

Conclusions and recommendations from the 17th meeting of greenhouse gas inventory lead reviewers

I. Introduction

1. The 17th meeting of greenhouse gas (GHG) inventory lead reviewers (LRs) took place from 29 June to 3 July 2020 as a virtual meeting. The in-person meeting that had been scheduled to take place in Bonn from 2 to 4 March 2020 had to be postponed owing to the circumstances related to the coronavirus disease 2019 (COVID-19). A total of 75 experts from Parties not included in Annex I to the Convention and 50 experts from Parties included in Annex I to the Convention were invited to the meeting. Of the 92 experts who attended the meeting, 56 were from Parties not included in Annex I to the Convention and 36 were from Parties included in Annex I to the Convention.

2. Two members of the facilitative branch of the Compliance Committee, the Co-Chairs of the committee under Article 15 of the Paris Agreement, two representatives of the International Energy Agency (IEA), one representative of the European Union and two representatives of the European Environment Agency attended the meeting as observers. The LR noted with appreciation the presentations made by one member of the facilitative branch, on the branch's tool to analyse published annual review reports; the representatives of IEA, on enhancing the quality of energy data in GHG inventories; the representatives of the European Environment Agency, on the review of GHG inventories under the European Union effort-sharing decision;¹ and a representative of the Task Force on National Greenhouse Gas Inventories of the Intergovernmental Panel on Climate Change (IPCC), on the *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories* (2019 Refinement to the 2006 IPCC Guidelines).

3. In accordance with the annex to decision 13/CP.20, the annex to decision 22/CMP.1 in conjunction with decision 4/CMP.11, and annex II to decision 24/CMP.1, the meeting helped to facilitate the work of LR in fulfilling their task to ensure consistency of GHG inventory reviews across Parties and the quality and objectivity of the technical examinations therein, and in providing suggestions on how to improve the quality, efficiency and consistency of the reviews.² In addition, at the meeting the LR provided guidance on matters such as review tools, materials and templates.³ These conclusions and recommendations will be reported to the Subsidiary Body for Scientific and Technological Advice (SBSTA) at its fifty-third session.⁴ Such reports provide the SBSTA with inputs for providing further guidance to the secretariat on selecting experts and coordinating the expert review teams (ERTs) and the expert review process.

II. Coordination and planning of the 2020 review cycle

4. The LR noted the information provided by the secretariat on the plan for organizing the 2020 GHG inventory review cycle. In spite of challenges due to COVID-19 (e.g. travel restrictions, difficulties in constituting regionally balanced ERTs), the revised plan was completed (finalized in May 2020) and accepted by Parties, comprising 12 centralized reviews, 9 in-country reviews and 4 desk reviews in August–November 2020. The LR noted the contingency plan of alternatives developed by the secretariat for mitigating the impacts of COVID-19 on the review process, such as holding remote meetings, expanding the time dedicated to the reviews, and prioritizing certain review tasks. The LR also noted, from the feedback on the responses to the secretariat's questionnaire on availability of experts to participate in remote reviews and also from experience with similar review processes using remote participation, the existence of several barriers to prepare ERTs

¹ Decision 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of European Union member States to reduce their GHG emissions to meet the Community's GHG emission reduction commitments up to 2020.

² Per decision 13/CP.20, annex, paras. 42 and 44.

³ See decision 13/CP.20, annex, para. 48.

⁴ Per decisions 13/CP.20, annex, para. 44, and 22/CMP.1, annex, para. 40(a).

(e.g. lack of reliable Internet connection and difficulty focusing on review tasks while working from home, and difference in time zones).

5. The LRs requested the secretariat to progress with the remaining steps in organizing the 2020 review cycle and encouraged the secretariat to further refine its contingency plan of alternatives for mitigating the impacts of any change of plan and overcoming the challenges of remote reviews. Given their special role in leading the review process, the LRs recognize the need to make every effort to ensure that the impacts of COVID-19 on the process are minimized, including any impact on the timeliness and quality of the review reports. The LRs reiterated the need for Parties to continue encouraging, supporting and facilitating the participation of their experts in GHG inventory reviews, particularly in remote reviews.

III. Training and availability of review experts

6. The LRs welcomed the information on training activities undertaken by the secretariat in 2019, on ongoing and planned training activities in 2020 and on improvements made to training activities in 2019 and 2020. The LRs recalled the need for new and experienced experts and new LRs to fulfil the mandatory requirements of the relevant training courses under the Convention and its Kyoto Protocol to enable them to participate in the reviews.

IV. Guidance on the development of review tools and materials

7. The LRs welcomed the development in 2019 and 2020 of the review issues database and the new module of the GHG inventory virtual team room (iVTR). They noted that all modules of the GHG data interface had been upgraded. The LRs reiterated the importance of cooperation and communication among stakeholders, particularly between the national inventory compilers and the providers of national energy statistics, for improving consistency between the energy balances used for GHG inventories and those reported to IEA.

V. Improvements to the quality, efficiency and consistency of reviews in accordance with decisions 13/CP.20 and 4/CMP.11

A. Improvements to the consistency of reviews

8. The LRs discussed specific ways of improving the consistency of the GHG inventory review process on the basis of experience from the 2019 review cycle and the background paper prepared by the secretariat on consistency issues identified during the 2019 GHG inventory review cycle. In particular, the LRs recommended that LRs promote the following guidance and procedures:

(a) Assessment and review of models and tier 3 methods, including country-specific approaches, during in-country and centralized reviews: The LRs concluded that, to be in line with the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* (2006 IPCC Guidelines), models and tier 3 methods have to be reported and documented transparently in order for their results to be understandable, assessable and credible. The LRs noted that it is not responsibility of the ERT to judge on the application by a Party of a model or tier 3 method, including country-specific approaches, but the ERT should review whether input and output data and parameters of the model or tier 3 method have been reported transparently and accurately and are consistent across the time series. The ERT should request the Party to provide complete information on models and tier 3 methods before the review week starts. The LRs also concluded that in-depth review of estimates calculated using tier 3 methods and models should be prioritized during in-country reviews, while during centralized reviews the ERT should prioritize reviewing whether the models and tier 3 methods, including country-specific approaches, have been transparently and well documented in the national inventory report (NIR). The ERT should indicate in the review report whether the models and tier 3 methods were already reviewed during a previous in-country review. The LRs noted that models and tier 3 methods, including country-specific

approaches, can be deemed to have been transparently and well documented in the NIR when the information provided covers:

- (i) Reasons for selecting the particular model;
- (ii) If an existing model is being used and adapted: area of application of the original model and how it has been adapted (description of why and how the model was adapted for conditions outside the originally intended domain of application);
- (iii) Main equations/processes;
- (iv) Material assumptions (important assumptions made in developing and applying the model);
- (v) Domain of application of the model (description of the range of conditions for which the model has been developed to apply);
- (vi) How the model parameters were estimated;
- (vii) Description of key inputs and outputs;
- (viii) Details of calibration and evaluation using calibration data and independent data;
- (ix) Description of the approach undertaken for the uncertainty analysis and for the sensitivity analysis, and the results of these analyses;
- (x) Quality assurance (QA) and quality control (QC) procedures applied and findings from these procedures;
- (xi) Comparison of the results from models, tier 3 methods or country-specific approaches with the results from lower-tier or default approaches;
- (xii) References to peer-reviewed literature (where details of research on the model can be found).

The LRs further concluded that, during an in-country review, the ERT should focus on considering input data, key assumptions, the type of model used and the parameters used, as well as on output data, in order to ascertain whether or not the application of a model is suitable. The ERT should also cross-check, where possible, the Party's assessment of the accuracy of the results from the model or tier 3 method, including country-specific approaches, by comparing them with the results from the tier 1 (or 2) method. The LRs noted that generally the aim of applying a tier 3 method is to increase the accuracy of the estimates, leading to a lower uncertainty when compared with that of a tier 1 estimate. The LRs also noted that, after the overall assessment, the ERT should identify any instances of the 2006 IPCC Guidelines not being followed and should provide clear recommendations on the steps needed to be taken by the Party to improve transparency, resolve problems and make improvements to the models and tier 3 methods, including country-specific approaches;

(b) Review of the allocation of GHG emissions from iron and steel between the industrial processes and product use (IPPU), and energy sectors and assessment of the use of notation key "IE" (included elsewhere): The LRs concluded that, whenever possible, the ERT should check that (1) the total reported bottom-up calculated estimates of CO₂ emissions from non-energy use of fuels including uses as feedstock and reductant at different subcategory levels are complete, consistent and transparent; and (2) feedstock or reductant requirements of processes are in balance with the non-energy use or feedstock supply recorded in the national energy statistics. The LRs noted that the ERT may request the Party to provide information for the purpose of verifying the estimated emissions from iron and steel industry and demonstrating that no double counting or omission has occurred, if this information was not provided in the NIR. The LRs also noted that, if the Party provides accurate and clear information during the review, the ERT would be able to identify whether all emissions have been accounted for (regardless of the GHG inventory sector). However, if the information provided by the Party is not accurate or unclear (or not provided), the ERT would not be able to identify what proportion of emissions from iron and steel have been reported under the energy sector (because reducing agent may also be used in other industries such as cement production, ferroalloys production and carbide production). The ERT should in both cases encourage the Party to provide accurate information (e.g. a carbon balance) in the NIR to increase the transparency of its reporting. If the ERT identifies an issue of accuracy, in particular an underestimation of emissions, the ERT should recommend that the Party

provide more transparent information to demonstrate that there has been no double counting or omission of emissions from iron and steel industry. The LRs further concluded that, when the Party is using a different allocation of emissions from that recommended in the 2006 IPCC Guidelines and is reporting the emissions as “IE” under the energy or IPPU sectors, the ERT should check whether the Party has transparently reported where the emissions have been included and ensured the accuracy of the estimates. If this is not the case, the ERT should follow up with a relevant recommendation;

(c) How to ensure that potential problems related to transparency in a given GHG inventory are included in the list of potential problems and further questions raised by the ERT at the end of the review week (“Saturday paper”) in accordance with the “Guidelines for review under Article 8 of the Kyoto Protocol”: The LRs concluded that it is very important that LRs ensure that the ERT has identified all potential problems, including those of transparency, well before the end of the review week. Therefore, the ERT should prioritize identifying transparency issues that could be potential problems before the review week and discuss them within the ERT. The LRs noted that the ERT should, early in the review week, discuss with the Party in particular issues related to transparency that could trigger potential problems, and communicate to the Party potential problems related to transparency as soon as possible and before the end of the review week. The LRs and review officers should provide relevant guidance to the ERT through presentations, earlier in the review process or at least at the beginning of the review week, clarifying the type of issues that should be included in the review report and in the “Saturday paper”, with an emphasis on transparency issues. The LRs also noted that the QC activities performed by the secretariat should start as early as possible during the review process. The LRs also concluded that the ERT should always include a potential problem in the “Saturday paper” when it is not able to understand whether the issue leads to an underestimation of emissions or overestimation of removals, because the information provided in the NIR and requested from the Party before and during the review week is not sufficient to assess the possible level of emissions or removals and accuracy of the estimates. The LRs further concluded that the ERT should provide clear guidance to the Party on the expected information that it needs to provide, as soon as possible and before the end of the review week, to enable the final judgment to be made on the identified possible problem with the reported emissions;

(d) Consideration and assessment of issues related to indirect carbon dioxide (CO₂) emissions: The LRs concluded that, when indirect CO₂ emissions are reported by a Party, the ERT should assess the accuracy, consistency, comparability and transparency of the indirect CO₂ emission estimates. The LRs also concluded that, when an issue has been identified with the reported estimates in relation to these principles, the ERT should encourage the Party, as necessary, to improve the accuracy, consistency, comparability and transparency of the estimates and the relevant background information provided. The LRs noted that the ERT may cross-check the non-methane volatile organic compound (NMVOC) estimates originating the indirect CO₂ emission estimates against those reported in the air pollutant inventories submitted under the Convention on Long-range Transboundary Air Pollution (CLRTAP), and that the ERT should ask the Party for the reasons for any discrepancies and, where relevant, encourage the Party to correct the estimates. The LRs further concluded that, in the cases when a Party decided to report indirect CO₂ emissions, the ERT should check that the Party has reported the national totals with and without indirect CO₂, and encourage the Party to continue reporting such emissions in subsequent GHG annual inventory submissions and ensure that no double counting occurs;

(e) Consideration and assessment of the Party’s implementation of a review recommendation referred to the “reporting on progress in implementing a recommendation by previous ERT”: The LRs concluded that the ERT should consider whether the Party has implemented previous review recommendations by assessing the information provided in the NIR and relevant common reporting format (CRF) tables, including information on changes in response to the review process, taking into account the recommendations provided in the previous three review reports. The LRs also concluded that “reporting on progress in implementing a recommendation by previous ERT” is in accordance with paragraph 50(i) of the “Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories”, which state that the NIR shall include information on changes in response to

the review process. If the Party did not provide in the NIR information on changes in response to the review process or the progress made, the ERT should recommend that the Party include such information in the NIR. The LRs further concluded that, if the status of addressing any previous recommendation is not clear from the NIR and/or CRF tables, or in the Party's responses to the assessment report, the ERT should seek clarification from the Party through questions. On the basis of the Party's response, the ERT should reflect the status of implementation of any such recommendation from previous ERT in the review report and the rationale for its assessment;

(f) Assessment of the use of "NO" (not occurring) or other notation keys for nitrous oxide (N₂O) emissions from mineralization/immobilization in agricultural soils, while loss of soil carbon from change in management of mineral soils actually occurs and is reported under the land use, land-use change and forestry sector: The LRs concluded that, when carbon loss occurs as a result of land-use/management change, the ERT should check that an estimate of associated direct and indirect N₂O emissions has been reported under the agriculture sector or whether the notation key "NE" (not estimated) has been used together with the justification that these emissions fall under the insignificance threshold. The LRs also concluded that, if the Party does not estimate soil organic carbon changes in mineral soils under cropland remaining cropland, the ERT should recommend that the Party estimate such changes as well as the associated N₂O emissions from nitrogen (N) mineralization. The LRs noted that, if a Party reports data in CRF table 3.D for N mineralization, they should be consistent with loss of soil carbon under cropland remaining cropland reported in CRF table 4.B.

9. The LRs noted that they could not agree conclusions and recommendations on some of the issues discussed during the meeting; in particular: possible treatment of the 2019 Refinement to the 2006 IPCC Guidelines in the 2020 review process, including country-specific approaches based on or consistent with the 2019 Refinement; review of the use of a method from the IPCC *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* (2000); and assessment of the application of the insignificance criteria for gaps in the time series (specific years) or within a category. The LRs requested the secretariat to include the consideration of those issues in the next meeting of LRs, taking into account the discussions at their 17th meeting and the background paper prepared by the secretariat for this meeting on consistency issues identified during the 2019 GHG inventory review cycle.

B. Operationalization of reviews

10. The LRs noted with appreciation the information provided on the recent work of the secretariat in revisiting and updating the annual review report templates, the review tools and the iVTR.

11. The LRs considered the relevant background paper and presentations prepared by the secretariat and the information provided by the secretariat during the meeting, and noted that the timeliness of publication of the review reports, their length and the number of issues identified affect their usability. The LRs requested the secretariat to explore, with the support of a number of LRs and taking into consideration the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" and the "Guidelines for review under Article 8 of the Kyoto Protocol" and previous conclusions and recommendations from meetings of LRs, options for enhancing the efficiency and efficacy of the review report workflow. The LRs noted that these options could be implemented as comprehensive guidance for reviewers and review officers for use before, during and after the review week. The LRs requested the secretariat to undertake the following and to prepare a short paper thereon for consideration at the next meeting of LRs:

(a) Explore the possibility of including in the annual review report template an additional or separate short summary on the overall assessment of the inventory, summarizing the information in the current table 2, or revise and enhance table 2;

(b) Develop decision trees for defining the type and extent of the review taking into account the quality of the inventory and the findings from the initial assessment by the secretariat, and evaluate the possibility of implementing the review process following a stepwise approach;

(c) Develop a checklist based on the handbook for the review of national GHG inventories, with guidance for each sector to be followed during the review week. This guidance could be useful in particular for new experts participating in reviews and thereby reduce the work of LRs in supporting new experts during reviews;

(d) Explore the feasibility of implementing an option in the iVTR for providing information to the Party on small correction issues, complementing the review reports and provisional main findings;

(e) Explore options for improving the readability and reducing the length of the review reports, for instance by reducing the quantity of text and enabling use of figures, tables and annexes, where feasible, taking into consideration that ERTs should make every effort to keep the reports from exceeding 30 pages;⁵

(f) Consider the importance of focusing QA/QC procedures performed by the secretariat on substantive issues and consistency across Parties; analyse the bottlenecks related to the QA/QC process affecting the timeliness of report preparation; and analyse what barriers and bottlenecks are preventing the report cut-off dates from being met, and suggest ways to mitigate those challenges.

12. The LRs requested the secretariat to organize, after the 2020 GHG inventory reviews, regional webinars for both inventory reviewers and compilers from developed and developing countries on experience with previous reviews, aiming to engage additional experts in the review process and improve the capacity of both inventory reviewers and compilers, with a focus on key issues in relation to GHG inventories and the review process.

13. The LRs reiterated the need to continue to increase the number of review experts who can actively participate in the review process with the support of their nominating Parties in order to ensure completeness and balance of expertise in ERTs. The LRs also reiterated the importance of Parties supporting their experts to ensure that they are fully available for the entire review process and required training activities, and further stressed the importance of Parties nominating experts with GHG inventory experience and robust sectoral technical expertise to the UNFCCC roster of experts and regularly updating their nominations.

14. The LRs noted that for Parties to the Kyoto Protocol the review of the 2022 annual submissions (inventory year 2020) is the last annual review of the second commitment period, and that the 2022 review reports will be those considered for the compliance accounting. The LRs also noted the importance of paying special attention to the review of the 2022 annual submissions at the next meeting of LRs, in time for the recommendations to be implemented in preparing the 2022 annual submissions, and requested the secretariat and encouraged LRs and ERTs to take all appropriate measures with this aim in mind during the review of the 2020 and 2021 annual submissions.

15. The LRs wish to convey to the SBSTA the importance of using the lessons learned and experience from the GHG inventory review process for developing the enhanced transparency framework (ETF) under the Paris Agreement.

VI. Other matters

16. The LRs took note of the work of the secretariat in developing tools such as the frequently asked questions on the ETF under the Paris Agreement and the reference manual on the ETF. They also took note of the information provided by the secretariat on the implementation of the international consultation and analysis process, which helps developing country Parties to gain experience.

⁵ Per decision 13/CP.20, annex, para. 98.