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

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I. Introduction and summary

A. Overview

1. This report covers the technical assessment (TA) of the submission of Poland on its forest management reference level (FMRL), submitted on 16 May 2011 in accordance with decision 2/CMP.6, and the draft of a revised submission presented to the expert review team (ERT) by Poland on 25 July 2011. The TA took place (as a centralized activity) from 30 May to 3 June 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 (LULUCF) experts from the UNFCCC roster of experts: Mr. Kumeh Assaf (Liberia), Mr. Karsten Dunger (Germany), Ms. Thelma Krug (Brazil), Ms. Rosa Rivas Palma (New Zealand), Mr. Atsushi Sato (Japan) and Ms. Marina Shvangiradze (Georgia). Ms. Thelma Krug and Mr. Atsushi Sato 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 Poland, which provided comments that were considered and incorporated, as appropriate, into the final version of the report.

B. Proposed reference level

3. Poland has proposed an FMRL of –27.133 million tonnes of carbon dioxide equivalent (Mt CO₂ eq) per year. This consists of net removals of –22.750 Mt CO₂ eq per year without consideration of harvested wood products (HWP), plus net annual accumulation of –4.383 Gg CO₂ per year in the HWP pool.

II. General description of the reference level

A. Overview

4. The FMRL is based on an annual average of projected emissions and removals for the period 2013–2020. Projected emissions and removals are calculated by applying the same methodological approaches as those used for the national greenhouse gas (GHG) inventory of Poland. Projected activity data and emission factors were based on historical data used by Poland in its GHG inventory. Net accumulation of the HWP pool is estimated by the C-HWP model, which is the commonly used approach for several European Union member States.

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 historical data on GHG emissions and removals as well as the forest area used in the construction of the FMRL are taken from the GHG inventory submitted in 2011. The original sources for the GHG inventory were the national forest inventory (NFI) of 2011,

statistical information generated by the Central Statistical Office and information derived from a country-wide forest research and inventory project. The methodologies for the calculation of the FMRL are consistent with the 2011 GHG inventory.

6. Poland submitted its 2011 GHG inventory on 15 April 2011 and resubmitted an updated version of its 2011 GHG inventory on 25 May. All historical data shown in the tables of the FMRL submission are derived from the new version of the 2011 GHG inventory submitted on 25 May 2011. The updated historical data were used to estimate the projected emissions and removals from forest management in the FMRL submission.

2. Age-class structure

7. The age-class structure is taken into account in the construction of the FMRL, consistent with the latest national GHG inventory (2010 NFI and the 2008 forests in figures study). Stands aged 41–80 are the dominant age class in Poland, accounting for 46 per cent of the forest area and 53 per cent of the growing stock. At present, the proportion of stands older than 80 years has increased and that of young stands has decreased.

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

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

4. Other elements

Forest management activities already undertaken

9. Past forest management activities are indirectly taken into account through the use of the latest available forest time-series data based on the GHG inventory and the 2010 NFI.

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

10. This element is not applicable.

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

11. Projected forest management activities considered in the construction of the FMRL are based on the silvicultural guidelines of Poland's forestry measures over the past two decades. The ERT notes that Poland's approach to the construction of projections in the future period 2010–2020 is significantly affected by the historical data and by the trend in the GHG inventory as well as by management activities over the past 20 years. Hence, the above-mentioned 'business as usual' scenario is consistent with the data used for the construction of the FMRL.

C. Pools and gases

1. Pools and gases included in the reference level

12. Above- and below-ground biomass, dead wood, litter, soil organic matter in mineral soil and HWP are included in the FMRL. The area of organic soil in forest land is subject to forest management activities, but emissions from organic soil are not estimated in the GHG inventory and are excluded from the FMRL. Non-CO₂ GHG emissions from biomass burning are included. Emissions from fertilization, liming and drainage are excluded.

13. Poland explained during the course of the TA that generally the drainage of organic soil on forest land is limited, following good practices related to sustainable forest

management. The current measures in Poland are aimed at preventing the process of lowering the groundwater level of soil on forest land. The ERT recommends that technical correction be conducted if emissions from organic soil of forest land are estimated in the future.

14. It was clarified during the course of the TA that carbon stock changes of the litter pool are included in the calculation of the mineral soil pool in the FMRL in the same manner as in the GHG inventory. The ERT notes that litter is included in the FMRL but is not at present identifiable separately.

2. Consistency with inclusion of pools in the estimates

15. The inclusion of pools and gases in Poland's FMRL is consistent with the inclusion of pools and gases in the GHG inventory.

D. Approaches, methods and models used

1. Description

16. The methodologies used for the GHG inventory are applied for the estimation of the projected emissions and removals from forest management in the period 2010–2020. The input data are developed by Poland and derived from an analysis of historical data used in the GHG inventory and historical emissions and removals reported in the GHG inventory. The ERT notes that the historical trend and data in the period 1988–2009 have been used in the estimation of the projected forest management.

17. Carbon stock changes in living biomass from forest management are calculated using the methodology for the GHG inventory with projected AD. The GHG inventory methods for living biomass estimate the annual increase for all forest types based on the increase in growing stock and harvesting volume (see details on page 159 of the 2011 National Inventory Report). Poland identified two main drivers of the projection, which are the harvesting rate and the annual increment in growing stock. The estimated annual harvesting rates are derived from a country-specific forecast to 2020 and a linear interpolation from the current level (see chapter II.E.4 for details). An average of historical data for 1988–2009 of the annual increment in the growing stock was used as the projected annual increment in growing stock for the whole of the time series for 2010–2020.

18. Poland assumes a constant averaged annual increase in growing stock in the forest management projection and explained during the course of the TA that this assumption is based on an analysis of the impact of increasing the harvesting rate on the annual increase in the growing stock. Both the historical annual harvesting rates and the historical annual increase in growing stock used for the GHG inventory are increasing and have similar trends in the period 1988–2009 (figure 2 in the FMRL submission). The ERT notes that the applied method using the historical averaging value takes into account the complexity, uncertainty and difficulty in interpreting the observed phenomena.

19. As the annual increment in growing stock has been increasing since 1988 (figures 7–10, 2011 NIR), the averaged value used in the construction of the FMRL is lower than that of recent years. The ERT notes that this is one of the reasons that the projected removals during 2010–2020 are lower than the reported removals for the period 2005–2009 in the GHG inventory. However, this situation is consistent with the Party's explanation that under the 'business as usual' scenario removals in forest management are expected to be lower than at present (see para. 35 below).

20. Carbon stock changes in the dead wood pool are reported as constant and equal to zero in the GHG inventory, following the application of the Intergovernmental Panel on

Climate Change tier 2 method with country-specific data for 2005–2009, based on the 2010 NFI. A linear extrapolation of this historical trend is applied for the period 2010–2020. Hence the FMRL assumes a constant value for the dead wood pool.

21. Carbon stock changes in the mineral soil pool are reported as a sink for all years and carbon stock changes in the litter pool are reported together with the mineral soil pool in the GHG inventory. Poland used the same methodologies and parameters of the GHG inventory for the estimation of projected carbon stock changes in those pools. The projected parameters are estimated based on the average of historical data of mineral soil under forest land such as soil type distribution and soil structure. The projected area of organic soil and mineral soil in forest land subject to forest management (AD) in the future is based on the extrapolation of historical trend. As a result, projected net removals of mineral soil in the FMRL show a small decreasing trend during the period 2010–2020. The ERT notes that the projected removals in the period 2010–2020 are consistent with the removals reported for forest management in 2008 and 2009. However, there is a large gap in the time series between 2007 and 2008 in reported removals from mineral soil in forest land remaining forest land in the GHG inventory, thus the projected removals in the period 2010–2020 are not consistent with the removals reported for forest land remaining forest land in the period 1988–2007. This time-series gap between 2007 and 2008 in the GHG inventory was not covered in the review of the GHG inventory nor was it resolved by Poland at the time of the FMRL review. The ERT recommends to revise the projection for the mineral soil pool estimates when the historical mineral soil pool estimation is recalculated.

22. The mean of historical GHG emissions from forest fires excluding atypical fire years (1992 and 2003) was used as the projected emissions from forest fires in the FMRL.

2. Transparency and consistency

23. Poland's FMRL report together with the replies to questions posed during the TA make the construction of the FMRL transparent. Relevant information, including the rationale for the assumptions and the historical and projected time series, is provided in the revised FMRL submission.

24. The historical data used in the construction of the FMRL are consistent with those in the 2011 GHG inventory. The approaches taken in the construction of the FMRL and used in the GHG inventory are based on the same methodologies and parameters provided in chapter 7 of the NIR.

E. Description of the construction of the reference levels

1. Area under forest management

25. The historical area under forest management is estimated for the period 1990–2010 using the area of forest land remaining forest land in 1990 as a starting point and the actual forest management area reported under the Kyoto Protocol under forest management (KP-LULUCF) for 2009 and 2010. Areas for 1991–2008 are reduced by the annually reported area of deforestation published by the Central Statistical Office. The forest management area in 2009 decreased by 11,000 ha compared with the assumed forest management area in 1990, owing to deforestation activities that are now strictly controlled by national regulations. This decreased forest area in 2009 accounted for 0.1 per cent of the assumed forest management area in 1990.

26. Poland assumed that the forest management area in 2010 was equal to that reported under KP-LULUCF for 2009 (8,873.05 kha). An average area (547.60 ha) of deforestation for the period 1990–2008 was used as a linear extrapolation to estimate the projected forest area under forest management from 2011 onwards. As a result, the forest area under forest

management is almost stable over the years. The projected forest management area in 2020 decreased by 0.2 per cent compared with the assumed forest management area in 1990.

27. The ERT notes that the data reported in KP-LULUCF of 2008 and 2009 are used as the data for 2009 and 2010 in the construction of the FMRL. Poland explained that the state of its forests is assessed on 31 December and published on the next day on 1 January. In the GHG inventory, Poland uses the forest area at the beginning of the next inventory year in order to reflect the results of the various activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol within an inventory year. In the FMRL, the forest area is applied based on the published year. The ERT notes that, albeit minor, a discrepancy exists between the GHG inventory and the FMRL (forest management areas in 2009 were reported to be 8,873,041 ha in KP-LULUCF and 8,873,690.56 ha in FMRL). The ERT considers that the calculation approach in the FMRL estimates a larger forest management area in the future period 2010–2020 and yields a conservative result of the forest management area projection compared with the projection using the same years applied in the GHG inventory. The ERT notes that Poland will recheck this issue during the GHG inventory review and will recalculate the FMRL if needed.

28. The ERT considers that the projected area under forest management considered in the FMRL is appropriate, from a technical point of view.

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

29. Poland clarified that the term “human induced” is related to any forest land use in Poland, thus there is no difference in the methodology used in the estimation of the balance of emissions and removals between forest management and forest land remaining forest land. The area reported as forest land remaining forest land under the Convention and the forest management area reported under the Kyoto Protocol in 2008 and 2009 are similar. In this regard, the ERT considers that the approach that the forest land remaining forest land area in 1990 was used as a proxy of the forest management area in 1990 is appropriate.

30. The forest management area in the FMRL of Poland is consistent with the reported forest management area in 2008 and 2009. The ERT notes that the assumed forest management area does not include the potential afforestation/reforestation (AR) and deforestation (D) area, which will be reported under Article 3, paragraph 3, of the Kyoto Protocol. The AR and D data for 2008 and 2009 reported under the Kyoto Protocol were also used for the reporting under the Convention.

3. Forest characteristics

31. Forest land in Poland covered 29.7 per cent of the total land area of the country in 2009 and this area has increased due to the expansion of the forest area. Coniferous species dominate in Polish forests, covering nearly three quarters of the total forest area. Pine has found the optimal climatic and site conditions within its Euro–Asiatic natural range (2011 NIR).

32. Poland provided information in the FMRL submission about the current and historical age-class structure, increment of volume in the period 1988–2009 rotation length under the current forest management scheme and forest management activities under the ‘business as usual’ scenario.

33. The AD, except for the harvesting rates, are projected based on historical data in the period 1988–2009. The ERT notes that projected activity data are affected by historical status or the trend of forest characteristics.

34. Poland explained during the course of the TA that the amount of timber (gross merchantable timber) to be harvested in forests is defined in a cutting plan set for a 10-year period. The final yield is prescribed as the maximum volume of timber that could be harvested in mature stands ready for regeneration. The ERT notes that future forest characteristics, such as age class, rotation length and anticipated volume of timber, are considered in the construction of the projected harvesting rates assumed by Poland.

35. Poland stated in its FMRL submission that the measures for the forest sector aim to achieve a near natural forest ecosystem, taking into account the importance of the multiple functions of forests. It is anticipated that the policies for remodelling the forest stands from monocultures to a more diverse composition and a vertically diverse structure will potentially have the impact of decreasing removals in forest management area forests. In addition, the increasing share of older age classes will also result in a reduction in the annual increment in the near future.

4. Historical and assumed harvesting rates

36. The submitted historical harvesting rates in the period 1990–2009 are based on data from the Central Statistical Office. The data for projected harvesting rates in Poland come from the *Forecast of Wood Fiber Availability in Light of NATURA 2000 Constraints* (see reference in the annex), which uses a scientific and peer-reviewed methodology. The study forecasts that the harvesting rates in 2020 will be equal to 42.57 million m³, which is about 23 per cent higher than that in 2009. Poland assumes annual harvesting rates for the period 2010–2019 by applying linear interpolation between actual data in 2009 and the forecasted data for 2020. Both historical harvesting rates and assumed harvesting rates show increasing trends, and the two are almost identical. The ERT notes that the impact of the increasing trend of assumed harvesting rates leads to an increased loss of biomass carbon compared with the current level in the FMRL.

37. Poland explained during the course of the TA that the current size of estimated harvesting rates is mainly linked to the need of harvest to produce timber carried out in accordance with the forest sustainability principle and persistent enlargement of the forest area. The future demand for wood products takes into account market demand for timber on an annual basis, which ensures proper economic conditions, environmental conditions, and forest resources in Poland's forest land in the future.

5. Harvest wood products

38. The estimated annual increase of –4,383 Gg CO₂ eq per year in the HWP pool included in the FMRL is estimated using the C-HWP model with annual production data, specific half-lives for product types and instantaneous oxidation assumed for wood in solid waste disposal sites. Historical data date back to 1964 and an extrapolation of this data back to 1900 by using the average from 1964 to 1968 is taken into account. The current estimates include exports. Poland 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. The ERT recommends a technical correction to the FMRL when final agreement on HWP estimation is arrived at.

39. The ERT notes that the assumed harvesting rates for the period 2010–2020 in table 16 of the FMRL submission were developed by Poland based on an in-country study. The assumed harvesting rates were applied consistently for the estimations of both the projected loss of carbon in the living biomass pool and the projected carbon inflow into the HWP pool.

6. Disturbances in the context of force majeure

40. Poland explained that only wild forest fires on forest land subject to forest management have been internalized as the main source of emissions from natural disturbances in the FMRL. Poland also explained during the course of the TA that the effects of disturbances are calculated based on averaging the emissions from wildfires for the period 1990–2008 with the exclusion of large-scale forest fires that influence the inter-annual trend. Emissions from atypical fire events in 1992 and 2003 were excluded from the projected annual emissions from wildfires for the period 2010–2020. The emissions from biomass burning due to wildfires on forest land in 1992 and 2003 contributed 0.4 per cent of the total GHG emissions without land use, land-use change and forestry in 1988 (the base year for Poland) for both years. The ERT recommends a technical correction to the FMRL if the final agreement on the treatment of force majeure requires a different way of treating natural disturbances than that used by Poland in the construction of its FMRL.

7. Factoring out

41. Poland stated in its FMRL submission that the indirect and natural GHG emissions and removals were not factored out in the construction of the FMRL. This is a consistent way of treating factoring out under the current forest management area accounting system of Poland according to the supplemental information relating to KP-LULUCF in the 2011 GHG inventory. Owing to the construction of the FMRL being based on historical data, the ERT considers that paragraph 1(h)(i) and (ii) of the annex to decision 16/CMP.1 was not factored out.

F. Policies included

1. Description of policies

42. The national forest policy, changes in land use and measures relating to forest management, incentives and measures supporting afforestation, and the preservation of the environmental stability of forests were taken into account in the construction of the FMRL. Poland explained that explicit provisions of forest policies in Poland are included in the 1991 forestry act. The policies after 2009 are not included in the FMRL because there were no decisions taken after mid-2009 that would have a potential impact on the projected reference level.

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

43. The ERT notes that the measure of preventing changes in land use from forest land converted to non-forest land were reflected in the area projection and that the national forest policy was taken into account in the establishment of the projected harvesting rates and the annual increment of volume.

III. Conclusions and recommendations

44. Poland has calculated an FMRL on a transparent basis suitable for consideration by the Conference of the Parties. The FMRL is established using the projection approach and has neither a specific reference year nor a specific historical reference value. The projection approach is based on the methodologies used for the GHG inventory of Poland with assumed AD developed by the Party. The assumption is based on the historical data reported in the GHG inventory, thus the projected emissions and removals in the FMRL are highly affected by the historical trend of various forest data.

45. The ERT notes the following areas that could be subject to technical corrections in the future:

(a) The recalculation and improvement of forest land in LULUCF or KP-LULUCF in the GHG inventory of Poland imply a change of fundamental data used in the construction of Poland's FMRL. In the event that a recalculation or improvement will be conducted in the future, the change will be followed by a technical correction;

(b) The technical correction for the HWP component and GHG emissions from forest fires in Poland's FMRL is to be conducted when final agreement on HWP estimation and force majeure is arrived at.

Annex

Documents and information used during the technical assessment

Reference documents

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

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Kangas K, Baudin A. 2003. Modelling and Projections of Forest Products Demand, Supply and Trade in Europe. Discussion paper No. ECE/TIM/DP/30. Available at <<ftp://ftp.fao.org/docrep/fao/009/ae889e/ae889e00.pdf>>.

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