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

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Contents

I. Introduction and summary

A. Overview

1. This report covers the technical assessment (TA) of the forest management reference level (FMRL) submitted by Switzerland on 9 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. Jim Penman (United Kingdom of Great Britain and Northern Ireland), Mr. Sandro Federici (San Marino), Ms. Gro Hylen (Norway), Mr. Agustín Inthamoussu (Uruguay), Mr. Mattias Lundblad (Sweden) and Mr. Nalin Srivastava (India). Mr. Jim Penman and Mr. Sandro Federici 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), a draft version of this report was communicated to the Government of Switzerland, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

B. Proposed reference level

3. Switzerland has proposed an FMRL value of 0.22 million tonnes of carbon dioxide equivalent (Mt CO_2 eq) per year. This consists of net emissions of 0.48 Mt CO_2 eq per year less accumulations of 0.21 Mt CO_2 eq and 0.05 Mt CO_2 eq in the harvested wood products (HWP) pool and the soil carbon pool, respectively. Data provided by Switzerland during the TA show that including emissions from forest fires would increase Switzerland's FMRL to 0.23 Mt CO_2 eq.

II. General description of the reference level

A. Overview

4. Switzerland's FMRL is based on historical forest inventory data that provide parameter values and initial conditions for two linked models, MASSIMO3 and YASSO07; these models project carbon stocks and stock changes in forest biomass and soils, respectively, taking management into account.

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. The Swiss national forest inventory (NFI) and Swiss forestry statistics provide the historical data used for the Swiss greenhouse gas (GHG) inventory and for the calculation of the FMRL. The FMRL is consistent with the GHG inventory except for the differences noted in chapter II.C.

2. Age-class structure

6. Sampling conducted for the NFI between 2004 and 2006 shows that more than 60 per cent of Switzerland's trees are in the 80- to 120-year age class, or older. This is consistent with decreasing net removals of CO_2 from forest management since 1990 and becoming, under 'business as usual' conditions, a net source of CO_2 over the period 2013–2020.

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

7. See paragraph 21 below.

4. Other elements

Forest management activities already undertaken

8. Switzerland has a long tradition of forest conservation, which has lead to a relatively large and expanding forest area and a low deforestation rate. Sustainable management was reaffirmed in the country's Forest Act (1993) and codified in the Wood Resource Policy (2008) and the Wood Action Plan (2009). The latter aims at co-optimization between sequestration and use of wood for products and energy, through aiming to establish a cascade (hierarchy) of uses, with combustion for energy production left as a latest option. The Forest Act (1993) prescribes sustainable forest management, prohibits clear-cutting and bans all deforestation with the exception of projects of public interest that are replaced by an equal area of afforested land or an equivalent measure to improve biodiversity. Switzerland foresees no change in these policies over the period to 2020.

Projected forest management activities under a 'business as usual' scenario

9. The FMRL proposed by Switzerland is based on the 'business as usual' scenario. This is in agreement with Switzerland's wood policy, which includes an increase of 30 per cent in the harvesting rate and the following high-priority objectives: maintaining and/or enhancing protection from natural hazards; improving the economic viability of the forestry sector and its contribution to the Swiss economy; conserving biodiversity; and protecting trees and soils in drinking water catchment areas.

Continuity with the treatment of forest management in the first commitment period

10. Not relevant.

C. Pools and gases

1. Pools and gases included in the reference level

11. Above- and below-ground biomass, soil organic matter, litter and HWP are included in the FMRL. The dead wood carbon pool is assumed to be in dynamic equilibrium for the purposes of constructing the reference level. CO_2 and non-CO_2 GHG from forest fires are excluded from the reference level. The effect of fertilization, liming and drainage are not estimated because they are prohibited under Swiss law. A representative of the Government of Switzerland said during the TA that inclusion of soil organic carbon and HWP are provisional and under review, and that consequently an adjustment of Switzerland's FMRL is likely before the seventeenth meeting of the Conference of the Parties in Durban, South Africa. Switzerland also provided estimates indicating that inclusion of emissions from forest fires would increase the FMRL from 0.22 to 0.23 Mt CO_2 eq per year. The data are included in the annex to this report.

2. Consistency with inclusion of pools in the estimates

12. The FMRL is consistent with the GHG inventory, except that changes in soil organic matter are included in the FMRL but not in the GHG inventory. The expert review team (ERT) understands that Switzerland intends to include soil organic carbon in its next GHG inventory submission. Non-CO_2 gases from forest fires are included in the GHG inventory and in the current reporting on forest management activity, but are excluded from the FMRL. Both the GHG inventory and the FMRL estimate HWP for domestically harvested and consumed wood taking account of the historic pool back to 1900.

D. Approaches, methods and models used

1. Description

13. The estimates are based on the tree growth and harvesting model MASSIMO3 with parameters adjusted empirically to three successive NFIs. MASSIMO3 is linked to a soil carbon model called YASSO07, which has been calibrated to Swiss environmental conditions. Further details on these models can be found in Kaufmann (2001)[1] and on the website of the Finnish Environment Institute.[2]

2. Transparency and consistency

14. The Swiss submission and the replies received to questions posed during the TA by the ERT are transparent. The approach is consistent with the historical data.

E. Description of the construction of the reference levels

1. Area under forest management

15. The FMRL assumes a total area of productive forest excluding the areas associated with activities related to Article 3, paragraph 3, of the Kyoto Protocol, which are projected by linear interpolation. The area of productive forest established under the second and third NFIs is 1.116 million hectares (ha). This is consistent with the area under forest land remaining forest land, quoted in the 2011 common reporting format (table 5.A) as being 1.217 million ha, excluding the area of non-productive forest, quoted as being 0.101 million ha. The area under forest management is in fact expected to increase by 0.5 per cent during the second commitment period because of natural regeneration, which is not considered as afforestation or reforestation under Article 3, paragraph 3, of the Kyoto Protocol. About half of the land covered by this increase, or 0.25 per cent of it, is expected to become productive forest area and to be recorded in the GHG inventory. The net removals from this area are estimated to be about 0.0012 Mt CO_2 eq per year on average over the period 2013–2020, equivalent to about 0.5 t CO_2 ha^{-1} per year.

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

16. The FMRL refers to a forest area that is almost identical to the area in the forest land remaining forest land category. The difference is that under forest management only direct human-induced conversion of forest land to other land use is reported as deforestation.

[1] Kaufmann E. 2001. Prognosis and management scenarios. *In*: P Brassel and H Lischke (eds.). *Swiss National Forest Inventory: Methods and Models of the Second Assessment*. pp. 197–206.

[2] <http://www.ymparisto.fi/default.asp?node=21608&lan=en>.

3. Forest characteristics

17. Swiss forests comprise pre-montane, montane and subalpine ecosystems under sustainable management. About 10 per cent of the forest area is classified as unproductive and taken to be in equilibrium. The FMRL is based on the area of productive forest, determined from the second and third Swiss NFI to be 1.116 million ha. This is about 2 per cent less than the area reported for productive forests on Switzerland's 2011 NIR (1.139 million ha).

4. Historical and assumed harvesting rates

18. Scenarios provided in the Swiss submission suggest that to maintain forest biomass carbon stocks over the period 2013–2020 at the 2008–2012 level, the harvest could increase by about 17 per cent compared with the 1990–2007 level. Under the basic ('business as usual') scenario, the increase in harvested trees would be about 30 per cent, and under a scenario in which energy costs increase by 25 per cent, the increase in harvested trees would be about 35 per cent. The FMRL is based on the basic scenario.

5. Harvested wood products

19. The estimated annual accumulation of 0.21 Mt CO_2 eq per year in HWP pools included in the FMRL is estimated using an Intergovernmental Panel on Climate Change tier 2 country-specific method with annual production data and specific half-lives for different uses of wood, with instantaneous oxidation assumed for wood in solid waste disposal sites. Historical data since 1900 are taken into account. The current estimates do not include exports. Switzerland plans to adopt first-order decay functions with default half-lives of two years for paper, 25 years for wood panels and 35 years for sawn wood and will propose a technical adjustment to the FMRL accordingly.

6. Disturbances in the context of force majeure

20. The effects of disturbances, including the major storms Vivian (1990) and Lothar (1999), have been recorded in sampling for the three NFIs covering the period 1985–2006, and therefore these storms are part of the boundary conditions for projecting forest carbon stocks. The exceptional harvesting amounts in these years are not included in the projected future harvest amounts since this would lead to an overestimation of harvest levels.

7. Factoring out

21. The use of a projected reference level that includes the age-class structure is considered to factor out dynamic age-class effects. The effects of elevated CO_2 concentrations and indirect nitrogen deposition occur in the FMRL and in the estimated commitment period, and, therefore, based on current scientific knowledge, they can be assumed to factor out. The Swiss submission provides scientific evidence that the effects of elevated CO_2 are insignificant for Switzerland, and that elevated nitrogen deposition may decrease growth.

F. Policies included

1. Description of policies

22. These are described under paragraph 8 above.

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

23. Switzerland takes into account policies by fitting model parameters to historical data that embody the actual effects of Swiss forestry policy and by choosing future harvesting probabilities to correspond to 'business as usual' trends.

III. Conclusions and recommendations

24. Switzerland has calculated an FMRL on a transparent basis suitable for consideration by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP) at its seventh session, recognizing that a technical correction may be needed for the inclusion of exports in HWP, on an agreed basis. The ERT notes that further analysis is under way for HWP and soil organic carbon, which are currently included in Switzerland's FMRL on a provisional basis, and that consequently a technical correction of Switzerland's FMRL is likely to be submitted before the seventh session of the CMP.

25. The ERT notes that, while the omission of emissions from the FMRL submitted on 9 March 2011 is conservative, Switzerland is reporting GHG emissions from forest fires in the GHG inventory and should consider including them in the FMRL for consistency with future reporting. During the review, Switzerland provided data that show that inclusion of these emissions would increase the FMRL to 0.23 Mt CO_2 eq.

26. The ERT notes that the area of productive forests used as a basis for the FMRL is about 2 per cent less than the area reported for productive forests in the 2011 NIR and recommends that Switzerland consider, as part of the process for the adjustment discussed in paragraph 24 above, whether any technical correction is needed because of this.

Annex

Documents and information used during the technical assessment

A. Reference documents

Switzerland's submission on reference levels as an accounting approach for forest management under the Kyoto Protocol, 9 March 2011. Available at <http://unfccc.int/files/meetings/ad_hoc_working_groups/kp/application/pdf/awgkp_switzerland_2011.pdf>.

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

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

B. Additional information provided by the Party[1]

Switzerland reports the following values for forest fires (mean values 1990–2007; see table 7-29 in Switzerland's National Inventory Report 2011):

- Carbon dioxide (CO_2) emissions from forest fires amount to **0.008 Mt CO_2**
- Emissions of other greenhouse gases (GHGs) from forest fires amounts to **0.004 Mt CO_2**
- Total GHG emissions from forest fires amounts to **0.012 Mt CO_2**

Including these emissions from forest fires, Switzerland's forest management reference level amounts to 0.23 Mt CO_2 instead of 0.22 Mt CO_2.

Mt CO_2 year^{-1}	
0.48	Calculated reference level, wood harvesting
0.01	GHG emissions from forest fires
–0.21	Annual harvested wood product production from wood harvested in the reporting country (domestic harvest) including existing pool since 1900
–0.05	Organic soil carbon
0.23	**Swiss reference level 2013–2020**

[1] Reproduced as received from the Party.