Norwegian Ministry
of Climate and Environment

Annex
Explanatory Note to the revised National Forestry Accounting Plan, including forest reference level for Norway for the first commitment period 2021-2025

9 November 2020

1   Introduction

Reference is made to the Joint Committee Decision No. 269/2019 on the joint fulfilment of the 2030 targets, i.e. the decision to include inter alia the Effort Sharing Regulation (2018/842) and the LULUCF Regulation (2018/841) into Protocol 31 of the EEA Agreement. The Joint Committee Decision was adopted on 25 October 2019 and entered into force 12 March 2020.

According to Article 8(3) of the LULUCF Regulation, Iceland and Norway are required to submit their National Forestry Accounting Plans to the EFTA Surveillance Authority (ESA), including their proposed Forest Reference Levels for the period 2021 to 2025. Norway informally shared its draft National Forestry Accounting Plans to the Authority in March 2019, and formally submitted it on 12 March 2020.

The EFTA Surveillance Authority issued a decision on 26 June 2020 (Decision No: 068/20/COL) with an assessment and technical recommendations to the National Forest Accounting Plans of Iceland and Norway. This explanatory note describes the Norwegian response to the Authority's technical recommendations to the Norwegian National Forest Accounting Report (NFAP), as described in Annex II to the Decision. The note also includes the technical updates to the model that have been done in this revision.

1.1   Technical recommendations on Article 8(5) Principles

1) Demonstrate that the approach used in the determination of the Forest Reference Level (FRL) ensures the continuation of forest management practices as documented in the period 2000-2009.

Response:

- The forest management practices implemented in the simulation are based on National Forest Inventory (NFI) data from the reference period (2000-2009) for forest land remaining forest land, except for regeneration, where NFI data is not suitable. NFI is not suitable for regeneration due to the small size of the trees and survival is a sub sample of the main plot. Regeneration are therefore estimated based on data from surveys. Table 8 section 3.2.2 (page 22) in the NFAP presents thinning and harvest intensities in the reference period, as calculated based on the NFI data for forest land remaining forest land. We have added two new figures in section 4.1 (Figure 8 and 9 on Page 29 and 30), which show how both thinning and harvest intensities remain approximately constant per stratum and management class in the reference period (as presented in Table 8 on page 22) and the simulation.

1.2   Technical recommendations on Annex IV, Section A Criteria

e) Provide a ratio between solid (harvested wood products, "HWP") and energy use of forest biomass as documented in the period from 2000 to 2009 used for the estimation of the FRL and demonstrate it remains constant throughout the projection.

Response:

- In the reference period 2000-2009 the ratio of use of solid forest biomass (HWP)/harvest was on average 0.765 (see NFAP Table 2, page 7) while the energy use/harvest was 0.235, i.e. the energy use/HWP ratio = 0.308. The total volume for HWP cannot be summarised directly since sawnwood and wood-based panels are provided in m^3, while paper and paperboard are

provided as metric tonnes. Hence, to demonstrate that the energy use/HWP ratio is constant throughout the projection, the volumes of harvest and HWP is recalculated to Mg C. This information has been added to the NFAP, see the description of criterion e) in chapter 1.2.1 (Page 6) and text and table 10 in chapter 3.3.10 (Page 26).

h) Demonstrate that the estimated FRL is based on the area under forest management as indicated in **Annex IV, Part B (e) i**. Demonstrate the ability of the model used to construct the FRL to reproduce historical data from the national greenhouse gas ("GHG") inventory. Demonstrate the consistency between historical data from the national GHG inventory and modelled data for estimating the FRL for the reference period. Provide information on the level of agreement between historical and projected carbon stock changes (Figure 5 of the NFAP for Norway) and assess its potential impact on the FRL. Correct editorial mistakes in tables 1 and 15 of the NFAP.

Response:

- Table 4 in the NFAP (Page 19) shows the area under each stratum at the beginning of the simulation, which is kept constant throughout the simulation. This area is slightly larger (3 Kha) than the area reported for forest land remaining forest land in the National Inventory Report 2020 (NIR2020). The difference of 3 kha between the simulated area (12 092 kha) and the area under forest management in the NIR2020 corresponds to partial plots and unproductive and low-productive birch dominated plots. The difference between the area in the FRL simulation and NIR2020 accounts for 0.02% and are in low-productive areas. The impact on the total FRL is therefore minimal.
- We demonstrate in Tables 11-15 (Page 33 to 37) and Figures 12-14 (Page 38 to 39) that the model used to calculate the FRL can reproduce the data in the GHG inventory for the reference period. Both the figures and the table show that there is a good match between the historical data for the reference period and the projected data.
- We have also added text in chapter 4.2 to describe the method used to demonstrate the consistency between historical data and modelled data.
- Figure 5 (Now Figure 6 on page 27 in the NFAP) has been updated due to technical changes (see section 1.4 in this document) in the simulation, including the use of the latest national greenhouse gas inventory (NIR2020). The figure shows a high level of agreement between historical and projected carbon stock changes. The gap between historical and projected data is now narrowed, compared to the first submission, and well within the interannual variability in the historical data.
- The editorial mistakes in tables 1 and 15 (now table 16) have been corrected.

1.3   Technical recommendations on Annex IV, Section B Elements

c) Provide information on the development of area in forest management practices for both the reference period and the compliance period.

Response:

- We have added Figures 9 and 10 (Page 30 and 31) which show the development of the area in forest management practices for both the reference period and the simulated period, including the compliance period. We have also added a new figure (Figure 5 on page 27) that shows the development of area by stratum and maturity throughout the simulation.

d) Provide detailed information on how harvest rates are expected to develop under different policy scenarios.

Response:

- Additional text is added in chapter 2.3.2 in the NFAP to describe how new policies and measures can increase removals in the forestry sector and how emission reductions in other sectors may influence demand for forest biomass, and thereby the harvest level.

e) i Provide the area under forest management consistent with Table 4.A ("Forest land remaining forest land"), where applicable, from the latest national GHG inventory using the year preceding the starting point of the projection. Provide further information on the development of the area of afforestation, deforestation and protected area.

Response:

- The area of forest land remaining forest land in 2009, as reported in NIR 2020, was 12 092 ha. This area formed the basis for this simulation. After 2009 the area remained unchanged, since we don't account for areas converted to or from forest (afforestation and deforestation) during the commitment period. The assumption of constant area of managed forest land is in accordance with the technical guidance on developing and reporting FRLs. We have added Figures 9 and 10 (Page 30 and 31) to show the development of the different strata and forest management practices during the reference periods and the simulation, including the protected area.

e) ii Provide detailed data on the evolution of HWP for the historical and the projection period and on the evolution with time of the harvest rate. Provide clarification statement or information concerning how imports and exports are considered when calculating the carbon pool of HWP in the FRL.

Response:

- Historical data for harvest and HWP ratios can be found in Table 2 (Page 7) in the NFAP. Figure 8 in the NFAP (Page 29) shows the annual change in HWP categories until the year 2100. See Table 1 and Table 2 in the annex in the NFAP for detailed data on the evolution of harvest and activity data for the HWP categories, and annual net change in kt CO_2 in total and for the different HWP categories from year 2010 until 2100.
- As informed in e) on page 6 and in chapter 2.2.6 on page 11 in the NFAP, domestic consumption and export is included when calculating the carbon pool of the HWP in the FRL. We have added information to clarify that import is not included. This is in accordance with the current Norwegian NIR model using the so called "Production approach".

e) iii Provide further information on the development of age class distribution, growing stock volume and increment for both the reference period and the compliance period.

Response:

- Figures showing age class distribution (Figure 10 on page 31), growing stock volume (Figure 11, page 32), and volume increment (Figure 12 on page 38) under the reference period and compliance period have been added to the NFAP.

e) iv Provide the historical and future harvesting rates disaggregated between energy and non-energy uses.

Response:

- Total volume for the HWP activity data cannot be summarised directly since sawn wood and wood-based panels are provided in m³, while paper and paperboard are provided as metric tonnes. Hence, to provide the historical and future harvesting rates disaggregated between energy and non-energy uses the volumes of harvest and HWP was recalculated to Mg C. This information is added to the NFAP, see chapter 3.3.10 (Page 25). **Feil! Fant ikke referansekilden.** in the Annex in the NFAP demonstrates historical and future harvesting rates disaggregated between energy and non-energy uses.

1.4 Technical updates in the simulations of the revised FRL

- Some of the technical updates were implemented to address the technical recommendations from the EFTA Surveillance Authority, and some of the updates to ensure the correct implementation of the methodology, or to make the simulation more transparent and robust.
- We have updated both the database used as an initial point of the simulation, and the reference database for the reference period used to simulate growth, mortality, ingrowth, and other harvest to be consistent with NIR2020. New imputation models have been fitted to the updated reference database.
- The planting regeneration function has been updated so it correctly implements the regeneration densities of Table 5 (Page 20 in the NFAP). This has resulted in a smaller slope on the long-term trend of the development in carbon stock changes (see Figure 6 on page 27 in the NFAP).
- The stand age function has been updated and simplified. The current algorithm for predicting stand age adds 5 years to the previous stand age.
- Protected areas are now ensured to remain in a stratum where no harvest is allowed (other harvests, thinning or final felling).

2 References

Norwegian Environment Agency 2020. "Greenhouse Gas Emissions 1990-2018, National Inventory Report." M–1643/2020. Oslo, Norway: Norwegian Environment Agency.