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## Report on the technical assessment of the proposed forest reference emission level of Argentina submitted in 2019

### *Summary*

This report covers the technical assessment of the voluntary submission of Argentina on its proposed forest reference emission level (FREL) in accordance with decision 13/CP.19 and in the context of results-based payments. The FREL proposed by Argentina covers the activity “reducing emissions from deforestation”, which is among the activities included in decision 1/CP.16, paragraph 70. For its submission, Argentina developed a subnational FREL for four forest regions, with the aim of transitioning to a national FREL in the future. The FREL presented in the original submission corresponds to 101,141,848 tonnes of carbon dioxide equivalent a year for the reference period 2002–2013. As a result of the facilitative process during the technical assessment, the submission was modified to include additional data and information without altering the value of the FREL. The assessment team notes that the data and information used by Argentina in constructing its FREL are transparent, complete and in overall accordance with the guidelines contained in the annex to decision 12/CP.17. This report contains the assessed FREL and a few areas identified by the assessment team for future technical improvement in accordance with the provisions on the scope of the technical assessment contained in the annex to decision 13/CP.19.

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## Abbreviations and acronyms

AD	activity data
AT	assessment team
BEF	biomass expansion factor
BUR	biennial update report
COP	Conference of the Parties
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
EF	emission factor
FAO	Food and Agriculture Organization of the United Nations
FRA	Global Forest Resources Assessment
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
OTF	other forest land
PINBN	first national native forest inventory
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 assessment
TF	forest land
2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>

## I. Introduction and summary

### A. Overview

1. This report covers the TA of the voluntary submission of Argentina on its proposed FREL,<sup>1</sup> submitted on 8 January 2019, in accordance with decisions 12/CP.17 and 13/CP.19. The TA took place (as a centralized activity) from 18 to 22 March 2019 in Bonn and was coordinated by the secretariat.<sup>2</sup> The TA was conducted by two LULUCF experts from the UNFCCC roster of experts<sup>3</sup> (hereinafter referred to as the AT): Thelma Krug (Brazil) and Raúl Abad Viñas (European Union). In addition, Gervais Ludovic Itsoua Madzous, an expert from the Consultative Group of Experts, participated as an observer<sup>4</sup> during the centralized activity in Bonn. The TA was coordinated by Jenny Wong (secretariat).

2. In response to the invitation of the COP and in accordance with the provisions of decision 12/CP.17, paragraphs 7–15 and annex, Argentina submitted its proposed FREL on a voluntary basis. The proposed FREL is one of the elements<sup>5</sup> to be developed in the implementation of the activities referred to in decision 1/CP.16, paragraph 70. Pursuant to decision 13/CP.19, paragraphs 1 and 2, and decision 14/CP.19, paragraphs 7 and 8, the COP decided that each submission of a proposed FREL, as referred to in decision 12/CP.17, paragraph 13, shall be subject to a TA in the context of results-based payments.

3. Argentina provided its submission in Spanish. The submission is supported by seven annexes<sup>6</sup> in Spanish: reports of deforestation for different provinces for the periods 1998–2002, 2002–2004, 2002–2006, 2006–2011, 2011–2013, 2013–2014, 2014–2015 and 2016 (annex I); digital coverage of deforestation for the periods included in the FREL (annex II); tables of deforestation per period (1998–2006 and 2006–2017) (annex III); a set of manuals for the implementation of the PINBN (annex IV); volumetric equations used in the PINBN (annex V); databases for the estimation of volume and biomass at the levels of tree, sample unit and forest regions (annex VI); and worksheets for the annualization of AD, the estimation of gross emissions from deforestation at the forest region level, and separately by forest class (annex VII), with the aim of enhancing the transparency of the FREL. In its modified submission (see para. 6 below), Argentina provided information on uncertainties in annex VII and added an annex VIII with information on the methodology used to assess the accuracy of the maps used in the National Native Forest Monitoring System.

4. The objective of the TA is to assess the degree to which the information provided by Argentina is in accordance with the guidelines for submissions of information on reference levels<sup>7</sup> and to offer a facilitative, non-intrusive, technical exchange of information on the construction of the FREL with a view to supporting the capacity of Argentina for the construction and future improvement of its FREL, as appropriate.<sup>8</sup>

5. The TA of the FREL submitted by Argentina was undertaken in accordance with the guidelines and procedures for the TA of submissions from Parties on proposed FRELs and/or FRLs.<sup>9</sup> This report on the TA was prepared by the AT following the same guidelines and procedures.

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<sup>1</sup> The submission of Argentina is available at <https://redd.unfccc.int/submissions.html?country=arg>.

<sup>2</sup> Per decision 13/CP.19, annex, para. 7.

<sup>3</sup> Per decision 13/CP.19, annex, paras. 7 and 9.

<sup>4</sup> Per decision 13/CP.19, annex, para. 9.

<sup>5</sup> See decision 1/CP.16, para. 71(b).

<sup>6</sup> In its annexes, Argentina also provided online access to additional information on Argentina's second BUR (available at <https://unfccc.int/documents/180598>), the national GHG inventory system (available at <https://inventariogei.ambiente.gob.ar/>) and the information related to the National Native Forest Monitoring System (available at <https://www.argentina.gob.ar/manejo-sustentable-de-bosques/sistema-nacional-de-monitoreo-de-bosques-nativos>). Additional supporting information can be obtained upon request by writing to [cambioclimatico@ambiente.gob.ar](mailto:cambioclimatico@ambiente.gob.ar).

<sup>7</sup> Decision 12/CP.17, annex.

<sup>8</sup> Decision 13/CP.19, annex, para. 1(a) and (b).

<sup>9</sup> Decision 13/CP.19, annex.

6. Following the process set out in those guidelines and procedures, a draft version of this report was communicated to the Government of Argentina. The facilitative exchange during the TA allowed Argentina to provide clarifications and additional information, which were considered by the AT in the preparation of this report.<sup>10</sup> As a result of the facilitative interactions with the AT during the TA, Argentina provided a modified version of its original submission on 9 October 2019 that took into consideration the technical input of the AT. The modifications improved the clarity and transparency of the submitted FREL without needing to alter the approach used to construct it. This TA report was prepared in the context of the modified FREL submission. The modified submission, containing the assessed FREL, and the original submission are available on the UNFCCC website.<sup>11</sup>

## B. Proposed forest reference emission level

7. In decision 1/CP.16, paragraph 70, the COP 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 and in accordance with their respective capabilities and national circumstances, in the context of the provision of adequate and predictable support. The FREL proposed by Argentina, on a voluntary basis for a TA in the context of results-based payments, covers the activity “reducing emissions from deforestation”, which is one of the five activities referred to in that paragraph. Pursuant to paragraph 71(b) of the same decision, Argentina developed a subnational FREL covering four forest regions<sup>12</sup> in the country, which comprise nearly 65 per cent of the area of all forest regions, with the aim of transitioning to a national FREL incorporating all forest regions in the country in the future.

8. Native forests in Argentina cover approximately 53.6 million ha. The four forest regions mentioned in paragraph 7 above are a subset of the seven forest regions distributed in the country. This subset comprises Parque Chaqueño, Selva Misionera (Selva Paranaense), Selva Tucumano Boliviana (Yungas) and Espinal (only the Caldén and Ñandubay districts)<sup>13</sup> and covers approximately 90 per cent of the forest land in the country. As explained by the Party in its modified submission, these regions are where most of the deforestation of native forests occurs. Parque Chaqueño, Selva Misionera, Selva Tucumano Boliviana and Espinal cover approximately 41 per cent, 2 per cent, 3 per cent and 20 per cent, respectively, of the total forest area in the country. The mean annual areas deforested in these four forest regions in the period 2002–2013 were 324,705 ha/year, 10,902 ha/year, 11,069 ha/year and 21,720 ha/year, respectively. For its submission, Argentina applied a stepwise approach to developing its FREL in accordance with decision 12/CP.17, paragraph 10. The stepwise approach enables Parties to improve their FRELs and/or FRLs by incorporating better data, improved methodologies and, where appropriate, additional pools.

9. The subnational FREL proposed by Argentina corresponds to 101,141,848 t CO<sub>2</sub> eq/year and was submitted with the aim of accessing results-based payments for REDD+ activities for the period 2014–2018. The FREL is calculated on the basis of the annual average of CO<sub>2</sub> emissions associated with “gross deforestation” using data from the historical reference period 2002–2013.<sup>14</sup> Gross deforestation is defined as the loss (clear-cut) of native forest cover from the conversion of forest land to other land-use categories. The main drivers of deforestation are related to agriculture and animal husbandry, urbanization, forest fires, infrastructure development and mining. The proposed FREL covers only native forests,<sup>15</sup> and

<sup>10</sup> Per decision 13/CP.19, annex, paras. 1(b), 13 and 14.

<sup>11</sup> See footnote 1 for the weblink to the submission.

<sup>12</sup> Forest regions are defined on the basis of the natural distribution zones of native forests.

<sup>13</sup> The forest regions Bosque Andino Patagónico, Monte and Delta and Islas del Río Paraná were not included in the current FREL submission.

<sup>14</sup> During the TA, Argentina clarified that the selected reference period, 2002–2013, reflects the historical dynamics of deforestation in Argentina, including the increase in the rate of deforestation from 2002 to 2010, the historical peak of deforestation in 2010 and the results of the effective implementation of Forest Law No. 26.331 (2007) in reducing deforestation. Argentina explained that although the law entered into force in 2007, its effective implementation only started in 2010.

<sup>15</sup> Native forests are defined as natural forest ecosystem at any stage of development, of primary or secondary origin, which has a canopy coverage of native tree species greater than or equal to 20 per

hence excludes forest plantations even if planted with native species. During the TA week, Argentina clarified that the conversion of native forest to forest plantation is considered to be deforestation.

10. The AD used in the construction of the FREL cover the deforested area in each of the four forest regions disaggregated by year and two forest classes: TF and OTF (see para. 36 below). The AD originate from official data reported by the National Forest Agency, which reports to the Secretary of Environment and Sustainable Development, for the entire time series 2002–2013.

11. Argentina provided in its submission information regarding the contribution of each forest region to the total CO<sub>2</sub> emissions included in the FREL calculation. Out of the four forest regions considered in the submission, Parque Chaqueño contributed 86 per cent of the total CO<sub>2</sub> emissions in the historical period (of which, 91 per cent were from TF and 9 per cent from OTF); Selva Misionera and Espinal with 5 per cent each (of which, for Selva Misionera, 94 per cent were from TF and 6 per cent from OTF; and for Espinal, 61 per cent were from TF and 39 per cent from OTF); and Selva Tucumano Boliviana with 4 per cent (of which, 95 per cent were from TF and 5 per cent from OTF).

12. The proposed FREL includes the carbon pools above-ground biomass and below-ground biomass. Regarding GHGs, the submission includes only emissions of CO<sub>2</sub>.

13. Argentina provided several annexes (see para. 3 above) that were not subject to the TA. The Party also provided the geographic information system layers that enabled verification by the AT of the deforestation polygons considered in the FREL. These data and information enabled the AT to reproduce most of the data used in the construction of the FREL, particularly the information on EFs. More specifically, data in Argentina's annex VI were used to reproduce all the EFs in table 3 of the modified submission (EFs per forest region, per class of forest, in terms of biomass (t/ha) and carbon (t/ha)). The AT commends Argentina for providing access to the information contained in the annexes as well as contact details should further information be required (see footnote 6 above).

## **II. Data, methodologies and procedures used in the construction of the proposed forest reference emission level**

### **How each element in the annex to decision 12/CP.17 was taken into account in the construction of the forest reference emission level**

#### **1. Information used by the Party in the construction of its forest reference emission level**

14. The REDD+ activity included in the construction of the FREL was “reducing emissions from deforestation”. The FREL was constructed on the basis of a time series of CO<sub>2</sub> emissions from the period 2002–2013 with the aim of obtaining results-based payments for the period 2014–2018. In addition, Argentina provided in its submission information related to processes that lead to forest degradation (e.g. wood harvesting, grazing and agricultural activities, encroachment of exotic species into the native forest area) and acknowledged that, despite direct observations in the field suggesting that forest degradation is occurring, the quantification and spatial distribution of emissions from these processes prevented the inclusion of the activity “reducing emissions from forest degradation” in the FREL of the present submission.

15. For the construction of its FREL, Argentina used the 2006 IPCC Guidelines as a basis for estimating the annual CO<sub>2</sub> emissions from deforestation. Specifically, default values from the guidelines were used for the carbon content of dry living biomass and for root-to-shoot ratios to estimate the below-ground biomass as a fraction of the above-ground biomass.

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cent, trees that reach a minimum height of 3 m and patches or units of more than 0.5 ha of continuous occupation.

16. The AD were estimated using visual interpretation of Landsat satellite imagery,<sup>16</sup> where conversion from TF and OTF to other land (considered as deforestation) for the periods 2002–2006, 2006–2007, 2007–2011 and 2011–2013 was identified at the province level. The annual AD estimates for the FREL period (2002–2013) were derived from the application of a model developed by the National Climate Change Agency. The model uses adjustment coefficients based on expert judgment to account for the different dates of the satellite imagery used in each of the above-mentioned periods and at the province level.<sup>17</sup> Deforestation (i.e. loss of forest cover) was identified by overlapping pairs of images from those periods and a native forest map<sup>18</sup> was used to differentiate between forest classes TF and OTF.

17. In order to estimate EFs for the forest class TF, Argentina used dasometric information collected during the PINBN,<sup>19</sup> which was carried out from 1998 to 2006 on 343 sample units.<sup>20</sup> Based on the dasometric data, biomass stocks (reported in tonnes of dry matter) were estimated for each of the forest regions using the volumetric information collected at the tree level. Using the height and diameter at breast height of each measured tree, the volumes of the main stems were derived using species-specific volumetric equations.<sup>21</sup> The biomass of the main stems was estimated using densities. In one region (Selva Misionera), Argentina applied species-specific densities, whereas for the other regions, a weighted average was applied, based on the volume of the species in the sample plot. In order to expand the biomass of the main stem of the measured trees into total biomass at the sample unit level, Argentina applied specific BEFs<sup>22</sup> depending on the biomass of the main stem (i.e. whether above or below 190 t/ha). In order to express the biomass in unit area (tonnes of dry matter/ha), the different areas of the sample plots were used to extrapolate the values. Finally, default carbon fractions from the 2006 IPCC Guidelines were selected for each forest region to convert the biomass values into carbon stocks per hectare.

18. For the forest class OTF, emission estimates were derived on the basis of a bibliographical review and consultation with experts that led to the adjustment of the information to the specific conditions of Argentina.

19. The below-ground biomass pool was estimated as a fraction of the above-ground biomass pool using values from the 2006 IPCC Guidelines for each forest region, which ranged from 0.23 to 0.28 for the TF class, and was equal to 0.32 for the OTF class.

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<sup>16</sup> The Landsat satellite imagery used are 564 series from Landsat 8 images and 453 series from Landsat 5 and 7.

<sup>17</sup> For the period 2002–2006, a linear interpolation (on the basis of the dates of the imagery) was used to annualize the deforested areas.

<sup>18</sup> An original native forest map was created in 1998 in the context of the PINBN using Landsat 5 satellite images and ground observations. This original map was improved in subsequent years in terms of scale and detail. The minimum mapping units used to assess deforestation changed from 10 ha for the period 1998–2006 to 4 ha for the period 2007–2013.

<sup>19</sup> The PINBN used sample units of different shapes and sizes for each forest region that were allocated only in forest areas classified as TF and distributed over a systematic grid of different sizes among the regions.

<sup>20</sup> The distribution of the sample units within each forest region is as follows: 55 for Parque Chaqueño, 108 for Selva Misionera, 60 for Selva Tucumano Boliviana and 120 for Espinal.

<sup>21</sup> The volume of the main stem of each measured tree was calculated using volumetric equations (included in annex V to the submission) expressed as a function of tree diameter and height. The equations used were derived at the level of a single tree species or sometimes a group of species.

<sup>22</sup> The BEF for the TF class was estimated to be 1.74 for those sample units for which the biomass of the main stem was larger than 190 t/ha (Brown, 1997). Otherwise, the BEF was estimated using an exponential equation on the basis of the biomass of the main stem (equation 1 in the modified submission).

**2. Transparency, completeness, consistency and accuracy of the information used in the construction of the forest reference emission level**

**(a) Methodological information, including description of data sets, approaches and methods**

20. The methodology applied by Argentina to derive EFs for the TF class within each forest region is described in paragraph 17 above. During the TA, the AT sought clarification from Argentina regarding the use of a weighted average value of the tree wood densities to estimate the biomass of the main stem from its volume, particularly for the forest regions where specific species densities were available. In the modified submission, Argentina clarified that the weighted average values were used to maintain consistency with the GHG inventory. The AT considers that the use of species-specific densities provides more accurate biomass values than the use of the weighted averages and identifies this issue as an area for further development.

21. During the TA, the AT sought clarification regarding the estimation of EFs from the dasometric information collected during the PINBN, particularly with regard to the estimation carried out at the forest region level rather than at a more disaggregated level, which might have reduced the uncertainties of the estimates. Argentina clarified that the PINBN was originally conceived to be implemented using the forest regions as strata. The AT notes that, in general, the sample sizes used to estimate EFs for the four forest regions are rather small. For Parque Chaqueño, the forest region where most deforestation occurs (see para. 8 above), EFs were estimated from the smallest number of sample units among the four regions included in the FREL (see para. 17 above). The AT commends Argentina for the planned and ongoing improvements for the second cycle of the national native forest inventory, which include the establishment of additional sample units. The AT identifies the increase in the number of sampling units upon which EFs are estimated as an area for future technical improvement in the context of the stepwise approach.

22. During the TA, the AT also sought additional clarification regarding the treatment of AD and EFs in the OTF class. The AT noted that, because of the low canopy cover considered in this class (i.e. as low as 5 per cent) and the vegetation types included (e.g. shrubland of 0.5 m in height) the identification of deforested areas through visual comparison of pairs of satellite images is difficult and, therefore, highly uncertain. In addition, the AT considers that when estimating specific EFs for this class the use of ground data instead of data from bibliographical review or expert judgment would improve the accuracy of the estimates, and therefore identifies the treatment of the OTF areas as an area for future technical improvement.

23. The annexes included by Argentina in its FREL submission (see para. 3 above) increased the transparency of the submission and allowed the AT to better understand the methodology used in the construction of the FREL. The annexes provide relevant information on AD and EFs for the period 1998–2017, including historical emissions for each year of this period (annex VII).<sup>23</sup> During the TA, the AT sought clarification regarding the period considered by Argentina in the FREL (i.e. 2002–2013), considering that data were available for a longer period of time. Argentina clarified that the period 2002–2013 was selected for several reasons: this period was considered to be representative of the historical emissions; the AD for this period were more complete and consistent; and the period met the requirements of the Green Climate Fund for results-based payments. Moreover, Argentina explained that 2013 was the year of the adoption of the Warsaw Framework for REDD+, which meant that the REDD+ results obtained in the following years could already be reported for the purpose of seeking and obtaining results-based payments. The AT commends Argentina for providing the information included in the annexes to the submission and the clarifications provided to the AT.

24. Decision 13/CP.19, annex, paragraph 2(a), indicates that the TA of the proposed FREL should assess the extent to which the FREL maintains consistency with the corresponding forest-related anthropogenic GHG emissions by sources and removal by sinks reported in the national GHG inventory. The AT notes that non-CO<sub>2</sub> emissions from fires are

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<sup>23</sup> Information on historical emissions is available at <https://inventariogei.ambiente.gob.ar/resultados>.



reported in the GHG inventory included in Argentina's second BUR under the assumption that all deforestation is conducted through controlled burning. Argentina explained in the submission that because this practice is not monitored it is not possible to assign all deforestation to fires, and therefore, non-CO<sub>2</sub> emissions from fires are not included in the FREL. The AT considers that the inclusion of these non-CO<sub>2</sub> emissions could lead to an overestimation of the FREL (see para. 33 below).

25. The AT notes that Argentina did not include emissions from dead organic matter pools (litter and deadwood) in the FREL, which is consistent with the reporting in the GHG inventory in the Party's second BUR. However, in the national GHG inventory, Argentina does provide estimates of emissions associated with the soil organic carbon pool and, during the TA, it explained that the estimates in the GHG inventory are broadly aggregated, do not cover the entire territorial area and do not differentiate between forest land converted to cropland and that converted to pasture. Argentina explained that the data and methodologies used in the construction of the FREL are consistent with those used in the national GHG inventory that will be included in its third BUR (which will be submitted in late 2019). The AT commends Argentina for its endeavour to ensure consistency between future FRELS and forest-related GHG emissions reported in the national GHG inventory. The AT noted, given that the third BUR was not available at the time of the TA, that it could not fully assess whether the requirement of maintaining consistency between the FREL and the Party's forthcoming national GHG inventory in accordance with decision 13/CP.19, annex, paragraph 2(a), was met.

26. In assessing the extent to which the information used in the construction of the FREL is consistent with the information submitted to other international organizations, the AT notes that Argentina provided in its report to the FAO FRA 2015<sup>24</sup> definitions for two categories relevant to the FREL: forest land and other forested land. The forest definition in the Party's report to the FAO FRA includes forest plantations, but the AT noted that emissions from the deforestation of forest plantations are not included in the FREL, which considers only native forests: a subset of the forest definition reported to the FAO FRA. During the TA, Argentina clarified that it reports forest plantations as part of the forest to the FAO FRA in order to be consistent with the international forest definition used in the FRA. The AT commends the Party for the explanation provided and considers that the FREL is constructed on the basis of emissions from deforestation of native forest only and that this does not invalidate the consistency of the definitions applied in reporting to both processes.

27. The AT notes that Argentina included in its original FREL an assessment of the uncertainty associated with the EFs used to estimate CO<sub>2</sub> emissions from deforestation. In particular, the uncertainty associated with these factors was taken as the sample error<sup>25</sup> of the total volume of the native forest (m<sup>3</sup>/ha) calculated for each of the four forest regions. During the TA, Argentina informed the AT that it was assessing the accuracy and uncertainty associated with the thematic maps used to identify deforestation. Argentina also informed the AT about the plan to include the overall uncertainty of the FREL emission estimates following the error propagation methodology in the 2006 IPCC Guidelines. The AT commends Argentina for the inclusion of the uncertainty and accuracy of the thematic maps used to derive AD<sup>26</sup> in the modified submission and for providing the overall uncertainty associated with the gross deforestation emissions in the FREL. The overall uncertainty associated with the FREL submitted by Argentina was estimated as 2 per cent.

**(b) Description of relevant policies and plans, as appropriate**

28. As the proposed FREL is based entirely on historical data, no assumptions about future changes in domestic policies have been included in the submission. However,

<sup>24</sup> Available at <http://www.fao.org/forest-resources-assessment/current-assessment/country-reports/en>.

<sup>25</sup> The sample error of total volume (m<sup>3</sup>/ha) at a 95 per cent confidence interval estimated for each of the four forest regions is as follows: Parque Chaqueño, 15 per cent; Selva Misionera, 7 per cent; Selva Tucumano Boliviana, 20 per cent; and Espinal, 21 per cent.

<sup>26</sup> The global error of the maps used to derive the AD for each of the four forest regions is as follows: Parque Chaqueño, 29.2 per cent; Selva Misionera, 24.9 per cent; Selva Tucumano Boliviana, 22.4 per cent; and Espinal, 30.3 per cent.

Argentina provided information on the legal framework for the forest sector (section 2.3 of the modified submission), actions taken to address climate change (section 2.4) and the relevant institutional arrangements (section 3). The AT notes that the main legal instrument for native forests is Forest Law No. 26.331 of December 2007,<sup>27</sup> which sets the minimum standards for the protection, restoration, conservation and sustainable use of native forests. The AT commends Argentina for providing relevant information on the legal framework for the forest sector and on the efforts undertaken in the country to protect forests and ensure their sustainable use, which enhanced the AT's understanding of the sector and its role in climate change mitigation in the country.

### **3. Pools, gases and activities included in the construction of the forest reference emission level**

29. According to decision 12/CP.17, annex, subparagraph (c), reasons for omitting a pool and/or activity from the construction of the FREL should be provided, noting that significant pools and/or activities should not be excluded.

30. Argentina included in its FREL estimates of CO<sub>2</sub> emissions for above-ground biomass and below-ground biomass resulting from deforestation. However, Argentina did not include dead organic matter pools (litter and deadwood) and soil organic carbon (in mineral and organic soils) in the construction of its FREL. In its original submission, Argentina justified the omission of these pools on the basis of lack of reliable data, explaining that the available information originated from single studies that could not be generalized to all deforestation events. During the TA, the AT explained to the Party that, according to decision 12/CP.17, annex, subparagraph (c), significant pools should not be excluded from the FREL construction.

31. As a result of the interaction with the AT, Argentina elaborated further on the exclusion of the carbon pools in the modified submission, indicating that the country has a low coverage of organic soils and that these are not located in the regions covered by the FREL. However, the AT notes that Argentina did not provide sufficient information in its modified submission to justify the omission of soil organic carbon in mineral soils. In relation to the litter pool, Argentina justified the omission of this pool on the basis of the IPCC default values, which assign to litter a contribution of 1.82 and 4.12 per cent of the above-ground biomass and below-ground biomass, respectively, depending on the forest region. The AT also notes that there was insufficient information in the modified submission to justify the exclusion of the deadwood pool in the construction of the FREL. Argentina emphasized that the 2006 IPCC Guidelines do not provide default values that could be used as a basis for estimating changes in carbon stocks, as was done for litter. The AT notes that, according to the information provided in the submission, Argentina intends to include emissions from dead organic matter and soil organic carbon pools in a future FREL submission, as part of the stepwise approach, on the basis of data collected during the ongoing second national native forest inventory. The AT commends Argentina for the efforts to obtain better information that enabled the Party to justify the exclusion of carbon pools in the modified submission on the basis of these pools not being significant. The AT also commends Argentina for the planned efforts to include emissions from dead organic matter and soil organic matter in a future FREL as part of the stepwise approach.

32. However, in assessing the extent to which the FREL submission was in line with the information to be provided in accordance with the annex to decision 12/CP.17, the AT requested more information on the possible significance of the excluded carbon pools. Regarding the soil organic carbon pool, the AT noted that the contribution of CO<sub>2</sub> emissions from changes in soil organic carbon in Argentina's third national communication (table

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<sup>27</sup> This law established the obligation for the administrative provinces to carry out "territorial planning or management of native forests" and creates the National Fund for the Enrichment and Conservation of Native Forests. Argentina explained that in 2010 most of the provinces had approved, by law, their plans for the management of native forests. Therefore, 2010 is considered as the year of effective implementation of the law. See also footnote 14 above.

3.2.17) accounts for 30.4 per cent of the total emissions for LULUCF.<sup>28</sup> However, the AT could not find disaggregated percentages (or absolute values) for emissions from forest land converted to other land-use categories (deforestation). The AT also assessed<sup>29</sup> the potential significance of emissions from organic soils resulting from deforestation and concluded that they are probably not significant.

33. Argentina included only gross CO<sub>2</sub> emissions from deforestation in the FREL. Non-CO<sub>2</sub> emissions from fire are not included because the fire data available in the country are not robust enough to allow the estimation of emissions resulting from deforestation alone. The AT considers that the treatment of non-CO<sub>2</sub> gases is an area for future technical improvement so as to maintain consistency with the GHG inventory included in the second BUR<sup>30</sup> (see para. 24 above), noting that fire is one of the drivers of deforestation (see para. 9 above).

34. The AT acknowledges that Argentina included in the FREL “reducing emissions from deforestation”, the most significant activity of the five activities identified in decision 1/CP.16, paragraph 70, in accordance with its national capabilities and circumstances. The AT noted that other activities could also be significant, in particular reducing emissions from forest degradation. Argentina acknowledged the relevance of this activity to the CO<sub>2</sub> emissions and provided further information to indicate its efforts to address this issue. Among the relevant information provided, Argentina included a comprehensive list of scientific and technical research projects related to the sustainable management of forests affected by degradation, which might provide guidance on how to include the activity in a future FREL submission. In addition, Argentina informed the AT that information from the second national native forest inventory, to be concluded in 2020, could also be used to estimate emissions from forest degradation by comparing this information with that from the PINBN.

35. During the TA, the AT sought further clarification regarding the significance of the activity on “reducing emissions from forest degradation”. In particular, the AT queried the magnitude of the areas of TF converted to OTF which, in the view of the AT, could be taken as a proxy for the significance of forest degradation. In response, Argentina explained that, for the period 1998–2006 the area of TF converted to OTF was 250 kha, corresponding to approximately 8 per cent of the area of TF and OTF lost in the period. The AT notes that, given the wide range of tree cover defining forests, the conversion of TF to OTF is just a partial representation of the degradation process within forest areas in Argentina. The AT commends Argentina for all the information provided, including on the steps being taken to improve future FREL submissions when new and adequate data and better information about forest degradation become available.

#### 4. Definition of forest

36. Argentina provided in its submission the existing forest definitions in the country<sup>31</sup> and clarified that, for the purposes of the FREL, the country applied an operative definition of forest that includes TF and OTF, as follows:

(a) TF: land that forms a natural ecosystem with a tree cover of equal to or greater than 20 per cent native species, with trees that reach a minimum height of 7 m;

(b) OTF: land that forms a natural ecosystem with a tree cover of between 5 and 20 per cent native species, with trees that can reach a minimum height of 7 m; or with a tree cover equal to or greater than 20 per cent, where the trees present a height of less than 7 m;

<sup>28</sup> The third GHG inventory (2015) covering the period 1990–2012 provides estimates for the LULUCF activities consistent with those in the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*.

<sup>29</sup> Source consulted: Joosten, 2010.

<sup>30</sup> Argentina explained that the data used in the construction of the FREL are based on the GHG inventory in the third BUR, which will be submitted in late 2019.

<sup>31</sup> Presently, Argentina has three forest definitions: (1) the one used in the construction of the FREL (as described in para. 36); (2) the one that is included in Forest Law No. 26.331 (2007); and (3) a third one that aims to harmonize the different definitions and information on forest available in the country. Argentina noted in the submission that the use of the third definition will result in a recalculation of the FREL.

or that present at least 20 per cent of shrubland cover of native species, where the bushes have a minimum height of 0.5 m. It includes palms and reed bed formations.

37. These definitions were used by Argentina to report to the FAO FRA 2015 and are an adaptation of the FAO definitions of forest land and other forest land to account for the national circumstances. The definitions of TF and OTF (see para. 36 above) are similar to those used by Argentina in its GHG inventories, which also include forest plantations. The AT commends Argentina for the transparency of information related to forest definitions.

### III. Conclusions

38. The information used by Argentina in constructing its FREL for the activity “reducing emissions from deforestation” is transparent and complete and in overall accordance with the guidelines for submissions of information on reference levels.

39. The FREL presented in the modified submission for the reference period 2002–2013 corresponds to 101,141,848 t CO<sub>2</sub> eq/year.

40. The AT acknowledges that Argentina included in its FREL the most significant activity, the most important forest regions and the most significant pools in terms of emissions from forests. The AT considers that, in doing so, Argentina followed decision 1/CP.16, paragraph 70, on activities undertaken, and paragraph 71(b), on elaboration of a subnational FREL as an interim measure, and decision 12/CP.17, paragraph 10, on applying the stepwise approach. The AT commends Argentina for providing information on its ongoing work to develop FRELs and/or FRLs for other activities as well as for other forest areas in the country, as steps toward constructing a national FREL.

41. As a result of the facilitative interactions with the AT during the TA, Argentina provided a modified submission that took into consideration the technical input of the AT. The AT notes that the transparency and completeness of the information provided were significantly improved in the modified FREL submission, without having to alter the approach or values used in the construction of the FREL and commends Argentina on its efforts. The AT also notes that the information provided in the modified submission, including the data made available online<sup>32</sup> and the examples showing how CO<sub>2</sub> emissions from deforestation were estimated, increased the reproducibility of the FREL calculations.

42. The AT notes that, overall, the FREL maintains methodological consistency with the GHG inventory included in Argentina’s second BUR,<sup>33</sup> including the sources of AD and EFs as well as the definition of forest used. Argentina informed the AT that the FREL is consistent with the national GHG inventory to be included as part of the third BUR, which will be submitted to the secretariat in late 2019 (see para. 25 above).

43. Pursuant to decision 13/CP.19, annex, paragraph 3, the AT identified the following areas for future technical improvement:

(a) Use of available species-specific wood densities for deriving the biomass values used to obtain the EFs to increase the accuracy of the estimates (see para. 20 above);

(b) Establishment of additional sampling units in the forest regions of concern to enhance the accuracy of estimates (see para. 21 above);

(c) Use of ground data to derive estimates of OTF instead of using a bibliographical review and expert judgment (see para. 22 above);

(d) Enhancement of the data acquisition process for the OTF class with new methods that allow for unequivocal identification of forest cover loss in this forest class (see para. 22 above).

44. Pursuant to decision 13/CP.19, annex, paragraph 2(f), in assessing the pools and gases included in the FREL, the AT noted that the pools and gases excluded by Argentina are likely to be not significant in the context of the FREL. Nevertheless, the AT identified the following

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<sup>32</sup> See footnote 6 above.

<sup>33</sup> In reference to the scope of the TA, as per decision 13/CP.19, annex, para. 2(a).

additional areas for future technical improvement regarding pools and gases that could be included in future FRELs:

- (a) Treatment of emissions from deadwood (i.e. the inclusion of the pool or the provision of more information justifying its omission) (see para. 31 above);
- (b) Treatment of emissions from soil organic carbon in mineral soils (i.e. the inclusion of the pool or the provision of more information justifying its omission) (see para. 31 above);
- (c) Treatment of non-CO<sub>2</sub> gases (i.e. to maintain consistency with the GHG inventory included in the Party's national communication/BUR) (see paras. 24 and 33 above).

45. The AT acknowledges and welcomes the Party's intention to:

- (a) Establish additional sample units during the second cycle of the national native forest inventory (see para. 21 above);
- (b) Ensure consistency between the FREL and the forest-related GHG emissions reported in the national GHG inventory (see para. 25 above);
- (c) Include emissions from dead organic matter and soil organic matter in a future FREL as part of the stepwise approach (see para. 31 above);
- (d) Include in future FRELs emissions from forest degradation and/or other significant REDD+ activities when new and adequate data and better information are available (see para. 34 above);
- (e) Expand its FREL to include all forest regions in the country (see para. 7 above);
- (f) Continue working on the implementation of a forest definition that allows for a more harmonized treatment of the forest information, in particular, in relation to assessing forest degradation (see para. 35 above).

46. In conclusion, the AT commends Argentina for showing strong commitment to the continuous improvement of its FREL estimates in line with the stepwise approach. A number of areas for the future technical improvement of Argentina's FREL have been identified in this report. At the same time, the AT acknowledges that such improvements are subject to national capabilities and policies, and notes the importance of providing adequate and predictable support.<sup>34</sup> The AT also acknowledges that the TA was an opportunity for a rich, open, facilitative and constructive technical exchange of information with Argentina.

47. The table contained in annex I summarizes the main features of Argentina's proposed FREL.

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<sup>34</sup> Per decision 13/CP.19, annex, para. 1(b), and decision 12/CP.17, para. 10.

## Annex I

## Summary of the main features of the proposed forest reference emission level based on information provided by Argentina

<i>Main features of the FREL</i>		<i>Remarks</i>
Proposed FREL	101,141,848 t CO <sub>2</sub> eq/year	The FREL includes emissions from deforestation and excludes any subsequent emissions and removals (see para. 9 of this document)
Type and reference period of FREL	FREL = average of historical CO <sub>2</sub> emissions in 2002–2013	See paragraph 9 of this document
Application of adjustment for national circumstances	No	–
National/subnational	Subnational	The FREL includes four out of the seven forest regions in the country (see para. 8 of this document)
Activity included	Reducing emissions from deforestation	Deforestation is defined as the conversion from native forests to non-forest lands, including the conversion of native forests to plantations (see para. 9 of this document)
Pools included	Above-ground biomass Below-ground biomass	Dead organic matter (i.e. deadwood and litter) and soil organic carbon in mineral and organic soils were not included. The justification for their omission is the lack of reliable data for estimating dead organic matter and soil organic carbon in mineral soils, as well as the insignificance of emissions from litter when using IPCC default factors, and the lack of organic soils in the territory covered by the current FREL (see para. 30 of this document)
Gas included	CO <sub>2</sub>	See paragraph 29 of this document
Forest definition	Included	Forest area separately considered in two classes: 1.TF: natural ecosystem with a tree cover equal to or greater than 20 per cent of native species, with trees that reach a minimum height of 7 m; 2.OTF: natural ecosystem with a tree cover of between 5 and 20 per cent of native species, with trees that can reach a minimum height of 7 m; or with a tree cover equal to or greater than 20 per cent, where the trees present a height of less than 7 m; or that present at least 20 per cent of shrubland cover of native species, where the bushes have a minimum height of 0.5 m. It includes palms and reed bed formations

<i>Main features of the FREL</i>		<i>Remarks</i>
		A consistent definition is also used to report to the FAO FRA 2015 and to compile the GHG inventory (see paras. 36 and 37 of this document)
Consistency with latest GHG inventory	Methods used for estimating the FREL are consistent with the latest GHG inventory included in the second BUR	The methods and background data used to estimate the FREL are consistent with those used for compiling the GHG inventory (see para. 42 of this document)
Description of relevant policies and plans	Included	See paragraph 28 of this document
Description of assumptions on future changes to domestic policies, if included in the construction of the FREL	Not applicable	See paragraph 28 of this document
Description of changes to previous FREL	Not applicable	–
Identification of future technical improvements	Included	Areas for future technical improvements were identified (see paras. 43–45 of this document)

## Annex II

### Documents and information used during the technical assessment

#### Reference documents

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