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Overview of the existing training programmes for technical expert reviews

Technical paper by the secretariat

Summary

This technical paper provides information on the current training programmes for technical experts participating in the technical expert review of the annual greenhouse gas inventories, supplementary information submitted under Article 7 of the Kyoto Protocol and biennial reports and national communications submitted by Parties included in Annex I to the Convention; and biennial update reports submitted by Parties not included in Annex I to the Convention. The paper provides an overview of those training programmes, the results of their implementation with relevant statistics, observations and lessons learned from their development and implementation and how they could be used for developing the training courses under the enhanced transparency framework of the Paris Agreement.

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Contents

Abbreviations and acronyms

AFOLU	agriculture, forestry and other land use
AI	Party included in Annex I to the Convention
Annex I Party	Party included in Annex I to the Convention
BR	biennial report
BUR	biennial update report
CGE	Consultative Group of Experts
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
COP	Conference of the Parties
ERT	expert review team
ETF	enhanced transparency framework
FOD	first order draft
FTC	finance, technology and capacity-building
GHG	greenhouse gas
HR	human resources
IAR	international assessment and review
ICA	international consultation and analysis
IDR	in-depth review report
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
KP-LULUCF activities	activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
LDCs	least developed countries
LMS	learning management system
LR	lead reviewer
LULUCF	land use, land-use change and forestry
MPGs	modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement
MRV	measurement, reporting and verification
NA	not applicable
NAI	Party not included in Annex I to the Convention
NC	national communication
NFP	national focal point
NIR	national inventory report
non-Annex I Party	Party not included in Annex I to the Convention
PaMs	policies and measures
QA/QC	quality assurance/quality control
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
reporting guidelines for supplementary information	"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol. Part II: Reporting of supplementary information under Article 7, paragraph 2"
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
RO	review officer
SBSTA	Subsidiary Body for Scientific and Technological Advice
TA	technical analysis
TRR	technical review report

TTE	team of technical experts
UNFCCC reporting guidelines on NCs	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications"
2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*

I. Introduction

A. Background and mandate

1. In accordance with the relevant decisions of the COP[1] and request of the SBSTA, since 2003 the secretariat has developed and implemented training programmes for technical experts to participate in the technical reviews to support the implementation of the reviews of the annual GHG inventory submissions, BRs and NCs of Annex I Parties under the Convention and its Kyoto Protocol: the training programme for review experts for the technical review of GHG inventories of Parties included in Annex I to the Convention (hereinafter referred to as the GHG inventory reviewers training programme); the training programme for members of ERTs participating in annual reviews under Article 8 of the Kyoto Protocol (hereinafter referred to as the Kyoto Protocol training programme); and the training programme for review experts participating in the technical review of BRs and NCs of Annex I Parties (hereinafter referred to as the BR/NC training programme). Further, to facilitate the implementation of ICA through to the first step of the technical analysis of BURs submitted by non-Annex I Parties, COP 19 requested the secretariat to assist the CGE in developing and organizing appropriate training programmes for nominated technical experts to take part in the TTE for the technical analysis of BURs (hereinafter referred to as the TTE training programme).[2]

2. The overall purpose of these training programmes is to ensure that the members of the ERTs and the TTE have the knowledge and skills required for such reviews and technical analysis, including the technical knowledge of respective thematic areas reported by Parties and the application of the relevant UNFCCC reporting and review guidelines.

3. SBSTA 50 requested the secretariat to prepare a technical paper providing an overview of the existing training programmes for technical expert reviews, including lessons learned, and how they could be used for developing a training programme for technical experts participating in the technical expert review of the ETF under the Paris Agreement to facilitate further work on developing a training programme at SBSTA 51.[3]

B. Scope of the technical paper

4. This technical paper presents information on existing training programmes, how they have been developed and are being implemented, together with findings for future improvement, through the experience of respective training programmes. Further, key lessons learned for developing and implementing training programmes are provided for consideration by Parties on the development and implementation of the training programme under Article 13 of the Paris Agreement.

II. Existing training programmes developed and implemented by the secretariat

A. Overview of the training programmes

1. Key elements of existing training programmes

5. All existing training programmes are, in general, composed of e-learning study periods and final examinations. How the e-learning courses and other methods are structured to form individual training programmes, the target audiences, which experts must take and pass the final examinations of individual courses, the format and timing of the examinations all vary by programme.

[1] Decisions 12/CP.9, 10/CP.15, 14/CP.20, 15/CP.20, 19/CP.23, 24/CMP.1, 8/CMP.5 and 5/CMP.11,
[2] Decision 19/CP.19, para. 9(e).
[3] FCCC/SBSTA/2019/2, para. 126.

6. Each programme except the Kyoto Protocol training programme, which is for the experts who passed the overview course of the basic course for the review of GHG inventories of Annex I Parties (hereinafter referred to as the basic course) under the GHG inventory reviewers training programme, offers one e-learning course to provide an overview of the relevant review/technical analysis process, key documents including the relevant UNFCCC reporting and review guidelines, as well as the general guidance on how to conduct the reviews, including the drafting of the review reports. In addition, each training programme offers thematic/sectoral courses that are relevant to the expertise necessary for conducting the review/technical analysis. The e-learning study period is in general intended for self-study by participants. However, depending on the programme, measures to assist participants studying technical subjects are offered, such as online instruction by experienced reviewers. Final examinations are timed. The pass mark of each examination is 65 against 100 points.

7. Table 1 provides an overview of the training programmes to show their variations.

Table 1

Key elements of existing training programmes for experts participating in the technical review of annual greenhouse gas inventories, national communications and biennial reports submitted by Annex I Parties and analysis of biennial update reports submitted by non-Annex I Parties

Training programme	*Approach/format offered under the programme*	*Structure*	*Implementation period of current programme and frequency*	*Target audience*	*Examination*			
					Requirement by experience	*Requirement by role*	*Format*	*Access*
Training programme for review experts for the technical review of GHG inventories of Parties included in Annex I to the Convention: Basic course for the review of greenhouse gas inventories of Parties included in Annex I to the Convention	Instructed course: consists of e-learning with instructors and hands-on training seminar Non-instructed course for experienced GHG inventory experts offers e-learning without instructors/a training seminar	Two stages: First stage: eight-week e-learning period to study mandatory courses: a combination of general courses and one sector-specific course Second stage: three-day in-person training seminar	2017–2020 Instructed course: one or two (regional) cycles, subject to resource availability Non-instructed course: all year round	New and experienced review experts for the technical review of GHG inventories	New experts must pass the examinations on the overview course and one of the sectoral courses	LRs and experienced review experts are encouraged to take the examinations on revised courses	In person Closed book examination on the overview course (time limit: 120 minutes) Open book examination on the sectoral course (time limit: 180 minutes)	During the training seminar. Other arrangements are possible if the conditions of "in person with the secretariat staff" and "no additional cost for the secretariat" are met. Option to retake examinations once
Training programme for review experts for the technical review of GHG inventories of Parties included in Annex I to the Convention: Review of complex models and higher-tier methods	E-learning, without instructors	Stand-alone e-learning course	2017–2020 All year round	LRs and review experts for the review of GHG inventories	Optional	Optional	Self-check online (time limit: 45 minutes for non-LULUCF, 60 minutes. for LULUCF)	Access to the examinations is provided at the end of the course Option to retake examination once.
Training programme for review experts for the technical review	E-learning, without instructors	Stand-alone e-learning course	2017–2020 All year round	LRs and review experts for	Optional	Optional	Self-check online (no time limit)	Access to the examinations is

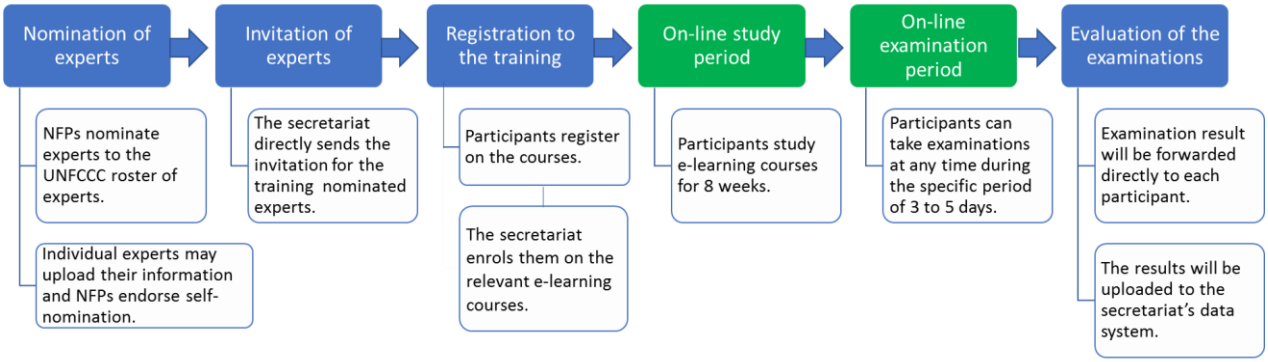
Training programme	*Approach/format offered under the programme*	*Structure*	*Implementation period of current programme and frequency*	*Target audience*	*Examination*			
					Requirement by experience	*Requirement by role*	*Format*	*Access*
of GHG inventories of Parties included in Annex I to the Convention: Improving communication and facilitating consensus in ERTs				the review of GHG inventories				provided at the end of the course Option to retake examination once
Training programme for review experts for the technical review of GHG inventories of Parties included in Annex I to the Convention: Refresher Seminar for experienced greenhouse gas inventory review experts	In-person seminar	Depending on the subject taken up each year	2017–2020 Once a year	Experienced reviewers, LRs	NA	NA	NA	NA
Training programme for members of expert review teams participating in annual reviews under Article 8 of the Kyoto Protocol	E-learning: With instructors for technical courses Without instructors for non-technical courses	Five thematic e-learning courses. Mandatory courses are depending on the role in the ERT	2016–2022 Once a year	LRs, generalists and GHG inventory experts who have passed the mandatory basic course examinations	New experts who successfully completed the basic course must pass their mandatory courses for their roles in the ERT before participating in an ERT	Requirements vary according to role and the experiences of individual experts	Online Time limits vary between 25 and 120 minutes, depending on the courses	Access to the examinations at any time during the designated three-day period. Option to retake examinations once
Training programme for review experts for the technical review of BRs and NCs of	E-learning, without instructor	E-learning period to study mandatory courses: a	2017–2020 Once or twice a year, depending	New and experienced review	New experts must pass the examinations on the general/ cross-cutting courses and	The updated general/cross-	Online (time limit: 80 minutes)	Access to the examinations at any time during the

Training programme	*Approach/format offered under the programme*	*Structure*	*Implementation period of current programme and frequency*	*Target audience*	*Examination*			
					Requirement by experience	*Requirement by role*	*Format*	*Access*
Annex I Parties to the Convention		combination of general courses and one thematic course	on the schedule of BR reviews	experts and LRs	on one of the thematic courses before participating in an ERT	cutting course is: Mandatory for new LRs; Encouraged for LRs and experienced experts	Or in person by the secretariat provided that no additional resources are required	designated three-day period Option to retake examinations twice
CGE training programme: technical analysis of BURs from non-Annex I Parties	E-learning, without instructor	Layered structure: Cluster A – guidance for conducting the technical analysis: a combination of general courses and at least one thematic course Cluster B: methods and science Cluster C: REDD+ course E-learning period to study mandatory courses	Not specified Twice a year	Cluster A: mandatory for all participants Cluster B: optional for experienced experts Cluster C: mandatory for LULUCF experts who conduct technical analysis on REDD+	New experts must pass the overview module and one of the thematic modules under cluster A and the corresponding module of cluster B to be eligible for participating in the TTE	REDD+ experts must take the overview course under cluster A and the REDD+ course under cluster C	Online (time limit: 60 minutes, open book examinations)	Each training cycle includes a retake period four weeks after the first attempt Access to the examinations at any time during the designated five-day period No limitation to retake examinations

2. General procedure of implementing training programmes

8. Once a year, the secretariat sends an invitation to the UNFCCC NFPs to nominate experts to the UNFCCC roster of experts for the relevant review and technical analysis activities. The secretariat directly invites experts nominated by the NFPs and those available in the UNFCCC roster of experts to participate in a training programme. Figure 1 below shows the general procedure of implementing training programmes.

Figure 1
General procedure of implementing training programmes



9. The prior nomination of experts by NFPs to the UNFCCC roster of experts for specific reviews and technical analysis is the basic requirement to take part in the training programmes. For example, if an expert is nominated to the technical analysis of the BUR, but not to the review of the GHG inventories of Annex I Parties, they may not automatically receive an invitation to the GHG inventory reviewers training programme.

10. E-learning courses are made open to the participants during the designated time periods of six to eight weeks. The actual time required for individual experts to complete each e-learning course varies substantially, because it is highly dependent on the level of prior knowledge and the experience of each expert. The secretariat may mail the offline version of the training materials, upon request, to the experts from developing country Parties who have difficulty in accessing e-learning courses.

11. Examinations are made available immediately after the e-learning study period. In the case of online examinations, participants can access their examinations at any time during the designated three-day period for the Kyoto Protocol and BR/NC training programmes or five-day period for the TTE training programme. In-person examinations are held during the training seminar or other occasions where supervision by the secretariat staff is possible.

12. For all online examinations, except for the REDD+ module, the results appear immediately on the screen once the participants submit their final examinations. For the in-person written examinations, as well as the REDD+ module of the TTE training programme, which includes web-based written questions, results are sent directly to the participants through email.

3. E-learning courses development

13. In general, the secretariat developed all e-learning training courses with the help of external consultants who were chosen from experienced reviewers, or recognized experts with the relevant expertise in developing courses on new thematic areas. The timelines and the resources required for the development of new training courses vary depending on various factors, including the number of courses under the programme and the complexity and the technicality of information covered in the courses.

14. In general, the overall process of developing the current training programmes consists of three steps: (1) the drafting of training courses and examinations by consultants selected from the LRs and recognized experts, assisted by the ROs, (2) the drafting of the storyboards for e-learning courses by the consultants, supported by the ROs, and (3) the development of the e-learning courses by the e-learning course developer assisted by the ROs and assistants.

Throughout the process, the consultants and the ROs conduct QA/QC of the course contents and user-friendliness.

15. Once developed, e-learning courses are hosted by the LMS of the secretariat, except for the basic course, which is hosted by an external e-learning provider.

B. Training programme for review experts for the technical review of greenhouse gas inventories of Parties included in Annex I to the Convention

1. Background

16. The current GHG inventory reviewers training programme was adopted by COP 20[4] to reflect the newly adopted revised UNFCCC reporting and review guidelines,[5,6] and the use of the 2006 IPCC Guidelines. The first decision on this training programme dates back to 2003 where the COP requested the secretariat to develop and implement the training programme for members of ERTs for the technical review of GHG inventories submitted by Annex I Parties. COP 9 requested the secretariat to develop and implement the training programme in accordance with its provisions, including the coverage and format of the training courses and the requirements for the examinations.[7] Revisions and update of this training programme were made in 2010[8] and 2015.[9] SBSTA46 decided to extend the implementation of the programme to 2020.

2. Overview of the training programme

17. The GHG inventory reviewers training programme offers three courses: the basic course, review of complex models and higher-tier methods and improving communication and facilitating consensus in ERTs. Table 2 shows the overview of the programme.

Table 2
Overview of greenhouse gas inventory reviewers training programme

Programme structure	*Courses*	*Course structure*	*E-learning courses offered*	*Activities*	*Examination requirements*	*Preparation*
For new experts: One mandatory course supplemented by two non-mandatory courses	Basic course for the review of GHG inventories of Annex I Parties Experts can take a non-instructed course without a training seminar	Each course is presented as an e-learning course with a final examination held in person Participants must select an overview course and one sectoral course which is relevant to their expertise	Overview course and five sectoral courses: Energy, IPPU, Agriculture, LULUCF and Waste	Self-study during e-learning study period	Mandatory to pass in-person examinations on the overview course and one sectoral course	2015
		In-person training seminar	NA	Three-day hands-on training, including a simulation exercise	NA	

[4] Decision 14/CP.20.
[5] Decision 24/CP.19.
[6] Decision 13/CP.20.
[7] Decision 12/CP.9.
[8] Decision 10/CP.15.
[9] Decision 14/CP.20.

Programme structure	*Courses*	*Course structure*	*E-learning courses offered*	*Activities*	*Examination requirements*	*Preparation*
				of a centralized review		
	Review of complex models and higher-tier methods	An e-learning course with final examination	A course on the review of complex models and higher-tier methods	Self-study during e-learning study period. Online examination	Optional	2010
	Improving communication and facilitating consensus in ERTs	An e-learning course with final examination	A course on the improving communication and facilitating consensus in ERTs	Self-study during e-learning study period Online examination	Optional	2003
For experienced experts: Annual seminar	Refresher seminar for experienced GHG inventory review experts	In-person seminar Invited participants only Held annually	NA	Presentations and discussions on the technical review of GHG emission estimates to strengthen and refresh knowledge	NA	NA

(a) Basic course – instructed course

18. The basic course aims to ensure that the review experts have the requisite knowledge and skills to carry out the reviews of Annex I Parties' GHG inventories under the Convention. The course consists of three components: an e-learning study period, in which participants study e-learning courses at their own pace, followed by a hands-on training seminar with a simulation exercise of the centralized review and the final examinations (see also table 1). Table 1 in annex II provides brief descriptions of the e-learning courses under the basic course.

19. During the e-learning study period, instructors will communicate with participants online using the question forum of each course. Participants are expected to ask questions about the contents of the courses, IPCC methodologies and the reporting and review of GHG inventory sectors under the Convention. The instructors and the secretariat closely monitor the progress of individual experts, based on their performance through the question forum and the weekly reports that provide information on how many times each participant has accessed the individual courses. Since there is no PDF version of the training materials for the basic course, the secretariat may provide the offline version of the training courses in a USB via mail.

20. The purpose of the training seminar is to provide participants with the opportunity to test their skills in conducting the reviews, but not to prepare for the final examinations. During the three-day training seminar held immediately after the e-learning study period, instructors facilitate the simulation exercise of the centralized reviews, helping participants to develop questions to the Party under review and write review reports using the Annex I Parties' GHG inventory submissions.

(b) Basic course – non-instructed course

21. The basic course is available upon request all year round without facilitation by instructors and the training seminar. There is no limit for the study period of non-instructed courses. So far, most participants to the non-instructed course have been new experts from Annex I Parties or experienced reviewers studying the updated basic courses introduced in 2015. Participants to the non-instructed course must seek the opportunity for in-person examinations supervised by the secretariat staff.

(c) Basic course – examinations

22. Following the recommendations of the LRs at their 16th meeting, the examination for the sectoral courses have been open book since 2019. Experts who do not pass a course examination at the first attempt may retake the examination once only. For experts who wish to retake the examinations after failing them at the first attempt, the secretariat makes arrangements to organize in-person examinations on various occasions (e.g. LRs' meeting, sessions of the subsidiary bodies, in-country reviews). For experienced review experts, including the LRs, the examination of the updated basic course is optional; however, they are encouraged to take non-instructed courses.

(d) Review of complex models and higher-tier methods

23. This course is optional and aims to improve the understanding and technical skills for the review of GHG emission estimates performed using higher-tier methods and complex models. The course is targeted to LRs and experts who already have experience with GHG inventories. In recent years, more Annex I Parties have been using international and/or country-specific models and methods to develop their inventories; therefore reviewers' skills to review such inventories and the facilitation of consistent review approaches among the ERTs are becoming more important.

(e) Improving communication and facilitating consensus in expert review teams

24. The course is optional and aims to increase the competence of experts participating in the review of GHG inventories under the Convention by providing tools to improve the work of ERTs and facilitate cross-cultural teamwork. The course covers general aspects of working in cross-cultural teams, recommendations to improve teamwork in ERTs and techniques to prevent or manage disagreements.

(f) Refresher seminar for experienced greenhouse gas inventory review experts

25. Since 2010[10] as a part of the GHG inventory reviewers training programme, refresher seminars are organized annually for experienced reviewers and LRs back to back with the LRs' meetings. The refresher seminar aims to enable experienced review experts to strengthen and refresh their knowledge, in relation to both cross-cutting aspects and sector-specific issues. The themes of the seminars have been chosen by the secretariat from suggestions by the LRs and the experience gained through the review activities. Typically, experienced LRs are requested to make presentations and/or provide background papers for the seminar. Themes of the refresher seminars since 2010 and the presentations are available on the UNFCCC website.[11]

3. Development of the training courses and examinations

26. The update of the training courses 10 years after the launch of the original courses required the complete replacement of all courses. Consequently, the entire process in updating the e-earning courses with final examinations took more than 70 weeks. Six consultants developed the storyboards of the courses. E-learning course developers were hired by the e-learning provider contracted with the secretariat. Eleven ROs were involved in different stages of the work assisting the authors and providing QA/QC to the storyboards and the web pages. A brief overview of the process and the resources required for updating the basic course in 2014–2015 is presented in tables 1 and 2 in annex I.

27. The work of developing the e-learning courses was divided into two phases: (1) the drafting of the storyboard for the e-learning courses and (2) the development of the e-learning courses. The consultants selected from the LRs drafted the storyboards of individual training courses with the help of the secretariat. E-learning course development based on the storyboard provided by the secretariat, the publication of e-learning courses on the online

[10] As indicated in decisions 10/CP.15 and 14/CP.20.

[11] https://unfccc.int/process-and-meetings/transparency-and-reporting/training-programmes-for-experts/training-programmes-for-the-review-of-information-submitted-by-annex-i-parties/refresher-seminars-for-experienced-ghg-inventory-review-experts.

platform and the maintenance of the e-learning courses were outsourced to the e-learning provider. This resulted in the need for repeated QA processes by ROs and the authors for reasons including the following:

(a) The software used was not advanced enough to meet the requirement for developing the technical courses of the GHG inventories;

(b) The tight schedule for the e-learning course developers affected the time that could be spent on internal QC before publishing the test versions;

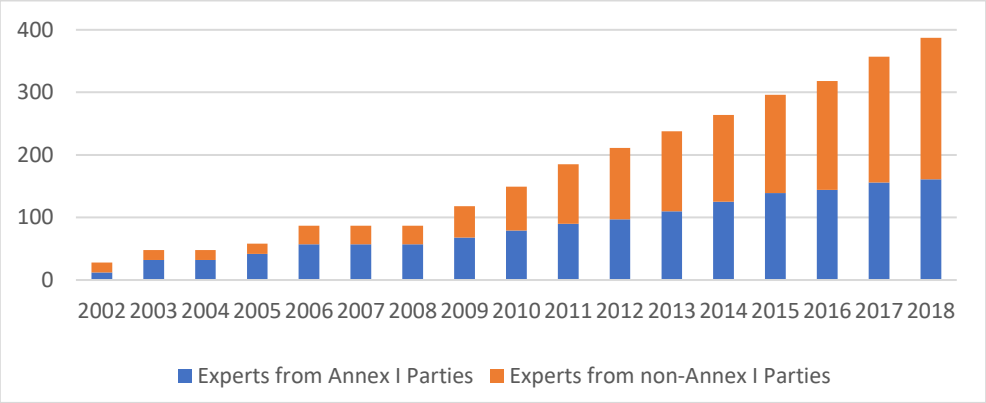
(c) The lack of direct communication with the e-learning course developer and the QA officers in the secretariat.

4. Implementation of the training programme

28. Since the launch of the basic course, 773 experts have taken courses, including 401 experts from Annex I Parties and 372 experts from non-Annex I Parties. A total of 1,677 examinations have been taken. As at the end of August 2019, 414 experts from 100 Parties were eligible to take part in the reviews of the GHG inventories submitted by Annex I Parties under the Convention. An overview of the experts who passed the final examinations and have become eligible to participate in the reviews of Annex I Parties' GHG inventories under the Convention are presented in tables 3 and 4 in annex I.

29. The typical size of each round of the instructed course is around 30 participants. Priority is given to experts with GHG inventory reporting expertise, nominated to the UNFCCC roster of experts, from Parties that do not have review experts who have previously participated in review activities.[12] The secretariat aims to organize training seminars twice a year: once in Bonn and once as a regional seminar, as far as resources allow. Since 2004, 20 rounds of instructed courses with 14 training seminars in Bonn and six regional training seminars have been implemented. Locations of training seminars are indicated in figure 1 in annex I. Travel support is provided for participants from non-Annex I Parties. During the e-learning study period and the training seminar, instructors make efforts to help experts to fill the gaps of experience for reviewing other Parties' GHG inventories, applying the UNFCCC reporting and review guidelines and the IPCC methodological guidelines. Figure 2 below shows the cumulative number of participants in the instructed courses since 2004 and the pilot training seminars in 2002–2003, indicating the contribution that training seminars have made to increasing the number of non-Annex I Party experts being provided with the opportunity to be trained to be reviewers.

Figure 2
Basic course: cumulative number of participants of the instructed courses



30. Furthermore, having experts from Annex I and non-Annex I Parties studying together has been shown to be advantageous for all participants. This is because, in many cases, participants from Annex I Parties have experience from real reviews of their annual GHG inventory submissions and this stimulates sound sectoral discussions during the e-learning period and in the training seminar. For Annex I Party experts, it is a good exercise to

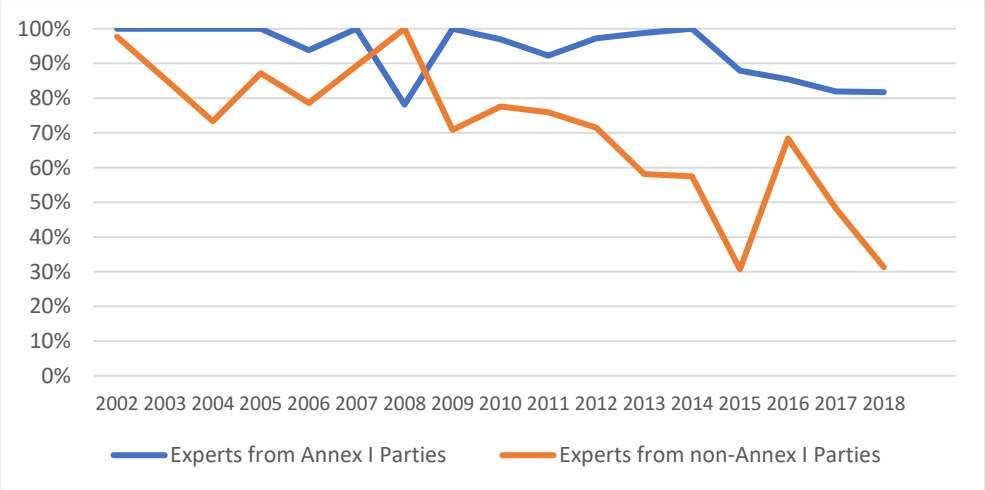
[12] See also decision 14/CP.20.

effectively communicate with experts with different background and levels of expertise; it is very important to work in a multicultural environment during the reviews.

31. A total of 237 experts, including experienced experts who have studied on updated courses and experts retaking the examinations, have taken the option of the non-instructed course. Some Annex I Parties use the non-instructed course for training their new staff for developing national GHG inventories. In some cases, the Party makes arrangements for its national inventory experts to take the online courses during the same period and invites the secretariat staff to supervise the in-person final examinations. Since, in general, participants in non-instructed courses are from Annex I Parties who already have some experience of the GHG inventory reporting and review, the pass rate of the non-instructed course is higher than the instructed course.

32. As figure 3 below indicates, the pass rates of the examinations in the instructed courses are showing in general a decreasing trend. Firstly, in the early period, participants included many authors of IPCC guidelines and experts who were developing their national GHG inventories for the stricter process of review under Article 8 of the Kyoto Protocol. Their knowledge of the IPCC methodologies and the UNFCCC reporting and review guidelines was robust. Secondly, in updating the courses in 2014–2015, all courses became on average twice as long as the previous versions, in order to reflect methodological guidance based on the 2006 IPCC Guidelines with more case studies and exercises based on the experience of reviewers, which required the participants to devote more time to completing the courses. In addition, experts are getting busier carrying out multiple tasks, including newly introduced BR/BUR reporting. In accordance with the weekly report of participants' progress in e-learning courses, most of the participants, regardless of whether they are from Annex I or non-Annex I Parties, are having difficulty in completing the courses within the training cycle of six to eight weeks. These could be the reasons for the notable decrease in pass rates since 2016. Thirdly, since 2009, the effort to organize instructed courses with the training seminars twice a year has been constant, and priority has been always given to non-Annex I Party experts whose experience in the national GHG inventories vary; this can be another reason for the notable decline of the pass rate in the instructed courses.

Figure 3
Basic course: pass rates in the examinations in instructed courses



5. Findings for future improvements

33. In view of the decreasing trend of pass rates, it can be concluded that prior solid knowledge of the GHG inventory methodologies is a prerequisite for the participants in the basic course. Considering that almost of all experts who satisfied this condition could complete the e-learning courses within the required period and pass the final examinations, the scope and the contents of the current courses appear to be well suited to the objectives of the training. However, the authors and the secretariat recognize the need to update the courses, owing to the outdated links to external sources, the deviation of the guidance from

the latest review approaches recommended by the LRs and the outdated guidance on the review tools.

(a) Suggestions from the scoping work on seeking user-friendly e-learning courses

34. Improved user-friendliness is called for to increase the number of experts who pass the courses. In 2018, an exercise to critically analyse the basic course from the viewpoint of its user-friendliness was conducted by the secretariat with the help of a small group of experienced experts. The two main points among the various practical recommendations resulting from this exercise are as follows:

(a) The training courses should be designed to give incentive to participants to continue their studies;

(b) Training courses should put more focus on practical guidance on how to review and draft the report.

35. Furthermore, LRs at their 16th meeting discussed how to improve the pass rate and user-friendliness of the training programme. Some suggestions concern the use of the latest information technology and communication techniques to make the online courses more attractive and accessible.

(b) Difficulties of non-Annex I Party experts in retaking the examination

36. The annex to decision 14/CP.20 indicates that new experts may retake the examinations only once, if they do not pass a course examination at the first attempt, providing that the retake does not require the secretariat to incur additional costs. The limitation of two attempts is not in itself a major obstacle to increasing the number of experts passing examinations. Many Annex I Party experts took the opportunity of in-country reviews of their GHG inventories and NCs, or visiting Bonn, to retake and pass examinations. The obstacle for non-Annex I Party experts in retaking examinations is the provision indicating that no additional cost should be incurred by the secretariat. To date, not many non-Annex I Party experts have been able to retake the examinations, since there are no opportunities like in-country reviews for non-Annex I Party experts. Eventually, most non-Annex I Party experts stopped studying to become reviewers after failing their first examinations. A measure to ensure that non-Annex I Party experts can retake an in-person written examination must be sought.

C. Training programme for members of expert review teams participating in annual reviews under Article 8 of the Kyoto Protocol

1. Background

37. The current Kyoto Protocol training programme was launched in 2016, prior to the first reviews of the GHG inventories and supplementary information for the second commitment period of the Kyoto Protocol. In 2015 CMP 11 had requested the secretariat to update the former training programme[13,14] to reflect the changes arising from the implementation of decisions 2/CMP.7 to 4/CMP.7 and 1/CMP.8 and other relevant CMP decisions in order to ensure that the courses incorporated the rules and modalities applicable to the second commitment period of the Kyoto Protocol.[15] Immediately after the launch of the training programme, all GHG inventory reviewers who had participated in the first commitment period reviews and the new experts who had completed the basic course successfully were invited to take the courses. As indicated in decision 5/CMP.11, the implementation period of this updated training programme is 2016–2022.

[13] Decision 24/CMP.1.
[14] Decision 8/CMP.5.
[15] Decision 5/CMP.11.

2. Overview of the training programme

38. The Kyoto Protocol training programme consist of five e-learning courses that cover different topics related to the review of GHG inventories and supplementary information submitted by Annex I Parties under the second commitment period of the Kyoto Protocol. Table 3 indicates the structure of the programme, topics of e-learning courses and the requirements for the experts to pass the final examinations by their roles in the ERT.

Table 3
Overview of the Kyoto Protocol training programme

			Examination requirements[a]					
Programme structure	*E-learning courses offered*	*Activities*	*New LRs*	*LULUCF*	*New generalist*	*New non-LULUCF*	*New LULUCF*	*Generalist*
Five e-learning courses	National systems	Self-learning, without instructor	O	X	X	O	O	O
Each course is presented as an e-learning course with a final online examination		Final online examination						
	Application of adjustments	Self-learning, with an instructor	O	X	X	O	O	O
Participants must take mandatory courses/examinations depending on their roles in an ERT		Final online examination						
	Modalities for the accounting of assigned amounts under Article 7, paragraph 4, of the Kyoto Protocol	Self-learning, without instructor	X	X	X	O	O	O
		Final online examination						
	Review of national registries and information on assigned amounts	Self-learning, without instructor	O	X	O	X	X	O
		Final online examination						
	Review of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol	Self-learning, with an instructor	O	O	X	X	O	X
		Final online examination						

[a] Columns indicate the experts by their roles in the ERT and their mandatory requirement to pass the examinations updated for the Kyoto Protocol second commitment period. "O" indicates that it is mandatory, and "X" indicates that it is not mandatory, to pass the examination of the updated course.

39. Development The mandatory requirements for new/experienced experts, LULUCF/non-LULUCF experts, generalists and LRs are indicated in table 3. Instructors are available during the e-learning for the courses of "Application of adjustments" and the courses "Review of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol". The role of the instructors includes answering questions from the participants to help them to understand technical information and methodologies. Table 2 in annex II provides brief descriptions of the e-learning courses under the Kyoto Protocol training programme.

3. Development of the training courses and examinations

40. The entire process of updating the e-earning courses took around 45 weeks, involving four consultants to develop storyboards and an e-learning course developer. Six ROs and one assistant for technical work supported the work at different stages, assisting the authors and providing QA/QC. A brief overview of the process and resources required for developing the e-learning courses is presented in tables A5 and 6 in annex I.

41. The overall process of developing the training programme in 2015–2016 was mostly the same as that taken for the basic course. However, to improve the efficiency of the project management, the secretariat applied new approaches, including:

(a) Using the secretariat's LMS system to implement the e-learning courses;

(b) Directly hiring an e-learning course developer, instead of outsourcing the entire process of e-learning course development;

(c) Applying the authoring software that is used by other LMS courses offered by the secretariat and developing an internal capacity to edit e-learning courses.

4. Implementation of the training programme

42. As indicated in table 3 above, the Kyoto Protocol training programme requires participants to take different combinations of mandatory examinations according to their experiences and roles as experts in the ERTs. Since the introduction of the courses in 2006, 104 experts have passed the mandatory courses required for the LRs of the Kyoto Protocol reviews. Since the launch of the courses for the second commitment period of the Kyoto Protocol, 14 experts have passed the mandatory courses to become generalists and 15 experts for the reviews of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. See also table 7 in annex I.

43. The pass rates of the final examinations are in general good, ranging between 75 and around 90 per cent of participants. The Kyoto Protocol training programme is offered only to those experts who have passed the basic course and whose technical skills have thus already been proved. The exceptions to these results are the courses "Review of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol" and "National registry", for which the average scores are lower than 65 points.

44. Normally, the training cycle of the Kyoto Protocol training programme opens in May to July for a six week-period, to enable experts who passed the basic course since the previous cycle to take part in the Kyoto Protocol reviews.

45. In order to ensure that ERTs have the skills and knowledge to meet the requirements for the reviews in the second commitment period, decision 5/CMP.11 set different requirements for examinations depending on the roles of reviewers. Experienced experts are exempted from taking the examinations of the updated courses if they have successfully completed and passed examinations of the relevant courses of the training implemented during the first commitment period, while, decision 5/CMP.11 requires experienced experts to pass specific course examinations to take new roles in the ERT. When the updated courses for the second commitment period were launched, those who had participated in the first commitment period reviews were invited to study the courses and take final examinations. However, more than three years since the launch of the updated course, these provisions are not being fully observed. For example, experienced experts who are willing to take the role of an LR must pass the examinations on the review of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol. This provision seems to be a challenging one for the experts whose expertise is not the LULUCF sector. In view of this, support material for non-LULUCF experts titled "Accounting of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol in the second commitment period" was prepared and made available to course participants in 2017.

5. Findings for future improvements

46. The high pass rates of participants indicate that the current approach, e-learning courses and online examinations, with supportive measures including the instructor and additional material for the technical courses, has achieved satisfactory results. Nevertheless, there are some points for further consideration for improving the training programme.

(a) Mandatory and non-mandatory courses for the lead reviewers

47. As indicated above, many experienced non-LULUCF experts who are willing to become LRs have fulfilled the requirements to pass the examination of the "Accounting of

activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol" course. During the LRs' meeting, it was pointed out that the review of the information reported is under the responsibility of the LULUCF experts, and the LRs should not/cannot take over that task. This indicates that careful consideration is necessary when considering who should take which courses and examinations.

(b) In-house e-learning course development

48. The approach of directly hiring an e-learning course developer had positive and negative effects. One of the most significant disadvantages was the extra work for the ROs in coordinating the development of the courses and their QA/QC with the course developer. However, this disadvantage could be offset by ensuring the autonomy of the software and the platform used for developing the courses.

49. The latest experience indicates that ideally the secretariat would have the basic capacity to use the technologies such as software applications to develop e-learning courses. Some ROs and an assistant learned how to use the authoring application of the e-learning courses. This led to a reduction in the time required for the QA in developing new courses and a reduction in the cost of their maintenance. This experience indicates that in future, if any new format/approach/platform is to be introduced for conducting the training of experts, careful consideration should be given to whether or not its development requires outsourcing, and whether the technologies/applications used are practical for the secretariat.

50. As far as time permits, it would be better to separate the processes of developing the course in the form of PDF documents and developing storyboards for e-learning courses. This may require extra time, such as an additional 16 to 20 weeks for developing training materials in a PDF format before converting them into the storyboard (see para. 94 below on the BR/NC training programme); however, the separation will allow the following:

(a) The course materials before transfer into the storyboard can be made available in a PDF format for the experts who have difficulties in accessing the Internet, as well as for the ERTs as a reference for the reviews;

(b) Since the course contents become robust and fixed before the development of the storyboard, the authors of the storyboard and QA can put the focus on ensuring user-friendliness.

D. Training programme for review experts for the technical review of biennial reports and national communications of Parties included in Annex I to the Convention

1. Background

51. The current e-learning courses of the BR/NC training programme were updated in 2017, responding to the request of COP 23,[16] with the objective of enhancing the training programme materials before the start of the reviews of Annex I Parties' third BRs and NC7s due on 1 January 2018. Decision 19/CP.23 indicates that the implementation period is 2017-2020.

52. Despite the reporting and review of NCs submitted by Annex I Parties dating back to the early 1990s, the history of the training of review experts started only in 2014 in order to assist the operationalization of the newly introduced reporting and review of Annex I Parties' submissions of BRs. COP 20 requested the secretariat to develop and implement the training programme for review experts for the technical review of BRs and NCs submitted by Annex I Parties, including the examination of experts.[17] In response to that request, the secretariat developed a training programme and launched it in April 2015 for training the experts participating in the review of NC6s/first BRs.

[16] Decision 19/CP.23.
[17] Decision 15/CP.20.

2. Overview of the training programme

53. The BR/NC training programme consist of four e-learning courses to help experts to understand general reporting and review requirements, as well as the procedures for the NC/BR review process (overview course) and to improve the skills necessary for the technical review of the thematic areas of the NCs/BRs. Table 3 in annex II provides brief descriptions of the courses. Table 4 shows the overview of the BR/NC training programme.

Table 4
Overview of the biennial reports/national communications training programme

			Examination requirements		
Programme structure	*E-learning courses offered*	*Activities*	*New experts*	*New LRs*	*Experienced reviewers*
Four e-learning courses Each course is presented as an e-learning course with a final online examination Participants must select an overview course and at least one thematic course that is relevant to their expertise	Overview Three thematic courses: Technical review of targets and of PaMs, their effects and their contribution to achieving those targets Technical review of GHG emissions, emission trends, projections and the total effect of PaMs Technical review of the provision of financial support, technology transfer and capacity-building	Self-study during e-learning study period Final online examination	Mandatory to pass the examination of updated course Mandatory for new experts reviewing the specified information to pass the examination	Mandatory to pass the examination of updated course Optional LRs are encouraged to take the examination	Optional Experienced experts, including LRs, are encouraged to take the examination

54. To enrol on these e-learning courses, experts do not necessarily need prior experience of the UNFCCC review processes, but they do need to have an expertise in the following areas: mitigation targets and PaMs, effects of individual PaMs and their contribution to achieving mitigation targets; GHG emissions, emission trends, projections and total effect of PaMs; and financial support, technology transfer and capacity-building provided. Participants must study the courses at their own pace. There are no instructors to give guidance or answer any questions from participants.

3. Development of the training courses and examinations

55. For the BR/NC reviews, no established or common methodological guidance exists on many review issues, such as how to review the reporting on the progress towards targets, how to review additionality in the financial contributions, etc. In developing the training courses, methodological guidance was drafted mainly by the secretariat, based on the experience of previous NC reviews, other existing knowledge and guidance from the LRs. Once the contents of the training courses had been assessed as being of good quality, the conversion of the training courses into the respective storyboards was performed by a consultant assisted by the secretariat. This contributed to the harmonized development of the e-learning courses across all courses in terms of substance and editorial style, and shortened the period required for developing them. A brief overview of the production process and resources required for developing the e-learning courses is included in tables 9 and 10 in annex I.

56. Three years after the launch of the BR/NC training programme, Parties recognized a need to revise and update the training courses because of an increase in the level of general technical knowledge and experience in the reporting and review of BRs and NCs since the NC6/first BR reviews. In revising and updating the courses, the following were incorporated:

(a) Review approaches captured in the first and second technical review reports of BRs and NC6s, suggestions in the conclusions of the LRs' meetings and the latest version of the review practice guidance (2017);[18]

(b) Review report templates that were developed to facilitate the technical assessment and to ensure consistency and comparability of reports.

57. In addition, the user-friendliness and coverage of the courses were improved through revising their structure, including updated tests, quizzes and other means for learners to self-check their understanding of the course contents. Along with the updates of the courses, final examinations were also revised.

58. The updated course was launched in September 2017 to allow the secretariat to take into consideration the experts' eligibility while forming the ERTs for the reviews of NC7s/third BRs of Annex I Parties due on 1 January 2018. The approach to developing training materials and e-learning courses was more or less the same as the original version; however, the secretariat directly hired an e-learning course developer and published the courses on the secretariat's LMS, instead of the external e-learning provider's platform which had been using for the original version.

59. In updating the courses, the ROs took main responsibility in drafting the training material and the storyboards. This approach had many advantages, particularly in selecting/drafting the best examples and case studies for various issues based on their experience of the reviews.

60. Before starting to draft updates, the secretariat engaged the International Training Centre of the International Labour Organization to provide an advisory service on e-learning instructional and courseware design for UNFCCC staff. This approach led to a harmonized structure across thematic courses by organizing each topic with three major steps of the review process, "Know-Assess-Draft", and enhanced the clarity and user-friendliness of the training courses. In this exercise, ROs made sure that the lessons were concise and focused to allow experts to better understand key concepts and approaches, for example, by optimizing the amount of information displayed in one slide. Secretariat staff could participate in this task because of the time available to them in a year when there were no BR submissions (BRs are reported and reviewed every other year). Nevertheless, the task put tremendous pressure the ROs working on multiple tasks.

61. Figure 2 in annex I shows the timeline of the development, implementation and update of training programmes for BR/NC reviews since the COP adopted the "UNFCCC biennial reporting guidelines for developed country Parties" in 2011.

4. Implementation of the training programme

62. While no specific timing or frequency is set for the BR/NC training programme, e-learning study periods and examinations have been organized at least once a year, prior to the start of a new BR/NC review cycle to meet the training needs of review experts in a flexible manner.

63. Since the launch of the BR/NC training programme, 328 experts have taken the course examinations, including 173 experts from Annex I Parties and 155 experts from non-Annex I Parties. A total of 1,254 examinations have been taken. As at the end of August 2019, 232 experts from 40 Annex I Parties and 223 experts from 80 non-Annex I Parties were eligible to take part in the BR/NC reviews.

64. The average scores of the final examinations of all courses are over 65 out of 100 points. Since 65 points is the requirement to pass the examinations, the performance of the participants can be said to be satisfactory.

65. One feature of the BR/NC and the BUR courses that is different from the GHG inventory reviewers courses is the tendency of many experts to take the training courses of

[18] https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/international-assessment-and-review/reviews/review-practice-guidance.

more than one or even all three thematic areas and their final examinations. This increases the administrative work in implementing the training course programme.

5. Findings for future improvements

66. Considering the high average score and pass rate of the examinations, the current format and approaches of the training and final examinations (non-instructed e-learning courses) can be considered as appropriate for the training of experts for the BR/NC reviews. The training courses provides a good introduction of the review process and principles of the reviews. Nevertheless, in the actual reviews, LRs and ROs found that the new reviewers require significant guidance on the review approaches with regard to the UNFCCC reporting and review guidelines and to meet quality standards in drafting the review reports, and it will sometimes become burdensome for the entire team to effectively conduct reviews within a limited time.

67. When the updated courses were launched in late 2017, the secretariat invited both newly nominated experts and experienced experts to take the examinations, because experienced experts are encouraged to study the updated courses by decision 19/CP.23. This resulted in a surge in the need for administrative support in 2017, while not many requested to take the courses in 2018 and later. Noting the fluctuating interest in the training programme per year and taking into account the cost efficiency of conducting the online examination, one examination round per year seems to be sufficient for the BR review purposes.

68. It is noted that, after the updated training courses have been implemented, the average scores of the participants have been improved for all courses. (see table 11 in annex I). More data may be required to assess the influence of the updated courses; however, the improvements made to the user-friendliness and the use of more interactive modalities in the updated e-learning courses may partly explain the improved performance of participants.

69. Separating the processes of developing the training materials and the storyboard for the e-learning course meant that more time was required to develop the courses than for the other training programmes. However, this approach proved to have major advantages in ensuring the user-friendliness and quality of the courses.

E. Consultative Group of Experts training programme for technical experts undertaking the technical analysis of biennial update reports from Parties not included in Annex I to the Convention

1. Background

70. COP 16 decided that developing countries, consistent with their capabilities and the level of support provided for reporting, should submit BURs and to conduct ICA of these reports.[19] COP 17 adopted the modalities and guidelines for the ICA, including a first step of the technical analysis of BURs by a TTE.[20]

71. By decision 20/CP.19, the COP adopted the composition, modalities and procedures of the TTE under the ICA, and requested the CGE to develop and organize training programmes for nominated technical experts, based on the most up-to-date training materials of the CGE on national communications from non-Annex I Parties. In the same decision, it indicated that only those nominated experts who have successfully completed the training programme shall be eligible to serve on the TTE.[21] In response, the CGE, with the help of the secretariat, developed the TTE training programme, which was launched in April 2015 with training materials for self-studying. E-learning courses were introduced in December 2015.

72. Upon the request of the developing country Party seeking to obtain and receive payments for results-based actions, two LULUCF experts from the UNFCCC roster of experts, one from a developing country Party and one from a developed country Party, will

[19] Decision 1/CP.16, paras. 60(c) and 63.
[20] Decision 2/CP.17, para. 56 and annex IV, para 3(a).
[21] Decision 20/CP.19, para. 4 and annex, para. 4.

be included among the members selected for the TTE for the technical analysis of results-based REDD+ actions reported in the technical annex to the BUR.[22] A module on REDD+ is included in the TTE training programme.[23]

73. Three years after the launch of the TTE training programme, the CGE, at its 20th meeting, held in February 2018, requested the secretariat to update the online courses of cluster A of the TTE training programme reflecting the experience gained through the implementation of the MRV of the BUR. The implementation period of the programme is up to 2020.

2. Overview of the training programme

74. The TTE training programme consists of three clusters: cluster A on provisions on reporting information in the BURs and conducting technical analysis of BURs under the ICA process; cluster B on background materials covering methods and science on key themes addressed in BURs; and cluster C, on provisions relevant to the technical analysis of a technical annex containing information on results-based actions relating to REDD+ activities. Clusters are further divided into thematic modules to offer e-learning courses and online examinations to assess the proficiency of participants.[24] Table 4 in annex II provides brief descriptions of the courses.

75. One unique feature of the TTE training programme is the independent modules under cluster B that provide technical guidance and scientific information on each thematic area. The modules under cluster A focus on procedural guidance on the technical analysis. To be eligible to participate as a member of a TTE conducting the technical analysis of a BUR, an expert must successfully complete the course of study and the related final examinations of the respective modules under clusters A and B. Only experienced experts may skip taking modules under cluster B. Cluster C is specifically for the experts who conduct the technical analysis of the technical annex containing information on results-based actions relating to REDD-plus activities.

76. Another unique approach of the TTE training programme is its built-in retake period in each training cycle for the experts who have not passed their final examination(s) at the first attempt. All participants are expected to self-study their mandatory modules for six weeks and take their online examinations at any time during the designated period of five days. The retake period is set by default four weeks after the first examinations for those who failed them at the first attempt.

77. There is no limit to the number of online modules that can be undertaken by experts in a specific training cycle. This is particularly important for GHG inventory experts covering multiple GHG inventory sectors when undertaking a technical analysis. Table 5 provides the overview of the TTE training programme.

[22] Decision 14/CP.19, para. 15.

[23] Decision 2/CP.17, annex III, and decision 14/CP.19.

[24] For the TTE training programme, the term “proficiency assessment” is used, instead of “examination” to evaluate the understanding of participants. In practice, the function of the proficiency assessment of the TTE programme and the final examinations of other courses is the same.

Table 5
Overview of the team of technical experts training programme

				Examination requirements				
					GHG inventories experts			
Programme structure	*Cluster structure*	*E-learning courses offered*	*Activities*	*Mitigation experts*	*Non-AFOLU*	*AFOLU*	*FTC support and cross-cutting issues experts*	*REDD+ experts*
Cluster A: technical analysis of BURs	Four e-learning courses Each course is presented as e-learning course with final online examination Participants must select an overview course and at least one thematic course which is relevant to their expertise	Module 1: Overview Module 2 (three thematic modules): Module 2.1 on mitigation actions and their effects Module 2.2 on national GHG inventories Module 2.3 on FTC needs and support received	Self-study during e-learning study period Final online examination	Mandatory to pass the examination				
				All experts, regardless of whether new or experienced, must study mandatory modules of their expertise and pass the examinations				Optional
Cluster B: background materials covering methods and science	Eight e-learning courses to provide background materials for thematic modules under cluster A	Module 2.1 on mitigation actions and their effects Module 2.2(a)–(f) on national GHG inventories Module 2.3 on FTC needs and support received		All experts must study mandatory modules of their expertise and pass the examinations under cluster B AFOLU experts must study module 2.2(c) on agriculture and (d) on LULUCF Only experts who are recognizably experienced are exempted from modules under cluster B				Optional
Cluster C: technical analysis of technical annex on REDD+	One e-learning course to provide guidance on REDD+	Module 3: Technical annex on results-based actions relating to REDD+		Optional				Mandatory

3. Development of the training courses and examinations

78. The project to develop the TTE training programme was initiated in 2014. Challenges encountered by non-Annex I Parties in the preparation of their NCs, as identified in the CGE progress report,[25] as well as the areas of information covered in the BUR and the expertise required to conduct the technical analysis,[26] were taken into consideration in the programme's development.

79. The initial drafts of the training materials, which were developed by consultants, supported by the secretariat, were peer reviewed at a two-day workshop organized by the CGE in October 2014 with a view to ensuring that the training materials fully respond to the needs of the technical analysis of BURs. International experts who are actively engaged in the process and the preparation of NCs and/or BURs participated in the workshop. Based on the feedback received, the CGE, supported by the secretariat, finalized the thematic modules.[27] The e-learning courses were then developed based on the training materials. Tables 12 and 13 in annex I show the major steps and the time frame and personnel involved in developing the TTE training programme.

80. In 2018, following suggestions from the TTE members to align the TTE training courses for conducting the technical analysis with the CGE training materials for Parties developing BURs and to reflect the experience of the technical analyses in the training courses, the cluster A modules were updated. The update improved user-friendliness, streamlined the modules under cluster A by avoiding the overlap of information under cluster B, and clarified the guidance on how to conduct the technical analysis.

81. In updating cluster A, one consultant, assisted by a RO, revised the training courses for all four modules in PDF format and developed storyboards of the e-learning courses. This approach harmonized the format across the modules and improved the clarity of information and guidance, which greatly helps experts who study more than one thematic module.

82. One of the major changes in the update was to remove the written answer section from the final examinations. Originally, the web-based examination site included two written examination questions for each modules of clusters A and C, using fields to allow examinees to type in the answers. Unfortunately, this function was removed from the updated cluster A examinations. Each question of the new examinations allows one correct answer to be selected from the options presented. The main reason for this change was the lack of sufficient resources for the secretariat to evaluate each individual written answer.

4. Implementation of the training programme

83. As at October 2019, the secretariat had coordinated 9 rounds of the TTE training programme. The 10th round will be completed in December 2019.

84. Since the launch of the TTE training programme course, 402 experts have taken the course examination, including 149 experts from Annex I Parties and 258 experts from non-Annex I Parties. The total number of examinations taken amounts 3,228. As at 31 August 2019, 247 experts from 40 Annex I Parties and 285 experts from 80 non-Annex I Parties were eligible to take part in the technical analysis of BURs. Table 14 in annex I provides a breakdown by thematic area.

85. For each cycle of the TTE training programme, the secretariat tries to contact all experts nominated to the UNFCCC roster of experts for the technical analysis of BURs to make them aware of the opportunities available. There is no limitation regarding registering on the courses.

86. The average scores of all participants of the cluster A overview module is 73.5 points, with mitigation module at 70.8 points, GHG inventories at 64.1 points and the FTC at 69.9 points. This indicates that, considering the pass mark is 65 points for all examinations, the

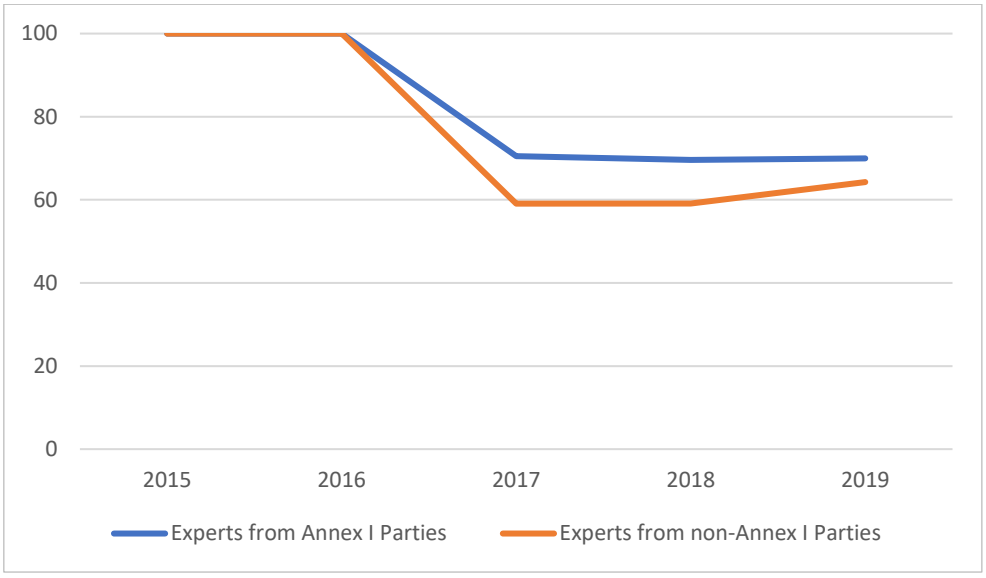
[25] FCCC/SBI/2014/19.
[26] Decision 20/CP.19, annex, para.3.
[27] See document FCCC/SBI/2014/19 for further details on the workshop.

performance of the participants is in general satisfactory, except for the GHG inventory experts. Further breakdown of average scores is presented in tables 15(a)–(c) in annex I.

87. Many experts, in particular those from non-Annex I Parties, retake the examinations after failing at the first attempt. Pass rates taking into account the retake period are 4 to 20 per cent higher than those focusing on the first examination period, suggesting that the option to retake examinations is helpful to non-Annex I experts wishing to become eligible to take part in the technical analysis.

88. Figure 4 shows general pass rates of cluster A examinations. In the first two years following implementation, the pass rate of all examinations was at the satisfactory level. All experts who took the cluster A examinations passed in the first or the second attempt during the retake period. This is because, in the first two years, many experienced experts of the NC and the GHG inventory reviews of the Annex I Parties submissions took the exams to contribute to the newly established technical analysis process. The decline shown since 2017 indicates that more new experts started to participant in the training, which is welcoming fact.

Figure 4
Team of technical experts training course: average pass rates in 2015–2019



89. The revision of the cluster A modules and the final examinations is considered to be one of the reasons for the slight increase from 2018 to 2019, thanks to the enhanced clarity and user-friendliness, with another being the removal of web-based written examination questions from the final examinations.

5. Findings for future improvements

(a) Criteria used to decide mandatory requirements

90. It can be said that the requirements to pass final examinations to be eligible to the TTE are self-determined because participants decide whether or not cluster B modules are mandatory for them. To assist experts, the following working criteria are used: recognizably experienced experts include those who have participated in at least one of the similar processes under the Convention, such as the review of NCs of Annex I Parties as a member of the ERT with experience in relevant areas, at least once in recent years before 2015, or those who have participated in such reviews, at least once, after passing the examinations of the BR/NC training programme or the basic course of Annex I Parties inventories since March 2015. In this way, participants can decide whether or not they can skip cluster B. However, the criteria are still not sufficiently clear. Decision 20/CP.19 requires CGE members to be included in the TTE but there is no requirement for them to study the TTE training courses since they are expected to be experienced experts. During the technical analysis week, however, the secretariat has observed that experts seek technical guidance from CGE members on both procedural and technical matters. Therefore, CGE members

could benefit from undertaking the training programme, at least the modules in cluster A on procedural guidance on the technical analysis, in order to effectively support experts in the TTE in conducting a technical analysis.

(b) How to fill the gap in the experience of greenhouse gas inventory experts

91. Currently, the basic course and the TTE training programme provide the courses of national GHG inventory reviews/technical analysis; however, their approaches to addressing the gaps between less experienced and experienced experts are different. Regarding the basic course, the gap in the skills and expertise of participants is addressed mainly through the instructed course and hands-on training seminars. The TTE training programme takes a layered approach in providing e-learning courses; under cluster B, scientific and technical background information is provided for less experienced experts.

(c) Administrative cost and concerns regarding efficiency

92. Owing to the approach to put no limitation on experts registering on the same courses and taking examinations, the number of experts registering on the courses is growing year by year. In addition, owing to the layered structure of the clusters of this training programme, many experts take different thematic courses and sectoral GHG inventory courses over a period of years to expand their expertise in taking part in the technical analysis of BURs.

93. The effort by the experts to expand their expertise into more than one thematic area makes it easier for the secretariat to assemble the TTE. It also contributes to ensuring the quality of the assessment by the TTE since the team members can discuss the issues among themselves. However, the administrative burden to support this approach and the concerns about efficiency cannot be ignored. For example, the total number of requests to register individual examinations in 2018 amounted to 2,003. Each individual request requires the administrative and technical work of the support staff. However, only around 670 of the examinations were actually taken by the participants in that year (about 33.4 per cent of those registered). The secretariat is observing a similar situation in supporting the BR/NC course implementation; however, the magnitude of the administrative support required is far less than that for the TTE course. To improve the efficiency of the administrative support for the training of experts, a way must be sought to harness the registrations by the experts who are already eligible to the technical analysis/review or those by the experts who register but do not study or take the examinations.

94. Recently, in responding to the requests from the reviewers/TTE, the secretariat has been providing the TTE members and the BR/NC review experts with access to the training courses during the technical analysis/reviews. In future, if separate training courses for reviewers/TTE members without examinations can be published in the open space for free access at any time, and registration for examinations that have already been passed could be prohibited, the provision of unnecessary administrative support be avoided.

III. Key lessons learned

95. In this section, key lessons learned from the experience of developing and implementing training programmes for different processes under the current MRV arrangements are discussed. Where possible, the options for the improvements based on the discussions at CGE meetings, LRs' meetings and a scoping exercise carried out by the secretariat with the help of a small group of experienced reviewers are presented for further consideration.

A. Development of new training courses

96. An early start to the development of the new training courses is desirable. This is to ensure that the comprehensive and robust offline training courses and e-learning courses, as well as the other interactive modes of the training courses, become available in good time. In particular, the overview course, which provides generic guidance applicable to all thematic courses, should be initiated as early as possible.

97. The experience from the update of the basic course indicates that the time frame required for developing a training programme is around 70–80 weeks. In order to launch a training programme before the first review cycle under the Paris Agreement, the drafting of the training courses on the technical review of the NIR of anthropogenic emissions by sources and removals by sinks of GHGs must be initiated as early as possible.

98. Good records of pass rates in the BR/NC training programme and the TTE training programme indicate that their thematic courses can be a good basis for developing new courses for the ETF under the Paris Agreement. While the records indicate that the scope and the contents of the basic course for the GHG inventory reviewers are well suited to the objectives of the training, the LRs and the ROs note that there is room for improvement, including the need to enhance the user-friendliness of the e-learning courses. Considering that the current basic course has not been updated since 2014, preparation for the development of the courses on GHG inventory on reviews under the ETF by revising the basic course would be required. It is also important to note that the time and resources required for the revision of such a voluminous training course for all sectors of GHG inventory reviewers would be considerable, and timely provision of the resources required would be desirable.

99. It is important to include in the workplan the developing an offline version of training courses, with interactive mode, for those experts who have difficulties in accessing the Internet. An early start to the development of the offline interactive mode version will ensure that the necessary quality QA/QC are carried out by both the LRs and the ROs.

B. User-friendliness, applicability and practicability of the training courses

100. User-friendliness, applicability and practicability should guide the choice, approach, format and mode of the training courses. A combination of e-learning courses with final examinations (non-instructed e-learning courses) as the training format proved to be successful in terms of how it has contributed to the number of trained reviewers and its cost-effectiveness. To continue to harvest these benefits some improvements are needed. In view of this, the LRs of the GHG inventory reviews suggested that interactive modalities and the use of modern e-learning methodologies and tools for the administration of the courses and associated examinations, which could also include the possibility of doing the examinations remotely, be explored.

101. A careful evaluation of how the courses can be administered on mobile platforms such as tablets and smartphones is required, in particular to assist experts from developing countries who do not have access to high-speed Internet connectivity. This evaluation should cover applicability and usability, including the possible audio functions. Furthermore, those modalities and tools must be simple and practical enough to allow the secretariat to directly work on the course contents for timely revisions with no additional budgetary implications.

102. The collaboration with the advisory service on e-learning instructional design referred to in paragraph 60 above and the ROs in updating the e-learning courses of the BR/NC training programme was successful in improving user-friendliness. The involvement of communication experts in the development of the new courses is indispensable in ensuring user-friendliness.

C. Support for developing country experts

103. Measures to encourage more technical experts from developing countries to take part in and successfully complete the training programmes must be built into in the training programme.

1. Training seminars with simulation exercises can be expanded to all thematic courses

104. Training seminars with simulation exercises that allow for interaction between experts from both developing and developed countries need to be expanded to cover all thematic

courses. This ensures peer-to-peer learning, as in many cases experts from Annex I Parties have experience from reviews of their annual GHG inventory submissions, which could stimulate sound sectoral discussions during the e-learning period and in the training seminars.

2. Instructed courses are helpful for participants

105. Instructed courses are helpful, in particular for highly technical courses, in assisting participants to fill the gaps in their knowledge and understanding of technical issues. Instructors can facilitate the study planning to help experts to complete the courses and prepare for the final examinations on a timely basis.

106. Recent experiences in the basic course indicates that the guidance given by the instructors to the participants on their time management, the provision of the curriculum towards the completion of the online studies and the active communication with participants was successful in guiding participants to complete the courses within the limited time frame. The possibility of expanding the instructed courses for other thematic courses could be considered.

3. Create an environment to support experts studying the courses

107. Experience indicates that a challenge faced by almost all participants in the existing training programmes is time management for studying the training courses while continuing with their multiple tasks at the national level. This is particularly true for the experts in developing country Parties who are carrying out multiple tasks at home and/or having difficulties in accessing the Internet outside their office. It would be desirable for the direct supervisors of participants to be made aware of the importance of the training programme.

4. Ensure opportunities to retake examinations

108. All training programmes should provide the opportunity for all participating experts to retake examinations. This will help to increase the pool of experts to support the implementation of the transparency framework.

109. The TTE training programme's built-in retake period of the final examinations for those who have not passed the examinations at the first attempt works well in helping experts from developing country Parties to become eligible to take part in the technical analysis. Similarly, under other programmes, participants are allowed to retake examinations once or twice, depending on the programmes. However, not all experts can take the opportunity to retake the in-person examinations because of the provision indicating that no additional cost should be incurred by the secretariat. Measures or an approach to ensure opportunities in retaking examinations for all experts who are capable of becoming reviewers must be sought. Care would need to be taken, however, to maintain the rigour of the written examination to evaluate the knowledge and skills of experts. Originally, for cluster A of the TTE training programme, a web-based written examination function was applied. The use of such a function could enable participants from developing countries to be provided with more retaking opportunities without diluting the rigour of the examination and certification system for highly technical areas. Careful consideration is necessary, however, of measures to prevent experts making copies or taking photographs of the examination questions from the computer screens, since the capacity of the secretariat to develop multiple versions of examinations is limited.

D. Clear guidance on the examination requirements

110. There should be clarity on the examination requirements related to which are mandatory and which are not. This is important in ensuring that ERTs have the sufficient skills and up-to-date knowledge to meet the requirements for the reviews.

111. The terminology commonly used for the existing training programmes such as "experienced experts", "new lead reviewers must pass the examination before participating in ERTs", and so on are not necessarily clear for the experts and the secretariat to identify

mandatory examinations for individual experts. Consequently, some experts could have missed the opportunity to take their mandatory examinations to take up new roles in the ERT.

112. Ideally, all experts will take the examinations of any new training programmes in order to ensure that the ERTs have up-to-date knowledge. However, such strict requirements may be considered as an extra burden and may carry the risk of an insufficient number of experts being available for the reviews under the ETF. Therefore, clear and simple, or more descriptive, guidance for the experts would be helpful.

113. Recalling the difficulties encountered by the GHG inventory LRs in fulfilling the requirement to pass the technical course of the review of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, the role of LRs must be carefully considered when creating their mandatory requirements. As pointed out in the meeting of the LRs of GHG inventory reviews, the LRs are not expected to take over the task of reviewing specific areas that are not their expertise. If required, special courses for LRs could be included in the training programme, instead of asking them to study additional courses outside their own expertise.

E. The frequency and timing of training cycles

114. The appropriateness of the frequency of training cycles and final examinations varies depending on the frequency of the review cycles, how many experts are necessary to make up ERTs, the number of Parties to be reviewed and the number of review experts already available.

115. For the annual GHG inventory reviews, continuous expansion of the pools of review experts is necessary to ensure complete and well-balanced ERTs. In order to increase the number of experts from developing country Parties in the review of GHG inventories of all sectors, it is desirable to continue at least two training cycles with training seminars per year, one held in Bonn and one as a regional seminar. However, one training cycle per year seems to be sufficient for the current BR/NC training programme, taking into account the cost efficiency of conducting the online examination. After the surge of the (re)training of existing reviewers for the technical expert reviews under the ETF of the Paris Agreement, the optimum frequency and timing of training cycles and final examinations of a new training programme could be revisited.

F. Update of new training courses

116. A planned update a few years after the launch of the courses is desirable. This update should take into account experiences from the actual reviews and preparation of the review reports in the training materials/courses to reinforce their contents; reflect the conclusions of the LRs on the agreed review approach; and update links to the external reference materials.

117. Further periodical updates are necessary to ensure that the reviewers are provided with up-to-date information.

G. Further training opportunities for experienced experts

118. It is valuable to continually identify opportunities for refresher courses for experienced experts to further enhance their knowledge and skills. For example, refresher seminars for experienced experts under the GHG inventory reviewers training programme have provided such opportunities over the past decade to refresh, maintain and enhance the skills of expert reviewers. Topics for these seminars have been selected from the suggestions of the LRs based on recent review experiences. The meetings of the LRs of GHG inventory and BR/NC reviews have also been offering opportunities for experienced experts to update their skills and knowledge. These continuous learning opportunities for experienced reviewers should be a part of the training programme under the ETF.

IV. Conclusion

119. The training programmes have been contributing to building trust among Parties on the existing transparency framework by ensuring the necessary levels of skills and knowledge of the members of the ERTs and TTEs, and by promoting consistent approaches among the experts in conducting reviews and technical analysis, all of which could provide a solid basis for the development of the training programme referred to in decision 18/CMA.1, paragraph 12(c).

120. The secretariat, the CGE, the LRs and consultants on training materials and e-learning course development have accumulated knowledge and skills for developing and implementing training programmes to support the transparency arrangement under the Convention and its Kyoto Protocol. This constitutes a solid foundation for the development and implementation of training programmes under the Paris Agreement.

121. Key lessons learned from the experience of developing and implementing the training programmes are summarized as follows:

(a) An early start is desirable when developing new training courses;

(b) User-friendliness, applicability and practicability must be the key words in choosing the approach, format and mode of the training courses;

(c) Measures to support experts from developing country Parties must be built into a new training programme;

(d) Clear guidance on the examination requirements is required, regarding whether an examination is mandatory or non-mandatory for individual experts;

(e) The optimum frequency and timing of training cycles vary depending on the review process;

(f) The first update of new training courses is desirable in three to four years after the launch;

(g) Further training opportunities for experienced experts to take refresher courses must be built into the new training programme.

Annex I

Statistics and additional information

Table 1
Basic course: time and steps required to update e-learning courses

Description	*Time/steps*
Time frame to complete the work	About 72 weeks (late June 2014 to early December 2015)
Breakdown of the process	Step 1. Drafting the FOD of storyboards and the examinations, QA and finalization of the storyboards
	Step 2. E-learning course development

Note: The time frame to complete the work indicates the period required to deliver the expected output, not the actual working days required for the personnel involved.

Table 2
Basic course: resource required to update e-learning courses in 2014–2015

Process	*Resource required*
Drafting storyboards	Six consultants, supported by 3 ROs, and 11 ROs for QA
E-learning course development	E-learning courses provider and three ROs
Publication, maintenance and implementation of the e-learning courses	Outsourced to an external e-learning provider

Table 3
Basic course: overview of the number of experts passing mandatory courses

	AI	*NAI*
Number of experts available for the review	244	170
Number of Parties that have GHG inventory experts eligible for the reviews of Annex I Parties submissions under the Convention	39	61

Note: Data are obtained from the latest UNFCCC roster of experts.

Table 4
Basic course: number of experts passing mandatory courses by sector

	Energy		*IPPU*		*Agriculture*		*LULUCF*		*Waste*		*Not specified*	
	AI	NAI	AI	NAI	AI	NAI	AI	NAI	AI	NAI	AI	NAI
Number of experts available for the review	60	48	43	25	35	29	62	25	29	23	39	27

Note: Data are obtained from the latest UNFCCC roster of experts. For some eligible experts, detailed data are missing.

Figure 1
Locations of training seminars for the basic course

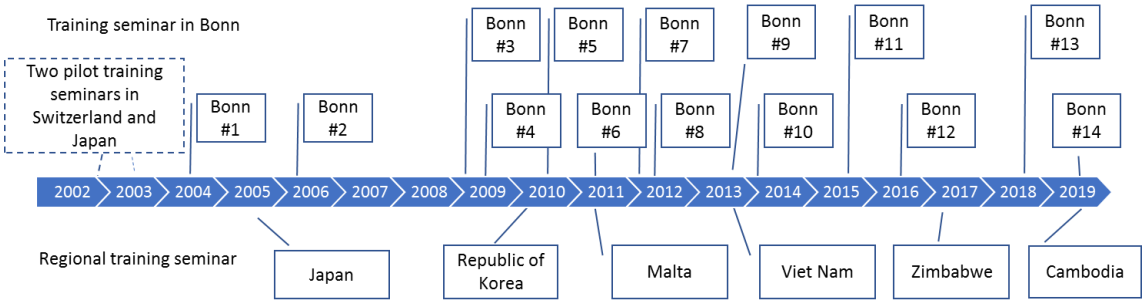


Table 5
Kyoto Protocol training programme: time and steps required to update e-learning courses

Description	*Time/steps*
Time frame to complete the work	About 45 weeks (September 2015 to July 2016)
Breakdown of the process	Step 1. Drafting the FOD of storyboards and the examinations, QA and finalization of the storyboards
	Step 2. E-learning course development

Table 6
Kyoto Protocol training programme: resources required to update e-learning courses

Process	*Resource required*
Drafting storyboards	Four consultants, supported by five ROs, and six ROs for QA
Support for drafting	Five ROs
E-learning development	One consultant and one RO, and one assistant for technical work
Publication of the e-learning courses on the website	Two ROs (including one from HR) and one assistant for technical work
Maintenance and implementation of the e-learning courses	Two assistants, supported by two ROs (including one from HR)

Table 7
Kyoto Protocol training programme: number of experts passing examinations by roles

	LRs		*Generalists*		*KP-LULUCF*		*Sectoral experts*	
	AI	NAI	AI	NAI	AI	NAI	AI	NAI
Number of experts	58	46	10	4	15	0	50	19

Table 8
Kyoto Protocol training programme: average scores of participants' examinations

	National system		*Adjustment – non-LULUCF*		*Adjustment – LULUCF*		*Assigned amount*		*National registry*		*KP-LULUCF*	
	AI	NAI	AI	NAI	AI	NAI	AI	NAI	AI	NAI	AI	NAI
Average scores for the training for the first commitment period of the Kyoto Protocol (2005–2014)	91.1	90.1	83.7	75.6	79.8	74.7	80.1	76.1	76.7	71.7	79.7	75.4
Average scores for the training for the second commitment period of the Kyoto Protocol (2015–2019)	90.0	82.6	80.8	72.1	77.0	68.5	77.7	71.0	72.1	63.1	74.8	60.8

Table 9
Biennial report and national communications training programme: time and steps required to develop e-learning courses

Description	*Time /steps*
Time frame to complete the work	About 84 weeks (mid-2013 to March 2015)
	Mid-2013 to January 2014 for developing training material in PDF format
	February 2014 to March 2015 for developing the e-learning courses and examinations
Breakdown of the process	Step 1. Developing the training material for four training courses
	Step 2. Drafting the FOD of the storyboards and the examinations
	Step 3. QA and finalization of the storyboards
	Step 4. E-learning course development

Table 10
Biennial report and national communications training programme: resources required to develop e-learning courses

Process	*Resource required*
Drafting the training material	One consultant, and four ROs for drafting and QA/QC
Drafting storyboards	One consultant for four modules, supported by one RO for drafting, and four ROs for QA
E-learning course development	E-learning courses provider and one RO
Publication, maintenance and implementation of the e-learning courses	Outsourced to an external e-learning provider

Table 11
Biennial report and national communications training programme: average scores – by course

	General		*Projections*		*PaMS*		*FTC*	
	AI	NAI	AI	NAI	AI	NAI	AI	NAI
Average from the beginning of the training 2015–2016	86.5	80.9	84.4	73.8	82.4	74.6	72.2	65.7
Average 2017–2018 (for NC7/third BR)	87.3	82.1	84.4	78.4	86.6	83.4	77.3	68.8

Figure 2
Biennial reports and national communications training programme: timeline of the training programme development

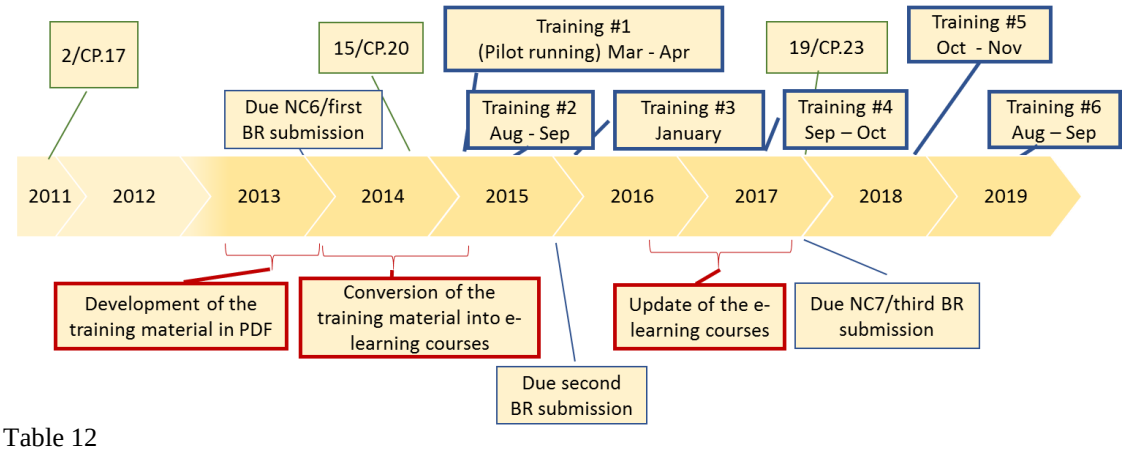


Table 12
Team of technical experts training programme: time and steps required to develop e-learning courses

Description	*Time/steps*
Time frame to complete the work	About 85 weeks (May 2014 to December 2015)
	May 2014 to December 2014 for developing training material in PDF format
	April 2015 to December 2015 for developing the e-learning courses and final examinations
Breakdown of the process	Step 1. Developing the training material in PDF format
	Step 2. CGE workshop provides peer review on the draft training materials
	Step 3. Launch the training with offline version of the training material and the online examination
	Step 4. E-learning course development based on the training material

Table 13
Team of technical experts training programme: resource required to develop e-learning courses

Process	*Resource required*
Drafting training material for three clusters	Four consultants, supported by two ROs
Peer review at the two-day workshop	Thirty participants (25 from non-Annex I Parties and 5 from Annex I Parties), CGE members and four resource persons (two from non-Annex I Parties and two from Annex I Parties)
QA of draft training material	CGE supported by one RO
E-learning development	One consultant to develop e-learning courses, one consultant to coordinate the development, supported by five ROs for developing examinations
QA of draft e-learning courses	One consultant and five ROs
Publication of the e-learning courses on the UNFCCC website	One consultant and one RO, assisted by LMS manager

Table 14
Team of technical experts training programme: eligible experts by sector

	Mitigation		*GHG – non-AFOLU*		*GHG – AFOLU*		*FTC*		*REDD+*	
	AI	NAI	AI	NAI	AI	NAI	AI	NAI	AI	NAI
Number of experts available for the review	71	112	68	91	66	79	52	89	44	38

Note: The total number of experts eligible for the technical analysis does not match the total sum of table 14, since in table 14 the experts passed more than one examination are included in more than one column.

Table 15
Team of technical experts training programme: average scores – cluster A

	Module 1: Overview		Module 2.1: Mitigation		Module 2.2: GHG inventories		Module 2.3: FTC	
	AI	NAI	AI	NAI	AI	NAI	AI	NAI
2015	76.9	74.0	77.7	78.0	72.2	70.1	75.3	78.0
2016	79.2	75.1	76.4	69.9	73.8	68.3	74.4	69.9
2017	78.8	66.3	70.3	63.1	66.3	53.0	68.2	62.0
2018	70.3	65.7	68.5	64.5	55.8	50.6	69.0	67.9
2019	76.6	71.7	72.8	66.3	69.1	61.4	66.9	67.6

Table 16
Team of technical experts training programme: average scores – cluster B

	Module 2.1: Mitigation		Module 2.2(a): Energy		Module 2.2(b): IPPU		Module 2.2(c): Agriculture		Module 2.2(d): LULUCF		Module 2.2(e): Waste		Module 2.2(f): 2006 IPPC Guidelines		Module 2.3: FTC	
	AI	NAI	AI	NAI	AI	NAI	AI	NAI	AI	NAI	AI	NAI	AI	NAI	AI	NAI
2015	67.3	68.1	78.9	73.4	92.1	94.4	89.1	89.5	81.8	72.4	89.2	86.5	85.5	86.8	92.0	93.5
2016	64.4	68.0	72.3	72.8	93.0	81.4	79.2	84.7	68.4	79.5	87.7	79.7	78.0	81.5	85.4	86.3
2017	63.1	51.0	78.3	63.6	77.8	74.8	75.5	72.4	74.4	70.8	83.4	72.8	79.4	68.1	84.8	72.1
2018	45.9	47.6	65.9	66.4	58.2	79.3	73.2	70.1	66.9	66.3	72.7	73.8	70.3	71.7	79.5	77.5
2019	60.4	55.3	61.8	65.9	72.6	71.3	93.5	73.4	89.0	75.0	81.3	81.3	90.2	80.3	91.9	84.0

Table 17
Team of technical experts training programme: average scores – cluster C

	Module 3: REDD+	
	AI	NAI
2015	79.6	80.9
2016	75.5	74.8
2017	44.0	61.2
2018	68.4	60.8
2019	72.0	62.3

Annex II

Description of training courses

Table 1
Basic course: description of e-learning courses

Course	*Course description*
Overview	The course covers the information on general aspects and cross-cutting issues of the GHG inventory reviews that the ERT members need to know regardless of the inventory sector that they are assigned to review. The guidance covers: • A comprehensive introduction to Annex I Parties' GHG inventory reporting and review guidelines and practical guidance on how to apply them for the technical reviews; • The common reporting format; • NIRs; • The review process; • Review tools The course also provides information on, for example, the national inventory arrangements, which is necessary for the generalist in the ERT
Sectoral course: Energy IPPU Agriculture LULUCF Waste	Each course covers guidance on all categories under the sector, including detailed guidance on main source/sink categories. Lessons provide a sector overview and the technical background of the sector, including emission processes. The category-specific guidance covers the IPCC methodology on emissions/removals estimates and cross-cutting issues and how to conduct the review of information reported in the NIR and the common reporting format tables, exercises and case studies to allow learners to self-check for conducting reviews

Table 2
Kyoto Protocol training programme: description of e-learning courses

Course	*Course description*
National systems	The course covers guidance for the reviewers of national systems under Article 5, paragraph 1, in accordance with of the reporting and review guidelines under Articles 7 and 8 of the Kyoto Protocol. The guidance covers: • Applicability and definitions of national systems; • Objectives, characteristics and general functions of national systems; • How to review reported information on national systems, including self-check exercises
Application of adjustments	The course covers guidance on the application of adjustments under Article 5, paragraph 2, of the Kyoto Protocol for Parties with a quantified emission limitation or reduction commitment. Separate courses and the examinations for the non-LULUCF experts and for the LULUCF experts are provided. The guidance covers: • Review issues which may trigger an adjustment; • Procedure of the adjustment; • Calculation method and choice of data for the adjustment; • Reporting of adjustments; • Examples and exercises covering the adjustments in all inventory sectors
Modalities for the accounting of assigned amounts	The course covers guidance for reviewing information provided in the initial report for the second commitment period and its conformity with the modalities for the accounting of assigned amounts under Article 7, paragraph 4, of the Kyoto Protocol. Lessons include: • Overview of the compliance structure; • Reporting and review of assigned amounts, commitment period reserve, KP-LULUCF, national registry; • Standardized electronic format, and discrepancy and notification failure reports;

	• Reporting and review of accounting of KP-LULUCF
Review of national registries and information on assigned amounts	The course covers the review of information on assigned amounts, Kyoto Protocol units and the standard electronic format for conformity with Article 7, paragraph 4, of the Kyoto Protocol. The course also provides guidance on the review of national registries and their conformity with the technical standards for data exchange between registry systems. The course covers: • The standard independent assessment report; • Review of information on assigned amounts; • Review of changes in registries and assigned amounts, review of LULUCF accounting; • End of commitment period review
Activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol	The course provides guidance on reviewing the information provided for the activities under Article 3, paragraphs 3 and 4, including the adjustments under Article 5, paragraph 2, of the Kyoto Protocol. The course covers: • Reporting, accounting and review of KP-LULUCF activities; afforestation, reforestation and deforestation; • Forest management, cropland, grazing land management, revegetation and wetlands; • Natural disturbances; • Harvested wood products

Table 3
Overview of biennial reports/national communications training programme

Course	*Course description*
Module 1: General and cross-cutting aspects of the review of BRs and NCs	The course covers the information on general and cross-cutting aspects of the technical reviews of the BR/NC that all ERT members need to understand. The guidance includes: • A comprehensive overview of the reporting and review process; • A comprehensive introduction of the reporting and review guidelines of the BRs/NCs of Annex I Parties and practical guidance on how to apply them for the technical reviews; • Practical stepwise guidance on how to conduct reviews and prepare the review reports; • A summary for each lesson and self-check quiz at the end of the course
Module 2: Technical review of mitigation targets and of PaMs, their effects and their contribution to achieving those targets	The course covers: • Approaches for the technical review of information on: o National GHG mitigation targets; o PaMs and their effects; o Parties' progress towards the target; • Stepwise guidance on how to conduct the review of the information listed above; • How to draft findings; • Self-check quiz
Module 3: Technical review of GHG emissions, emission trends, projections and total effect of PaMs	The course covers: • Approaches for the technical review of information on: o Emission trends, projections and total effect of PaMs; o Results of projections and assessment of progress in achieving the target; o Supplementarity relating to the flexible mechanisms under the Kyoto Protocol; • Stepwise guidance on how to conduct the review of the information listed above; • How to draft findings; • Self-check quiz
Module 4: Technical review of the provision of financial support, technology transfer and capacity-building	The course covers: • Approaches for the technical review of information on: financial support, technology transfer and capacity-building support to developing countries; • Stepwise guidance on how to conduct the review of the information reported in the NCs and BRs; • How to draft findings; • Self-check quiz

Table 4
Team of technical experts training programme: description of e-learning courses

Course	*Course description*
Cluster A: technical analysis of BURs	
Module 1 Technical analysis of biennial update reports: an overview	The module covers: • A comprehensive overview of the knowledge base necessary to conduct the technical analysis of BURs; • Guidance on cross-cutting elements that can facilitate the efficient conduct of the technical analysis
Module 2.1 Technical analysis of biennial update reports: thematic elements *Mitigation actions and their effects* Module 2.2 Technical analysis of biennial update reports: thematic elements *National GHG inventories* Module 2.3 Technical analysis of biennial update reports: thematic elements *Finance, technology and capacity-building needs and support received*	The modules aim to: • Facilitate the technical analysis of the reporting provisions outlined in the UNFCCC reporting guidelines on BURs; • Enhance the knowledge and expertise of the experts of the TTE to perform the specific tasks of the technical analysis of BURs; • Provide practical guidance, by thematic area, on (1) how to identify the extent of information reported (completeness), (2) how to conduct a technical analysis, including the clarity of the information reported and (3) identify capacity-building needs, in the light of the "UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention"; • Provide practice activities and a self-check quiz
Cluster B: background materials covering methods and science	
Module 2.1 Background material: *Mitigation actions and their effects*	The module covers information such as: What are mitigation actions, how to describe mitigation actions, approaches/methods to analyse the effect of mitigation actions, domestic MRV and international market mechanisms
Module 2.2 – Background material on national GHG inventories	
Module 2.2 a – *Energy* Module 2.2 b – *Industrial processes and product use* Module 2.2 c – *Agriculture* Module 2.2 d – *LULUCF* Module 2.2 e – *Waste*	Each sectoral module covers information on sector overview, GHG inventory methodologies and guidance by category
Module 2.2 f – *Key differences between the Revised 1996 IPCC Guidelines and the 2006 IPCC Guidelines*	The module focuses on the difference in methodological guidance in the Revised 1996 IPCC Guidelines and the 2006 IPCC Guidelines
Module 2.3 Background material: *Finance, technology and capacity-building needs and support received*	The module covers the information that assists experts to understand key elements of FTC support received
Cluster C: technical analysis of technical annex on REDD+	
Module 3 The technical annex on results-based actions relating to REDD+	The module intends to facilitate the technical analysis of the technical annex containing information on results-based actions relating to REDD+ activities

Annex III

Other training activities implemented by the secretariat

I. Regional training workshops on sustainable national greenhouse gas inventory management systems and the use of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories

1. Since 2016, the secretariat has organized, on an annual basis, in collaboration with the IPCC and FAO, three regional training workshops on sustainable national GHG inventory management systems and the use of the 2006 IPCC Guidelines for the following regions: Africa, Latin America and the Caribbean, and Asia-Pacific and Eastern Europe. These regional workshops aimed at strengthening the technical capacity of national experts with respect to the building and/or maintenance of sustainable national GHG inventory management systems and the use of the 2006 IPCC Guidelines in the preparation of their national GHG inventories. The workshops gather around 50 participants involved in GHG inventory management systems from more than 30 countries and address key elements required to ensure the sustainability of such systems as well as general guidance and reporting, sector-specific methodologies (the energy, IPPU, AFOLU and waste sectors) and hands-on training on the IPCC inventory software. They are very interactive, and include country presentations and break-out group discussions, providing a platform for countries to share their experiences, challenges and lessons learned on establishing a GHG inventory management systems and preparing quality national GHG inventory reports, and to gather feedback from national experts.

II. E-learning and certification courses on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories for developing country experts

2. E-learning and certification courses on the 2006 IPCC Guidelines are being offered to experts from developing countries, for three months starting in October 2019, in collaboration with the Greenhouse Gas Management Institute. National experts enrolled on the courses are those nominated by the UNFCCC national focal points in response to a call for nominations from the UNFCCC secretariat. The courses that are directly related to the 2006 IPCC Guidelines and the 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands are made available by the Greenhouse Gas Management Institute. Participants start with the prerequisite course, “Introduction to cross-cutting issues” and then each participant chooses one additional sector-specific course on energy, IPPU, AFOLU and waste. Participants who have a mark of 70 per cent or more for both courses will receive a certificate of proficiency from the secretariat and the Greenhouse Gas Management Institute confirming that they are experts in IPCC guidelines. Participants have two attempts to pass each examination.

III. UNFCCC Climate Action and Support Transparency Training programme

3. This is a professional training programme on GHG inventories for national experts from developing countries launched in 2016 by the UNFCCC secretariat. The programme is being offered in collaboration with the Greenhouse Gas Inventory and Research Center of Korea through a memorandum of understanding. Each year, approximately 30 experts from developing countries receive, in Seoul, Republic of Korea, four-week in-depth training on national GHG inventory management systems and the 2006 IPCC Guidelines. The training is segmented into packages, including on MRV under the ETF of the Paris Agreement, GHG

inventory management systems and cross-cutting issues, as well as in-depth training on the energy, IPPU, waste and AFOLU sectors.

IV. Training activities with the Consultative Group of Experts

4. The secretariat assists the CGE to provide technical assistance and support to developing country Parties to prepare their NCs and BURs. The assistance and support are delivered mainly in the form of developing and disseminating guidance and training materials and conducting training workshops in the thematic areas of NCs and BURs, including national GHG inventories, mitigation actions and their effects, vulnerability and adaptation assessment, institutional arrangements and technical and capacity-building needs and support received. The workplan of the CGE for 2019 is available on the UNFCCC website.[1]

[1] https://unfccc.int/CGE.