



T-VER-P-TOOL-01-11
Calculation of Long-Term Average Greenhouse Gas benefit

Version 01

1. Introduction

This document is a tool for calculating long-term carbon removal by sink for forest projects where harvesting is taking place. Carbon losses from harvesting will be included in the quantity of greenhouse gas emissions of the project and must be used to calculate the long-term average greenhouse gas benefit. Therefore, the maximum amount of carbon credits that can be applied to the project must not exceed the long-term average greenhouse gas benefit of the project.

2. Characteristics of relevant activities and conditions

Project activities that aims to generate income from harvesting shall calculate the long-term average greenhouse gas benefit of a project depending on the difference between estimated greenhouse gas emission or removal of the project and the baseline. This comes from estimated selected carbon pool and N₂O, CH₄ and CO₂ emissions from project emissions and leakage emissions.

3. Calculation

The long-term average greenhouse gas benefit is calculated using the following procedure:

- 1) Define the period for calculation of long-term average greenhouse gas benefit as follows:
 - For even-aged stand project, the period for calculation of long-term average greenhouse gas benefit must cover at least one full harvest/cutting cycle and also the last harvest/cutting cycle.
 - For improved forest management project which has a selective cutting model, the period for calculation of long-term average greenhouse gas benefit must cover throughout the project crediting period.
- 2) Determine the annual total greenhouse gas benefit during the specified period. The annual total greenhouse gas benefit is the estimated project emission or removal minus by the estimated baseline emission or removal.
- 3) Sum up the total greenhouse gas benefit for each year over the specified period.
- 4) Calculate average greenhouse gas benefit of the project over the specified period.
- 5) Calculate long-term average greenhouse gas benefit using the following equation:

$$GHG_{benefit} = \frac{\sum_{t=0}^n PE_t - BE_t}{n}$$

Where:

$GHG_{benefit}$ = Long-Term average greenhouse gas benefit
 PE_t = Estimated project emission or removal in year t (equivalent to tons of carbon dioxide)

** Reducing greenhouse gas emissions from project implementation requires consideration of CO₂, N₂O, CH₄ emissions and leakage emissions.*

BE_t = Estimated baseline emission or removal in year t (equivalent to tons of carbon dioxide)

t = Year of monitoring

n = Total number of years as specified in Section 3 (1)

- 6) Projects can apply for certification of carbon credits at each verification to long-term average GHG emissions benefits. When the project requests certification of carbon credits for all greenhouse gas emission benefits, projects will not be able to claim carbon credits exceeding the specified value. The long-term average greenhouse gas benefit is calculated whenever it is verified. This means that long-term average greenhouse gas benefit may change over time depending on verification data. Therefore, greenhouse gas benefit shall be tracked continuously.

However, buffer credits are deducted only when carbon credits are issued. Buffer credits are only deducted based on the amount of carbon sequestration change. Therefore, the buffer credit is based on changes in long-term average carbon sequestration using the following equation:

$$LC_{AVE} = \frac{\sum_{t=0}^n C_{PROJ,t} - C_{BSL,t}}{n}$$

Where:

LC_{AVE} = Change in long-term average carbon stock

$C_{PROJ,t}$ = Sum of carbon stock in the project in year t (tons of carbon dioxide equivalent)

$C_{BSL,t}$ = Sum of carbon stock of in the baseline in year t (tons of carbon dioxide equivalent)

t = Year of monitoring

n = Total number of years as specified in Section 3 (1)

5. Reference

- 1) The American Carbon Registry. 2018. Improved Forest Management Methodology for quantifying GHG removals and emission reduction through increased forest carbon sequestration on Non-Federal U.S. forestlands. Version 1.3
- 2) VERRA. 2022. Verified Carbon Standard: A VERRA Standard.
- 3) VCS VM0003 Methodology for Improved Forest Management through Extension of Rotation Age (IFM ERA).
- 4) The Gold Standard for the Global Goals. 2021.



| |
|----------------------|
| Document information |
|----------------------|

| Version | Amendment | Entry into force | Description |
|---------|-----------|------------------|-------------|
| 01 | -- | 1 March 2023 | - |