknowledges the detailed information provided in the Bulgarian IIR on the preparation of the inventory. To the questions raised by the ERT on the prioritization of improvements, Bulgaria replied that results of both internal and external reviews are taken to the improvement plan which is scheduled annually according to the technical and expert resources. The ERT commends Bulgaria for its efforts to further develop the inventory and recommends that Bulgaria takes the results of the key category analysis and uncertainty analysis into account in the prioritization of the improvements and provides an inventory improvement plan in the IIR.

33. The ERT also notes that the quality control activities did not prevent all mistakes, for instance in the agriculture sector, and recommends that Bulgaria follows its procedures more strictly in the preparation of the inventory.

FOLLOW-UP TO PREVIOUS REVIEWS

34. Bulgaria provided detailed responses to the questions identified in the Stage 2 review for their submissions in 2012 and 2008.

35. The ERT notes that the Party has carried out most recommendations given by the previous ERT in 2009. The ERT commends Bulgaria for these efforts and recommends that the Party carries out the remaining work, for instance in the agriculture sector.

AREAS FOR IMPROVEMENTS IDENTIFIED BY BULGARIA

36. Bulgaria identified the following further improvements in the IIR 2013: development of higher tier methods for estimation of emissions and incorporating information from the ETS, E-PRTR and industrial associations in the inventory, as well as improvement of activity data in the agriculture sector.

37. To the questions raised by the ERT during the review, Bulgaria provided additional information on planned improvements for the next years: carrying out a quantitative uncertainty analysis and improvement of the QA/QC checks, use of the CollectER software and application of methods from the EEA/EMEP Guidebook 2009 and updates 2013.

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

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

(a) Add the KCA for the base years of the pollutants in the IIR

(b) Update methodologies and emission factors to the latest version of the EMEP/EEA Guidebook

(c) Assess the quantitative importance of the sources currently not estimated and provide a plan when the estimates would be prepared

(d) Finalize recalculations for the years before 2000, check the consistency of the time series and provide information on the impacts of recalculations on the time series in the IIR

(e) Prepare an uncertainty analysis and assess the impact of the not estimated (NE) emissions on the uncertainties

(f) Take the results of the key category analysis and uncertainty analysis into account in the prioritization of the improvements and to provide an inventory improvement plan

SECTOR SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

ENERGY

Review Scope

Pollutants Reviewed		All		
Years		1990 – 2011		
NFRCode	**CRF_NFRName**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
1.A.1.a	public electricity and heat production	x		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	x		x
1.A.2.b	non-ferrous metals	x		x
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		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	
1 A 3 e	Pipeline compressors		x	
1.A.4.a.i	commercial / institutional: stationary	x		x
1.A.4.a.ii	commercial / institutional: mobile		x	
1.A.4.b.i	residential plants	x		x
1.A.4.b.ii	household and gardening (mobile)		x	
1.A.4.c.i	Agriculture/forestry/fishing. stationary	x		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		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		x
1 B 2 a iv	Refining / storage	x		x
1 B 2 a v	Distribution of oil products	x		x
1 B 2 b	Natural gas	x		x
1 B 2 c	Venting and flaring	x		x
1 B 3	Other fugitive emissions from geothermal energy production , peat and other energy extraction not included in 1 B 2	x		
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which have and which have not in the respective columns.				

General recommendations on cross cutting issues.

Transparency:

39. The ERT considers the inventory of Bulgaria not transparent for the energy sector. The Informative Inventory Report (IIR) does not contain the necessary information to conduct a technical review. The IIR does not contain detailed tables of emission factors with references but only tables containing broad ranges of emission factors at NFR sector level rather than SNAP which is used in compiling emissions and for fuel groups rather than the individual fuels. The ERT recommends that Bulgaria improves transparency by including this information in future submissions.

Completeness:

40. Bulgaria does not report any categories as NE for stationary combustion. However, the ERT noted that in some cases emissions were reported as NA, when the correct notation key would be NE. The identified instances are described in the sector specific recommendations.

Consistency including recalculation and time series:

41. No specific findings.

Comparability:

42. During the review the ERT noted that the current "National Common Methodology" used to estimate emissions is based on the 2007 EMEP/Corinair Guidebook and that the implementation of the 2009 EMEP/EEA Guidebook was planned for the 2014 submission. The ERT commends Bulgaria for implementing the latest version of the Guidebook. However, the ERT notes that there will be a new version of the EMEP/EEA Guidebook published in 2013 and that it could be useful to implement this version rather than first implementing the 2009 version.

43. During the review, the ERT noted that emissions reported to UNECE under the CLRTAP for 2011 differed significantly from emissions reported to the European Commission under the National Emission Ceilings Directive (NECD). For example, the ERT notes that for public electricity and heat production the NOx emission is reported as 48.87Gg under the NECD, while the reporting under CLRTAP is 53.63Gg. In response, Bulgaria explained that the significant discrepancies between the reported emissions under the NECD and the CLRTAP for 2011 are due to the activity data used. The ERT recommends that Bulgaria ensures that the same data, to the extent possible, are used in estimating emissions to all international reporting as this will create a more robust reporting system.

Accuracy and uncertainties:

44. Bulgaria does not estimate uncertainties of the inventory. The ERT recommends that Bulgaria implements an uncertainty estimation as a tool for, together with the key category analysis, prioritising improvements for the inventory.

Improvement:

45. The IIR only contains a list of very generic planned improvements, e.g. to improve overall accuracy, transparency and completeness. The ERT recommends that Bulgaria reports in more detail on the sector specific planned improvements, as a minimum to address the recommendations made during the review process.

Sub-Sector Specific Recommendations.

Category issue 1: 1A Stationary combustion – All pollutants

46. The emission factors as presented in table 3.2 of the IIR consist of very broad intervals and are only for the general fuel groups. This limits transparency and makes it difficult to review the inventory. In response to a question raised by the ERT, Bulgaria provided a spreadsheet containing more detailed emission factors. The ERT notes that the emission factors provided in the spreadsheet were presented with many decimals. In response, Bulgaria informed the ERT that the emission factors are either country specific or default values from the 2007 EMEP/Corinair Guidebook. Furthermore, Bulgaria explained that according to the national methodology, many emission factors are subject to correction because they depend on the parameters related to the type of fuel used and that the National Statistics Institute is carrying out the corrections. The ERT recommends that Bulgaria includes a description on the corrections made to emission factors in order to improve transparency. The ERT further recommends that Bulgaria presents (in the IIR, e.g. as an annex) the original emission factors for the individual sectors and fuels, indicates whether the emission factors are country specific or default values, and also presents the corrected values.

Category issue 2: 1A Stationary combustion – HCB and PCBs

47. During the review, the ERT noted that emissions of HCB and PCBs are in many cases reported as NA or NE, even when there are default emission factors available in the EMEP/EEA Guidebook. In response, Bulgaria informed the ERT that the current National Common Methodology is based on the 2007 EMEP/Corinair Guidebook and the implementation of the 2009 EMEP/EEA Guidebook was planned for the 2014 submission. The ERT recommends that Bulgaria implement the latest version of the EMEP/EEA Guidebook in the National Common Methodology.

Category issue 3: 1A2c Chemicals & 1A2e: Food processing – All pollutants

48. Bulgaria reports emissions from 1A2c and 1A2e as included under 1A2a. The ERT notes that the data reported by Bulgaria to Eurostat include information on the fuel consumption in chemical industry as well as for food industry. In response to a question raised by the ERT, Bulgaria explained that the National Statistical Institute compiles the energy balance using primary national data as well as regional data and that the disaggregation into technologies (the SNAP categorisation) was not possible for 1A2c and 1A2e. The ERT recommends that Bulgaria uses the data available and reported to Eurostat as a basis for disaggregating emissions. If no better information is available Bulgaria can assume the same technology split for 1A2c and 1A2e as for the other subcategories under 1A2.

Category issue 4: 1A4 Other sectors – All pollutants

49. The estimation of emissions from other sectors is not described in sufficient detail as the emission factors and references are not included in the IIR. In response, Bulgaria provided the ERT with a spreadsheet clearly documenting the emission factors and the references for these emission factors. The ERT notes the very transparent information provided by Bulgaria in the spreadsheet and recommends that Bulgaria includes this information future submissions of its IIR, e.g. in an annex.

Category issue 5: 1B Fugitive emissions from fuels – All pollutants

50. During the review the ERT noted that the estimation of emissions from fugitive emissions from fuels is not described in sufficient detail to allow for a proper review. In response to questions raised by the ERT, Bulgaria provided a spreadsheet with the emission factors used and also text documents describing the references. The ERT notes that the text documents were provided in Bulgarian. The ERT recommends that the key information, i.e. the emission factors used and the precise reference, is included in the next submission.

Category issue 6: 1B1a Coal mining and handling – NMVOC, PM

51. During the review the ERT noted that the IIR states that coal mining occurs in Bulgaria and that the NFR contains activity data. However, all emissions are reported as NA. The ERT further noted that methodology and default emission factors are available in the EMEP/EEA Guidebook. In response, Bulgaria informed the ERT that the current National Common Methodology is based on the 2007 EMEP/Corinair Guidebook and the implementation of the 2009 EMEP/EEA Guidebook was planned for the 2014 submission. The ERT recommends that Bulgaria implements the latest version of the EMEP/EEA Guidebook in the National Common Methodology.

Category issue 7: 1B2c Venting and flaring – NMVOC

52. The ERT notes that only emissions of NOx, SO2 and CO are reported for 1B2c. The EMEP/EEA Guidebook also contains an emission factor for NMVOC. In response, Bulgaria informed the ERT that the current National Common Methodology is based on the 2007 EMEP/Corinair Guidebook and the implementation of the 2009 EMEP/EEA Guidebook was planned for the 2014 submission. The ERT recommends that Bulgaria implements the latest version of the EMEP/EEA Guidebook in the National Common Methodology. Furthermore, the ERT encourages Bulgaria to estimate emissions of other pollutants from flaring using national data and if not available from other literature sources.

TRANSPORT

Review Scope

Pollutants Reviewed		Main pollutants, particulate matter, HM and CO		
Years		1990 – 2011		
NFRCode	**CRF_NFRName**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
1.A.3.a.i.(i)	international aviation (LTO)	x		x
1.A.3.a.i.(ii)	international aviation (cruise)		x	
1.A.3.a.ii.(i)	civil aviation (domestic, LTO)	x		x
1.A.3.a.ii.(ii)	civil aviation (domestic, cruise)		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		x
1.A.3.b.v	road transport, gasoline evaporation	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	x		x
1.A.3.d.i (ii)	international inland navigation		x	
1.A.3.d.ii	national navigation	x		x
1.A.4.b.ii	household and gardening (mobile)	x		x
1.A.4.c	agriculture / forestry / fishing	x		x
1.A.4.c.ii	off-road vehicles and other machinery	x		x
1.A.4.c.iii	national fishing	x		x
1.A.5.b	other, mobile (including military, land based and recreational boats)		x	
1 A 3 d i (i)	International maritime navigation		x	
1 A 3	Transport (fuel used)		x	
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which have and which have not in the respective columns.				

General recommendations on cross cutting issues.

53. The transparency of the Bulgarian emission estimates for mobile sources is good. That said, there is a need for increasing the completeness of the Bulgarian emission inventory for mobile sources. The ERT would like to thank Bulgaria for providing thorough answers in a timely manner during the review.

Transparency:

54. Bulgaria's methodologies for calculating emissions from road transport are thoroughly described in the IIR. The ERT encourages Bulgaria to expand the descriptions for the other mobile sources, in particular the descriptions of methodologies used for calculating emissions from navigation prior to 2000.

55. There is limited use of the notation key "included elsewhere" (IE) for mobile sources in the Bulgarian inventory; see category issue 1.

Completeness:

56. For mobile sources, Bulgaria's energy balance is the core set of activity data for emission calculations. During the past few years, biomass consumption in road transport has increased. Bulgaria does not calculate emissions from biomass; see category issue 2.

57. There are many potentially significant emission sources reported as not estimated (NE) in the Bulgarian NFR tables, e.g. particulate emissions from road abrasion and emissions from off-road machinery. However, during the review it became apparent that many of these emissions are actually included elsewhere; see category issue 3 and 4. The ERT recommends that, as far as possible, these emissions are disaggregated, and where this is not possible, the notation key should be changed to IE.

Consistency including recalculation and time series:

58. The time series consistency of mobile sources in the Bulgarian inventory is good. In some cases, changes in data availability have led to inconsistencies in the time series; see category issue 1, 5, and 6.

Comparability:

59. Bulgaria uses the COPERT model for road transport emission calculation. This gives good comparability between years and with other countries. Bulgaria has used Slovenian activity data for a detailed split of vehicles. Road transport is an important emission source for many pollutants, and the ERT encourages Bulgaria to as far as possible incorporate country-specific activity data in the emission calculations for road transport.

60. The ERT observed that Bulgaria uses emission factors from the 2007 Guidebook for many sources, e.g. NOx emission factors for railways. These default emission factors have in some cases been altered significantly in updates of the Guidebook, and the ERT encourages Bulgaria to review their emission factors, in preparation of its next submission.

Accuracy and uncertainties:

61. Bulgaria has currently not performed a quantitative uncertainty analysis, but has plans for doing so for the next submissions. The ERT welcomes these plans, and hopes that the uncertainty analysis will bring valuable information on areas that need further improvement.

62. As described in the IIR, Bulgaria performs detailed QA/QC routines for road traffic emissions. The ERT commends Bulgaria for these routines.

Improvement:

63. Bulgaria provides source specific plans for improvements in the IIR. The ERT commends Bulgaria for this, and welcomes the plans for investigating country specific parameters for road traffic and the plans within navigation and railways.

Sub-Sector Specific Recommendations.

Category issue 1: 1A3d ii – All pollutants

64. Emissions of all pollutants from national navigation (1A3d ii) are reported as included in 1A2 from 2000 onwards. The IIR explains that there no longer are available data sources for emission calculations. This aggregation reduces the transparency of the Bulgarian inventory. The ERT encourages Bulgaria to explore possibilities for disaggregating activity data for national navigation and manufacturing industries/construction.

Category issue 2: 1A3b i-iv – All pollutants

65. Emissions from biomass combustion in road transport are not calculated. These emissions are of only minor importance to greenhouse gas emissions, but they can potentially be important emission sources for other pollutants. During the review, Bulgaria expressed willingness to consider the inclusion of biomass fuels in the COPERT model for the next submission. The ERT recommends that Bulgaria calculates and reports emissions from use of biomass in road transport for the next submission. The ERT also encourages Bulgaria to report biomass separately in the activity data section of the NFR, or, if this is not possible, to include the amount in liquid fuels and use the notation key IE for biomass.

Category issue 3: 1A3b vii – TSP, PM_{10} and $PM_{2.5}$

66. Particulate emissions from road abrasion are reported as NE in the NRF tables. The 2009 Guidebook provides emission factors for these pollutants, and the demand for activity data is the same as for 1A3b vi, in which Bulgaria reports emissions. Bulgaria informed the ERT during the review that particulate emissions from non-exhaust are calculated using COPERT, and reported under 1A3b vi. The ERT encourages Bulgaria to gather information to disaggregate non-exhaust emissions in 1A3b vi and 1A3b vii. One possibility could be to use the relationship between emission factors in the two sources from the 2009 Guidebook as an allocation key to be used on the non-exhaust emissions from COPERT. Until the emissions can be reported in 1A3b vi and 1A3b vii separately, the ERT recommends that the notation key IE is used for 1A3b vii.

Category issue 4: 1A4a ii, 1A4b ii, 1A4c ii, and 1A4c iii – All pollutants

67. Emissions from off-road machinery in 1A4 are reported as NE in the NFR tables. These are possibly significant emission sources for several pollutants. During the review Bulgaria informed the ERT that fuel consumption in these sources is included in the road transport sector, and that the notation key will be changed to IE in the next submission. The ERT welcomes this correction of notation keys, and suggests that this is also the case for 1A2f ii. The ERT recommends that Bulgaria examines whether fuel consumption in 1A2f ii is reported elsewhere or not. In the longer term, the ERT encourages Bulgaria to gather activity data to allocate emissions more precisely to the different sources.

Category issue 5: 1A3b ii – All pollutants

68. There are no emissions reported from light duty vehicles for the years 1990 and 1991. Bulgaria informed the ERT during the review that this was because vehicle composition is modelled based on proxy data from Slovenia, and according to the available information from Slovenia, up to 1992 there are no vehicles in the light duty vehicle category. Bulgaria informed the ERT that the transition in the beginning of the 90s led to the drastic change in the vehicle fleet - from mostly Soviet Union vehicles to second hand EU cars. Bulgaria thus considers it unfeasible to extrapolate 1992 values for light duty vehicles backwards. The ERT finds it unlikely that there were no light duty vehicles in Bulgaria in 1990 and 1991, and recommends that the notation key NE is used, with an explanation in the IIR.

Category issue 6: 1A3a i (i) and 1A3a ii (i) – All pollutants

69. Emissions for LTO are reported as NA prior to 1998. The IIR states that the lack of emissions is due to missing information on number of LTOs for these years. During the review, Bulgaria expressed their willingness to extrapolate the existing time series (from 1998) backwards to render emission estimates possible. The ERT welcomes Bulgaria's plans to include a complete emission time series in 1A3a i (i) and 1A3a ii (i) for the next submission.

INDUSTRIAL PROCESSES

Review Scope

Pollutants Reviewed		NOx, NMVOC, SOx, NH_3, $PM_{2.5}$, PM_{10}, TSP, CO, Cd, Hg, Pb, POPs		
Years		1990 – 2011		
NFRCode	**CRF_NFRName**	**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	x		x
2.A.4	soda ash production and use	x		x
2.A.5	asphalt roofing	x		x
2.A.6	road paving with asphalt	x		x
2.A.7.a	Quarrying and mining of minerals other than coal	x		x
2.A.7.b	Construction and demolition	x		x
2.A.7.c	Storage, handling and transport of mineral products	x		x
2.A.7.d	Other Mineral products (Please specify the sources included/excluded in the notes columr to the right)	x		x
2.B.1	Ammonia production	x		x
2.B.2	Nitric acid production	x		x
2.B.3	Adipic acid production	x		
2.B.4	Carbide production	x		
2.B.5.a	Other chemical industry (Please specify the sources included/excluded in the notes columr to 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)		x	
2.C.1	iron and steel production	x		x
2.C.2	ferroalloys production	x		x
2.C.3	aluminium production	x		x
2.C.5.a	Copper Production	x		x
2.C.5.b	Lead Production	x		x
2.C.5.c	Nickel Production		x	
2.C.5.d	Zinc Production	x		x
2.C.5.e	Other metal production (Please specify the sources included/excluded in the notes columr to the right)		x	
2.C.5.f	Storage, handling and transport of metal products (Please specify the sources included/excluded in the notes column to the right)	x		x
2.D.1	pulp and paper	x		x
2.D.2	food and drink	x		x
2.D.3	Wood processing	x		x
2.E	production of POPs	x		x
2.F	consumption of HM and POPs (e,g. Electrical an dscientific equipment)	x		x

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

General recommendations on cross cutting issues

Transparency:

70. The industrial processes inventory of Bulgaria is not completely transparent. The ERT notes that tables with activity data and emission factors (including references) and details on methodological issues are missing. The ERT recommends that Bulgaria includes these items, at least for the key-categories, in the next submission.

71. The ERT notes that the explanations for the use of the notation keys NE and IE are provided in the NFR tables for almost all source categories. Only for 2F the explanation for the use of NE is missing. The ERT encourages Bulgaria to add this explanation for 2F in the next submission.

72. The ERT notes that Bulgaria obtains its emission factors from the National Common methodology for emissions inventories under UNECE/CLRTAP and UNFCCC. During the review Bulgaria responded that the sources of the emission factors in the National Common methodology are the EMEP/EEA Guidebook, the IPCC Guidelines and country-specific EFs for some categories. Furthermore, Bulgaria supplied the ERT with an overview on the EFs used to calculate the emissions for the Industrial Processes sector and the ERT thanks the Party for this.

73. The ERT notes that Bulgaria included explanations on dips and jumps or other changes in the emission time series in its IIR and commends the Party for this.

Completeness:

74. In the previous stage 3 review report (2009), the ERT encouraged Bulgaria to submit a complete "Industrial Processes" sector chapter with all the necessary information in its IIR. The 2013-ERT still does not consider the industrial processes sector description to be fully complete for the main sources. Additional details and specific recommendations are given in the section on sector recommendations below.

75. In the previous stage 3 review report, the ERT also encouraged Bulgaria to report the calculated or estimated emissions even if insignificant, rather than reporting NA or NE, in future submissions. The ERT notes that Bulgaria still uses the notation keys NA and NE very often. To avoid under-estimations, the ERT recommends that Bulgaria includes plans to address the missing emissions (NE) in its IIR, either by obtaining data allowing an emission estimate to be made, or by reporting the emissions as not applicable.

Consistency including recalculation and time series:

76. The ERT notes that based on the recommendations given in the previous stage 3 review report, EFs from the EMEP/EEA Emission Inventory Guidebook 2009 were applied for some categories/pollutants in order to improve the inventory. Such improvements have been made in the following NFR-categories: 2A1, 2A2, 2A4, 2A6, 2B1, 2B5a, 2C2, and 2D1. The ERT commends Bulgaria for this.

77. The ERT notes that the time series of the activity data and the EFs used to calculate emissions of the key sources are consistent.

Comparability:

78. Bulgaria reported its emissions inventory in accordance with the reporting requirements and submitted it in the requested NFR format.

79. In the previous stage 3 review report, the ERT encouraged Bulgaria to coordinate the reporting of emissions and activity data between the different conventions and directives. This has been done and the ERT commends Bulgaria for this improvement. Despite this improvement, the ERT notes that there are significant differences between the CLRTAP and NEC emissions in the industry sector. The ERT recommends that Bulgaria corrects these differences in the next submission.

Accuracy and uncertainties:

80. In the previous stage 3 review report, the ERT encouraged Bulgaria to implement sector specific OA/QC procedures for the industrial processes sector. The ERT notes that Bulgaria has been undertaken all activities regarding QC as described in the QA/QC System in all NFR sectors. Furthermore the following sector specific QA/QC procedures have been carried out: Check of methodology, emissions, emission factors (time series); Time series consistency; Plausibility checks of dips and jumps; and Documentation and archiving of all information required in IIR. The ERT commends Bulgaria for this.

81. So far, no uncertainty analysis has been carried out. However, Bulgaria plans to present a quantitative estimate of the inventory uncertainty for each source category and for the inventory in total in its next submission.

Improvement:

82. In the previous stage 3 review report from 2009, the ERT encouraged Bulgaria to include details of planned improvements in future IIRs. The 2013-ERT notes that Bulgaria planned source specific improvements, such as applying of higher Tier methods for estimation of emissions, for all sub-categories within the Industrial Processes sector. The ERT commends Bulgaria for this.

Sub-Sector Specific Recommendations.

Category issue 1: 2A1 and 2A2

83. In the previous stage 3 review report, the ERT encouraged Bulgaria to separate the industrial process emissions for 2A1 and 2A2 from 1A2f where possible and where not to describe where the emissions are included in future IIRs. The ERT finds that Bulgaria reported the process emissions from 2A1 and 2A2 under 2A1 and 2A2 and commends the Party for this.

Category issue 2: 2A5 and 2A6

84. In the previous stage 3 review report, the ERT encouraged Bulgaria to add the missing NMVOC and PM2.5 emissions from 2.A.5 and 2.A.6. The ERT notes that Bulgaria reported these missing emissions in its current submission and commends the Party for this.

Category issue 3: 2B1

85. In the previous stage 3 review report, the ERT encouraged Bulgaria to add the missing NOx and NH_3 emissions from 2.B.1. The ERT observes that Bulgaria reported these missing emissions and commends the Party for this.

Category issue 4: 2C1

86. In the previous stage 3 review report, the ERT encouraged Bulgaria to use a higher Tier method to calculate emissions for this key category. The 2013-ERT notes that the emissions have been calculated based on a Tier 2 approach now and commends Bulgaria for this.

Category issue 5: 2C3, 2C5a, 2C5b and 2C5d

87. The ERT notes that Bulgaria used the notation key IE in almost all the pollutant cells of 2C3, 2C5a, 2C5b and 2C5d. The explanation for the use of this notation key can be found in the sheet “Additional info” of the NFR tables. However, in Table 1.7 of the IIR no explanations on the use of these IE notation keys can be found. To increase consistency, the ERT encourages Bulgaria to also include the explanations for the use of this notation keys in Table 1.7 of its next IIR. Furthermore the ERT encourages Bulgaria to separate the industrial process emissions for 2C3, 2C5a, 2C5b, and 2C5d from 1A2b in the next submission.

Category issue 6: 2D1 and 2B5a

88. The ERT notes that Bulgaria's NFR-tables contain emission figures for 2D1, while no description of 2D1 can be found in the IIR. After consulting, Bulgaria send a description of 2D1 to the ERT. The ERT thanks the Party for this. Similarly, the ERT notes that the NFR-tables contain emission figures for the key source 2B5a, while no description of 2B5a can be found in the IIR. The ERT strongly recommends that Bulgaria includes descriptions of 2B5a and 2D1 in the next submission.

SOLVENTS

Review Scope

Pollutants Reviewed		NMVOC		
Years		1990 – 2011		
NFRCode	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
3.A.1	Decorative coating application	x		x
3.A.2	Industrial coating application	x		x
3.A.3	Other coating application (Please specify the sources included/excluded in the notes column to the right)	x		x
3.B.1	Degreasing	x		x
3.B.2	Dry cleaning	x		x
3.C	Chemical products,	x		x
3.D.1	Printing	x		x
3.D.2	Domestic solvent use including fungicides	x		x
3.D.3	Other product use	x		x
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which have and which have not in the respective columns.				

General recommendations on cross cutting issues

Transparency:

89. Bulgaria's emissions calculations for NFR 3.A, 3.B, 3.C, and 3.D are based on the Tier 2 methodology from the EMEP/CORINAIR Guidebook 2009, except for NFR 3.C (SNAP 060302) which uses Tier 1 EFs. All EFs are presented in the IIR. Still, the ERT recommends that Bulgaria also presents activity data, emissions as well as emission factors for each sub-category on the highest possible level of detail for better transparency.

90. The ERT also recommends that Bulgaria elaborates on the dynamics of emission time series within every solvent sub-sector in its IIR.

Completeness:

91. The ERT acknowledges that most of the activities are covered in Bulgaria's inventory, but also recommends that Bulgaria estimates the emissions from the domestic solvent use (SNAP 060408) in NFR 3.D.2 and the use of tobacco in NFR 3.D.3. If there are no country specific methodologies available, the ERT recommends that Bulgaria uses the default methodology presented in the EMEP/EEA Guidebook 2009.

Consistency including recalculation and time series:

92. The ERT notes that there are dips and jumps of emissions and activity data in all the solvents sub-sector's time series. Bulgaria explained these changes during the review. The ERT recommends that Bulgaria explains the major changes of estimates in the IIR.

Comparability:

93. The ERT notes that the used methods are consistent with those proposed in the EMEP/EEA Guidebook 2009 and are therefore comparable to the methods applied in other countries.

Accuracy and uncertainties:

94. Bulgaria describes in the IIR that all activities regarding QC as described in the section on the "QA/QC System" have been carried out for the solvents sector. The ERT considers this in line with good practice.

Improvement:

95. Bulgaria has a general solvent sector improvement plan, listing (amongst others) the application of higher tier methodologies for emissions estimations, improved accuracy of the estimates, as well as the inclusion of text on recalculations. The ERT commends Bulgaria's inventory improvement activities and encourages Bulgaria to carry them out.

Sub-Sector Specific Recommendations.

Category issue 1: 3.A.1. Decorative coating application - NMVOC

96. The ERT encourages Bulgaria to take into account the different types of paints used (solvent borne and water borne paints) for building and construction applications and domestic uses. Bulgaria is also encouraged to take into account the impact of the EU Directive of 21 April 2004 [2004/42/EC] related to the use of paints for building applications and car repairing which specifies a maximum solvent content for products in the EU member states.

Category issue 2: 3.A.2. Industrial coating application – NMVOC

97. The ERT is unable to determine whether an appropriate tier 3 methodology has been used for estimates of industrial applications of paints due to a lack of transparency in the IIR. The ERT encourages Bulgaria to provide additional information, in its future IIRs, on the share of the activity according to different emission factors, details of plant data used and on verifications made to ensure that 100% of the activity is taken into account in the estimates.

Category issue 3: 3.B.1. Degreasing – NMVOC

98. Bulgaria uses three emission factors for different types of degreasing processes. Two of them are expressed as a mass of VOC per unit independent of the size of the operating unit. The EFs do not take into account the progress made in degreasing operations and do not take into account the impact of EU directive 1999/13. The ERT encourages Bulgaria to improve the EFs for these activities and to better take into account the improvements in the industry and impacts of the EU Directive.

Category issue 4: 3.B.2. Dry cleaning – NMVOC

99. The methodology developed for dry cleaning, although apparently correct, is not described clearly in the IIR. The ERT encourages Bulgaria to provide a transparent description of the method, data sources and assumptions used to estimate the share of the different machines and the amount of textiles cleaned in its future IIRs.

Category issue 5: 3.C. Chemical products - NMVOC

100. The ERT notes that there are strong activity data fluctuations in this sub-sector throughout the time series which also affects the dynamics of NMVOC emissions. Following the review, Bulgaria explained that for the period of 2007-2011, there are no activity data for polyester processing (SNAP 060301), polyvinylchloride processing (SNAP 060302), rubber processing (SNAP 060305) and ink manufacturing (SNAP 060308) and also there are no activity data of glue manufacturing (SNAP 060309) for the years 2007-2009. The ERT recommends that Bulgaria explains this kind of data inconsistencies in the next submission. Where possible, the ERT recommends that Bulgaria calculates a complete time series for these activities using the gap-filling methods provided in the EMEP/EEA Guidebook 2009.

Category issue 6: 3.D.1. Printing - NMVOC

101. For NFR 3.D.1 printing activities, the emission factor for Tier 2 "heat set offset printing" is used across the time series. The EF does not take into account any progress made in printing operations or the impact of the EU directive 1999/13, or other possible technologies for printing. The ERT suggests that Bulgaria improves the EFs for the printing activity and develops a methodology to follow the progress made in solvent emission reduction, taking into account the other possible printing technologies that may be in use in Bulgaria.

Category issue 7: 3.D.2. Domestic solvent use including fungicides - NMVOC

102. Bulgaria does not estimate emissions for this sub-sector. Activities such as domestic uses of products could be large contributors of emissions. The ERT encourages Bulgaria to attempt an estimate or to provide some justification for not estimating emissions in the next submission.

Category issue 8: 3.D.3. Other solvent uses (including products containing HMs and POPs) – NMVOC

103. ERT encourages Bulgaria to check the existence of emissions from pharmaceutical product manufacturing and to include the emissions from the use of tobacco in the inventory. The ERT acknowledges that these sources are unlikely to be key categories. However, the ERT encourages Bulgaria to attempt to estimate or provide some details in its IIR on these categories.

AGRICULTURE

Review Scope:

Pollutants Reviewed		NOx, NMVOC, NH_3, CO		
Years		1990 – 2011		
NFRCode	**CRF_NFRName**	**Reviewed**	**Not Reviewed**	**Recommendation Provided**
4 B 1 a	Cattle dairy	x		
4 B 1 b	Cattle non-dairy	x		
4 B 2	Buffalo	x		
4 B 3	Sheep	x		
4 B 4	Goats	x		
4 B 6	Horses	x		
4 B 7	Mules and asses	x		
4 B 8	Swine	x		x
4 B 9 a	Laying hens	x		
4 B 9 b	Broilers	x		
4 B 9 c	Turkeys	x		
4 B 9 d	Other poultry	x		
4 B 13	4 B 13 Other	x		
4 D 1 a	Synthetic N-fertilizers	x		x
4 D 2 a	Farm-level agricultural operations including storage, handling and transport of agricultural products	x		
4 D 2 a	Off-farm storage, handling and transport of bulk agricultural products	x		
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)	x		
4 F	Field burning of agricultural wastes	x		x
4 G	Agriculture other(c)	x		
11 A	(11 08 Volcanoes)		x	
11 B	Forest fires		x	
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes please indicate which have and which have not in the respective columns.				

General recommendations on cross cutting issues

Transparency:

104. The ERT finds that Bulgaria's IIR lacks transparency. Only for sector 4.B some information on ammonia emission factors is provided, the agriculture sub-sectors 4.D and 4.F are not included in IIR, although sector 4.D.1 was identified as key source for NMVOC and NH_3. The ERT strongly recommends that Bulgaria increases the transparency of emission calculations by including activity data, emission factors, parameters and clear references to the methodologies used in its IIR of the next annual submission.

Completeness:

105. The ERT notes that Bulgaria improved its completeness by including NOx, NMVOC and NH_3 emissions from sector 4.F (Field burning) in the inventory.

Additionally, time series from 1990 to 2000 were estimated as recommended in the previous review report. Emissions of PM, HM, and POPs are not reported for the agriculture sector. Emission calculations within sector 4.B follow the simple methodology provided in the EMEP/Corinair Guidebook 2007. As emission factors include NH3 emissions from grazing, under 4.D.2.c an “IE” should be reported. For the following sources Bulgaria reports "NA" although methodologies are provided in the EMEP/EEA guidebook:

(a) NO_X: 4.B, 4.D.1.a

(b) SO_X: 4.F

(c) PM: 4.B, 4.D.2.a

(d) HM and POPS: 4.F

106. The ERT recommends that Bulgaria uses the correct notation keys, if existing sources are not estimated ("NE") and to improve continuously the completeness by estimating the sources mentioned above. For the sub-sectors 4.D.2.a and 4.D.2.b and all pollutants (except PM) the notation key “NA” should be reported.

Consistency including recalculation and time series:

107. Bulgaria reports time series from 1990 to 2011 for NH3, NOx, and NMVOC. Some outliers were identified in the trend of ammonia emissions.

108. Bulgaria explained that

(a) The sharp decrease in emissions from 1990 to 1991 within source category 4.B.9.d (Other Poultry) is due to political processes in the country by that time which led to the transition from planned to market based economy;

(b) The sharp decrease in 2008 (4.B.7 – Mules and asses) is a technical mistake during the data transition process which would be rectified in the next submission;

(c) The low emission value in the year 2000 in sector 4.D.1.a (Synthetic N-fertilizers) was explained by the change of data collectors from the National Statistical Institute to the “Agrostatistics” department of the Ministry of Agriculture and Food. The gap for the year 2000 is due to the differences in the methods by which the two institutions collect and process data. There is a plan to make an extrapolation for the year 2000 and to cross check it with the FAO database to resolve the issue.

109. The ERT encourages Bulgaria to explain unusual activity data trends in its next IIR and recommends that Bulgaria generates a consistent time series as announced in its answer to the ERT.

Comparability:

110. The ERT notes that activity data reported under UNFCCC and CLRTAP convention are not consistent. Bulgaria’s emission data reported to NEC and

CLRTAP show minor inconsistencies. The ERT encourages Bulgaria to improve its consistency in reporting.

111. The methodology used in the estimation of emissions from agricultural soils is not documented and results in very high NMVOC emissions compared to those of other countries. The ERT recommends that Bulgaria improves its QA/QC procedures by comparing emission factors with the default EMEP/EEA factors and those used by other countries and clearly documents methods, parameters and emission factors in the IIR of its next submission.

Accuracy and uncertainties:

112. No quantitative uncertainty analysis is available. Bulgaria describes source category specific QA/QC procedures in its IIR, but there seems to be a problem with the implementation. Additional efforts have to be made to check the plausibility of applied methodologies and emission factors, time series consistency and documentation in IIR.

Improvement:

113. The ERT commends Bulgaria for improving the completeness of its inventory in response to a recommendation of the previous review report. The ERT welcomes Bulgaria's plan to update the national methodology with the requirements of the EMEP/EEA Guidebook 2009 and encourages Bulgaria to improve consistency by coordination with the GHG reporting as noted in the IIR 2013.

Sub-Sector Specific Recommendations

114. As emissions from the sectors 4.B.1, 4.B.3, 4.B.8, 4.B.9, and 4.D.1.a are key sources, the ERT encourages Bulgaria to adopt the Tier 2 approach provided in the newest available version of the EMEP/EEA Guidebook for these sources.

Category issue 1: 4.B.8 Swine – NH_3

115. Bulgaria uses NH_3 emission factors following the simpler methodology of the EMEP/CORINAIR Guidebook 2007. In the Bulgarian IIR only the lower EF of fattening pigs (6.39kg NH_3/hd/yr) is listed in Table 6.2, the EF of sows is not presented. The default Tier 1 emission factors following the EMEP/EEA emission inventory guidebook 2009 are 15.8 kg NH_3/a for sows on slurry and 18.2kg NH_3/a for sows on solid. In a response to a question of the ERT, Bulgaria explained that NH_3 emissions were calculated following the National Common methodology for emissions inventory under UNECE/CLRTAP and UNFCCC and provided the excel file including the calculation. The fattening pig EF has been used for all swine, including sows. The ERT recommends that Bulgaria includes background information on the methodological choice, emission factors, activity data and trends in the IIR of its next annual submission.

Category issue 2: 4.D.1.a Synthetic N-fertilizers - NH_3, NMVOC

116. Bulgaria estimated emissions of NMVOC and NH_3 but there is no description on methodologies and emission factors used in IIR. In a response to a question of

the ERT, Bulgaria explained that NH_3 and NMVOC emissions were calculated following the National Common methodology for emissions inventory under UNECE/CLRTAP and UNFCCC, and provided the excel file including the calculation. Following the explanations of Bulgaria the national methodology is based on the old version of the EMEP/EEA Guidebook which not could be verified in the review. In a second reply Bulgaria explained that the National Common methodology for the emission inventory is based on CORINAIR 94. The ERT strongly recommends that Bulgaria applies refined methods and emission factors available in the newest version of the EMEP/EEA Guidebook in its next annual submission.

Category issue 3: 4.F Field burning - NOx, NMVOC, NH_3, CO

117. Bulgaria estimated emissions of NOx, NMVOC, NH_3 and CO but there is no description on methodologies and emission factors used in the IIR. In its response to a question from the ERT, Bulgaria explained that NH_3 and NMVOC emissions were calculated following the National Common methodology for emissions inventory under UNECE/CLRTAP and UNFCCC, and provided the excel file including the calculation. In a second reply Bulgaria explained that emission factors used in the National Common Methodology are taken from CORINAIR 94. The ERT strongly recommends that Bulgaria applies the methods outlined in the newest version of the EMEP/EEA Guidebook in its next annual submission.

WASTE

Review Scope:

Pollutants Reviewed		All		
Years		1990 – 2011		
NFRCode	CRF_NFRName	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		x
6 C b	Industrial waste incineration (d)	x		x
6 C c	Municipal waste incineration (d)	x		x
6 C d	Cremation	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 have and which have not in the respective columns.				

General recommendations on cross cutting issues.

118. The ERT commends Bulgaria for implementing recommendations from the previous review. The ERT considers the waste sector to be of an acceptable stage of completeness but encourages Bulgaria to increase the level of transparency.

Transparency:

119. The ERT does not consider Bulgaria's Informative Inventory Report to be transparent. The included information are very superficial and do not provide activity data, details on notation keys or explanations for dips and jumps in the time series. The ERT encourages Bulgaria to include more information in the IIR e.g. details of methods, assumptions and to include the activity data used for estimating emissions for the waste sector.

Completeness:

120. The ERT considers the waste sector to be of an acceptable stage of completeness but with room for future improvements. Emission estimates for cremation and small scale waste burning have not been submitted. The ERT encourages Bulgaria to consider using Tier 1 methods for the estimation of emissions rather than reporting them as NE in order to improve the completeness of the inventory.

Consistency, including recalculation and time series:

121. The ERT considers the waste sector to be consistent after the recalculation of the activity data for 6Ca Clinical waste incineration and 6Cb Industrial waste incineration described under "Sub-Sector Specific Recommendations" below.

Comparability:

122. The ERT considers the waste sector to be comparable with the 2009 EMEP/EEA Guidebook and other reporting countries. The ERT notes that

comparability between the reported data to the UNFCCC and the CLRTAP is still an issue; this was also noted under the previous review. The ERT recommends that Bulgaria coordinates its inventories and makes sure to report the same data to both obligations. Where data are not the same, the reasons for the differences should be detailed in the IIR.

Accuracy and uncertainties:

123. The ERT encourages Bulgaria to undertake a Tier 1 uncertainty analysis for the waste sector in order to help support the improvement process and to provide an indication of the reliability of the inventory data.

Improvement:

124. The ERT commends Bulgaria for implementing recommendations from the previous and the present review and notes Bulgaria's intention to improve the coordination with the UNFCCC reporting. The ERT encourages Bulgaria to carry out the planned improvements stated in the IIR and the other improvements identified during this review.

Sub-Sector Specific Recommendations

Category issue 1: 6A Solid Waste Disposal on Land – NH_3

125. Prior to this review, Solid Waste Disposal on Land was identified by Bulgaria as a key category for NH_3. The ERT notes that no other Parties identify this sector as a key category for NH_3 and most Parties use the notation key NA. The ERT notes that the 2009 EMEP/EEA Guidebook states that "Small quantities of NMVOCs, NOx, NH_3 and CO may be emitted, but there are no estimates available on the emission factors for these pollutants". The ERT suspected that Bulgaria was overestimating NH_3 emissions from 6.A. During the review Bulgaria replied that "Based on the ERT question, Bulgaria revised reported emissions" and will in future submissions report the NH_3 from SWDS as "NA". The ERT commends Bulgaria for this reassessment of the NH_3 emission from landfills.

Category issue 2: 6B Wastewater Handling – NMVOC and NH_3

126. The ERT commends Bulgaria for following the recommendation of the previous review to include emissions of NMVOC and NH_3 from Wastewater Handling.

Category issue 3: 6Ca Clinical waste incineration – Main pollutants

127. The ERT commends Bulgaria for following the recommendation of the previous review to include emissions of NOx, NMVOC, SO_x, TSP and CO from Clinical waste incineration.

Category issue 4: 6Ca Clinical waste incineration and 6Cb Industrial waste incineration – Activity data

128. The ERT notes a large increase in emissions from Clinical waste incineration from 2009 to 2010. During the review Bulgaria replied that "The sharp increase of emissions in 2010 and 2011 is due to activity data completeness. For the period 1990-2009, activity data for Clinical waste incineration are based only on the amount of non-hazardous clinical waste, while the activity data for 2010 and 2011 include

also the hazardous clinical waste." Based on this review Bulgaria has revised their activity data for both Clinical and Industrial waste incineration.

129. The ERT commends Bulgaria for this recalculation and the provided description of the data handling. The ERT encourages Bulgaria to include a similar description in the text of the future submissions of the Informative Inventory Report.

Category issue 5: 6Ca Clinical waste incineration and 6Cb Industrial waste incineration – Emission factors

130. The ERT notes an inconsistency between the emission factors presented in Table 8.2 in the Informative Inventory Report and the reported data in the NFR and also between Table 8.2 and the reference (2009 EMEP/EEA Guidebook). During the review, Bulgaria replied that Table 8.2 of the IIR has not been updated and therefore displays emission factors that are no longer being used, the emission data in the NFR are calculated using the Tier 1 emission factors from the EMEP/EEA Guidebook. The ERT commends Bulgaria for updating the emission factors and encourage Bulgaria ensure that the correct data are presented in the future IIRs.

Category issue 6: 6Cc Municipal waste incineration

131. The ERT notes that Bulgaria reported Municipal Waste Incineration as "not occurring". During the review Bulgaria has responded that "all municipal waste is deposited at SWDS or is recycled. There is no municipal waste incineration with energy recovery in Bulgaria". The ERT encourages Bulgaria to include this short explanation in the text of the waste chapter of the IIR.

Category issue 7: 6Cd Cremation and 6Ce Small Scale Waste Burning

132. The ERT notes that Bulgaria reports Cremation and Small Scale Waste Burning as "not estimated". During the review Bulgaria responded that "there is no available activity data for 6Cd". In addition, there is no Small scale waste burning (6Ce) in Bulgaria. The correct notation key in the former case is "NO" instead of "NE". The ERT notes that it should be possible, based on data from crematoria or based on population data and assumptions on how common cremations are in Bulgaria, to estimate emissions from human cremation. The ERT encourages Bulgaria to develop methods for estimating emissions from cremation and to include in the IIR a short justification of why Bulgaria considers Small Scale Waste Burning to be "NO".

Category issue 8: 6D Other Waste

133. The ERT encourages Bulgaria to include emissions from sources for which there are methodologies and default emission factors available in the 2009 EMEP/EEA Guidebook e.g. compost production, sludge spreading and accidental fires.

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

1. Responses to preliminary question raised prior to the review
2. Responses to questions raised during the review
3. NFR 2D1 details
4. FINAL SNAP 04.rar file