**UNITED
NATIONS**

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
CZECH REPUBLIC

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_2, NOx, NMVOC, NH_3, plus PM_{10} & $PM_{2.5}$ 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 and EU NEC Directive inventories of the Netherlands coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 22nd June 2015 to 26th 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 – Kristina Saarinen (Finland), Energy – Stephan Poupa (Austria) and Kristina Juhrich (Germany), Transport – Yvonne Pang (United Kingdom) and Jean-Marc Andre (France), Industry – Juan Luis Ortega (Spain), Solvents – Mirela Poljanac (Croatia), Agriculture – Michael Anderl (European Union) and Jim Webb (United Kingdom), Waste – Intars Cakars (Latvia).

4.   Ole-Kenneth Nielsen (Denmark) served as lead reviewer. The review was coordinated by Katarina Marečková (EMEP Centre on Emission Inventories and Projections - CEIP).

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[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 inventory is generally in line with the *EMEP EEA Inventory Guidebook* and the UNECE Reporting Guidelines. Transport emissions are calculated on the basis of fuels used/fuel sold. Emissions reported under CLRTAP and NECD are currently not consistent.

6.   The ERT noted   on account of information provided by the Party - that recalculations have been carried out consistently, however, only 2000-2013 emissions are reported in NFR14 format.

7.   The ERT commends the Czech Republic for improvements currently underway related to KCA and UCA, and also notes the need to complete the IIR and the sector specific issues according to the detailed recommendations provided in this report.

8.   Due to the chapters of a draft IIR submitted to the ERT before the review week and the Party's responsiveness the ERT were able to review the inventory in detail and provide a number of detailed recommendations.

INVENTORY SUBMISSION

9.   The Czech Republic submitted NFR tables under the UNECE CLRTAP on 15 February 2015, i.e. within the deadline of 15 February 2015 and under the EU NECD on 29 December 2014, within the deadline of 31 December 2014. NFR tables under the CLRTAP for 2000-2013 were received on 8 June. These submissions were reported in the NFR 2014 format. The Czech Republic has previously reported emissions for its Protocol base year (1990) and a full time series for one year at a time in the previous reporting formats. The transport sector emissions are based on fuels used.

10.   The ERT note that a draft version of the IIR was submitted to the ERT before the review week. The ERT appreciates the effort made by the Czech Republic to provide documentation of the methodologies used for the inventory for review purposes and recommends the Party to annually report the IIR to provide timely documentation and data analysis for each annual submission.

11.   The Czech Republic reported projections on 30 March 2015 and LPS data in 2012 and earlier gridded emissions for the Gothenburg protocol pollutants for 2005. The ERT recommend the Czech Republic to report gridded data as requested in the Reporting Guidelines in its 2017submission at the latest.

12.   The ERT notes that the inventory submitted by the Czech Republic is of good quality.

KEY CATEGORIES

13.   The Czech Republic did not include a key category analysis (KCA) in its IIR but has provided the analysis to the ERT upon request. The results of the KCA covered NOx, NMVOC, SO$_x$, NH$_3$, PM$_{2.5}$, PM$_{10}$, CO, Pb, Cd, As, Ni and B[a]P and matched the results of the KCA performed by the CEIP. The KCA presented by the Party was carried out according to the reporting guidelines for sources adding up to 80% of the national total in 2013. The Party did not include TSP, BC, Hg, Cr, Cu, Se, Zn, PCDD/F, PAH-4, HCB and PCB emissions in the KCA. The Czech Republic did not present a trend KCA. The ERT recommends that the Party includes all pollutants in the KCA, carries out both level and trend

analysis and presents the results in the relevant IIR chapter. The ERT also recommends that the results of the KCA are used to prioritize improvements in the inventory.

QUALITY

Transparency

14.   The ERT recognises the level of effort undertaken by the Czech Republic in providing an inventory with a significant level of detail, enabling the ERT to undertake a detailed review. The ERT encourages the Party to continue with the good work in the areas described below.

15.   The ERT commends the level of information already made available in the draft of the IIR, and the improvements made with regards to its transparency since the last submission.

16.   During the review the ERT presented a number of questions for further clarifications, and recommends that the Party includes the information provided in it replies to the questions in the IIR.

17.   The ERT found the sector chapters in the draft IIR to be generally transparent, however, the ERT recommends that the Czech Republic completes the IIR with additional information which would allow a thorough review of the methods used in the inventory, as listed below and explained in detail in the sector chapters:

(a)   Energy: EFs/IEFs (para 40), information on data sources and AD (paras 42-43), reasons impacting emission levels (para 45), use of notation keys (paras 46 and 48)

(b)   Transport: EFs (para 49, 50, 59), AD (para 53), explanations for trends (para 52), recalculations (56), allocation (para 64), methodology (para 65)

(c)   Industrial processes: additional data to increase transparency (paras 69-72, 81)

(d)   Solvent and product use: information on AD and improvement of documentation of methodologies (para 93, 100-106), inclusion/allocation of sources (para 99)

(e)   Agriculture: information on EF (para 115)

(f)   Waste: information on EF (para 117, 121, 129). AD and EF (para 128), additional information (paras 127, 130-132)

18.   The draft of the IIR did not include information related to Chapters 1.4-1.8, 2 and 8-10 as presented in the annotated outline of an IIR in the Annex to the Reporting Guidelines. The Czech Republic replied to most of the ERT questions related to these missing chapters. The Party indicated to be in the process of preparing all IIR chapters according to the outline defined in the Reporting Guidelines. The ERT welcomes this work and recommends that the Party completes information in the IIR for the missing chapters:

(a)   Chapter 1.4: include a general description of methodologies and data sources used and an overview of what is used in the national inventory in terms of

country specific or default (i.e. EMEP/EEA Guidebook) emission factors, and highlight which version of the Guidebook is used for default emission factors and methods.

(b)   Chapter 1.5: include explanation of methods used to determine key categories and complete the KCA as recommended under paragraph 18.

(c)   Chapter 1.6: include information on QA/QC and verification methods that are carried out for the inventory on the basis of the reply provided to the ERT during the review. However, the ERT noted that regarding the transport sector, QA/QC procedures have been clearly described.

(d)   Chapter 1.7: include information on the preparation and results of the completed uncertainty analysis.

(e)   Chapter 1.8: include information on the use of notation keys (NE, NA, IE, NO); In the the previous Stage 3 review report it was also recommended that the Czech Republic provides this information.

(f)   Chapter 2: include information on possible time series inconsistencies, dips, jumps or more permanent trends to enable a better understanding of the reasons affecting the emission trends. Information provided by the Czech Republic via the link to a CHMI website provides a good starting point for such information.

(g)   Chapter 8: include description of recalculations performed with justifications and their impact on emissions on the basis of the response to the reply to the ERT's related question, taking also into account what is requested in the Annex to the Reporting Guidelines. Including information in the IIR on recalculations was also recommended by the previous ERT review report

(h)   Chapter 8: include an improvement plan with information on how improvements are identified and prioritized.

(i)   Chapter 9: include information on projections

(j)   Chapter 10: include information on gridded data and LPS.

Completeness

19.   The ERT acknowledges the effort to which the Czech Republic has gone to provide estimates of emissions for all sub-sectors and all pollutants reviewed.

20.   The ERT concludes that the Party's inventory for the pollutants reviewed is generally complete in terms of sources, pollutants and geographical coverage.   The time series of emissions is not complete, emissions are mostly estimated from 2000 onwards, only. The ERT recommends that the Czech Republic reports emissions in its Protocol base years and the time series for all pollutants for at least from 1990 onwards in NFR 2014 format.

21.   The ERT has identified some issues of

(a)   underestimates: possibility of underestimates to be checked in the energy (para 43) and transport (para 57) sectors, possible overestimation in the transport sector (paras 59- 60), and

(b)   missing sources in the energy sector (1B2b NMVOC, para 47), transport (road transport PCDD/F, PCB, heavy duty vehicles Pb, heavy metals from tyre and brake wear, para 54), IP (ammonia production, para 82), solvent and product use (road paving with asphalt, other solvent and other product uses (para 92), fluorescent tubes (para 101), fireworks, tobacco, shoes, other (para 106), wastewater handling (para 119), domestic composting (para 127), domestic and industrial wastewater treatment (paras 134 and 135).

Consistency, including recalculations and time-series

22.   A comparison carried out by CEIP between the NOx, SOx, NMVOC and CO emissions data submitted under the different conventions showed differences between the data submissions for CLRTAP and the UNFCCC in 2000-2013, between the CLRTAP and NECD for 2012-13 and between NECD and UNFCCC in 2012. When asked about the reasons for these differences by the ERT, the Czech Republic explained that these were due to the different data collection systems used for the different reporting obligations and stated that these differences would be solved by using the same data for all reports.

23.   In its reply to the ERT the Czech Republic provided information on the recalculations carried out: in 1A4bi due to an update of national EFs (2000-2013) resulting in an increase in VOC, CO, PAH and $PM_{2.5}$ emissions; in 1A3 due to new knowledge about the car fleet and an update of EFs (2000-2013) resulting in a decrease of all emissions; in 3B due to an update of EFs (1990-2013) resulting in an increase in particle emissions; and, in addition, new sources added to 1B1a, 5A, 2A5b, 2C2, 2C3, 2C4, 2C5, 2C7a, 2C7c, 2D3c, 3Da1, 3Dc and 5E. The ERT finds the recalculations justified and consistent and recommends that the Party documents these in the IIR in the respective sector chapters, and also in Chapter 8 as recommended in para 18 above, with information on the recalculations' impacts on the emission levels.

24.   The ERT has noted that the Czech Republic used the currently prevailing reporting formats in the years from 1990 and resubmitted emissions data for 2000-2013 in the NFR 2014 format in June 2014. The ERT recommends that the Czech Republic reports a consistent time series in the 2014 reporting format in future submissions.

25.   The ERT also identified some minor inconsistencies with the allocation of sources in the time series (e.g. paras 83-84) and in the use of notation keys (para 89) and recommends that the Party corrects these allocations.

Comparability

26.   The ERT found the inventory of the Czech Republic to be generally comparable with those of other reporting parties. The allocation of source categories follows that of the EMEP/UNECE Reporting Guidelines, with few exceptions (e.g. paras 75-76)

27.   The ERT has noted that the Czech Republic uses older Guidebook methods for some key sources (aviation, railways, navigation, off-road vehicles and other machinery and other mobile sources) and cremation, and recommends that the Party updates the estimates according to the latest version of the Guidebook.

28.   The ERT also found that country-specific emission factor values sometimes significantly differ from the default values in the Guidebook (solid waste disposal on land, municipal waste incineration). The ERT recommends that the Party provides more detailed information on the country specific methodologies to increase the comparability of methods used.

CLRTAP/NECD comparability

29.   The comparison carried out by CEIP between the NOx, SOx, NMVOC and CO emissions data showed differences between the submissions under the CLRTAP and NECD for 2012-13. The differences mostly relate to the energy sector. The Czech Republic explained that these differences were due to the different data collection systems used for the different reporting obligations and replied that these differences would be solved by using the same data in all reports.

Accuracy and uncertainties

30.   The ERT recommends that the Czech Republic corrects some errors identified by the ERT in the emission estimates (paras 83-85) and in the IIR (122).

31.   Due to the question raised by the ERT regarding the lack of an uncertainty assessment, the Czech Republic submitted information on the status and preliminary results of the on-going uncertainty analysis, and the Party stated that it would provide the completed information in the next IIR. According to the preliminary results, the uncertainty of point source data is estimated at 5%, for modelled area source data at 25-30% and for emissions estimated using statistical data and Guidebook default values at 50-200% (solvents, agriculture, transport). The ERT recommends that the Czech Republic completes the work and reports the results in its next submission, using the results of the analysis to prioritize improvements in the inventory.

Verification and quality assurance/quality control approaches

32.   The Czech Republic has not provided any information on the general QA/QC and verification processes carried out for the inventory in its draft IIR. When asked about this by the ERT the Party replied that automated data checks as well as tests and checks by the Czech Hydrometeorological Institute CHMI and regional environmental offices had been carried out during data collection. The ERT recommends that the Czech Republic includes more detailed information on its QA/QC work in the IIR and completes the description of QA/QC for data collection with information on QA/QC procedures carried out during the preparation and reporting of the inventory.

33.   The ERT notes that the Czech Republic uses data reported by the plants in the inventory and recommends that the Party checks and validates the data before including it into the inventory, and documents the QA/QC procedures in the IIR.

34.   The ERT commends the Czech Republic for the QA/QC activities already carried out and encourages the Party to provide information on sector specific QA/QC procedures in its IIR.

FOLLOW-UP TO PREVIOUS REVIEWS

35.   The ERT commends the Czech Republic for the ongoing work in response to the previous review report with regard to preparing the KCA, UCA and IIR and recommends to report these in the next submission.

36.   The Czech Republic did not respond to the questions identified in the Stage1 and 2 reviews on the CEIP website. The ERT notes the following status with regard to the previous review recommendations from 2011:

−   Reporting a full time series: the Czech Republic has provided a full time series since 2000 in NFR 2014 format under CLRTAP. The time series 1990-1999 has been reported earlier in the currently prevailing format, one year at a time. The ERT recommends that CZ reports a full time series in the 2014 format.

−   The ERT repeats the recommendations of the previous ERT, namely to provide a complete IIR according to the annotated outline of the IIR presented in the Annex to the Reporting Guidelines; to provide complete and detailed information on recalculations and the use of notation keys, to provide an improvement plan, information on trends and their drivers, in the IIR.

−   The ERT recommends that the Party submits projected emissions for the 'With measures' and 'With additional measures' scenarios together with the associated social economic data for the years 2020 to 2050, if possible.

−   The ERT has noted that the Czech Republic has improved the transparency of the inventory, especially in the transport and industrial processes sectors.

AREAS FOR IMPROVEMENTS IDENTIFIED BY THE PARTY

37.   The draft IIR submitted by the Czech Republic to the ERT the week before the review week did not include information on planned improvements, other than those identified in the transport sector (para 55) related to the measurement of country-specific emission factors for the main categories of road transportation.

38.   To the question raised by the ERT on the issue the Czech Republic provided information on planned improvements in the following areas:

(a)   updating of data reported for the years 1990-1999,

(b)   harmonization of fuel consumption data from REZZO with energy balance,

(c)   emission of black carbon will be included in the inventory,

(d)   and emissions of HM in sector 1A3bvi will be included in the inventory.

39.   The ERT commends the Party for identifying improvement areas and repeats the recommendation made by the previous ERT to include this information in the IIR.

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS-CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

40.   The ERT recommends that the Czech Republic:

(a)   prepares the IIR according to the annotated outline of the Reporting Guidelines , updates and reports it annually in order to provide timely documentation and data analysis for each annual submission

(b)   completes the documentation of the inventory in the IIR according to the recommendations for the sector chapters presented in paragraph 17, i.e. consistent time series since 1990 in NFR 2014 format

(c)   includes information on QA/QC, verification procedures and planned improvements in the IIR

(d)   includes KC and UC analyses for all pollutants in the IIR and uses the results of these analyses to prioritize improvements

(e)   improves the use and explanations of notation keys

(f)   completes the inventory by (a) including currently missing emissions, (b) making a plan to investigate the sources currently reported as NE: estimates emissions or the significance of the emission levels with regard to the total emissions, and by completing the time series for the years 1990-1999

(g)   includes information on recalculations, their justifications and impacts on emission levels

(h)   solves differences in the energy, chemical industry and metallurgy of ferrous metals sectors and the national energy balance, provides the results of the discussion in the IIR, and checks the fuel classification (para 34)

(i)   explains the share of CO and NMVOC by including a graph and a short explanation in the IIR (para 36)

(j)   checks and validates data reported by the plants and used in the inventory (para 78-80)

SECTOR SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

ENERGY

Review Scope

Pollutants Reviewed	All		
Years	1990 – 2013		
NFR Code	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
1A1a	Public electricity and heat production	X		X
1A1b	Petroleum refining	X		X
1A1c	Manufacture of solid fuels and other energy industries	X		
1A2a	Iron and steel	X		
1A2b	Non-ferrous metals	X		
1A2c	Chemicals	X		
1A2d	Pulp, Paper and Print	X		
1A2e	Food processing, beverages and tobacco	X		
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	X		
1A2gviii	Stationary combustion in manufacturing industries and construction: Other (please specify in the IIR)	X		
1A3ei	Pipeline transport	X		
1A3eii	Other (please specify in the IIR)		X	
1A4ai	Commercial/institutional: Stationary	X		
1A4bi	Residential: Stationary	X		
1A4ci	Agriculture/Forestry/Fishing: Stationary	X		
1A5a	Other stationary (including military)	X		X
1B1a	Fugitive emission from solid fuels: Coal mining and handling	X		
1B1b	Fugitive emission from solid fuels: Solid fuel transformation	X		
1B1c	Other fugitive emissions from solid fuels	X		
1B2ai	Fugitive emissions oil: Exploration, production, transport	X		
1B2aiv	Fugitive emissions oil: Refining / storage	X		
1B2av	Distribution of oil products	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)	X		
1B2d	Other fugitive emissions from energy production	X		X

General recommendations on cross-cutting issues.

Transparency:

41. Compared to the last version, the Czech IIR has been remarkably improved. Methodological descriptions are available as well as emission factors, even for heavy metals and POPs. However, emission factors or implied emission factors for the main pollutants are still missing. During the review the Party has provided a comprehensive description of the quality checks which were undertaken. The ERT recommends to include this information in the IIR.

Completeness:

42. The stationary combustion inventory is considered to be complete regarding the coverage of the sectors. Only in a few cases of emissions of minor importance the notation key NE has been used.

43. During the review the ERT checked the IEFs in the refinery sector, which seemed to be low. The Party explained that activity data reported for the period 2000–2013 were taken from the national energy balance, but that for the calculation of HM and POPs emissions, however, fuel consumptions according to the REZZO database were used. Values of emission factors derived from reported data can therefore come out lower. The ERT recommends reporting the activity data, which were used for the calculation in the NFR tables in order to improve consistency. Furthermore, the ERT recommends providing the information on the data source of the activity data which were used for emission reporting in the IIR. The description of the REZZO model in the IIR only contains information on emission data provided by the operators.

44. The Party also explained that the national energy balance does not comprise gases from the distillation of crude oil under emissions from the use of liquid fuels. Furthermore, there are differences in the mapping of technology related to the solid fuels transformation and using coal gas and metallurgy gases. These differences are reflected in the energy sector, the chemical industry and metallurgy of ferrous metals. In the sector domestic heating the Party uses its own methodology for estimating fuel consumption, because it is considered to be more suitable for emission inventorying. The ERT is aware that there are always differences between the monitoring reports of the operators and the national energy balance. But in the case of a deviation from the national energy balance further quality checks are necessary to ensure the completeness of the inventory. Actually, activity data should not be lower than energy balance data. The ERT recommends discussing these problems with the statistical office and the body which is responsible for the national energy balance and providing the results of the discussion in the IIR. Furthermore, the ERT recommends that the Czech Republic checks the fuel classification. For example refinery gas is often considered as gaseous fuel but emission factors are very different from natural gas. The low implied emission factors in the refinery sector could be an indication of a potential underestimate.

1.A.1.a Public electricity and heat production – All Pollutants

45.   During the review the Party provided emission factors for the main fuels in source category 1.A.1.a. All emission factors are in a plausible range. The SO_2 emission factor of natural gas seems to be high compared with the default value. The ERT recommends that the Czech Republic publishes emission factors or implied emission factors for the main fuels and the main pollutants in the IIR including a short description of the fuel categories.

1.A.4.b.i Residential: Stationary – NMVOC and CO

46.   During the review the ERT has raised the question of why the share of CO and NMVOC in source category 1.A.4.bi is very high compared to other countries. The Party explained that the reason is the high brown coal consumption. The ERT encourages the country to provide a graph, which shows the fuel specific development of NMVOC and CO emissions of the residential sector, including a short explanation in the IIR.

1.A.5.a Other stationary (including military)

47.   Source category 1.A.5.a is reported as NE. During the review the Party explained that emissions are included in source category 1.A.4.ai. The ERT recommends changing notation keys and using IE instead of NE. An appropriate explanation of the allocation method should be provided in the IIR.

1.B.2.b Fugitive emissions from natural gas – NMVOC

48.   Regarding fugitive emissions the Czech inventory is nearly complete. Only NMVOC from source category 1.B.2.b is missing. The ERT recommends calculating these emissions and reporting them in the next submission.

1.B.2.d Other fugitive emissions from energy production

49.   In source category 1.B.2.d the Party uses the notation key NE. However, there are no relevant emissions, which can be expected in this source category. The majority of the countries use the notation key NA or NO. The ERT recommends changing the notation key to NO.

TRANSPORT

Review Scope

NFR Code	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed	All			
Years	1990 – 2013			
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	
1A3aii(i)	Domestic aviation LTO (civil)	X		X
1A3aii(ii)	Domestic aviation cruise (civil)		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		X
1A4bii	Residential: Household and gardening (mobile)	X		X
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	X		X
1A4ciii	Agriculture/Forestry/Fishing: National fishing	X		
1A5b	Other, Mobile (including military, land based and recreational boats)	X		X
1A3di(i)	International maritime navigation		X	
1A3	Transport (fuel used)		X	

General recommendations on cross-cutting issues.

Transparency:

50.   The Czech Republic has provided a detailed and generally transparent emission inventory. The ERT commends the Party for providing emission factors and activity data tables in the IIR. However, the source of road transport (1A3b) EFs was not clearly stated in the IIR. The Party has provided clarification during the review and the ERT encourages the Party to include this information in future IIRs.

51.   Similarly, the ERT has asked the Party to clarify the source of Tier 1 EFs used for other mobile sources since they do not correspond to the values in the 2013 EMEP/EEA Emission Inventory Guidebook. The Party clarified that an older version of the Guidebook was used. The ERT recommends that the Party clearly states the version of the Guidebook used in future IIRs for transparency purposes.

52.   The ERT commends the Party for implementing recommendations from the previous Stage 3 review, for example using appropriate notation keys (instead of reporting zero values for some categories as identified by previous ERT) in the NFR reporting tables.

53.   During the review, the Party provided explanations on the trend of PM emissions for 1A3bi in response to a question raised by the ERT. The ERT encourages the Party to include sector-specific explanations of trends in future IIRs.

54.   The ERT has noted that activity data were not provided for 1A2gvii, 1A4aii, 1A4bii, 1A4cii and 1A5b in the IIR. The Party has acknowledged the gaps during the review and intends to address this in future IIRs.

Completeness:

55.   The ERT considers the transport inventory of the Czech Republic nearly complete. However, the ERT notes that emissions have not been estimated for the following sources and pollutants:

(a)   PCDD/F and PCB emissions from 1A3b (Road transport);

(b)   Pb emissions from 1A3biii (Heavy duty vehicles and buses);

(c)   Heavy metal emissions from 1A3bvi (Tyre and brake wear).

56.   There are emission factors available from the 2013 EMEP/EEA Emission Inventory Guidebook. During the review, the Party indicated the intention to provide emission estimates for these pollutants in the next submission. The ERT recommends that the Czech Republic carries out this improvement.

Consistency including recalculation and time series:

57.   The Party has not provided explanations for the recalculations of emission estimates for mobile sources in the IIR. The ERT recommends that the Party includes this information in future IIRs.

58.   The ERT has identified an underestimate of PM_{10} and $PM_{2.5}$ emissions for 1A4cii (Agriculture/Forestry/Fishing: Off-road vehicles and other machinery) in 2000, as the $TSP/PM_{10}/PM_{2.5}$ ratio is not consistent with the remaining time series. The ERT recommends that the Party investigates this issue and makes the appropriate corrections with the next submission.

Comparability:

59.   The methods used by the Party to estimate emissions of pollutants from mobile sources are consistent with those proposed in the Guidebook.

60.   The ERT notes that the country-specific emission factors for the main pollutants and particulate matter used by the Party to estimate road transport emissions only go up to Euro 3/III and then remain constant; in contrast, the emission factors provided in the Guidebook do vary for these pollutants from Euro 3/III upwards. Therefore, the ERT recommends that the Party to reviews the country-specific emissions factors against those from the Guidebook.

61.   The ERT has noted that the Party has the highest NO_x implied emission factors (IEFs) for 1A4cii (Agriculture/Forestry/Fishing: Off-road vehicles and other machinery) when compared to other reporting countries. During the review, the Party responded that they intend to investigate this issue further, and indicated that the reason for this could be the use of emission factors from an older version of the Guidebook (2006 EMEP/CORINAIR Emission Inventory Guidebook). The ERT recommends that the Czech Republic reports on the results of the investigation in the next submission.

Accuracy and uncertainties:

62.   In the IIR, there is no mention of any uncertainty analysis performed by the Party for the mobile sources, although it is stated that there was no recent and accurate information available for assessing the uncertainties of the emissions from the agricultural off-road mobile machinery sector. The ERT encourages the Party to undertake an uncertainty analysis for the transport sector in order to enhance the improvement process and to provide an indication of the reliability of the inventory data.

63.   The ERT commends the Party for clearly describing the QA/QC procedures for the mobile sources.

Improvement:

64.   The ERT takes note of the Party's planned improvements, as stated in the IIR, to measure country-specific emission factors of other main categories of road transportation. The Party also plans to implement improved emission factors for newer tractors for the agricultural and forestry non-road mobile sources. The ERT encourages the Party to carry out these improvement plans.

Sub-Sector Specific Recommendations.

1.A.3.b.i-ii Road transport passenger cars and light duty vehicles – All Pollutants

65.   Emissions from 1A3bii (light duty vehicles) are currently included in 1A3bi (passenger cars) due to the design of the emission model used by the Party. As recommended in the previous Stage 3 review, the ERT encourages the Party to split these emissions into passenger cars and light duty vehicles, as described in the Guidebook.

1.A.3.b.v Road transport: Gasoline evaporation – NMVOCs

66.   The ERT commends the Party for improving its emission estimates from gasoline evaporation by using the COPERT model. However, the IIR does not say which version of the COPERT model was used. The ERT encourages the Party to include more information on the methodology and sources of input data used in future IIRs.

1.A.4.c.ii Agriculture/Forestry/Fishing: Off-road vehicles and other machinery – All Pollutants

67.   The Party currently uses the Tier 2 methodology from the 2006 EMEP/CORINAIR Emission Inventory Guidebook to estimate emissions of pollutants from 1A4cii, which is a key source for NO_x, PM and Cu in 2013. The ERT recommends that the Party prioritises its efforts to implement the most up-to-date emission factors from the Guidebook in future submissions.

Other mobile sources – All Pollutants

68.   The Czech Republic uses Tier 1 emission factors from an older version (not specified) of the Guidebook to estimate emissions from aviation, railway, navigation, and non-agriculture off road mobile sources. The ERT recommends that the Party uses the latest EMEP/EEA Emission Inventory Guidebook to estimate emissions from these sources.

INDUSTRIAL PROCESSES

Review Scope

Pollutants Reviewed		All		
Years		1990 – 2013		
NFR Code	CRF_NFRName	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		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		X
2B1	Ammonia production	X		X
2B2	Nitric acid production	X		X
2B3	Adipic acid production	X		
2B5	Carbide production	X		
2B6	Titanium dioxide production	X		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		X
2C2	Ferroalloys production	X		X
2C3	Aluminium production	X		
2C4	Magnesium production	X		
2C5	Lead production	X		X
2C6	Zinc production	X		
2C7a	Copper production	X		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		X
2H2	Food and beverages industry	X		X
2H3	Other industrial processes (please specify in the IIR)	X		
2I	Wood processing	X		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:

69.   The previous Stage 3 report describes a finding related to a lack of activity data and methodological descriptions in the submission of the Czech Republic, which was in part explained by the Tier 3 approach followed by the country. Following the recommendations made by the previous ERT, the Czech Republic has worked to improve the transparency of the inventory. The Czech Republic has extended the number of variables monitored by the Register of Emissions and Air Pollution Sources (REZZO) database, which furnishes more activity data for the inventory, and the ERT commends the Czech Republic for this improvement.

70.   Despite the improvements made, the Czech Republic's inventory is not fully transparent, and the activity data of several categories are missing, either because they are not being collected by the REZZO database or because the inventory team does not gather them (see sub-sector specific recommendations below).

71.   The Czech Republic explained to the ERT that they have problems to encompass the emissions of certain categories within the design of the REZZO database, as this database is a registry of measurements. Therefore, emissions which are not easily measured (such as emissions from consumption of products, or emissions related to production activities) and the activity data, which are not well defined (square meters, volume, etc.), are not covered, neither by the REZZO database nor the inventory.

72.   Additionally, the Czech Republic cannot explain the fluctuation in all emissions, as for certain categories (see below) they have neither activity data nor proxy information to explain the evolution of the emissions.

73.   The ERT commends the effort made by the Czech Republic to apply such advanced Tier 3 methodology, but recommends that the Czech Republic combines the advanced tier that they have already in place (based on measurements) with other methodologies (estimates from the inventory team based on the Guidebook) that could enable the inventory to be complete, accurate and transparent.

Completeness:

74.   The ERT considers the industrial processes sector to be complete, apart from the already mentioned problem related to the lack of activity data (see transparency above).

75.   The ERT has noted that the Czech Republic has used appropriate notation keys in the NFR tables for the source categories of the industrial processes sector and commends the country for this. To avoid underestimates, the ERT recommends that Czech Republic includes plans to address missing emissions (NE) in its IIR, either by obtaining data allowing an emission estimate to be made, or by ascertaining the emissions to be not applicable (NA).

76.   The ERT found that most of the time series start in the year 2000. The Czech Republic explained that the country has a plan to estimate the emissions for the years 1990-1999. The ERT commends the Czech Republic for this plan and recommends that the country finalises it.

Consistency including recalculation and time series:

77. The IIR did not provide information on source specific recalculations. The ERT recommends that the inventory team of the Czech Republic verifies the trends of the measurements provided by REZZO, and also compares these emissions with other estimates (using default emission factors), socio-economic variables (components of the GDP), etc. The ERT also recommends that the Czech Republic provides detailed information on the recalculations made at NFR category level.

Comparability:

78. The previous Stage 3 report describes a problem of comparability of emissions due to the fact that the Czech Republic cannot differentiate combustion emissions from process emissions, since the flue gases are emitted via the same stack. Again, this is a problem related to the nature of the emissions and the design of the REZZO database. Despite this issue, the Czech Republic has provided in the IIR a guide which allows an understanding of where emissions are allocated. The ERT commends the Czech Republic for this. The ERT considers that, in this context, the Czech Republic should report IE for the sources, where the emissions are not allocated.

79. The previous Stage 3 report also raises the issue of a lack of comparability between UNFCCC and CLRTAP submissions. The Czech Republic explained to the ERT that in the report to be presented to the UNFCCC, data on emissions reported to the CLRTAP will be used. In certain categories of industry, activity data were unified. Reporting to the CLRTAP moreover involves data about certain production facilities that are monitored by the REZZO system, but not by national statistics. This includes, for example, the production of lead, magnesium, ferroalloys or asphalt mixes. The Party is also working on the unification of data on fuel consumptions. The ERT commends the Czech Republic for solving this issue and for all the effort made.

Accuracy and uncertainties:

80. Except for the sub-sector specific recommendations provided below, the ERT did not identify any over- or underestimates. The Czech Republic did not report source-specific uncertainty estimates. The ERT recommends that the Czech Republic carries out an uncertainty analysis for the industrial processes sector.

Improvement:

81. No information on source category specific improvement plans were reported in the IIR.

Sub-sector Specific Recommendations.

2.A.5.a quarrying and mining, 2.B.1 ammonia production, 2.B.2 nitric acid production, 2.I wood processing, 2.H.1 pulp and paper, 2.H.2 food and beverages, 2.B.6 titanium dioxide production – All Pollutants

82. The ERT noted that the activity data for these categories were not provided. The Czech Republic gave two reasons for this; firstly that there are categories for which the activity data were available but not used for estimating the emissions (ammonia, nitric acid, etc) and secondly that the REZZO database does not cover the AD for the categories which "depend on the amount of product manufactured" (see transparency above). The ERT

commends the Czech Republic for the clear answer given and encourages the country to report the activity data that are available, and also to gather activity data (or highly correlated proxies: for instance, for the emissions from galvanization processes both the product's surface & weight are good proxies) for the second case mentioned above.

2.B.1 Ammonia production – All Pollutants

83.   The ERT found that the Czech Republic has ammonia production data at its disposal, but does not report emissions for this category. The ERT recommends that the Czech Republic estimates and reports emissions for the next submission.

2.B.2 Nitric acid production – NH_3, CO

84.   The ERT found that the implied emission factor (even though the Party does not report the AD in the NFR tables, there is a graph in the IIR, which has enabled the ERT to approximate the IEF) sharply drops in 2010. The ERT also found a gap in the time series in the year 2001. The Czech Republic explained that this was due to an error in the mapping of sources between sectors 1.A.2.c and 2.B.2, which would be corrected in the next submission. The ERT recommends that the Czech Republic corrects these errors in the next submission.

2.B.6 – Titanium dioxide production – CO, SO_x

85.   The ERT found that there was a gap in the time series in 2008 of the emissions of CO and SO_x. The Czech Republic explained that this was due to an error in the mapping of sources between sectors 1.A.2.c and 2.B.2, which would be corrected in the next submission. The ERT recommends that the Czech Republic corrects these errors in the next submission.

2.C.1 – Iron and steel production – CO

86.   The ERT has noted that the trend of CO for this category showed different tendencies during the years 2005 – 2013. The Party explained that there was an error in the calculation of the emissions, which would be corrected for the next submission. The ERT encourages the Czech Republic to correct this error in the next submission.

2.C.2 – Ferroalloys production – PCDD/F

87.   The ERT found that the implied emission factor for years 2001 to 2008 was stable, but not constant. Nevertheless, since the year 2009 the IEF was the same value for all years, which indicated to the ERT that these emissions were calculated, not measured. The Czech Republic explained that PCDD/F emissions are ascertained by the source operators themselves, who carry out authorized measurements and, hence, emission factors were not used. The ERT recommends that the Czech Republic inventory team checks and validates the data, even though it comes from source operators. This will enable the Czech Republic to explain all emissions trends , and, thus, improve the consistency of the inventory.

2.C.5 – Lead production – As

88.   The ERT found that the implied emission factor for As increased from 0.1 g/t in 2012 to 5.5 g/t in 2013. The Czech Republic explained that As emissions are ascertained by the source operators themselves, who carry out authorized measurements. Although this variation could be explained by the scrap quality, the ERT recommends that the Czech Republic's inventory team checks and validates the data, even though it comes from source

operators. This will enable the Czech Republic to explain all emissions trends of the, and, thus, improve the consistency of the inventory.

2.C.7.a – Copper production – Zn

89.   The ERT found that an outlier in 2007. The Czech Republic explained that Zn emissions are ascertained by the source operators themselves, who carry out authorized measurements. Even though this variation could be explained by the scrap quality, the ERT recommends that the the Czech Republic's inventory team checks and validates the data, even though it comes from source operators. This will enable the Czech Republic to explain all emissions trends, and, thus, improve the consistency of the inventory.

SOLVENTS

Review Scope

NFR Code	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed	All			
Years	1990 – 2013			
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

General recommendations on cross cutting issues

Transparency:

90.   During the review week the ERT has noted that the use of notation keys (IE, NE) for emissions are not always consistent between the NFR tables and the IIR. The ERT recommends that the Czech Republic includes information in the IIR explaining why emissions are reported as IE or NE, and, if reported as IE, that the Czech Republic specifies the category under which they are reported.

91.   The Czech Republic has provided a detailed and generally transparent emission inventory for most of the source categories within the scope of the solvent sector for the period 2000 - 2013. Estimates are provided at a detailed level for all solvent sectors. The ERT considers the Czech Republic's methodology, references of data sources as well as assumptions and emission factors to be transparent and well described in the IIR. Still, the ERT encourages the Czech Republic to include the reasons for dips and jumps in the pollutant emission trend in the IIR, in order to facilitate transparency.

92.   The ERT notes that the emission factors used for some source categories are country-specific and that they were properly included and referenced in the IIR, and commend the Czech Republic for that.

Completeness:

93.   The ERT considers the solvent sector to be mostly complete and comprehensive with good levels of detail in the methodology descriptions. The ERT also considers that all key categories where NMVOC emissions occur are covered by the Czech Republic's inventory; still there is room for improvement regarding the future completeness of the solvent sector such as:

(a)   NFR 2.D.3.a Domestic solvent use including fungicides by providing more detailed information in the IIR;

(b)   NFR 2.D.3.b Road paving with asphalt by calculating emissions;

(c)   NFR 2.D.3.g Chemical products by providing details for SNAP code 060400 Other solvent use, 060412 Other;

(d)   NFR 2.D.3.i Other solvent use by providing information on methodological issues and including missing activities;

(e)   NFR 2G Other product use by calculating emissions.

94.   The ERT notes that in the submitted NFR tables 2000 – 2013 there are no activity data for the solvent sector, although in the IIR (draft version) Chapter Solvent use there is some information on activity data used by each source category in the scope of 2.D. The ERT recommend the Czech Republic to complete NFR tables with activity data for the solvent sector for the next submission.

Consistency including recalculation and time series:

95.   The Czech Republic hasn't performed recalculations for the solvent sector in the latest submission, and the IIR does not include any information on recalculations. The ERT encourages the Czech Republic to always provide information on whether recalculations are performed or not for all source categories. The ERT recommends that - if recalculations are performed - detailed explanations for the recalculations are provided in the IIR, including the rationale, the impact on the sector and implications for trends for the solvent sector.

Comparability:

96.   The ERT considers that the methods used are consistent with the EMEP/EEA Emission Inventory Guidebook. For a few source categories country-specific factors are used. Country-specific methods are described to an appropriate level of detail. The ERT commends the Czech Republic for the inventory's good comparability.

Accuracy and uncertainties:

97.   The ERT encourages the Czech Republic to undertake an uncertainty analysis for the solvent sector in order to support the improvement process and to provide an indication of the reliability of the inventory data. During the review the Czech Republic indicated that they would include an uncertainty analysis in their next IIR.

98.   The Czech Republic has implemented basic QA/QC checks for the solvent sector. The ERT encourages the Party to implement sector-specific QA/QC procedures. During the review the Czech Republic indicated that they would include sector-specific QA/QC procedures for the solvent sector in their next IIR.

Improvement:

99.   The ERT noted that the Czech Republic does not have a plan for the improvement of the solvent sector. However, the ERT encourages the Czech Republic to review the completeness of the solvent sector in order to improve it.

Sub-sector Specific Recommendations.

2.D.3.b Road paving with asphalt – All pollutants

100.   During the review week the ERT noted that the Czech Republic has used the notation key "NE" for a few years in the NFR tables and also "IE" for other years. In the Czech IIR draft version 2015 there is information (pg. 39 of IIR) that emissions from gaseous and liquid fuels that are used for heating and drying of bituminous mixtures are reported under sector NFR 1.A.2.f. The ERT noted that it is not clear, whether emissions from 2.D.3.b Road paving with asphalt are included elsewhere or have not been estimated. The ERT recommends that the Czech Republic when using notation keys "IE" and "NE" clearly indicates the reasons and allocation in the IIR and in NFR tables to improve the transparency of the inventory. Furthermore, the ERT encourages the Czech Republic to complete the NFR tables with the missing activity data for the source category 2.D.3.b.

2.D.3.a Domestic solvent use including fungicides – NMVOC, Hg

101.   The ERT noted that in the IIR, the source category 2.D.3.a needs to be described in more detail, such as activities included and emission factors used. During the review week the Czech Republic provided the ERT with detailed information for this category. The ERT commends the Czech Republic for that, and encourages the Czech Republic to include the new information in the next IIR.

102.   During the review week the ERT noted that this source category is almost complete. In order to complete this source category the ERT recommends that the Czech Republic calculates Hg emissions from use of fluorescent tubes using the Tier 1 or Tier 2 methodology according to the Guidebook. The ERT also recommends that the Czech Republic calculates NMVOC emissions from pesticide use, because it seems that these emissions are currently not included in the Czech inventory. The ERT recommends that the Czech Republic provides information in the next IIR on tiers used for emission calculations to improve transparency. Furthermore, the ERT encourages the Czech Republic to complete the NFR tables with the missing activity data for the source category 2.D.3.a.

2.D.3.c Asphalt roofing – All pollutants

103.   During the review the ERT noted a few dips and jumps in pollutants emission trends (2000 – 2013) for 2.D.3.c. The ERT recommends that the Czech Republic explains and includes reasons for dips and jumps in emission trends in the IIR. The ERT encourages the Czech Republic to complete the NFR tables with the missing activity data for the source category 2.D.3.c.

2.D.3.d Coating applications – NMVOC

104.   The information on activity data and EF used for NMVOC emission calculations for source category 2.D.3.d Coating applications is transparent and complete. The ERT commends the Czech Republic for following up on previous review recommendations. However, the ERT encourages the Czech Republic to complete the NFR tables with the missing activity data.

2.D.3.e Degreasing, 2.D.3.f Dry cleaning, 2.D.3.g Chemical products & 2.D.3.h Printing – NMVOC

105.   The ERT encourages the Czech Republic to complete the NFR tables and IIR with the missing trends of activity data for source categories 2.D.3.e, 2.D.3.f, 2.D.3.g and 2.D.3.h.

2.D.3.i, 2.G Other solvent and product use – All pollutants

106.   The ERT encourages the Czech Republic to complete the NFR tables and IIR with the missing trends of activity data for the source category 2.D.3.i.

107.   The ERT recommends that the Czech Republic completes the inventory with emission estimates for missing activities in the scope of 2.D.3.i, 2.G such as: Use of fireworks, Use of tobacco, Use of shoes and Other use (concrete additive, cooling lubricant, lubricant etc.).

AGRICULTURE

Review Scope:

NFR Code	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed		SO$_2$, NOx, NMVOC, NH$_3$, PM$_{10}$ & PM$_{2.5}$		
Years		1990 – 2013		
3B1a	Dairy cattle	X		
3B1b	Non-dairy cattle	X		
3B2	Sheep	X		
3B3	Swine	X		
3B4a	Buffalo	X		
3B4d	Goats	X		
3B4e	Horses	X		
3B4f	Mules and asses	X		
3B4gi	Laying hens	X		
3B4gii	Broilers	X		
3B4giii	Turkeys	X		
3B4giv	Other poultry	X		
3B4h	Other animals (please specify in IIR)	X		
3Da1	Inorganic N-fertilizers (includes also urea application)	X		
3Da2a	Animal manure applied to soils	X		
3Da2b	Sewage sludge applied to soils	X		X
3Da2c	Other organic fertilisers applied to soils (including compost)	X		X
3Da3	Urine and dung deposited by grazing animals	X		
3Da4	Crop residues applied to soils	X		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		X
3Df	Use of pesticides	X		
3F	Field burning of agricultural residues	X		
3I	Agriculture other (please specify in the IIR)		X	
11A	Volcanoes		X	
11B	Forest fires		X	

General recommendations on cross-cutting issues

Transparency:

108.   Emission estimates are reported transparently by the Czech Republic. Livestock numbers and national EFs are provided, except for the NH$_3$ EF for rabbit production. The ERT suggested to the Czech Republic that it would be useful to include the national EF for rabbits in Table 5-3 and the Czech Republic agreed to do so in the final version of the IIR.

109.   Time series were estimated using same method and trends reported, albeit the time series only goes back to 2000. The ERT asked the Czech Republic if there were plans to

report a time series back to 1990. The Czech Republic replied that at that moment there was no a plan to recalculate the time series back to 1990. While this could theoretically be done, the question remains whether these recalculations for NH_3 would be meaningful. Czech agriculture went through significant changes between 1990 and 2000. The number of livestock, especially cattle, decreased significantly, new livestock genotypes of greater productivity were introduced and NH_3 emission abatement techniques were introduced in response to EU legislation. Older EFs would need to be used for these recalculations as the current ones take account of abatement techniques. The ERT recognises that recalculating the full time series for NH_3 is particularly challenging due to the significant changes in the sources involved. However, it is best practice to undertake recalculations for the complete time series each year (as explained in the 2013 EMEP/EEA Emissions Inventory Guidebook, Part A). This is not only to provide accurate information from earlier years, but also to ensure full consistency across the time series. Consequently, the ERT recommends that the Czech Republic undertakes recalculations for the complete NH_3 time series. The ERT acknowledges that older EFs will need to be used for the early years to recognise the different production systems in use during those years.

Completeness:

110.   The ERT considers the Agriculture sector to be complete and comprehensive with good levels of detail in the methodology descriptions. Only emissions for 1990-1999 are missing as discussed above.

Consistency including recalculation and time series:

111.   The Czech Republic has used a consistent method to calculate a time series for the years 2000-2013. The desirability of calculating the time series back to 1990 is discussed above.

Comparability:

112.   The methods used by the Czech Republic to calculate emissions are consistent with those proposed in the Guidebook. Country-specific EFs are reported in the IIR together with livestock numbers and data on soil cultivation (for the calculation of PM emissions). The results are comparable with those reported by other Parties.

Accuracy and uncertainties:

113.   No uncertainty analysis has been presented in the IIR. The ERT encourages the Czech Republic to undertake an uncertainty analysis for the Agriculture Sector in order to support the improvement process and to provide an indication of the reliability of the inventory data.

114.   No clear statement of how the QA/QC process for agriculture was carried out has been provided by the Czech Republic in the IIR. The Czech Republic informed the ERT that the QA/QC procedures for the agricultural sector are defined in Chapter 1.5 of the Czech NIR. These QA/QC procedures were used in the preparation of the IIR. The Czech Republic informed the ERT that a link to the NIR QA/QC procedures will be included in the final version of the IIR. The ERT thanks the Czech Republic for this.

Improvement:

115.   The ERT commends the Czech Republic for its intention to improve the inventory by including the calculation of NO_x emissions from agriculture. The ERT encourages the Czech Republic to prepare and implement a comprehensive improvement plan for the sector.

Sector Specific Recommendations.

4.B.4.h Manure management, other animals (rabbits) – NH₃

116.   The ERT suggested to the Czech Republic that it would be useful to include the national EF for rabbits in Table 5-3 and the Czech Republic agreed to do so in the final version of the IIR.

4.B Manure management, time series – NH₃

117.   While recognising that recalculating the full time series for NH_3 is particularly challenging due to the significant changes in the sources involved, the ERT recommend that the Czech Republic undertakes recalculations for the complete NH_3 time series. The ERT acknowledges that older EFs will need to be used for the early years to recognise the different production systems in use during those years.

WASTE

Review Scope:

NFR Code	CRF_NFRName	Reviewed	Not Reviewed	Recommendation Provided
Pollutants Reviewed		All		
Years		2000 – 2013		
5B1	Biological treatment of waste - Solid waste disposal on land	X		X
5B2	Biological treatment of waste - Anaerobic digestion at biogas facilities	X		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		X
5C2	Open burning of waste	X		
5D1	Domestic wastewater handling	X		X
5D2	Industrial wastewater handling	X		X
5D3	Other wastewater handling	X		X
5E	Other waste (please specify in IIR)	X		

General recommendations on cross-cutting issues.

Transparency:

118.   The emission calculations are not transparent for all sub-sectors (waste incineration sub-sectors). The ERT encourages the Czech Republic to provide references for national EFs, which were used for emission calculations for waste incineration. The ERT recommends that the Czech Republic provides clear information about waste incineration facilities (working with or without energy recovery) in the next submission.

Completeness:

119.   The emission calculations are not complete. Emission data are available only from 2000. The ERT recommends that the Czech Republic finds solutions for developing time series of emissions calculations back to 1990. Extrapolation of data could be used, also investigations about emissions sources activities etc.

120.   Emissions from wastewater handling are not estimated. The ERT recommends that the Czech Republic estimates emissions of pollutants for which there are default emission factors in the Guidebook.

Consistency, including recalculation and time series:

121.   No recalculations were made for the Czech Republic's waste sector. Disposed amount of waste increased in years 2006-2010. The ERT recommends that the reasons for this trend are described in the IIR in the next submission.

Comparability:

122.   The Czech Republic uses many national EFs. The ERT recommends that the Czech Republic provides explanations in the IIR, if the country-specific values differ significantly from the default values in the Guidebook.

Accuracy and uncertainties:

123.   No sector-specific QA/QC procedures are in place. There are mistakes in figures and tables headings (Table X.: Comparison of the amount and share of deposited and incinerated municipal waste). The ERT encourages the Czech Republic to review and make corrections in the waste chapter of the IIR.

124.   No uncertainty analysis is done. The ERT encourages the Czech Republic 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:

125.   No improvements mentioned in the Czech Republic's reports. The ERT recommends that the Czech Republic makes improvements in waste water handling sub-sectors.

Sector-specific Recommendations.

5.A Biological treatment of waste - Solid waste disposal on land – CH$_4$

126.   For calculating the emissions the Czech Republic has chosen the lowest EF from the Guidebook. The ERT recommends that the Czech Republic explains why these factors were chosen in the next submission.

127.   The ERT recommends that the Czech Republic provides information on the number of active and closed landfills in the IIR in the next submission.

5.B.1 Biological treatment of waste – Composting

128.   The ERT welcomes the description of composting facilities. The ERT recommends that the Czech Republic reviews the assumptions about collected composting gases. The ERT thinks that not all composting gases could be collected in facilities. Composting is one of the activities used by households to reduce the amounts of waste, but currently residential composting is not included in the inventory. The ERT recommends that the Czech Republic investigates the possibility to estimate amounts of biological waste composted in households.

5.B.2 Biological treatment of waste - Anaerobic digestion at biogas facilities

129.   The ERT welcomes the initiative to calculate emissions from biogas flaring at biogas facilities. The ERT recommends that the Czech Republic provides the used emissions factors and flared amounts in the IIR in the next submission.

5.C.1.a Municipal waste incineration

130.   Many national EFs are used. The ERT recommends that the Czech Republic provides references for national emissions factors and compares the country-specific EFs with the default emission factors in the Guidebook. The ERT notes that if energy is recovered from waste incineration, then emissions should be reported in the energy sector.

5.C.1.b.i Industrial waste incineration

131.   It is not clear how the amounts of incinerated industrial waste are determined. The ERT recommends that the Czech Republic provides figures in tables and a description of activity data estimates for the next submission. The ERT notes that if energy is recovered from waste incineration, then emissions should be reported in the energy sector.

5.C.1.b.iii Clinical waste incineration & 5.C.1.b.iv Sewage sludge incineration

132.   The ERT encourages the Czech Republic to provide data on incinerated amounts and specific EFs. The ERT notes that if energy is recovered from waste incineration, then emissions should be reported in the energy sector.

5.C.1.b.v Cremation

133.   The Czech Republic uses EFs from the 2009 version of the Guidebook with the explanation that these factors are lower. The ERT recommends that the Czech Republic uses EFs from the 2013 version of the Guidebook. Activity data estimation is based on the assumption that 80 % of bodies are burned. The Czech Republic reports that 30 crematoriums operate in the Czech Republic. The ERT recommends that the Czech Republic collects data directly from crematoriums.

5.C.2 Open burning of waste

134.   The Czech Republic reports NO for this sub-sector. The ERT recommends that the Czech Republic reviews this notation key. Burning of agricultural wastes occur in many countries. The Notation key "NE" could be used instead of "NO".

5.D.1 Domestic wastewater handling

135.   The Czech Republic reports only emissions from flaring. The ERT recommends that the Czech Republic collects statistical data about domestic wastewater and calculates emissions. The ERT also recommends that the Czech Republic obtains information about the number of households connected to sewage systems. It is necessary to estimate NH_3 emissions.

5.D.2 Industrial wastewater handling

136.   The Czech Republic does not report emissions in this sub-sector, using the notation key "NE". The ERT recommends that the Czech Republic obtains statistical data about industrial wastewater and estimates and reports NMVOC emissions.

5.E Other waste

137.   The Czech Republic reports emissions from biodegradation and solidification facilities. The ERT welcomes the initiative to calculate and report these emissions. The ERT recommends that the Czech Republic provides activity data and uses EFs for these calculations in the IIR in the next submission.

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

1. Response to preliminary question raised prior to the review
2. Response to questions raised during the review
3. Czech Republic Stage 2 S&A report 2015
4. Czech Republic Stage 1 report 2015
5. Czech Republic IIR 2015