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

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Contents

I. Introduction and summary

A. Overview

1. This report covers the technical assessment (TA) of the submission of Latvia on its forest management reference level (FMRL), submitted on 5 May 2011 in accordance with decision 2/CMP.6. 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 experts from the UNFCCC roster of experts: Mr. Zhang Xiaoquan (China) and Mr. Richard Volz (Switzerland), Ms. Tuija Lapveteläinen (Finland), Mr. Hector Ginzo (Argentina), Mr. Sandro Federici (San Marino) and Mr. Justin Goodwin (United Kingdom of Great Britain and Northern Ireland). Mr. Zhang Xiaoquan and Mr. Richard Volz 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 Latvia, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

B. Proposed reference level

3. Latvia proposed an FMRL of –16.340 million tonnes of carbon dioxide equivalent (Mt CO_2 eq) per year applying a first-order decay function for harvested wood products (HWP) and –14.293 Mt CO_2 eq per year assuming instantaneous oxidation of HWP. Decay of HWP accounts for removals of –2.047 Mt CO_2 eq per year. Models were rerun taking into consideration the recommendations of the expert review team (ERT). The new reference level differs slightly from that submitted in April 2011, being –16.302 Mt CO_2 eq per year applying a first-order decay function for HWP and –14.255 Mt CO_2 eq per year assuming instantaneous oxidation of HWP.[1]

4. The values of the FMRL and the HWP pool given in paragraph 3 above include a correction[2] to those values contained in the official submission on the FMRL submitted by Latvia, by which the HWP account, applying a first-order decay function, changed from –1.822 Mt CO_2 eq per year to –2.047 Mt CO_2 eq per year in accordance with an official communication sent by the Party.

II. General description of the reference level

A. Overview

5. Latvia, together with 14 other member States of the European Union (EU), has adopted a common methodological framework to calculate its FMRL. This framework was

[1] See the annex.

[2] The correction was required because in the model version used for the calculation of the HWP pool an equation related to non-coniferous industrial round wood was not applied correctly, owing to a shifted cell in the calculation matrix.

implemented by a team of research groups coordinated by the Joint Research Centre (JRC) of the European Commission.

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

6. Removals or emissions from forest management as shown in greenhouse gas (GHG) inventories and relevant historical data were taken into account by adjusting the results of the modelling exercise through an ex post processing of model results. There was a small discrepancy between the Kyoto Protocol forest management figure provided in the latest GHG inventory (2011 submission) and Latvia's FMRL submission. Latvia's national forest inventory (NFI) and forest statistics provide the historical data used for Latvia's GHG inventory and for the calculation of the FMRL. The FMRL is consistent with the GHG inventory, except for the differences noted below under pools and gases (see chapter II.C.1).

2. Age-class structure

7. The evolution of the age-class structure is provided in the FMRL submission. The age-class structure shows an increase in the share of age classes of forests of 61–80 years old and 81–100 years old. Also, the area of young forests (0–20 years) will increase. During the review, the age-class structure from the NFI (2004–2008) was provided. There seemed to be some deviation between the EFISCEN modelled age-structure values and NFI (2004–2008) age-class values concerning the age class 1–20. The ERT agrees with Latvia that there is no significant deviation between Latvia's and the EFISCEN modelled age-structure values (see the annex). The differences are because Latvia reports an age class for every 10 years, while EFISCEN reports an age class for every 20 years.

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 (from the NFI or other country statistics). According to the forest law (published on 24 February 2000), forest management in Latvia is the sustainable utilization and management of forests and forest resources in order to preserve the biodiversity, productivity and vitality of forests as well as the ability to regenerate, while providing economic, social and cultural opportunities for the benefit of present and future generations. Therefore all forests are considered as managed forests.

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

10. Projected forest management activities are taken into account through the estimation of the evolution of harvest demand by 2020 based on macroeconomic drivers and the application of policies implemented in the EU member States by April 2009 and by legislative provisions adopted by April 2009.

C. Pools and gases

1. Pools and gases included in the reference level

11. Above- and below-ground biomass, soil organic matter on organic soils and HWP are included in the FMRL. Soil organic matter on organic soils is included as a constant value (the average of the 2000–2008 soil organic matter values reported in 2011 for organic soil). Soil organic matter on mineral soils and dead organic matter pools are excluded on the basis of the assumption that they are not a net source of carbon. According to the FMRL submission dead wood data from the NFI are very likely to be currently overestimated, and hence excluded, but after the finalization of the second NFI in 2012 new information will be available. Non-CO_2 GHGs from fertilization and liming are excluded, because they are not used in forest management in Latvia. Biomass burning is included as a constant ratio (the average of the 2000–2008 values reported in the latest GHG inventory submission). Also, nitrous oxide emissions from the drainage of organic soils are included as a constant ratio (the average of the 2000–2008 values reported in the latest GHG inventory submission).

2. Consistency with inclusion of pools in the estimates

12. The FMRL is consistent with the pools reported in the GHG inventory, with the following exceptions:

(a) Net emissions from organic soils are kept constant in the FMRL (at the level of the average values for 2000–2008 from the GHG inventory submission of 2011). The ERT agrees that this is likely to be a sound assumption, since the emissions from organic soils do not show a clear trend in GHG inventory data but have been fairly constant from 1990 to 2008;

(b) Emissions from biomass burning are kept constant in the FMRL (at the average level of the 2000–2008 values from the GHG inventory submission of 2011). The ERT agrees that this is likely to be a sound assumption, since the emissions from biomass burning do not show a clear trend in GHG inventory data but have been fairly constant from 1990 to 2008.

D. Approaches, methods and models used

1. Description

13. Latvia is one of the 15 member States of the EU for which JRC developed projections in collaboration with two EU modelling groups. The models, G4M (Global Forestry Model)[3] from the International Institute for Applied Systems Analysis and EFISCEN (European Forest Information Scenario Model)[4] from the European Forest Institute, project annual estimates of emissions and removals for forest management until 2020 for the above- and below-ground biomass carbon pools. To estimate the FMRL, the emissions and removals estimated by the models for the time series 2000–2020 were calibrated/adjusted using historical data from the country for the period 2000–2008. In this

[3] G4M relies on spatial data. These data may or may not have been provided by countries. Other forest and forest management parameters (e.g. age-class structure, increment, historical harvest) were taken from the NFIs or other country statistics.

[4] EFISCEN uses as data input forest area data from the NFI scaled to match the forest area reported in the national inventory reports (either the forest land remaining forest land area deducting the deforested area or the forest management area if elected under the Kyoto Protocol) and provides projections on basic forest inventory data (stemwood volume, increment, age-class structure), as well as carbon in forest biomass and soil.

post-calibration, a constant offset is added to the results of the models for 2000–2020 based on the average historical data provided by each country for the period 2000–2008.

14. The future harvest demand under a 'business as usual' scenario was derived from macroeconomic drivers (e.g. gross domestic product, population) and policies enacted in Latvia up to 2009. This information is used as data input to the model GLOBIOM (Global Biomass Optimization Model), which projects demand for timber.

15. The underlying methodological approach from all these models could provide useful future trends for Latvia. However, the quality of timber demand projections will be dependent on how well macroeconomic variables can predict timber demand for the country. According to Latvia's submission, in the future a considerable area of forests in Latvia will reach the final felling age and therefore the amount of harvested wood could considerably increase in comparison with the current situation. The trend in timber demand will be mainly determined by economic reasons and regulations on forest use, which prohibit certain types of felling practices.

2. Transparency and consistency

16. Latvia's submission plus the replies received to questions posed during the review are transparent. The models and methods are described in the submission and the sources of the main parameters and characteristics as used in the models are provided.

17. The main forest parameters and characteristics used by the models and the GHG inventory are provided in table 14 of the submission. The models and the GHG inventory do not use consistently the same parameters (e.g. biomass expansion factors), which may be reflected as differences in the levels of biomass in model predictions and data reported in the GHG inventory. However, this should not have an impact on the trends of biomass pool development.

18. The model results deviate notably from the historical inventory data reported in GHG inventories for the period 2000–2008. The historical GHG inventory data on the biomass pool show an increasing sink trend, while G4M and EFISCEN predict a decreasing sink for 2000–2020. It is evident that there is a lack of consistency between the historical data provided by the country and the model results. The G4M results deviate significantly from the historical data and the EFISCEN results. During the review, Latvia analysed the situation and responded that this is probably due to the fact that GHG inventory data and EFISCEN used gross increment for which the mortality rates are not included. However, the G4M increment rates include mortality. This may have led to a significant overestimation of the values reported in GHG inventories and the EFISCEN results, which are based on the inventory data.

19. In the rerun of EFISCEN, an increment including the natural mortality rate of 20 per cent was used. A mortality rate of 20 per cent is based on *Global Forest Resources Assessment 2010* of the Food and Agriculture Organization of the United Nations.[5] After the rerun, the EFISCEN results were close to the G4M results, which included natural mortality. However, the new average model biomass results for 2000–2008 deviate even more from the values reported in the 2011 GHG inventory submission, since Latvia has not included natural mortality in GHG inventory calculations. According to Latvia, this will be corrected in the next inventory round (the 2012 GHG inventory submission). Since Latvia's FMRL is calculated using post-calibration (see para. 13 above), where a constant offset is added to the model results for 2000–2020, the amount of the offset is expected to become smaller and therefore the amount of the net sink in the FMRL would decrease. The ERT

[5] <http://www.fao.org/forestry/fra/fra2010/en/>.

notes that the suggested FMRL is a conservative estimation. Latvia might wish to make a technical correction to the FMRL later.

20. The difference in the trends between country data and modelled data for the years 2000–2008 are also explained partly by the fact that the models use five-year average values, while inventories use annual harvesting rates.

21. During the review, Latvia expressed a wish to update the rotation length for some tree species used in the model runs to correspond with the latest country-specific information available. In the rerun of EFISCEN, new values for the rotation length were used (see the annex).

E. Description of the construction of the reference level

1. Area under forest management

22. Area data used by the models and GHG inventory area data are provided in the submission. There was a small discrepancy between the latest GHG inventory area data and the area data used by the models. In the rerun of the models, EFISCEN area data were corrected to use the same area data that were used in the latest GHG inventory submission (2011) (see the annex). For G4M, area data were not corrected, owing to the relatively small difference (3.5 per cent) and the amount of work the correction would require.

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

23. The area under forest land remaining forest land and forest management land reported under the Convention and the Kyoto Protocol is the same.

3. Forest characteristics

24. Latvia's forests are all considered as managed forests. The forest law lays down provisions on the management and utilization of forests. The evolution of the age-class structure as modelled by EFISCEN and the rotation length of the main species regulated by national legislation are provided in the submission. During the review, the age-class structure from the NFI was provided. Latvia has noted in its submission that national legislation allows reducing the rotation length for the most important tree species in fertile site types where trees reach dimensions characteristic for the final felling age much sooner. This option is not yet used broadly in Latvia.

4. Historical and assumed harvesting rates

25. Historical harvesting rates are provided for 1990–2009. The harvest is predicted to increase by 10 per cent compared with the 2005 level. The harvest demand is modelled with PRIMES (for wood for bioenergy) and GLOBIOM (for timber).

26. During the review, Latvia expressed its concern about future harvesting rates increasing more than the models currently predict. The ERT suggests that Latvia provide more information to support this concern.

5. Harvested wood products

27. The estimated annual accumulation of –2.047 Mt CO_2 eq per year in HWP pools included in the FMRL is estimated using the approach proposed in document FCCC/KP/AWG/2010/18/Add.1, chapter II, annex 1, paragraph 27, with annual production

data, specific half-lives for product types, application of the first-order decay function using equation 12.1 from the *2006 IPCC Guidelines for National Greenhouse Gas Inventories* with default half-lives of two years for paper, 25 years for wood panels and 35 years for sawn wood and instantaneous oxidation assumed for wood in solid waste disposal sites. Historical data back to 1900 are taken into account. The estimates include exports. The ERT recommends a technical correction to the FMRL when final agreement on HWP estimation is reached.

6. Disturbances in the context of force majeure

28. Latvia did not consider force majeure in the construction of the FMRL; the post-calibration procedure applied automatically incorporates the average rate of past disturbances (for the period 2000–2008) into the projections. Natural disturbances (forest fires) in the past in Latvia have been negligible in magnitude compared with total GHG inventory emissions.

7. Factoring out

29. The use of a projected reference level that includes age-class structure is considered to factor out dynamic age-class effects. With the present state of scientific knowledge, the effects of elevated CO_2 concentrations and indirect nitrogen deposition occur in the reference level and in the estimates of the commitment period and therefore they can be assumed to factor out.

F. Policies included

1. Description of policies

30. The assumptions on policies and the economy underpinning the projection of the FMRL are the same as in the baseline scenario of PRIMES.[6] Policy assumptions include current trends on the population and economic development, including the recent economic downturn, and take into account bioenergy markets. Assumptions also include policies and measures implemented by April 2009 and legislative provisions adopted by April 2009. The baseline does not include the biomass demand resulting from the renewable targets agreed as part of the EU Climate and Energy Package. Information on how these EU-level policies (provided in annex II to the submission) are being implemented at the national level and what is the anticipated impact on the FMRL is not provided.

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

31. All energy policies implemented at the EU and domestic levels are taken by PRIMES as input values for the estimation of wood fuel demand driven by these policies. Output of PRIMES is further used as input for models used in as input in the model GLOBIOM, which is a static partial equilibrium model integrating the agriculture, bioenergy and forestry sectors, whose output is used as input in the G4M and EFISCEN models. Forest management policies are not directly taken by models as an input parameter, but the impact of forest management policies is integrated into the projection process through increment and harvesting rates and through changes in the age-class structure. Furthermore, Latvia confirms that no domestic policies other than those included by PRIMES were taken into account when estimating the FMRL.

[6] <http://ec.europa.eu/energy/observatory/trends_2030/doc/trends_to_2030_update_2009.pdf>.

III. Conclusions and recommendations

32. Latvia has calculated an FMRL on a transparent basis suitable for consideration by the Conference of the Parties. The ERT notes the following:

(a) During the review, Latvia expressed its concern about future harvesting rates increasing more than the models currently predict. Latvia, as suggested by the ERT, is seeking more information to support this concern;

(b) Regarding the information provided in paragraph 27 above, the ERT recommends a technical correction to the FMRL when final agreement on HWP estimation is reached;

(c) If force majeure is to be included as a modality and the country decides to apply it, a technical correction of the FMRL may be needed, especially if the effect of the 2005 windstorm mentioned in Latvia's FMRL submission exceeds any fixed threshold.

Annex

Documents and information used during the technical assessment

A. Reference documents

Submission of information on forest management reference levels by Latvia, 5 May 2011. Available at <http://unfccc.int/files/meetings/ad_hoc_working_groups/kp/application/pdf/awgkp_latvia_fmrl_2011.pdf>.

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

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

B. Additional information provided by the Party[1]

Table 1
Model results after the rerun

			av. 2000–2008	2000	2005	2010	2015	2020	av. 2013–2020
Step 1: models' results		EFISCEN (1)	–8 606	–8 564	–8 703	–8 326	–6 856	–5 513	–6 462
(only biomass)		G4M	–8 369	–10 702	–7 850	–4 617	–3 203	–2 129	–2 906
		Average of models	–8 488	–9 633	–8 276	–6 471	–5 029	–3 821	–4 684
Step 2: ex–post processing	Offset (2)	biomass	–10 847						
		non–biomass pools and GHG sources	1 276						
		total offset	–9 571						
	Calibrated average of models (3)		–18 059	–19 204	–17 847	–16 042	–14 600	–13 392	–14 255
Sensitivity analysis (4)	+10% harvest					–15 890	–13 133	–11 944	–12 775
	–10% harvest					–17 064	–15 640	–14 547	–15 311

(1) Efiscen does not estimate data for all countries for 2000 and 2005. When data were missing, backward extrapolation was applied as follow: sink in 2005 = sink in 2010 x ratio of harvest 2010/2005; this approach assumes that in the short term harvest is the main factor determining the sink. Estimates were extrapolated for the following countries: Bulgaria, Czech Republic, Estonia, Hungary, Italy, Latvia, Lithuania, Netherlands.

(2) The "offset" is distinguished between:

[1] Reproduced as received from the Party.

- Biomass: calculated as difference between [average of country's emissions and removals from biomass for the period 2000-2008] and [average of models' estimated emissions and removals from biomass for the period 2000-2008]

- Non-biomass pools and GHG sources: calculated as the sum of non-biomass pools and GHG sources as reported by the country for the period 2000-2008.

(3) The calibrated average of models, which is used for the setting of reference level, is obtained by adding the offset to the models' average.

(4) Preliminary simulation of the impact of +/-10% harvest as compared as BAU harvest on the emissions and removals from FM. Data are calibrated averages of models' results.

Table 2
New area data

	AREA of FM in 2008							
	from 2011 GHG inventories		used by models		difference % models vs. GHG inventories		**AREA of FM in 2020 used by models**	
	area (kha)	source	G4M (6)	EFISCEN	G4M	EFISCEN	G4M (7)	EFISCEN (8)
Latvia	3131	(1)	3246	3131	3.5	0.0	3240	3111

(1): area of FM from KP LULUCF reporting (2011). For years between 2000 and 2007, the annual area of deforestation under KP reporting was considered.

(2): area of FL-FL in 2008 from GHG inventory 2011. For years between 2000 and 2007, the annual area of deforestation under KP reporting was considered.

(3): area of FM from KP LULUCF reporting, excluding overseas territories. For years between 2000 and 2007, the annual area of deforestation under KP reporting was considered.

(4): Since the FM area reported under KP is not correct, this estimate has been obteined as (e.g. (area of FL in 1990) - (area AR in 1990 (estimated as area AR in 2008 / 19)) - (area of D in 2008)). This estimate is very similar to FL-FL in 2008. For years between 2000 and 2007, the annual area of deforestation under KP reporting was considered.

(5): Forest under Kyoto definition, from CRF table 5A (2011)

(6): Given the amount of work required for adjusting the area of G4M, no correction of area was done in cases where the difference with GHG inventories is very small (Bulgaria, Estonia, Latvia, Luxembourg, Netherlands). Given the ex-post calibration of models' results, the impact of the remaining area discrepancies on FMRL can be considered absolutely negligible.

(7): from 2008 onward FM area was estimated considering the deforestation estimated by G4M (as explained in the Annex of EU submission).

(8): from 2008 onward FM area was estimated assuming the continuation of the deforestation trends (average 1990-2008) reported under the KP.

Figure 1. Age-class structure evolution of the forest age-class structure (in years) as modelled by EFISCEN[centre figure titles]

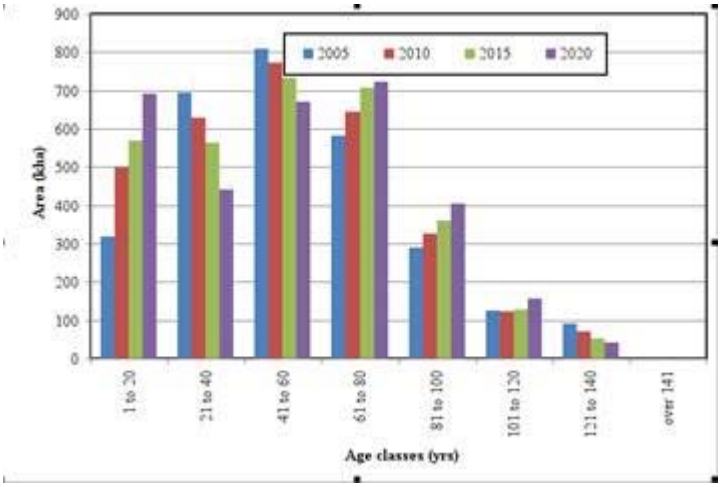

Figure 2. Age-class structure of forests in Latvia