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

**STAGE 3 REVIEW REPORT
GEORGIA**

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INTRODUCTION

1. The mandate and overall objectives for the emission inventory review process under the LRTAP Convention are given by the UNECE document '*Updated methods and procedures for the technical reviews of air pollutant emission inventories reported under the Convention*¹' – hereafter referred to as the 'Review guidelines 2018'.
2. This annual review has checked all pollutants covered by LRTAP Convention and its protocols (NO_x, NMVOC, SO_x, NH₃, plus PM_{2.5}, PM₁₀, BC, 3 HMs and POP_s) for the time-series years 1990 – 2017, 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 review of the UNECE LRTAP Convention inventory of Georgia coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 25th June 2019 to 28th June 2019 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 – Ms Elo Mandel (Estonia), Energy – Ms Marion Pinterits (EU), Transport – Mr Jean-Marc André (France), IPPU – Mr Julien Jabot (Norway), Agriculture – Ms Lotte Lagerwerf (Netherlands), Waste – Mr Intars Cakars (Latvia).
4. Mr Germán Méndez Magaña (Spain) was the lead reviewer. The review was coordinated by Ms Katarina Marečková (EMEP Centre on Emission Inventories and Projections - CEIP).

¹ Decision 2018/1 adopted by EB: *Updated methods and procedures for the technical review of air pollutant emission inventories reported under the Convention*. ECE/EB.AIR/142/Add.1
http://www.unece.org/fileadmin/DAM/env/documents/2002/eb/air/EB%20Decisions/Decision_2018_1.pdf

PART A: KEY REVIEW FINDINGS

5. The ERT thanks the Party for participating actively in the Stage 3 review process by answering the question raised. However, Georgia did not start answering any of the ERT's questions until the last day of the review week without providing the ERT with any reason for it. The ERT strongly recommends that Georgia engage more with the review process by providing answers by the required deadlines in future reviews so that the ERT will be able to understand the details of the inventory and to provide recommendations which help the Party to further develop the inventory.

6. The ERT welcomes the Party's announcement of its plans for allocating more human resources for inventory compiling and reporting and the support they will receive from the Swedish International Development Agency in order to further develop the emission inventory.

7. The inventory is partly in line with the EMEP/EEA air pollutant emission inventory guidebook 2016 (hereafter referred to as the EMEP/EEA GB 2016) and the UNECE Reporting Guidelines (ECE/EB.AIR/125). Reported emission data cover only the period 2007-2017. Furthermore, emissions for a number of categories are reported as "IE" and "NE".

8. The ERT also noted a lack of quantification of the recalculations and the Party has not reported an uncertainty analysis and provides limited information on planned improvements. The ERT acknowledges that improvements performed by parties in their inventories might have an impact on recalculations and uncertainties. For this reason, good monitoring, quantification and descriptions of improvements, recalculations and uncertainties would contribute to the overall quality of the inventory.

9. The ERT has identified significant quality issues during the review, so it proposes to the EMEP Steering Body that review periods be undertaken more frequently for Georgia.

INVENTORY SUBMISSION

10. Georgia submitted NFR tables under the CLRTAP on 14th February 2019 (by the deadline of 15th February). In the 2019 submission, Georgia reported emissions in the NFR 2014-1 format for the years 2007-2017. Therefore, the ERT was only partly able to review Georgia's inventory.

11. The IIR was submitted on 14th March 2019 (by the deadline of 15th March).

12. The submission did not include data on projections or gridded emissions data. The ERT recommends that Georgia should include data on gridded emissions in its future submissions and encourages the Party to report its projections. The submission includes LPS emission data. The ERT commends Georgia for this effort.

KEY CATEGORIES

13. Georgia has carried out a level Key Category Analysis (KCA) consistent with the EMEP/EEA GB 2016 for the following pollutants: NO_x, CO, NMVOC, SO_x, NH₃, TSP, PM₁₀ and PM_{2.5}, BC, heavy metals, PCDD/F, PAHs, HCB and PCBs.

14. As stated in Georgia's 2019 IIR, page 12, a trend KCA does not make sense, because since 2013 more detailed methodological approaches have been used and emissions for more categories and pollutants have been calculated. However, the ERT reiterates its previous recommendation that Georgia should perform a trend KCA after analysing its activity data and re-estimating emissions as planned for the next submissions.

15. Georgia does not specify in the IIR if the results of the KCA are used to identify priorities for improvements of the inventory.

QUALITY

Transparency

16. Georgia provides in its IIR some information about the trends in the main pollutants, a table on key categories and information on the completeness of the inventory. Information on how the emissions are estimated is provided only for some sectors. The ERT finds that there is significant room for improvement in the transparency of Georgia's reporting and reiterates its previous recommendation to provide more detailed information.

Completeness

17. The ERT acknowledges the effort to which Georgia has gone to enhance the completeness of the inventory. Compared with the Stage 3 review in 2016, Georgia has covered more categories and pollutants. However, Georgia still reports "NE (Not Estimated)" for a number of potentially relevant categories and pollutants.

18. Georgia reported emissions for the years 2007-2017. During the review week, the Party indicated that due to the lack of human resources it was impossible to extrapolate activity data but that, with the planned project due to be launched in September 2019, they would provide emissions estimations for the full period in the next submission. The ERT commends Georgia for the effort and encourages reporting emissions for the whole time-series covering all pollutants in the next submission.

19. The ERT commends Georgia for including information on the use of "NE" and "IE" notations keys in the 2019 IIR in the chapter of "General assessment of completeness". However, further developments of this section of the IIR could be made by providing additional information on the actual reasons for allocating emissions elsewhere. Additionally, an analysis of the percentage of categories/pollutants reported as "NE" or "IE" would help the Party and future ERTs to track progress towards the target of compiling a more complete inventory.

20. The ERT notes that Georgia uses zero values in the IPPU, Energy and Transport sectors for some pollutants. The ERT encourages Georgia to use the appropriate notation keys.

Consistency, including recalculations and time series

21. The ERT noted several inconsistencies in the inventory as explained under the Sub-sector specific Recommendations below. The ERT would like to highlight the importance of applying a consistent estimation methodology along the time series as well as using the recommended techniques for gap-filling included in the EMEP/EEA GB 2016.

22. Georgia has carried out recalculations for several subcategories and provides information on the main reasons for those recalculations in the IIR. The ERT commends the Party for this effort and encourages Georgia to provide additional details on the rationale for the recalculations as well as on the impacts of the changes on the national estimates and time series.

Comparability

23. The ERT finds that the inventory of Georgia is mainly comparable with those of other reporting parties. The allocation of source categories follows that of the UNECE Reporting Guidelines and the methodologies are consistent with the EMEP/EEA GB 2016. However, in order to improve this quality aspect, more information on methods, activity data and emissions factors should be included in the IIR and/or NFR tables (see Transparency).

Accuracy and uncertainties

24. The ERT notes that Tier 2 or higher methodologies have been applied only to some of the key categories. Good practice suggests using Tier 2 or higher methods for all key categories in order to increase the accuracy of the inventory.

25. Georgia did not perform an uncertainty analysis as part of the 2019 submission. During the review week, the Party indicated that due to the lack of human resources was not possible to perform an uncertainty analysis for the time being. The uncertainty analysis is a tool to measure the reliability of the inventory emissions estimates and helps the Parties, in connection with the key category analysis, to better plan future improvements.

Verification and quality assurance/quality control approaches

26. The quality control and quality assurance (QA/QC) procedures carried out for the air pollutant inventory are briefly described in the IIR. Common statistical quality checks are carried out. However, sector-specific checks are not documented in the IIR. The ERT encourages the Party to develop and document in the IIR a more complete QA/QC system that ensures the good performance of all quality objectives (transparency, completeness, consistency, comparability and accuracy) of the inventory.

27. The IIR does not provide information on the verification of the inventory.

Reporting of Condensable

28. Georgia did not provide any information on the condensable component in PM for relevant sectors/ categories in their IIR.

FOLLOW-UP TO PREVIOUS REVIEWS

29. Results from the Stage 1 and Stage 2 reviews on the 2019 emission data were used in this Stage 3 review. The ERT invites Georgia to also refer to these previous reviews when examining this review report and when updating its improvement plans.

30. Compared to the Stage 3 review in 2016, Georgia has covered more categories and pollutants. However, there are many issues that should be further improved, for example to extend the time series back to 1990 for the main pollutants. The ERT has listed areas for further improvements in Part B.

31. The ERT notes the importance of providing information on compliance with previous inventory reviews in the IIR. Although not specifically requested by the latest Reporting Guidelines, the ERT encourages Georgia to include an appendix in the IIR in which the status of implementation of the recommendations contained in the latest review report is assessed.

AREAS FOR IMPROVEMENTS IDENTIFIED BY GEORGIA

32. The IIR identifies areas for improvement only in the energy sector. As stated in the IIR, Georgia indicates that it is working on the following issues to improve its estimates:

- (a) To use energy balance data and recalculate emissions from the energy sector;
- (b) To estimate emissions from aviation and to recalculate road transport emissions by using COPERT 5;

33. The ERT welcomes the information provided by the Party during the review on the following future inventory improvements:

- (a) To allocate further human resources for inventory compiling and reporting;
- (b) To report a complete time series for the next submission (1990-2018);
- (c) To estimate emissions for categories under the Solvents sector;

TECHNICAL CORRECTIONS CONSIDERED AND / OR CALCULATED BY ERT

34. The ERT identified some possible overestimations and prepared technical corrections for the sectors Transport and IPPU. The ERT strongly recommends that Georgia implements the technical corrections prepared by the ERT in their 2020 submission. The Party may also provide revised estimates instead of the technical corrections. Detailed documentation of such revised estimates should be included in the 2020 IIR.

Table 1 Summary of potential technical corrections identified by ERT for Georgia

NFR category (s)	Pollutants	Years	Calculated by Georgia/ Calculated by ERT/ Not calculated	Potential contribution to national total (%)
1.A.3.b.i	SOx	2017	Georgia	-1.08 % (2017)
1.A.3.b.ii	SOx	2017	Georgia	-0.21% (2017)
1.A.3.b.iii	SOx	2017	Georgia	-0.73% (2017)
2.A.1	TSP	2014-2017	ERT	-4.5% (2014), -4.9% (2015), -5.7% (2016) and -6.4% (2017)
2.A.1	PM ₁₀	2014-2017	ERT	-4.9% (2014), -5.7% (2015), -6.6% (2016) and -7.5% (2017)
2.A.1	PM _{2.5}	2014-2017	ERT	-3.3% (2014), -4.0% (2015), -4.6% (2016) and -5.3% (2017)
2.A.2	PM _{2.5}	2010	Georgia	-37.7%

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS-CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

35. The ERT identifies the following cross-cutting issues for improvement:
- (a) To report future submissions in the NFR 2014-2 format (latest version of templates available on the CEIP website).
 - (b) To use the results of the KCA to prioritise improvements in the inventory.
 - (c) To undertake a trend assessment in the key category analysis for all pollutants once the completeness of the inventory is improved.
 - (d) To provide more detailed information at the sub-sectors and category level on emission factors, activity data, methodologies (including country-specific) and assumptions used in the calculation of emissions in the IIR. More detailed references to the sources of information would also be desirable, as well as further descriptions on emission trends with information on the drivers of the trends.
 - (e) To continue improving the completeness of the inventory by estimating emissions for categories and pollutants currently reported as “NE (Not Estimated)” for which the relevant methodology is available.
 - (f) To further update the national methodology to cover missing pollutants.
 - (g) To provide a complete time series from 1990 onwards (for particles since 2000).
 - (h) To provide additional information in the IIR on the actual reasons for the use of the “IE” notation key. Additionally, an analysis of the percentage of categories/pollutants reported as “NE” or “IE” would help the Party and future ERTs to track progress towards the target of compiling a more complete inventory.
 - (i) To use the appropriate notation keys e.g. “NO” where emissions are “Not Occurring”, “NE” where emissions are “Not Estimated” and “IE” where emissions are “Included Elsewhere” for reporting where estimates are not available, or necessary according to the definitions of the notation keys in the Reporting Guidelines.
 - (j) To provide quantitative information in the IIR on differences to previous estimates and on the impact of the recalculation on the time series and on the National Total.
 - (k) To use Tier 2 or higher methods for all key categories.

- (l) To perform and present an uncertainty analysis, at least for key categories, and to describe the quantification of uncertainties and the results in the future submissions, and to use this information as a tool to focus planned improvements on key categories
- (m) To improve QA/QC procedures in order to detect outliers and big changes in emissions and implied emission factors trends. Reasons for the main fluctuations should be documented in the IIR.
- (n) To include information on the condensable component of PM emissions in the IIR for the different sectors, following the guidance provided in Annex II (v.2018) of the 2014 Reporting Guidelines.
- (o) To provide a detailed improvement plan in the IIR, including all the needs for improvement identified by the Party itself as well as the recommendations derived from the review processes. Items included in the improvement plan should be specific (well defined), measurable (measure progress), achievable (realistic goals), relevant (set up a priority order based on key categories and uncertainty analysis) and time-bound (establish a timeframe).
- (p) To include an appendix in the IIR assessing the status of implementation of recommendations contained in the latest review report.
- (q) Recommended improvements relating to specific source categories are presented in the relevant sector sections of this report.

SECTOR SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

ENERGY

Review Scope

Pollutants Reviewed		All pollutants, activity data		
Years		1990 – 2017		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
1A1a	Public electricity and heat production	x		x
1A1b	Petroleum refining	x (NO)		
1A1c	Manufacture of solid fuels and other energy industries	x (NO)		
1A2a	Iron and steel	x		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	x		
1A3ei	Pipeline transport	x(NE)		
1A3eii	Other	x		
1A4ai	Commercial/institutional: Stationary	x		
1A4bi	Residential: Stationary	x		x
1A4ci	Agriculture/Forestry/Fishing: Stationary	x		
1A5a	Other stationary (including military)	x(NA)		
1B1a	Fugitive emission from solid fuels: Coal mining and handling	x		x
1B1b	Fugitive emission from solid fuels: Solid fuel transformation	x		x
1B1c	Other fugitive emissions from solid fuels	x(NO)		
1B2ai	Fugitive emissions oil: Exploration, production, transport	x		
1B2aiv	Fugitive emissions oil: Refining / storage	x(NA)		
1B2av	Distribution of oil products	x(NA)		
1B2b	Fugitive emissions from natural gas (exploration, production, processing, transmission, storage, distribution and other)	x		
1B2c	Venting and flaring (oil, gas, combined oil and gas)	x(NE)		
1B2d	Other fugitive emissions from energy production	x(NO)		
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

Transparency

36. The ERT notes that Georgia provides information on all source categories including trends and a short description of applied methodologies. The ERT recommends that Georgia provide further detailed information on the methodology, activity data and applied emission factors to estimate emissions from subcategories in its next submission to enhance the transparency of the inventory.

37. The ERT notes that Georgia does not provide information on activity data in some subcategories (see para 55). The ERT recommends that Georgia provide activity data or the respective notation keys in its NFR tables for those subcategories where emissions occur, and that it also provide information on activity data in its IIR.

Completeness

38. The ERT commends Georgia for the improvements implemented to enhance the completeness of the inventory. The ERT encourages the Party to estimate emissions for those pollutants where activity data and emission factors are available to further minimise the use of the notation keys “NE”, “NO”, “IE” and “NA”.

Consistency including recalculation and time-series

39. The ERT has noticed that the time series is not complete for some pollutants (see para 51). The ERT recommends that Georgia provide estimates for the entire time series in those categories where emission factors and activity data are available.

40. The ERT notes that the time series in several categories show significant dips and jumps but that the Party does not provide information in its IIR to describe these outliers (see para 49). The ERT recommends that Georgia include information on significant outliers in its IIR.

Comparability

41. Georgia applies methodologies to estimate emissions which are generally in line with the EMEP/EEA GB 2016. In cases where country-specific methods are applied, the ERT recommends that Georgia describe those methodologies in its IIR to allow comparability and transparency for its inventory.

42. The ERT highlights that in some categories the method for estimating emissions is not applied to the whole time series (see para 52). The ERT recommends that Georgia apply the same method for estimating emissions across the whole time series or – in case this is not possible – explains in its IIR why the method cannot be applied to the whole time-series.

Accuracy and uncertainties

43. The ERT encourages Georgia to undertake an uncertainty analysis for the Energy sector in order to help inform the improvement process and to provide an indication of the reliability of the inventory data.

44. The Party has described some basic QA/QC checks in its IIR. The ERT encourages Georgia to implement sector-specific QA/QC procedures and describe these at a more detailed level in the IIR.

Condensable

45. The Party has not provided explanatory information on the condensable component of PM. In the IIR, there is no information on whether PM_{2.5} includes or excludes the condensable component. The ERT recommends that Georgia include such information in the next submission.

Improvement

46. The ERT commends Georgia for its improvement in providing estimations for all categories and therefore subsequently reducing the number of notation keys. The ERT notes the Party's intention to recalculate emissions from the Energy sector to improve the consistency and comparability of the inventory. The ERT encourages Georgia to implement planned improvements in future submissions.

Potential Technical Corrections

47. The ERT has not prepared any technical corrections for the Energy sector of Georgia's inventory.

Sub-Sector Specific Recommendations

Category issue 1: 1.A.1.a Public electricity and heat production – activity data, all pollutants

48. The ERT notes that Georgia reports PCDD/PCDF emissions from category 1.A.1.a as not estimated (notation key "NE") although this is likely to be a source of PCDD/PCDF; the EMEP/EEA GB 2016 provides default emission factors for this pollutant to estimate emissions with a Tier 1 methodology. In response to a question raised by the ERT during the review regarding this issue, Georgia stated that emissions from this source were estimated using the Tier 2 emission factors provided in the EMEP/EEA GB 2016, Table 3-17 (Tier 2 emission factors for source category 1.A.1.a, gas turbines using gaseous fuels), where emission factors for estimating PCDD/PCDF emissions are not provided. The ERT acknowledges Georgia's clarification and encourages the Party to provide detailed information on the methodologies used for estimating emissions in its IIR.

49. Georgia states in its IIR that emissions from category 1.A.1 come from natural gas consumption (IIR 2019, p20) but provides in its NFR also activity data for subcategory 1.A.1.a from solid fuels (2017, 2016), liquid fuels (2007-2012) and biomass (2007-2012). The Party clarified during the review that for the period 2007-2012, there was no National

Energy Balance, so no detailed information on energy consumption by categories was available. Thus, the emissions from energy production were calculated for all fuels together (liquid fuels, solid fuels, gaseous fuels and biomass) and reported in category 1.A.1.a. Since 2013, a National Energy Balance has been available and emissions from each category have been calculated separately, so from 2013 to 2015, there were power plants which were using only natural gas. The ERT recommends that Georgia clarify whether the emissions from this source are estimated taking all activity data into account and that it provides information on the methodology in its IIR.

50. SO_x emissions from subcategory 1.A.1.a are reported by Georgia from 2013 onwards, showing a sharp increase of 7,572% from 2015 (0.0064kt) to 2016 (0.491kt) and an increase of 50% from 2016 to 2017 (0.735kt). The Party states in its IIR that the emissions from category 1.A.1 come from natural gas consumption (IIR 2019, p20). Activity data of gaseous fuels for the same period of time show a decrease. The IIR does not provide information on the methodology used or on the trend. In response to a question raised by the ERT during the review, the Party clarified that emissions from energy production are calculated for all fuels together (liquid fuels, solid fuels, gaseous fuels and biomass) and that the sharp increase in SO_x emissions is caused by a new power plant operating on coal. The ERT recommends that Georgia provide a justification for the significant dips and jumps in the time series in the IIR to enhance the transparency of the inventory.

51. The ERT notes that emissions of all pollutants in subcategory 1.A.1.a are reported from 2013 onwards; for the years 2007-2012, emissions of most pollutants (SO_x, PM_{2.5}, PM₁₀, BC, Pb, Cd, Hg, As, Cr, Cu, Ni, Se, PAHs) are reported as not occurring, not estimated or not applicable. Only emissions of NO_x, NMVOC, CO and TSP are reported from 2017 onwards. It is very likely that emissions of all pollutants from this source also occurred in the years 2007-2012. The ERT recommends that Georgia estimate emissions from subcategory 1.A.1.a for the whole time series for all pollutants to ensure the consistency and completeness of the inventory.

52. Georgia states in its IIR (p20 and Figure 3.2), that the decrease in NO_x, NMVOC, TSP emissions from subcategory 1.A.1.a since 2013 is related to the introduction of a National Energy Balance and a switch to a more detailed methodological approach. The ERT recommends that the Party apply this more detailed methodological approach for the whole time series to ensure consistency and comparability of the inventory. In cases where the methodological approach cannot be applied to the whole time series, the Party is encouraged to provide information in the IIR on why this is not possible.

Category issue 2: 1.A.2.a Iron and Steel – SO_x

53. Georgia reports, in its NFR tables, SO_x emissions from 1.A.2.a as 'included elsewhere' for 2007-2012, and provides a calculation of SO_x emissions from 2013 onwards. Table 1.15 of the IIR (p15) does not provide information on the category in which the emissions from this source are included for those years. In response to a question raised by the ERT during the review, Georgia clarified that for 2007-2012, SO_x emissions from 1.A.2.a were included in category 1.A.2.g.viii, and that it would estimate full time series emissions from category 1.A.2.a. The ERT recommends that Georgia provide information

on the allocation of emissions in the completeness chapter of the IIR to ensure completeness and comparability of the inventory.

Category issue 3: 1.A.4.b.i Residential: Stationary – NMVOC, TSP, CO, HM, POPs

54. Following a recommendation from the Stage 3 review report 2016 (para 53), the ERT notes that the key source analysis shows that NFR sector 1.A.4.b.i is a key source for the pollutants NMVOC, TSP, CO, HM and POPs. For a key source, a Tier 2 or 3 methodology should be used. Georgia, however, reports that a Tier 1 method has been used for this sector and pollutants. To a question raised by the ERT during the review, the Party replied that information about used combustion technologies was still not available to shift to a higher tier method for estimating emissions from this source. The ERT reiterates its recommendation from the previous Stage 3 review that more detailed information should be gathered to enable a more advanced methodology for estimating emissions from category 1.A.4.b.i, that this should be included in the planned improvements and followed up accordingly

Category issue 4: 1.B.1 Fugitive emissions – activity data, NMVOC, SO_x, NH₃, Heavy metals, PCDD/F, benzo(b)fluroanthene

55. The ERT notes that Georgia does not provide activity data for category 1.B.1 in its NFR tables or in the IIR. During the review, the Party clarified that activity data was not provided for confidentiality reasons. The ERT encourages the Party to provide the correct notation key ('C' – confidential information) in its next submission and to provide an explanation in the IIR. Furthermore, the ERT encourages the Party to find feasible ways to provide information on activity data in the IIR without violating confidentiality restrictions (i.e. evolution index graphs 1990 = 100%).

56. Georgia reports NMVOC emissions from category 1.B.1.a as “not estimated” (notation key “NE”) and states in its IIR (p28) that emissions from this source are estimated using plant-specific emissions (from the state’s reporting system) and the EMEP/EEA GB 2016, Tier 1 approach. It is very likely that NMVOC emissions from this source do occur, and a default emission factor is provided by the EMEP/EEA GB 2016. During the review, Georgia clarified that it would estimate NMVOC emissions from this source in future submissions. The ERT recommends that Georgia calculate estimates of NMVOC emissions from category 1.B.1.a in its next submission.

57. Georgia reports in its IIR (p14) that emissions of the pollutants NMVOC, NH₃, heavy metals, PCDD/F, benzo(b)fluroanthene and benzo(k)fluroanthene are not estimated for subcategory 1.B.1.b, stating in the IIR that emissions occur but have not been estimated due to a lack of emission factors in the national methodology. It is very likely that emissions of the mentioned pollutants from this source do occur, and default emission factors are provided by the EMEP/EEA GB 2016. The ERT recommends that Georgia estimate emissions of NMVOC, SO_x, NH₃, heavy metals, PCDD/F, benzo(b)fluroanthene and benzo(k)fluroanthene from subcategory 1.B.1.b in its next submission to enhance completeness and comparability of its inventory.

TRANSPORT

Review Scope

Pollutants Reviewed		All		
Years		2007 – 2017		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
1A2gvii	Mobile Combustion in manufacturing industries and construction	x		x
1A3ai(i)	International aviation LTO (civil)	x		x
1A3ai(ii)	International aviation cruise (civil)	x		x
1A3aii(i)	Domestic aviation LTO (civil)	x		x
1A3aii(ii)	Domestic aviation cruise (civil)	x		x
1A3bi	Road transport: Passenger cars	x		x
1A3bii	Road transport: Light duty vehicles	x		x
1A3biii	Road transport: Heavy duty vehicles and buses	x		x
1A3biv	Road transport: Mopeds & motorcycles	x		x
1A3bv	Road transport: Gasoline evaporation	x		x
1A3bvi	Road transport: Automobile tyre and brake wear	x		x
1A3bvii	Road transport: Automobile road abrasion	x		x
1A3c	Railways	x		x
1A3di(ii)	International inland waterways		x	
1A3dii	National navigation (shipping)	x		x
1A4aii	Commercial/institutional: Mobile		x	
1A4bii	Residential: Household and gardening (mobile)		x	
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	x		x
1A4ciii	Agriculture/Forestry/Fishing: National fishing		x	
1A5b	Other, Mobile (including military, land based and recreational boats)		x	
1A3di(i)	International maritime navigation		x	
1A3	Transport (fuel used)		x	

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

General recommendations on cross-cutting issues

Transparency

58. The ERT commends Georgia for its IIR. As in the last review (2016), the IIR could, however, be more detailed if descriptions of activity data such as fleet, mileage, traffic, fuel consumption, etc. and explanations of the trends in these data were added. Georgia could do the same for the emission factors and all the hypotheses used. This would help the ERT to better understand the inventory and enable reviewers to fully assess underlying assumptions and the rationale for choices of data, methods and other inventory parameters.

Completeness

59. As in the last review, the ERT finds that the Transport sector could be more complete and more comprehensive if it contained methodology descriptions with good levels of detail.

60. Georgia has not taken into account the recommendations from the last review about the use of the notation keys. As in the last review, the ERT also recommends consistency in the use of the notation keys, i.e. if "NO" is used for one pollutant, "NE" cannot be used for another one.

61. The ERT recommends again that Georgia submits reporting templates with consistent emission data for the complete time series (from 1990 to last year).

Consistency including recalculation and time series

62. Georgia recalculated its inventory for almost all sectors in the year 2016. The IIR includes explanations, but the ERT encourages Georgia to provide much more detailed explanations of the recalculations, including impacts on the sector and implications for trends in the Transport and Energy sectors in the IIR.

Comparability

63. The ERT notes that the inventory of Georgia is comparable with those of other reporting parties. The ERT commends Georgia for using methodologies in accordance with the EMEP/EEA GB 2016 for the Transport sector.

64. The ERT encourages Georgia to improve its National Energy Balance to be able to provide a complete, consistent and comparable time series.

65. The ERT encourages Georgia to implement the latest COPERT version for road transport emissions calculations and to calculate aviation to improve comparability.

Accuracy and uncertainties

66. Georgia has not provided any uncertainty estimates. Georgia planned to improve its QA/QC and uncertainty analysis for its submissions from 2017 onwards. The ERT has not found any sectoral QA/QC. The ERT encourages Georgia to undertake an uncertainty analysis for the Transport sector to help inform the improvement process and to provide an indication of the reliability of the inventory data.

67. There is a description of general QA/QC activities. The ERT reiterates its encouragement to implement and report on sector-specific QA/QC procedures in future submissions.

Condensable

68. The Party has not provided explanatory information on the condensable component of PM for categories in its IIR. The ERT recommends that the Party improve its IIR by clearly listing which sectors include (or do not include) the condensable component in the next submission, according to Annex II (v. 2018) of the 2014 Reporting Guidelines.

Improvement

69. The ERT commends Georgia for its improvements since the last review and encourages the Party to apply expected improvements in its next IIR submission. The ERT strongly encourages the Party to implement the recommendations derived from the review processes in order to improve its inventory. Encouragements and recommendations should be included in the IIR improvements plan.

Potential Technical Corrections

70. The ERT notes that the SO_x emissions of the NFR category 1.A.3.d.ii (National navigation - shipping) have not been calculated. A technical correction would be necessary due to the fact that these emissions should occur (every fuel contains sulphur) but could not be estimated due to a lack of information on the sulphur content per fuel used and linked activity data (fuel consumption).

71. The ERT strongly encourages Georgia to calculate these emissions in the next submission.

72. During the Stage 3 review, the ERT noted a strange evolution of SO_x emissions between 2016 and 2017 (i.e. a high increase) for 1.A.3.b.i, 1.A.3.b.ii and 1.A.3.b.iii categories. After checking, Georgia found a technical mistake in the sulphur content in the fuel used for the year 2017 and provided the ERT with revised estimates. The ERT notes that the contribution of the revised estimates to SO_x emissions in the individual subcategories was below the threshold of significance (2%); however, the sum of the three revised values slightly exceeds the threshold (2.02%) for the entire 1.A.3.b subcategory. The ERT strongly recommends that Georgia implements the revised estimates provided in the 2020 submission, and the recalculations should be explained in the relevant section of the IIR. The ERT points out that the implementation of the technical correction (or the revised estimate) might be reviewed in 2020. Furthermore, the ERT encourages Georgia to improve its QA/QC procedures in order to reduce such errors in reporting.

NFR	Pollutant	Year	Calculated by country/ERT	Potential contribution to national total (%) in 2017 (NA*=Not reported by the Party)
1.A.3.b.i	SO _x	2017	Country	-1.08 % (2017)
1.A.3.b.ii	SO _x	2017	Country	-0.21% (2017)
1.A.3.b.iii	SO _x	2017	Country	-0.73% (2017)

Sub-Sector Specific Recommendations

Category issue 1: 1.A.2.g.vii Mobile Combustion in manufacturing industries and construction – NO_x, NMVOC, SO_x, TSP, CO, BaP – Notation Key

73. The ERT noted that Georgia reported an “IE” notation key for the 2007-2012 time series and “NA” for 2013-2017 for the pollutants in this sector. Table 1.15 of the IIR does not explain where the emissions are included. During the review, Georgia responded that emissions from 1.A.2.g.vii were included in 1.A.2.g.v.iii and that no information on fuel consumption had been available since the development of the first energy balance in 2013,

which explains the use of the “NA” notation key. The ERT encourages the Party to explain clearly where the emissions are included and to include the rationale for the use of two different notation keys in the next IIR submission. If information on fuel consumption under 1.A.2.g.v.ii or 1.A.2.g.v.iii categories is not available and the Party assumes that fuel consumption might be included under other categories, the more suitable notation key would be “IE” instead of “NA”.

Category issue 2: 1.A.2.g.vii Mobile Combustion in manufacturing industries and construction – NH₃, PM, BC, HMs, PCCD/F, PAHs, HCB, PCBs – Notation Key

74. The ERT noted that Georgia reported the “NO” notation key for the whole time series for the pollutants in this sector. The EMEP/EEA GB 2016 provides emission factors for these pollutants. Georgia responded that no emission factor was available in the national methodology. The ERT encourages the Party to improve the inventory by estimating emissions with, at least, the EMEP/EEA GB 2016 emission factors.

Category issue 3: 1.A.3.a Aviation – All pollutants – Completeness / Comparability

75. The ERT noted that, since the last review, no aviation emissions have been reported. In the National Communication to the UNFCCC activity data have been reported, so the ERT thinks that it could be possible to report pollutant emissions. Georgia responded that the hiring of new employees would allow Georgia to calculate and report aviation emissions and activity data. The ERT encourages Georgia to build the capacity for estimating and reporting aviation emissions and activity data in the next submission.

Category issue 4: 1.A.3.b.i-iv Road transport – biomass activity data – Transparency

76. The ERT noted that Georgia reported the “NA” notation key for biomass activity data for all these sectors. In a question raised during the review, the ERT asked if the fuel used in road transport contained biomass. Georgia responded that fuel used in road transport did not contain biomass. In 2018, a small factory started operating in the country, producing a negligible amount of biodiesel from used cooking oil. For the next submission, the notation key for the years before 2018 would be changed to “NO”. The ERT encourages Georgia to use the appropriate notation key, i.e. “NO” for biomass activity data before 2018.

Category issue 5: 1.A.3.b.iii Road transport: Heavy duty vehicles and buses – NO_x, NH₃, PMs – Trend

77. The ERT noted an irregularity in the trend in NO_x, NH₃ and PM emissions for 1.A.3.b.iii sector. For the year 2015, emissions are +14% higher than those from 2014 and do not follow the general increasing trend. Georgia responded that in 2015 fuel consumption was significantly higher compared to the previous year (both petrol/gasoline and diesel had increased by 11% and 16% correspondingly). The ERT encourages Georgia to improve the inventory by adding this type of information in its next IIR submission.

Category issue 6: 1.A.3.b.i-vii Road transport- Activity data – Completeness/comparability

78. During the last review, the ERT asked Georgia to report activity data (such as fleet, traffic, consumption, etc.) in its IIR. The ERT cannot find any activity data in the IIR which would help to better understand the emissions. Georgia responded that the hiring of new employees would allow Georgia to provide more detailed data in its next IIR submission. The ERT encourages Georgia to build the capacity for reporting activity data clearly in the IIR (fleet, mileage, etc.), as well as the sources of the emission factors used, and to explain clearly the trends in these data.

Category issue 7: 1.A.3.b.vi-vii Road transport: wear emissions – PMs and BC – Completeness

79. The ERT noted that Georgia had not estimated wear emissions from brakes, tyres and road. Georgia responded that these emissions were an output of the COPERT software used to calculate road transport emissions. The output file gives the “NE” notation key for these sectors and pollutants. The ERT encourages Georgia to improve the inventory by adding the emissions from these sectors in the next submission, by using the EMEP/EEA GB 2016 emission factors.

Category issue 8: 1.A.3.c Railways- all pollutants – Completeness / Trend

80. The ERT noted that emissions from railways had been estimated by using a Tier 1 method. So, emissions and activity data (AD) should show the same trend. For the years 2015 and 2016, however, the emissions and AD (in TJ) do not show the same trend. When this question was raised, Georgia answered that the units of the activity data used for the emission calculations were tonnes of fuel consumed, whose trend seems to be consistent with the emission trends. For this reason, the ERT believes that the problem could be related to the conversion from tonnes to TJ. The ERT also noted that no AD and emissions before 2013 had been provided. Georgia informed the ERT that they would be helped by the Swedish International Development Agency to estimate and report AD and emissions before 2013. The ERT strongly recommends that Georgia should check the emissions and reported AD in order to ensure total proportionality in reporting and that it improves the inventory by reporting AD on railways and emissions before 2013 in the next submission.

Category issue 9: 1.A.3.d.ii National navigation (shipping) – SO_x and Activity data – Completeness / Trend

81. The ERT noted a big jump in the activity data (and emissions) between 2016 and 2017, without any explanation in the IIR. The ERT also noted that SO_x emissions had not been reported (NE notation key used in reporting tables). SO_x emissions have to be estimated as the sulphur content of fuels should be known. Georgia responded that shipping activity increased considerably in 2017 and as this activity is limited, a small change in the level could result in a high percentage rise. The ERT recommends that Georgia explain trends in activity data and emissions in its next IIR submission. The ERT encourages Georgia to ask fuel providers for the sulphur content of fuel sold to be able to estimate SO_x emissions for this sector in the next submission.

Category issue 10: 1.A.4.c.ii Agriculture/Forestry/Fishing: Off-road vehicles and other machinery – NO_x, NMVOC, SO_x, CO, Pb – Trend

82. The ERT noted that Georgia did not explain in its IIR which Tier methodology had been used for this sector. The ERT also noted that no explanation had been given in the IIR to describe the trends in pollutant emissions. The ERT did not understand why some pollutants followed the activity data trend and others did not. Georgia responded that the Tier 1 methodology had been used to estimate emissions and that the difference in pollutant emissions trends was due to the difference in trends between petrol/gasoline and diesel oil consumption. The ERT encourages Georgia to explain clearly which methodology has been used and the trends in both activity data and emissions in the next submission.

INDUSTRIAL PROCESSES

Review Scope

Pollutants Reviewed		All pollutants		
Years		2007 – 2017		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
2A1	Cement production	x		x
2A2	Lime production	x		x
2A3	Glass production	x		x
2A5a	Quarrying and mining of minerals other than coal	x		
2A5b	Construction and demolition	x(NE)		x
2A5c	Storage, handling and transport of mineral products	x(NA)		x
2A6	Other mineral products	x		x
2B1	Ammonia production	x		x
2B2	Nitric acid production	x		x
2B3	Adipic acid production	x(NO)		
2B5	Carbide production	x(NO)		
2B6	Titanium dioxide production	x(NO)		
2B7	Soda ash production	x(NO)		
2B10a	Chemical industry: Other	x		x
2B10b	Storage, handling and transport of chemical products			
2C1	Iron and steel production	x		x
2C2	Ferroalloys production	x		x
2C3	Aluminium production	x		x
2C4	Magnesium production	NO		
2C5	Lead production	x		x
2C6	Zinc production	NO		
2C7a	Copper production	NO		
2C7b	Nickel production	NO		
2C7c	Other metal production	NO		
2C7d	Storage, handling and transport of metal products	x(NA)		
2D3b	Road paving with asphalt	x		
2D3c	Asphalt roofing	x		
2H1	Pulp and paper industry	x		
2H2	Food and beverages industry	x		
2H3	Other industrial processes	NA		
2I	Wood processing	x		
2J	Production of POPs	NO		
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	NA		

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

General recommendations on cross cutting issues

Transparency

83. Georgia provided emission data for the period 2007-2017 but did not provide any data for the years prior to 2007. The IIR does not provide any explanation for the choice of the time series. After the review, Georgia explained to the ERT that emissions had not been estimated for the years prior to 2007 due to a lack of reliable activity data. Georgia also explained to the ERT that a capacity building project would be launched in September which would make reporting of a complete and consistent time series possible for the next submissions.

84. Georgia uses country-specific national methodologies for almost all emission calculations in the Industry sector. The IIR provided by Georgia gives short methodology descriptions, mostly by main NFR categories (2.A, 2.B, 2.C, 2.D, 2.H and 2.I), but detailed information regarding the methodology is missing. The inventory for the emissions from the Industry sector provided by Georgia is therefore assessed as not transparent enough by the ERT due to a lack of relevant descriptions in the IIR.

85. The NFR tables provided by Georgia contain emission data or use notation keys where estimates are not available for all source categories within the Industrial Processes sector. The ERT commends Georgia for this. Nevertheless, the notation keys "NO" and "NE" are used for several potentially significant sources and no information is provided regarding the reason why these emissions have not been included. The notation key "NA" is also used for some source categories where it may not be accurate. The ERT recommends that Georgia use appropriate notation keys as outlined in the Reporting Guidelines (e.g. "NO" where emissions are "Not Occurring", "NE" where emissions are "Not Estimated", "IE" where emissions are "Included Elsewhere" and "NA" where emissions are "Not Applicable") for reporting where estimates are not available or necessary, and that it provides a justification for the use of these notation keys in the IIR.

86. Georgia has not provided activity data for all categories where emissions have been reported in the NFR table. As no information for these categories was made available to the ERT before, during and after the review, it has not been possible to compare any of the implied emission factors with the values recommended by the EMEP/EEA GB 2016.

87. Georgia has not provided a detailed or generally transparent emission inventory for the Industrial Processes sector. Not enough information was made available to the ERT on the methodologies used before and during the review. The ERT recommends that Georgia provide a transparent IIR including more detailed descriptions of the methodologies, emission factors and activity data used to estimate emissions for all source categories.

Completeness

88. Georgia has reported emissions for 15 different source categories in the NFR tables provided to the ERT. Georgia uses also notation keys for potentially significant emissions sources in the NFR tables - emission sources for which greenhouse gases were estimated and reported in the greenhouse gas inventory submitted by Georgia in 2019 to the UNFCCC, and for which methodologies are available in the EMEP/EEA GB 2016. The

inventory provided by Georgia is therefore not considered complete. The ERT recommends that Georgia estimate the emissions for all source categories within the Industry sector, using the methodologies provided by the EMEP/EEA GB 2016.

89. Georgia has improved its inventory by including emissions from source category 2K as recommended by the previous review. The ERT commends Georgia for this. Nevertheless, the source categories 2.A.5.b and 2.D.3.c, which are likely to be emitting sources, are still reported as “NE”. The ERT reiterates its encouragement for Georgia to try to collect data for these source categories and to calculate all relevant emissions for its next submission, using the available methodologies from the EMEP/EEA GB 2016.

Consistency including recalculation and time series

90. The recommendation from the previous review regarding PM_{2.5} and PM₁₀ emissions from industry has been implemented by Georgia as Georgia has included PM_{2.5}, PM₁₀ and BC in its inventory. The ERT commends Georgia for this.

91. Georgia has only provided data for the time series 2007 – 2017. For several potentially significant source categories, Georgia has reported the notation key “NE” for the period 2007-2010 or 2007-2013. The ERT notes that Georgia submitted a greenhouse gas inventory in 2019 to the UNFCCC which included emissions from 1990 to 2015. The ERT recommends that Georgia submit a consistent emission inventory to the UNECE by estimating emissions for the whole time series, as it was done for the greenhouse gas inventory. After the review, Georgia explained to the ERT that emissions had not been estimated for the years prior to 2007 due to a lack of reliable activity data. Georgia also explained to the ERT that a capacity building project would be launched in September which would make reporting of a complete and consistent time series possible for the next submissions.

92. Georgia has recalculated its inventory for the sector *2K-Consumption of POPs and heavy metals (e.g. electrical and scientific equipment)*. The IIR includes explanations about this recalculation and the ERT commends Georgia for this. Nevertheless, the ERT encourages Georgia to provide more detailed explanations regarding the recalculations in its IIR, including the impact on the sector and implications for trends in the Industry sector.

Comparability

93. As there is not enough information regarding methodologies in the IIR and as Georgia did not provide the ERT with the necessary information during the review, the comparability of the Georgian inventory could not be assessed by the ERT.

Accuracy and uncertainties

94. As there is not enough information regarding methodologies in the IIR and as Georgia did not provide the ERT with the necessary information during the review, the accuracy of the Georgian inventory could not be assessed by the ERT.

Condensable

95. Georgia did not provide any information on the condensable component of PM for the Industry sector. In its IIR, there is no information on whether PM_{2.5} includes or excludes the condensable component. The ERT recommends that Georgia include such information in the next submission according to Annex II (v.2018) of the 2014 Reporting Guidelines.

Improvement

96. The ERT noted that Georgia had not included any categories from the industrial sector in its improvement plan. The ERT encourages Georgia to set up an improvement plan for the Industry sector and to include in it the recommendations of the ERT.

Potential Technical Corrections

97. The ERT noted possible overestimations as listed below and prepared technical corrections, using activity data reported by Georgia and in the NFR tables reported in 2019, and emission factors recommended by the EMEP/EEA GB 2016. The ERT recommends that Georgia apply the calculated technical corrections proposed by the ERT to the following potential overestimates:

- (a) NFR 2.A.1- cement production: possible overestimation of PM_{2.5}, PM₁₀ and TSP emissions for the period 2014-2017.
- (b) NFR 2.A.2- lime production: overestimation of PM_{2.5} for the year 2010.

NFR	Pollutants	Years	Calculated by Party/ ERT	Potential contribution to national total
2.A.1	TSP	2014-2017	ERT	-4.5% (2014), -4.9% (2015), -5.7% (2016) and -6.4% (2017)
2.A.1	PM ₁₀	2014-2017	ERT	-4.9% (2014), -5.7% (2015), -6.6% (2016) and -7.5% (2017)
2.A.1	PM _{2.5}	2014-2017	ERT	-3.3% (2014), -4.0% (2015), -4.6% (2016) and -5.3% (2017)
2.A.2	PM _{2.5}	2010	Georgia	-37.7%

Sub-Sector Specific Recommendations

Category issue 1: 2.A.1 Cement production

98. The ERT noted that, in the NFR tables submitted by Georgia, activity data had been set to "Cement" for the years from 2007 to 2013 and to "Clinker production" for the years from 2014 to 2017. The ERT recommends that Georgia report a consistent time series for the activity data by reporting the same type of activity data for the whole time series. The ERT encourages Georgia to estimate clinker production for the years where data is not available and to report clinker production for the whole time series to be in line with the EMEP/EEA GB 2016.

99. The ERT noted that Georgia reported emissions of NO_x, NMVOC, NH₃, CO, Pb, Cd, Hg, As, Cr, Cu, Ni, Se, Zn, PCDD/ PCDF, PAHs, HCB, PCBs as "NA (Not Applicable)". According to the EMEP/EEA GB 2016, only PCBs are considered "Not Applicable" for cement production. The ERT recommends, therefore, that Georgia use the notation key "NE (Not Estimated)" for all pollutants that are not PCBs, according to the EMEP/EEA GB 2016.

100. The ERT was able to calculate an IEF for TSP emissions based on reported AD and emissions in the NFR table provided by Georgia. This IEF amounts to between 1000 and 1700 g/Mg of clinker for the period 2014-2017. The recommended Tier 1 emission factor for TSP in the EMEP/EEA GB 2016 amounts to 260 g/Mg of clinker and a range of values between 130 and 520 g/Mg is given in the EMEP/EEA GB 2016. After the review, Georgia confirmed to the ERT that fabric filters had been in use in Georgia's cement facilities since 2009 to control stack emissions. Despite the use of best available techniques to reduce particles emissions in cement plants, Georgia has used a national emission factor which is between four and seven times higher than the Tier 1 emission factor recommended by the EMEP/EEA GB 2016. As Georgia has not provided the ERT with enough information on the emission factor to explain the high national EF used to estimate TSP emissions from cement production, and as Georgia has not provided the ERT with revised estimates, the ERT has not been able to assess the accuracy of the emission factor and recommends that Georgia apply the technical correction proposed by the ERT (see section "Potential Technical Corrections" below).

Category issue 2: 2.A.2 Lime production

101. The ERT noted that, in the NFR tables submitted by Georgia, emissions and activity data for lime production had been reported as "not occurring (NO)" for the year 2007. The ERT noted, also in that table, that neither emissions nor activity data had been reported for the year 2011. "NA" had been reported for that year. The ERT also noted, in the greenhouse gas inventory submitted by Georgia to the UNFCCC in 2019, that Georgia had reported CO₂ emissions from lime production for the period 1990-2015. According to this information, it seems that the use of the notation keys "NO" and "NA" is not accurate. The ERT recommends that Georgia estimate emissions from lime production for all the years during which lime production occurred, using consistent methodologies.

102. The ERT noted that, according to the emissions reported in the NFR table by Georgia for lime production, PM_{2.5} emissions corresponded to 7.78 % of TSP emissions for

all reported years except 2010, 2012, 2013 and 2014. A size fraction of 7.78 % of TSP is recommended for PM_{2.5}, in the EMEP/EEA GB 2016. The ERT also noted that in the reported NFR table for the year 2010, Georgia had estimated PM_{2.5} emissions at 2.23 kt whereas emissions of TSP had been estimated at 0.82 kt. After the review, Georgia confirmed to the ERT that the reported values for 2010, 2012, 2013 and 2014 were not correct and provided the ERT with corrected values. The ERT commends Georgia for this and recommends that Georgia correct the respective values for the next submission.

103. The ERT noted that Georgia reported emissions of NO_x, NMVOC, SO₂, CO, Pb, Cd, Hg as “NA” (Not Applicable) for the period 2008-2017. According to the EMEP/EEA GB 2016, these pollutants should not be considered as “NA”. The ERT recommends that Georgia use the notation key “NE” (Not Estimated) for these components, according to the EMEP/EEA GB 2016.

Category issue 3: 2.A.3 Glass production

104. After the review, Georgia provided the ERT with an explanation regarding the methodology used to estimate emissions from glass production. The ERT commends Georgia for this and recommends that Georgia should add these explanations to the IIR for the next submission.

105. The ERT noted that, in the NFR table submitted by Georgia, emissions of heavy metals had been reported as “not applicable” (“NA”) for the years from 2009 to 2012. As emissions of these components have been reported for the years after 2012, the use of this notation key does not seem to be accurate. The ERT recommends that Georgia should revise the use of its notation keys according to the EMEP/EEA GB 2016 and the Reporting Guidelines.

106. The ERT noted that Georgia had reported emissions of SO₂, NMVOC, NH₃, PCDD/PCDF, PAHs as “NA” (Not Applicable) for the period 2009-2017. According to the EMEP/EEA GB 2016, these components should not be considered as NA. The ERT recommends that Georgia should use the notation key “NE” (Not Estimated) for these components, according to the EMEP/EEA GB 2016.

Category issue 4: 2.A.5.c Storage, handling and transport of mineral products

107. In the NFR table submitted by Georgia, the ERT noted that particle emissions had been reported as “NA” for all years. The EMEP/EEA GB 2016 gives emission factors for particle emissions from this source category. The choice of the notation key “NA” is therefore not accurate. If emissions are not estimated, the notation key “NE” should be used for particle emissions instead, while the notation key “IE” should be used if emissions are included in other sectors of the mineral processes. The ERT recommends that Georgia should revise the use of its notation keys according to the methodologies used in its inventory.

Category issue 5: 2.A.6 Other mineral products

108. In the NFR table submitted by Georgia, the ERT noted that BC emissions had been reported as “NA” for the years 2007 to 2012, while emissions had been reported for the

years from 2013 to 2016 and the notation key “NE” had been used for 2017. The choice of the notation key “NA” is therefore not accurate. The ERT recommends that Georgia should revise the use of its notation keys according to the EMEP/EEA GB 2016 and the Reporting Guidelines.

109. In the NFR table submitted by Georgia, the ERT noted that CO, NO_x, SO₂ emissions had been reported as “NA” for the year 2009, while for the other years from 2007 to 2017 emissions had been reported. When the issue was raised with the Party, Georgia explained that the emissions of these pollutants had been from brick production plants from 2007 to 2017 but had not been reported in 2009 as there was no brick production in 2009. According to this information, the choice of the notation key “NA” does not seem accurate. The ERT recommends that Georgia should revise the use of its notation keys according to the EMEP/EEA GB 2016 and uses the notation key “NO” as production was not occurring in 2009.

110. In the NFR table submitted by Georgia, the ERT noted that emissions of PAHs total (total 1-4) had been reported as “NA” for the whole period. However, the ERT noted also that emissions of benzo(a)pyrene had been reported for some years. Total PAHs emissions should be the total of the 4 reported PAHs. Therefore, the choice of the notation key “NA” does not seem accurate. The ERT recommends that Georgia should revise the use of its notation keys according to the EMEP/EEA GB 2016 and the Reporting Guidelines.

Category issue 6: 2.B.1 Ammonia production

111. The ERT noted that, according to the NFR tables reported by Georgia, ammonia production was not occurring in Georgia as the notation key “NO” (Not Occurring) had been used both for activity data and emissions. The ERT noted also that, in the greenhouse gas inventory submitted by Georgia to the UNFCCC in 2019, Georgia had reported CO₂ emissions from ammonia production for the period 1990-2015. After the review, Georgia explained that the emissions from ammonia production had been reported within the sector 2B10a - chemical industry, together with emissions from fertiliser production, as the same plants produced both products. According to this information, it seems that the use of the notation key “NO” is not accurate. The ERT recommends that Georgia should use the notation key “IE” as the emissions are included elsewhere and that it provides an explanation in the IIR.

Category issue 7: 2.B.2 Nitric acid production

112. The ERT noted that, according to the NFR tables reported by Georgia, nitric acid production was not occurring in Georgia as the notation key “NO” (Not Occurring) had been used both for activity data and emissions. The ERT noted also that, in the greenhouse gas inventory submitted by Georgia to the UNFCCC in 2019, Georgia had reported CO₂ emissions from nitric acid production for the period 1990-2015. After the review, Georgia explained that the emissions from nitric acid production had been reported within the sector 2B10a - chemical industry, together with the emissions from fertiliser production, as the same plants produced both products. According to this information, it seems that the use of the notation key “NO” is not accurate. The ERT recommends that Georgia should use the notation key “IE” as the emissions are included elsewhere and that it provides an explanation in the IIR.

Category issue 8: 2.B.10.a Chemical industry: Other

113. The ERT noted that, according to the reported NFR tables, NH₃ emissions had only been reported for the years 2016, 2017. Ammonia production (2B1) is a source of NH₃ emissions, so according to the answer provided by the Party (see category issue 6), NH₃ emissions are expected to be found under the 2B10a category. Furthermore, the ERT has also noted that NMVOC emissions have only been reported for the period 2007-2012. The ERT noted that for the rest of the period the notation key “NE” had been used for both components. Georgia did not provide any explanation in the IIR, and did not provide sufficient information to the ERT during the review. The ERT recommends that Georgia should provide emissions estimates for the missing years or includes clear explanations for the choice of its notation keys in the IIR.

114. Based on the data included in the NFR table, the ERT has been able to calculate an implied emission factor (IEF) for NO_x, TSP and CO emissions. The ERT noted that the IEFs for these pollutants had been almost constant for the period 2007-2012. The ERT also noted that the IEF decreased by 96% for NO_x, 74% for TSP and 75% for CO between 2012 and 2013. After the review, Georgia explained to the ERT that two different methodologies had been used for the time series, one for the period 2007-2012 and one for the years after 2012. The use of these two methodologies clearly results in inconsistencies in the time series. The ERT recommends that Georgia should revise the methodology used to estimate emissions from that sector so as to calculate a consistent time series and that it provides an explanation in the IIR.

115. The ERT noted that TSP emissions from this source category decreased by 96% between 2016 and 2017 according to the emissions reported in the NFR table. After the review, Georgia confirmed to the ERT that this was a mistake and provided the ERT with the corrected value. The ERT commends Georgia for this and recommends that Georgia should correct this value for the next submission.

Category issue 10: 2.C.2 Ferroalloys production

116. In the NFR table submitted by Georgia, the ERT noted that NH₃, Pb, Cd, Hg, As, Cr, Cu, Ni, Se, Zn, PCDD/PCDF, PAHs emissions had been reported as “NA”. According to the EMEP/EEA GB 2016, the notation key should be “NE”. The ERT recommends that Georgia should revise the use of the notation key for these components according to the EMEP/EEA GB 2016.

Category issue 11: 2.C.3 Aluminium production

117. The ERT noted that, according to the IIR p31, emissions from secondary aluminium production had been estimated using the EMEP/EEA GB 2016 Tier 1 approach. Based on the data included in the NFR table, the ERT was able to calculate an implied emission factor (IEF) for the reported pollutants. For TSP, PM₁₀, PM_{2.5} these IEFs do not match the EFs recommended by the EMEP/EEA GB 2016. After the review, Georgia provided the ERT with partial explanations. Georgia does not use a Tier 1 methodology; it uses a Tier 2 methodology to estimate emissions from secondary aluminium production. In addition, plant-specific abatement factors have been included in the calculations. Nevertheless, no information has been provided to the ERT regarding the inconsistencies of the times series

for the emission factors. The ERT recommends that Georgia provide detailed information on the methodology used to estimate emissions from aluminium production in the IIR.

Category issue 12: 2.C.5 Lead production

118. The ERT noted that Georgia had reported lead production in the NFR table. Activity data had been reported for the years 2013 to 2016 while the notation key “NO” had been used for the period 2007-2012. For the year 2017, no activity data had been reported, although emissions had been included in the NFR table,. After a question raised by the ERT, Georgia explained to the ERT that since only one plant had produced lead in 2017, the notation key “NO” had been used. According to this information, it seems that the use of the notation key “NO” is not accurate. The ERT recommends that Georgia should use the notation key ‘C’ as appropriate in cases where emissions are occurring and reporting could lead to the disclosure of confidential information, and that Georgia provides an explanation in the IIR.

Category issue 13: 2.H.1 Pulp and paper industry

119. The ERT noted that, according to the IIR, emissions from the pulp and paper industry had been estimated using country-specific emission factors. As no more information is given in the IIR regarding the methodology and the emission factors used to estimate emissions from the pulp and paper industry, the ERT requested more information during the review. Georgia provided the ERT with detailed information regarding the emission factors after the review and the ERT commends Georgia for this. The ERT recommends that Georgia include this information in the IIR for the next submission in order to enhance the transparency of the IIR.

Category issue 14: 2.H.2 Food and beverages industry

120. The ERT noted that, according to the IIR, emissions from the food and beverages industry had been estimated using country-specific emission factors. As no more information is given in the IIR regarding the methodology and the emission factors used to estimate emissions from food and beverages industry, the ERT requested more information during the review. Georgia provided the ERT with detailed information regarding the emission factors after the review and the ERT commends Georgia for this. The ERT recommends that Georgia should include this information in the IIR for the next submission in order to enhance the transparency of the IIR.

Category issue 14: 2.I Wood processing

121. Based on the data reported in the NFR tables, the ERT has been able to calculate an implied emission factor (IEF) for TSP emissions for the reported time series. The ERT has noted that this IEF is constant for the time series, except for 2013. During the review, Georgia informed the ERT that there was a mistake in the activity data reported for the year 2013 and provided the ERT with the corrected value. The ERT commends Georgia for this and recommends that Georgia correct the reported activity data value in the next submission.

SOLVENTS

Review Scope

Pollutants Reviewed		NO _x , NMVOC, SO ₂ , NH ₃ , PM ₁₀ & PM _{2.5}		
Years		2007 – 2017		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
2D3a	Domestic solvent use including fungicides	x		x
2D3d	Coating applications	NE		
2D3e	Degreasing	NE		
2D3f	Dry cleaning	NE		
2D3g	Chemical products	NE		
2D3h	Printing	NE		
2D3i	Other solvent use	x(NA)		x
2G	Other product use	x(NA)		x
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

Transparency

122. Georgia provided emissions data for the period 2007-2017 but has not provided any data for the years prior to 2007. The IIR does not provide any explanation for the choice of the time series.

123. The NFR tables provided by Georgia contain emission data only for the category 2.D.3.a - Domestic solvent use including fungicides and use notation keys for all other sectors where estimates are not available. The notation key "NE" is used for several potentially significant sources and no information is available regarding the reason for these emissions not being included. The notation key "NA" is also used and may not be appropriate. The ERT recommends that Georgia should use appropriate notation keys as outlined in the Reporting Guidelines (e.g. "NO" where emissions are "Not Occurring", "NE" where emissions are "Not Estimated", "IE" where emissions are "Included Elsewhere" and "NA" where emissions are "Not Applicable") for reporting where estimates are not available or necessary.

124. Georgia has not provided a detailed or generally transparent emissions inventory for the Solvents sector. The information on the methodologies used provided to the ERT before and during the review was not enough. The ERT recommends that Georgia submit an IIR with more detailed descriptions of the methodologies, emission factors and activity data used to estimate emissions, and with explanations regarding the choice of notation keys.

Completeness

125. Georgia has improved its inventory by including emissions from source category 2.D.3.a- Domestic solvent use including fungicides as recommended under the previous review. The ERT commends Georgia for this. Nevertheless, all other source categories within the Solvent sector have been reported as "NE" in the NFR tables provided to the

ERT. Georgia uses the notation key “NE” for potentially significant emissions sources. The inventory provided by Georgia is therefore not considered complete. The ERT recommends that Georgia estimate emissions for all source categories within the Solvent sector using methodologies provided by the EMEP/EEA GB 2016.

Consistency including recalculation and time-series

126. Georgia only provided data for the time series 2007 – 2017 for the source category 2.D.3.a- Domestic solvent use including fungicides. For all other sources, Georgia reported the notation key “NE”. The consistency of the Georgian inventory could therefore not be assessed by the ERT.

127. Georgia has recalculated its inventory for source category 2.D.3.a. The IIR includes explanations about this recalculation and the ERT commends Georgia for this. Nevertheless, the ERT encourages Georgia to provide a more detailed explanation in its IIR regarding the recalculations, including the impact on the sector and implications for trends in the Solvent sector.

Comparability

128. As Georgia did not provide the ERT with the necessary information before or during the review, the comparability of the Georgian inventory could not be assessed by the ERT.

Accuracy and uncertainties

129. As Georgia did not provide the ERT with the necessary information before or during the review, the accuracy of the Georgian inventory could not be assessed by the ERT.

Improvement

130. The ERT noted that Georgia had not included any categories from the solvent sector in its improvement plan although most of the source categories had been reported as not estimated. The ERT encourages Georgia to set up an improvement plan for the Solvent sector and to include in it the recommendations of the ERT.

Sub-Sector Specific Recommendations

Category issue 1: 2.D.3.a Domestic solvent use including fungicides

131. In the NFR tables submitted by Georgia, the ERT noted that particle emissions had been reported as NA. According to the EMEP/EEA GB 2016, the notation key should be “NE”. The ERT recommends that Georgia should revise the use of the notation key according to the EMEP/EEA GB 2016 and that it includes explanations for the use of this notation key in the IIR (“General assessment of completeness”).

Category issue 2: 2.D.3.i-, 2.G Other product use

132. According to the NFR tables submitted by Georgia, the ERT noted that ‘NMVOC’ emissions had been reported as “NA”. According to the EMEP/EEA GB 2016, the notation key should be “NE”. The ERT recommends that Georgia should revise the use of the

notation key according to the EMEP/EEA GB 2016 and that it includes explanations for the use of this notation key in the IIR (“General assessment of completeness”).

AGRICULTURE

Review Scope

Pollutants Reviewed		NO _x , NMVOC, SO ₂ , NH ₃ , PM ₁₀ & PM _{2.5}		
Years		1990 – 2017		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
3B1a	Dairy cattle	x		x (NH ₃)
3B1b	Non-dairy cattle	x		x (NH ₃)
3B2	Sheep	x		x (NH ₃)
3B3	Swine	x		x
3B4a	Buffalo	x		x (NH ₃)
3B4d	Goats	x		x (NH ₃)
3B4e	Horses	x		x
3B4f	Mules and asses	x		x
3B4gi	Laying hens	x		x (NH ₃)
3B4gii	Broilers	x		x
3B4giii	Turkeys	x		x
3B4giv	Other poultry	x		x (NH ₃)
3B4h	Other animals	x		
3Da1	Inorganic N-fertilizers (includes also urea application)	x		
3Da2a	Animal manure applied to soils	x		x (NH ₃)
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		x (NH ₃)
3Da4	Crop residues applied to soils	x		x
3Db	Indirect emissions from managed soils	x		x
3Dc	Farm-level agricultural operations including storage, handling and transport of agricultural products	x		x
3Dd	Off-farm storage, handling and transport of bulk agricultural products	x		x
3De	Cultivated crops	x		x
3Df	Use of pesticides	x		x
3F	Field burning of agricultural residues	x		x
3I	Agriculture other	x		
11A	Volcanoes	x		
11B	Forest fires	x		
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

133. The ERT commends Georgia for the inclusion of PM emissions from agriculture.

134. The ERT notes that the use of the notation keys is not explained - neither in the NFR nor in the IIR; this makes it difficult to see where emissions are included when “IE” is used, or why emissions are not included in the NFR when “NE” is used. The ERT recommends that Georgia should include explanations for all notation keys.

135. The ERT notes that for all key sources a Tier 1 calculation method has been used. The key sources have a great impact on the national total, which is why it is important to calculate these emissions with a greater level of detail. The ERT recommends that Georgia calculate all key sources with a Tier 2 or higher calculation method, as requested by the Reporting Guidelines.

136. The inventory covers emissions of NH₃, NO_x, NMVOC, PM_{2.5}, PM₁₀ and TSP from the most important livestock categories and from the use of mineral fertilisers. The ERT encourages Georgia to continue including more emission sources and to improve the transparency of its IIR by including information on activity data.

Transparency

137. The ERT commends Georgia for the use of all notation keys in the NFR tables and for using no zero-values for agriculture. However, the ERT notes that there are no explanations for the different notations keys included in the NFR nor in the IIR. The ERT recommends that Georgia should include explanations for the different notation keys, for example by referring to the category in which the emissions from broilers are included.

138. The ERT notes that Georgia uses the 'total emission factor' for the calculation of NH₃ emissions. There are more detailed emission factors available, with disaggregated emissions. The ERT recommends that Georgia should use the disaggregated emission factors provided in the EMEP/EEA GB 2016 for the calculation of the 3.B, 3.D.a.2.a and 3.D.a.3 emissions to make the impact of the different categories more transparent.

139. The ERT notes that the use of notation keys is not always correct, for example in category 3.D.a.2.a. The ERT recommends that Georgia should use the appropriate notation keys as outlined in the Reporting Guidelines.

140. The ERT notes that the emission factors that are used for the calculation of the emissions are not reported in the IIR. The ERT needs these emission factors to be able to reproduce the calculated emissions. Georgia provided the emission factors during the review process. The ERT recommends that Georgia include these emission factors in the IIR.

Completeness

141. The ERT notes that Georgia uses a notation key for 17 of the 25 NFR categories. Not reporting these emissions could lead to an underestimation of emissions. In response to the ERT's questions, the Party indicated a lack of activity data in some cases. The ERT recommends that Georgia should gather all the relevant information so that all these emissions can be included. In cases where emissions are not reported, the ERT encourages Georgia to provide a justification in the IIR.

142. The ERT commends Georgia for including PM emissions in the key source analysis as recommended in 2016.

Consistency including recalculation and time-series

143. The ERT notes a drop in emissions in 2014. Georgia indicated during the review that this drop was caused by a recalculation of activity data by Geostat. However, Georgia could not explain the difference that caused the shift in the activity data. It is important for consistency between years to use the same activity data, otherwise it is not possible to compare emissions from different years with each other or analyse emission trends. The ERT recommends that Georgia should use a consistent source of activity data throughout the time series.

Comparability

144. The ERT notes that Georgia uses methods as described in the EMEP/EEA GB 2016. The ERT commends Georgia for the use of the EMEP/EEA GB 2016 and for making it comparable to the other countries. However, the lack of information in 3.D makes complete comparability a challenge. The ERT recommends that Georgia include more details on 3.D emissions in its IIR.

Accuracy and uncertainties

145. The ERT notes that no uncertainties are reported in the IIR. The ERT encourages Georgia to undertake uncertainty analysis for the Agriculture sector in order to help inform the improvement process and to provide an indication of the reliability of the inventory data.

Condensable

146. The ERT notes that nothing is mentioned about the condensable component of PM in the IIR. The ERT is aware that there are no condensable emissions from the Agriculture sector and encourages Georgia to state this in its IIR, as requested by Annex II of the Reporting Guidelines.

Improvement

147. The ERT notes that there are no planned improvements mentioned in the IIR. The ERT recommends that Georgia include an improvement plan together with a work plan for the Agriculture sector for the next submission. Recommendations from inventory reviews should be included in this improvement plan.

148. The ERT encourages Georgia to undertake some improvements such as providing explanations for emission trends and to ensure that descriptions of planned and performed improvements are included in the IIR in future submissions.

Potential Technical Corrections

149. The ERT has not prepared any technical corrections for the Agriculture sector of Georgia's inventory.

Sub-Sector Specific Recommendations

Category issue 1: 3.B Manure management

150. The ERT notes that the emission factors that are used for the calculation of 3.B emissions are not reported in the IIR. The ERT needs these emission factors to be able to reproduce the calculated emissions. Georgia provided the emission factors during the review process. The ERT recommends that Georgia include the emission factors for the calculation of 3.B emissions in the IIR in the next submission.

151. The ERT notes that for the calculation of 3.B.3 emissions from swine, Georgia makes a distinction between fattening pigs and sows. The animal numbers in the different categories are not included in the IIR. The ERT recommends that Georgia include the activity data for 3.B.3 in the IIR.

Category issue 2: 3.B Manure management – NH₃

152. The ERT notes that 3.B.1.a, 3.B.1.b and 3.B.g.ii are key sources for NH₃ emissions. These emissions are calculated using a Tier 1 method. The ERT recommends that Georgia should apply a Tier 2 or higher method for the calculations of NH₃ emissions from 3.B.1.a, 3.B.1.b and 3.B.g.ii as requested in the Reporting Guidelines.

Category issue 3: 3.B Manure management – NO_x

153. The ERT notes that an average emission factor is used for NO_x emissions from manure management. The ERT encourages Georgia to collect more data on the manure management system for 3.B NO_x, so that a difference can be made between solid and liquid manure to obtain a better estimate of the emissions.

Category issue 4: 3.B Manure management – NMVOC

154. The ERT notes that 3.B.1.a is a key source for NMVOC emissions. These emissions are calculated using a Tier 1 method. The ERT recommends that Georgia should apply a Tier 2 or higher method for the calculation of NMVOC emissions from 3.B.1.a as requested in the Reporting Guidelines.

Category issue 5: 3.B Manure management – PM₁₀

155. The ERT notes that 3.B.g.ii is a key source for PM₁₀ emissions. These emissions are calculated using a Tier 1 method. The ERT recommends that Georgia should apply a Tier 2 or higher method for the calculations of PM₁₀ emissions from 3.B.g.ii as requested by the Reporting Guidelines.

Category issue 6: 3.D Crop production and agricultural soils

156. The ERT notes that the use of notation keys is not always correct. For example, emissions of 3.D.a.2.a are reported as “NA” while these emissions are included with 3.B emissions; therefore, this should be ‘Included Elsewhere’ (IE). The ERT recommends that Georgia should use the appropriate notation keys.

157. The ERT notes that for the calculation of 3.D.a.1 emissions from inorganic N fertilisers the area is used as activity data for NMVOC and PM emissions. This activity data is not reported in the IIR. The ERT recommends that Georgia include the activity data for the calculation of NMVOC and PM emissions from 3.D.a.1 in the IIR in its next submission.

158. The ERT notes that the amount of nitrogen used in mineral fertilisers, which is used as activity data for the estimation of NH₃ and NO_x emissions, is given in the NFR table. The ERT recommends that Georgia include a table in the IIR showing the N content in fertilisers.

159. The ERT notes that 3.D.a.1 is a key source for NH₃ emissions. These emissions are calculated using a Tier 1 method. The ERT recommends that Georgia use a Tier 2 or higher method for the calculations of NH₃ emissions from 3.D.a.1 as requested by the Reporting Guidelines.

WASTE

Review Scope

Pollutants Reviewed		All		
Years		2007 – 2017		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
5A	Biological treatment of waste - Solid waste disposal on land	x		x
5B1	Biological treatment of waste - composting		x	x
5B2	Biological treatment of waste - Anaerobic digestion at biogas facilities		x	x
5C1a	Municipal waste incineration		x	x
5C1bi	Industrial waste incineration	x		x
5C1bii	Hazardous waste incineration		x	x
5C1biii	Clinical waste incineration	x		x
5C1biv	Sewage sludge incineration		x	X
5C1bv	Cremation		x	
5C1bvi	Other waste incineration (please specify in the IIR)		x	
5C2	Open burning of waste		x	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	x

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

General recommendations on cross-cutting issues

Transparency

160. Georgia provides brief descriptions of the calculation of emissions in the IIR including some general references to activity data and EF sources. The ERT encourages the Party to explain in more detail the calculation methods, EFs and data sources in the IIR. The ERT suggests the following IIR content as proposed in the Reporting Guidelines.

Completeness

161. The inventory for the Waste sector is not complete for all years or all sub-categories. For the year 2017, 5 out of 15 sub-categories are reported in the Waste sector. Emissions are reported for the period 2007-2017. No emissions are reported for the period 1990-2006. The ERT encourages the Party to increase the completeness of the inventory.

Consistency, including recalculation and time series

162. Based on the information given in the NFR tables and in the IIR, the ERT concludes that the inventory for the Waste sector is not entirely consistent. No further explanation is provided in the IIR. The ERT encourages Georgia to examine the use of its notation keys and to provide explanations for their application in the IIR. In the IIR, Georgia mentions recalculations for sector 5.A due to updated data on CH₄ emissions from solid waste

disposal on land which have become available from Georgia's Biennial Update Report to the UNFCCC. The ERT recommends for the next recalculations that Georgia should explain in more detail any changes (EF, activity data or methodology) that have led to the recalculations.

Comparability

163. The emissions estimates in the Waste sector are not comparable to other parties' estimates. No activity data has been reported in the NFR tables for annual deposition of MSW at SWDS [kt] and total organic product [Gg DC/yr]. The ERT recommends providing activity data in the NFR tables and IIR. Activity data gives the opportunity to compare Georgia's reported emissions with other parties' reported emissions.

Accuracy and uncertainties

164. Georgia does not report an uncertainty analysis for the Waste sector. The ERT encourages the Party to establish an uncertainty analysis for the Waste sector according to EMEP/EEA GB 2016.

Improvement

165. In the previous Stage 3 review in the year 2016, Georgia stated that improvements would be implemented in the next submissions in sector 5.A (activity data time series, emissions of particulate matters). In the year 2019 there are no improvements in this sector. Also, no emissions from waste incineration are reported for the previous years (1990 - 2012) although this had been announced in the 2016 review responses. The ERT encourages Georgia to work on obtaining the necessary data and on emissions calculations for a full time series (starting 1990).

Potential Technical Corrections

166. The ERT has not prepared any technical corrections for the Agriculture sector of Georgia's inventory.

Sub-Sector Specific Recommendations

Category issue 1: 5.A Solid waste disposal on land – NMVOC

167. Georgia reports NMVOC emissions from solid waste disposal on land. The ERT finds that the description of the emission calculation is not transparent. The ERT encourages the Party to provide a more detailed explanation for the methodology used for landfill gas estimation, including general assumptions.

Category issue 2: 5.A Solid waste disposal on land – PM_{2,5}, PM₁₀ and TSP

168. Georgia does not estimate PM_{2,5}, PM₁₀ and TSP emissions from solid waste disposal on land. The ERT recommends that the Party should calculate PM_{2,5}, PM₁₀ and TSP emissions according to the EMEP/EEA GB 2016 methodology using annual amounts of disposed waste. It is stated that in Georgia's waste management plan disposed waste

amounts must be estimated. Also, information from GHG reporting to the UNFCCC could be used to determine disposed wastes amounts.

Category issue 3: 5.B.1 Biological treatment of waste – Composting

169. Georgia does not report emissions from composting. As household composting occurs in every country, the ERT recommends that the Party establish a data collection or estimation system for composted waste amounts and estimates and reports emissions using the methodology from the guidebook.

Category issue 4: 5.B.2 Biological treatment of waste – Anaerobic digestion at biogas facilities

170. Georgia does not report emissions from anaerobic digestion in biogas facilities. The notation key “NA” is used. If anaerobic digestion does not occur in Georgia, the notation key “NO” should be used. However, the ERT recommends obtaining information and checking the possibility of anaerobic digestion taking place in the country.

Category issue 5: 5.D.1 Domestic Wastewater handling – NH₃

171. Georgia does not report NH₃ emissions from domestic wastewater handling. In the Stage 3 review Georgia responded that NH₃ emissions calculations would be included in the next submission. In the year 2019 these emissions are not reported. The ERT recommends that Georgia should estimate the number of inhabitants who are not connected to centralised wastewater collection systems. If this is known, it will be possible - according to the EMEP/EEA GB 2016 - to calculate NH₃ emissions from latrine usage.

Category issue 6: 5.C Waste incineration

172. Georgia reports emissions in 2 sub-categories (industrial and clinical) for waste incineration. Emissions are reported only for the year 2013. In the IIR it is explained that the emissions levels come from the enterprises' annual emissions reports. The ERT wishes to remind Georgia that in the waste incineration sector only emissions from incineration without energy recovery should be reported. The ERT recommends that Georgia provide more detailed explanations for waste incineration emissions estimations. In cases where emissions are from the enterprises' annual reports are provided, the ERT would like to know according to which methodology these emissions are reported in the annual reports. Are there any abatement techniques in use etc.?

Category issue 7: 5.C.2 Open burning of wastes

173. Georgia does not report emissions from open burning of wastes. The ERT encourages the Party to investigate the existence of the activity in the country and to estimate and report emissions for the next submissions.

Category issue 8: 5.E Other waste

174. Georgia reports NE for category 5.E. The ERT encourages Georgia to gather data about accidental fires and to calculate these emissions for the next submissions. If it is not

possible to obtain precise data on accidental fires, an average number of fires per inhabitant from the neighbouring countries could be used.

INFORMATION SUBMITTED BY THE PARTY IN 2019

Filename	Short description of content
NFR_Georgia_2007-2017.xlsx	Annex I, MS Excel file , years 2007-2017
IIR_Georgia_2019.pdf	IIR 2019, pdf-document in English ; 39 pg

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

1. Response to preliminary question raised prior to the review (wiki)
2. Response to questions raised during the review (wiki)
3. Excel file: Activity Data_5D.xlsx (wiki)
4. Excel file: AD_Agriculture_3Da1_Area covered by crop.xlsx (wiki)
5. Excel file: EF_Agriculture 3B_3D_Georgia.xlsx (wiki)
6. Excel file: EFs_National Methodology_2C2_2I_2H1_2H2.xlsx (wiki)

ANNEX I POTENTIAL TECHNICAL CORRECTIONS

175. Technical corrections were proposed by the ERT during the review week for the Transport and IPPU sectors. A summary table is provided below for the years 2010, 2015 and 2017. Detailed related information for all calculated years is provided separately in the Excel file **TC-GE-NFR_1A3_2A_Review_2019.xlsx**.

Description	Reference	Pollutant estimates (kt)		
		2017	2015	2010
SO_x				
National total as reported 2019 (row 141)	Annex I, 14/02/2019	10.54	NA	NA
Difference between original estimate and revised estimates provided by Party and accepted by the ERT				
1.A.3.b.i: RT - Passenger cars		-0.11	NA	NA
1.A.3.b.ii: RT - Light dusty vehicles		-0.02	NA	NA
1.A.3.b.iii: RT - Heavy duty vehicles and buses		-0.08	NA	NA
Difference between original estimate and technical correction deemed necessary by the ERT				
		NA	NA	NA
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using data above	10.33	NA	NA
REVISSED ESTIMATES				
Description	Reference	Pollutant estimates (kt)		
		2017	2015	2010
TSP				
National total as reported 2019 (row 141)	Annex I, 14/02/2019	28.28	27.93	NA
Difference between original estimate and revised estimates provided by Party and accepted by the ERT				
		NA	NA	NA
Difference between original estimate and technical correction deemed necessary by the ERT				
2.A.1 - cement production		-1.82	-1.38	NA
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using data above	26.46	26.55	NA
REVISSED ESTIMATES				
Description	Reference	Pollutant estimates (kt)		
		2017	2015	2010
PM₁₀				
National total as reported 2019 (row 141)	Annex I, 14/02/2019	21.88	21.83	NA
Difference between original estimate and revised estimates provided by Party and accepted by the ERT				
		NA	NA	NA
Difference between original estimate and technical correction deemed necessary by the ERT				
2.A.1 - cement production		-1.64	-1.24	NA

National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using data above	20.24	20.58	NA
PM_{2.5}				
Description	Reference	Pollutant estimates (kt)		
		2017	2015	2010
National total as reported 2019 (row 141)	Annex I, 14/02/2019	17.27	17.47	5.76
Difference between original estimate and revised estimates provided by Party and accepted by the ERT				
2.A.2 - lime production		NA	NA	-2.17
Difference between original estimate and technical correction deemed necessary by the ERT				
2.A.1 - cement production		-0.91	-0.69	NA
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using data above	16.36	16.78	3.59