CCQI
Carbon Credit
Quality Initiative

Key CCQI findings

Commercial afforestation projects have higher additionality risks than projects establishing natural forests as they do not solely rely on carbon credit revenues but also gain revenues from harvesting. In addition, some carbon crediting programs do not require checking for new legal requirements mandating the project activity at a later stage.

Quantification methodologies for this project type are likely to lead to a low to medium overestimation of removals.

The project type has material non-permanence risks as forests are in jeopardy of being destroyed or degraded. Scores hinge on how carbon crediting programs address these risks.

Afforestation is essential for achieving the transition to net zero emissions. Sustainable development benefits for the project type are highly dependent on the context of the individual project.

What is this project type about?

Establishment of a planted forest on non-forest land areas that are ecologically appropriate for forests, excluding naturally non-forested biomes, semi-natural grasslands, as well as the boreal region due to albedo effects. Since the forest may be used for commercial purposes such as timber harvesting, the tree species composition may differ from the natural forest type in the area. This project type neither includes the establishment of agroforestry and marine coastal ecosystems, such as mangroves, nor the management of the project area through community forestry. The project type removes greenhouse gases by increasing forest carbon stocks and possibly carbon stored in harvested wood products.

Carbon market background

All major carbon crediting programs (American Carbon Registry (ACR), Clean Development Mechanism (CDM), Climate Action Reserve (CAR), Gold Standard (GS), and Verified Carbon Standard (VCS)) offer registration for the project type, categorized as 'afforestation and reforestation'. In our classification, we distinguish between 'Commercial afforestation' and 'Establishment of natural forests', which covers only non-commercial activities. While forestry projects are commonly associated with 'planting trees', the share of credits issued for afforestation and reforestation is lower than for other forestry projects.[1]
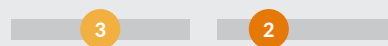
[1] **Source:** University of California, Berkley (2023) Voluntary Registry Offset database, v8

CCQI score summary

Additionality/Vulnerability

1 ———————— 3

Quantification Methodologies

3
ACR Afforestation and Reforestation of Degraded Lands
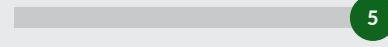Version 1.2

2
CAR U.S. Forest Protocol
Version 4.0

3
CDM AR-ACM0003
Version 2.0

2
GS Methodology for Afforestation/Reforesta-tion (A/R) GHGs Emission Reduction & Sequestration
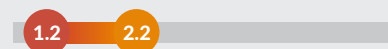Version 2.0

Non-permanence

1 ———————— 3

Compatibility with net zero

5

SDG Impacts

1.2 — 2.2

Double issuance due to indirect overlaps between projects

1 ———————————— 5

Why do I see a range of scores for some quality objectives?

In these cases, scores differ between carbon crediting programs, quantification methodologies, countries or other circumstances. The range represents the spectrum that applies for all possible combinations.

CCQI resources

- CCQI Methodology & Definitions
- FAQ on our assessments
- Directory of assessment sheets

www.carboncreditquality.org

FOUNDATION
Development
and Climate
Alliance

Main factors driving project type scores

Additionality/Vulnerability	**Due to the revenue stream from timber harvesting, there is a high risk that projects are financially attractive without carbon revenues**

Here we assess the likelihood that the mitigation activity typically would not have taken place in the absence of the added incentive created by the carbon credits (additionality).

In cases where the market for the type of carbon credit has collapsed (e.g., CDM for some project types), we assess whether the mitigation activity typically is at risk of discontinuing greenhouse gas abatement without ongoing revenues from carbon credits (vulnerability).

How do other project types score?

Graph shows the range of scores for all project types assessed by CCQI.

Commercial afforestation projects entail that project owners, which include timber companies, harvest timber commercially in the project area. This means that projects have revenue streams other than the monetization of carbon credits. Hence, we assess the additionality risk for this project type to be higher than for the project type *establishment of natural forests*. Moreover, data on global timber investments shows that the degree of their profitability depends on tree species and project location. While some country-species combinations fail to fetch returns that clear financial hurdle rates, most tend to yield returns on investment that are above respective benchmarks. Furthermore, our evaluation of investment analyses from registered projects shows that revenues from carbon credits only have a moderate impact on increasing the financial attractiveness of this project type.

To be additional, project activities must not take place on land where afforestation or reforestation is driven by legal requirements (for example, if rezoning of land areas mandates the land to become forests). Carbon crediting programs require project developers to demonstrate that no legal mandates exist that require implementing the proposed project. The stringency of respective provisions differs, however, resulting in a differentiation of scores by program (see scale above). While most programs require this demonstration at registration, not all ask for periodic reassessments at later stages of the project.
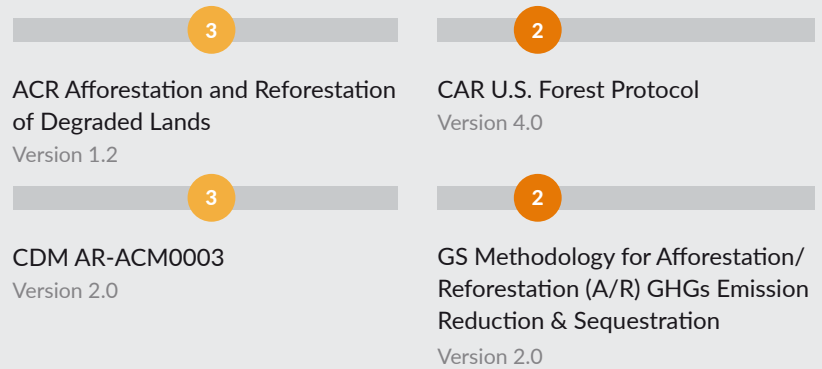
In the case of CDM projects, the market for the project type has collapsed. Our assessment on the likelihood that afforestation activities will continue without carbon credit revenues is inconclusive. Possible scenarios are that the project owners: 1) continue to manage the afforested land for timber harvest, 2) sell part of the land to generate income required for upholding maintenance activities on the remaining project area, 3) harvest the project area for timber earlier than scheduled to generate revenues required for upholding maintenance

activities on the remaining project area, 4) clear the forest and sell the land, and 5) clear the forest and use the land for another purpose. It is however not possible to rank the likelihood of these scenarios as the chosen course of action for individual projects depends on the context.
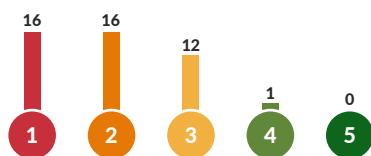
Quantification Methodologies

3

ACR Afforestation and Reforestation of Degraded Lands
Version 1.2

2

CAR U.S. Forest Protocol
Version 4.0

3

CDM AR-ACM0003
Version 2.0

2

GS Methodology for Afforestation/ Reforestation (A/R) GHGs Emission Reduction & Sequestration
Version 2.0

Applying methodologies is likely to lead to an overestimation of removals, but for most methodologies the degree of overestimation is likely to be low to medium

Carbon crediting programs adopt methodologies for calculating the emission impact of a project. The methodologies prescribe, inter alia, equations, data sources and monitoring approaches. Here we assess whether quantification methodologies mitigate overestimation risks by applying conservative approaches for estimating emission reductions.

How do methodologies for other project types score?

Graph shows the score distribution for quantification methodologies assessed by CCQI.

While we differentiate between *commercial afforestation* and *establishment of natural forest projects* to highlight differences in their overall objectives, all afforestation and reforestation projects use the same set of methodologies to quantify their removals. The most popular ones are *CDM AR-ACM0003*, *Climate Action Reserve U.S. Forest Protocol*, *ACR Afforestation and Reforestation of Degraded Lands* and *Gold Standard Methodology for Afforestation/Reforestation (A/R) GHGs Emission Reduction & Sequestration*. The overestimation risks are largely the same for *commercial afforestation* and *establishment of natural forest*. We assess that applying methodologies is likely to lead to an overestimation of removals, but for most methodologies the degree of overestimation is likely to be low to medium.

Overestimation risks result from multiple issues in the quantification methodologies. A key issue in all methodologies is the lack of provisions to update the baseline if new legal requirements are enacted or when activities become common practice in the project area. This is especially relevant for this project type, as crediting periods can reach up to 100 years. An innovative approach in the ACR methodology might remedy these concerns. It requires the establishment of

regeneration monitoring areas to verify the validity of baseline assumptions on an ongoing basis.

The GS methodology does not require modelling baseline carbon stocks and allows zero growth assumptions in baseline setting, which potentially could lead to significant overestimation. For the CAR methodology, uncertainty associated with leakage deduction estimates drives our score.

Other elements that can lead to overestimation of removals are the omission of relevant sources for project emissions (e.g., fertilizer use, road building and transportation emissions) and setting default values too high or too low (e.g., for carbon in litter or dead wood).

Approaches for accounting carbon stored in harvested wood products associated with additional overestimation risks

Unlike the *establishment of natural forest*, *commercial afforestation* typically involves periodic harvesting for timber on the project area. Such harvest effectively transfers a portion of the carbon from trees into wood products. In some cases, products may store the carbon for long periods of time. Two methodologies (*CAR U.S. Forest Protocol* and *ACR Afforestation and Reforestation of Degraded Lands*) allow accounting for such storage, with the result that not all onsite carbon lost to harvesting will count as an emission. We assess that both methodologies use approaches that likely lead to overestimation of carbon stored in wood products over the long term. Particular risks include the lack of accounting for market displacement of other wood production as well as guidance on how to measure extracted volumes. The degree of overestimation depends on the amount and frequency of harvesting, which may vary significantly between projects. Overall, we consider that the inclusion of carbon stored in harvested wood products makes the application of these methodologies prone to overestimation.

The CDM and GS methodologies (*CDM AR-ACM0003* and *Gold Standard Methodology for Afforestation/Reforestation (A/R)*) exclude carbon stored in wood products. This means that all onsite carbon stocks lost due to harvesting are treated as an immediate emission. This is conservative, as it may underestimate actual cumulative net removals. Hence, for these methodologies the same overestimation risks and scores apply as for *establishment of natural forest* projects.

Non-permanence

1 ——————————— **3** ————

The project type has material non-permanence risks, which some carbon crediting programs address better than others

Non-permanence means that emission reductions or removals achieved by a project are later reversed e.g., due to a natural disaster or project mismanagement.

We assess whether the project type has significant non-permanence risks.

For project types that do have significant non-permanence risks we assess the robustness of carbon crediting program provisions to address these risks.

How do other project types score?
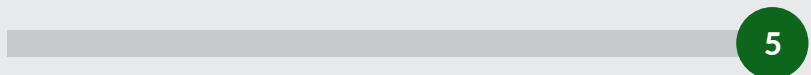
1 ——————————— **5**

Graph shows the range of scores for all project types assessed by CCQI.

Commercial afforestation has a material non-permanence risk: forests are inherently in jeopardy of being destroyed or degraded, and thus releasing the stored carbon back into the atmosphere, for example in cases of land conversion or wildfires.

Carbon crediting programs employ different approaches to reduce non-permanence risks and to account and compensate for reversals. The predominant approach to compensate for reversals is the cancellation of issued carbon credits, including using 'pooled buffer reserves' – a type of insurance mechanism. A range of scores applies for this criterion, because some carbon crediting programs have stricter rules than others. For example, the time for which reversals must be monitored and compensated varies among programs between 20 and 100 years.

Compatibility with net zero

———————————— **5**

Afforestation is essential for the transition towards net zero emissions

Here we assess whether the technology or practices applied by the project type facilitate the transition towards net zero emissions.

How do other project types score?

———— **3** ———— **5**

Graph shows the range of scores for all project types assessed by CCQI.

Commercial afforestation projects aim at removing CO_2 from the atmosphere, which is essential for achieving the net zero transition. The project type rates highest among those assessed by the CCQI.

SDG Impacts

Very few SDG benefits compared to the baseline scenario

Here we assess whether the project type contributes to the achievement of the Sustainable Development Goals (SDGs).

Note that projects implemented in Small Island Developing States (SIDS) and Least Developed Countries (LDCs) receive an upgrade to the score by one point due to the special circumstances of these countries.

How do other project types score?

1 **5**

Graph shows the range of scores for all project types assessed by CCQI.

Establishing a planted forest on non-forest land areas does not provide substantial SDG benefits. The forest creates conditions that enable progress on SDG 3 (Good Health and Well-being) as forests provide microclimatic regulation to protect people from heat stress and can reduce pollutants in air and soil. The project type directly contributes to the afforestation target under SDG 15 (Life on Land) and afforested areas have higher water retention and thus likely decrease flood and erosion risks. A commercial plantation can, however, negatively impact biodiversity (also SDG 15) by introducing fast-growing species – potentially in a monoculture – and by applying fertilizer. The likely use of fertilizer for the commercial plantation further negatively impacts SDG 6 (Clean Water and Sanitation) as fertilizer application deteriorates water quality and can lead to an increase in nutrient levels in freshwater ecosystems. Especially in arid or semi-arid regions, forest plantations can exacerbate water scarcity as fast-growing tree species might be water intensive.

The conflicting objectives between forests as a carbon sink and using wood products is a challenge inherent to this project type. Further, some positive or negative impacts are highly contextual (e.g., the creation of jobs) and depend on the scale of the plantation, making the overall SDG impacts of the project type uncertain.

Double issuance due to indirect overlaps between projects

1 — 5

Carbon crediting programs might accidentally issue credits for the same emission reductions to commercial afforestation projects and to projects reducing firewood consumption

Here we assess whether the project type has low risks to overlap with other project types in the carbon market.

For project types where we identified a high risk, we also assess if carbon crediting programs have robust provisions in place that avoid that the same credit is issued twice for the same emission reduction in the case that two projects.

How do other project types score?

Graph shows the range of scores for all project types assessed by CCQI.

The risk of double issuance due to indirect overlaps between projects is oftentimes overlooked for forestry projects. Double issuance can happen when a commercial afforestation project and a project reducing firewood consumption, i.e., a cook-stove or a household biodigester project, happen in the same area. The latter aims to reduce the consumption of non-re-newable biomass and thereby preserves carbon stocks in surrounding forest areas. If a commercial afforestation project is implemented in the same forest area, it might claim the same emission reductions.

None of the assessed carbon crediting programs applies systematic checks for identifying and avoiding over-laps between forestry projects and projects reducing firewood consumption.

This risk is however only relevant in countries where cooking with non-renewable biomass is likely to take place. Scores are therefore differentiated by country.

Starting points for further due diligence

This factsheet summarizes key risk factors for the quality of carbon credits from this project type, as identified in CCQI's detailed assessments. Individual projects might outperform any of our scores by making project-design choices that mitigate these risks. CCQI scores therefore do not apply to individual projects. They can however inform further due diligence when assessing the quality of individual projects. Questions to ask might include:

● Which species is planted? Do timber investments for the species in the respective country generally yield returns which clear financial benchmarks?

● Are there legal requirements in the region that would mandate afforestation activities? If so, the project might have high additionality risks.

● Does the carbon crediting program under which the project is registered require periodic reassessments whether new legal requirements mandate afforestation activities in the region?

● Does the project model baseline carbon stocks? Does the project reassess and update the baseline, including accounting for changes in legal requirements and an increased uptake of commercial afforestation in the region?

● Does the project account for carbon stored in harvested wood products? If yes, what is the amount and frequency of harvesting? For projects that account for carbon stored in harvested wood products there is a higher risk that quantification methodologies may overestimate total net removals, in particular if they involve heavy harvesting.

● Has the project identified reversal risks and established a management plan to mitigate identified risks? Until what year will reversals from the project be monitored and compensated for? This influences the likelihood that the removals are permanent.

● What biodiversity impact does the project have? What kind of and how much fertilizer is used? Is there water scarcity in the region that the project might exacerbate?

For assessments of specific projects, you may contact specialized rating agencies such as BeZero, Calyx Global or Sylvera.
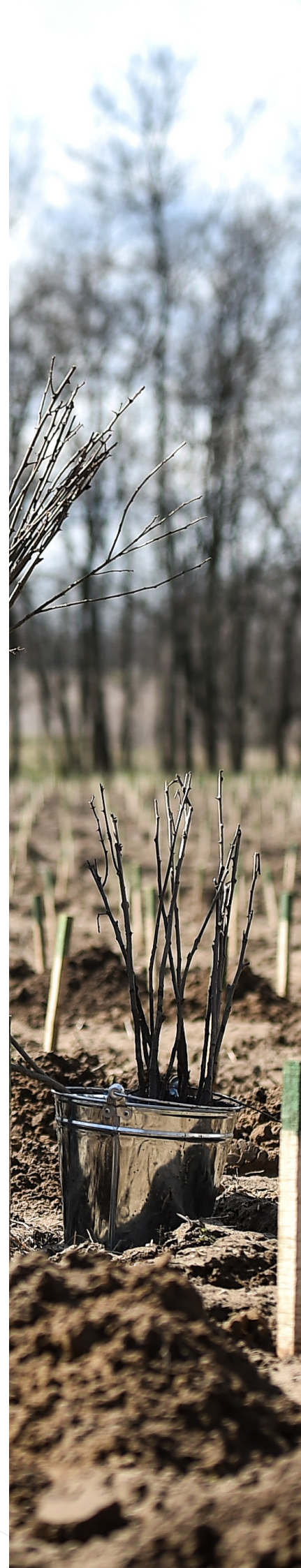
About CCQI

The Carbon Credit Quality Initiative (CCQI) was established to provide free, transparent information on the quality of different types of carbon credits, enabling users to understand what types of carbon credits are more likely to deliver actual emission reductions as well as social and environmental benefits.

CCQI was founded and is managed by Environmental Defense Fund (EDF), World Wildlife Fund (WWF-US) and Oeko-Institut, a leading European research and consultancy institution working for a sustainable future. Scores published by CCQI are derived from applying the CCQI assessment methodology. The assessment is led by Oeko-Institut, with support from experienced carbon market experts from Carbon Limits, Greenhouse Gas Management Institute (GHGMI), INFRAS and Stockholm Environment Institute (SEI). Draft results are reviewed by the full CCQI team before public release. All experts involved in CCQI have deep expertise in carbon markets and are not employed by project developers or carbon crediting programs.

This factsheet was commissioned by

www.allianz-entwicklung-klima.de

www.carboncreditquality.org

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How does CCQI assess quality?

CCQI assesses quality aspects of different types of carbon credits. The following main features define a type for our assessments:
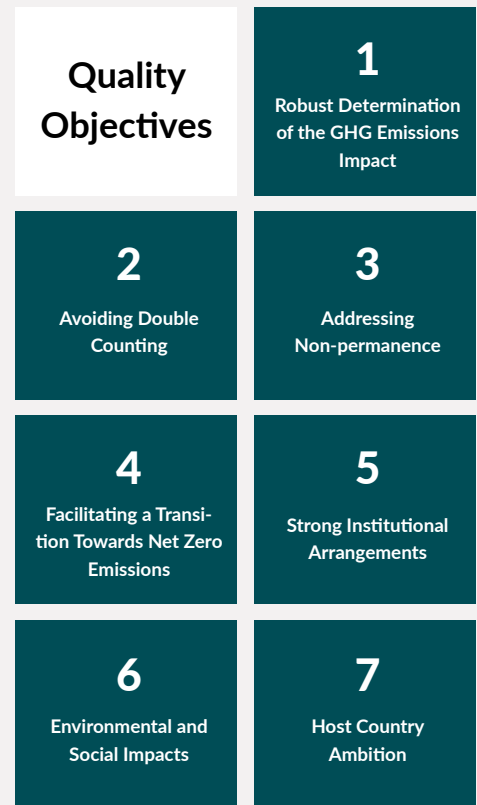
- The type of project (e.g., landfill gas utilization)
- The carbon crediting program (e.g., Verified Carbon Standard)
- The quantification methodology used to estimate emission reductions for the project activity
- The country in which the activity takes place

We assess each type against several criteria, sub-criteria and indicators that are clustered around seven quality objectives.

Each assessment follows our publicly available methodology.

In this factsheet we present results for selected quality objectives, criteria and sub-criteria whose scores depend primarily on characteristics of the type of project.

To see how this project type scores against all our criteria, explore our scoring tool.

Quality Objectives

Quality Objectives	**1** Robust Determination of the GHG Emissions Impact
2 Avoiding Double Counting	**3** Addressing Non-permanence
4 Facilitating a Transition Towards Net Zero Emissions	**5** Strong Institutional Arrangements
6 Environmental and Social Impacts	**7** Host Country Ambition

VISIT CCQI SCORING TOOL

www.carboncreditquality.org/scores.html

How to interpret CCQI Scores?

Our scores use an interval scale from 1-5, with 5 representing the highest score.

Scores are risk-based and indicative of the confidence or likelihood that the assessment subject meets the quality objective.

We do not provide an aggregated score for types of carbon credits to provide users with a nuanced picture on different quality aspects.

CCQI Score Scale

Level of confidence that the assessment subject meets the criterion or quality objective

Very High — 5
High — 4
Moderate — 3
Low — 2
Very Low — 1