United Nations FCCC/TAR/2011/NOR

Framework Convention on Climate Change

Distr.: General
19 September 2011

English only

Report of the technical assessment of the forest management reference level submission of Norway submitted in 2011

GE.11-63744

Contents

I. Introduction and summary

A. Overview

1. This report covers the technical assessment (TA) of the submission of Norway on its forest management reference level (FMRL), submitted on 21 March 2011 in accordance with decision 2/CMP.6. The TA took place (as a centralized activity) from 23 to 27 May 2011 in Bonn, Germany, and was coordinated by the UNFCCC secretariat. The TA was conducted by the following team of nominated land use, land-use change and forestry experts from the UNFCCC roster of experts: Mr. Nagmeldin G. Elhassan (Sudan), Mr. Giacomo Grassi (European Union), Ms. Rehab Ahmed Hassan (Sudan), Mr. Vladimir Korotkov (Russian Federation), Mr. Rae-Hyun Kim (Republic of Korea) and Mr. Kevin Black (Ireland). Mr. Nagmeldin G. Elhassan and Mr. Giacomo Grassi were the lead reviewers. The TA was coordinated by Ms. María José Sanz-Sánchez (UNFCCC secretariat).

2. In accordance with the "Guidelines for review of submissions of information on forest management reference levels" (decision 2/CMP.6, appendix II, part II) (hereinafter referred to as the TA guidelines), a draft version of this report was communicated to the Government of Norway, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

B. Proposed reference level

3. Norway elected to use 1990 data for establishing its FMRL in net–net accounting[1] and proposed a value of –11.4 million tonnes of carbon dioxide equivalent (Mt CO_2 eq) per year. This consists of net removals of –6.42 Mt CO_2 eq by living biomass and –5.1 Mt CO_2 eq by dead organic matter and soil organic matter, and of net emissions from biomass burning (0.002 Mt CO_2 eq), fertilization of forest land (0.001 Mt CO_2 eq) and drainage of soils (0.15 Mt CO_2 eq). The Party indicated that the correction of the FMRL in its 2011 submission (in comparison with the FMRL inscribed in appendix I to decision 2/CMP.6) is due to: (a) a more realistic relationship between annual increment and harvest; and (b) an increase in the total forest area (under forest management) due to the inclusion of forests in the county of Finnmark and mountain birch areas.

II. General description of the reference level

A. Overview

4. The updated historical FMRL is based on national statistics and repeated national forest inventories (NFIs) over the period 1986–1993. In order to indicate a more realistic relationship between increment and harvest, a correction factor has been applied to the historical time series to reflect the strategy of re-sampling permanent plots. The NFI data were also used to provide parameter values and initial conditions for the calculation of dead organic matter and soil carbon pools using the Yasso model.

[1] Net–net accounting refers to the accounting of both emissions and removals in a base year and in a future year in accordance with Article 3, paragraph 4, of the Kyoto Protocol.

B. How each element of footnote 1 to paragraph 4 of decision 2/CMP.6 was taken into account in the construction of the reference level

1. Historical data from greenhouse gas inventory submissions

5. Norway's NFI provides the historical data used for Norway's greenhouse gas (GHG) inventory and for the calculation of the FMRL. The FMRL is consistent with the GHG inventory. Compared with the 2010 submission the whole time series has been recalculated in the 2011 submission following the updating of the activity data, revision of the methods used to calculate the net change in carbon stock in living tree biomass and inclusion of estimates for the entire country.

2. Age-class structure

6. Historical removal estimates inherently include age-class structure since these are characterized in Norway's GHG inventories (1986–1993).

3. The need to exclude removals from accounting in accordance with decision 16/CMP.1, paragraph 1

7. This is achieved by the provisions for factoring out (see chapter II.E.7)

4. Other elements

Forest management activities already undertaken

8. Norway's FMRL is based on inventory data for the period 1986–1993 and, therefore, reflects forest management activities undertaken before 1990.

C. Pools and gases

1. Pools and gases included in the reference level

9. The FMRL contains the following pools and gases: living biomass (above- and below-ground); dead organic and soil organic matter; nitrous oxide (N_2O) from fertilization under forest management; CO_2 and N_2O from drainage of soils under forest management; and N_2O and methane from biomass burning (forest wildfires).

10. Harvested wood products (HWP) are not reported in Norway's FMRL submission.

2. Consistency with inclusion of pools in the estimates

11. The FMRL includes all carbon pools reported in Norway's forest-related estimates in its national inventory report (NIR) of 2011 and related common reporting format tables.

12. Norway reported on HWP in its 2011 NIR (annex VII), but this is not accounted for in the FMRL submission.

D. Approaches, methods and models used

1. Description

13. Norway provided a detailed description of the approaches, methods and models used for the construction of its FMRL and in its 2011 NIR. The historical FMRL calculations of carbon stock changes in living biomass are conducted according to the stock change method and are based on data obtained from the NFI. The methodology is also well

documented in previously reviewed NIR submissions (2010 NIR). Modifications to the methodologies outlined in the 2011 NIR and the FMRL submission are transparently documented. For the historical time series, the NFI utilizes a five-year cycle based on a re-sampling method using permanent plots. The data obtained between 1986 and 1993 form the basis for the estimated carbon stock in living biomass for 1990. The stock change method is also used to calculate the changes in CO_2 sequestrated in dead organic matter and soil. The annual fluctuation of CO_2 sequestration in dead organic matter and soil is influenced by the annual variation in the input data to the Yasso model: litter from standing biomass, natural mortality, harvest residues, and stumps and roots from harvested trees.

14. Although projected data were not required for the submission of a historical reference level, the expert review team (ERT) commends Norway for including such data. Estimation of projected annual removal of CO_2 was based on the improved projection models and more realistic assumptions, giving a higher carbon increment and higher build-up of dead organic matter and soil carbon up to 2020. The new models applied have significantly reduced the uncertainty and provided a more realistic estimate for Norway´s forest management removals in 2020, based on the best currently available knowledge. During the TA, Norway provided a manuscript by Antón-Fernández and Astrup, which provides a more detailed description of the method for harvest predictions and error calculations.

2. Transparency and consistency

15. The description of methods used in the estimation of the FMRL is transparently documented in the FMRL submission. Descriptions are also consistent with documentation in the 2011 NIR. Clarification, when requested, was provided following consultation with Norway during the TA. Hence, the ERT considers that the submission with the related documentation (2011 NIR) fulfils the required assessment criteria of the TA as outlined in decision 2/CMP.6.

E. Description of the construction of the reference level

1. Area under forest management

16. The managed forest area for the FMRL is 11,777.93 thousand hectares.

2. Relationship of the forest land remaining forest land category with the forest management activity reported previously under the Convention and the Kyoto Protocol

17. The forest area definition and the areas of forest land remaining forest land in Norway as reported in the 2011 NIR are consistent with the managed forest areas used in the FMRL. Similarly, the reported FMRL net CO_2 eq removal is consistent with the values reported in the 2011 NIR.

3. Forest characteristics

18. Forest land covers around 30 per cent of the mainland area of Norway. All areas of forest land, including unproductive areas, mountain birch areas and conifer/birch areas in the county of Finnmark, are considered to be managed. The management includes areas utilized for harvesting, as well as recreation areas, protected areas and nature reserves. During the TA, Norway provided additional information about the current and projected age-class distribution for areas and standing volume of deciduous dominated stands and pine and spruce stands. Future age-class structure dynamics are consistent with historical natural disturbances and management. For example, a predicted ‘right-shifted’ age-class

structure in 2020 could be explained by reforestation efforts and replanting after harvesting during 1950–1970.

4. Historical and assumed harvesting rates

19. Norway provided historical and projected harvest levels in cubic metres (m^3) for the submitted forest management scenario (using a 'business as usual' approach reflecting the past 10 years of forest management). For 1990, the volume of harvesting was about 12.5 million m^3. The average harvest level from 2010 to 2020 is assumed to be 12 million m^3 per year and the harvest level in 2020 is assumed to be 13 million m^3. Based on improved projection models, the annual removal from forest management in 2020 was estimated to be around 23.2 Mt CO_2 per year.

5. Harvested wood products

20. In accordance with the Intergovernmental Panel on Climate Change default approach, all HWP were assumed to be instantaneously oxidized at the time of harvest. In annex VII to its 2011 NIR, Norway has provided information about the HWP contribution by using the stock change approach and the revised models. These estimates include harvests from pre-1990 forests, harvested wood pools from 1960 and imports of HWP. HWP in 1990 was a sink of –732 Gg CO_2 per year.

6. Disturbances in the context of force majeure

21. Force majeure is not accounted for in the estimate of the FMRL.

7. Factoring out

22. The Party stated that no factoring out approaches were taken into consideration in estimating the FMRL. However, the ERT emphasizes that, based on the present state of science and knowledge, the effects of elevated CO_2 concentrations and indirect nitrogen deposition are considered to be approximately the same in the reference level and in the future period (i.e. the commitment period), and therefore they can be assumed to factor out. The dynamic age-class effects will remain over any given commitment period (see chapter II.E.3) but may be removed from accounting by taking into consideration the contribution of forest management to commitments overall.

F. Policies included

1. Description of policies

23. Forest expansion policy after the Second World War and increased demand has resulted in an increase in the afforestation of large areas, particularly during the period 1955–1992. The maturity and scheduled harvesting of these stands in the future would be consistent with the observed increased harvest levels for the projected time series 2010–2020. The projections of the FMRL incorporate the expected effects of policies and programmes decided no later than December 2009, in accordance with paragraph 11 of the TA guidelines.

2. How policies are taken into account in the construction of the reference level

24. The FMRL reflects Norway's existing forest and climate change policy.

III. Conclusions and recommendations

25. The historical FMRL of Norway is presented in a transparent manner. The approach used in the construction of the FMRL is consistent with previously reviewed and recent NIR submissions.

26. The Party has not included HWP in its projections, but has included estimates for HWP in annex VII to the 2011 NIR. It should be highlighted that a technical adjustment may be needed for the inclusion of HWP in the future, on an agreed basis.

Annex

Documents and information used during the technical assessment

A. Reference documents

Information on forest management reference level by Norway, 21 March 2011. Available at <http://unfccc.int/files/meetings/ad_hoc_working_groups/kp/application/pdf/awgkp_norway_2011.pdf>.

National greenhouse gas inventory of Norway submitted in 2010. Available at <http://unfccc.int/5270.php>.

National greenhouse gas inventory of Norway submitted in 2011. Available at <http://unfccc.int/5888.php>.

B. Additional information provided by the Party

Antón-Fernández C and Astrup R. Empirical harvest models and their use in regional business-as-usual scenarios of forest development. *Scandinavian Journal of Forest Research*. In review (PDF file).