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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
KYRGYZSTAN**

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INTRODUCTION

1. The mandate and overall objectives for the emission inventory review process under the LRTAP Convention is given by the UNECE document '*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. Under this annual review, all pollutants covered by the LRTAP Convention and its protocols (SO₂, NO_x, NMVOC, NH₃, plus PM₁₀ PM_{2.5}, BC, 3 HMs and POPs) have been checked for the time series years 1990 – 2018 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 under the UNECE LRTAP Convention of Kyrgyzstan coordinated by the EMEP Centre on Emission Inventories and Projections (CEIP) acting as review secretariat. The remotely conducted review was performed by ERT during May and June 2020. The following team of nominated experts from the roster of experts performed the review: Generalists – Risto Saarikivi (CZ), Ben Richmond (UK), Energy – Erik Honig (NL), Marion Pinterits (EU), Garnt Jans Venhuis (NL) and Kristina Jurich (DE), Transport – Giannis Papadimitriou (EU) and Magdalena Zimakowska-Laskowska (PL), IPPU Mirela Poljanac (HR), Juan Luis Martin Ortega (ES), Michaela Titz (AT), Agriculture - Peder Gjølstad Røhnebæk (NO), Hakam Al-Hanbali (SE) and Gwenaëlle Le Borge (FR), Waste – Zuzana Jonacek (SK) and Sabino Del Vento (UK).
4. Kristina Saarinen (FI) was the lead reviewer. The review was coordinated by Katarina Marečková (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 recognises the effort undertaken by Kyrgyzstan in providing an inventory that enables a detailed review and thanks the Party for providing responses to the questions of the ERT during the review that enabled the ERT to make recommendations for further developments of the inventory.
6. Kyrgyzstan provided NFR tables for the year 2018 on 23rd March 2020 after the reporting deadline of 15th February. The IIR was submitted on 23rd March 2020 after the reporting deadline of 15th March. The Party has not yet submitted gridded emissions for Gothenburg Protocol pollutants at a 0.1 x 0.1 long/lat resolution, some LPS data were reported in 2018.
7. The ERT found the inventory not to be transparent. The use of notation keys does not always follow the definitions in the Reporting Guidelines. The IIR is partly prepared according to Annex II of the Reporting Guidelines and includes a key category analysis.
8. The inventory is not complete nor consistent. The ERT noted that several emission sources are not included and that the submission includes only one year (2018) instead of a full time series since 1990.
9. The inventory methodologies are generally in line with the EMEP EEA Emission Inventory Guidebook (version 2016) and reporting is partly in line with the UNECE Reporting Guidelines, thus the inventory is partly comparable with those of other reporting Parties.
10. The accuracy of the inventory is compromised as the Party does not apply Tier 2 methods to key categories. The ERT did not identify systematic under- or over-estimates that would compromise the accuracy of the inventory.
11. During the review, the ERT calculated technical corrections for the Industry and Solvent Use, Agriculture and Waste sectors.
12. Transport emissions are calculated on basis of fuels sold.
13. As a summary of the main findings, further improvement needs were identified for the following items:
 - a) Transparency: information on emission sources in Kyrgyzstan, explanations of emission trends, recalculations and improvements, checking and documentation of notation keys.
 - b) Completeness: completeness of emissions for which there are methods in the Guidebook
 - c) Consistency: completeness of the time-series
 - a) Accuracy: use of Tier 2 or higher methods for all key categories

14. Based on the findings during the review the ERT recommends that Kyrgyzstan establishes a permanent inventory team, nominates sector experts and provides sufficient resources for the work. The ERT recommends that Kyrgyzstan arranges activity data collections to ensure the calculation of all emissions from all sources existing in Kyrgyzstan for which methods exist in the Guidebook, and establishes a close cooperation between national experts working with air pollutant and greenhouse gas inventories for Kyrgyzstan as it is good practice to use the same data in all submissions.

INVENTORY SUBMISSION

15. In the 2020 submission Kyrgyzstan has reported emission data for the year 2018 for its Protocol pollutants. In addition, Kyrgyzstan has provided CO, PM₁₀, PM_{2.5}, TSP, BC, HM and POP emissions for the year 2018. The 2020 submission also includes an IIR in Russian.

16. Emission data are reported by NFR categories; however, some categories are reported as included elsewhere (IE): 1A2gviii, 1A2a-1A2e, 1A4bii, 1A4ai, 3B4giii, 3B4gii and 3B4d, which are reported as included elsewhere (IE) and emissions from the following categories are not estimated (NE): 1A3ai, 1A3aii, 1A3biv, 1A3ei, 1A4aii, 1A5b, 1B, 2A1, 2D3g, 2H1, 2H3, 2I, 3D, 5C1bi, 5C1bii, 5C1biii, 5C1bvi, 5C2, 5E and 6A.

17. The ERT was not able to properly assess the quality of the CLRTAP inventory submitted by Kyrgyzstan, because emission data was provided only for the one year and the IIR did not contain sufficient information to check or to replicate the calculations of emissions estimates.

18. National totals are reported for the entire territory. The Party did not fill out row 152 (National total for compliance calculations and checks (CLRTAP)). The ERT recommends that the Party fill out this row in the next submission, using the same data as in row 141 (National total based on fuel sold) when no emissions are reported in rows 143-151.

KEY CATEGORIES

19. Kyrgyzstan has compiled and presented in its IIR a level Key Category Analysis (KCA) for the year 2018 for the following pollutants: NO_x, CO, NMVOC, SO_x, NH₃, TSP, PM₁₀ and PM_{2.5}, Pb, Cd, Hg and PCDD/F, PAHs and HCB. The ERT notes that the results of the KCA depend on emissions included in the analysis and that there are several likely large emission sources currently missing from the inventory.

20. The ERT recommends that Kyrgyzstan provide a level Key Category Analysis for all the pollutants in the next submission and also develop a trend analysis when a consistent emissions time series is available.

21. The ERT did not find information in the IIR on how Kyrgyzstan uses the results of the KCA. The ERT therefore recommends that the Party use the results of the KCA to prioritise improvements in the inventory and that it document this in the IIR.

22. Kyrgyzstan uses Tier 1 methods for all key categories. According to paragraph 21 of the Reporting Guidelines, the Parties should make every effort to use a Tier 2 or higher (detailed) methodology, including country-specific information. The ERT recommends that the Party upgrade Tier 1 methods to higher tier methods because the use of Tier 1 methods can contribute to under- or over-estimates of emissions.

QUALITY

Transparency

23. The ERT recognises that according to the UNECE Reporting Guidelines (ECE/EB.AIR/125), the Parties should, to improve "Transparency", clearly explain the data sources, assumptions and methodologies used for an inventory (paragraph 5(a)) and that the submission of an IIR is strongly encouraged (paragraph 43). A lack of sufficient documentation in an IIR prevents the ERT from performing a technical review; therefore, the Party needs, in case of a missing or not transparent IIR, to provide the missing information during the review. For this reason, in this technical review report recommendations are given instead of encouragements in cases where there is a need to improve the documentation of data, methods and assumptions used in the inventory.

24. The ERT notes that Kyrgyzstan's IIR partly follows the structure recommended in Annex II of the Reporting Guidelines. The ERT was not able to properly assess the quality of the inventory submitted by Kyrgyzstan because of the limited source descriptions and the limited documentation of details in the assumptions for applied parameters and methods used to calculate emissions. The ERT recommends that Kyrgyzstan follow the IIR structure and details described in Annex II to the Reporting Guidelines, as explained under Sector Specific Recommendations below, and in paragraph 5(a) of the Reporting Guidelines. The ERT also encourages Kyrgyzstan to provide an English translation of the IIR.

25. The ERT notes that the IIR. In Chapter 1.8 Table 1.3 and Table 1.4, provides lists of categories reported as NE and IE. However, the IIR did not provide information on where emissions reported as "included elsewhere" are included or any justifications for not estimating emissions. The ERT recommends that the Party clearly explain the use of each notation key in accordance with paragraph 12 of the Reporting Guidelines where for "NE" under 12(a) the Party should indicate in the IIR why such emissions have not been estimated and for "IE" the Party should indicate, in the IIR, where in the inventory the emissions for the displaced source category have been included,

26. The ERT noted that while emission data was provided only for the year 2018 the IIR did not contain explanations of emission trends, or graphs to visualise trends or developments in emissions or sectors. During the review, Kyrgyzstan provided the statement: *"Presenting Kyrgyzstan data for the full time series of 1990-2017 requires a lot of time and additional staffing. In this regard, we find it difficult to provide an answer regarding the plan and schedule for Kyrgyzstan and present the full time series. Perhaps this issue needs to be addressed at a higher level"*. The ERT recommends Kyrgyzstan, to improve the transparency of the inventory and to include graphical presentations of emission trends and about the drivers behind the trends in addition to

textual explanations. This would be especially helpful for an audience that has no knowledge of the Russian language. The ERT also recommends that Kyrgyzstan ensure sufficient resources for the inventory work.

27. The ERT noted that the information in the IIR on general QA/QC processes used in the preparation of the inventory is only very brief. The ERT recommends that Kyrgyzstan describe QA/QC processes in more detail and transparently, and that it include information on source category specific QA/QC processes especially for key categories in the next submission.

28. The ERT noted that it was not clear which improvements Kyrgyzstan had made based on the previous review recommendations. Kyrgyzstan agreed during the review that information could be clearer. The ERT also noted that the Party does not have an inventory improvement plan. The ERT recommends that Kyrgyzstan develop an inventory improvement plan, include the recommendations from the reviews in the plan, in addition to other identified improvements, and that it present clear steps for each of the improvement items with schedules while also reporting on progress in the IIR.

Completeness

29. The ERT considers the 2020 submission to be incomplete for the pollutants reviewed due to the fact that of only one year (2018) is included, while according to the paragraph 37 of the Reporting Guidelines, the emission inventory should cover all years from 1990 onwards (for particles from 2000 onwards), or from the reference year of the Protocol. The ERT recommends that the Party report a full time series of emissions in future submissions.

30. For geographical coverage the ERT considers the submission to be complete.

31. The following categories are reported as NE: 1A3ai, 1A3aii, 1A3biv, 1A3ei, 1A4aii, 1A5b, 1B, 2A1, 2A5b, 2D3g, 2H1, 2H3, 2I, 3D, 5C1bi, 5C1bii, 5C1biii, 5C1bvi, 5C2, 5E. The ERT recommends that Kyrgyzstan include the missing emissions and notes that some of the missing categories are potential key categories for some emissions.

32. The ERT notes that activity data is in most cases not included in the NFR table or in the IIR and recommends that Kyrgyzstan report activity data as explained in detail in the Sector Specific Recommendations.

Consistency, including recalculations and time-series

33. It was not possible for the ERT to assess the consistency of the inventory and the time series, because Kyrgyzstan provided data for only one year and did not provide time series data. In response to a question posed during the review, Kyrgyzstan responded that collecting data for the period 1990-2014 was technically problematic due to a lack of specialists and time and that, understanding the importance of clear and comprehensive time series, Kyrgyzstan was planning to gradually carry out this work as far as possible, but that it was not possible to determine

the terms necessary for carrying out this work at this stage. The ERT welcomes this plan and strongly recommends that Kyrgyzstan allocate resources to develop a full time series as soon as possible, and that it meanwhile provide a detailed plan, schedule and the current status of the work in the IIR, already in the next submission.

34. The ERT notes that no information on recalculations for the previous years was provided in the IIR. The ERT notes that Kyrgyzstan has carried out recalculations for the year 2016 for example, for NO_x, SO_x, PM_{2.5}, PM₁₀, TSP and BC with an increase in emissions by more than 10%. During the review the Party stated that “The increase in emissions in these categories was due to a change in the reporting methodology. Until 2016, reports were submitted according to the National Statistics Committee of Kyrgyzstan. For 2016, the report was presented using the EMEP/EEA emission inventory guide. This is how the difference in the emissions came about”. The ERT has provided several recommendations for missing or incorrect emissions under the Sub-Sector Specific Recommendations to encourage recalculation for future submissions and recommends that Kyrgyzstan document any future recalculations as requested in paragraphs 33-34 and 38 of the Reporting Guidelines⁷.

Comparability

35. The ERT notes that Kyrgyzstan uses methods in accordance with the 2016 version of the Guidebook and that the allocation of source categories follows the NFR 2014-2 format and that the inventory is therefore not fully comparable with those of other reporting Parties.

36. In response to a question regarding the use of an older version of the Guidebook, Kyrgyzstan stated that the lack of a Russian translation of the 2019 Guidebook has made an implementation of the latest version of the Guidebook difficult. The ERT recommends that Kyrgyzstan revise and update the emissions estimates according to the latest version of the Guidebook according to paragraph 27 of the Reporting Guidelines when that version becomes available in Russian, and that it apply methodologies consistently for the full time series from 1990 to the current reporting year.

37. The ERT recommends that Kyrgyzstan report emission data in the latest version of the NFR table (currently 2019) as indicated on the CEIP website².

Accuracy and uncertainties

38. The ERT did not identify systematic under- or over-estimates of emissions.

39. The ERT notes that the Party uses Tier 1 methods for all key categories and recommends that for all key categories Tier 2 or higher methods are used according to paragraph 21 of the Reporting Guidelines.

40. Kyrgyzstan has not provided a quantitative or qualitative uncertainty analysis in their 2020 submission. The ERT recommends that Kyrgyzstan include uncertainty

² https://www.ceip.at/ms/ceip_home1/ceip_home/reporting_instructions/index.html

quantification in its emission estimates for all pollutants with the most appropriate methodologies available, taking into account guidance provided in the EMEP/EEA Guidebook 2019 as requested in paragraph 31 of the Reporting Guidelines, and using it as a tool for prioritising improvements in the inventory.

Verification and quality assurance/quality control approaches

41. Kyrgyzstan has not developed or implemented a quality assurance/quality control (QA/QC) plan as described in the Guidebook (Inventory Management Chapter). In response to a question about the issue, Kyrgyzstan stated during the review that they do not have resources to provide a QA/QC plan at present, but maybe it would be possible in the future. The ERT notes that implementing systematic quality checks will minimise errors such as those identified in the current submission, as explained in detail under *Sector Specific Recommendations*, and recommends that Kyrgyzstan prepare a QA/QC plan and implement it as soon as possible, and that it meanwhile add the preparation of QAQC plan to the improvement plan and report annually on the status of the work.

42. The ERT notes that an inventory improvement plan is an essential tool for the further development of the inventory and therefore recommends that Kyrgyzstan makes a plan with clear targets and a schedule for improvements, ensuring that resources are available for the work and reporting on progress with the work in the annual submissions.

Reporting of Condensable Particulate Matter

43. Kyrgyzstan does not provide explanatory information in the IIR on whether particle emissions include or exclude the condensable component. The ERT recommends that Kyrgyzstan include such information in the next submission following Annex II of the Reporting Guidelines.

FOLLOW-UP TO PREVIOUS REVIEWS

44. The ERT notes that Kyrgyzstan has implemented the following recommendations from the previous S3 reviews:

- a) Kyrgyzstan included an IIR in the 2020 submission.
- b) Kyrgyzstan conducted a Key Category Analysis and presented the results from a level KCA in its 2020 IIR for the following pollutants: NO_x, CO, NMVOC, SO_x, NH₃, TSP, PM₁₀, PM_{2.5}, Pb, Cd, Hg, PCDD/F, PAHs and HCBs.

45. The ERT notes that Kyrgyzstan has not implemented the following recommendations from the previous S3 reviews and reiterates its recommendations:

- a) Review of the use of notation keys in the inventory and provision of appropriate explanations of that use in the IIR.
- b) Undertake an uncertainty assessment of the inventory.

- c) Report activity data.
- d) Develop a QA/QC plan and apply QA/QC procedures as described within the Guidebook.
- e) Include in the IIR information about any archiving procedures related to the air emission inventory.
- f) Include in the IIR explanations of trends across the time series.

AREAS FOR IMPROVEMENTS IDENTIFIED BY KYRGYZSTAN

46. The ERT notes that Kyrgyzstan does not report on improvements in the IIR. The ERT recommends that Kyrgyzstan prepare an improvement plan for the next submission with schedules and improvement priorities, taking into account the review recommendations:

47. During the review, the Party indicated that it was working to improve several areas including:

- a. Developing a QA/QC plan and implementing QA/QC processes in the future.
- b. Improving the data for all categories, taking into account all the recommendations of the ERT.
- c. Gradually developing the time series as far as possible.

TECHNICAL CORRECTIONS CONSIDERED AND OR CALCULATED BY THE ERT

48. The ERT noted possible underestimations of Hg and PCB emissions from NFR 2K – Consumption of POPs and heavy metals, NMVOC emissions from NFRs 2D3d – Coating applications and 2D3g – Chemical products, NH₃ emissions from NFRs 3Da2a – Animal manure applied to soils and 3Da3 – Urine and dung deposited by grazing animals. as well as from NFRs 5C2 – Open burning of waste and 5E – Other waste (accidental fires) and prepared technical corrections (PTC) as listed below and detailed under Annex I of this report.

49. The ERT used the following methods for the PTCs (explained in detail under Sub-Sector Specific Recommendations):

- a) NFR 2K: Hg and PCB EFs from the 2019 version of the Guidebook and Kyrgyzstan's population³ (2018) as surrogate AD.
- b) NFR 2D3g: Ukraine's⁴ NMVOC emission data (2018) as surrogate, scaled with GDP per capita ratios.

³ <http://data.worldbank.org/indicator/SP.POP.TOTL>

⁴ <https://www.ceip.at/status-of-reporting-and-review-results/2020-submissions>

- c) NFR 3Da2a: Azerbaijan's⁴ NH₃ emissions and animal numbers (2017) as surrogate, scaled with the number of grazing animals in Kyrgyzstan (2018).
- d) NFR 3Da3: Azerbaijan's⁴ NH₃ emissions and animal numbers (2017) as surrogate, scaled with the number of grazing animals in Kyrgyzstan (2018).
- e) NFR 5C2: Moldova's⁴ amount of waste burned (2018) as surrogate AD, scaled with GDP and Guidebook EFs.
- f) For NFR 5E: Moldova's⁴ accidental fires' numbers (2018) as surrogate AD, scaled with GDP and Guidebook EFs. Note that the current PTC is incomplete because it does not include un-detached house fires, fires in apartment buildings and industrial buildings or car fires.

50. The ERT recommends that Kyrgyzstan apply the technical corrections proposed by the ERT, or develops other methods that more accurately correspond to conditions in Kyrgyzstan, for the following potential underestimates:

Potential technical corrections prepared by the ERT

NFR	Pollutant	Year	Calculated by the ERT	Potential contribution to national total
2K	Hg	2018	ERT	23.6% (2018)
2K	PCB	2018	ERT	8925% (2018)
2D3d	NMVOG	2018	ERT	15.7% (2018)
2D3g	NMVOG	2018	ERT	3.0% (2018)
3Da2a	NH ₃	2018	ERT	34.3% (2018)
3Da3	NH ₃	2018	ERT	18.1% (2018)
5C2	Cd	2018	ERT	10.8% (2018)
5C2	PCDD/F	2018	ERT	3.2% (2018)
5C2	PAH-4	2018	ERT	4.2% (2018)
5E*	PM ₁₀ , PM _{2.5} , TSP	2018	ERT	2.2% (2018)
5E*	Cd	2018	ERT	3.7% (2018)
5E*	Hg	2018	ERT	1.2% (2018)
5E*	Pb	2018	ERT	0.03% (2018)
5E*	PCDD/F	2018	ERT	18.9% (2018)

** Note that the current PTC for NFR 5E is incomplete because it does not include un-detached house fires, fires in apartment buildings and industrial buildings or car fires.*

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

51. The ERT identified the following cross-cutting issues for improvement and recommends that the Party:

- (a) Establish a permanent inventory team, nominating sector experts and ensuring that there are sufficient resources for the work.
- (b) Establish close cooperation with the experts that are preparing the air pollutant and greenhouse gas inventories for Kyrgyzstan as it is good practice to use the same data in all submissions.
- (c) Arrange for the collection of activity data to ensure calculation of all emissions from all sources existing in Kyrgyzstan.
- (d) Calculate and report a full time series of emissions since 1990 (particles since 2000) according to paragraph 37 of the Reporting Guideline with consistent methodologies according to paragraphs 22 and 34 of the Reporting Guidelines.
- (e) Complete the inventory by including currently missing emissions in the inventory in line with paragraph 12(a of the Reporting Guidelines) and replace zero-values for emissions and activity data with values or appropriate notation keys.
- (f) Include all Revised Estimates and Technical Corrections provided during the 2020 review (Tables 1 and 2 and Annex I) in the next inventory submission or replace these with emissions calculated with national activity data and Guidebook methods.
- (g) Use Tier 2 or higher methodologies, including country-specific information, for all key categories in line with paragraph 21 of the Reporting Guideline's.
- (h) Use the latest version of the EMEP/EEA Emission Inventory Guidebook (paragraph 37 of the Reporting Guidelines) and the latest version of the NFR table (currently 2019) as indicated on the CEIP website⁵.
- (i) Include in the IIR
 - the structure and contents recommended in Annex II to the Reporting Guidelines
 - a Key Category Analysis (KCA) for all pollutants, using the results of the KCA to prioritise improvements in the inventory, while noting that there are several likely key categories currently missing from the inventory

⁵ https://www.ceip.at/ms/ceip_home1/ceip_home/reporting_instructions/index.html

- a quantitative uncertainty analysis (UCA) in line with paragraph 31 of the Reporting Guidelines, using it as a tool for prioritising improvements in the inventory
 - clearly document the use of notation keys in the IIR in line with paragraph 12 of the Reporting Guidelines.
 - a QA/QC plan and details of QA/QC activities carried out in preparation of the inventory
 - an inventory improvement plan with clear steps and a schedule together with documentation of the improvements made since the last submission
 - information on the inclusion/exclusion of condensable particulate matter
- (j) The ERT further encourages Kyrgyzstan to provide an English language translation of the IIR to enable the ERT to understand the development of the inventory and to provide useful guidance and recommendations for the further development of the inventory.

SECTOR SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

ENERGY

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5} , Cd, Hg, Pb, Dioxin, PAH		
Years		1990 – 2018		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
1A1a	Public electricity and heat production	X		X
1A1b	Petroleum refining	X		X
1A1c	Manufacture of solid fuels and other energy industries	NO		X
1A2a	Iron and steel	IE		
1A2b	Non-ferrous metals	IE		
1A2c	Chemicals	IE		
1A2d	Pulp, Paper and Print	IE		
1A2e	Food processing, beverages and tobacco	IE		
1A2f	Stationary combustion in manufacturing industries and construction: Non-metallic minerals	X		
1A2gviii	Stationary combustion in manufacturing industries and construction: Other	IE		
1A3ei	Pipeline transport	NE		X
1A3eii	Other	NA		
1A4ai	Commercial/institutional: Stationary	IE		
1A4bi	Residential: Stationary	X		
1A4ci	Agriculture/Forestry/Fishing: Stationary	X		
1A5a	Other stationary (including military)	X		
1B1a	Fugitive emission from solid fuels: Coal mining and handling	NE		X
1B1b	Fugitive emission from solid fuels: Solid fuel transformation	NE		X
1B1c	Other fugitive emissions from solid fuels	NE		X
1B2ai	Fugitive emissions oil: Exploration, production, transport	NE		X
1B2aiv	Fugitive emissions oil: Refining / storage	NE		X
1B2av	Distribution of oil products	NE		X
1B2b	Fugitive emissions from natural gas (exploration, production, processing, transmission, storage, distribution and other)	NE		X
1B2c	Venting and flaring (oil, gas, combined oil and gas)	NE		X
1B2d	Other fugitive emissions from energy production	NE		X

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

General recommendations on cross cutting issues

Transparency

52. The ERT notes that the inventory is not sufficiently transparent to meet the criteria as defined in paragraph 5(a) of the Reporting Guidelines: “Transparency” means that the data sources, assumptions and methodologies used for an inventory should be clearly explained in order to facilitate the replication and assessment of the inventory by users of the reported information. The transparency of inventories is fundamental to the success of the process for the communication and consideration of the information. The use of the Nomenclature For Reporting (NFR) tables and the preparation of a structured Informative Inventory Report (IIR) contribute to the transparency of the information and facilitate national and international reviews. The ERT recommends that Kyrgyzstan include the further development of the IIR, in line with the content of Annex II of the Reporting Guidelines, in the inventory improvement plan for the IIR with clear steps and a schedule, while also reporting on progress with the work in the IIR.

Completeness

53. The ERT notes that the Energy sector inventory is partly complete regarding the sources, pollutants and years covered. Kyrgyzstan does not estimate all the pollutant emissions from the sectors 1A3ei, 1B1 and 1B2. In the IIR (Table 1.3) these sectors are listed as NE due to a lack of the necessary initial information. The ERT recommends that Kyrgyzstan gather all necessary activity data and estimate all pollutant emissions for the next submissions, using at least the Tier 1 method of the latest version of the Guidebook to ensure a suitable level of completeness. In case this is not possible the ERT recommends that Kyrgyzstan include this in the inventory improvement plan in the IIR with clear steps and a schedule and that it report on progress with the work in the IIR.

Consistency including recalculation and time series

54. The ERT notes that the inventory is not internally consistent for all the reported years for all elements across the sectors, categories and pollutants as requested in paragraph 5(b) of the Reporting Guidelines. With the current submission it is not possible to evaluate emission trends from the IIR and the NFR as Kyrgyzstan only reports emissions for the year 2018 in the NFR 2020 submission and the ERT can only find data for the years 2015-2017 when looking at older NFR submissions. In response to a question about the issue, Kyrgyzstan stated that the collection of data for the period 1990-2014 was technically problematic due to a lack of specialists and time. At the same time, understanding the importance of clear and comprehensive time series, Kyrgyzstan is planning to gradually carry out the work as far as possible; however, it is not possible to determine the terms necessary for carrying out this work at this stage. The ERT thanks Kyrgyzstan for their response and recommends that Kyrgyzstan include the improvement of consistency in the inventory improvement plan in the IIR and report on progress with the work in the IIR.

Comparability

55. The ERT notes that the inventory of Kyrgyzstan is currently not comparable with those of other reporting Parties as instead of the latest version of the NFR table, the 2014-2 version is used and as Kyrgyzstan uses the 2016 version of the Guidebook instead of the latest version (currently 2019). In response to a question about the issue, Kyrgyzstan stated that the absence of a translation of the EMEP/EEA 2019 Guidebook into Russian made its use more complicated. The ERT thanks Kyrgyzstan for their response and recommends that Kyrgyzstan uses the latest versions of NFR Table 6 and the Guidebook in future submissions.

Accuracy and uncertainties

56. The ERT found several potential under- and over-estimates in the inventory related to methodological choices in the inventory.

57. Kyrgyzstan uses Tier 1 methodology for all sectors and pollutants. When asked why no Tier 2 or 3 methodologies were used for key categories (IIR table 1.2), Kyrgyzstan responded that for most pollutants, the main key category of emissions was category 1A4bi - Residential: Stationary. The national energy balance only presents data on the total consumption of various types of fuel without dividing it into different types of combustion (fireplaces, stoves, etc.). At present, reliable data on the technology of fuel combustion is not available for the population of Kyrgyzstan, which makes it impossible to carry out calculations on the 2nd level of the Guidebook's Tier 2 level. The Guidebook recommends using data on the distribution of fuel used by the population for the main combustion technologies based on analysis of GAINS model data for the 28 EU member states, which is not applicable for Kyrgyzstan.

58. The ERT notes that using a Tier 1 method is not best practice and could result in an over- and/or under-estimate of emissions. This over-/under-estimate may in some cases have a significant impact on the total emissions. According to the paragraph 12 of the Reporting Guidelines, Parties should make every effort to use a Tier 2 or higher (detailed) methodology, including country-specific information, for sources that are key categories in accordance with the Guidebook methodologies. The ERT recommends that Kyrgyzstan investigate Tier 2 methodologies for Key Categories 1A1a for SO_x, NO_x and Cd, and 1A2f for Pb and Hg and provide a detailed plan and timetable to move to a Tier 2 methodology or a clear justification for using a Tier 1 methodology for these key categories. In case the impact of the over/underestimate is considered low, the ERT recommends providing an estimate of the impact on emissions when not using a higher tier method.

59. The ERT notes that Kyrgyzstan includes only some general information on QA/QC in their IIR, and no information specific for the Energy sector. The ERT recommends that Kyrgyzstan provide source-specific information on QA/QC procedures carried out in the Energy sector and on the results of the checks in the IIR.

⁶ <https://www.ceip.at/reporting-instructions>

60. The ERT notes that Kyrgyzstan has not yet undertaken an uncertainty analysis for the Energy sector and recommends that the Party develop an uncertainty analysis for the energy sector in order to help inform on the uncertainty elements impacting the inventory and that it identify improvement needs in the next submissions in line with paragraph 31 of the Reporting Guidelines, and if not yet possible, that it include this with a schedule in the inventory improvement plan and report on progress in the IIR.

Condensable Particulate Matter

61. The ERT notes that Kyrgyzstan does not provide any information on the condensable component in PM for relevant categories. The ERT recommends that the Party include information on whether particle emissions include or exclude the condensable component in the next submissions in line with Annex II of the Reporting Guidelines.

Improvement

62. In the IIR Kyrgyzstan reports that recalculations and improvements were not carried out.

63. The ERT notes that there is a minimal remark on planned improvements in the IIR but that it is not clear what Kyrgyzstan has planned in the way of improvements for the Energy sector, or what it has done with previous recommendations. In response to questions about these issues, Kyrgyzstan stated that they would try to improve the data for all categories, taking into account all the recommendations of the ERT. The ERT thanks Kyrgyzstan for their response and recommends that Kyrgyzstan includes an inventory improvement plan with scheduled actions for the Energy sector and reports on progress in the IIR.

Potential Technical Corrections

64. No potential technical corrections were prepared for the Energy sector.

Sub-Sector Specific Recommendations

Category issue 1: Sector 1A1a Use of notation keys – NH₃

65. The ERT notes that Kyrgyzstan uses the notation key NE for NH₃ in sector 1A1a. The ERT recommends that the Party explain in the IIR to which fuels and technologies the notation key NE is related.

Category issue 2: Sector 1A1b No Activity data presented – Completeness/transparency

66. The ERT notes in the NFR for sector 1A1b that Kyrgyzstan presents emissions for NO_x, NMVOC, particulates and CO, but that activity data is labelled as NA. In response to a question about the issue Kyrgyzstan stated that emission data from category 1A1b was provided based on emission information received from the national statistical office and that obtaining primary data on the amount of fuel used by category for reporting purposes was not possible. The ERT recommends that Kyrgyzstan

obtains all relevant activity data and includes them in future submissions and also points out that this data is available for the preparation of an inventory which is documented in Kyrgyzstan's National Communication under the UNFCCC and that it is good practice to use the same data in all submissions.

Category issue 3: Sector 1A1b Use of notation keys – TSP and BC

67. The ERT notes that for sector 1A1b Kyrgyzstan uses the notation key IE for TSP and BC although only entire source sectors can be included in other source sectors but not individual pollutants. The ERT asked Kyrgyzstan to send calculations of these emissions using the activity data for this sector and emission factors from the Guidebook. During the review week Kyrgyzstan responded that there had been a technical error in reporting on TSP and BC emissions from category 1A1b and that it would be corrected for next year's reporting. The ERT recommends that Kyrgyzstan corrects this in the next submissions.

Category issue 4: Sector 1A1b Use of notation keys – Hg

68. The ERT notes for sector 1A1b that Kyrgyzstan uses the notation key NE for Hg, although EFs are given in the Guidebook and that these emissions can be calculated using the activity data for this sector and emission factors from the Guidebook and that not estimated emissions can result in underestimates of emissions that may have an impact on the total emissions. In response to a question about the issue, Kyrgyzstan stated that emissions from category 1A1b were based on national statistics that do not contain information on Hg emissions and that since no initial input data (AD) was provided to national experts, it was not possible to make calculations. The ERT recommends that Kyrgyzstan obtains all relevant activity data in order to calculate emissions and includes them in future submissions and also points out that this data is available for the preparation of an inventory which is documented in Kyrgyzstan's National Communication under the UNFCCC and that it is good practice to use the same data in all submissions.

Category issue 5: Sector 1A1c Use of notation keys – All pollutants and activity data

69. The ERT notes that for sector 1A1c the notation key NO is used and that in the IIR no reference to the use of NO can be found. In response to a question about the issue, Kyrgyzstan stated that there were no enterprises falling under category '1A1c Manufacture of solid fuels' in Kyrgyzstan. The ERT recommends that Kyrgyzstan includes this information on the not occurring activity in the next submissions of the IIR.

TRANSPORT

Review Scope

Pollutants Reviewed		All		
Years		1990 – 2015		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
1A2gvii	Mobile Combustion in manufacturing industries and construction	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		
1A3bvi	Road transport: Automobile tyre and brake wear	x		
1A3bvii	Road transport: Automobile road abrasion	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		x
1A4cii	Agriculture/Forestry/Fishing: Off-road vehicles and other machinery	x		
1A4ciii	Agriculture/Forestry/Fishing: National fishing	x		
1A5b	Other, Mobile (including military, land based and recreational boats)	x		x
1A3di(i)	International maritime navigation	x		x
1A3	Transport (fuel used)	x		x

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

General recommendations on cross cutting issues

Transparency

70. The ERT notes that the description of the methods and activity data used in the calculation of emissions in the transport sector are not transparent. In order to better assess the quality of the estimations, the ERT recommends that the Party provides an exhaustive and detailed description of the applied methodology, activity data, parameters and emission factors used, distinctly by sub-category, and that it also includes the correct references to information sources according to paragraph 5(a) of the Reporting Guidelines.

71. The ERT notes that the use of notation keys is not explained in the IIR. The ERT has also noted an incorrect or inconsistent use of notation keys in the cases listed below and strongly recommends that Kyrgyzstan correct these as recommended below in accordance with paragraph 12 of the Reporting Guidelines:

- 1A5b - Other, Mobile including military, land based and recreational boats: instead of the notation key NE (not estimated) for all pollutants use "NO" if emissions do not occur or "IE" if the emissions are included under another NFR category.
- 1A3bi-iii - Road transport, instead of the notation key NE (Not estimated) for BC, NH₃, Pb, ID(1,2,3-cd)P, B(k)F, B(b)F and B(a)P: calculate emissions using the methods described in the latest version of the Guidebook (2019).
- 1A4cii - Agriculture/Forestry/Fishing: Off-road vehicles and other machinery: instead of the notation key NE (not estimated) for HCB, PCBs use the notation key NA (not applicable) as no methods are presented in the latest version of the Guidebook.
- 1A3ai(ii) - International aviation cruise (civil), 1A3aii(ii) - Domestic aviation cruise (civil), 1A3di(i) - International maritime navigation, 1A3 - Transport (fuel used): instead of reporting blank cells for activity data, report the relevant activity data, and in case not available, estimate it using methods presented in Part A4 of the Guidebook (Time series consistency), and calculate the missing emissions, or report the correct notation key in line with paragraph 12 of the Reporting Guidelines.
- 1A4bii - Residential: Household and gardening (mobile): for all pollutants reported as IE, provide an explanation in the IIR as to where emissions from this category are included.

72. The ERT notes that Kyrgyzstan did not include the time series of emissions in the NFR table. The ERT recommends that Kyrgyzstan report the whole time series from 1990 onwards in future submissions.

73. In response to questions asked the ERT during the review regarding Transport sector emissions, the Party sent a general response explaining that data are missing for the aviation, railways and navigation subsectors for several years, and that this issue needs to be further investigated and that critical issues about completeness, consistency and transparency have to be clarified. In this regard, the ERT strongly recommends that Kyrgyzstan verify and update the Transport sector inventory's time series according to the latest version of the Guidebook, and that it document all the related information in a transparent and comprehensive way, including recalculations, in the IIR.

74. The Kyrgyzstan reported emissions from the road transport sector; however, no information is provided in the IIR on the methodology. The ERT strongly recommends that the Party provide a detailed explanation of the calculations, possibly with extrapolations of missing estimates, as well as including the rationale behind the choice of methods. The ERT also recommends including information on the impact of the sector on the total emissions and defining the drivers behind the emission trends

in the Transport sector. The ERT also recommends that Kyrgyzstan use the latest version of COPERT V model.

Completeness

75. The ERT considers the Transport sector to be incomplete due to the many sub-sectors reported as “NE” in 2018 and due to the missing time series of emissions. The ERT recommends that the Party estimate and report all the missing emissions and years using the latest version of the Guidebook.

76. The ERT notes that the Party did not report emissions from categories: 1A3ai (i), 1A3aii (i), 1A3biv and 1A3ei. During the review, the Party indicated that those categories were included under 1A3bi, 1A3bii and 1A3biii, because no separate fuel consumption data was available. The ERT recommends collecting fuel consumption data separately for those categories and calculating emissions.

77. The ERT strongly recommends that Kyrgyzstan, on the basis of the review findings, review, update and complete the Transport sector historical time series paying attention to consistency issues related to both emissions values and notation keys for all pollutants and sub-categories.

Consistency including recalculation and time series

78. The ERT could not check the consistency of the time series (including recalculations) because only emission data for the year 2018 were included in the 2020 submission. The ERT recommends that Kyrgyzstan provide exhaustive and transparent documentation of recalculations in the IIR when the time series has been calculated.

Comparability

79. The ERT notes that Kyrgyzstan has not reported emissions the latest NFR format (currently 2019) in the Transport sector and has not used the methods available in the latest version of the Guidebook (currently 2019) and concludes, therefore, that the inventory is not fully comparable with other reports. The ERT therefore strongly recommends that Kyrgyzstan revise and update the emissions estimates, according to the latest version of the Guidebook, and that it use the latest version of the NFR tables as indicated on CEIP website for Reporting Instructions, Annexes to the Reporting Guidelines⁷.

Accuracy and uncertainties

80. The ERT could not check for uncertainties because no uncertainty analysis was available. The ERT recommends that Kyrgyzstan provide an uncertainty analysis as well as a quality system for the inventory in order to inform the improvement process.

⁷ https://www.ceip.at/ms/ceip_home1/ceip_home/reporting_instructions/annexes_to_guidelines/index.html

Condensable Particulate Matter

81. The Party did not provide explanatory information on the condensable component of PM for Transport sector. In the IIR, there is no information of whether particle emissions include or exclude the condensable component. The ERT recommends that Kyrgyzstan include such information in the next submission.

Improvement

82. The ERT notes that the Party, since the last Stage 3 review, has made some improvements in the IIR. The ERT also acknowledges the improvement plans in the IIR and the information on improvements of NFRs 1A3ai(i) and 1A3aii(i) indicated during the review related to, and recommends that the Party carry out these improvements to increase the completeness and accuracy of the inventory.

Potential Technical Corrections

83. No potential technical corrections were prepared for the Transport sector.

Sub-Sector Specific Recommendations

Category issue 1: 1A3b Road Transport - All Pollutants

84. The ERT notes that Kyrgyzstan is currently using Tier 1 country specific emission factors to estimate pollutant emissions for the whole road transport sector. The ERT recommends that Kyrgyzstan use Tier 2 or a higher tier methodology in line with the latest version of the Guidebook, which contains the most up-to-date emission factors for the relevant sources, or provides detailed documentation and references to the country-specific methods in order to enable the ERT to review the methods as explained in paragraph 19 of the Reporting Guidelines.

85. The ERT notes that in the 2020 submission emissions from Motorcycles and mopeds (1A3biv) are reported using the notation key NE. During the review, the Party informed the ERT that categories 1A3bi, 1A3bii and 1A3biii also included emissions from categories 1A3ai (i), 1A3aii (i), 1A3biv, 1A3ei, since there were no separate data on fuel consumption for these categories. The ERT point out that the correct notation key in this case would have been IE. The ERT recommends that the Party calculates and reports emissions from Motorcycles and mopeds (1A3biv) separately and not as part of emissions in other categories of Road Transport.

Category issue 2: 1A3b and 1A3c Road Transport and Railways - All Pollutants

86. The ERT notes that Kyrgyzstan is currently using a national methodology for calculating emissions based on fuel (oil) consumption data and that the coefficients do not correspond to the indicators of oil products that are used today in Kyrgyzstan. The ERT recommends that Kyrgyzstan uses the latest version (2019) of the Guidebook, which contains the most up-to-date emission factors for the relevant sources.

Category issue 2: 1A3dii National navigation (shipping)- All Pollutants

87. During the review, the Party explained that the emissions were not calculated because the activities under source categories 1A3di (ii) 1A3dii did not occur in Kyrgyzstan because there is no access to the sea and waterways. The ERT remarked that there are big lakes in the country and Kyrgyzstan stated, in response to a question about the issue, that some navigation occurs but that in the national statistics there is no data on the use of fuel for such navigation. Kyrgyzstan also confirmed that it would take into account the ERT's recommendations while preparing future reports. The ERT recommends that the Party collect the necessary activity data and that it calculate and report emissions from navigation.

INDUSTRIAL PROCESSES

Review Scope

Pollutants Reviewed		All pollutants		
Years		2016 - 2018		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
2A1	Cement production	x		x
2A2	Lime production	NO, x		x
2A3	Glass production	x		x
2A5a	Quarrying and mining of minerals other than coal	x		x
2A5b	Construction and demolition	x		x
2A5c	Storage, handling and transport of mineral products	x		x
2A6	Other mineral products	NO		
2B1	Ammonia production	NO		
2B2	Nitric acid production	NO		
2B3	Adipic acid production	NO		
2B5	Carbide production	NO		
2B6	Titanium dioxide production	NO		
2B7	Soda ash production	NO		
2B10a	Chemical industry: Other	NO		x
2B10b	Storage, handling and transport of chemical products	NA		
2C1	Iron and steel production	NO, x		x
2C2	Ferroalloys production	NO, x		x
2C3	Aluminium production	NO, x		
2C4	Magnesium production	NO, x		
2C5	Lead production	NO, x		
2C6	Zinc production	NO, x		
2C7a	Copper production	NO, x		
2C7b	Nickel production	NO, x		
2C7c	Other metal production	NO, x		
2C7d	Storage, handling and transport of metal products	x		x
2D3b	Road paving with asphalt	NA, x		x
2D3c	Asphalt roofing	NA, x		x
2H1	Pulp and paper industry	NE, x		x
2H2	Food and beverages industry	x		x
2H3	Other industrial processes	NE, x		x
2I	Wood processing	NE, x		x
2J	Production of POPs	NO		
2K	Consumption of POPs and heavy metals (e.g. electrical and scientific equipment)	NO, x		x
2L	Other production, consumption, storage, transportation or handling of bulk products	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

88. The ERT considers Kyrgyzstan's emission inventory for the Industrial Processes sector submitted in 2020 not to be transparent as all of the methods used to calculate emissions are either not described transparently or not described at all (e.g. country-specific method) in the IIR. Emissions factors and activity data in Kyrgyzstan's inventory are not well documented in the IIR and in Annex I (NFR table). The NFR table provides data for 2018 only, and the IIR contains information on two pages for the whole Industrial Processes sector with a lack of transparency as explained under Sector-Specific Recommendations.

89. The ERT compared the two sets of inventory data submitted in 2018 and 2019 and found that some of the reported emissions and activity data for the Industrial Processes sector are the same in both years with no explanation for that provided in the IIR. As the submission covers only one year, there are no explanations of dips and jumps or other outliers in the emission data reported in the NFR table.

90. The NFR table for 2018 contains both emissions data and notation keys for estimates that are not available or necessary within the Industrial Processes sector.

91. As Kyrgyzstan does not provide activity data in the NFR table for 2018 for all categories for which emission data are provided (except for NFR 2A1 Cement production), it has not been possible for all categories to back-calculate the emissions and obtain implied emission factors which could then be compared with the Guidebook.

92. The ERT notes that the IIR does not follow the outline provided in Annex II of the Reporting Guidelines. The ERT recommends that Kyrgyzstan improves the transparency of reporting by including all of the contents requested in Annex II of the Reporting Guidelines, and that it prioritise the improvements, starting by describing the emission sources and the methods that were used to calculate emissions, and by including activity data as indicated in the Sub-Sector Specific Recommendations.

93. The ERT notes that Kyrgyzstan frequently uses notation keys in the reporting tables when reporting emissions and activity data, and that the notation keys used are not always the appropriate ones. The ERT recommends that Kyrgyzstan follows paragraph 12 of the Reporting Guidelines' for the reporting of emissions and activity data. The ERT also recommends that Kyrgyzstan clearly explains the usage of notation keys in the IIR for each of the source categories for which Kyrgyzstan uses "NE", "IE" and "NO".

Completeness

94. The ERT considers the Industrial Processes inventory not to be complete. In the 2020 submission, Kyrgyzstan has reported emissions with values for five source categories: NFR 2.A.1 Cement production, NFR 2.A.3 Glass production, 2.A.5.a Quarrying and mining of minerals other than coal, NFR 2.C.7.d Storage, handling and transport of metal products and NFR 2.H.2 Food and beverages industry.

95. The submission covers only one year (2018) while reporting of the whole time series 1990 up to the current year (2018) is requested in paragraph 37 of the Reporting Guidelines.

96. The ERT found missing estimates as listed below for which detailed recommendations are provided under Sector Specific Recommendations:

- “NE” reported for emissions and activity data for source categories 2A5b, 2A5c, 2H2, 2H3 and 2I, some of which are potentially key categories.
- “NO” reported in the NFR table including Iron and steel production, all categories of Non-ferrous metals production and Chemical industry while Energy sector emissions from Manufacturing industries and construction are reported; therefore, it can be concluded that some activities within the scope of the manufacturing industries exist in the territory of Kyrgyzstan and that Kyrgyzstan’s inventory is not complete.
- “NA” reported in the NFR table for 2D3a Road paving with asphalt and 2D3c Asphalt roofing - two source categories that exist in almost all countries. The possible level of emissions from these categories can be estimated by scaling another country’s emission data. For example, using Ukraine’s emission data for NMVOC and PM₁₀ for categories NFR 2.D.3.b and 2.D.3.c as surrogate data and scaling emissions for Kyrgyzstan with GDP and population ratios, the ERT was able to conclude that the missing estimates for NMVOC would be approximately 0.02 kt in the case of NFR 2.D.3.b and 1.6E-07 kt in the case of NFR 2.D.3.c, and that for PM₁₀ the emissions would be approximately 0.002 kt for NFR 2.D.3.b and 8.1E-05 kt for NFR 2.D.3.c. The ERT recommends that Kyrgyzstan calculates the missing emissions as indicated in the Sub-Sector Specific Recommendations or that it uses a similar approach to the one presented above, or that it at least corrects the notation key to NE.

97. Kyrgyzstan reports emissions from NFR 2C7d and activity data from NFRs 2H1 and 2I using the notation key “IE”, but with no further information in the IIR on where the emissions and activity data are included. As a result, it is not possible to draw a conclusion as to whether the estimates for the pulp and paper and food sectors are complete or not.

98. Kyrgyzstan includes black carbon emissions for the 2018 only for one source category while for other sectors the notation keys “IE” and “NE” are used but no further explanation is provided in the IIR.

Consistency including recalculation and time series

99. Kyrgyzstan has provided data for one year only, so it is not possible to judge the consistency of the inventory and the time series.

100. Kyrgyzstan has not performed recalculations or other changes in emissions, source categories or years in the latest submission. The ERT has therefore identified

a need for improvement in almost the source categories, as presented in the Sub-Sector Specific Recommendations. Therefore, the ERT recommends that Kyrgyzstan includes in the IIR all information on future recalculations and other changes made to the Industrial Processes sector such as the rationale, the impact on the sector and the implications for emission trends.

Comparability

101. The ERT notes that the inventory of Kyrgyzstan is not comparable to those of other reporting Parties because the methods used to calculate emissions, although consistent with the 2016 version of the Guidebook, are not consistent with the latest 2019 version, and because the country-specific method used for the Industrial Processes sector is not explained in detail in the IIR. Also, the 2020 submission is provided in the NFR 2014 format instead of the 2019 format. The ERT recommends that the Party always uses the latest NFR table format and that it move to the latest version of the Guidebook when it becomes available in Russian.

Accuracy and uncertainties

102. The ERT found possible underestimations because of missing emissions as explained under Sub-Sector sector-specific recommendations.

103. Kyrgyzstan provided a basic description of its quality management system in the IIR. Kyrgyzstan does not carry out QA/QC checks for the Industrial Processes sector. The ERT recommends that Kyrgyzstan implements general quality assurance/quality control (QA/QC) activities in the inventory for the Industrial Processes sector as described in Part A6 of the Guidebook in line with paragraph 32 of the Reporting Guidelines.

104. Kyrgyzstan does not provide a quantitative or a qualitative uncertainty analysis for the Industrial Processes sector. The ERT recommends that Kyrgyzstan includes an uncertainty quantification for estimates of all pollutants with the most appropriate methodologies available, taking into account guidance provided in the 2019 version of the Guidebook (paragraph 31) and using it as a tool for prioritising improvements in the inventory and for providing an indication of the reliability of the inventory data, and recommends that this information is included in the IIR.

Condensable Particulate Matter

105. Kyrgyzstan does not provide explanatory information in the IIR on whether particle emissions include or exclude the condensable component. The ERT recommends that Kyrgyzstan includes such information in the next submission following Annex II of the Reporting Guidelines.

Improvement

106. Kyrgyzstan has not presented any improvement plans for the Industrial Processes sector. However, the ERT recommends that Kyrgyzstan reviews the current inventory in light of the Reporting Guidelines, the Guidebook and the recommendations provided under Sector Specific Recommendations, that it includes new information and

implement improvements and creates an inventory improvement plan with clear tasks and a schedule, while also reporting on progress in future submissions.

Potential Technical Corrections

107. The ERT has noted possible underestimations and prepared technical corrections as listed below and detailed under Annex I of this report. The ERT used Kyrgyzstan’s population in 2018 as activity data (source: <http://data.worldbank.org/indicator/SP.POP.TOTL>), and emission factors as recommended in the 2019 version of the Guidebook. The ERT recommends that Kyrgyzstan applies the calculated technical corrections proposed by the ERT to the following potential underestimates, or that it develops other methods that more accurately correspond to the conditions prevailing in Kyrgyzstan:

108. Table 3. NFR 2K Consumption of POPs and heavy metals: possible underestimation of Hg and PCB emissions for 2018

NFR	Pollutant	Year	Calculated by Party/ ERT	Potential contribution to national total
2K	Hg	2018	ERT	+24%
2K	PCB	2018	ERT	+8925%

Sub-Sector Specific Recommendations

Category issue 1: 2A1 Cement production - PM_{2.5}, PM₁₀, TSP and BC

109. The ERT noted that Kyrgyzstan reported the notation key “NA” for clinker production in 2015 and for the years 2016, 2017, 2018, using the same production volume, and that PM_{2.5}, PM₁₀, TSP and BC emissions in 2018 were approx. 48% higher in 2018 than in 2017 and 2016. In response to a question about this issue, Kyrgyzstan explained that the report for 2015 did not take into account the requirements of the Guidebook and it thus was flawed. In 2018 clinker production amounted to 1 544 080 tons (Statistical Office), which was used to calculate emissions. The ERT recommends that Kyrgyzstan corrects the production volumes and recalculates the whole time series of emissions using the annual production rates for the next submission.

Category issue 1: 2A2 Lime production – notation key NO

110. During the review, Kyrgyzstan explained that lime production in Kyrgyzstan existed, but did not function in 2018, and that therefore the notation key NO was reported in 2018. The ERT recommends that Kyrgyzstan documents the description of lime production as well as of all other sources existing in the country, including information on annual fluctuations in the production rates in the IIR and that it completes the NFR time series with emission data, or where needed by using notation keys, for all years 1990-2018.

Category issue 2: 2A3 Glass production - PM_{2.5}, PM₁₀, TSP, BC, Pb, Cd, Hg, As, Cr, Cu, Ni, Se, and Zn

111. During the review, the ERT noted that Kyrgyzstan reported PM_{2.5}, PM₁₀ and TSP emissions from glass production for 2016 and 2017, 2018 and activity data as well as BC, Pb, Cd, Hg, As, Cr, Cu, Ni, Se, and Zn emissions using the notation key "NE", while for these emissions there are methods in the Guidebook. The ERT was unable to validate the reported emissions due to a lack of basic information in the IIR on glass production. In response to a question about the issue, Kyrgyzstan stated that due to the lack of data on glass volume production, emission data for category 2A3 are based on statistics for emissions from stationary sources reported in accordance with national legislation, and that in 2018, only one glass factory was operating in Kyrgyzstan and that in this regard, there was a drop in emissions. Kyrgyzstan also responded that they would contact the Statistical Office to obtain the missing production data. The ERT recommends that Kyrgyzstan reports the missing emissions in line with paragraphs 7, 8 and 27 of the Reporting Guidelines in the next inventory submission.

Category issue 3: 2C7d Storage, handling and transport of metal product – NO_x, NMVOC, SO_x, PM_{2.5}, PM₁₀ and CO

112. The ERT notes in the IIR on p. 13 that emissions reported in the NFR table for 2016, 2017 and 2018 are based on statistics for emissions from stationary sources. The ERT notes that the Party does not report the related activity data. In response to a question about the missing AD, Kyrgyzstan responded that the category included 3 small enterprises that are engaged in the secondary smelting of metal waste for the manufacture of metal products, that emissions were based on emission statistics, and that in Kyrgyzstan, there was no primary production of metal from iron ore and that therefore, they would not be able to provide data on the amount of storage, processing and transportation of iron ore. The ERT thanks the Party for the responses and recommends that Kyrgyzstan contacts the enterprises in the category to obtain data on the amount of storage, processing and transportation of metal waste and that it document and report these in the next submission. The ERT notes that storage, handling and transport of metal products is expected to result in particle emissions (PM_{2.5}, PM₁₀ and TSP, for which the Guidebook provides methods), and that emissions of NO_x, NMVOC, SO_x and CO are likely to be fuel combustion related, and recommends that the Party report these under the relevant Energy NFR 1A2a or 1A2b. The ERT also recommends that Kyrgyzstan checks with the supervising authorities whether the emission data only covers the secondary smelting of metal waste processes or also emissions from storage, handling and transport. In case the emissions cover the production process only, the ERT recommends that the Party checks with the supervising authorities which type of metal goes to the secondary smelting process and allocates these emissions to the correct NFR code (NFR 2C1, 2C2, 2C3, 2C4, 2C5, 2C6, 2C7a, 2C7b or 2C5c) and estimates the not covered emissions using the methods in the Guidebook in line with paragraphs 7, 8 and 27 of the Reporting Guidelines', for the next submissions.

Category issue 4: 2A5a Quarrying and mining of minerals other than coal - TSP, PM₁₀, PM_{2.5}

113. The ERT notes that Kyrgyzstan has not yet included a description of the methodology used to estimate emissions from this category as recommended in the earlier review. In response to a question about the issue, Kyrgyzstan responded that emissions from this category were based on the reported data from mining enterprises and on the use of coefficients for PM_{2.5} of 0.35 and for PM₁₀ of 0.65. When asked to explain the use of these coefficients Kyrgyzstan did not provide further information. The ERT notes that the coefficients are likely to be fractions of TSP emissions reported by the plants and recommends that Kyrgyzstan contacts the Statistics Office to confirm this and that Kyrgyzstan obtains the related activity data and document the details about the methodology used to estimate emissions in the next submission.

Category issue 5: 2A5b, 2A5c – Missing emissions TSP, PM₁₀, PM_{2.5}

114. The ERT noted that Kyrgyzstan has not yet followed the previous recommendation that emissions of PM₁₀ and PM_{2.5} from NFRs 2A5b and 2A5c should be estimated. In response to a question about the issue, Kyrgyzstan stated that they would try to collect data but that this would take some time, and that they would improve this category when submitting the next reports. The ERT thanks Kyrgyzstan for the response and recommends that the Party collects activity data and estimates and reports emissions, providing the related documentation in the IIR for the next submission. In case the data collection takes a longer time, the ERT recommends that the Party includes the issue in the inventory improvement plan with clear steps and a schedule and that it reports on progress in the next submissions. The ERT encourages Kyrgyzstan to make a rough estimate of the emission levels e.g. by using a similar country's emission data as a surrogate and scaling the data to reflect domestic circumstances e.g. by using GDP, population and the methods provided in the Guidebook, and to report these in the meantime by providing documentation in the IIR. The ERT, however, recommends collecting activity data and replacing the rough estimates with calculated emissions as soon as possible.

Category issue 6: 2D3b – Missing emissions NMVOC, TSP, PM₁₀, PM_{2.5}, BC

115. The ERT notes that Kyrgyzstan has not followed the previous recommendation, namely that the notation key NA should be replaced with emission data, and has requested the Party to provide revised estimates using the method provided in the Guidebook. Kyrgyzstan did not provide revised estimates, but responded that they were trying to improve the data when presenting the following reports, and to calculate emissions from the annual weight of asphalt used on the road surface using the Tier 1 methodology from the Guidebook. The ERT recommends that Kyrgyzstan collects activity data and estimates and reports emissions, and that it provides the related documentation in the IIR. In case the data collection takes a longer time, the ERT recommends that the Party includes the issue in the inventory improvement plan with clear steps and a schedule and reports on progress in the next submissions. The ERT encourages Kyrgyzstan to make a rough estimate of the emission levels using similar countries' emission data as surrogate and scaling it to domestic circumstances using e.g. GDP, population and methods provided in the Guidebook, and to report with

documentation in the IIR. The ERT also recommends collecting activity data and replacing rough estimates with calculated emissions as soon as possible. As an example, the ERT has calculated NMVOC and PM₁₀ emissions from NFR 2D3b for 2018 using emission data from Ukraine's NFR table as surrogate, and scaled these with GDP and population ratios, and was able to conclude that the missing NMVOC and PM₁₀ estimates would be approximately 0.1 kt/a for NMVOC and of 0.01 kt/a for PM₁₀.

Category issue 7: 2D3c - NMVOC, TSP, PM₁₀, PM_{2.5}, BC, CO

116. The ERT notes that the previous review recommendation regarding emissions of NMVOC reported as NA has not yet been resolved. According to the Guidebook, this category covers emissions of CO, NMVOC, TSP, PM₁₀, PM_{2.5}, and BC from the use of asphalt / bitumen to produce roofing products. The relevant statistics for emission calculations is the annual weight of shingles used in asphalt roofing. The ERT points out that this activity exists in all countries. In response to a question about the issue, Kyrgyzstan responded that the annual weight of the tiles produced could be determined, but that it would take some time and that they would try to improve the data. The ERT notes that the annual weight of tiles produced is not correct activity data for asphalt roofing, and that annual tonnes of shingle, asphalt felt, roofing, roll roofing (a mineral surfaced oil-based asphalt product) and siding products should be used. For a better understanding of relevant activity data, please see the link⁸). The ERT recommends that Kyrgyzstan contacts Statistics Office to obtain relevant data. Kyrgyzstan also responded that they could determine the annual tons of tiles and asphalt. Kyrgyzstan presented many questions regarding the AD to be used for roofing and driveways. The ERT advises Kyrgyzstan that only annual tonnes of shingle, asphalt felt, roofing, roll roofing (a mineral surfaced oil-based asphalt product), which are intended to cover roofs, should be used as activity data for the calculation of emissions and that these data are usually available from Statistical Offices or from the industry in other countries. As an example, to get an overview of the magnitude of the emission levels, the ERT calculated a rough estimate for missing NMVOC and PM₁₀ emissions using Ukraine's emissions data for NMVOC and PM₁₀ as surrogate, and scaled it with GDP and population ratios, and was able to conclude that the missing NMVOC and PM₁₀ estimates would be approximately 1.6E-07 kt/a for NMVOC and 8.1E-06 kt/a for PM₁₀. The ERT encourages the Party to follow the example of using some surrogate data until the real emissions are calculated. The ERT recommends that Kyrgyzstan estimates the missing emissions in line with paragraphs 7, 8 and 37 of the Reporting Guidelines to the next submissions, and that in the meantime put this issue in the improvement plan with clear steps and a schedule while also reporting on progress in the annual submissions.

⁸

https://www.google.com/search?rlz=1C1GCEU_hrHR905HR905&source=univ&tbn=isch&q=roll+roofing&sa=X&ved=2ahUKEwiG3bzCsovqAhWMw4sKHbEJD8gQsAR6BAgDEAE&biw=1828&bih=835&dpr=1#imgrc=jtwOpi9ww3BteM

Category issue 8: 2H1 - NO_x, CO, NMVOC, SO_x, TSP, PM₁₀, PM_{2.5}, BC

117. The ERT notes that in the NFR tables emissions are reported with the notation key "NE" and activity data with "IE". In response to a question about the issue, Kyrgyzstan stated that there was no primary pulp and paper production in the country, only small enterprises for the production of toilet paper and cardboard from paper waste (waste paper), and that due to a lack of methods for calculating emissions they reported "NE". The ERT notes that in case chemical processes such as Kraft (sulphate) pulping, Sulphite pulping (acid sulphite process) and Neutral sulphite semi-chemical pulping (NSSC) do not occur, the correct notation key is "NO"; however, the ERT recommends that Kyrgyzstan contacts the Statistical Office to verify the existence of activities. The ERT recommends that Kyrgyzstan documents in the next IIR submission whether these activities exist, and in case they exist, that it report the related emissions, or if this is not yet possible, that it puts this in the improvement plan with clear steps and a schedule while also reporting on progress in the next submissions.

Category issue 9: 2H3 – all relevant

118. The ERT noted that Kyrgyzstan reported emissions and activity data using the notation key "NE". In response to a question about the issue, Kyrgyzstan stated that they were not able to determine which industries should be categorised as Other industrial processes, so they reported "NE". The ERT explains that the source category NFR 2H3 provides a 'catch all' for other industrial processes that are not covered by the other methodology chapters of the Guidebook and that no methods are provided for these industries in the Guidebook, which means that country-specific methods should be developed if these activities exist in the country. The contribution of this source category is thought to be insignificant, i.e. less than 1 % of the national emissions of any pollutant. The ERT recommends that in case no activities in Kyrgyzstan can be identified under this category, the notation key should be changed to NO (not occurring) with an explanation in the IIR that no activities under this NFR category exist in Kyrgyzstan.

Category issue 10: 2I – TSP

119. The ERT noted that Kyrgyzstan reported emissions using the notation key "NE" and activity data with "IE". In response to a question about the issue, Kyrgyzstan responded that wood products were mainly made from finished and imported fibreboard and particleboard and that in some cases these were also used in construction and that also finished wood furniture was imported, and that it was difficult to determine the annual mass of products in the country produced from wood raw materials. The ERT notes that emissions from this category cover dust (TSP) emissions from the manufacture of wood products but not finished wood products. The ERT recommends contacting the Statistical Office to verify the data on the manufacture of wood products and documenting the results in the IIR of the next submission, and in case such activities exist, that Kyrgyzstan estimates and reports emissions.

Category issue 11: 2K Consumption of POPs and heavy metals - Hg, PCBs

120. The ERT notes that Kyrgyzstan uses the notation key "NO" for Hg and PCB. When asked if it was true that the activity does not occur in Kyrgyzstan, the Party stated

that it would consider the ERT's comments and leave this question open for now, as they needed further consultation. The ERT notes that in case the activity exists in the country, the impact of the underestimates has a significant influence on the emission levels. The ERT prepared a potential technical correction (see section "Potential Technical Corrections" above) that the ERT recommends that the Party use in the next report in case Kyrgyzstan finds that the activity exists in the country, or that it develops other more accurate methods that are in line with the Guidebook. In case the activity does not occur in the country, the ERT recommends that Kyrgyzstan documents this in the IIR.

Category issue 12: 2H2 Food and beverages industry – all relevant

121. The ERT noted that Kyrgyzstan reported NMVOC emissions on food and beverages production for 2016 and 2017 and for 2018 with the same value. In response to a question about the issue, Kyrgyzstan informed the ERT that for 2017 and 2018 they had not managed to process this category. The ERT recommends that Kyrgyzstan makes a scheduled plan for the preparation of the inventory and ensures that resources are available for the work of at least one expert for the Industrial Processes sector. The ERT recommends that for the next submission Kyrgyzstan collects activity data and calculates all relevant emissions in line with paragraphs 7, 8 and 37 of the Reporting Guidelines.

Category issue 13: 2C Metal production – all relevant

122. The ERT notes that Kyrgyzstan uses the notation key "NO" for the category. The ERT notes that in Kyrgyzstan's National Communication under the UNFCCC, available in EN/RU from the link: <https://unfccc.int/documents/116631>, it is stated that in 1990-2010, metal production activities existed in Kyrgyzstan and that emissions of SO₂, NO_x, CO and NMVOC are presented in that document. In response to a question about the issue, Kyrgyzstan responded that there was no primary production of pig iron and steel in the country and that there were small enterprises for the smelting of waste iron and steel, and asked if these could be included under this category. A ferroalloy plant has recently started operations, but aluminium production, magnesium production, lead production or zinc production do not occur. The ERT recommends that Kyrgyzstan documents all this information in the IIR of the next submission and calculates emissions for historical years in which these metal production activities existed in Kyrgyzstan in the relevant NFR categories 2C1/2C2. The ERT notes that secondary steel is mainly produced from recycled steel scrap which most often occurs in electric arc furnaces (EAFs), and that a Tier 2 method is provided in the 2016 version of the Guidebook which is also available in Russian.

SOLVENTS

Review Scope

Pollutants Reviewed		All pollutants		
Years		2017, 2018		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
2D3a	Domestic solvent use including fungicides	x		x
2D3d	Coating applications	x		x
2D3e	Degreasing	x		x
2D3f	Dry cleaning	x		x
2D3g	Chemical products	x		x
2D3h	Printing	x		x
2D3i	Other solvent use	x		x
2G	Other product use	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

123. The ERT notes that Kyrgyzstan's emission inventory for the Solvent sector submitted in 2020 is not transparent. The submission comprises the NFR table for 2018 only, with two pages of information on the whole Solvent and other product use sector with a lack of transparency.

124. The ERT compared inventory data submitted for 2018 and 2019 and found that some of the reported emissions and activity data for the Solvent sector are the same and that no explanation for that is provided in the IIR.

125. The use of notation keys in the NFR table in the Solvent sector is not always appropriate. The ERT recommends that Kyrgyzstan uses appropriate notation keys for the reporting of emissions and activity data in line with paragraph 12 of the Reporting Guidelines and that it clearly explains the usage of notation keys in the IIR for each of source category.

126. The ERT notes that the submission does not include activity data and EFs for NMVOC emissions in the IIR for the categories 2D3a and 2D3f; therefore, it was not possible for the ERT to verify the correctness of the calculations. The ERT recommends that Kyrgyzstan improves reporting of AD and methods as detailed under Sub-Sector Specific Recommendations.

Completeness

127. The 2020 submission of Kyrgyzstan is not complete in terms of pollutants, sources and years covered for the Solvent and other product use sector. Kyrgyzstan has reported emissions with values for two source categories NFR 2D3a Domestic

solvent use including fungicides and NFR 2D3f Dry cleaning for only one year (2018) in the NFR14 format.

128. The ERT found missing estimates in the Solvent and other product use sector as listed below and detailed under Sector Specific Recommendations:

- “NE” for emissions, activity data and all years for NFRs 2D3g and NFR 2D3h.
- “NO” for emissions, AD and all years for NFRs 2D3i and 2G – note that these two source categories exist in almost all countries
- “NA” for emissions, AD and all years for NFRs 2D3d and 2D3e: of these, at least 2D3d exists in all countries.

129. Kyrgyzstan reports black carbon emissions for 2018 using the notation key “NE” for two source categories.

Consistency including recalculation and time series

130. Kyrgyzstan provided data for one year only, so it is not possible to judge the consistency of the inventory or the time series.

131. Kyrgyzstan has not performed recalculations and other changes for emissions, source categories or years in the latest submission. The ERT notes that there is a need for improvement as presented in the Sub-Sector Specific Recommendations.

Comparability

132. The ERT notes that the inventory is not comparable with those of other reporting Parties. The methods used by Kyrgyzstan are consistent with the 2016 version of the Guidebook and Kyrgyzstan uses a country-specific method for category 2D3f in the Solvent sector; however, the methods are not described transparently or not described at all when it comes to country-specific methods in the IIR. Emissions factors and activity data are not well documented in the IIR and in the NFR table Kyrgyzstan uses the NFR 2014 format instead of the 2019 format. The ERT recommends always using the latest version of the NFR table and using the latest version of the Guidebook when it becomes available in Russian.

Accuracy and uncertainties

133. The ERT found possible under-estimations because of missing emissions as explained under Sub-Sector sector-specific recommendations.

134. The ERT notes that key category 2D3a have been estimated with a T1 method and notes that using a Tier 1 method can lead to an under- or overestimation of emissions.

135. Kyrgyzstan provides a basic description of the quality management system in the IIR but does not carry out QA/QC checks for the Solvent sector. The ERT

recommends that Kyrgyzstan includes a general quality assurance/quality control (QA/QC) plan and report on the results for the inventory of the Solvent sector in future submissions.

136. Kyrgyzstan does not provide a quantitative or a qualitative uncertainty analysis for the Solvent sector. The ERT recommends that Kyrgyzstan includes uncertainty quantification in line with paragraph 31 of the Reporting Guidelines and uses it as a tool for prioritising improvements in the inventory and for providing an indication of the reliability of the inventory data. The ERT also recommends that this information is included in the IIR.

Condensable Particulate Matter

137. Kyrgyzstan does not provide explanatory information in the IIR on whether particle emissions include or exclude the condensable component for categories in the scope of the Solvent sector. The ERT recommends that Kyrgyzstan includes such information in the next submission following Annex II of the Reporting Guidelines.

Improvement

138. Kyrgyzstan does not present an improvement plan for the Solvent sector. The ERT recommends that Kyrgyzstan develops an inventory improvement plan with clear tasks and a schedule and that it documents its progress in the next inventory submissions.

Potential Technical Corrections

139. The ERT noted possible underestimations and prepared technical corrections as listed below and detailed under Annex I of this report. The ERT used Ukraine's emissions data for NMVOC as surrogate and scaled it with GDP per capita ratios. The ERT recommends that Kyrgyzstan applies the calculated technical corrections proposed by the ERT to the following potential underestimates, or develops other methods that more accurately correspond to conditions in Kyrgyzstan:

- NFR 2D3d Coating applications: possible underestimation of NMVOC emissions for 2018.
- NFR 2D3g Chemical products: possible underestimation of NMVOC emissions for 2018.

140. Table 4. Potential technical corrections prepared by the ERT

NFR	Pollutant	Year	Calculated by the ERT	Potential contribution to national total
2D3d	NMVOC	2018	ERT	+15.7%
2D3g	NMVOC	2018	ERT	+3%

Sub-Sector Specific Recommendations

Category issue 1: 2D3d Coating applications – NMVOC

141. The ERT notes that Kyrgyzstan has not implemented the previous recommendation, namely correcting the use of the notation key “NA” for NMVOC from NFR 2D3d. This category covers paints used for buildings and in industry to coat vehicles, machinery, or metal packaging, for example. The ERT would expect that some coatings are used in every country and that there would therefore be emissions of NMVOC from this category. In response to a question about the issue, Kyrgyzstan stated that in Kyrgyzstan, paints were used in all areas the ERT has noted, but that for now the question remained of determining their annual volume, and that perhaps they misused the notation key “NA” and would try to take into account the ERT recommendations. The ERT recommends that Kyrgyzstan collects the AD, estimate, reports and documents the calculation in the next submissions, and if there are any other details, including these in an inventory improvement plan with clear steps and schedules while also reporting on progress with the work in the next annual submissions. As an example, the ERT calculated a rough estimate of the missing NMVOC emission from NFR 2D3d using Ukraine’s emissions data as surrogate and scaling it with GDP per capita ratios and concluded that the missing NMVOC and emissions would be approximately 15 kt/a.

Category issue 2: 2D3e Degreasing – NMVOC

142. The ERT notes that Kyrgyzstan has not implemented the previous recommendation, namely correcting the use of the notation key “NA” for emissions of NMVOC from 2D3e. This category covers emissions of NMVOC from solvents mainly used in metal-working industries but also in industries such as printing and the production of chemicals, plastics, rubber, textiles, glass, paper, and electric power for cleaning products from water-insoluble substances such as grease, fats, oils, waxes, carbon deposits, fluxes and tars and the ERT would expect that at least some industrial use of cleaning solvents occurred in each country, leading to some emissions of NMVOC. The ERT noted that according to the Guidebook the most common organic solvents for vapour cleaning are methylene chloride (MC), tetrachloroethylene (PER, trichloroethylene (TRI), xylenes (XYL). In response to a question about the issue, Kyrgyzstan explained that they misused the notation key “NA” which should be “NE” and that the types of activities listed in this category for Kyrgyzstan would be: extraction of gold, recycling of iron waste, printing and production of glass, electricity, and that in the future, they would clarify the annual statistics on the sales of solvents in the country and conduct calculations. The ERT recommends that Kyrgyzstan prepares a plan for improvements of category NFR 2D3e Degreasing, collects activity data by contacting the National Statistics Committee of Kyrgyzstan and estimates NMVOC emissions, and that it documents, and reports all new information in the inventory for the next submission in 2021.

143. The ERT calculated missing NMVOC emissions from category NFR 2D3e for 2018 for Kyrgyzstan using Ukrainian emissions data for NMVOC as surrogate, and scaled this data with GDP and population ratios, and was able to conclude that the missing NMVOC estimate would be below the threshold of significance. The ERT

strongly recommends that Kyrgyzstan estimates the missing emissions for NFR 2D3e for the period 1990-2018 for the next submission using some surrogate data e.g. GDP, population and the methods provided in the Guidebook in these cases.

Category issue 4: 2D3g Chemical products – NMVOC

144. The ERT notes that Kyrgyzstan has not corrected the use of the notation key “NE” in response to the previous review. This category covers emissions of NMVOC from the use of chemical products which includes many activities like: polyester processing, polyurethane and polystyrene foam processing, asphalt blowing, tyre production, rubber processing, pharmaceutical products manufacturing, manufacture of paints, inks and glues, adhesive tape manufacturing, manufacturing of shoes, and leather tanning. In response to a question about the issue, Kyrgyzstan explained that they applied “NE” due to a lack of data on the listed species and that in Kyrgyzstan there was no tyre production, rubber processing, pharmaceutical manufacturing, paints, inks and glues as these products were imported. They also informed the ERT that in Kyrgyzstan there was a polymer processing plant and asphalt production among other activities falling under this category. The reason for the incorrect presentation was due to a lack of baseline data for calculating emissions; this was an issue they needed to discuss with the Statistical Office to be able to apply the Guidebook methods. The ERT recommends that Kyrgyzstan collects the data needed for the calculation of emissions from the various activities coming within the scope of category 2D3g Chemical products, e.g. by sending questionnaires to companies to obtain data on the annual mass of products produced, or contacting the Statistical Office to collect the required data, and that Kyrgyzstan estimates and documents this work in the next submissions. Meanwhile, if some details are still missing, the ERT recommends that the Party develops an inventory improvement plan with clear steps and a schedule while also reporting on progress in the annual submissions.

145. As an example, the ERT calculated missing NMVOC emissions from category NFR 2D3g for 2018 for Kyrgyzstan using Ukraine’s emissions data for NMVOC as surrogate and scaled this data with GDP per capita ratios, and was able to conclude that the missing NMVOC emissions would be on the level of 2.9 kt/a.

Category issue 4: 2D3h Printing – NMVOC

146. The ERT notes that Kyrgyzstan has not implemented the previous recommendation, namely correcting the notation key “NE”. This category covers emissions of NMVOC from the use of inks, ink solvents, diluents, cleaners and dampeners in the printing industry. In response to a question about the issue, Kyrgyzstan stated that printing activities exist in the country but that for the calculation of emissions, they did not have any AD from the printing companies. The ERT recommends that Kyrgyzstan collects the data needed for the calculations, e.g. by sending questionnaires to the printing companies to obtain data on annual ink consumption, or that it cooperate with relevant industrial associations or the Statistical Office for the collection the data, and that it estimates, documents and reports its inventory work in the next submissions. Meanwhile, if some details are still missing, the ERT recommends that the Party develops an inventory improvement plan with clear steps and a schedule while also reporting on progress in the annual submissions.

147. The ERT calculated missing NMVOC emission from category NFR 2D3h for 2018 for Kyrgyzstan using of Ukraine emissions data for NMVOC as surrogate, and scaled this data with GDP and population ratios, and was able to conclude that the missing NMVOC estimate would be below the threshold of significance. The ERT strongly recommends that Kyrgyzstan estimates the missing emissions for NFR 2D3h for the period 1990-2018 for the next submission using some surrogate data e.g. GDP, population and the methods provided in the Guidebook in these cases.

Category issue 5: 2D3i, 2G Other solvent and product use – NMVOC and other relevant pollutants

148. The ERT notes that Kyrgyzstan has not implemented the previous recommendation, namely correcting the notation key "NO". This category covers the emissions of NMVOC from the other solvent use (2D3i) and other product use (2G) which both include many activities that the ERT would expect to be present in all countries. The ERT noted that according to a mapping exercise, Table 9 activities such as: Glass wool enduction, Mineral wool enduction, Fat, edible and non-edible oil extraction, Application of glues and adhesives, Preservation of wood, Underseal treatment and conservation of vehicles and Vehicles dewaxing fall under NFR 2D3i, and activities such as: Use of fireworks, Use of tobacco, Use of shoes and Barbeque fall under 2G. In response to a question about the issue, Kyrgyzstan explained that of the listed activities many categories existed in the country, and since there were many categories, they had used the designation "NE" (not estimated). Kyrgyzstan explained that for these categories the problem was to collect AD and that in the structure of national statistics there were no data on the use of products, or the annual total mass of solvents. Kyrgyzstan also explained that they could not find the volume of solvent use on the official website of the Statistical Office but that they would try to contact them and clarify this issue. The ERT recommends that Kyrgyzstan makes an effort and presents all new information in the next submission. Meanwhile, if some details were still missing, the ERT recommends that the Party develops an inventory improvement plan with clear steps and schedule and reports on progress in the annual submissions.

149. The ERT calculated missing NMVOC and PM₁₀ emissions from category NFR 2D3e for 2018 for Kyrgyzstan using Ukraine emissions data for NMVOC and PM₁₀ as surrogate, and scaled this data with GDP and population ratios, and was able to conclude that the missing NMVOC and PM₁₀ estimates would be below the threshold of significance. The ERT strongly recommends that Kyrgyzstan estimates the missing emissions for NFRs 2D3i and 2G for the period 1990-2018 for the next submission using some surrogate data e.g. GDP, population and methods provided in the Guidebook in these cases.

Category issue 6: 2D3f Dry cleaning – NMVOC

150. The ERT notes that Kyrgyzstan reports emissions of NMVOC from Dry cleaning but that there is no information in the IIR on the methodology and EFs used. The ERT also notes that activity data on solvents used for 2D3f is reported using the notation

⁹ name of Excel: Conversation Table Reporting Codes, available on link: https://www.ceip.at/ms/ceip_home1/ceip_home/reporting_instructions/

key "NA" in the NFR table. The ERT was therefore unable to validate the calculations of the emissions. When asked to provide information on the methodology used, including the activity data, or to justify using the notation key "NA" for reporting activity data, Kyrgyzstan responded that pollutant emissions for category 2D3f were calculated using the national methodology and were available in the national statistics on air emissions. This category covers emissions from solvents used in dry cleaning enterprises for clothes and household items. To present a report on the volume of solvent use in the national statistics there is no data available, therefore the designation "NA" is used. The ERT recommends that if the data on the solvents used [kt] for dry cleaning activities is not available for Kyrgyzstan the correct notation key is "NE" in line with paragraph 12 of the Reporting Guidelines. The ERT recommends that Kyrgyzstan contacts the Statistical Office to obtain the details about the methodology used for NMVOC emission calculations (EF and activity data) and that it represents and documents them in the IIR and in the NFR19 for the next submission.

AGRICULTURE

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ , PM _{2.5} and TSP		
Years		1990 – 2018 + (Protocol Years)		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
3B1a	Dairy cattle	X		X
3B1b	Non-dairy cattle	X		X
3B2	Sheep	X		X
3B3	Swine	X		X
3B4a	Buffalo	X		X
3B4d	Goats	X		X
3B4e	Horses	X		X
3B4f	Mules and asses	X		X
3B4gi	Laying hens	X		X
3B4gii	Broilers	X		X
3B4giii	Turkeys	X		X
3B4giv	Other poultry	X		X
3B4h	Other animals	X		X
3Da1	Inorganic N fertilisers (includes also urea application)	X		X
3Da2a	Animal manure applied to soils	X		X
3Da2b	Sewage sludge applied to soils	X		X
3Da2c	Other organic fertilisers applied to soils (including compost)	X		X
3Da3	Urine and dung deposited by grazing animals	X		X
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		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

Transparency

151. The ERT considers the Agriculture sector not transparent. The information in the IIR is not detailed enough and the methods used are not described in such way that the ERT can fully understand the calculations and assumptions made. Kyrgyzstan

only mentions in the IIR that the Tier 1 method from the 2016 version of the Guidebook is used to calculate emissions from NFR 3B. In addition, the activity data in the IIR do not match the activity data given in the NFR tables. The ERT recommends that Kyrgyzstan documents the methodologies, emission factors, activity data and assumptions used for estimating emissions in the IIR and provides references to data sources.

152. The ERT notes that the IIR does not include information on the allocation of emissions where the notation key IE (included elsewhere) is used and recommends that the Party provide information on the allocation of emissions for all subcategories that are reported as 'IE' under Manure management (NFR 3B) and Agriculture soils (NFR 3D) in the NFR tables in next submissions.

153. The ERT notes that the notation keys NO and NE are not used correctly in the following cases NFR 3D - Crop production and agricultural soils and NFR 3F - Field burning of agricultural residues and recommends that Kyrgyzstan use the appropriate notation keys in line with paragraph 12 of the Reporting Guidelines.

Completeness

154. The ERT considers the Agriculture sector not to be complete regarding pollutants, sources and years included. The inventory covers a wide set of pollutants with respect to the sources of emissions, but emissions from Crop production and agricultural soils - NFRs 3D and 3F Field burning of agricultural residues are not reported. The submission includes only one year (2018). The ERT recommends that Kyrgyzstan provides a full time series from 1990 upwards of all pollutants from all relevant agricultural sources including the correct activity data in its next submissions.

Consistency including recalculation and time series

155. The ERT was unable to check the consistency of the emission inventory for the Agriculture sector as the reported emission data covers the 2018 inventory only.

156. The ERT notes that no recalculations have been performed. The ERT recommends that Kyrgyzstan provides a detailed description of future recalculations including the rationale and the impacts on the emission levels in the time series.

Comparability

157. The ERT considers the inventory not comparable with those of other reporting Parties. The ERT found it difficult to assess the comparability of the inventory as methodologies, emission factors, references and information on the data used for estimating emissions were poorly described although Kyrgyzstan mentions that they used the 2016 version of the Guidebook. Also, the Party uses the NFR 2014 format instead of the latest NFR format (2019). The ERT recommends that Kyrgyzstan uses the latest version of the Guidebook when it becomes available in Russian, and that it always uses the latest NFR format to improve comparability with other reporting Parties in the next submissions.

Accuracy and uncertainties

158. The ERT has identified some under-estimates as Kyrgyzstan does not report emissions from categories 3D - Crop production and agricultural soils and 3F - Field burning of agricultural residues. The ERT provided a technical correction for those emissions with the highest impact on the total emissions, namely NH₃ emissions from 3Da2a - Animal manure applied to soils and 3Da3 - Urine and dung deposited by grazing animals as explained under "Potential Technical Corrections". The ERT recommends that Kyrgyzstan include the missing emissions in the next submission.

159. The ERT also notes that activity data reported in the NFR is equal for 3 the same for three consecutive years and does not match the information reported in the IIR. The ERT recommends that Kyrgyzstan include the correct AD for each year.

160. Kyrgyzstan does not use T2 or higher methods for calculating key categories. The ERT recommends that Kyrgyzstan implement a T2 method for calculating NH₃ emissions for the key categories: 3B1a (Manure management - Dairy cattle), 3B1b (Manure management - Non-dairy cattle) and 3B2 (Manure management – Sheep) in line with paragraph 21 of the Reporting Guidelines for the next submission, and in case this is not possible, that it include the issue into the improvement plan with clear steps and a schedule while also reporting on progress with the work in the next submissions.

161. Kyrgyzstan has not provided any information on QA/QC procedures in the IIR. The ERT recommends that Kyrgyzstan provide this information in the IIR in the next submission.

162. The ERT notes that Kyrgyzstan uses zero values in a number of areas in the reporting tables. The ERT recommends that Kyrgyzstan replace zero values with the proper notation key in line with paragraph 12 of the Reporting Guidelines, or, if an emission value is available, that it include all decimal places of the value in the NFR table.

163. Kyrgyzstan does not present an uncertainty analysis in the IIR. The ERT recommends that Kyrgyzstan undertake an uncertainty analysis for the Agriculture sector in order to steer the improvement process and provide an indication of the reliability of the inventory data in line with paragraph 31 of the Reporting Guidelines'.

Improvement

164. The ERT noted that Kyrgyzstan has carried out the improvements in the IIR including a section on the calculations in the Agriculture sector. The ERT recommends that Kyrgyzstan include an inventory improvement plan with clear steps and a schedule for the Agriculture sector, list the planned improvements and those already made and that it report on progress with the work in its future submissions in order to enhance the quality of its emission inventory.

Condensable Particulate Matter

165. The ERT has not found clear information on whether particle emissions include or exclude the condensable component and recommends that the Party include this information in line with Annex II of the Reporting Guidelines.

Potential Technical Corrections

166. Kyrgyzstan has not estimated emissions from NFR 3D - Crop production and agricultural soils. In response to a question about the issue, the Party stated that they did not have the activity data or the guidance needed to calculate these emissions. The ERT therefore provided technical corrections for those emissions with the highest impact on the total emissions, namely for NH₃ emissions from 3Da2a - Animal manure applied to soils and from 3Da3 - Urine and dung deposited by grazing animals as presented in detail in Annex I to this report:

- a) NH₃ emissions from NFR 3Da3 were calculated in the absence of activity data in Kyrgyzstan using, as surrogate data, the emissions and animal numbers from the 2017 NFR table of Azerbaijan, and scaling this data by the number of grazing animals in Kyrgyzstan (2018 NFR table). Azerbaijan was chosen as it was the country that was most similar in terms of emissions reported under this NFR category.
- b) NH₃ emissions from NFR 3Da2a were calculated in the absence of activity data in Kyrgyzstan using, as surrogate data, the emissions and animal numbers (except poultry) from the 2017 NFR of Azerbaijan, and scaling this data by the animal numbers in Kyrgyzstan (2018 NFR table). Azerbaijan was chosen as it was the country that was most similar in terms of emissions reported under this NFR category.

167. The ERT recommends that Kyrgyzstan prioritise the calculation of emissions from these categories in the next submission using national data and the Guidebook methods, or using the Potential Technical Corrections made by the ERT.

NFR	Pollutant	Year	Calculated by the ERT	Potential contribution to national total
2D2a	NH ₃	2018	ERT	34.3% (2018)
2Da3	NH ₃	2018	ERT	18.2% (2018)

Sub-Sector Specific Recommendations

Category issue 1: Activity data

168. The ERT notes that the activity data that was used for estimating the emission inventory of the Agriculture sector is reported in the IIR and the NFR tables; however, they are not the same. The ERT recommends that the Party report the correct activity data in the IIR and the NFR tables in the future inventories for the different sub-sectors of the Agriculture sector.

169. The ERT provided information during the review on where Kyrgyzstan could possibly find additional activity data, and made them aware of the fact that activity data is available to those experts that prepare the greenhouse gas inventory for Kyrgyzstan's National Communications under the UNFCCC and that probably these experts could help with questions about how to calculate emissions from the Agriculture sector. The ERT recommends that Kyrgyzstan contact experts working with greenhouse gas emissions in Kyrgyzstan to get help with activity data and other related questions.

Category issue 2: Manure management (3B): NO_x, NH₃, NMVOC, PM and TSP.

170. The ERT notes that Kyrgyzstan reported emissions of NO_x, NH₃, NMVOC and particles in some of the sub-categories under NFR 3B using the notation key included elsewhere "IE" in the NFR table but there was no information on the allocation of the emissions in the IIR. The ERT recommends that the Party provides information on the allocation of emissions reported as IE in the next IIR submission.

Category issue 3: Crop production and agricultural soils - 3D – All emissions

171. Kyrgyzstan does not have the data needed to calculate the emissions from these categories and has used "NE" for all emissions. The ERT recommends that Kyrgyzstan obtain data for the calculation of NO_x and NH₃ emissions from the following categories: 3Da1, 3Da2a, 3Da2b, 3Da2c, 3Da3 as well as emissions of PM_{2.5}, PM₁₀ and TSP from NFR 3Dc. The ERT also recommends using the appropriate notation keys in line with paragraph 12 of the Reporting Guidelines in the next submission.

Category issue 4: 3Db, 3Dc, 3Dd, 3De, 3Df: NO_x

172. Kyrgyzstan reports NO_x emissions as NE while there are no methods given in the Guidebook. The ERT recommends using the notation key NA when emissions from a source are not expected, in line with paragraph 12 of the Reporting Guidelines.

Category issue 5: 3Da1, 3Da2b, 3Da2c, 3Da3, 3Da4, 3Db, 3Dd, 3Db, 3Dc, 3Dd, 3De, 3D: SO₂, particles, CO, heavy metals and POPs

173. Kyrgyzstan reports emissions of SO₂, particles (TSP, PM₁₀, PM_{2.5}, BC), CO, all heavy metals and POPs as NE while there are no methods provided in the Guidebook (emissions of these pollutants from these categories are not relevant). For these pollutant emissions that are not expected to arise from a source the ERT recommends using the notation key NA, in line with paragraph 12 of the Reporting Guidelines.

174. The ERT notes that the notation key NE which is used for PM_{2.5}, PM₁₀ and TSP emissions is correct as there is a method provided in the Guidebook. The ERT recommends that the Party make efforts to report these emissions in the next submissions, or if this is not possible, that it meanwhile use the notation key NE (not estimated) and put this issue in the improvement plan with clear steps and a schedule, while also reporting on progress with the work in the next submissions.

Category issue 6: 3Df: SO_x, particles (TSP, PM₁₀, PM_{2.5}, BC), CO, heavy metals and POPs

175. Kyrgyzstan reported emissions of SO_x, particles (TSP, PM₁₀, PM_{2.5}, BC), CO, all heavy metals and POPs as NE. The ERT notes that emissions of these pollutants from these categories are not relevant (no method in the Guidebook). The ERT recommends that Kyrgyzstan use NA for all these emissions in line with paragraph 12 of the Reporting Guidelines.

176. For HCB, due to the presence of HCB in some pesticides as a contaminant, the ERT recommends that the Party make efforts to report emissions of HCB from the use of the pesticides in the next submissions, or if this is not possible, that it meanwhile use the notation key NE (not estimated) and put this issue in the improvement plan with clear steps and a schedule, while also reporting on progress with the work in the next submissions.

Category issue 7: 3Da1, 3Da2c, 3Da4, 3Db, 3Dd, 3Df: NMVOC

177. Kyrgyzstan reported NMVOC emission as NE while no methods are given in the Guidebook. The ERT recommends the use of NA.

Category issue 8: 3Db, 3Dc, 3Df: NH₃

178. Kyrgyzstan reported NH₃ emission as NE. No methods are given in the Guidebook. The ERT recommends that Kyrgyzstan use of NA for all these emissions in line with paragraph 12 of the Reporting Guidelines'.

Category issue 9: Field burning of agricultural residues (3F): NO_x, CO, NMVOC, SO_x, NH₃, PM, BC and heavy metals.

179. The ERT notes that Kyrgyzstan reports emissions from NFR 3F as not occurring "NO" for all pollutants. In response to a question during the review Kyrgyzstan responded that field burning was practiced and that they would provide this data in the future. The ERT recommends that the Party uses the notation key "NE" in its submission, until they have data for calculating the emissions, and recommends reporting these data in the next submission. However, if this is not possible, the ERT recommends putting this issue in the improvement plan with clear steps and a schedule, while also reporting on progress with the work in the next submissions.

WASTE

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5} , Heavy metals, POPs		
Years		1990 – 2018 + (Protocol Years)		
Code	Name	Reviewed	Not Reviewed	Recommendation Provided
5A	Solid waste disposal on land	x		x
5B1	Biological treatment of waste - Composting		x	
5B2	Biological treatment of waste - Anaerobic digestion at biogas facilities		x	
5C1a	Municipal waste incineration		x	
5C1bi	Industrial waste incineration	x		x
5C1bii	Hazardous waste incineration	x		x
5C1biii	Clinical waste incineration	x		x
5C1biv	Sewage sludge incineration			
5C1bv	Cremation			
5C1bvi	Other waste incineration	x		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	
5E	Other waste	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

180. The ERT considers the Waste sector inventory not transparent as the IIR of Kyrgyzstan does not provide any information about the methodology used for the calculation of emissions, emission trends or the national circumstances in the country as regards the Waste sector. The ERT recommends including all information as detailed in Annex II of the Reporting Guidelines in the next submission.

181. The ERT recommends that Kyrgyzstan check notation keys using the definitions in the Reporting Guidelines and that it provide detailed information on their use in the IIR.

Completeness

182. The ERT considers the Waste sector to be incomplete as only NMVOC and particle emissions from NFR 5A are reported and only for the year 2019. The ERT recommends that Kyrgyzstan check the Waste sector data provided in Kyrgyzstan's National Communication¹⁰ under the UNFCCC and that it contact the experts working on Kyrgyzstan's Waste sector greenhouse gas inventory to discuss how the air

¹⁰ <https://unfccc.int/documents/116631>

pollutant inventory for the Waste sector can be developed, and to build a national waste statistics system to obtain the necessary data to complete the inventory, in case such a system does not yet exist.

Consistency, including recalculation and time series

183. The ERT could not check time series consistency because the data reported covers only one year. The ERT recommends that Kyrgyzstan obtain activity data for all years from 1990 onwards and estimate and report all emissions in line with guidance from the Guidebook.

Comparability

184. The ERT could not fully check whether the Waste sector inventory is comparable with the inventories of other reporting Parties because only emissions from one category (5A) are reported. Regarding emissions from 5A, the method used is not documented so the ERT is not able to check comparability with the Guidebook. The emissions are reported in NFR14 but not in the latest NFR19 format. The ERT recommends that the Party always use the latest version of the Guidebook and the NFR table to allow comparability with other reporting Parties.

Accuracy and uncertainties

185. The ERT did not identify systematic under- or overestimations.

186. Kyrgyzstan used Tier 1 emission factors for the estimation of emissions in all reported categories in the Waste sector. The ERT notes that at the current stage of Kyrgyzstan's reporting there are no key categories within the Waste sector, but recommends that when the Waste sector emissions are completed for future submissions, the Party should use T2 methods for categories that are identified as key categories.

187. The ERT recommends that Kyrgyzstan undertake an uncertainty analysis for the Waste sector in order to help inform the improvement process and to provide an indication of the reliability of the inventory data in line with paragraph 31 of the Reporting Guidelines'.

188. The ERT did not find information on QA/QC procedures in the Waste sector and recommends that Kyrgyzstan include QA/QC procedures in emission inventory compilation in line with paragraph 32 of the Reporting Guidelines'.

Condensable Particulate Matter

189. In the IIR there is no information on whether PM_{2.5} and PM₁₀ emissions include or exclude the condensable component. The ERT recommends that the Party include such information in the next submission.

Improvement

190. The ERT commends Kyrgyzstan for the improvement in the Waste sector regarding the inclusion of emissions from NFR 5A in the inventory since the 2018

submission. The ERT recommends that Kyrgyzstan include emissions from the whole time series from 1990 upwards in the next report and preparing an improvement plan with the aim to ensure data quality, accuracy, transparency and consistency.

Potential Technical Corrections

191. The ERT noted underestimations for categories 5C2 – Open burning of waste and 5E – Other waste and provided potential technical corrections as detailed in Annex 1.

- a) For NFR 5C2 the ERT used, as surrogate, Moldova's¹¹ amount of waste burned in 2018 and scaled this data with GDP and Guidebook EFs.
- b) For NFR 5E the ERT used Moldova's¹² accidental fire numbers in 2018 as surrogate data and scaled it with GDP and Guidebook EFs.

NFR	Pollutant	Year	Calculated by the ERT	Potential contribution to national total
5C2	Cd	2018	ERT	10.8% (2018)
5C2	PCDD/F	2018	ERT	3.2% (2018)
5C2	PAH-4	2018	ERT	4.2% (2018)
5E	PM ₁₀ , PM _{2.5} , TSP	2018	ERT	2.2% (2018)
5E	Cd	2018	ERT	3.7% (2018)
5E	Hg	2018	ERT	1.2% (2018)
5E	Pb	2018	ERT	0.03% (2018)
5E	PCDD/F	2018	ERT	18.9% (2018)

192. As NFRs 5C2 and 5E are likely to be major sources of many pollutants, the ERT recommends that the Party report these technical corrections in the next submission, or if national data becomes available, that it calculate emissions using the methods described in the latest version of the Guidebook and report those estimates instead.

Sub-Sector Specific Recommendations

Category issue 1: 5A Biological treatment of waste – Solid waste disposal on land – Transparency, accuracy, activity data

193. The ERT notes that Kyrgyzstan reports only one year (2018) in its 2020 submission. In response to a question about the issue, the Party explained that they could get data for the period 1990-2018, but that due to a lack of capacity it was not possible for them to process all the data.

¹¹ <https://www.ceip.at/status-of-reporting-and-review-results/2020-submissions>

¹² <https://www.ceip.at/status-of-reporting-and-review-results/2020-submissions>

194. The ERT notes that Kyrgyzstan reported the same values of emissions for the years 2016 and 2018. In response to a question about the issue, the country explained that the data were not updated for the 2020 submission. The ERT recommends that the Party calculate emissions for each year of the time series and update the activity and emissions data annually where new information has become available.

195. The ERT notes that in the Third National Communication of Kyrgyzstan there are data on the amounts of solid waste disposal in Kyrgyzstan for the period 1990-2010. When asked if the data could be obtained from the greenhouse gas inventory compilers, the Party responded that even if it was possible, due to a lack of capacity they would not be able to process the data in time and that this issue should be resolved at leadership level at the State Agency for Environmental Protection and Forestry of Kyrgyzstan. The ERT recommends that the Party try to collect the data needed to calculate time series since 1990 in cooperation with the greenhouse gas inventory project and that it estimate the missing emissions.

Category issue 2: 5C1bi (Industrial waste incineration) – Completeness

196. The ERT notes that the category is reported as not estimated although there is a Tier 1 methodology available in the Guidebook. In response to a question about the issue, Kyrgyzstan responded that there was no official data on industrial waste incineration in their country and that some types of industrial waste were allowed to be burned in the boiler rooms, and that to obtain data on industrial waste, it would be necessary to systematise the data. Some statistics on street waste incineration are available, but what type of incineration is reported (open or in closed systems) is not known. They also explained that there were no incineration plants in the country. The ERT therefore assumed that the emissions were most likely burned in the open. The Party did not fully agree with this and said that more time was needed to resolve the issue. The ERT recommends that the issue be further investigated. If the amounts of industrial waste incinerated in any kind of boiler prove to be negligible, the ERT recommends that Kyrgyzstan use the notation key NO for NFR 5C1bi. In case the emissions are burned in the open, the ERT recommends that the Party estimate and report emissions under NFR 5C2 using the methods from the Guidebook for the open burning of waste. In case the wastes is not treated by burning, the ERT recommends that the Party study the treatment methods and estimate and report emissions in line with the Guidebook.

Category issue 3: 5C1bii (Hazardous waste incineration) – Completeness

197. The ERT notes that the category is reported as “not estimated” although there is a Tier 1 methodology available in the Guidebook. In response to a question about the issue, Kyrgyzstan responded that there was no official data on hazardous waste incineration in their country and that they were not sure which types of waste were classified as hazardous types of waste. According to national legislation, all types of waste were allocated to the hazard classes of waste (from the 1st to the 5th class) and further consultations were needed to clear this issue, and there were no incineration plants in the country. Therefore, the ERT assumed that the waste was most likely burned in the open. The Party did not fully agree with this and said that more time was needed to resolve the issue. The ERT recommends that the issue be further

investigated. If the amounts of hazardous waste incinerated in any kind of boiler prove to be negligible, the ERT recommends that the Party use the notation key NO for NFR 5C1bii. In case the emissions are burned in the open, the ERT recommends that the Party estimate and report emissions under NFR 5C2 using the methods from the Guidebook for the open burning of waste. In case the waste is not treated by burning, the ERT recommends that the Party study the treatment methods and estimate and report emissions in line with the Guidebook.

Category issue 4: 5C1biii (Clinical waste incineration)– Completeness

198. The ERT notes that the category is reported as not estimated although there is a Tier 1 methodology available in the Guidebook. In response to a question about the issue, Kyrgyzstan stated that there was no official data on clinical waste incineration in their country and that they were aware of the fact that part of the medical waste was incinerated, but that the process of systematising the reporting of medical waste and its inclusion in the statistics was just beginning. Once the process was completed they would be able to obtain data on the burning of medical waste. They also responded that there were no incineration plants in the country. Therefore, the ERT assumed that the waste was most likely burned in the open. The Party did not fully agree with this because there were some medical facilities with incinerators for burning medical waste; however, the processing of the data would take more time. The ERT recommends that the issue be further investigated and, if the amounts of clinical waste prove to be negligible, the ERT would recommend using the notation NO for this category in the next submission. In case waste is burned in the open the ERT recommends that the Party estimate and report emissions under NFR 5C2 using the methods from the Guidebook for the open burning of waste. In case the waste is not treated by burning, the ERT recommends that the Party study the treatment methods and estimate and report emissions in line with the Guidebook.

Category issue 5: 5C1bvi (Other waste incineration) – Completeness

199. The ERT notes that the category is reported as not estimated although there is a Tier 1 methodology available in the Guidebook. Kyrgyzstan responded that there was data available on incineration of households (street) garbage waste for the time period 2010-2018 and that they could use this data in the next submission. When asked if the waste was incinerated within the incineration plant or in the open, the Party did not respond. When asked whether it would be possible to calculate a revised estimate if data on street waste incineration became available, Kyrgyzstan responded that some statistics on street waste incineration were available, but that the type of incineration was unknown. According to the Party, there are no incineration plants in the country. Therefore, the ERT assumed that the waste was most likely burned in the open. The Party agreed to report the data that should be included in category 5C2 and to report emissions from category 5C1bvi as NO. The ERT recommends that the Party report category 5C1bvi as NO and all emissions from the burning of waste under the category 5C2.

Category issue 6: 5C2 (Open burning of waste) – Completeness

200. The ERT notes that the category is reported as not estimated although there is a Tier 1 methodology available in the Guidebook. In response to a question about the issue Kyrgyzstan explained that there was a need to clarify the issue in the future because they were aware of the fact that open burning of waste occurs in Kyrgyzstan. The ERT recommends that the country obtain the data and start processing them to be able to report the full time series as soon the resources and capacities make it possible.

201. During the review, the Party also informed the ERT that there were no incineration plants in the country. Therefore, the ERT assumed that the waste was most likely burned in the open. Regarding the question of whether all emissions from waste incineration categories should be reported under NFR 5C2, the Party stated that in order to include all the waste under category 5C2, they needed to determine the amount of waste burned in the open and that, since no clear data on the open burning of waste was available, they could not agree with the proposal that for all NFR categories 5C1 not occurring (NO) should be used, and that all emissions from waste burning should be reported under category 5C2.

202. As the Party does not agree with the proposal, the ERT recommends further investigation. If the Party is able to obtain data on waste that is incinerated in incineration plants, the ERT recommends collecting data, calculating emissions and reporting emissions in the relevant categories as soon as possible. In case the waste is not treated by burning, the ERT recommends that the Party study the treatment methods and estimate and report emissions in line with the Guidebook.

203. Since waste incineration is expected to be a major source of many pollutants, the ERT has calculated a technical correction for Kyrgyzstan for the pollutants Cd, PCDD/F and PAHs from the category and recommends that the Party report these emissions under NFR 5C2 in the next submission or, if national data become available, that it calculate emissions using those data and the latest version of the Guidebook.

Category issue 7: 5D1 (Domestic wastewater handling) – Transparency, accuracy, activity data

204. The ERT notes that Kyrgyzstan only reports one year (2018) in its 2020 submission. The Party responded that they could get data for the period 1990-2018, but due to a lack of capacity it was not possible for them to process all the data.

205. The ERT notes that in the third National Communication of Kyrgyzstan there are data available on the amounts of wastewater handling for the period 1990-2010. When asked if the data could be obtained from the greenhouse gas inventory experts, the Party responded that even if it is possible, due to a lack of capacity they would not be able to process them in time and that this issue should be resolved at leadership level at the State Agency for Environmental Protection and Forestry of Kyrgyzstan. The ERT recommends that the Party try to collect the data needed to calculate the time series from 1990 upwards in cooperation with the greenhouse gas experts and that it estimate emissions from the category.

Category issue 8: 5D2 (Industrial wastewater handling) - Transparency

206. The ERT notes that NMVOC emissions are reported as IE in the NFR table, but that a reference stating where these emissions are included is not provided in the IIR. Kyrgyzstan responded that the emissions from this category were included in category 5D1. For Kyrgyzstan it is not yet possible to separately determine the volumes of emissions from domestic wastewater and industrial wastewater sources, since the structure of the national statistics does not have separate data on the volume of domestic wastewater and industrial wastewater.

207. The ERT notes that in the third National Communication of Kyrgyzstan there are data available on amounts of wastewater handling for the period 1990-2010. When asked if the data could be obtained from the greenhouse gas experts, the Party responded that even if it was possible, due to a lack of capacity they would not be able to process them in time and that this issue should be resolved at leadership level at the State Agency for Environmental Protection and Forestry of Kyrgyzstan. The ERT recommends that the Party try to collect the data needed to calculate the time series from 1990 upwards in cooperation with the greenhouse gas experts and that it estimate the emissions.

Category issue 9: 5E (Other waste) - Completeness

208. The ERT notes that the category is reported as not estimated although there is a Tier 1 methodology available in the Guidebook. In response to a question about the issue, Kyrgyzstan stated that there were no data related to activities under the category "Other waste" available in the country and that to be able to estimate emissions from this source the Party had to improve the system of national reporting.

209. As this category includes accidental fires of cars, houses, apartment/industrial buildings, which most likely occur in all countries, the ERT recommends that the Party contact the relevant authorities which collect the data on accidental fires in the country, and that it estimate emissions from this source as soon as possible. Usually it is the national fire engineering office that collects this type of data. In response to a question about the issue, Kyrgyzstan explained that due to a lack of capacity and resources, they were not able to provide the revised estimate during the review.

210. The ERT calculated a technical correction for Kyrgyzstan for particle, heavy metal and PCDD/F emissions from the category as presented in Annex I and recommends that the Party report the emissions under category 5E in the next submission, or, if the national data becomes available, that it calculate emissions using those and the latest version of the Guidebook. Note that the current PTC is incomplete because it does not include un-detached house fires or fires in apartment buildings and industrial buildings or car fires.

DOCUMENTS PROVIDED TO ERT

1. Party IIR 2017
2. NFR Tables submitted 2020
3. Kyrgyzstan's Stage 2 S&A report
4. Kyrgyzstan's Stage 1 report 2017
5. Results of extended checks

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

6. Responses to preliminary question raised prior to the review
7. Responses to questions raised during the review

ANNEX I POTENTIAL TECHNICAL CORRECTIONS

211. Technical corrections have been proposed by the ERT during the review week for the Industrial Processes, Solvent Use, Agriculture and Waste sectors. Detailed related information is provided separately in the 3 Excel files:

- KG-TC-IPPU-2020.xlsx
- KG-TC-Agriculture-2020.xlsx
- KG-TC-Waste-2020.xlsx

	Description	Reference	Pollutant estimates		
			2018	2010	2005
TC REVISED ESTIMATES	Hg		Pollutant estimates (t)		
	National total as reported in 2018 (row 141)	Annex I, 23/03/2020	0.268		
	Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
	2 K Consumption of POPs and heavy metals		0.000		
	Difference between original estimate and technical correction deemed necessary by the ERT				
	2 K Consumption of POPs and heavy metals		0.063		
	National total (row 141) including revised estimates and technical corrections accepted by Party	Calculated using the data above	0.331	0.000	0.000
	PCB		Pollutant estimates (kg)		
	National total as reported in 2018 (row 141)	Annex I, 23/03/2020	7.08		
	Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
	Difference between original estimate and technical correction deemed necessary by the ERT				
	2 K Consumption of POPs and heavy metals		632.28		
	National total (row 141) including revised estimates and technical corrections accepted by Party	Calculated using the data above	639.364	0.000	0.000
	TC REVISED ESTIMATES	NM VOC		Pollutant estimates (kg)	
National total as reported in 2018 (row 141)		Annex I, 23/03/2020	96.41		
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT					
Difference between original estimate and technical correction deemed necessary by the ERT					
2D3d Coating applications			15.11		
National total (row 141) including revised estimates and technical corrections accepted by Party		Calculated using the data above	111.516	0.000	0.000
NM VOC		Pollutant estimates (kg)			
National total as reported in 2018 (row 141)		Annex I, 23/03/2020	96.41		
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT					
Difference between original estimate and technical correction deemed necessary by the ERT					
2D3g Chemical products			2.89		
National total (row 141) including revised estimates and technical corrections accepted by Party		Calculated using the data above	99.298	0.000	0.000
NH3					

National total as reported 2018 (row 141)	Annex I, 23/03/2020	56.711	NE	NE
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
Difference between original estimate and technical correction deemed necessary by the ERT				
3Da2a - Animal manure applied to soils		19.45	NE	NE
3Da3 - Urine and dung deposited by grazing animals		10.25	NE	NE
National total (row 141) including revised estimates and technical corrections accepted by Party	Calculated using the data above	86.410	NE	NE

Description	Reference	Pollutant estimates (kt)		
		2018	2010	2005
PM2.5				
National total as reported 2018 (row 141)	Annex I, 23/03/2020	23.884		
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
Difference between original estimate and technical correction deemed necessary by the ERT				
5E Other waste		0.531		
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using data above	24.415	0.000	0.000
PM10				
National total as reported 2018 (row 141)	Annex I, 23/03/2020	26.721		
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
Difference between original estimate and technical correction deemed necessary by the ERT				
5E Other waste		0.531		
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using the data above	27.252	0.000	0.000
TSP				
National total as reported 2018 (row 141)	Annex I, 23/03/2020	28.563		
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
Difference between original estimate and technical correction deemed necessary by the ERT				
5E Other waste		0.531		
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using the data above	29.094	0.000	0.000
Hg				
National total as reported 2018 (row 141)	Annex I, 23/03/2020	0.268		
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
Difference between original estimate and technical correction deemed necessary by the ERT				

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5E Other waste		0.012		
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using the data above	0.280	0.000	0.000
Pb				
National total as reported 2018 (row 141)	Annex I, 23/03/2020	5.598		
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
Difference between original estimate and technical correction deemed necessary by the ERT				
5E Other waste		0.000277		
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using the data above	5.598	0.000	0.000
Cd				
National total as reported 2018 (row 141)	Annex I, 23/03/2020	0.084		
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
Difference between original estimate and technical correction deemed necessary by the ERT				
5C2 Open burning of waste		0.009		
5E Other waste		0.003		
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using the data above	0.097	0.000	0.000
PCDD/F				
National total as reported 2018(row 141)	Annex I, 23/03/2020	28.094		
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
Difference between original estimate and technical correction deemed necessary by the ERT				
5C2 Open burning of waste		0.912		
5E Other waste		5.319		
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using the data above	34.325	0.000	0.000
PAHs				
National total as reported 2018(row 141)	Annex I, 23/03/2020	27.574		
Difference between original estimate and revised estimates provided by the Party and accepted by the ERT				
Difference between original estimate and technical correction deemed necessary by the ERT				
5C2 Open burning of waste		1.152		
National total (row 141) including revised estimates and technical corrections accepted by MS	Calculated using the data above	28.726	0.000	0.000