Norway

27 November 2009

Submission to the Ad-Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol (AWG-KP)

Data on forest management

In order to understand better the implications of the different proposals for the treatment of LULUCF in the second commitment period, Parties were at the AWG-KP meeting in Barcelona invited to submit data and information on forest management, without presuming particular accounting rules, by 27 November 2009. Norway, hereby submits such data in accordance with the common table format, see page five.

In the submission we give a brief explanation of how the data were established, including relevant definitions and assumptions. For more details we refer to the submission on LULUCF sent by Norway 30 October 2009, as well as the presentation held by Norway during the AWG-KP meeting in Bangkok 28 September to 9 October.

1. General

Forest land covers around 30 per cent of the mainland area of Norway. All forest land is considered managed. The management includes areas utilized for harvesting, as well as recreation areas, protected areas and nature reserves.

The area of forest land has increased by nearly five per cent in the period 1990-2007. This is due to conversion of grassland, cropland and other land to forest land. These conversions take place mainly in marginal and less productive areas with relative low incremental rate.

Forest land is defined according to the Global Forest Resources Assessment (FRA) 2004 (FAO, 2004), and is defined as *land with tree crown cover of more than 10 per cent and area of more than 0.5 ha*. The trees should be able to reach a minimum height of 5 m at maturity *in situ*. No minimum width for forest land is considered in the Norwegian inventory causing a small discrepancy according to the definition in FRA 2004. Young natural stands and all plantations established for forestry purposes, as well as forest land which is temporarily unstocked as a result of human intervention, are included under forest land.

The activity *forest management* under article 3.4 of the Kyoto Protocol is defined in accordance with Annex of decision 16/CMP.1, and all forested land in Norway is subject to forest management. In practical terms the difference between the activity *forest management* under article 3.4 and the land use category *forest land* under the Convention reporting (Land based approach) is therefore that Land converted to forest land is extracted from Forest management in order to report *Afforestation and reforestation* as a separate activity under Article 3.3. The removals from the land use category *forest land* will therefore be slightly higher than for the activity forest management, reflecting the limited removal effect from afforestation and reforestation activities due to the low growth rate in Norwegian forests.

Data for both forest management and forest land cover CO_2 emissions and removals from annual living biomass increment, as well as accumulation in soil and dead organic matter.

However, the submission does not include N_2O and CH_4 emissions, because these emissions are regarded as negligible in Norwegian forests.

Furthermore, no adjustments for natural disturbance (such as forest fires, wind falls and fungal and insects attacks) have been performed.

All data on emission/removals assume instantaneous oxidation of harvested wood. However, in chapter 6 we have presented some assessments of accounting for harvested wood products following the production approach (PA) and the stock change approach for HWP of domestic origin (SCAD).

2. Net removals in 1990 (Column A)

The net removal from forest management for 1990 is based on the data submitted to the UNFCCC in the Norwegian national inventory report (NIR 2009). The Norwegian Forest and Landscape Institute is in charge of estimating emissions and removals from land use, land use change and forestry (LULUCF) categories and activities, based on statistics from the National Forest Inventory (NFI). The sampling design is based on a systematic grid of georeferenced sample plots with 3 x 3 km spacing under the coniferous limit. The NFI utilizes a 5-year cycle based on a resampling method of the permanent plots.

The data include CO_2 removals from both annual living biomass increment and accumulation in soil and dead organic matter.

3. Proposed reference level (Column A)

Norway proposes to use 1990 as reference level/base year for a net-net accounting for forest management. Such an approach would be in accordance with how other activities under Article 3.4, as well as non-LULUCF categories, are accounted for. We also believe that 1990 as a reference level is simple and a transparent basis for accounting.

We will not propose to use any reference intervals, so called “band”.

4. Forecast forest management (Column C and D)

The projection of net removals for forest management under Article 3.4 for the period 2008-2020 is based on data from the Norwegian Forest and Landscape Institute. The projection reflects existing forest and climate change policy, i.e. business as usual projections (BAU), and is based on the projection model Avvirk 2000 (Eid and Hobbelstad 1999). The following modifications have been carried out:

1) increased productivity due to an increase in the temperature of 2 ºC,
2) inclusion of calculations on biomass and on dead organic material,
3) a modified mortality rate on old forest and
4) a direct link to the dynamic soil carbon model YASSO.

Unproductive forests do not have any productivity class, and projections for these forests can therefore not be estimated using the model described above. The biomass increment in unproductive forests is estimated to 0.4 ton per hectare per year. This is independent of age and is based on observed net increment in unproductive forests in the period 1990-2008. The net increment includes natural mortality.

In figure 1 the results of this BAU projection exercise is presented. The figure shows that the annual removal of CO_2 from forest management probably may have reached its highest level in the period 2003-2007. The annual removal of CO_2 will continue to be high, but is expected to decrease towards 2020. This is due to the age structure of the forests. Most forest areas in Norway have now reached their most productive phase, which indicates that the biomass growth rate will decrease in the future.

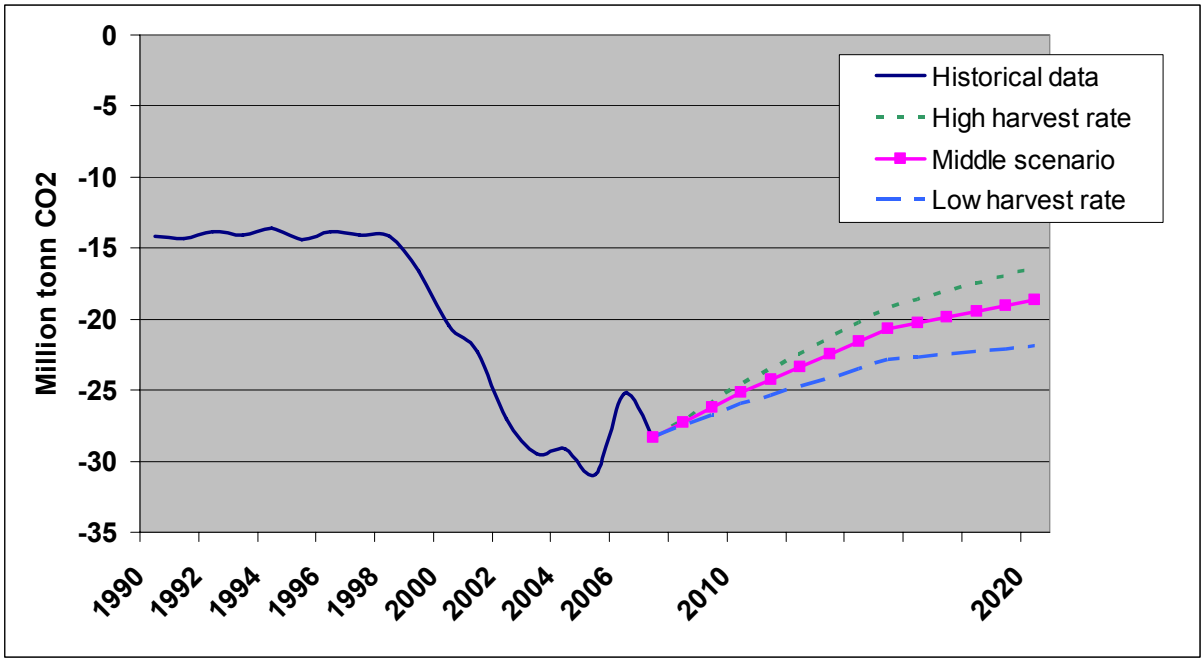

Figure 1. Emissions and removals from forest management.
Historical data and BAU projections.

The most probable middle scenario assumes that the annual removal of CO_2 from forest management will reach a level of 19.2 million tonnes of CO_2 per year in 2020. This corresponds to an annual average of 25.3 Mton/CO_2 for the period 2008-2012 (cf. column C) and 20.2 Mton/CO_2 for the period 2013-2020 (cf. column D).

The figure also indicates that the projection is sensitive to the harvest rate. In the low harvest rate scenario we have assumed a continuation of the present logging rate and forest management. The present logging rate varies around 10 million m3 per year.

However, this low harvest scenario would hardly represent a BAU scenario for Norway. Sustainable forest management, increased use of harvested wood products and increased production of bio-energy (to 14 TWh/year by 2020) are all political goals in Norway. In order to fulfil these goals, the logging intensity has to increase. An increased logging rate from 10 million to 15 million m3 per year, as in the high harvest rate scenario, would fulfil the bio-energy goal of 14 TWh.

Many policy incentives have already been implemented in order to fulfil these goals. Hence, it is reasonable to expect that the business as usual scenario will lie somewhere between these two scenarios. The middle scenario assumes that already implemented policies will increase the harvest rate from 10 million to 13 million m3 per year.

Uncertainties

There are always uncertainties related to projections and historical data. The projections on both short and long term are sensitive to fluctuations and their effects on forestry. In the long run the projections are dependent on the climate development and the effects on forest health and growth. For the historical data the uncertainties are smaller. However, the historical data are preliminary and changes may occur until the final reporting for the first commitment period is completed.

5. Forecast forest land – option B (Column H)

We have not made any separate projections for the category forest land (the land-based approach). Net removals for this category is, however, expected to follow the same development up to 2020 as forest management under Article 3.4.

The main difference between the activity *forest management* under article 3.4 and the land use category *forest land* under the Convention reporting is that removals from *Afforestation and reforestation* is included in the Convention reporting and accounted as a separate activity under the Kyotoprotocol accounting. The removals from the land use category forest land will therefore be slightly higher than for the activity forest management.

6. Harvested wood products

All data on emission and removals in chapter 2-5 and in the table below are based on the assumption that harvested wood is instantaneous oxidized. Norway is, however, in favour of including emissions from harvested wood products when they occur, provided that verifiable and transparent data are available. In the previous submission, dated 30 September 2009, Norway presented estimations for harvested wood products, following the production approach (PA) and the stock change approach for HWP of domestic origin (SCAD). These estimations show a net removal in 1990 of about 0.5 million tonnes CO_2 (using the SCAD approach) and about 1.4 million tonnes CO_2 (using PA approach). After 1990 the net removal has *decreased* to a level of 0.1 and 0.6 million tonnes CO_2 in 2007.

The projected increase in the harvest rate from 2007 to 2020, see chapter 4, will probably result in an *increase* in the net removal from harvested wood products , but this increase will hardly exceed 0.5 million tonne CO_2 compared to the level in 2007, and be close to the level in 1990.

Data on forest management for Norway

	A	B	C	D	E	F	G	H	I
Party	1990 emissions/ removals (MtCO2e/yr)	Proposed reference level & reference interval (if any)[1] (MtCO2e/yr)	Forecast for 1st CP[2] (MtCO2e/yr)	Forecast for 2013-2020[3] (MtCO2e/yr)	Forecast based on 1990 (MtCO2e/yr) (E=D-A)	Forecast based on reference level (MtCO2e/yr) (F=D-B)	Forecast based on 1st CP (MtCO2e/yr) (G=D-C)	Forecast under Option B for 2013-2020 (MtCO2e/yr)	Comments[4]
Norway	- 14.2	- 14.2	- 25.3	- 20.2	- 6.0	- 6.0	+ 5.0	- 20.7	See under

Note: Positive numbers denote emissions; negative numbers denote removals

[1] Reference interval refers to the proposed ”band”. It should be expressed in absolute numbers and not as percentages (e.g. from 0 to XX MtCO2e/yr).
[2] Absolute numbers, without application of the cap listed in the appendix to decision 16/CMP.1.
[3] Annual average for the period. This period in no way prejudges the length of the next commitment period.
[4] Each Party should provide a brief summary explaining how the date were established, including assumptions related to the treatment of natural disturbances, harvested wood products and any other relevant issues, as well as, if applicable, how elements contained in paragraph 11 Option 3 (contained in Option A of Annex II of FCCC/KP/AWG/2009/10/Add.3/Rev.3) were taken into account. Parties should also clarify how the reference interval, if included, has been taken into account. Columns can be added for this purpose.