United Nations

FCCC/ETF/TATR.1/2025/CHL

Framework Convention on Climate Change

Distr.: General
1 June 2026

English only

Technical report on the technical analysis of the technical annex to the first biennial transparency report of Chile submitted in accordance with paragraph 14 of decision 18/CMA.1 on 11 February 2025

Summary

This technical report covers the technical analysis of the technical annex submitted on a voluntary basis, in the context of results-based payments, by Chile on 11 February 2025 through its first biennial transparency report in accordance with paragraph 45 of decision 1/CP.24 and paragraph 14 of decision 18/CMA.1. The technical annex provides data and information on the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks, which are activities included in paragraph 70 of decision 1/CP.16, and covers the same national territorial forest area as the assessed forest reference emission level (FREL)/ forest reference level (FRL) proposed by Chile in its modified FREL/FRL submission of May 2023.

Chile reported the results of implementing these activities for 2018–2021, which amount to 238,793 tonnes of carbon dioxide equivalent (t CO_2 eq) per year for 2018–2019 and 8,397,944 t CO_2 eq/year for 2020–2021 and were measured against the assessed FREL/FRL of 18,052,357.14 t CO_2 eq/year.

The data and information provided in the technical annex are in overall accordance with the guidelines contained in the annex to decision 14/CP.19. The technical analysis concluded that the data and information provided by Chile in the technical annex are mostly transparent and consistent with the data and information used for establishing the assessed FREL/FRL in accordance with paragraph 71(b) of decision 1/CP.16 and section II of decision 12/CP.17. This report contains the findings from the technical analysis and a few areas identified for capacity-building and future technical improvement in accordance with paragraph 14 of decision 14/CP.19.

Abbreviations and acronyms

AD	activity data
BTR	biennial transparency report
BUR	biennial update report
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
EF	emission factor
FREL	forest reference emission level
FRL	forest reference level
GHG	greenhouse gas
IPCC	Intergovernmental Panel on Climate Change
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
N_2O	nitrous oxide
NFI	national forest inventory
NFMS	national forest monitoring system
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)
TA	technical analysis
TERT	technical expert review team

I. Introduction, overview and summary

A. Introduction

1. This technical report covers the TA of the technical annex provided by Chile on 11 February 2025 in accordance with paragraph 45 of decision 1/CP.24 and paragraph 14 of decision 18/CMA.1 as part of its BTR1, which was submitted in accordance with paragraph 3 of decision 18/CMA.1. In the technical annex, Chile provided the data and information used for estimating its anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, and changes in forest carbon stock and forest area resulting from implementing REDD+ activities. The submission of the technical annex is voluntary and in the context of results-based payments in accordance with paragraph 8 of decision 14/CP.19.

2. In accordance with paragraph 14 of decision 18/CMA.1, the TA of the technical annex to the BTR is carried out concurrently with the technical expert review of the BTR referred to in Article 13, paragraph 11, of the Paris Agreement. The TERT conducted the technical expert review of the information reported in the BTR1 of Chile as per the scope of the review defined in paragraph 146 of the MPGs,[1] resulting in a separate technical expert review report.[2]

3. Chile made its first and second FREL/FRL submissions, in accordance with decision 12/CP.17, on 4 January 2016 and 16 January 2023 respectively, which were subject to technical assessment following the guidance provided in decision 13/CP.19 and its annex. As a result of the facilitative interactions with the LULUCF experts during the TA, the Party provided a modified version of its latest FREL/FRL submission on 29 May 2023. The latest assessed FREL/FRL was included as one of the elements of the technical annex to its BTR1 in accordance with the guidelines contained in the annex to decision 14/CP.19. The findings from the technical assessment of the FREL/FRL are included in a separate report.[3]

4. Chile previously submitted a technical annex to its third BUR on 3 December 2018. The outcome of the TA thereof is contained in document FCCC/SBI/ICA/2019/TATR.1/CHL. Previous FREL/FRL submissions, technical annexes to BURs and associated technical assessment and analysis reports for the Party are available online.[4]

B. Process overview

5. The technical expert review of the BTR1 of Chile took place from 13 to 17 October 2025 as an in-country review and was undertaken by a TERT drawn from the UNFCCC roster of experts on the basis of the criteria defined in paragraphs 172–182 of the MPGs. Maria del Carmen Ruiz Jaen (Panama) and Maria José Sanz Sánchez (Spain) were the LULUCF experts who undertook the TA of the technical annex in accordance with paragraphs 10–13 of decision 14/CP.19. The TA was coordinated by Pierre Brender (secretariat).

6. The TA of the technical annex provided by Chile was undertaken in accordance with the procedures contained in decisions 2/CP.17, 14/CP.19 and 20/CP.19. This technical report on the TA was prepared by the LULUCF experts in accordance with paragraph 14 of decision 14/CP.19.

7. During the TA and subsequent exchanges, the LULUCF experts and Chile engaged in technical discussions, and Chile provided clarifications in response to questions raised by the LULUCF experts, in order to reach an understanding on the identification of the capacity-building needs of the Party and areas for future technical improvement.

8. Following the TA of the technical annex, the LULUCF experts prepared and shared the draft technical report with Chile for its review and comments. The LULUCF experts

[1] Decision 18/CMA.1, annex.
[2] FCCC/ETF/TERR.1/2024/CHL and Add.1.
[3] FCCC/TAR/2023/CHL, published on 24 June 2024.
[4] https://redd.unfccc.int/submissions/by-country/country_detail/chl.html.

responded to the Party's comments and incorporated them into and finalized this technical report in consultation with Chile.

C. Summary of results

9. In paragraph 70 of decision 1/CP.16 the Conference of the Parties encouraged developing country Parties to contribute to mitigation actions in the forest sector by undertaking a number of activities, as deemed appropriate by each Party in accordance with its respective capabilities and national circumstances. In the context of results-based payments and in line with decision 12/CP.17, Chile, on a voluntary basis, proposed a national FREL/FRL (see ID# 11 in the table below) for native forests covering the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks for the purpose of a technical assessment in accordance with decision 13/CP.19 and its annex. The activities are being implemented in 12 of Chile's 16 administrative regions. The 12 regions cover an area of 495,590 km^2, equating to 65.5 per cent of the national territory and 99.3 per cent of the country's total native forests. The assessed FREL/FRL of Chile is 18,052,357.14 t CO_2 eq/year.

10. The Party's FREL/FRL is based on its approach to estimating the historical CO_2 emissions and removals associated with the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks for the historical reference periods 2001–2013 (for emissions and removals associated with a land-use change) and 2001–2010 (for emissions and removals occurring in forest land remaining forest land). Chile noted that it is working on updating its FREL/FRL. It reported the results of implementing the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks for 2018–2021, calculated against the FREL/FRL, which amount to emission reductions of 238,793 t CO_2 eq/year for 2018–2019 and 8,397,944 t CO_2 eq/year for 2020–2021. The table contained in annex II summarizes the main features of the results in the technical annex, with the aim of accessing results-based payments for REDD+ activities, including the results period, the assessed FREL/FRL, and the pools and gases included.

11. Chile submitted its first FREL/FRL for technical assessment in 2016.[5] The assessed FREL/FRL was 159,826 t CO_2 eq/year for the reference periods 2001–2013 (for emissions and removals associated with a land-use change) and 2001–2010 (for emissions and removals occurring in forest land remaining forest land). Measured against this value, Chile also submitted results amounting to a total emission reduction of 6,136,475 t CO_2 eq/year (results pertaining to emissions and removals associated with a land-use change were estimated for 2014–2016, while results pertaining to emissions and removals occurring in forest land remaining forest land were estimated for 2011–2015), which were assessed in 2019.[6]

II. Technical analysis of the information reported in the technical annex

12. For the technical annex to the BTR1 submitted by Chile, see annex I.[7]

13. The scope of the TA is outlined in paragraph 11 of decision 14/CP.19, according to which the LULUCF experts shall analyse the extent to which:

(a) The methodologies, definitions, comprehensiveness and information provided are consistent between the assessed FREL/FRL and the results of implementing REDD+ activities;

[5] See document FCCC/TAR/2016/CHL.

[6] See document FCCC/SBI/ICA/2019/TATR.1/CHL.

[7] As per decision 14/CP.19, para. 14(a).

(b) The data and information provided in the technical annex are transparent, consistent, complete and accurate;

(c) The data and information provided in the technical annex are consistent with the guidelines referred to in paragraph 9 of decision 14/CP.19;

(d) The results are accurate, to the extent possible.

14. The table below describes the findings from the TA of the data, methodologies and procedures used by the developing country Party for estimating its anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, and changes in forest carbon stock and forest area resulting from implementing REDD+ activities within the scope of the TA outlined in paragraph 13 above.

Findings from the technical analysis of the data and information used by the developing country Party for estimating its anthropogenic forest-related emissions by sources and removals by sinks, forest carbon stocks, and changes in forest carbon stock and forest area resulting from implementing REDD+ activities

Finding ID#	*Aspect of the scope of the TA (decision 14/CP.19, para. 11)*	*Description of the issue, additional information shared by the Party during the TA and conclusions of the LULUCF experts*	*Area for future technical improvement*
1	11(a) Consistency with the guidelines in paragraph 3 of the annex to decision 14/CP.19 (consistency with the assessed FREL/FRL)	The LULUCF experts noted that Chile maintained consistency between its assessed FREL/FRL and estimated results of implementing the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks in 2018–2021 with regard to the following elements: (a) Using consistent methodologies to generate AD for each of the activities, namely applying the gain–loss method for emissions and removals associated with a land-use change (i.e. deforestation, afforestation/reforestation, as well as conversion of native forest land to forest plantation (which Chile refers to as substitution and includes in its estimates of emissions and removals from the activity reducing emissions from forest degradation) and vice versa (which Chile calls restitution)) and the stock-difference approach for emissions and removals occurring in forest land remaining forest land (due to forest degradation caused by forest fires, timber harvesting or extraction of non-timber products; conservation of forest carbon stocks; and recovery of degraded forests), with tier 2 approaches from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* used when estimating annual changes in carbon stocks and a tier 1 approach used for estimating non-CO_2 emissions from forest fires; (b) Using consistent data sources to generate AD, in particular a time series of AD on historical land use developed under the Cadastre and Evaluation of Vegetation Resources in Chile project of the National Forest Corporation of Chile. The cadastre provides detailed information on land use, particularly regarding native forests, forest plantations and grassland, and serves as the basis for national land-cover mapping. In constructing the FREL/FRL and estimating the results, Chile applied a multi-index method to detect spectral changes in vegetation, allowing for the preparation of land-use maps, which were then overlaid to determine land-use changes and generate spatially explicit maps showing such changes for the 12 administrative regions covered. To produce the spatially explicit information needed to estimate AD for forest land remaining forest land, Chile applied a non-parametric k-nearest neighbours algorithm. Chile used the algorithm to extrapolate information on parcels of land taken from its NFI to surrounding areas of forest land remaining forest land, applying distance-based weighting to neighbouring parcels, as detailed in Tomppo (1990). To estimate non-CO_2 emissions, Chile used tabular data on areas affected by forest fire for 2001–2022 taken from statistics published by the National Forest Corporation of Chile and forest companies for 1985 onward;	

Finding ID#	*Aspect of the scope of the TA (decision 14/CP.19, para. 11)*	*Description of the issue, additional information shared by the Party during the TA and conclusions of the LULUCF experts*	*Area for future technical improvement*

(c) Using consistent methodologies and data to generate EFs, which were mostly developed on the basis of Chile's NFI and national research conducted by the National Forest Corporation of Chile in collaboration with the Forestry Institute of Chile and the Austral University of Chile. For all REDD+ activities (except for when estimating emissions caused by fires), the EFs used were country-specific. For example, for above-ground biomass, Chile used country-specific EFs derived from Forestry Institute of Chile estimates of net annual increment for forests by type, while for biomass expansion factors and basic wood density a single country-specific EF was applied for all forest types (see para. 20(b) below). As for below-ground biomass, the relevant EFs were estimated using country-specific root-to-shoot ratios derived from national research, while for deadwood country-specific EFs were developed on the basis of NFI data disaggregated by forest type;

(d) Covering the same three carbon pools: above-ground biomass, below-ground biomass and deadwood. Consistently with the FREL/FRL, estimates of emissions from above- and below-ground biomass were taken into account for all four activities, while estimates of emissions from deadwood were considered for the activities reducing emissions from deforestation and reducing emissions from forest degradation only, and the soil organic carbon and litter pools were excluded for all four activities owing to lack of national data;

(e) Covering the same gases: CO_2, CH_4 and N_2O and using the same global warming potential from the IPCC Fourth Assessment Report. Chile reported CO_2 emissions from all selected activities and CH_4 and N_2O emissions from forest degradation due to fire events only;

(f) Covering the same area: 12 administrative regions, covering 65.5 per cent of the national territory and 99.3 per cent of the country's total native forests. The regions range from the semi-arid Coquimbo region in the north to the cold, humid, oceanic and sub-Antarctic regions of Aysén and Magallanes in the south. The excluded regions have desertic characteristics with little native forest cover (see finding ID#s 10–11 below);

(g) Using the same assumptions for specific pools and activities: for example, for harvested wood products, Chile assumed carbon stocks to be zero owing to a lack of reliable national data sources that would enable differentiation between harvested wood products resulting from deforestation and those resulting from forest degradation; and for conservation of forest carbon stocks, Chile took into account native forest areas under formal conservation mechanisms, including the National System of Protected Wilderness Areas and private forest conservation initiatives, as well as the net flux of carbon between areas of forest that are degrading and areas of forest that are recovering;

Finding ID#	*Aspect of the scope of the TA (decision 14/CP.19, para. 11)*	*Description of the issue, additional information shared by the Party during the TA and conclusions of the LULUCF experts*	*Area for future technical improvement*
		(h) Using the same forest definition: under Chile's 2008 Law on Native Forest Recovery and Forest Promotion, forest is defined as a site populated with plant formations, predominately trees, occupying an area of at least 5,000 m^2, with a minimum width of 40 m and tree crown coverage exceeding 10 per cent of the total area in arid and semi-arid conditions and 25 per cent in more favourable conditions. Native forest is defined as forest formed by autochthonous species (as a result of natural generation, natural regeneration or plantations under canopy, with autochthonous species within their original distribution area), but may also include randomly distributed exotic species. All land defined as native forest under the 2008 Law was considered in constructing the FREL/FRL and estimating the results. Forest plantations consisting mainly of monoculture species (which are classified as exotic species) were excluded. In addition, in line with the 2008 Law, land classified as arborescent scrubs was considered not to be included in the definition of native forests and was thus excluded from the estimations. The LULUCF experts conclude that Chile ensured overall consistency between its assessed FREL/FRL and estimated results.	
2	11(b) Approaches – Accuracy	The LULUCF experts noted that Chile applied a purely wall-to-wall regional approach to calculating AD. To estimate errors associated with land-use changes, Chile compared land-use map estimates with sample data using the method set out in Olofsson et al. (2014) as part of its uncertainty assessment, but did not undertake a bias-correction step in deriving the AD. During the TA, Chile explained that it used a wall-to-wall approach to calculating AD and that uncertainty estimates were generated on the basis of comparisons of sample data with land-use map estimates. However, the LULUCF experts noted that the absence of a bias-correction method for calculating AD limits the potential to improve the accuracy of land-use change estimates.	The LULUCF experts note that revising the stratification approach to enable the application of a bias-correction method for calculating AD (e.g. from Olofsson et al., 2020) or adopting a sample-based approach to calculating AD stratified by forest type, rather than taking a purely wall-to-wall regional approach to calculating AD, is an area for future technical improvement that would increase the accuracy of the technical annex.
3	11(b) Approaches – Accuracy	The LULUCF experts noted that the approach applied by Chile was associated with a high level of sensitivity to detecting carbon stock changes in forest land remaining forest land on the basis of changes in conditions affecting individual NFI plots. The experts noted that this level of sensitivity may be higher still in southern regions of the country, where persistent cloud cover may affect image quality, leading to a limited number of cloud-free images. For instance, in the Aysén region, 364,864 ha were assessed as degraded and associated emissions were estimated at 28,989,272 t CO_2 eq/year in 2020–2021, while 315,591 ha were assessed as subject to an increase in carbon stock and associated emissions were estimated at –22,944,732 t CO_2 eq/year in the same period as part of the	The LULUCF experts note that strengthening the assessment of EFs for both emissions and removals by comparing them with values available in scientific literature and conducting quality assurance of estimated emissions and removals by applying the gain–loss method to emissions and removals not involving a land-use change are areas for future technical improvement that would help to verify whether those estimates are

Finding ID#	*Aspect of the scope of the TA (decision 14/CP.19, para. 11)*	*Description of the issue, additional information shared by the Party during the TA and conclusions of the LULUCF experts*	*Area for future technical improvement*
		estimation of the net emissions from the activity conservation of forest carbon stocks based on estimated changes in carbon stocks in conservation areas. The LULUCF experts commend Chile for providing additional information during the TA, including that the higher estimates of carbon stock changes in southern regions of the country are due to the presence of large areas of native forest there, but note that the application of the approach used leads to higher removals during the results period than would be expected based on a comparison thereof with annual default gains in carbon stocks in standing forests. Given that Chile has completed four cycles of its NFI, the experts note that Chile could undertake quality assurance of estimated emissions and removals.	in line with the dynamic growth expected for native forests and thus could allow an increase in the accuracy of the estimates or justify the high net removals.
4	11(b) Approaches – Transparency	The Party explained in its submission that, given the high level of cloud cover in southern Chile, in estimating carbon stock changes it used an acquisition window of up to three months before or after the target date, thus covering the country's dry season, to construct multipixel mosaics with cloud-free pixels and therefore obtain spectral information representative of the beginning and end of the two periods for which results were estimated (2018–2019 and 2020–2021). During the TA, Chile explained that adjustments were made to the acquisition window to address cloud cover issues in regions with persistent cloudiness. The LULUCF experts noted that, while Chile acknowledged cloud cover as an issue affecting the detection of land-cover changes, the Party did not quantitatively assess how these adjustments influenced the AD or describe the sensitivity of the results to the expansion of the acquisition window. The LULUCF experts commend Chile for acknowledging cloud cover as an issue affecting the detection of land-cover changes and taking steps to mitigate it.	The LULUCF experts note that documenting the sensitivity of the results to the length of the acquisition window used to construct mosaics with cloud-free pixels, given that cloud cover is a known issue, is an area for future technical improvement that would increase the transparency of the technical annex and help verify whether estimated emissions and removals remain consistent across regions and time periods.
5	11(b) Approaches – Transparency	The LULUCF experts noted a lack of clarity regarding the differences observed in conservation areas between the reference period used to estimate the FREL/FRL and the results period. During the TA, Chile explained that the conservation areas covered encompass native forests under formal conservation mechanisms, including the National System of Protected Wilderness Areas and private forest conservation initiatives. However, the experts noted that the Party did not clearly describe how the geographical boundaries of conservation areas changed between the reference period and the results period.	The LULUCF experts note that clearly describing changes in the geographical boundaries of conservation areas between the reference and the results periods is an area for future technical improvement that would increase the transparency of the technical annex.
6	11(b) EFs – Completeness	The LULUCF experts noted that one EF per administrative region was used for estimating carbon stock losses due to deforestation and carbon stock gains in mixed forests.	

Finding ID#	*Aspect of the scope of the TA (decision 14/CP.19, para. 11)*	*Description of the issue, additional information shared by the Party during the TA and conclusions of the LULUCF experts*	*Area for future technical improvement*
		During the TA, Chile explained that each of these EFs was derived by taking the average of the EFs calculated for the different forest types and then weighting it on the basis of the area of each forest type subject to the same change in forest cover. It provided additional information on how this weighted average was determined and shared the relevant calculation spreadsheets with the LULUCF experts. The LULUCF experts commend Chile for its efforts to enhance completeness.	
7	11(b) EFs – Transparency and accuracy	The LULUCF experts noted that the documentation referenced in the technical annex does not clearly specify the origin of the data used to train the k-nearest neighbour algorithm, particularly which cycle(s) of the NFI were used to derive the EF for forest degradation. During the TA, Chile explained which data were used to train the k-nearest neighbour algorithm, clarifying that the EFs for forest degradation, as well as the EFs for above-ground biomass used in the calculation of EFs for activities other than reducing emissions from forest degradation, were developed using accumulated samples of relevant plot data from all previous cycles of the NFI. It also explained that the EFs were not calculated in isolation for each cycle, but were instead adjusted on the basis of the EFs previously used taking into account the data from all cycles. It noted that it used this approach both in developing the national GHG inventory and in estimating the results in order to maintain consistency. The LULUCF experts commend Chile for its efforts to improve completeness.	The LULUCF experts note that providing detailed information on the NFI cycles from which data were used to train the k-nearest neighbour algorithm, including the cycle(s) of the NFI used to derive the EF for forest degradation, is an area for future technical improvement that would increase the transparency of the technical annex. They also note that providing a comparison of EFs for above-ground biomass and forest degradation derived using data from the NFI cycle closest to the years for which results were reported with those derived using data from all cycles of the NFI is an area for future technical improvement of the technical annex.
8	11(b) AD – Transparency	The LULUCF experts noted that, since the technical annex includes only an aggregated summary of the AD used for estimating the results of implementing the four activities, it is difficult to compare those AD with the AD reported in the GHG inventory. During the TA, Chile provided additional information on the methodology used to compile AD for estimating the results of implementing activities, including the sources of and approach to estimating those AD. The LULUCF experts commend Chile for providing this additional information during the TA, which enhances transparency. Nevertheless, they conclude that the limited level of detail in the technical annex, in particular the absence of a land-use change matrix, limits their ability to fully assess the consistency of the AD used with those used for the GHG inventory.	The LULUCF experts note that providing a more detailed explanation of how the AD for those activities compare with those reported in the GHG inventory could facilitate an evaluation of the consistency of the technical annex with the national GHG inventory (e.g. using a land-use change matrix).
9	11(c) Consistency with the guidelines in paragraphs 1–2 of the annex to decision	Chile provided information on the assessed FREL/FRL, which covers the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest	

Finding ID#	*Aspect of the scope of the TA (decision 14/CP.19, para. 11)*	*Description of the issue, additional information shared by the Party during the TA and conclusions of the LULUCF experts*	*Area for future technical improvement*
	14/CP.19 (summary information and results)	carbon stocks across the same territorial area. The FREL/FRL, which covers the reference periods 2001–2013 and 2001–2010, corresponds to 18,052,357.14 t CO_2 eq/year overall.	
10	11(c) Consistency with the guidelines in paragraph 4 of the annex to decision 14/CP.19 (NFMS)	The LULUCF experts noted that Chile provided a description of the NFMS and a transparent summary of the roles and responsibilities of the agencies and institutions involved in measurement, reporting and verification of the results in the technical annex, together with weblinks for accessing further information. The NFMS consists of an NFI covering 12 of Chile's 16 administrative regions and a cadastre that provides information on land-use changes at the national level. It includes a series of standard operating procedures and semi-automated calculation tools for estimating emissions and removals aimed at reducing the number of manual steps, for which the error rate can be significant, in the process. Documents and information on different intermediate calculation steps were saved and shared through links contained in the submission to facilitate the estimation of emissions resulting from implementing the activities and the estimation of the associated uncertainty with a view to ensuring transparency, replicability and time-series consistency. According to paragraph 4(b) of decision 11/CP.19 the NFMS should enable the assessment of different types of forest in the country, including natural forest. The LULUCF experts noted that, while Chile considered the native forest types of Coigüe de Magallanes, Coigüe–Raulí–Tepa, Siempreverde subtype Canelo, Lenga, Roble–Hualo, Roble-Raulí–Coigüe, Esclerófilo and Esclerófilo subtype Espinal, as well as plantations with native species, in its monitoring and reporting, it excluded plantations with exotic species. However, to ensure completeness, Chile reported carbon fluxes in forest plantations from exotic species in its GHG inventory.	
11	11(c) Consistency with the guidelines in paragraphs 4 and 6 of the annex to decision 14/CP.19 (subnational monitoring and reporting)	According to footnote 7 to paragraph 71(c) of decision 1/CP.16, subnational monitoring and reporting should include monitoring and reporting emission displacement at the national level, if appropriate, and reporting on how the displacement of emissions is being addressed and on the means of integrating subnational monitoring systems into a national monitoring system. The Party excluded areas in the north of the country, where there is an extremely arid climate regime, as well as Easter Island and the Juan Fernández Archipelago, from its subnational monitoring and reporting and from its estimation of both the FREL/FRL and the results. However, the LULUCF experts noted that these areas contain semi-wooded natural formations, mainly consisting of xerophytic species (adapted to arid climates) such as Queñoa trees, which are isolated from the rest of the country's forests owing to the Atacama Desert, and cover a total area of 54,451	The LULUCF experts note that explaining how to estimate potential emission displacement in the four administrative regions excluded from the FREL/FRL and in forest plantations is an area for future technical improvement of the technical annex.

Finding ID#	*Aspect of the scope of the TA (decision 14/CP.19, para. 11)*	*Description of the issue, additional information shared by the Party during the TA and conclusions of the LULUCF experts*	*Area for future technical improvement*
		ha in small, scattered groves. These characteristics persist even as the latitude increases. During the TA, Chile explained that the 12 administrative regions selected in constructing the FREL/FRL and estimating the results serve as the basis for the national monitoring system, and that this selection reduces the risk of emission displacement. It stated that the risk of emission displacement is also reduced through legal and operational measures targeting the main drivers of potential displacement, such as expansion of agriculture and livestock farming, unsustainable vegetation management and forest fires. For example, Chile's 2008 Law on Native Forest Recovery and Forest Promotion, under which the legal definition of native forests was adopted, makes illegal land-use changes such as conversion of native forests to agriculture or housing, among others; requires a management plan to be put in place for native forests, to include environmental measures for preventing any unsustainable management; and requires a robust system for controlling and monitoring agricultural fires and wildfires to be put in place and preventive forestry measures to be taken prioritizing the protection of protected areas and vulnerable people. On the basis of the available information, the LULUCF experts noted that, so far, there is no evidence of displacement of emissions.	

III. Conclusions

15. The LULUCF experts conclude that Chile reported the results of implementing the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks for 12 of the country's 16 administrative regions, which represent 99.3 per cent of the country's native forest area.

16. The LULUCF experts also conclude that the results presented of implementing the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks are consistent with the assessed FREL/FRL. The LULUCF experts commend Chile for ensuring consistency of data and methodologies between the FREL/FRL submission for 2001–2013 (for emissions and removals associated with a land-use change) and 2001–2010 (for emissions and removals occurring in forest land remaining forest land) and the technical annex with the results for 2018–2021.

17. The LULUCF experts further conclude that Chile provided the information necessary for reconstructing the results of implementing the activities reducing emissions from deforestation, reducing emissions from forest degradation, conservation of forest carbon stocks and enhancement of forest carbon stocks. The data and information provided in the technical annex are considered to be mostly transparent (see findings ID#s 4, 5, 7 and 8 in the table above), consistent, complete and mostly accurate (see findings ID#s 2–3 in the table above), to the extent possible.

18. The LULUCF experts acknowledge that the technical annex includes summary information from the final report containing the assessed FREL/FRL; results in t CO_2 eq/year that are consistent with the assessed FREL/FRL; a demonstration that the methodologies used to produce the results are consistent with those used to establish the assessed FREL/FRL; a description of the forest monitoring system and institutional roles and responsibilities in measurement, reporting and verification of the results; the information necessary for reconstructing the results; and a description of how the elements contained in paragraph 1(c–d) of decision 4/CP.15 have been taken into account. The LULUCF experts conclude that the data and information provided in the technical annex are mostly consistent with the guidelines referred to in paragraph 9 of decision 14/CP.19 (see finding ID#s 2–5 and 7–8 in the table above).

19. The results are mostly accurate to the extent possible based on the assumptions used (see finding ID#s 2–3 in the table above). The LULUCF experts note that Chile has a number of policies in place designed to address the risks of deforestation and forest degradation in the forest areas excluded from the FREL/FRL and from estimating the results of implementing the activities (see finding ID# 11 in the table above). In addition, they note that the information provided by Chile suggests that, at present, displacement of emissions is not an issue.

20. Pursuant to paragraph 14 of decision 14/CP.19, the LULUCF experts identified areas for future technical improvement (see the table above). The LULUCF experts conclude that the following areas for future technical improvement identified in the report on the technical assessment of Chile's FREL/FRL also apply to the provision of information on the results:

(a) Considering applying a single common reference period for all selected REDD+ activities in constructing future FRELs and FRLs;

(b) Assigning specific values according to forest type for the conversion of wood volume to biomass, which would enhance the accuracy of the estimates;

(c) Summarizing carbon density at the plot level and including subplots with zero trees to avoid the overestimation of carbon density for the overall forest strata, as well as including inaccessible plots in calculating the variance in carbon densities;

(d) Defining areas under conservation in accordance with clear and specific criteria rather than solely on the basis of administrative decisions;

(e) Tracking emissions and removals from deforestation, forest degradation and enhancement of forest carbon stocks separately for areas with protected status and areas without protected status, to facilitate differentiation between these areas;

(f) Treating omitted emissions from soil organic carbon for both the FREL and the FRL;

(g) Treating emissions from litter (i.e. either including the pool or providing more information to justify its omission);

(h) Including additional plots for forest areas with small sample sizes to increase the representativeness of the sample plots for improving the EFs for deadwood;

(i) Reporting non-CO_2 emissions from forest fires by fire typology for all forest types and selected activities.

21. After exchanges with the LULUCF experts, Chile identified the following capacity-building needs:

(a) Institutionalizing a process to update emission and removal estimates into the NFMS, including visually analysing satellite imagery to improve AD and estimating emissions and removals for REDD+ activities using a sample-based area approach;

(b) Generating annual AD for 2015 onward for use in updating emission and removal estimates beyond the 2001–2013 reference period;

(c) Determining an appropriate start year and length for a common reference period over which emissions and removals for all REDD+ activities would be estimated, on the basis of sample-based area estimates;

(d) Applying automatized methodologies using open-source tools and open-code workflows to implement stratification and post-stratification approaches and calculate uncertainties, ensuring that best practices are applied with a view to reducing bias.

22. In conclusion, the LULUCF experts commend Chile for showing strong commitment to continuously improving the data and information used for calculating the results, in line with the stepwise approach, which are consistent with those used for constructing its assessed FREL/FRL. Some areas for future technical improvement and capacity-building needs identified by Chile have been identified in this report. At the same time, the LULUCF experts acknowledge that such improvements are subject to national capabilities and circumstances, and note the importance of adequate and predictable support.[8] The LULUCF experts also acknowledge that the TA process was an opportunity for a facilitative and constructive technical exchange of views and information with Chile.[9]

[8] As per decision 2/CP.17, para. 57.

[9] As per decision 14/CP.19, paras. 12–13.

Annex I

Technical annex to the biennial transparency report

Owing to the complexity and length of the submitted technical annex to the BTR, and in order to maintain the original formatting, the technical annex has not been reproduced here; it is available at https://unfccc.int/first-biennial-transparency-reports.

Annex II

Summary of main features of reported results of implementing activities referred to in paragraph 70 of decision 1/CP.16 based on information provided by Chile

Key element		*Remark(s)*
Results reported	238 793 t CO_2 eq/year for 2018–2019, 8 397 944 t CO_2 eq/year for 2020–2021	See paragraph 10 of this document
Results period	2018–2021	See paragraph 10 of this document
Assessed FREL/FRL	18 052 357.14 t CO_2 eq/year	See document FCCC/TAR/2023/CHL and the modified version of the Party's latest FREL/FRL submission of May 2023. See paragraph 9 of this document
Reference period	2001–2013 for emissions and removals associated with a land-use change and 2001–2010 for emissions and removals occurring in forest land remaining forest land	See paragraphs 10 and 20(a) of this document
National/subnational	National	See paragraph 9 of this document. See also finding ID# 11 in the table in this document
Activities included	Reducing emissions from deforestation Reducing emissions from forest degradation Conservation of forest carbon stocks Enhancement of forest carbon stocks	See paragraph 10 of this document
Pools included	Above-ground biomass Below-ground biomass Deadwood	See paragraph 20(f–g) of this document. See also finding ID# 1 in the table in this document
Gases included	CO_2, CH_4, N_2O	See finding ID# 1 in the table in this document
Consistency with assessed FREL/FRL	Methods, definitions and information used for the assessed FREL/FRL are consistent with those used for the results	See finding ID# 1 in the table in this document
Description of NFMS and institutional roles	Included	See finding ID# 10 in the table in this document
Identification of future technical improvements	Included	Several areas for future technical improvement have been identified (see finding ID#s 2–5, 7–8 and 11 in the table in this document and para. 20 of this document)

Annex III

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl.

B. UNFCCC documents

First and second modified FREL/FRL submissions of Chile. Available at https://redd.unfccc.int/submissions/by-country/country_detail/chl.html.

"Guidelines and procedures for the technical assessment of submissions from Parties on proposed forest reference emission levels and/or forest reference levels". Annex to decision 13/CP.19. Available at https://unfccc.int/sites/default/files/resource/docs/2013/cop19/eng/10a01.pdf#page=36.

"Guidelines for elements to be included in the technical annex referred to in decision 14/CP.19, paragraph 7". Annex to decision 14/CP.19. Available at https://unfccc.int/sites/default/files/resource/docs/2013/cop19/eng/10a01.pdf#page=42.

"Guidelines for submissions of information on reference levels". Annex to decision 12/CP.17. Available at https://unfccc.int/sites/default/files/resource/docs/2011/cop17/eng/09a02.pdf#page=19.

Report on the technical assessment of the proposed FREL/FRL of Chile submitted in 2016. FCCC/TAR/2016/CHL. Available at https://redd.unfccc.int/submissions/by-country/country_detail/chl.html.

Report on the technical assessment of the proposed FREL/FRL of Chile submitted in 2023. FCCC/TAR/2023/CHL. Available at https://redd.unfccc.int/submissions/by-country/country_detail/chl.html.

Technical report on the TA of the technical annex to the third BUR of Chile submitted in accordance with decision 14/CP.19, paragraph 7, on 3 December 2018. FCCC/SBI/ICA/2019/TATR.1/CHL. Available at https://redd.unfccc.int/submissions/by-country/country_detail/chl.html.

C. Other documents

The following references may not conform to UNFCCC editorial style as some have been reproduced as received or as cited in the technical annex:

Olofsson P, Arévalo P, Espejo AB, et al. 2020. Mitigating the effects of omission errors on area and area change estimates. *Remote Sensing of Environment.* 236: pp.111492.

Olofsson P, Foody G, Herold M, et al. 2014. Good practices for estimating area and assessing accuracy of land change. *Remote Sensing of Environment*. 148: pp.42–57.

Tomppo E. 1990. Designing a satellite image-aided national forest survey in Finland. *In*: *The Usability of Remote Sensing For Forest Inventory and Planning, Proceedings from SNS/IUFRO workshop. 26 - 28 February 1990.* Report 4. Swedish University of Agricultural Sciences, Remote Sensing Laboratory. pp.43–47.