Carbon Project Ratings – Renewable Energy Methodology

MSCI ESG Research

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Methodology overview

Objective

MSCI Carbon Project Ratings are composite ratings that independently assess the integrity and risks of carbon credit projects across multiple criteria, including their impacts on the climate, environment and society.

A project with a higher rating reflects a greater likelihood of having a positive emissions impact and a reduced risk of overestimating its emissions impact. It is also more likely that such project would have been implemented in a way that supports positive social and/or environmental outcomes and upholds legal and ethical standards. Consequently, a project with a higher rating would have a lower likelihood of incurring reputational risks.

Document description

This document describes the specific methodology used to assess renewable energy projects within the Carbon Project Ratings and Pipeline Carbon Project Ratings (but not Preliminary Carbon Project Ratings).

This project type-specific methodology is applied in addition to, and partially in replacement of, the methodology that is described in the overall MSCI Carbon Project Ratings methodology document, "MSCI Carbon Project Ratings and Assessments Methodology." Where an element of the overall methodology is replaced by this project type-specific methodology, it is detailed below. Every element of the overall MSCI Carbon Project Ratings methodology also applies to MSCI ESG Research's assessment of Carbon Project Ratings and Pipeline Carbon Project Ratings for renewable energy projects unless explicitly excluded in this document.

This methodology is subject to MSCI ESG Research's methodology governance and update process, as outlined in the overall methodology note. This ensures that updates and refinements to the methodology align with evolving best practices, stakeholder input, and data updates. For details on the governance process, methodology updates, and review timelines, please refer to Section 12 of the MSCI Carbon Project Ratings and Assessments Methodology document.

Section 2 introduces the core concept of carbon credit integrity and why its assessment is important to the development of the global carbon credit market. Section 3 introduces and defines renewable energy projects. Sections 4-8 provide details on the project type-specific methodology, including data sources and assumptions, used in MSCI ESG Research's Carbon Project Ratings and Pipeline Carbon Project Ratings assessments for renewable energy projects.

Introduction to carbon project integrity

What is carbon credit integrity?

Carbon credits have varying quality characteristics. These stem from fundamental differences in project types, but also from which methodologies have been used to define each project and create the credits (these methodologies are among the standards set by carbon crediting programs, and are hereafter called crediting program methodologies) and how rigorously they have been applied. Projects also differ in terms of their potential co-benefits and their legal and ethical characteristics.

This variation in quality was not intended. Standard setting and governance bodies attempted to create a system in which all carbon credits had an equivalent climate benefit (representing a tonne of carbon dioxide equivalent (CO_2e) removed or avoided) which could be used for voluntary or compliance purposes. This effort dates back to the Clean Development Mechanism (CDM) created under the 1997 Kyoto Protocol and has continued with the evolution of the carbon credit market.

A key challenge lies in the quantification of the climate benefit of a project — i.e., whether the carbon credits calculated for a project are genuinely equivalent to mitigating or removing one tonne of carbon dioxide from the atmosphere. This difficulty stems from the calculation method used to determine what would have happened in the absence of a project, i.e., in the "baseline" scenario (sometimes referred to as the "counterfactual" scenario).

Another difficulty is that projects differ hugely in age, size and technology. The science behind some crediting program methodologies has also evolved over time, as has the enforcement of standards and levels of governance.

Readers should note that, within the carbon markets, the words "quality" and "integrity" tend to be used somewhat interchangeably. Through the rest of this document, we use the word integrity when referring to carbon projects.

The importance of assessing carbon credit integrity

Corporate climate action is critical in the fight against climate change, and carbon credits represent one of the mechanism for corporates to mitigate their carbon footprint. However, concerns over carbon credit integrity may have held back, and may continue to hold back, the global carbon credit market from reaching its potential. These concerns center around the perception that many carbon credits are of low integrity and are not delivering the benefits they claim to.

In 2021, the Taskforce for Scaling the Voluntary Carbon Market (TS-VCM) found that credit integrity was at the "heart of buyers' hesitancy,"[1] with 45% of buyers identifying it as a key pain point. Buyer concerns around credit integrity and the related risk of being accused of greenwashing due to the use of low-integrity credits have only grown since then. For example, some 55% of respondents to an April 2023 survey run by the Science-Based Targets Initiative (SBTi) stated that the risk of a greenwashing accusation was stopping them from buying more credits.[2]

Concerns over carbon credit integrity have been central to the creation of two major initiatives: the Integrity Council on the Voluntary Carbon Market (IC-VCM) and the Carbon Credit Quality Initiative

[1] "Taskforce on Scaling Voluntary Carbon Markets: Summary of the Public Consultation Report," ICVCM, June 3, 2021.

[2] "Beyond Value Chain Mitigation (BVCM) Research," SBTI_press_release, September 1, 2023.

(CCQI). The IC-VCM aims to create minimum standards of integrity with a set of Core Carbon Principles (CCPs), and the CCQI has developed a scoring system for certain project types. Both initiatives primarily assess integrity at the project-type level (primarily based on a project's methodology used) or at the project-registry level (a project registry is an organization that registers mitigation activities and issues carbon credits for the emissions reductions or removals achieved by the mitigation activities). Neither initiative assesses integrity at the individual-project level.

MSCI ESG Research's assessment methodology draws on the IC-VCM's and CCQI's approach to assessing integrity, building on their principles to apply a more in-depth evaluation of integrity at the individual-project level.

The key components of carbon project integrity assessment

Market approaches to assessing carbon project integrity typically focus on three main issues:

A. **Emissions impact integrity:** How much CO_2e has been reduced/removed?

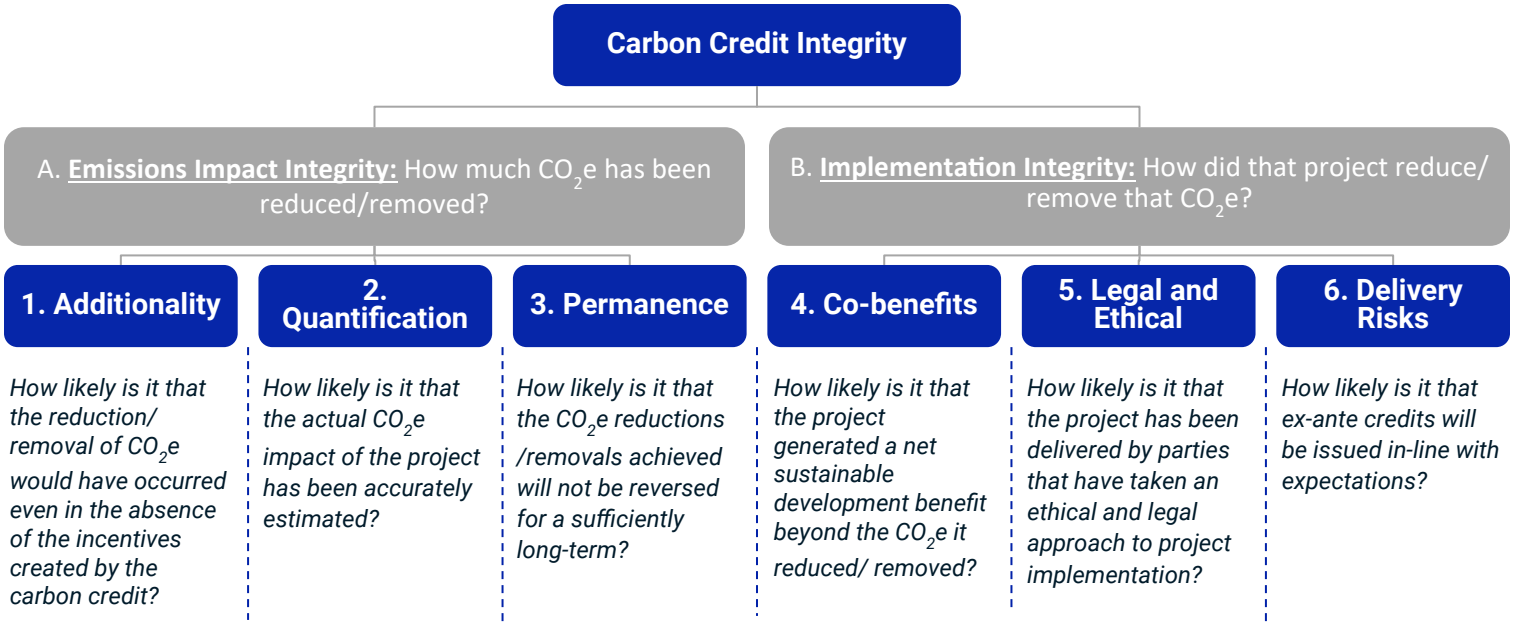
B. **Implementation integrity:** How did that project reduce/remove that CO_2e?

C. **Usage integrity:** How are the credits then reviewed and used?

Emissions impact integrity and implementation integrity can each be further broken down into three main areas of common concern. These are summarized in **Figure 1**, and outlined in detail below.

Emissions impact integrity, implementation integrity and usage integrity are each described in more detail in the overall MSCI Carbon Project Ratings methodology document, "MSCI Carbon Project Ratings and Assessments Methodology."

Figure 1: Key components of carbon project integrity



Introduction to renewable energy projects

What are renewable energy projects?

Transitioning energy production away from fossil fuels is at the heart of the climate challenge. Driving adoption and capacity of renewable energy therefore plays an essential role in the world's transition to net-zero. A report by the International Renewable Energy Agency (IRENA)[3] estimated that the amount of new renewable energy capacity added globally must more than triple by 2030 from 300 gigawatts (GW) in 2022 to an average of 1,000 GW annually to limit global warming to 1.5°C.

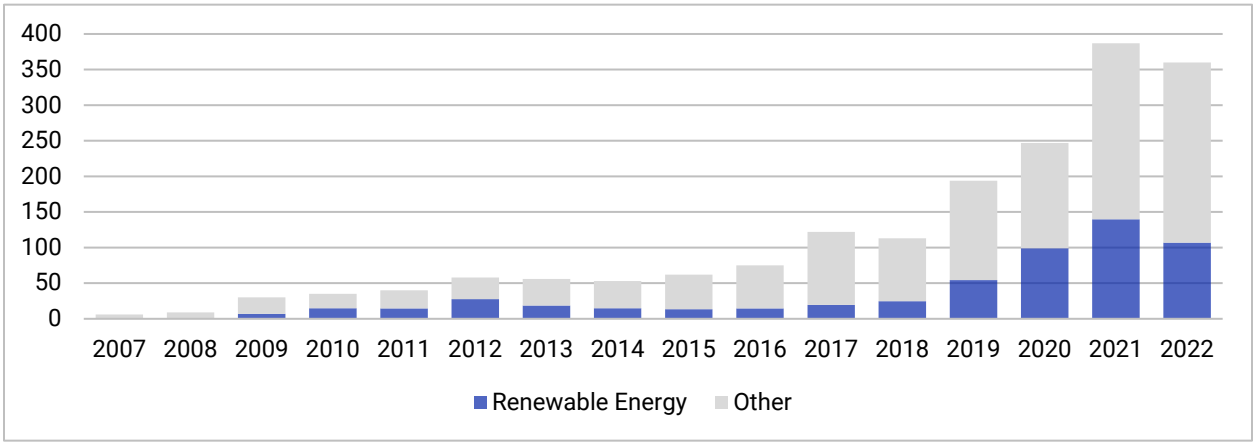
Renewable energy projects in the voluntary carbon market (VCM) aim to increase the supply of renewable energy beyond the increase that would have occurred in the absence of carbon credits. For example, projects can use revenue generated from the sale of carbon credits to construct and develop new renewable energy plants.

Renewable energy is defined as energy that comes from sources that are naturally replenished on a human timescale (e.g., at a higher rate than they are consumed).[4] The five most common subtypes of renewable energy are: solar, wind, hydropower (hydro), geothermal and organic biomass.

Market Overview

Since the early 2010s, renewable energy projects have represented a significant portion of the total voluntary carbon market. As illustrated in Figure 2, the number of issuances from renewable energy projects has grown significantly, with over 100 million renewable energy credits issued in 2022.

Figure 2: Annual issuances by project type (megatonnes CO2e)



Note: Issuances cover credits from American Carbon Registry, ART TREES, BioCarbon, Climate Action Reserve, CDM (Nationally Determined Contributions-eligible credits only), Climate Forward, EcoRegistry, Gold Standard, Puro Earth, and Verra registries. Date: As of December 2022. Source: MSCI Carbon Markets

[3] IRENA (2023). *Annual Renewable Power Must Triple until 2030*.

[4] U.S. Energy Information Administration (EIA). (2023). *Renewable energy explained*. https://www.eia.gov/energyexplained/renewable-sources/

Wind, solar and hydro projects form the majority of renewable energy projects and issuances in the voluntary carbon markets, as shown in Figure 3.

Figure 3: Comparison of renewable energy project sub-types

	Solar	Wind	Hydro	Geothermal	Organic Biomass
# Registered Projects[5]	343	982	503	16	98
# Pipeline Projects	158	186	133	17	77
2023 Global Market Penetration[6]	**5.5%** of worldwide electricity production	**7.8%** of worldwide electricity production	**14.3%** of worldwide electricity production	Other Renewables **2.6%** of worldwide electricity production	
Key Characteristics	• Low load factor • Non-continuous production • Low construction costs • Potential negative environmental impact during construction	• Non-continuous production • Low construction costs	• High load factor • High environmental impact during construction • Low up-front and ongoing costs	• High load factor and reliable production • High up-front construction costs	• High load factor • Low construction costs, but higher ongoing costs

Key integrity considerations

Over the past decade, technological advances and increasing scale have caused renewable energy generation costs to decline significantly.[7] Simultaneously, access to financing and government subsidies have also improved the financial attractiveness of these projects.

While this has driven large-scale investment into renewable energy globally, it has created very significant additionality concerns as renewable energy projects may have been financially attractive at the time they were setup even if they received no revenue from carbon credits. Due to these additionality concerns, since 2020, Verra and Gold Standard have stopped registering grid-connected renewable energy projects outside of United Nations-designated least developed countries (LDCs).

Assessing these additionality concerns is therefore a critical consideration when analyzing the integrity of renewable energy projects in the voluntary carbon market. Two dimensions are considered in particular:

[5] MSCI Carbon Markets. As of July 2024

[6] Our World in Data (2024). Share of electricity production by source globally. This data is not limited to production from carbon projects.

[7] International Renewable Energy Agency (IRENA). (2023). *Renewable Power Generation Costs in 2022*. IRENA. https://www.irena.org/publications/2023/Aug/Renewable-Power-Generation-Costs-in-2022

- **Financial Attractiveness:** To be additional, a project should demonstrate both that it would have been financially unattractive without carbon credits, and that the existence of carbon credits was decisive in making it financially feasible.
- **Common Practice:** The market penetration of the same type of technology in a country gives an indication of whether a particular type of project would have occurred even without carbon credits. A project located in a country where that project's technology is already common is considered quite likely to have happened even without carbon credits.

Approach to assessing the integrity of renewable energy projects

MSCI ESG Research's assessment of renewable energy projects builds on the overall MSCI Carbon Project Ratings methodology to provide more in-depth analysis of renewable energy projects. This project type-specific assessment includes sub-criteria that are additional to, and partially in replacement of, the sub-criteria of assessment used in the overall MSCI Carbon Project Ratings methodology, as detailed below. These project type-specific sub-criteria evaluate a deeper set of questions, which are focused on the most important, specific drivers of integrity for renewable energy projects.

These project type-specific assessments are conducted at the individual project level, including a review of each individual project's data and assumptions. In this way, these assessments represent a more granular, project-level review of renewable energy projects than what would be possible using the overall MSCI Carbon Project Ratings methodology alone.

In total, MSCI ESG Research assesses 17 sub-criteria (see **Figure 5**) under this project type-specific methodology that are either not assessed or are assessed differently in the overall MSCI Carbon Project Ratings methodology, as illustrated in Figure 4. These sub-criteria are focused on addressing the key drivers of integrity for renewable energy projects. Each of these sub-criteria align with and replace corresponding sub-criteria scores in the overall MSCI Carbon Project Ratings methodology.

In the following sections, we provide information only on those sub-criteria that are pertinent to the assessment of renewable energy projects and differ from the overall MSCI Carbon Project Ratings methodology. To review the sub-criteria that is shared between both the renewable energy assessment and the overall ratings assessment, please refer to the methodology titled: MSCI Carbon Project Ratings methodology.

Figure 4: MSCI ESG Research Overall Carbon Project integrity assessment

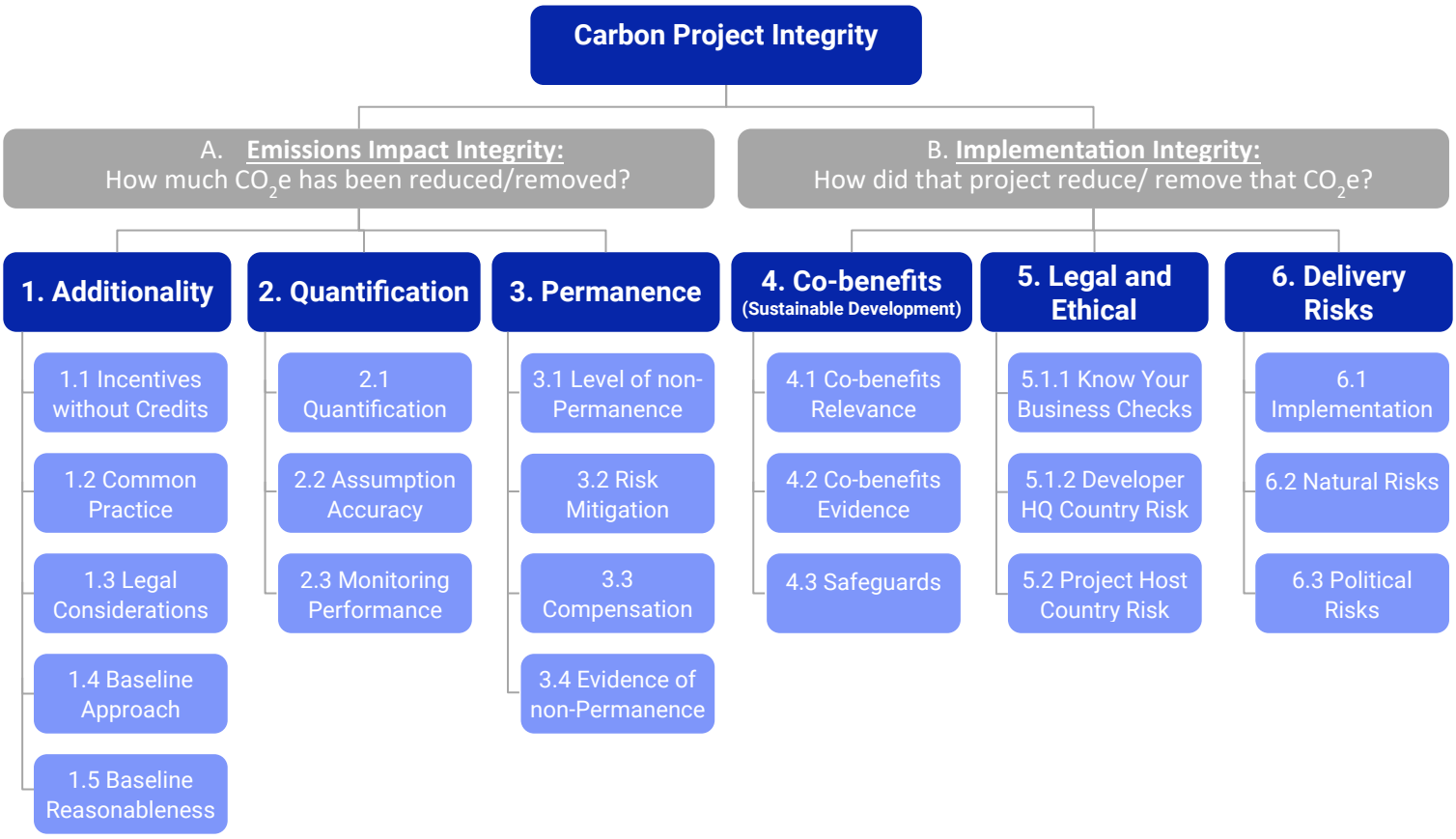
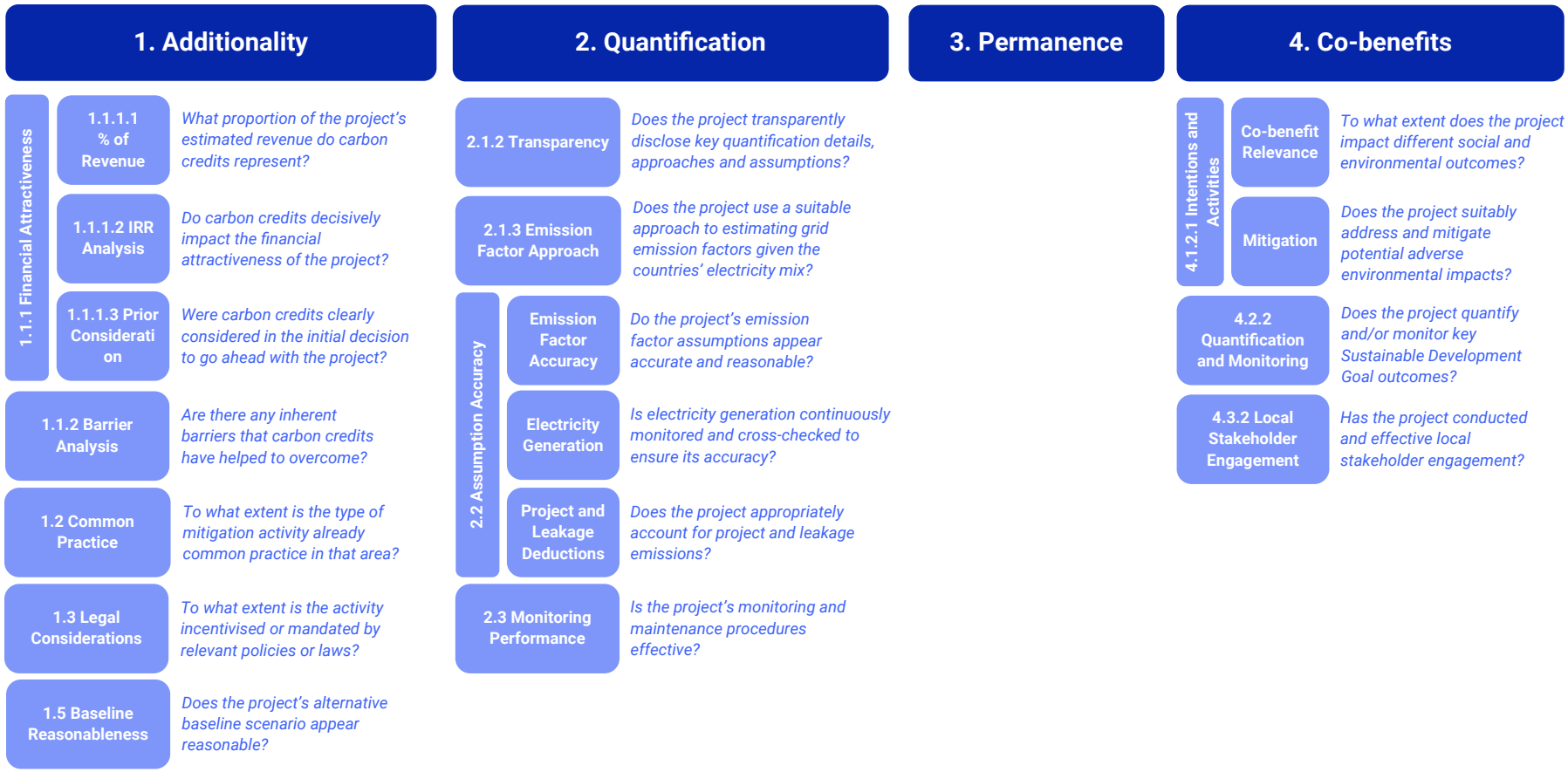


Figure 5: Sub-criteria and metrics that differ in the renewable energy assessment approach



Assessment of all other criteria and sub-criteria, for example, Criterion 5, Legal and Ethical Risks, and Sub-criterion 3.3, Compensation, within the renewable energy analysis use the same metrics and methodology as in the overall MSCI Carbon Project Ratings methodology framework. The granularity of the overarching framework for those sub-criteria, and the fact that their assessment is consistent across all project types (i.e., with no renewable energy-specific characteristics), means that no further enhancement is required.

For a detailed explanation of MSCI ESG Research's approach to data quality and update processes — including measures to ensure data accuracy, handle missing data, and update data in a frequent and recurring manner — please refer to our overall methodology note. This document outlines the steps MSCI ESG Research takes to verify data reliability and address any data gaps, ensuring consistency and accuracy across all project types.

Criterion 1 – Additionality

If a mitigation activity is not additional, then purchasing carbon credits has not led to any additional reduction or removal of emissions. Additionality is therefore a crucial component of the integrity of carbon credits. A non-additional carbon credit has no direct net positive environmental impact given that the emissions reductions/removals would have occurred anyway. However, it is worth noting that funding a non-additional credit may still indirectly help stimulate further investment in the same activity by raising its return.

Additionality is seen by many as the biggest integrity risk to renewable energy projects. Over the last 20 years, there has been significant investments in renewable energy technologies across the world even without carbon credits. Many renewable energy projects have been developed and achieved profitability without any support from the voluntary carbon markets, particularly in the many countries where favorable and sizeable government support/subsidies have been in place. For a renewable energy project to be additional, demonstrating that this same project would not have gone ahead without carbon credits is therefore crucial.

Figure 6 illustrates the sub-criteria through which MSCI ESG Research assesses the additionality of the emissions reductions achieved by renewable energy projects, and the overall MSCI Carbon Project Ratings methodology sub-criteria that they correspond to. The detailed sub-criteria are described in Figure 7.

Figure 6: Renewable energy additionality assessment approach

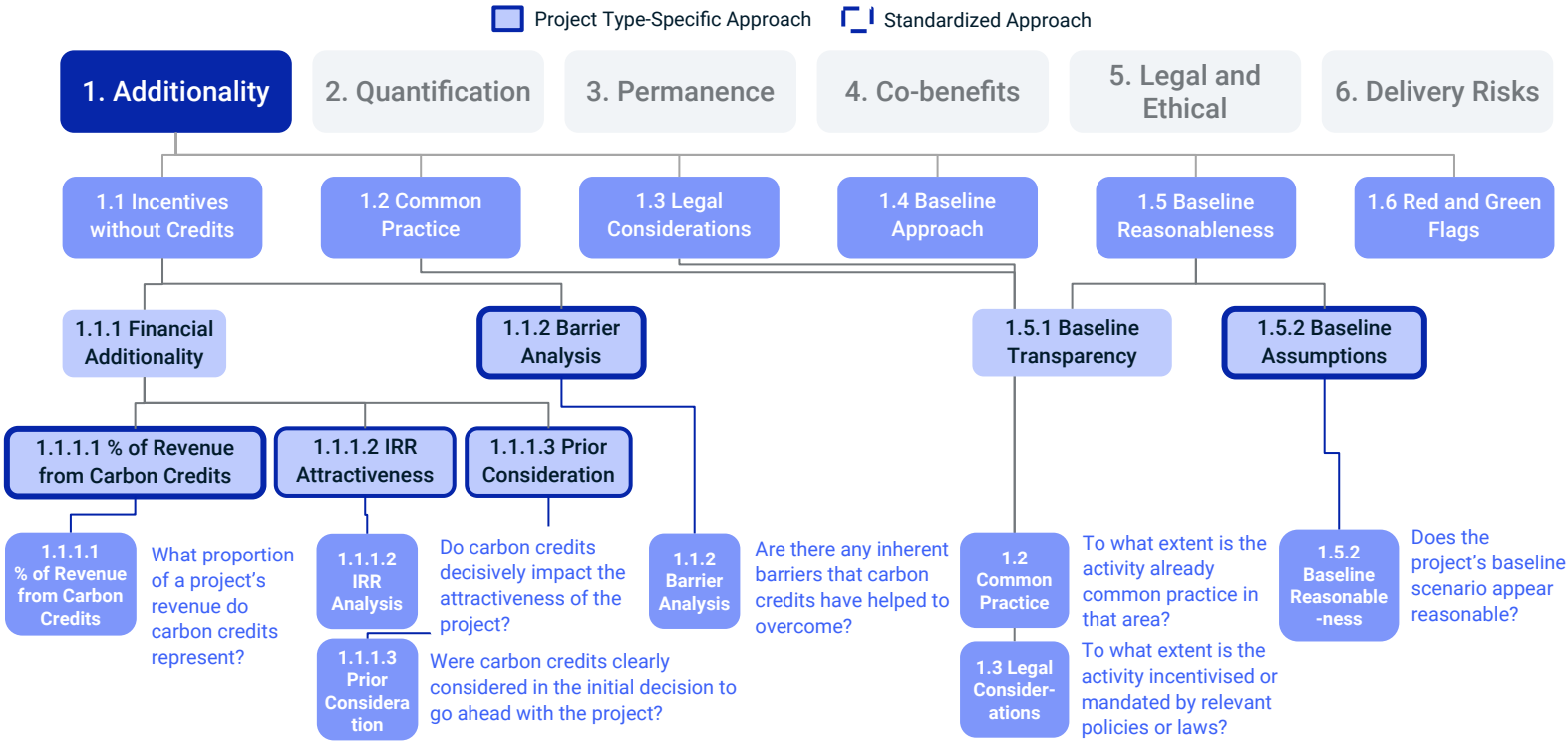


Figure 7: MSCI ESG Research Additionality integrity assessment framework

Sub-criteria		Metrics	Rationale	REDD+	Renewables	ARR	Cookstoves	Biochar	Landfill Gas	Safe Water	IFM	Waste Mgmt.	Blue Carbon
1.1 Incentives without Carbon Credits	1.1.1 Financial Additionality	1.1.1.1 % of Revenue from Carbon Credits	The higher the proportion of a project's revenue that comes from carbon credits, the greater the importance of credits to its financial attractiveness.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		1.1.1.2 IRR Attractiveness	Credits should play a decisive role in making a project financially attractive that would otherwise have not been.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		1.1.1.3 Prior Consideration	Carbon credits should have been considered at the time the decision to go ahead with a project was taken.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	1.1.2 Barrier Analysis	Strength of Barriers	Projects that face high barriers to implementation would be less likely to go ahead without the added incentives of carbon credits.	✗	✓	✗	✓	✓	✗	✓	✗	✓	✓
1.2 Common Practice		Market Penetration	If a practice is already common within a market, it indicates that these types of projects will go ahead without the introduction of carbon credits.	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
1.3 Legal Considerations		Legal Requirements	Projects that are legally required or incentivized are unlikely to be additional. However, if laws are not enforced, they may still be additional.	✗	✓	✗	✗	✗	✓	✗	✓	✓	✓
1.4 Baseline Approach		Baseline Approach	Each project methodology is scored on the extent to which it mitigates the key risks associated with establishing a baseline scenario.	✓	✗	✗	✗	✗	✗	✗	✓	✗	✓
1.5 Baseline Reasonableness		Baseline Transparency	Transparent detail on a project's assumptions is required to make an objective assessment of a project's performance and additionality.	✓	✗	✓	✗	✗	✗	✗	✓	✗	✓
		Baseline Assumptions	MSCI ESG Research assesses the key baseline scenario assumptions for each project type.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1.6 Red and Green Flags		News scanning	Review of academic papers, industry sources and the news for Red or Green Flags to project's additionality.	✓ *Standardized approach*									

✓ *Assessed* ✗ *Not Assessed*

1.1.1.1 % of Revenue from Carbon Credits

The proportion of expected and secure revenues that carbon credits represent can be an important indicator of the likelihood that a project went ahead because of carbon credits. Two key sub-criteria are used to evaluate this:

- **1.1.1.1.1 Secure Revenue Sources:** Whether the project already has preferential agreements to guarantee future electricity revenue.
- **1.1.1.1.2 % of Expected Revenue:** The proportion of expected revenue that carbon credits represent.

The overall score for 1.1.1.1 % of Revenue from Carbon Credits is determined by weighting Secure Revenue Sources as 33% and % of Expected Revenue as 67%.

1.1.1.1.1 Secure Revenue Sources

Secure revenue sources relate to whether the project already has any preferential agreements (such as Power Purchase Agreements) in place that guarantee future revenue.

Rationale	Projects that have secure revenue agreements in place have more visibility and security over their long-term revenue outside of carbon credits, and are therefore more likely to be able to access financing for the project even without carbon credits.

Key Sources

Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
☑					

Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates that the project has a very secure revenue agreement in place and 5 indicates that it has no secure revenue sources in place prior to the project start.
Scoring Approach	MSCI ESG Research assesses whether the project has any agreements in place to benefit from power purchase agreements, preferential tariffs, subsidies or grants. Projects are then scored based on the level of preferential security the agreements provide in the following way: - 1 = Preferential Tariff - 1.5 = Power Purchase Agreement - 2 = Subsidies and/or grants - 5 = No Revenue Sources

1.1.1.1.2 % of Expected Revenue

% of Expected Revenue relates to the proportion of a project's total revenue that is expected to come from carbon credits.

Rationale	The higher the proportion of revenue that carbon credits represent, the greater the importance of carbon credits to the overall financial outlook of the project. If carbon credits represent only a small proportion of revenue, then the project may have been financially viable even without carbon credits.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑				☑	☑
Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates that a very low proportion of revenue comes from carbon credits and 5 indicates a material proportion of revenue comes from carbon credits.					
Scoring Approach	For each project MSCI ESG Research estimates the expected revenue from both electricity generation revenue and carbon credit revenue. Electricity generation revenue is determined based on the amount of annual electricity generation multiplied by the tariff price in that country (at the time the project was initiated). Carbon credit revenue is estimated by multiplying the amount of estimated annual credits by the price per credit. Project estimates on the amount of annual electricity generation, estimated amount of annual credits and tariff prices are used where available. Where tariff prices are not available, third-party data is used on the relevant tariff price in that country. The price per carbon credit is based on MSCI Carbon Market's internal pricing data (rather than any price stated in the project's own documentation), which uses the average realized carbon credit price since the project started for the relevant subtype of renewable energy project based on historic pricing data. Using these four inputs, the revenue from each source is estimated and the proportion of total revenue expected to come from carbon credits at the time the project started is calculated. The % of revenue is then converted into a continuous 1-5 score for the sub-criteria based on the following scale: - 5 = 100% of a project's revenue comes from carbon credits - 4 = 90% of a project's revenue comes from carbon credits - 3 = 50% of a project's revenue comes from carbon credits - 2 = 10% of a project's revenue comes from carbon credits - 1 = Less than 1% of a project's revenue comes from carbon credits					

1.1.1.2 IRR Analysis

Internal Rate of Return (IRR) analysis refers to the likelihood that carbon credits played a decisive role in impacting the financial attractiveness of a project, as measured by a project's internal rate of return. Three key sub-criteria are used to evaluate this:

- **1.1.1.2.1 Transparency:** Whether financial details and assumptions are transparently disclosed.
- **1.1.1.2.2 Accuracy of Assumptions:** Whether project assumptions appear accurate and reasonable.
- **1.1.1.2.3 IRR Attractiveness:** Whether carbon credits decisively impacted a project's internal rate of return.

The overall score for 1.1.1.2 IRR Analysis is determined by weighting 1.1.1.2.1, 1.1.1.2.2 and 1.1.1.2.3 by 20%, 40% and 40% respectively.

1.1.1.2.1 Transparency

Transparency relates to whether the project is transparent in its approach to determining financial additionality.

Rationale	Projects that do not provide transparent information regarding their financial additionality prevent a detailed validation and assessment of a project's assumptions and approaches. It is not possible to be as confident in the project's additionality without transparency.
Key Sources	Project Documentation ☑ | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets
Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates that the project provided no supporting evidence for its financial additionality and 5 indicates that the project disclosed key assumptions behind its approach.
Scoring Approach	MSCI ESG Research reviews project documentation to understand the type of financial additionality approach used and extract information on seven key input assumptions: pre-credit IRR, post-credit IRR, IRR benchmark, assumed carbon credit price, energy tariff price, total investment cost ('CapEx') and annual operating and maintenance costs ('O&M). The type of financial additionality approach is then scored from 1 to 5 based on the rigour of the project's approach: - 1 = No financial additionality disclosed - 3 = Investment analysis only - 4 = IRR analysis only - 4.5 = IRR and sensitivity analysis - 5 = IRR and sensitivity analysis, supported by disclosure of the WACC (weighted average cost of capital) Transparency of key assumptions is then scored from 1 to 5 based on how many of the seven key assumptions the project disclosed. - 1 = No assumptions disclosed - 2 = Pre-credit IRR and IRR Benchmark only - 3 = Pre-credit IRR and IRR Benchmark with evidence - 4 = Pre-credit IRR, IRR Benchmark, CapEx and O&M costs - 5 = Pre-credit IRR, Post-credit IRR, IRR Benchmark, CapEx, O&M, energy tariff and assumed carbon credit price The total score for 1.1.1.2.1 Transparency was then determined through an equal weighting of both of these sub-components.

1.1.1.2.2 Accuracy of Assumptions

Accuracy of assumptions relates to whether the project's key financial assumptions appear appropriate and reasonable given the project's characteristics.

Rationale	Projects that use inappropriate or unreasonable assumptions within their financial additional analysis may over-state their financial additionality.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑				☑	
Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates that there is a very high risk that project's key assumptions are significantly overestimated compared to benchmark values, and 5 indicates that there is a very low risk that project's key assumptions are inaccurate.					
Scoring Approach	MSCI ESG Research extracts the values for key financial assumptions from project documentation and compares these assumptions against a combination of averages for similar projects (i.e., projects of the same subtype located in the same country that started at a similar time) and third-party country-specific benchmarks. The reasonableness of five key assumptions are assessed: IRR benchmark, total investment cost, annual operating and maintenance costs (O&M), energy tariff price and carbon credit price. The reasonableness of each of these five key assumptions is scored on a 1 to 5 scale based on a comparison of a project's assumption against benchmark values. For Organic Waste projects, the reasonableness of an additional assumption is also considered: biomass input costs. The overall score for 1.1.1.2.2 Accuracy of Assumptions is then determined by weighting the score of the five assumptions in the following way: 60% weighting for IRR benchmark; 10% for each of total investment cost, O&M, energy tariff price and carbon credit price. For Organic Waste projects, biomass input costs were weighted 15%, with the other assumptions weighted in the same proportions as above for the remaining 85%.					

1.1.1.2.3 IRR Attractiveness

IRR Attractiveness refers to the likelihood that carbon credits played a decisive role in impacting the financial attractiveness of a project, as measured by a project's IRR.

Rationale	Carbon credits should incentivize actors to implement mitigation activities that would not otherwise have been financially attractive without those revenues. Ideally carbon credits will make a mitigation activity that would otherwise have been financially unattractive into a financially viable one. Assessing a project's internal rate of return is therefore an important indicator of the likelihood of additionality.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets

	☑	☑
Scoring Definition	Each project is scored on a 1-5 scale where 1 indicates low likelihood that carbon credits decisively changed the IRR attractiveness of the project, and 5 indicates very high likelihood that carbon credits decisively changed the IRR attractiveness of the project.	
Scoring Approach	Data on the three components of IRR are extracted (see below) from project documentation and analyzed against an independent benchmark value. Each of these components is then categorized into high, medium, or low bands. High scores on these indicators suggest higher financial additionality. There are three components of IRR analysis: **Financial attractiveness without carbon credits (Pre-credit IRR as a % of the IRR Benchmark).** Projects that are not financially attractive without carbon credits are unlikely to have gone ahead without them. A project's internal rate of return without carbon credits is compared to a benchmark rate of return relevant to that project type and country. If the pre-credit IRR is significantly lower than the required benchmark, then this indicates that the project would not otherwise have taken place. **Financial attractiveness with carbon credits (Post-credit IRR as a % of the IRR Benchmark).** Carbon credits should make mitigation activities that would have been unattractive into financially viable projects. Comparing a project's post-credit IRR (IRR with carbon credit revenues) to the required benchmark indicates whether a project is financially viable with carbon credits. The likelihood that the activity is additional is high if the post-credit IRR clearly exceeds the benchmark. **Change in financial attractiveness due to carbon credits (Absolute Difference between Post-Credit and Pre-Credit IRR).** If the proceeds from carbon credits materially change the financial attractiveness of an activity, it is more likely that the carbon credits have played a decisive role. Alternatively, if carbon credits only mildly impact the financial attractiveness of a project, then higher uncertainty exists. A project's post-credit IRR is compared to the pre-credit IRR to determine the magnitude of the impact that carbon credits likely have on the project's profitability. The overall IRR score for each project is then determined based on the scores for each relevant component of IRR. A high score is needed on each indicator to achieve a high overall score. The overall score is estimated on a 1 to 5 scale: - 5 = 'High' score achieved on all three indicators - 4 = 'High' score on two indicators, and 'Medium' score on one indicator - 3 = 'Medium' score on at least two indicators, with no 'Low' scores - 2 = 'Low' score on at least one of the indicators - 1 = 'Low' score on at least two of the indicators	

1.1.1.3 Prior Consideration

Projects that can clearly demonstrate that carbon credits were considered prior to their decision to start, provide more evidence that credits acted as an important incentive in starting mitigation activities.

Two key sub-criteria are used to evaluate this:

- **1.1.1.3.1 Evidence of Consideration:** Whether any evidence exists that credits were considered prior to the project start.
- **1.1.1.3.2 Registration Gap:** Whether a significant gap exists between the start of the project's activities and the initial registration and issuance date.

The overall score for 1.1.3 Prior Consideration is determined by an equal weighting of these sub-criteria.

1.1.1.3.1 Evidence of Consideration

Evidence of consideration refers to whether the project has clear evidence that demonstrates that the use of carbon credits was considered prior to the project start date.

Rationale	Evidence that carbon credits were considered prior to the project start date indicates that credits played an important role in this decision process. On the other hand, if no evidence of prior consideration exists, there is a higher chance that the decision to go ahead with the project occurred without any expectation of carbon credits.

Key Sources

Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
☑					

Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates that no evidence has been made available, and 5 indicates that good quality evidence of prior consideration exists.
Scoring Approach	MSCI ESG Research identifies whether any evidence exists that carbon credits were considered prior to the project start date. This evidence may include a letter or notification of intent sent to a registry (such as CDM or Verra), the employment of a carbon credit consultant, or board meeting minutes indicating that carbon credits were analyzed. The date of any evidence of carbon credit consideration is then compared to the project start date to determine whether credits were considered prior to the start date or not.

1.1.1.3.2 Registration Gap

Registration gap evaluates the gap between the start date of the project activity and the project being registered with a crediting standard and able to issue credits.

Rationale	A longer time gap between the start of project activity and the project's registration suggests the project was able to maintain, at least to an extent, activities, and

	investment even in the absence of carbon credits. If credits were very important and decisive in the project going ahead, then we would typically expect a project to work hard to minimize this time taken in the registration process.
Key Sources	Project Documentation ☑ | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets ☑
Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates a very significant gap between the initial decision date and the registration date and 5 indicates a short or inconsequential gap.
Scoring Approach	MSCI ESG Research assesses the project's start date, the type of start date used and the project's registration date. Firstly, the type of start date used by the project is assessed. Project start dates are meant to represent the true start of the mitigation activity and initial decision date, but renewable energy methodologies do allow some flexibility in the type of start date used. Start dates that represent closer indicators of the initial decision date are scored higher, while start dates that clearly occurred after the initial decision date are scored lower. For example, the type of start date is scored on a 1 to 5 scale as follows: - 5 = Investment decision date - 4 = Construction contract signed or project equipment contract signed - 3 = Construction start date or first commissioning date - 1 = Plant fully operational or project registered with a registry Secondly, the project stated start date is compared to the registration date. This gap is then categorized into a 1 to 5 scale: - 5 = 2 years or fewer - 4 = 3-4 years - 3 = 5 to 6 years - 2 = 7 to 9 years - 1 = 10 years or higher Each of these scores for the type of start date and gap between project start date and registration date are then equally weighted to reach an overall score for Registration Gap.

1.1.2 Barrier Analysis

Renewable energy projects may face barriers to implementation that carbon credits can help to overcome. The existence of these barriers largely depends on the project's characteristics but can also be unique to an individual project. Two key sub-criteria are therefore used to evaluate this:

- **1.1.2.1 Evidenced Barriers:** Whether the project has clearly evidenced that barriers to implementation existed at the time the project started.
- **1.1.2.2 Inherent Barriers:** Whether the project's characteristics indicate that high inherent barriers to implementation existed at the time the project started.

The overall score for 1.1.2 is determined by weighting 1.1.2.1 Evidenced Barriers 25% and 1.1.2.2 Inherent Barriers 75%.

1.1.2.1 Evidenced Barriers

Evidenced barriers refer to whether the project has conducted an evidenced evaluation of the barriers to implementation that exist for the project.

Rationale	By providing well-evidenced analysis of specific barriers to implementation that exist, projects can provide more support that carbon credits helped to overcome these.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					

Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates that no evidenced barriers are identified by the project and 5 indicates that the project evidences multiple barriers to its implementation in the absence of carbon credits.
Scoring Approach	MSCI ESG Research reviews project documentation to identify whether the project conducted any barrier analysis and how many barriers were justified with high-quality supporting evidence. Projects are then scored based on the number of well-evidenced barriers that are provided: - 1 = No barriers evidenced - 3 = One evidenced barrier - 4 = Two evidenced barrier - 5 = Three or more evidenced barrier

1.1.2.2 Inherent Barriers

Inherent barriers relate to whether high barriers to implementing a project likely existed at the time it was started, given the project's core characteristics.

Rationale	Certain characteristics of projects may indicate higher inherent barriers to implementation that exist for that project. For example, smaller-scale or non-grid connectivity projects likely face higher inherent barriers to accessing financing.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑			☑		☑

Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates no or very limited inherent barriers to implementation existed and 5 indicates that very high inherent barriers to implementation existed.

MSCI ESG Research reviews project documentation to identify the project's scale, level of grid connectivity, country type and project developer type.

The inherent size of the barriers is then scored based on a combination of these project characteristics using insights from projects and relevant academic literature.

In this way, a micro-scale, off-grid project in an LDC will receive a score of 5, whereas a large-scale grid-connected project in a developed country conducted by an energy company would receive a score of 1.

Scoring Approach

Each project is scored as follows:

		Grid Connectivity	
Project Scale	**Country Type**	Yes	No
Large	LDC	2.0	4.0
Large	Low income	1.5	3.5
Large	Upper-middle	1.0	3.0
Small	LDC	2.5	4.5
Small	Low income	2.0	4.0
Small	Upper-middle	1.0	3.5
Micro	LDC	3.0	5.0
Micro	Low income	2.5	4.5
Micro	Upper-middle	1.5	3.0

1.2 Common Practice

If a technology or mitigation activity was already common practice within a region at the time a project started, then it suggests that the project's activities could have been implemented without carbon credits. Two main sub-criteria within common practice are considered:

- **1.2.1 Third Party Common Practice:** The extent to which that project technology was already common practice in that country's energy mix.
- **1.2.2 Evidenced Common Practice:** Whether the project provides clear evidence that the project was not common practice in that region.

The overall score for 1.2 Common Practice is calculated by weighting 1.2.1 Market Penetration by 75% and 1.2.2 Evidenced Common Practice by 25%.

1.2.1 Third Party Common Practice

Third Party Common Practice relates to how prevalent that technology or practice was within a region at the time of a project's inception.

Rationale

If a technology or practice is already common within a particular area, then this indicates that that type of project had high likelihood of happening even without the introduction of carbon credits; i.e., there is a high probability that the project's credits are not additional. Market penetration assessments evaluate the extent to which a type of mitigation activity or technology is already implemented in the relevant area. Low market penetration of a particular technology indicates higher additionality.

Key Sources

Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets

	☑
Scoring Definition	Projects are scored on a 5-point scale from 1 to 5, where 1 indicates that the mitigation activity technology is common in that region and 5 indicates that it has very low market penetration.
Scoring Approach	Third-party data on the share of energy production of each renewable energy subtype by country and by year is used to evaluate the market penetration of the specific renewable technology in a country in the year that the renewable energy project started. This data is sourced from Our World In Data[8]. Scores of 1 to 5 are then assigned to each project based on the market penetration bandings in the table below. The higher the market penetration of a specific technology, the lower the likelihood of additionality. These scoring thresholds differ for hydro and other renewable energy sources as shown in the table below.

		Example Market Penetration Rates	
		Hydropower	Other Renewable Energy
Points	1	30% or higher	6% or higher
	2	20% - 29.9%	4.5% - 5.9%
	3	10% - 19.9%	3.0% - 4.5%
	4	5% - 9.9%	1.0% - 2.9%
	5	Less than 5%	Less than 1%

1.2.2 Evidenced Common Practice

Evidenced common practice refers to whether the project provides an evidenced justification that its mitigation activity is not common practice within that region.

Rationale	By providing an effective justification and evaluation that the specific mitigation activity is not common practice in that specific region, projects can demonstrate that the nuances of their activities are unique and uncommon.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					

Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates no common practice analysis was conducted and 5 indicates a rigorous common practice was conducted that revealed no similar projects exist in that region.
Scoring Approach	MSCI ESG Research reviews project documentation to assess what type of common practice analysis is performed and, if any, how many similar projects were identified. The type of common practice analysis conducted is then scored on a scale of 1 to 5, where 1 indicates no common practice was performed, 2 indicates common practice

[8] Ember (2024); Energy Institute - Statistical Review of World Energy (2024)

analysis was a simple attestation or statement, 4 indicates that country analysis was conducted and 5 indicates that a country and industry analysis was performed.

The number of similar projects identified is scored from 1 to 5, where 1 indicates over 1,000 similar projects were identified and 5 indicates no similar projects were identified.

The overall score for this sub-criterion is then determined by weighting the type of common practice analysis 30% and the number of similar projects score 70%.

1.3 Legal Considerations

Legal Considerations refers to whether the presence and enforcement of local or national laws and regulations may have incentivized the project activity to go ahead even without carbon credits.

Rationale	Projects located in areas with high government support for certain types of renewable energy may have either financial or non-financial incentives to go ahead with the project even without carbon credits. Therefore, the presence of legal incentives or support will represent an additionality risk for projects, given there is greater risk that they would have gone ahead even without carbon credits, all else being equal. Furthermore, the presence of these legal incentives may also act as a more forward-looking version of common practice, given that implemented legal incentives may incentivize the construction of increased renewable energy capacity that is then operational a few years or more later.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑				☑	

Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates that significant legislation and targets existed to incentivize renewable energy at the time of the project start, and 5 indicates that no legislation or targets existed when the project started.
Scoring Approach	MSCI ESG Research reviews country-level policy to identify the presence of a variety of legal incentives and targets regarding renewable energy. This sub-criterion is evaluated based on three key components: (i) legal incentives; (ii) renewable energy targets; (iii) level of country-level enforcement. - **(i) Legal Incentives:** 10 types of incentives are identified and reviewed: 1) whether renewable energy is part of a country's NDC; 2) whether feed-in tariffs or premium payment is available for renewable power; 3) presence of net metering or billing; 4) presence of tradable Renewable Energy Credits; 5) use of tendering for renewable energy capacity; 6) tax reduction benefits for renewable energy projects; 7) investment or production tax credits; 8) payments for energy production; 9) availability of public investments, loans and grants; 10) capital subsidies, grants and rebates for renewable energy. Each of these 10 incentives are assessed, with a score based on the range and significance of each of these.

- **(ii) Targets:** Both the ambition of the country's renewable energy target and the current distance away from this target are assessed.
- **(iii) Enforcement:** Four country-level indicators are used as a proxy for the strength of the enforcement of the legal incentives and targets: 1) corruption; 2) rule of law; 3) political instability; 4) climate policy uncertainty.

These policies are evaluated each year from 2005 to 2023 for each country to ensure a score can be assigned to a project based on its project start year.

Legal Incentives and Targets are each scored on a 1 to 5 scale, with an overall score based on a 70% weighting of Legal Incentives and 30% weighting of Targets. The score for Enforcement is calculated on a 0 to 1 scale, and is then used as a multiplier to the Legal Incentives and Targets score.

Each project is then scored on a 1 to 5 score based on the relevant country-level score in the year in which the project started.

1.5 Baseline Reasonableness

The reasonableness of baseline describes the extent to which a project's consideration of alternative baseline scenarios[9] appear appropriate.

Rationale	Projects that have clearly considered an appropriate range of baseline scenarios will ensure a lower probability of overestimating the baseline emissions.

Key Sources

Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
☑					

Scoring Definition	Each project is scored on a 3-5 scale, where 3 indicates that no information on alternative baselines considered is provided and 5 indicates that multiple alternative baseline scenarios were considered such as grid connectivity and the construction of alternative plants without carbon credits were evaluated.
Scoring Approach	MSCI ESG Research reviews project documentation to assess what alternative baseline scenarios were considered by projects. Projects are then scored on a scale of 3 to 5 based on the following: - 3 = No information provided on the alternative baseline scenario considered - 4.5 = Grid electricity is the only alternative baseline scenario considered - 5 = Multiple alternative baseline scenarios were considered beyond grid electricity, such as the construction of a fossil fuel plant or another renewable energy plant without carbon credits Given that no information provided does not represent a significant risk to the additionality of the project, a minimum score of 3 is set for this sub-criterion.

[9] Baseline scenario refers to the most likely scenario that would have occurred if the carbon project had not gone ahead.

Criterion 2 – Quantification

Quantification refers to the likelihood that the emissions reduction or removals claimed by the project are accurate, assuming the baseline scenario is correct. It includes both emissions reductions or removals within a project area, and those that have occurred outside the project area, known as leakage.

Along with the strength of baseline assessment, Quantification is a key determinant of the risks of over-crediting: whether the number of credits issued by the project is equal to the CO_2e actually reduced/removed. In theory, all carbon credits are worth the equivalent of 1 tonne of CO_2e reduced or removed. A low carbon quantification score means that the emissions reductions or removals delivered by the credit is likely to be less than 1 tonne. In this case, buyers should be cautious in using one credit to offset 1 tonne of their own CO_2e emissions, as they are unlikely to be equivalent.

The quantification of a renewable energy project's emissions reduction is dependent on the renewable type and the baseline electricity generation that is displaced. Renewable energy sources like wind and solar do not generate any project emissions whereas hydroelectric, geothermal and organic waste projects will have project and leakage emissions. To evaluate the accuracy and conservativeness of a project's carbon quantification, MSCI ESG Research's approach primarily focuses on estimating the emissions impact from the generated electricity that was displaced by the project. This comes from two main assumptions: first, the amount of electricity generated; second, the emissions factor associated with each unit of displaced electricity. The approach and accuracy of these assumptions for each project has been assessed by mainly considering the following four questions:

1. **Project transparency:** Is a project transparently disclosing the key quantification details, approaches and assumptions needed to quantify the emissions reduction?
2. **Reliability of approach:** Does a project use accurate and representative methods or approaches to measure key assumptions and inputs?
3. **Accuracy of assumptions:** Do a project's key assumptions appear accurate when compared to third-party data and projects with similar characteristics?
4. **Monitoring performance:** Does a project have effective monitoring and maintenance procedures in place to ensure that the achieved emissions reduction matches what was estimated?

Figure 8 illustrates the sub-criteria through which MSCI ESG Research assesses the quantification of the emissions reductions achieved by renewable energy projects, and the overall MSCI Carbon Project Ratings methodology sub-criteria that they correspond to. The detailed sub-criteria are described in Figure 9.

Figure 8: Renewable energy quantification assessment approach

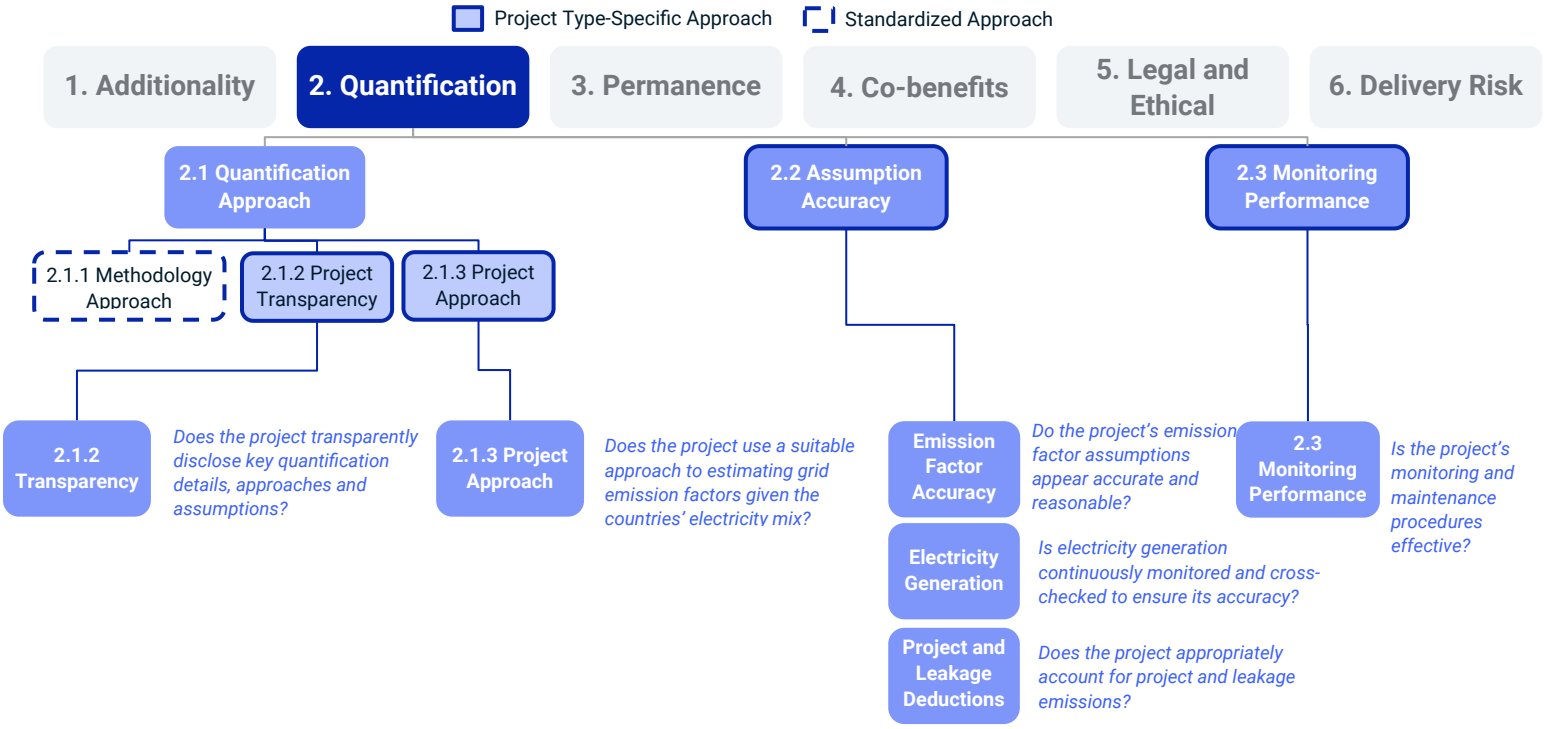


Figure 9: MSCI ESG Research Quantification integrity assessment framework

Sub-criteria	Metrics	Rationale	REDD+	Renewables	ARR	Cookstoves	Biochar	Landfill Gas	Safe Water	IFM	Waste Mgmt.	Blue Carbon
2.1 Quantification Approach	2.1.1 Methodology Approach	Through setting the assumptions that projects must make, and the sources that can be used to estimate them, crediting program methodologies can play an important role in reducing or even increasing the level of quantification risk.	✓ *Standardized approach*									
	2.1.2 Project Transparency	Transparent documentation and detail on a project's assumptions are required to make an objective assessment of its approach to carbon quantification.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	2.1.3 Project Approach	Two projects with the same methodology may carry different quantification risks depending on the approach that each uses.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.2 Assumption Accuracy	Quantification Accuracy	Each project type has a set of key assumptions that determine the accuracy of their carbon quantification. Evaluating the reliability and accuracy of these key assumptions shows whether a project has over- or understated their emissions reductions or removals.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.3 Monitoring Performance	2.3.1 Monitoring Plan	Projects that have effective processes in place to regularly monitor and measure key quantification inputs and assumptions are more likely to accurately estimate and update their emissions impact.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	2.3.2 VVB Analysis	Projects that use a diverse mix of well-regarded verification and validation bodies (VVBs) will improve the likelihood that key quantification details are accurately checked and validated.	✓ *Standardized approach*									
2.4 Red and Green Flags	News scanning	Review of academic papers, industry sources and the news for Red or Green Flags relating to project's quantification.	✓ *Standardized approach*									

2.1.2 Project Transparency

Transparency relates to whether the project transparently discloses key quantification assumptions.

Rationale	It is more difficult to gain confidence in the accuracy of a project's quantification if it is not transparent with either its quantification approach or assumptions. Projects should transparently disclose these key details of information.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					
Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates that the project provides no key quantification details and 5 indicates that the project provides information on all key quantification inputs.					
Scoring Approach	Through a detailed review of project documentation, MSCI ESG Research collects information on a number of key parameters regarding a project's quantification approach and assumptions. Three parameters are assessed: the emissions factor calculations, load factor estimates, and electricity generation calculations. Projects that provided transparent information on all three topics receive the maximum score of 5. Projects that provide information on two of the topics receive a score of 4. Projects that provide information on one of the topics receive a score of 3. Projects that do not provide information on any of the key parameters receive a score of 1.					

2.1.3 Project Approach

Projects that employ more accurate methods to estimate their emissions impact minimize their risk of inaccuracy. Methodologies usually allow for multiple approaches to be used to make these estimations, though some methods are more reliable than others.

In particular, the assessment focuses on the approach that the project takes to estimating their emissions factor and electricity generation. As part of this, four main factors are considered:

- **2.1.3.1 Operating Margin Method:** Whether the project uses an appropriate method to calculate the operating margin emissions factor given its electricity mix.
- **2.1.3.2 Build Margin Method:** Whether the project estimates its build margin emissions factor using a representative sample size.
- **2.1.3.3 Combined Margin Method:** Whether the project uses a best-practice approach to estimating its combined margin.
- **2.1.3.4 Electricity Generation Approach:** Whether the project uses scientifically best-practice techniques for estimating and validating the ongoing electricity generation of the project.

The Combined Margin is used to estimate the total impact of a renewable energy project on the grid compared to a baseline. It is the product of two emission factors pertaining to the electricity system: the "operating margin" and the "build margin". The operating margin is the emission factor that refers to the group of existing power plants whose current electricity generation would be affected by the proposed project. The build margin is the emission factor that refers to the group of prospective power plants whose construction and future operation would be affected by the proposed project activity.

Each sub-criterion is assessed independently and scored on a 3 to 5 scale. The overall score for 2.1.3 Project Approach is then calculated by giving a weighting of 30% for 2.1.3.1 Operating margin method, 15% for 2.1.3.2 Build margin sample, 30% for 2.1.3.3 Combined margin and 25% for 2.1.3.4 Electricity Generation.

2.1.3.1 Operating Margin Method

Whether the project uses an appropriate method to calculate the operating margin emissions factor, given its electricity mix.

Rationale	There are several methods available to projects to estimate their operating margin (OM) emissions factor. Projects that use more appropriate methods given the electricity mix within their country will improve the accuracy and reliability of this assumption.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑			☑	☑	

Scoring Definition	Each project is scored on a 3 to 5 scale, where 3 indicates that the simple OM method was used in which low-cost/must-run sources were excluded, 4 indicates that the simple adjusted OM method was used, 4.5 indicates that the average OM method was used and 5 indicates that the dispatch data method was used, in which data is based on measured grid data and no default values are allowed.
Scoring Approach	MSCI ESG Research reviews project documentation to identify which approach method it used to estimate its operating margin emissions factor. This is then with insights from academic studies on the scientific representativeness of these different methods. Methods are then classified based on their scientific best-practice.[10] In order of best-practice, the different operating margin methods can be ranked as followed from most to least best-practice: dispatch data OM, average OM, simple adjusted OM and simple OM. As simple OM still requires the usage of some national data, projects that used this method received a score of 3, meaning the sub-criterion was based on a 3 to 5 scale.

2.1.3.2 Build Margin Method

Build Margin Method relates to whether the project estimates its build margin emissions factor using a representative sample size.

Rationale	Projects that estimate the relevant build margin emissions factor using a more representative sample of projects increase the likelihood that their assumption will be an accurate measure of the future grid emissions factor.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					

[10] Hayashi, D., Seebauer, M., & Mori, H. (2014). *Suitability of default grid emission factors for Clean Development Mechanism projects and their impact on project viability*. Climate Policy, 14(4), 433–451. https://doi.org/10.1080/14693062.2014.861758

Scoring Definition	Each project is scored on a 3 to 5 scale, where 3 indicates projects do not transparently disclose any power units that they sampled and 5 indicates a sample size of over 50 units.
Scoring Approach	MSCI ESG Research conducts a detailed review of project documentation to understand how each project estimated its build margin emissions factor, and how many sample power plants are used in this calculation. Projects are then categorized on a scale of 3 to 5 based on the size of the sample size used given the country size.

2.1.3.3 Combined Margin

Combined Margin Method refers to whether the project uses a best-practice approach to estimating its combined margin.

Rationale	Projects that estimate their combined margin through incorporating both the operating and build margin calculation ensure that their estimates account for evolving energy mix within the grid.

Key Sources

Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
☑					

Scoring Definition	Each project is scored on a 3 to 5 scale, where 3 indicates that a default value is used without any calculation of the operating and build margin and 5 indicates that the combined margin is also estimated ex-post based on measured and reliable grid data.
Scoring Approach	MSCI ESG Research conducts a detailed review of project documentation to understand each project's approach to calculating its combined margin emissions factor. Projects are then categorized on a scale of 3 to 5 based on the effectiveness of their approach. The most effective approach was where projects used an ex-post approach[11], resulting in a score of 5. The least effective approach was where projects used a default value without building up a view of the operating and build margin, resulting in a score of 3. Projects that used an ex-ante approach by weighting their operating and build margin received a 4.5. The overall score is then reached by adding each of these factors to reach a 3 to 5 score.

2.1.3.4 Electricity Generation Approach

Electricity Generation Approach relates to whether a project estimates its electricity generation from the power plant on an ongoing basis using measured and monitored grid data.

[11] An ex-post approach refers to when the assumption after the event has occurred, and is therefore set based on historic data.

Rationale	Projects that use metered grid data to estimate and monitor the electricity generated by the power plant increase the certainty and accuracy of this estimate.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					
Scoring Definition	Each project is scored on a 4 to 5 scale, where 4 indicates that no information on the electricity generation approach is provided, and 5 indicates that metered grid data is used.					
Scoring Approach	MSCI ESG Research conducts a detailed review of project documentation to understand how each project estimates and monitors its electricity generation. Projects are then categorized on a scale of 4 to 5 based on their approach. Given that all power plant projects will monitor electricity generation through multiple methods, the lowest score assigned to this sub-criterion is 4, reflecting the lower levels of uncertainty here. Projects that used metered grid data as part of these calculations received a score of 5.					

2.2 Assumption Accuracy

Quantification of renewable energy projects is estimated based on two main components: the amount of electricity generated and the emissions factor, which reflects the emissions factor of the power plant the project displaces.

In general, the biggest uncertainty in this quantification equation comes from a project's emissions factor calculation given that this requires an assessment of what electricity sources will be displaced by the project and what the emissions factor of these sources are. The amount of electricity generated is usually a very reliable measure given that it comes from ex-post metered and measured data. However, projects can enhance this reliability through using multiple methods to cross-check and validate measurement accuracy.

In order to validate the accuracy of assumptions, we primarily focus on these two components. However, the project load factor and estimation of project and/or leakage emissions are also considered.

In total, the following four metrics are considered:

- **2.2.1 Emissions Factor Accuracy:** Whether the project's emissions factor assumptions appear accurate and reasonable compared to other benchmarks.
- **2.2.2 Electricity Measurement Accuracy:** Whether the accuracy of the project electricity measurement is cross-checked and validated on an ongoing basis using multiple methods.
- **2.2.3 Project Load Factor Accuracy:** Whether the project's ex-ante load factor assumption appears conservative and accurate for this technology type.
- **2.2.4 Project and Leakage Emissions Accuracy:** Whether the project appropriately accounts for project and leakage emissions.

Each sub-criteria is assessed independently and scored on a 1 to 5 scale. The overall score for 2.2 Accuracy of Assumptions is then calculated by giving a weighting of 45% for 2.2.1 Emissions Factor

Accuracy, 45% for 2.2.2 Electricity Generation Accuracy, 5% for Project Load Factor Accuracy and 5% for 2.2.4 Project Emissions Accuracy.

2.2.1 Emissions Factor Accuracy

To validate the accuracy of the project's emissions factor, two methods are used:

- **2.2.1.1 Emissions Factor Third-Party Validation:** Whether the emissions factor used by the project appears appropriate and accurate when compared to third-party grid data.
- **2.2.1.2 Emissions Factor Benchmarking:** Whether the emissions factor used by the project appears appropriate and accurate when compared against similar projects that share the same project subtype, region and start date.

2.2.1.1 Emissions Factor Third-Party Validation

Emissions Factor Third-Party Validation refers to whether the emissions factor used by the project appears appropriate and accurate when compared to relevant third-party data.[12]

Rationale	Given that renewable energy projects are primarily displacing grid electricity, the emissions factor used by the project should broadly resemble the emissions factor of the grid that it is a part of. Projects that use an emissions factor significantly higher than that of the grid are likely overestimating this displacement impact.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑				☑	
Scoring Definition	Each project is scored on a 1 to 5 scale, where 1 indicates that a project's emissions factor appears between 75% and 100% higher than the third-party value, and 5 indicates that a project's emissions factor is within 10% of the third-party value.					
Scoring Approach	MSCI ESG Research leverages a range of national grid data sources (such as India's Central Electricity Authority) and international databases on countries (such as IRENA) to build up a database of the grid emissions factors across major grid systems over time. Where possible, multiple input sources are used, with an average of these sources taken. The project combined margin emissions factor assumption is then compared against the relevant third-party grid data for the associated grid at the time that the project started. Projects are then categorized on a scale of 1 to 5 which reflected the size of the difference between the project estimate and third-party estimate: - 1 = Project assumption 75%+ higher than the third-party data - 2 = Project assumption 50-75%+ higher than the third-party data - 3 = Project assumption 25-50%+ higher than the third-party data - 4 = Project assumption 10-25%+ higher than the third-party data - 5 = Project assumption within 10% of the third-party data					

[12] International Energy Agency; IRENA; greenhouse gas emissions from Our World in Data, Energy Data Explorer.

2.2.1.2 Emissions Factor Benchmarking

Emissions Factor Benchmarking relates to whether the emissions factor used by the project appears appropriate and accurate when compared against similar projects that share the same project subtype, region and start date.

Rationale	Renewable energy projects that operate at the same time in the same region should, by definition, have similar emissions factors to each other, given they are displacing the same mix of electricity. Projects that use an emissions factor significantly higher than similar projects therefore carry greater risks of overestimation.
Key Sources	Project Documentation ☑ | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets
Scoring Definition	Each project is scored on a 1 to 5 scale, where 1 indicates that a project's emissions factor is significantly higher than that used in similar projects, and 5 indicates that a project's emissions factor is more conservative than that used in similar projects.
Scoring Approach	MSCI ESG Research has conducted a review of project documentation for over 2,000 renewable energy projects. Given the number of projects that occur within the same grid system at a similar point in time, this project data is used to build a benchmark database of project-level emissions factors. Each project's emissions factor assumption is compared with the average emissions factor of projects that are in the same region and started around the same time. Projects are then categorized on a scale of 1 to 5 which reflected the size of the difference between the project estimate and the average project benchmark estimate: - 1 = Project assumption 50%+ higher than the average benchmark - 2 = Project assumption 25-50% higher than the average benchmark - 3 = Project assumption between 25% higher and 5% lower than the average benchmark - 4 = Project assumption 5%-20% lower than the average benchmark - 5 = Project assumption 20% or more lower than the average benchmark. If no similar projects can be found for a project, then this sub-criterion is not assessed. This applied to less than 5% of the renewable energy projects assessed, for example, where the project was located in a region with no other renewable energy carbon projects.

2.2.2 Electricity Measurement

Electricity Measurement relates to whether the accuracy of the project's electricity measurement estimate is supported by cross-checks and validation.

Rationale	Projects that use multiple methods to cross-check and validate the metered data on electricity generation increase the likelihood that this data is accurately estimated.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					

Scoring Definition	Each project is scored on a 3.5 to 5 scale, where 3.5 indicates that no information on the project measurement approach is provided, and 5 indicates the use of electricity meters with continuous or hourly monitoring that are cross-checked by multiple sources.
Scoring Approach	MSCI ESG Research identifies the measurement and monitoring procedures for electricity generation of each individual project. In particular, the frequency of electricity generation monitoring and the usage of cross-checks to validate the metered estimates are assessed. The amount of electricity generation may be cross-checked using invoice data or electricity sales information. Projects are then categorized on a scale of 3.5 to 5 based on the following:

		Electricity Cross-check	
		No	Yes
Frequency of Monitoring	Not Found	3.5	4
	Annually	3.5	4.25
	Monthly	4	4.5
	Continuously	4.5	5

2.2.3 Project Load Factor

Project Load Factor relates to whether the project's ex-ante load factor assumption appears accurate for this technology type.

Rationale	Projects that accurately estimate the load factor of the power plant increase the probability that ex-ante emissions reduction estimates will be accurate.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					

Scoring Definition	Each project is scored on a 1 to 5 scale, where 1 indicates that the project load factor assumption appears significantly overestimated compared to similar projects and 5 indicates that this assumption appears accurate.
Scoring Approach	Through a review of project documentation, the initial load factor assumption made by the project is identified. The project load factor assumption is then compared against the assumptions across other projects of the same type and region. While the load factor of a power plant can be highly localized and dependent on the specific characteristics of that location, projects that use an estimate significantly higher than other similar projects may indicate a risk of overestimation.

Projects are then categorized on a scale of 1 to 5 which reflected the size of the difference between the project estimate and the average regional project benchmark estimate:

- 1 = Project assumption 80%+ higher than the average regional benchmark
- 2 = Project assumption 40-80% higher than the average benchmark
- 3 = Project assumption between 40% higher and 5% lower than the average benchmark
- 4 = Project assumption 5%-20% lower than the average benchmark
- 5 = Project assumption 20% or more lower than the average benchmark.

If no similar projects could be found for a project, then this sub-criterion is not assessed.

2.2.4 Project and Leakage Emissions

Project and Leakage Emissions relates to whether the project appropriately considers and accounts for project and/or leakage emissions given the project type.

Rationale

Renewable energy projects may create emissions during their operation through the usage of fossil fuels to operate the plant (known as Project Emissions), or lead to fossil fuel usage outside of the project boundary (known as Leakage Emissions). For some renewable subtypes, these emissions are trivial and of low importance. However, for certain renewable projects, it is important that these emissions are appropriately considered and accounted for. Emissions during construction and supply chain emissions are not assessed as part of renewable energy methodologies and are not assessed in MSCI ESG Research's Integrity Assessment framework for renewable energy projects.

Key Sources

Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
☑			☑		

Scoring Definition

Each project is scored on a 1 to 5 scale, where 1 indicates that the project does not account for project and/or leakage emissions despite their high relevance to that project subtype and 5 indicates that the project appropriately accounts for project and/or leakage emissions.

Scoring Approach

MSCI ESG Research assesses whether each project considered and accounted for project and leakage emissions as part of their emissions reduction calculations.

Solar, Wind, Hydro and Geothermal

Through a review of academic literature sources on the relevance of these emissions sources for each project subtype, the relevance of project and leakage emissions are categorized as shown below:

		Relevance	
		Project	Leakage
	Solar	Low	Low
	Wind	Low	Low

Renewable Energy Sub-type	Hydro	High	Low
	Geothermal	Medium	Low
	Organic Waste	High	Low

Projects are then scored on a 1 to 5 scale based on the relevance and accounting of these emissions sources for the project for each project subtype. Given their relevance, hydro projects that do not account for leakage or project emissions received a score of 2. In contrast, solar projects that do not account for either received a score of 4.5.

Organic Waste

For Organic Waste, given the higher significance of project and leakage emissions, a more granular review of how these projects consider and account for different components of these emissions is conducted. Not all these components are relevant to each biomass type, so both whether these components are relevant and, if so, whether they are accounted for are considered.

For leakage, whether three main components of leakage have been accounted for are analyzed with points assigned to each as follows if they are accounted for:

- Leakage due to shifts in pre-project activities: 1 point.
- Leakage due to competing use of biomass: 1 point.
- Leakage due to biomass production: 1 point and up to an additional 2.5 points if this is calculated through primary research.

If any of these emissions are not relevant given the biomass type (for example, leakage due to biomass production is not relevant if the biomass comes from waste), the project will receive the maximum points for that component.

For project emissions, whether emissions have been accounted for within five emission source components are considered:

- Anaerobic digestion
- Decomposition of manure / waste biomass
- Combustion of fossil fuel
- Transportation and supply of biomass
- Biomass processing

Projects receive a score of 1 for each component for which they account. If any of these emissions are not relevant given the biomass type (for example, leakage due to biomass production is not relevant if the biomass comes from waste) the project will receive the maximum points for that component.

2.3.1 Monitoring Performance

Effective monitoring procedures ensure that key quantification inputs are reliably updated and measured on an ongoing basis. More effective monitoring procedures will regularly monitor the project measured data in regular site visits, while providing adequate and regular maintenance resources to ensure that the project is operating reliably and consistently.

As part of this, three factors are considered:

- **2.3.1.1 Monitoring Frequency:** The frequency of which the project conducts monitoring procedures and site visits to ensure the effective operation of the power plant.
- **2.3.1.2 Maintenance and Technical Assistance:** Whether the project includes adequate maintenance and technical assistance to ensure the plant continuously operates.
- **2.3.1.3 Bioenergy Monitoring:** Whether the project frequently monitors bioenergy emission factors and densities.

Each of the above sub-criterion is scored individually, with the overall score determined through an equal weighting of the relevant factors for that project type.

2.3.1.1 Monitoring Frequency

Monitoring Frequency relates to whether the project conducts regular monitoring procedures and site visits to ensure the effective operation of the power plant.

Rationale	More frequent monitoring increases the likelihood that key inputs represent the most accurate and up-to-date estimates, and the plant will continue to operate in a consistent and reliable way going forwards.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					
Scoring Definition	Each project is scored on a 3 to 5 scale, where 3 indicates that no information on monitoring procedures is provided and 5 indicates that site visits are conducted on a monthly basis.					
Scoring Approach	The monitoring procedures of each project are assessed, including the extent to which frequent site visits take place. Projects are then assigned one of 5 scores between 3 to 5 based on the following scale: - 3 = Monitoring frequency not provided or greater than once every 5 years - 3.5 = Monitoring frequency is once every 4 or 5 years - 4 = Monitoring frequency is once every 2 or 3 years - 4.5 = Monitoring frequency is annual - 5 = Monitoring frequency is at least monthly					

2.3.1.2 Maintenance and Technical Assistance

Maintenance and Technical Assistance relates to the extent to which the project includes adequate maintenance and technical assistance to ensure the plant continuously operates.

Rationale	Projects that more frequently provide available technical and maintenance support improve the reliability of the power plant, reducing the risk that problems arise.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets

	☑
Scoring Definition	Each project is scored on a 3 to 5 scale, where 3 indicates that no information on maintenance and technical procedures is provided and 5 indicates that frequent maintenance and technical support is provided as part of the project.
Scoring Approach	Through a review of project documentation, MSCI ESG Research assessed the maintenance and technical support procedures of each project. Projects then received a score of either 3 or 5 based on the transparency of this information and whether plans were in place to provide maintenance and technical support as required. Projects that provided technical support on an ongoing basis received a score of 5. Projects that did not disclose that they provided any technical support received a score of 3.

2.3.1.3 Bioenergy Monitoring

Bioenergy Monitoring refers to the extent to which the project is frequently monitoring bioenergy emission factors.

Rationale	Projects that more frequently monitor key bioenergy emission factors improve the reliability of these estimates and assumptions.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					

Scoring Definition	Each project is scored on a 1 to 5 scale, where 1 indicates that no emission factors are not monitored and 5 indicates that emission factors / densities are continuously monitored and monitoring equipment is continuously calibrated.
Scoring Approach	Through a comprehensive review of bioenergy project documentation, MSCI ESG Research assessed whether and how continuously bioenergy emission factors are monitored. Projects are scored depending on how frequently emission factors are monitored and measuring equipment is calibrated. Projects are then scored as follows:

		Frequency of Calibration of Measuring Equipment			
		None	Quarterly	Monthly	Continuously
Emission Factor Monitoring	None	1	2.5	3	3.5
	Quarterly	2.5	3	3.5	4
	Monthly	3	3.5	4	4.5
	Continuously	3.5	4	4.5	5

Criterion 4 – Co-benefits

Co-benefits reflect the sustainable development benefits (and safeguards) of a project beyond the CO_2e it saves; in other words, its "externalities." These environmental and societal externalities are typically positive but can, on occasion, be negative.

Carbon projects have the potential to reduce/remove CO_2e, and simultaneously have a broader positive societal impact via issues such as development, adaptation and biodiversity.

In general, the sustainable and environmental positive impacts of renewable energy projects are limited to their economic impacts. Through their construction and then operation, renewable energy projects could create employment and training opportunities within local communities, supporting the development of the local economy.

Some renewable energy projects risk having negative environmental consequences due to their impact on local fauna and flora. It is important that these projects, to the greatest extent possible, properly mitigate these risks to minimize their potential negative impacts.

MSCI ESG Research's approach to co-benefit assessment builds on the UN's Sustainable Development Goals (SDG) framework. We focus on understanding both the SDG significance of a project and the extent to which the project provides evidence of these outcomes being achieved through effective monitoring.

Figure 10 illustrates the sub-criteria through which MSCI ESG Research assesses the co-benefits of renewable energy projects, and the overall MSCI Carbon Project Ratings methodology sub-criteria that they correspond to. The detailed sub-criteria are described in Figure 11.

Figure 10: Co-benefits integrity assessment approach

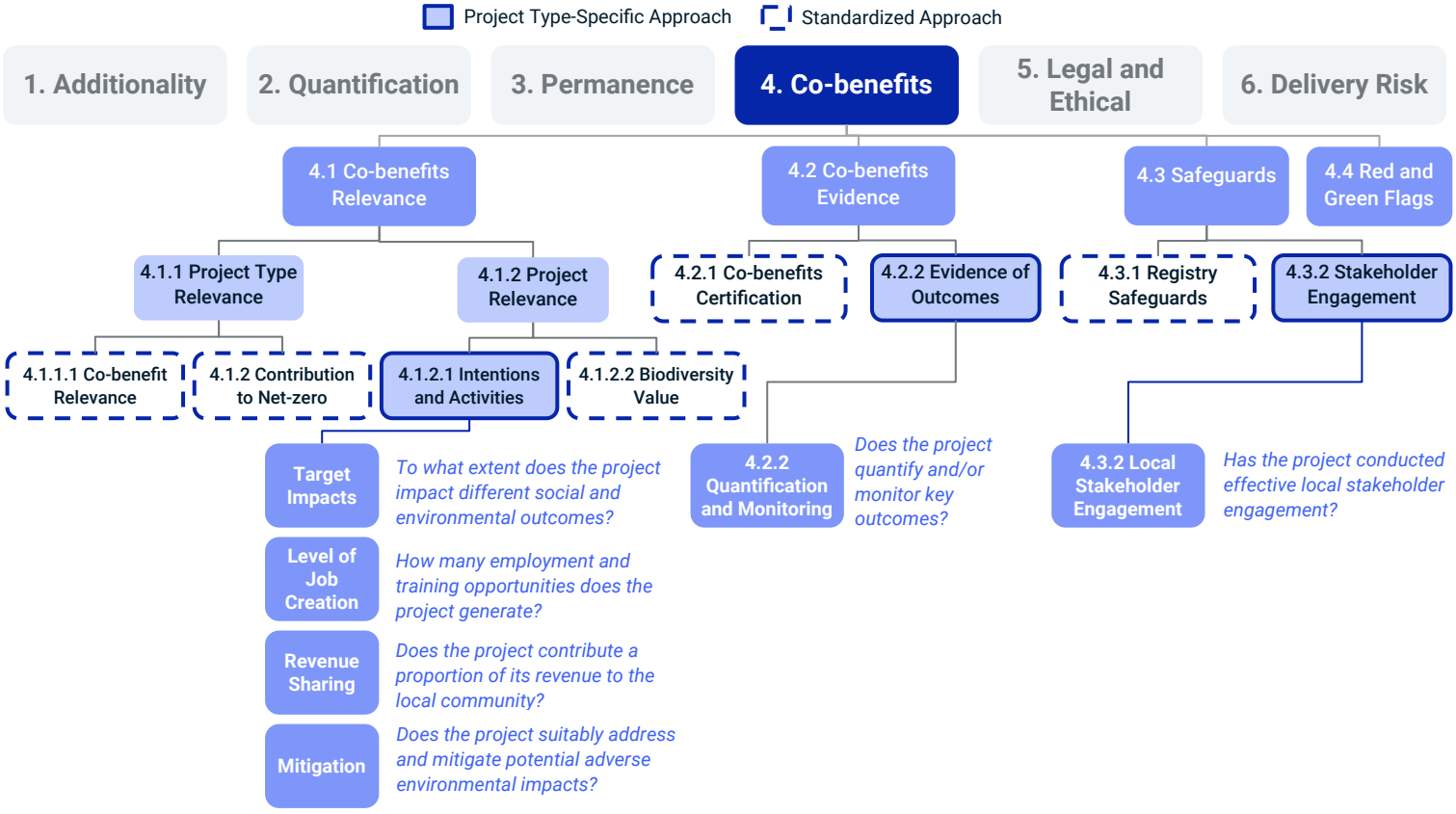


Figure 11: MSCI ESG Research Co-benefits integrity assessment framework

Sub-criteria		Metrics	Rationale	REDD+	Renewables	ARR	Cookstoves	Biochar	Landfill Gas	Safe Water	IFM	Waste Mgmt.	Blue Carbon
4.1 Co-benefits Relevance	4.1.1 Project Type Relevance	4.1.1.1 Relevance to Project Type	Different project types have an inherently different impact on each sustainable development impact.	✓ *Standardized approach*									
		4.1.1.2 Contribution to Net-zero	Some project types create "carbon lock-ins" of technologies or practices that are not compatible with a net-zero economy.	✓ *Standardized approach*									
	4.1.2 Project Relevance	4.1.2.1 Project Intentions to Activities	The specific design and implementation of a project's activities are critical drivers for whether a project generates positive sustainable development impact.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		4.1.2.2 Biodiversity Value	Nature-based projects that enhance or protect areas of rich biodiversity have greater environmental value.	✓		✓					✓		✓
4.2 Co-benefits Evidence		4.2.1 Certification	Achieving certification involves more stringent project verification. This improves the likelihood that a project's co-benefits have been realized.	✓ *Standardized approach*									
		4.2.2 Evidence of Outcomes	Projects can increase the confidence that co-benefits are attributed to their actions through measuring, monitoring, and quantifying the outcome.	✓		✓	✓	✓		✓	✓		✓
4.3 Safeguards		4.3.1 Registry Safeguards	More effective environmental and social safeguards required by registries reduce the likelihood of projects causing harm.	✓ *Standardized approach*									
		4.3.2 Local Stakeholder Engagement	Projects that successfully engage with local stakeholders reduce the likelihood of any negative impacts occurring.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
4.4 Red and Green Flags		News scanning	Review of academic papers, industry sources and the news for Red or Green Flags relating to project's co-benefits.	✓ *Standardized approach*									

4.1.2.1 Project Intentions to Activities

The specifics of a project's design and implementation play an important role in determining both the relevance and significance of each sustainable development impact of the project. Projects that target certain impacts through additional activities increase the positive co-benefits that they create.

There are three metrics used to evaluate this sub-criterion:

- **4.1.2.1.1 Target Impacts:** The social and environmental benefits that the project explicitly identifies and targets through its activities.
- **4.1.2.1.2 Social Impacts:** The extent to which the project positively or negatively impacts local livelihoods through either economic or accessibility impacts.
- **4.1.2.1.3 Biodiversity Impacts:** Whether the project positively or negatively impacts local biodiversity.

4.1.2.1.1 Target Impacts, 4.1.2.1.2 Social Impacts and 4.1.2.1.3 Biodiversity Impacts are scored on a 1 to 5 scale, and then weighted 15%, 50% and 35% respectively to create a combined score.

4.1.2.1.1 Target Impacts

Target Impacts refers to whether the project explicitly or implicitly targets specific SDGs with their project activities.

Rationale	Projects which implement specific activities targeted at a sustainable development impact or SDG increase the likelihood that this SDG is relevant and significant.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					
Scoring Definition	Each project is scored on a scale of 1-5, where 1 indicates that the project's activities do not target any sustainable development goals and 5 indicates the project's activities targets seven or more SDGs.					
Scoring Approach	The number of SDGs both explicitly and implicitly impacted and targeted by the project are identified through a review of the project's activities. For projects that do not reference the SDGs themselves, all of the sustainable development impacts mentioned by the project (such as improved air pollution and local economic development) are identified and mapped onto the number of SDGs that they relate to. The overall score is then based on both the quantity of SDGs or sustainable development impacts identified by the project.					

4.1.2.1.2 Social Impacts

Renewable energy projects can have positive social impacts, through the generation of additional employment and local economic benefits, and the provision of renewable energy capacity in areas that do not have reliable access to energy.

There are three metrics used to evaluate this sub-criterion:

- **4.1.2.1.2.1 Level of Job Creation:** The number of temporary and permanent jobs that the project creates as a proportion of their credit generation.
- **4.1.2.1.2.2 Access to Electricity:** Whether the project is located in an area that has low access to electricity, and therefore may help to address a significant supply gap in that region.
- **4.1.2.1.2.3 Revenue Sharing:** Whether the project agrees to contribute a proportion of its future revenue to community causes.

4.1.2.1.2.1 Level of Job Creation and 4.1.2.1.2.2 Access to Electricity are scored on a 1 to 5 scale, and then weighted equally to create a combined score. The score for 4.1.2.1.2.3 Revenue Sharing (scored on range of 0 to 2) is then added to this combined score.

4.1.2.1.2.1 Level of Job Creation

Level of Job Creation relates to the amount of permanent and temporary jobs created by the project, in proportion to its emissions reduction impact.

Rationale	Projects which generate more permanent employment and training opportunities will have a larger and longer-term impact on the local economy. Employment opportunities can have multiplier effects on the economy as a whole, as supporting businesses and infrastructure are developed to support this employment, and cater to the local income it generates.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					

Scoring Definition	Each project is scored on a 1 to 5 scale, where 1 indicates no quantified job information is provided by the project and a 5 indicates that at least 5 jobs are created per thousand tonnes of estimated annual emissions reductions.
Scoring Approach	MSCI ESG Research reviews key project documentation in detail to assess how many permanent and temporary jobs were expected to be created from the project. The number of jobs is then divided by the project's estimated annual emissions reductions. This ratio is then categorized into scoring bands as shown below, which reflected higher scores for the greater proportion of job creation.

Points Scoring	# Jobs per kiloton CO_2e
1	0
2	0-1
3	1-2.5
4	2.5-5
5	5+

4.1.2.1.2.2 Access to Electricity

Access to Electricity relates to whether the project is located in an area that has low access to electricity, and therefore may help to address a significant supply gap in that region.

Rationale	Projects located in a country which currently faces a shortage in supply of electricity and lower electricity accessibility may help to address this supply shortage, and provide electricity to regions in which it is currently lacking.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets

	☑	☑

Scoring Definition	Each project is scored on a 1 to 5 scale, where 1 indicates that the project takes place in an area of very high electricity access, and 5 indicates that the project takes place in an area of very low access to electricity.
Scoring Approach	MSCI ESG Research leverages data from the World Bank on the proportion of a population that has access to electricity for each country from 1990 to 2023. This proportion is then converted into a 1 to 5 score for each project, based on the level of electricity access in the year in which the project started as follows:

Points Scoring	Proportion of Population with Access to Electricity
1	90-100%
2	80-89%
3	70-79%
4	60-79%
5	Lower than 60%

4.1.2.1.2.3 Revenue Sharing

Revenue Sharing refers to whether the project has agreed to contribute a proportion of its revenue to local community causes and investments.

Rationale	Projects may contribute a proportion of their revenue to local community initiatives, such as education, health or social causes. These investments should, in theory, lead to positive benefits to the population.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					

Scoring Definition	Each project is scored on a 0 to 1 scale, where 0 indicates that no revenue sharing agreement is in place, 0.5 indicates the project contributes up to 2% of their carbon credit revenues to local community initiatives, and 1 indicates that the project contributes 2% or more of their carbon credit revenues.
Scoring Approach	MSCI ESG Research reviews key project documentation in detail to assess whether the project has agreed to contribute a proportion of their revenue to local communities. Projects are then scored based on the presence and size of this contribution. Projects that do not state what share of their revenues are contributed to the local community are assumed to contribute none, and hence scored 0.

4.1.2.1.3 Biodiversity Impacts

Renewable energy projects can negatively impact local biodiversity depending on both the previous land use of the area, and the impact of the subtype of renewable energy in that location.

There are four metrics used to evaluate this sub-criterion:

- **4.1.2.1.3.1 Forest Cover Change:** Whether the project appears to have taken place in an area of high forest cover, and therefore reduces the level of forest cover in the area.
- **4.1.2.1.3.2 Nature and Biodiversity Impacts:** Whether the project subtype has inherent positive or negative impacts on a range of nature and biodiversity outcomes.
- **4.1.2.1.3.3 Ecoregions:** Whether a project is located in one of the top 200 biodiversity ecoregions worldwide.
- **4.1.2.1.3.4 Mitigation:** Whether the project subtype has inherent positive or negative impacts on a range of nature and biodiversity outcomes.

4.1.2.1.3.1 Forest Cover Change

Whether the project appears to have taken place in an area of high forest cover, and therefore reduces the level of forest cover in the area.

Rationale	Renewable energy projects constructed in areas that were previously forested may lead to negative emissions and biodiversity impacts compared to what would have otherwise occurred without the project going ahead. In particular, projects that require the destruction of forests in order to build the renewable energy facilities will lead to project emissions that are not captured in a project's emissions calculations.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑	☑				

Scoring Definition	Each project is scored on a 1 to 5 scale, where 1 indicates the project takes place in an area of high forest cover and appears to lead to significant forest loss, and 5 indicates that the project does not take place in an area of forest cover.
Scoring Approach	Using co-ordinates on the project's location, a geospatial assessment of the level of forest cover in the project area is conducted both prior to and after the project. Projects are then scored on a 1 to 5 scale based on the level of forest cover prior to the project start and the extent of forest loss.

4.1.2.1.3.2 Nature and Biodiversity Impacts

Whether the project subtype has inherent positive or negative impacts on a range of nature and biodiversity outcomes.

Rationale	Certain types of renewable energy projects can directly or indirectly impact a range of nature and biodiversity outcomes.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑			☑	☑	

Scoring Definition	Each project is scored on a 1 to 5 scale, where 1 indicates the project likely has negative impacts on a range of nature and biodiversity metrics, and 5 indicates the project inherently supports very high positive nature and biodiversity outcomes.
Scoring Approach	Through a review of academic literature and third-party data on the impact of different types of renewable energy technologies, MSCI ESG Research assess the inherent direct and indirect impacts of renewable energy technologies on nature and biodiversity. The impact is assessed across five main themes of nature and biodiversity: (i) habitat; (ii) pollution; (iii) water quality; (iv) soil health; and (v) species. Renewable energy subtypes are then scored on a 1 to 5 scale on each of these themes with the overall score based on an equal weighting of these components.

4.1.2.1.3.3 Ecoregions

This criterion refers to whether a project is located in one of the world's top 200 ecoregions, representing areas of high species richness and conservation value.

Rationale	The biodiversity impact and conservation value of a nature-based project is likely to be higher if it is located in an area of high biodiversity and species richness.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑	☑				
Scoring Definition	Each project located in one of the world's top 200 ecoregions receives a score of 1. Projects located within 25km of a biodiversity ecoregion receive a score of 2, and projects not located close to a biodiversity ecoregion receive a score of 3.					
Scoring Approach	Geospatial data on the project's location is combined with data from the WWF on the world's top 200 ecoregions to identify if a project's boundaries sat within them. Projects are then scored on a 1 to 3 scale based on their proximity to an ecoregion. The maximum score of 3 is assigned given that not being located close to a biodiversity ecoregion does not represent a positive biodiversity outcome or does not necessarily mean that the project has no negative biodiversity impact.					

4.1.2.1.3.4 Mitigation

Mitigation refers to whether the project has effectively mitigated any risks that the project creates negative environmental consequences.

Rationale	The construction of renewable energy projects may impact local ecosystems and wildlife. It is important that projects located in areas of high biodiversity consider and address these risks to ensure that no adverse harm is caused.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets

	☑		☑		

Scoring Definition	Each project is scored on a -1 to 0, where -1 indicates that the project has high potential adverse biodiversity consequences that have not been mitigated, and 0 indicates that any adverse consequences have been appropriately mitigated.
Scoring Approach	Firstly, the level of adverse environmental risk is assessed through understanding if the project is located within a biodiversity ecoregion through geospatial analysis. The location of each individual renewable energy project is assessed against data from the WWF on the world's top 200 ecoregions to identify if a project's boundaries sat within them. Then key project documentation is reviewed in detail to assess whether the project has conducted an environmental impact assessment (EIA) and if key risks have been mitigated. Projects are then scored based on both the size of this risk and the level of mitigation as shown in the table below.

		Mitigation		
		No EIA	EIA without Mitigation	EIA with Mitigation
Biodiversity Ecoregion	No	-0.50	-0.25	0.00
	Yes	-1.00	-0.50	0.00

4.2.2 Quantification of Outcomes

Quantification of outcomes relates to whether the project monitors and/or quantifies the impact of the project on targeted sustainable development goals.

Rationale	Assessing the evidence of co-benefit impacts is crucial to evaluating the degree to which co-benefits are achieved and can be attributed to a project. Projects that measure, quantify, and monitor their co-benefit impacts provide greater evidence in support of the targeted social and environmental benefits being achieved.

Key Sources

Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
☑					

Scoring Definition	Each project is scored on a scale of 1 to 5, where 1 indicates there is no quantification or monitoring of SDGs and 5 indicates that benefits are quantified and monitored.
Scoring Approach	MSCI ESG Research reviews each individual project's key documentation, such as its design document and monitoring reports, to assess the level to which both specific sustainable development goals and other economic indicators, such as job creation, have been quantified or monitored by the project. Scores ranging from 1 to 5 are assigned to each project based as per the scoring matrix below:

	Economic Benefits Quantified

		None	Single Metric	Multiple Metrics
SDG Metric Quantification	None	1	2	3
	Identified	2	3	4
	Quantified and Monitored	4	5	5

4.3.2 Local Stakeholder Engagement

When renewable energy projects are developed, it is important that developers engage with the local community to understand any local context or concerns. Projects with high levels of stakeholder engagement are more likely to avoid harm (and instead positively contribute) to the local community or environment.

MSCI ESG Research evaluates this through the following sub-criteria:

- **4.3.2.1 Effective Consultation:** How effective is +the consultation conducted?
- **4.3.2.2 Representation and Inclusivity:** Has the project ensured proper and inclusive representation of stakeholders?
- **4.3.2.3 Access to Information:** Has the project relayed the relevant information to the stakeholders?
- **4.3.2.4 Feedback and Grievances:** Does the project display effective feedback and grievance redressal mechanisms?
- **4.3.2.5 Worker Relations:** Whether the project provides training and employment opportunities to stakeholders.

Each project is scored on a 1 to 5 scale for each of these sub-criteria and an overall score is reached through a straight average of these five scores. Projects scoring a 5 will represent projects with a detailed stakeholder consultations which are representative of the target users. These stakeholders will be informed on the project and provided with the opportunity to voice their opinions and have an influence on the project.

Using the project's specific co-ordinates, a geospatial assessment of the population density of the area in which the project is located is conducted. Projects that are not located close to local communities or villages and have very low population density, will receive a minimum score of 2 for 4.3.2 Local Stakeholder Engagement given the lower importance of local stakeholder consultation to these projects.

4.3.2.1 Effective Consultation

Effective consultation relates to whether the project uses effective techniques to engage and consult with stakeholders.

Rationale	Projects that use multiple methods of in-person consultation provide more open and effective channels to engage with stakeholders and receive any feedback.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					

Scoring Definition	Each project is scored on a scale of 1 to 5 scale, where 5 indicates that the project conducts multiple in-person engagements and 1 indicates that very limited in-person stakeholder consultation is performed.
Scoring Approach	MSCI ESG Research assesses the types and range of consultation conducted. The types of consultation may include surveys/questionnaires, in-person meetings, signed documents or interview calls. Projects then receive a score from 1 to 5 based on both the type of consultation and level of in-person engagement:

		In-person Consultation	
		No	**Yes**
Number of Consultation Activities	0	1	1
	1-2	2	4
	3-5	3	5

4.3.2.2 Representation and Inclusivity

Representation and Inclusivity relates to whether the project has ensured that it consults with a representative and inclusive range of stakeholders.

Rationale	Projects which consult a greater number of stakeholders tend to have a lower permanence risk as more of the local community are involved in the planning process. This allows more end users to voice their opinions on the project and have greater involvement.

Key Sources

Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
☑					

Scoring Definition	Each project is scored on a 1 to 5 scale, where 5 indicates that the project transparently consults with a representative group of stakeholders, including women, while 1 indicates that no information is provided regarding which stakeholders were consulted.
Scoring Approach	MSCI ESG Research assesses if the number of stakeholders in attendance has been provided. In particular, if the total number of stakeholders and the gender breakdown of attendees is disclosed. This is then scored as shown in the table below.

		# Stakeholders Consulted		
		Unknown	**<50**	**50+**
Transparency of Disclosures	Total, with gender breakdown disclosed	3	4	5
	Total	2	3	4
	None	1	n/a	n/a

4.3.2.3 Access to Information

Access to Information refers to whether the project provides transparent information to stakeholders regarding the project's activities.

Rationale	Through providing greater access to information, stakeholders will be informed on the project's activities and more able to provide feedback to the project to ensure the project meets their needs.
Key Sources	Project Documentation ☑ | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets
Scoring Definition	Each project is scored on a 1 to 5 scale, where 5 indicates that the project provides very transparent access to information through both documentation and in-person meetings, and 1 indicates that no information appears to be provided to stakeholders.
Scoring Approach	MSCI ESG Research assesses whether in-person meetings were conducted to present project information or whether clear documentation is provided. For in-person meetings, projects receive a score of 2 if they have conducted meetings to present information on the projects, and 0 otherwise. For documentation, MSCI ESG Research assesses if any documentation has been provided to local communities, and projects receive a score of 3 if Project Design Documents and/or pamphlets are provided, and 1 otherwise. The overall scores are based on adding each of these to reach a score from 1 to 5.

4.3.2.4 Feedback and Grievance

Feedback and Grievance refers to whether the project has procedures in place to receive and act on feedback received from stakeholders.

Rationale	Projects are more likely to satisfy the needs of stakeholders if there is a clear feedback mechanism and projects disclose and take actions as a result of the feedback.
Key Sources	Project Documentation ☑ | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets
Scoring Definition	Each project is scored on a 1 to 5 scale, where 5 indicates that the project transparently discloses and acts on stakeholder feedback and has an ongoing feedback mechanism in place, and 1 indicates that no feedback procedure has been disclosed either at the project start or during its operation.

Scoring Approach	Three aspects of a project's feedback procedure are assessed: - **Feedback Mechanism:** Whether the project has a feedback and grievance procedure in place. - **Feedback Disclosure:** Whether the project transparently discloses any feedback received. - **Feedback Response:** Whether the project has clearly taken action on any feedback received. Projects receive a score of 3 if they have a feedback mechanism in place, and 1 otherwise. Projects receive a score of 1 if they satisfy the other 2 factors. The overall scores are then based on adding each of these components to reach a score from 1 to 5.

4.3.2.5 Worker Relations

Worker Relations refers to whether the project provides training and/or employment opportunities to stakeholders.

Rationale	Through the provision of training opportunities there may be more benefits to the local community through increased employment opportunities and improved knowledge.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					
Scoring Definition	Each project is scored as a 1 or a 5, where 5 indicates training opportunities are provided to local stakeholders and 1 indicates there is no mention of training opportunities.					
Scoring Approach	MSCI ESG Research assesses whether the project will employ and provide training opportunities for local stakeholders.					

Appendix – Key References

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Change log

Date	Key Changes
01-Nov-2024	Initial publication
16-Dec-2024	- Incorporation of new sub-criterion (1.3) to evaluate the impact of legal considerations on additionality. - Addition of multiple sources of data for key inputs, such as emissions factors. - Incorporation of new sub-criteria on the social and biodiversity impacts of renewable energy projects, including the access to electricity of the population (4.1.2.1.2.2) and the level of forest cover change impact (4.1.2.1.3.1). - Assessment of population density within assessment of local stakeholder engagement.

Contact us

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AMERICAS

United States	+ 1 888 588 4567 *
Canada	+ 1 416 687 6270
Brazil	+ 55 11 4040 7830
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EUROPE, MIDDLE EAST & AFRICA

South Africa	+ 27 21 673 0103
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