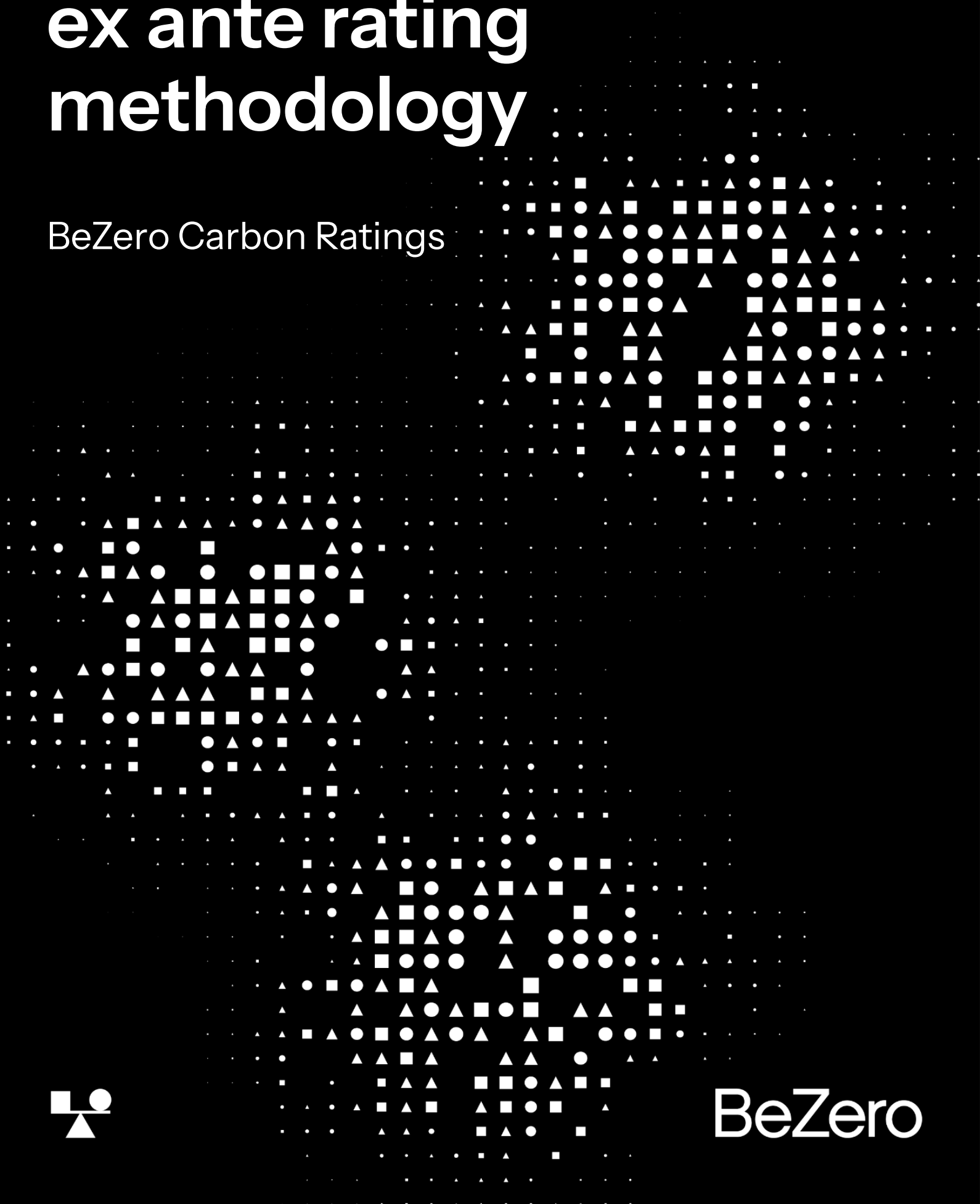
BeZero Carbon ex ante rating methodology

BeZero Carbon Ratings



BeZero

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Introduction to the BeZero Carbon ex ante Rating

A carbon credit is a contract certifying a commitment that a tonne of CO_2e has been removed or avoided for a given period of time as a result of a given project activity.

This commitment typically relies upon third-party verification and validation, and ongoing monitoring, of a project's adherence to a given methodology for a given activity. Methodologies are designed and maintained by Standard Bodies, and in some instances have additional validation by industry initiatives such as the ongoing Integrity Council for the Voluntary Carbon Market. Some Standard Bodies also act as registries for the issued credits. This process, known as accreditation, is binary by design. It results in a standardised unit of account, i.e. a tonne of CO_2e avoided or removed, and credits are transacted and eventual climate claims made on that basis.

However, in our view, solely relying on a binary assessment to understand carbon efficacy or carbon credit quality is insufficient. Whether a whole tonne of CO_2e has been achieved cannot be verified with absolute accuracy. Assessing the quality of carbon projects involves counterfactual analysis, a mix of subjective and objective parameters that change over time, and retirements do not involve physical delivery for settlement. The heterogeneous nature of nature and engineered avoidance and removal projects also prohibits perfect fungibility. As do contrasting customer preferences and perceived value.

In order to confidently assess the CO_2e achieved, BeZero Carbon believes all carbon market participants (developers, investors, intermediaries, end buyers) need information and tools to understand the risks and uncertainties present. This is equally important across the various phases of project development, where the project has not issued any carbon credits, as it is for the parties interacting with credits that have been issued.

This document explains BeZero Carbon's approach to assessing carbon efficacy risk for ex ante carbon credits. This framework is applicable to any project type in any sector and leverages: a blend of qualitative and quantitative factors; financial, environmental, and policy assessment techniques; primary and secondary data sources.

Our Ratings, Geospatial, Data, and Research teams are made up of dozens of climate and data scientists, geospatial experts and financial market analysts. They bring with them the highest academic and industry credentials, a tenacious approach to scientific inquiry and a dedication to climate action through science. They hold PhDs and qualifications in disciplines from remote sensing, forest ecology, ecosystem disturbance, peatlands, and blue carbon to statistics, machine learning, artificial intelligence, financial research, industrial engineering, and public policy. And they have published hundreds of academic papers and have been cited tens of thousands of times in peer-reviewed scientific academic literature.

BeZero Carbon Rating analytical framework

BeZero Carbon Rating Methodologies

We have designed an approach to assessing the carbon efficacy risk for ex ante (yet to be issued) carbon credits. This framework is applicable to any project type in any sector accredited by any standards body, and leverages a blend of qualitative and quantitative factors; financial, environmental, policy assessment techniques; and primary and secondary data sources.

The BeZero Carbon ex post Rating Methodology details our risk based assessment for understanding and interrogating the efficacy of issued carbon credits of any type, in any sector and country.

The BeZero Carbon ex ante Rating Methodology, described in this document, similarly details our framework for assessing carbon efficacy of credits yet to be issued from projects of any type, in any sector and country. Ex ante ratings will also consider project execution risk.

BeZero Carbon Sector Classification Methodology

BeZero classifies projects by project type using the proprietary BeZero Carbon Sector Classification system, a hierarchical sector classification system for verified carbon markets. The classification is periodically reviewed and the BeZero Carbon Sector Classification Methodology is publicly available.

In addition to overarching ex post and ex ante rating methodologies BeZero also provides sector specific methodology documents. Sector methodologies can be seen as nested within the overarching ex post or ex ante methodologies. The overall rating definitions, risk factors and risk driver categories are common across all projects while the sector methodologies complement the overarching methodologies. It is recommended that users consult both the main and sector methodologies for a complete overview of the rating frameworks.

BeZero Carbon ex ante rating definition

A BeZero Carbon ex ante Rating (referred to as the 'ex ante rating') represents BeZero Carbon's opinion on the likelihood of the carbon credit achieving a tonne of CO_2e avoided or removed. It is an opinion on the greenhouse gas efficacy of an ex ante credit.

The BeZero Carbon ex ante Rating is:

- Assigned to **carbon credits which are not yet issued.**
- Ratings are vintage specific, meaning the rating is assigned to a specific (ex ante) vintage range.
- An opinion based on: a blend of qualitative and quantitative factors; financial, environmental, and policy assessment techniques; primary and secondary data sources - to the extent that they are relevant to assessing carbon efficacy risk.
- An assessment of the carbon efficacy of a project combined with the project execution risk. This provides a qualitative assessment of the risk that a project will fail to successfully reach operation.
- A rating that provides an ordinal ranking of carbon efficacy – i.e. a focus on the relative likelihood of achieving a tonne of CO_2e rather than on the absolute (or cardinal) likelihood.
- Since this is an opinion specifically on the carbon efficacy of a carbon credit, it does not assess environmental impact and risks according to the double materiality principle.

The ex ante rating can be applied to credits at any stage of a carbon project's life cycle prior to a credit being issued. Once a credit is issued and available for retirement, it is no longer eligible for the ex ante rating but may be eligible for the BeZero Carbon Rating, (referred to as the 'ex post rating') upon fulfilling the requisite qualifying criteria '(please consult the BeZero Carbon Rating methodology (ex post) for details)'. BeZero Carbon will provide an ex-post rating for all such projects as soon as practicable.

The ex ante rating is expressed on the same eight-point scale as the ex post rating, with the addition of a "pre" suffix, which stands for "pre-issuance", to distinguish it from the ex post rating.

A BeZero Carbon ex ante rating is a point in time assessment. IE the rating and associated analysis reflect the information available and assessment at the time of publication. Ex ante ratings are not subject to continuous monitoring by default. This means that the rating will not be reviewed unless BeZero is requested and commissioned to do so.

BeZero Carbon ratings are assessed with reference to the time period committed to by the project. This is particularly relevant for the Permanence risk factor (see below). The rating incorporates both backward looking and forward looking analysis. Backward looking analysis includes all known project activity, reporting and documentation, and relevant contextual data and information. Forward looking analysis considers how project and contextual information is likely to change and whether and to what extent that impacts our assessment of carbon risk factors and overall carbon efficacy. Ex ante ratings by their nature are more forward looking since the ratings apply to unissued credits.

Table 1. Ex ante rating definitions.

Rating	Definition
BeZero Carbon Rating **AAA.pre**	A credit has the **highest likelihood** of achieving 1 tonne of CO_2e avoidance or removal
BeZero Carbon Rating **AA.pre**	A credit has a **very high likelihood** of achieving 1 tonne of CO_2e avoidance or removal
BeZero Carbon Rating **A.pre**	A credit has a **high likelihood** of achieving 1 tonne of CO_2e avoidance or removal
BeZero Carbon Rating **BBB.pre**	A credit has a **moderate likelihood** of achieving 1 tonne of CO_2e avoidance or removal
BeZero Carbon Rating **BB.pre**	A credit has a **moderately low likelihood** of achieving 1 tonne of CO_2e avoidance or removal
BeZero Carbon Rating **B.pre**	A credit has a **low likelihood** of achieving 1 tonne of CO_2e avoidance or removal
BeZero Carbon Rating **C.pre**	A credit has a **very low likelihood** of achieving 1 tonne of CO_2e avoidance or removal
BeZero Carbon Rating **D.pre**	A credit has the **lowest likelihood** of achieving 1 tonne of CO_2e avoidance or removal

Alongside the BeZero Carbon ex ante rating, projects must be assessed for the risk that a project will fail to be fully implemented and reach operational stabilisation. Project execution risk is assessed at the project level and applied as a standalone risk factor and must be communicated together with the ex ante carbon rating. Project execution risk is scored on an 8 notch scale from lowest to highest risk.

Table 2. Project execution risk definitions.

Risk level	Definition
Lowest	A project has the **lowest risk** of failing to be fully implemented and reach operational stabilisation.
Very low	A project has a **very low risk** of failing to be fully implemented and reach operational stabilisation.
Low	A project has a **low risk** of failing to be fully implemented and reach operational stabilisation.
Moderate	A project has a **moderate risk** of failing to be fully implemented and reach operational stabilisation.
Moderately high	A project has a **moderately high risk** of failing to be fully implemented and reach operational stabilisation.
High	A project has a **high risk** of failing to be fully implemented and reach operational stabilisation.
Very high	A project has a **very high risk** of failing to be fully implemented and reach operational stabilisation.
Highest	A project has the **highest risk** of failing to be fully implemented and reach operational stabilisation.

The ex ante rating is not an assessment of:

- The broader risks faced by a carbon project, e.g., fraud, negligence, default risk, political interference, business interruption, other than the extent to which such risks may inform our assessment of project execution risk.

- Any other element of the credit's quality other than how they relate to carbon efficacy, such as potential co-benefits from broader ecological and social impacts. These could include: biodiversity effects; social, health or economic impacts on local communities; or actual or potential SDG claims. To the extent such effects may compromise carbon efficacy they would be taken into consideration e.g., when considering stakeholder relations and the effect on permanence or project execution risk.

- The ex ante rating is not a measure of the likelihood that a forecast credit will be delivered or the risk that the number of credits actually issued by a project will vary from the number forecasted ex ante, also known as delivery risk. Delivery risk can occur as either an under or over-performance of issuance versus forecast, and can be driven by a number of factors. While the factors driving this are often related to the subsequent rating of the credits, this risk factor relates to quantity and does not feature directly in the rating. Please see here for more information on delivery risk.

Ex ante and ex post ratings

The ex ante rating is distinct from the ex post rating:

- An ex ante rating is assigned to **carbon credits which are not yet issued**. The ex post rating is applicable to carbon credits that **have been** issued.
- The ex ante rating is **valid as on the date the rating is issued; the ex post rating is valid at all times.**
- The ex ante rating is reviewed periodically (subject to request) whereas the ex post rating is monitored and reviewed on an ongoing basis.
- An ex ante rating and an ex post rating can coexist for the same project but cannot coexist for the same vintage.
- Once a credit has been issued, an ex post rating can be assigned dependent on fulfilling the eligibility criteria.
- Ex ante ratings are published at the customer's discretion and can either be kept private, shared with a list of recipients, or shared publicly. All ex post ratings and rating summaries for BeZero Carbon-rated projects are available on our website alongside the BeZero Carbon Rating methodology and explainer documents - www.bezerocarbon.com. The full rating analyses, including features and tools, for all ex post ratings are available to all subscribers via the BeZero Carbon Markets platform.
- Note that a unanimous consensus at the BeZero Carbon Rating Committee is required for an ex ante rating to be assigned, similar to the process adopted for all ex post ratings.

Table 3. A summary of the differences between the ex ante and ex post BeZero Carbon Ratings.

	BeZero Carbon ex ante Rating	**BeZero Carbon ex post Rating**
Carbon credit scope	Pre-issuance (ex ante)	Post-issuance (ex post)
Design phase	✓	X
Implementation phase	✓	X
Operational phase: Pre-issuance	✓	X
Operational phase: Issued	X	✓
Valid when issued	✓	✓
Valid at all times	X	✓
Continuously monitored	X	✓
Publicly available	At discretion of customer	✓
Privately available	✓	X
Full analysis	At discretion of customer	All BeZero Carbon Markets Platform users
Assignment criteria	Unanimous decision at the Rating Committee	Unanimous decision at the Rating Committee

BeZero Carbon ratings & the project life cycle

There are four phases in a typical carbon credit's lifecycle, as outlined in exhibit 1. An ex ante rating can be assigned at Phases 1 to 3, the ex post rating can be assigned at Phase 4.

Exhibit 1. Evolution of BeZero Carbon Ratings across a project's life cycle.

Rating type	**Ex ante (provisional)**	**Ex ante**	**Ex ante**	**Ex post**
Phase	**Phase 1** Design	**Phase 2** Implementation	**Phase 3** Pre-issuance	**Phase 4** Issued
Example rating	AAA.pre*	AAA.pre	AAA.pre	AAA
Publication	Private only	Private/Public	Private/Public	Public only
Description	This is the design and conceptualisation phase. The parameters of how a project will be structured and implemented are yet to be fixed at this phase. Ratings assigned at this phase are marked as provisional by adding a '*' at the end of the headline letter rating. Ratings are provided on a bilateral basis to users as a private report with a limited distribution list to be agreed with the user.	The project has moved beyond the design phase, with the proposed parameters finalised. The ex ante rating can be applied to credits at this stage of the project lifecycle, with the rating applied to a vintage range. Once there is sufficient information available to show a project has moved to the implementation stage, the rating is no longer marked as provisional.	The project has been implemented and is operational. A project can now have both ex ante credits based on forecast operations, or issued ex post credits based on realised performance reported in monitoring reports. The ex ante rating is applicable only to ex ante credits at this stage and is vintage-based.	The verified credits have been issued for a given vintage and are available for retirement on a registry. The ex post rating is monitored on an ongoing basis and remains live as long as the project fulfils the qualifying criteria.

Introduction to the risk factor framework

Analytical framework

The ex ante rating is our opinion based on the balance of risks across four risk factors assessed across a number of steps. These are broken down as follows:

1. **Risk factor conclusions.** For each risk factor, Ratings Analysts propose risk levels from 'aaa' to 'd'.

2. **BeZero Carbon ex ante rating.** BeZero's assessment of the project's ex ante carbon rating represents our opinion on the inherent carbon efficacy of credits expected to be issued by the project.

    a. The ex ante carbon rating is arrived at based on our analysis of carbon risk factors i.e. additionality, carbon accounting, and permanence.
    b. BeZero's rating model equates a score (numerical value) to each proposed risk level and multiplies these scores to calculate an overall carbon efficacy score.

3. **Project execution risk.** BeZero's assessment of project execution risk refers to our opinion on the risk that a project will fail to be fully implemented and reach operational stability. Execution risk is assessed at the project level and applied as a standalone risk factor. It must be communicated together with the ex ante carbon rating.

4. **Rating committee oversight.** The BeZero Carbon rating committee assigns all finalised rating and risk conclusions considering all available evidence presented by the analyst team and discussed in committee. This includes the final risk levels for each risk factor and the final BeZero Carbon ex ante rating.

    a. It should be noted that assigning the rating is a deeply analytical process, wherein the sole objective is to assign ratings reflective of the carbon credit's efficacy or quality. Any risk factor can fundamentally limit the rating we assign to that project's credits, if deemed appropriate.

This framework is summarised in the following tables.

Table 4. Example summary table for BeZero Carbon rating assessments*.

Risk factor	**Ex ante Assessment**	**Ex post Assessment**
Additionality	a	a
Carbon accounting	bbb	bbb
Permanence	aa	aa
Project execution	bb	n/a
BeZero Carbon Rating	**BBB.pre (Moderate likelihood)**	**BBB (Moderate likelihood)**
Project execution risk	moderately high execution risk	n/a

** These are hypothetical case studies. Every project is assessed individually. Final conclusions and ratings reflect the balance of risks across all risk factors wherein the sole objective is to assign ratings reflective of the carbon credit's efficacy or quality.*

Risk factor definitions

The BeZero Carbon ex ante rating follows a robust analytical framework involving a detailed assessment of four critical risk factors affecting the expected quality and carbon efficacy of credits issued by the project and likelihood of successful project implementation:

Additionality: The likelihood that a project's activities are materially different from the counterfactual or business-as-usual activities.

Carbon Accounting: The likelihood that or degree to which climate benefits are accurately or conservatively quantified.

Permanence: The likelihood that the climate benefits of the project will persist for the time committed.

Project execution risk: The risk that a project will fail to be fully implemented and reach operational stabilisation.

Across a carbon credit's lifecycle, BeZero Carbon's assessment of carbon efficacy risk looks at the same risk factors for ex post ratings and ex ante ratings.

Holistic assessment

The assessment of a carbon credit's efficacy includes a detailed, project-specific, bottom-up and top-down analysis, to provide a comprehensive assessment of risk. This assessment is grounded in scientific evidence, taking into account multiple data sources and with reference to a comprehensive range of scientific research and literature, and the scientific consensus.

BeZero Carbon ratings are not explicitly defined or calibrated with reference to the targets and objectives of the Paris Agreement or other relevant international agreements. However, such agreements may be relevant when assessing Policy risk within Additionality.

To make their assessment, BeZero Carbon analysts use a broad range of qualitative and quantitative inputs including, but not limited to, financial, environmental, and policy assessment techniques based on primary and secondary data sources. Such inputs will be reviewed for their reliability and applicability to the project conditions.

Ex ante rating opinions, therefore, incorporate a comprehensive assessment of the fundamental drivers of risks associated with carbon efficacy at a project and vintage level, including, inter alia, natural, technological, economic, social, legal and regulatory factors. The rating will also incorporate any information risk, defined as the risk posed by the reliability or robustness of the information available. The assessment will consider the extent and implications of any information risks, and - where appropriate - will reflect that in the relevant risk factor.

Data source and limitations

Our assessments are based on a comprehensive review of relevant data, information and evidence. This includes but is not limited to:

- All available project documentation such as Project Design Documents, Monitoring or Verification reports and other related documents and datasets
- Standard body rules and criteria, methodology documents and any related supplements or datasets
- All relevant peer-reviewed literature and research
- Grey literature including industry research and research from civil society, governmental organisations, non-profits and other organisations deemed relevant
- Media and other articles or research
- BeZero in-house models, frameworks and databases. These include geospatial and Earth observation evidence and techniques where relevant (see below)

BeZero maintains and continuously expands a curated database from peer-reviewed literature, industry research and third-party datasets totalling more than 23,000 sources as of August 2026. Our team of scientists and experts routinely search for relevant research and literature as part of all ratings processes. This ensures that BeZero ratings are based on the latest scientific evidence and consensus.

Pre-issuance projects by their nature may have limited publicly available documentation. Data collection for ex ante ratings typically involves access to both private and public information. In most cases ex ante ratings involve direct communication with the project proponent with scope for follow up questions and clarification. In some cases BeZero analysts may conduct a site visit.

Limitations

Carbon projects and carbon credit issuance are all subject to uncertainty and imperfect information, meaning their performance can never be fully measured. Some sources of uncertainty may be (partly) reducible such as reported emissions calculated from measurement and monitoring data. Some sources of uncertainty are irreducible (i.e. can never be completely eliminated) such as calculations of baseline emissions (which are modelled and cannot be observed). BeZero ratings and risk factor scores take account of this limitation i.e. uncertainty and information risk of this nature and the extent to which data is likely to be accurate and / or conservative.

Note that while BeZero independently assesses the credibility and reliability of reported data it does not validate or audit that data. A carbon ratings agency is not a standards body, validation and verification body, or project design consultant. It offers third-party opinions expressed as ratings on the evidence provided by these entities to support a project's climate claims.

How BeZero Uses AI to Deliver Ratings

BeZero uses artificial intelligence (AI) to support defined tasks in the production of BeZero Carbon Ratings, for example data collection and ratings analysis.

AI may assist with extracting and structuring information from project documents and other sources, locating and synthesising relevant evidence, supporting preliminary analysis (including the review of geospatial information) and preparing draft content for analyst review.

Core principles for AI usage

- BeZero's ratings process relies on a sub-sector specific methodology, including an underlying analytical framework ("operating manual"), and is led by a named analyst. The analyst is responsible for applying the operating manual, as well as evaluating evidence, exercising analytical judgement and determining rating conclusions where project level characteristics require inference, nuance, and idiosyncratic scientific analysis. Every rating is supported by senior scientific review and requires approval from the Ratings Committee. Every sub-sector methodology is updated on a regular basis. This approach reflects best practice in financial market bond ratings, because it balances the need for consistent outcomes based on a replicable framework, with the reality that every project is unique and expert judgement is

required to most accurately appraise project-level conditions. A framework-only approach risks treating every carbon project as the same, and a judgement-only approach risks lack of consistency. Our primary use of AI is to support data collection and analysis as it pertains to our framework, rather than making analytical judgements or conclusions.
- Information produced or identified using AI is linked to its underlying source, enabling analysts to verify it.
- AI outputs may be incomplete, inaccurate or inconsistent, may not capture relevant context or nuance, and depend on the availability and quality of source information. BeZero treats AI output as supporting material and does not rely on it as the sole basis for a rating decision.
- BeZero limits rating-related AI use to approved services and configurations subject to security, privacy and contractual controls. Providers are not permitted to use BeZero inputs to train their models.

Sector and country analysis

Top-down analysis focuses on the market sector of a proposed project, the country and/or region where it is based, and the methodology and standards applied. The bottom-up analysis focuses on interrogating the project's claims and the extent to which top-down risks are mitigated. Risks to carbon efficacy take account of all available evidence from top-down and bottom-up, and how these interact with each other.

Our assessments are based on all provided project documentation and information in combination with our in-house models, frameworks and databases. These include geospatial and Earth observation evidence and techniques where relevant, and a curated database from peer-reviewed literature, industry research and third-party datasets totalling more than 23,000 sources as of August 2026.

Beyond Carbon and ESG

The BeZero Carbon ex ante Rating is an opinion on the likelihood of carbon efficacy, meaning the rating scope is environmental (specifically climate impact) from an ESG perspective. The rating is not explicitly an opinion therefore on social or governance factors or other environmental factors. Governance is an important component of the project execution risk assessment. All ex ante ratings are expressed as a carbon rating alongside an opinion on project execution risk.

Note also that carbon credits are not economic activities within the scope of the Taxonomy Regulation (EU) 2020/852, no taxonomy-alignment percentage attaches to a rated item, and no correlation therefore arises. Carbon credits and BeZero Carbon ratings are also not assessed with reference to topics from the sustainability reporting standards developed pursuant to Article 29b of Directive 2013/34/EU.

However, social, governance or other environmental factors may be relevant when assessing carbon efficacy. This reflects the frequent interaction effects between environmental, social and governance factors in the context of a carbon project. Such interaction effects are considered within our risk factor and risk driver framework.

The ex ante carbon rating does not provide an opinion on governance directly. However, project governance is typically relevant when assessing a range of risk drivers such as project effectiveness and additionality, the reliability of monitoring protocols that underpin carbon accounting, and the mechanisms in place to ensure the long-term sustainability of the project.

Similarly, the project execution risk assessment provides our view on the likelihood a project is successfully implemented and reaches operational stabilisation. However, governance can have an important influence on the risk factors considered within project execution risk.

Our review process also includes a project governance assessment that reviews the accuracy and reliability of project disclosures, carbon accounting data, project boundaries, and registry data and operations.

Within the carbon rating, the Permanence risk assessment reviews anthropogenic risks in significant detail. This includes a review of project management and carbon rights which considers the existence and stability of rights, and the willingness and ability (legal, financial, or otherwise) to conduct project activities and to generate and commercialise the associated carbon credits.

Similarly, the ex ante rating is not an opinion explicitly on social risk and impact but it will consider the extent to which they may influence carbon efficacy. Stakeholder engagement, for example, is assessed in detail for community based projects to review stakeholder incentives and relations. This evaluates the presence and success of stakeholder consultations, grievance channels, benefit-sharing structures, and alternative livelihood activities through project-specific case studies, academic literature and project documents.

Standards and methodology screening

The ex ante rating is not an assessment of potential compliance with standards body rules or the accreditation process. As an assessment of carbon efficacy, the methodology and standards followed form only one part of the overall review. Nevertheless, the strength, effectiveness, and scientific integrity of those methodologies and the rigour with which each project has implemented them form an integral part of our rating analysis. This reflects that it is not necessarily the methodology in isolation that drives credit quality, but how a project applies it (which can sometimes vary considerably).

Our analytical approach evaluates the rules of each standards body and each methodology on an individual basis. This screening includes an assessment of methodology development and consultation (for an overview of why this is important, see our Insight on carbon markets methodologies). Further to this, we consider all deviations from methodologies exhibited by projects. For example, this can include deviations in baseline assessments, minimum sampling requirements, minimum project parcel size, monitoring, and verification requirements. Further, we consider the risks associated with projects that apply older or invalid methodologies, for example, due to outdated emission factors and global warming potentials.

Project-and vintage-specific analysis

Our bottom-up assessment considers all publicly available project documentation and data, including that provided by the standards body, registry, or project developer, and any information from third-party sources, and data sourced using our internal models, notably including proprietary geospatial and Earth observation evidence and techniques where relevant.

A vintage is the time period to which a project's GHG emission reductions or removals are associated and is a subset of a monitoring, reporting and verification (MRV) period. BeZero has always rated projects at the vintage level with each rating clearly tied to a rated vintage range.

BeZero can issue multiple ratings per project which correspond to differences in the rated vintages that map onto a project's monitoring and verification periods. A monitoring and verification period is the specific time span, which determines which credits the rating applies to. Although the carbon market has historically referred to vintages by calendar year (e.g. "2021 vintage"), monitoring periods frequently do not align to calendar years. This period informs our assessment of a project's eligibility for a post-issuance rating. As projects transition to newer, more robust methodologies and market labels are associated with specific methodologies, we can expect the market to increasingly move toward more precise date-based identification of credits. BeZero's approach reflects this direction: using the monitoring period date range as the authoritative anchor for a rating, rather than a simplified calendar-year label.

Multiple ratings to a project may be issued due to systemic gaps in data availability that affect eligibility for a rating across vintages, or due to fundamental step changes in a project's risk profile across its lifetime. A vintage-based approach allows us to incorporate changes in project boundaries, baselines, issuance and buffer contributions over time. It also enables a dynamic process for assessing the role of policy, changes in forestry investment landscapes, and other exogenous factors in reducing forest loss and productivity relative to the project.

Geospatial and Earth Observation

For all NBS projects, data and analysis from our Geospatial and Earth Observation team forms a core part of the analytical process. The team draws on a diverse set of data inputs, drawn from a range of sources including publicly available, via partnerships and from our in-house databases. These include:

- Spaceborne LiDAR, synthetic-aperture radar, and multispectral measurements from space agencies such as NASA and ESA. These provide medium to coarse resolution data with repeat global coverage. Such datasets support large-scale monitoring, and analysis over long historical time periods.
- We work with commercial providers to access multispectral measurements at high spatial resolutions. These data are used for tree crown segmentation, for monitoring of low canopy density, planting, and degradation.
- Commercial and in-country partnerships also provide access to national and global carbon maps, which we assess and apply as appropriate for the project context, as well as airborne LiDAR, which provides dense point clouds for structural canopy measurement, contributing to the calibration and validation of models for canopy height, cover and biomass.
- Through partnerships and collaborations globally, BeZero is accumulating a rich database of in situ measurements and ground data. The BeZero Carbon Plots Database is growing constantly, and numbers over 350,000 plots (as of October 2026). This inventory data is sourced from across the world and referenced against LiDAR, satellite, and market data. These data are key for understanding uncertainties in satellite-derived biomass estimates, project carbon stocks, and biodiversity.
- Other geospatial inputs include data on road and river networks, human demographics, land ownership and governance, soil and climate data, and biodiversity.

Analytical techniques employed

Our geospatial data inputs are combined in statistical and machine learning frameworks to inform project- and vintage-level risk associated with common practice, over-crediting, leakage and non-permanence. Specific analytical techniques include the following:

- Auditing project boundaries. The reliability of publicly available boundary data can be patchy. To overcome this, BeZero Carbon checks, corrects or reconstructs digital boundary data. BeZero has built the most complete spatial database of nature-based projects in the voluntary carbon market - over 3,000 projects across 20+ registries.
- Visual and automated contextualisation of project area conditions and surrounding landscapes over time, using 2D and 3D maps.
- Using geospatial and Earth observation data to interrogate each component of emissions calculations, including carbon stock densities, baseline scenarios, assessment of forest cover (and other vegetation) change, and evidence of activity displacement (leakage).

- Carbon stock assessments combine our extensive ground data with satellite-derived carbon maps, sourced from space agencies, national research institutes, academic labs, and industry partners.
- Assessments of forest cover and change use a range of data including in-house machine learning models. We use local labels to train and validate canopy cover models to improve classification accuracy and reduce uncertainty. In grassland systems, we monitor vegetation changes using indices such as the Enhanced Vegetation Index and Normalized Difference Vegetation Index.
- For ex post baseline assessments, we use statistically-matched dynamic baselines. This involves the pairing of pixels using proprietary models, guided by machine learning and expert review of local factors. These methods are adapted in the ex ante context to provide an assessment of deforestation drivers and the appropriateness of the project's reference region, compared to our matched controls.
- Additionality assessments are assisted through geospatial analysis of the extent to which project activities (e.g., tree planting) are common practice in the region.
- BeZero Carbon's fire detection tools leverage data from NASA, to help assess permanence risk at the project level. BeZero is contributing to the next-generation models for fire risk and committed emissions, working with ESA, academia, and other partners.
- BeZero Carbon's drought monitoring tools integrate climate reanalysis data from European Centre for Medium-Range Weather Forecasts with soils data from the International Soil Reference and Information Centre. Our next iteration forecasts risk to 2050 using climate projections from the Intergovernmental Panel on Climate Change's 6th Assessment Report. We also use climate projections to assess future risks to coastal projects from sea level rise, such as in the Mangroves sub-sector.

The BeZero Carbon Rating reflects the balance of evidence across all types of information, geospatial or otherwise. Subject to project-specific characteristics and evidence, our geospatial analysis may not be paramount in the final rating view if, for example, financial, policy or other analysis is deemed more decisive. In all cases, non-spatial data (e.g. buffer pool contributions) provide essential context. Where the quality of matching or of the underlying data is insufficient to support a conclusion, we say so and weigh the evidence accordingly rather than relying on it.

Assessing carbon risk factors

Sector methodologies

In the following sections, we outline the overall approach we take to assess carbon risk factors. This lays out the overarching analytical framework. We have detailed sector-specific methodologies for each sector. For more detail on the specific analytical approach to different sectors please consult our Ratings resources page. These documents provide a more granular perspective on the analytical techniques employed to assess carbon risk factors within each sector.

Additionality

The likelihood that a project's activities are materially different from the counterfactual or business-as-usual activities.

Our additionality assessment considers the risk that a credit does not achieve a tonne of CO_2e avoided or removed that would not have otherwise happened. Our assessment is independent of the accreditation process or requirements of standards bodies.

The ratings team undertakes its own research to assess additionality and how it relates to the quality of carbon credit projects. We will consider any evidence from the proposed or actual accreditation process that seeks to demonstrate additionality. This may include the appropriateness and results of any additionality tests applied. However, our assessment considers a much broader set of evidence and interrogates all aspects of additionality, regardless of how additionality is claimed under the rules of a standards body.

A holistic assessment of additionality

To assess additionality risk, we take a comprehensive approach that integrates various components of additionality including, but not limited to, common practice, carbon finance, regulatory and technology-based barriers, and the plausibility of alternative scenarios. This holistic approach is in contrast to the approach used in the accreditation process, which may often be more narrow in focus.

For every rated project in every sub-sector of the carbon market, we assess three risk driver categories of additionality.

Table 5. Definitions of BeZero Carbon risk driver categories for additionality assessment.

Risk driver category	Definition
Activity analysis	The prevalence and effectiveness of project activities within its anticipated scale and region.
Financial analysis	The accuracy and robustness underlying the project's financial claim, barriers, incentives and benefit-sharing structures.
Legal and policy	Risks to additionality arising from a lack of regulatory surplus.

Within each risk driver category, we consider several risk drivers, depending on the sector group (see Table 3), typically between seven and ten. Certain risk drivers may be specific to a project type or may be deemed not relevant to individual projects. However, the three risk driver categories are assessed

in all cases. Risk driver analysis in turn considers multiple sub-drivers, and dozens of parameters as required related to project activities, legal backdrop, finances, and policy.
We take account of myriad drivers of additionality - and how they may change over a project's lifetime based on vintage splits - to go beyond the binary approach taken by standards bodies and deliver a probability-based risk assessment. This reflects the fact that whether a project is additional is ultimately an opinion - one that relies on a mix of objective and subjective analysis that changes through time.

Table 6. Typical risk drivers of additionality assessed.

Activity analysis

Risk driver	Definition
Common practice	The pervasiveness of the project activities or technology at the project's scale within the region and sector, without the use of carbon finance.
Alternatives to the proposed project	Assessment of alternatives in the absence of the project, and their credibility and/or likelihood relative to the proposed project.
Project effectiveness	The degree to which the project activities are effective in achieving emissions reductions or removals.

Financial analysis

Risk driver	Definition
Prior consideration of carbon finance	Consideration of carbon finance prior to project implementation.
Investment analysis	The importance of carbon finance to the project's investment case and how well the case is supported.
Barrier analysis	The extent to which the project faces obstacles that may impact the implementation of project activities or technologies, and the role of carbon finance in overcoming them.
Benefit sharing	The incentive structure the project provides to achieve necessary buy-in from local stakeholders.

Legal and policy

Risk driver	Definition
Land and carbon rights	The rights to access and manage the project area, and to generate carbon credits.
Policy support	The attractiveness of legislative support mechanisms that are designed to promote or mandate project activities.
NDC and Article 6	The extent to which the project activity aligns with the host country's NDC and Article 6 strategy, and supports increased mitigation ambition by the host country.

Carbon accounting

The likelihood that or degree to which climate benefits are accurately or conservatively quantified.

Our carbon accounting assessment considers the risk or extent to which the carbon accounting underlying a credit does not quantify the climate benefits accurately or conservatively. Our analysis assesses the core building blocks of a carbon project's proposed credit issuance, interrogating how appropriate the calculations and assumptions are. This review includes an assessment of both over-crediting and leakage risks:

- Over-crediting: the risk that more credits are issued than tonnes of CO_2e achieved (or proposed to be achieved) by a given project due to factors such as unrealistic baseline assumptions or employing data with large uncertainties.

- Leakage: the risk that the carbon avoided or removed by a project is pushed beyond its boundaries, thereby undermining the degree of carbon efficacy. The two sources of leakage are market leakage and activity displacement.

Our assessment of carbon accounting is driven by the accuracy and appropriateness of each of the four components of credit calculation: baseline carbon stocks, project carbon stocks, leakage emissions and non-permanence deductions.

The relative contribution of each of the four components toward credit calculations depends on the project type and context. Such variability in the composition of credit calculations requires bespoke assessments of over-crediting, which take into account both top-down sectoral and national trends, and bottom-up project specifics.

Reconstructing the project's crediting structure

Our assessment of carbon accounting begins by reconstructing how a project arrives at or proposes to arrive its net issuance across the rated vintage period, so that the effect of each subsequent finding can be located within that structure.

Using project-reported values, we establish the project's total gross emissions reductions or removals as the difference between project-area carbon stocks or emissions under the baseline and project scenarios.

Separately, we construct the equivalent quantities on our own terms to obtain our best estimate range for comparison. Where our analysis of the risk drivers below leads us to a different view, we quantify the emissions reductions that our own assumptions would imply, and arrive at a BeZero view of net emissions reductions or removals for the rated vintages. The proportion of the project's claimed net issuance that our analysis does not support is the central output of our carbon accounting assessment, and the primary determinant of the risk factor score.

Three points of method follow from this. First, quantification is attempted wherever the evidence permits it, including where we conclude that a project's proposed accounting is conservative rather than aggressive. Second, non-trivial assumptions are sometimes unavoidable. Third, in many cases we also need to consider the range and shape of uncertainty, strength of the scientific consensus that underpins the estimations, the likelihood of other unknowns, and other more qualitative considerations. Where the evidence supports a range rather than a point estimate, we present a range, and in conditions of material uncertainty we prefer to do so.

For every rated project in every sub-sector of the carbon market, we assess two risk driver categories, with at least five risk drivers of carbon accounting (see Table 7). Further components are considered for certain individual sub-sectors. These include analysis of the components, drivers, and assumptions that underpin the baseline used, the reported greenhouse gas flows, and drivers of leakage.

Table 7. Definitions of BeZero Carbon risk driver categories for carbon accounting assessment.

Risk driver category	Definition
Direct accounting	The accuracy and robustness of emissions accounting within the project boundary.
Leakage accounting	The accuracy and robustness of emissions accounting beyond the project boundary.

Within each risk driver category, we consider several risk drivers, depending on the sector group (see Table 8), typically between five or six. Our baseline scenario analysis (where relevant) may evaluate multiple parameters related to the baseline, including the baseline model used, relevant reference data, and the drivers and agents of resource use, project activities and related emissions.

The leakage accounting assessment will consider activity displacement, market leakage and any ecological leakage.

Table 8. Typical risk drivers of carbon accounting assessed.

Direct accounting

Risk driver	Definition
Baseline scenario	The appropriateness of the modelling, monitoring, and characterisation of the baseline.
Project scenario	The appropriateness of the modelling, monitoring, and characterisation of project activities.
GHG conversions	The appropriateness of the variables used to convert the primary activities in the baseline and project scenarios into carbon dioxide equivalents.

Leakage accounting

Risk driver	Definition
Activity displacement	The extent to which emissions may arise through the displacement or transfer of activities outside of the project boundaries, as a result of project enforcement.
Market leakage	The extent to which emissions may arise due to the project's activities altering the supply and demand equilibrium.
Ecological leakage	The extent to which emissions may arise due to the project's activities and/or technologies altering ecological processes in the surrounding area.

Leakage

Leakage is the risk that emissions avoided or removed by a project are pushed outside the project boundary. The sources of such emissions vary from sector to sector, however, they can be broadly categorised into market leakage and activity displacement.

Market leakage occurs when a project's activities alter the supply and demand equilibrium, shifting market dynamics such that emissions avoided or removed by a project are offset by market activities

elsewhere. Meanwhile, activity displacement refers to a specific emitting activity being displaced more locally.

Both market leakage and activity displacement are unintended consequences that can undermine a project's carbon benefits. It is vital that project developers anticipate, monitor, and mitigate risks to ensure that each credit delivers a full tonne of CO_2e avoided or removed.

Key factors when assessing leakage risk

To break down our assessment of leakage risk, we assess the two components of leakage (activity shifting and market effects) and leakage mitigatory safeguards employed by projects.

- Components of leakage

Projects can be exposed to both market leakage and activity displacement. Our consideration of market leakage includes upstream emissions, lifecycle emissions and product supply and demand dynamics. Meanwhile, our consideration of activity displacement includes specific analyses on the drivers and agents of project activities, carbon stocks of areas where activities may be moved to, baseline conservativeness and models applied, etc. We also note that this form of leakage is typically most relevant to NBS projects.

In certain cases, ecological leakage can occur, such as when a project's activities lead to a growth in carbon stocks beyond its boundaries. An example of this is when the management of sustainable woodlots leads to continued growth of carbon stocks outside of a project, acting to mitigate negative leakage.

There is variation in how projects account for leakage, if at all. If risks are deemed to be negligible, leakage emissions are often assumed to be zero.

In line with our ex ante rating framework, we consider risks arising from both a top-down and bottom-up perspective. For the former, this involves consideration of global and national data on parameters such as product supply and demand. The latter pertains to the interrogation of project-specific information on factors such as historic land-use in the area.

This hybrid approach ensures that as broad a range of sources of potential leakage risk as possible are considered and accounted for in the rating.

- Safeguards

Once potential leakage sources are identified, we interrogate any safeguards employed (or proposed to be employed) by the project.

Possible safeguards include measurement of emissions in leakage belts, the creation of leakage management areas and mitigatory activities (e.g., development of alternative livelihoods), and the application of leakage discount factors, among others. For each of these safeguards, our analysis considers their appropriateness and conservativeness and finally, actual application.

When assessing the suitability of the discount factor used, a range of techniques may be employed. This could include comparing the employed value to other estimates of leakage rates in a project's region, whether derived from our own in-house estimates or those from top-down evidence and peer-reviewed literature.

Permanence

The likelihood that the climate benefits of the project will persist for the time committed.

Our rating assessment considers the risk that the carbon avoided or removed by a project will not remain so for the time committed. This includes credit issuance adjustments for non-permanence such as allocations to a risk buffer pool.

Our analysis of this risk factor considers the permanence of the contractual commitment of a given project and its proposed credits. A full assessment of these risks requires an understanding of: a) how long is actually committed to ensuring the carbon avoided or removed remains so, b) the mechanisms in place to guard against any losses, and c) the strength and accuracy of the claims made.

Key factors when assessing risk of permanence

To break down our assessment of permanence, we lay out the primary considerations and how they vary across different sectors and registries: commitment periods, risks, and employed safeguards.

- Commitment periods

In order to make an assessment of a credit's permanence risks, it is first necessary to determine the time period a credit commits to, and then whether the credit faces reversal risks. Commitment periods are the duration over which sequestration or abatement activities have permanence horizons, and may differ from crediting periods (the timeframes during which reductions or removals are eligible for issuance as verified carbon credits).

Across standards bodies rules on commitment periods vary and there is a lack of standardised terminology relating to how measurement, reporting, and verification (MRV) is conducted over multi-decadal timescales.

- Risks and safeguards: sectoral variation

We assess natural risks, anthropogenic (including legal) risks and mitigation as the three major components of permanence risk for Natured-based Solutions (NBS) projects. For Non-NBS projects, technical risks are the major components of permanence.

Table 9. Definitions of BeZero Carbon risk driver categories for permanence assessment.

Risk driver category	Definition
Natural risks	Risks to the permanence of project activities related to natural phenomena.
Anthropogenic risks	Risks to the permanence of project activities related to human activities.
Risk mitigation instruments	The mechanism or tools implemented to reduce risk to the permanence of project activities.
Technical risks	Risks to the permanence of project activities related to durability and crediting structures (only for Non-NBS projects).

Within each risk driver category, we consider several risk drivers, depending on the sector group (see Table 10), up to as many as ten. Certain risk drivers may be specific to a project type or may be deemed not relevant to individual projects.

Table 10. Risk drivers of permanence assessed for Avoided Deforestation projects.

Natural risks

Risk driver	Definition
Fire	Exposure and vulnerability of carbon stocks to fire events.
Extreme weather	Exposure and vulnerability of carbon stocks to extreme weather events.
Pests and diseases	Exposure and vulnerability of carbon stocks to pests and diseases.
Sea level change	Exposure and vulnerability of carbon stocks to sea level change.
Geological hazards	Exposure and vulnerability of carbon stocks to geological hazards.
Other natural risks	Exposure and vulnerability of carbon stocks to other natural risks.

Anthropogenic risks

Risk driver	Definition
Project management and carbon rights	The existence and stability of rights, and the willingness and ability (legal, financial, or otherwise) to conduct project activities and to generate and commercialise the associated carbon credits.
Encroachment risk	Unplanned or unanticipated human intrusion into the project area that leads to a loss of climate benefits claimed by the project.

Risk mitigation instruments

Risk driver	Definition
Risk buffer and mitigation	Mechanisms in place to safeguard climate benefits.
Stakeholder engagement	Measures employed to involve and include individuals and/or groups who may be affected by the implementation and activities of a project. This includes mechanisms to ensure landholder contentment and continued enrolment.

- NBS buffer pool requirements

Procedures for assessing and mitigating permanence risks also vary across the main market accreditors. GS requires all NBS projects to make a fixed contribution of 20% towards a pooled risk buffer. VCS, on the other hand, requires that such projects undertake an independent and bespoke

risk assessment to determine the proportion of credits which must be transferred to a global buffer pool.

The use of a buffer pool can mitigate against unforeseen losses in carbon stocks. We consider projects registered under VCS to follow best practice, given the requirements that both internal risks (e.g., project management) and external risks (e.g., natural hazards) are quantified and accounted for. Projects registered under Climate Action Reserve also require an independent risk assessment, however this involves many 'default' risk factors which can lead to project-specific details not being considered. Meanwhile, the American Carbon Registry has a buffer pool, yet also permits the use of a variety of insurance mechanisms. These can include bonds and letters of credit, and are designed to act as proof that a project developer could cover the costs of sufficient credits to offset a reversal event.

For NBS projects, understanding how and why buffer pool contributions are made is vital for making permanence assessments, especially since there is strong evidence that risk buffer rules are not always fully implemented.

Assessing project execution risk

Project execution risk refers to the risk that a project will fail to be fully implemented and reach operational stabilisation. Execution risk is assessed at the project level and applied as a standalone risk factor. This must be communicated together with the ex ante carbon rating. This risk is inherent in all projects, irrespective of how well they are designed and how experienced the project proponent/project implementation team is.

Table 11. Risk drivers of project execution risk assessed

Risk driver	Definition
Technical risk	Refers to the risk that the project's chosen technology, design, and configuration may not work as planned.
Project proponent past experience risk	An assessment of the project proponent's background and past experience is a critical component of our assessment of implementation risk. A new, inexperienced project proponent will increase project risk as compared to an experienced project proponent.
Financial risk	Refers to the risk that a project may not be implemented or operate as planned if it has not secured adequate funding.
Legal and regulatory risk	Encompasses risk to the project from current and evolving regulations, government policies, the permissions/licences required, rights over the project land etc.
Operational risk	Refers to the risk associated with operating the project as planned, post-implementation. This is an equally important component of the project risk assessment, as a well-executed project that cannot operate efficiently renders the project infeasible.

Time period of assessment for Project execution risk

Project execution risk is assessed until the project is commercially and operationally stable, typically when it starts issuing credits. If there is a 'ramp-up' phase, the risk assessment extends until the project reaches full capacity and steady-state issuance.

Inclusion of Delivery risk assessment

Project execution risk is a standalone risk factor of the ex ante carbon rating and its assessment must always be communicated together with the ex ante carbon rating. The rating report may also include a delivery risk assessment, whose details and analytical framework are outlined in the delivery risk assessment methodology. BeZero Carbon's delivery risk assessments are closely related to, yet distinct from, project execution risk assessments, and more details on their interaction can be found in the delivery risk assessment methodology. For the avoidance of doubt, wherever a delivery risk assessment is included in the rating report, this is not a component of the ex ante rating and as such does not necessarily need to be communicated together with the ex ante carbon rating.

Technical/technological risks

Technical/technological risk refers to the risk that the project's chosen technology, design, configuration may not work as planned. These could be technical (an untested DAC technology), design (choosing a wind farm location without adequate analysis of historical wind data) or configuration (an afforestation project in land historically occupied by tribes, without due consultation with them) etc. This risk is also referred to as 'technical feasibility' risk, though the term 'technical' is loosely defined in the context of voluntary carbon projects.

Our technical/technology risk assessment includes (but is not limited to) understanding :

- How proven/untested is the project's chosen technology?
- How simple/complex is the project's configuration - are there multiple moving parts/stakeholders involved or very few moving parts/stakeholders involved? Is this the first of its kind project or there are several examples of such projects being implemented locally, regionally, or globally
- Has the project conducted a detailed technical feasibility study?
- What were the challenges faced by such projects when (if) previously implemented? How were they overcome? Has the project planning/design adequately factored in the learning from this and made suitable adjustments to the project design/implementation?
- Has the project tied up all aspects of the project implementation including identification/contracts with subcontractors, vendors, specialists, etc.?
- Has the project procured rights to use the land/space required for the project?
- Has the project assessed risks of floods/fire/natural disasters relevant to the project area? How is it proposing to mitigate these risks?
- Has the project consulted and onboarded all relevant stakeholders and local communities?
- How long is the project implementation period? Does it have multiple phases or a single phase? What are the interim milestones and the processes proposed to monitor and report on progress?
- Has the project defined when/what would determine that the project has 'completed' implementation and moved into the 'operations' phase?
- How easy / difficult is it to replace any of the project implementation partners/suppliers/personnel involved in the implementation of the project? What is the associated cost/impact of such replacement? How does such replacement affect the project feasibility/implementation?

Financial risk

Financial risk refers to the risk that a project may not be implemented or operate as planned if it has not secured adequate funding.

Our financial risk assessment involves understanding:

- Has the project conducted a financial feasibility study to determine cash flows, IRR, etc.?
- Has the project made an assessment of the total funding required during the project implementation phase and the operational phase?
- What are the sources of funds and are there binding contracts/agreements to support availability of these funds?
- Are any of the funding sources linked to market risk/uncertainty (e.g., price of carbon credit, milestones linked, variable interest rate). If yes, how has the project planned for variations in the cost/quantum of funds available to the project?
- Is there a funding gap and if so, what are the plans to bridge this gap?
- Does the project proponent have prior experience in raising funds from the proposed sources? Do they have existing relationships with the financiers?
- Has the project entered into firm offtake agreements for its output/services/carbon credits, as applicable?
- How easy/difficult is it to replace these offtake partners in the event they back out?
- What is the nature and quantum of insurance covers the project is proposing to take?

Legal and regulatory risks

Legal and regulatory risks encompass risks to the project from current and evolving regulations, government policies, permissions/licences required, rights over the project land, etc.

Our assessment of legal and regulatory risks involve and understanding of:

- Does the project have legal ownership/lease over the project land granting it irrevocable right to implement the project?
- Are there any ongoing legal proceedings with respect to the legal ownership of the land and/or rights to develop the project?
- Is the project proponent entitled to commercialise the carbon reductions/removals?
- What permissions/licences are required for the project and have these been secured?
- Has the project received accreditation from a Standards body? Is the accreditation process based on a new/existing methodology?
- What government policies/regulations are applicable to the project at the national, state and local level and is the project in compliance with all these requirements?
- Is the regulatory/policy landscape well established or evolving? What are the expected changes to the regulatory/policy environment and the impact it may have on the project? Has this impact been adequately addressed?
- What has been the support/challenges faced by similar projects (if any) from a regulatory perspective?

- Does the project proponent have good relationships with local/regional/national government/regulatory authorities and what is the basis of this relationship?

- Is there an expectation that the government will support the project in case of any legal/regulatory distress? Have there been any previous instances of such support?

- How high is legal risk at a jurisdictional level with respect to property rights, contract enforcement, and the rule of law in general? To what extent is such risk relevant to the legal risk assessment at a project level?

Operational risk

Operational risk refers to the risks associated in operating the project as planned, post implementation. This is an equally important component of project risk assessment, as a well-executed project which cannot operate efficiently renders the project infeasible. We also assess the time to 'ramp-up' the project to full 'capacity' post implementation.

Our operational risk assessment comprises of understanding:

- How long will it take for the project to achieve 'stabilisation' post implementation?

- Does the project require specialist knowledge or expertise to operate it and if so, how is the project planning to acquire this expertise?

- Are there any specific post-implementation challenges likely to be faced by the project?

- Does the project have adequate financial resources to operate the project?

- What are the alternative funding sources for the project if there is a significant drop in the prices of carbon credits and/or a reduction/delay in the volume of credits issued by the project?

- Are there any planned changes to the project proponent/operators post implementation of the project? If so, what is the rationale for/impact of this on the project?

- How easy/difficult is it to replace any of the project operators/service providers/personnel.

Project proponent past experience

Assessment of the project proponent's background and past experience is a critical component of our assessment of implementation risk. A new, inexperienced project proponent will increase project risk as compared to an experienced project proponent.

Our experience of project proponent risk comprises understanding:

- Who is the primary project proponent and what is their background? Is the background relevant to / useful for the project?

- Who are the other stakeholders involved in the project and their respective roles?

- Do each of the stakeholders have a background/experience in their respective roles as regards the project?

- Does the project proponent have experience in implementing similar projects? How successful were they in their previous endeavours?
- Does the project proponent have experience in sourcing and managing finances of the scale required by the project?
- Does the project proponent have experience in operating similar projects (post implementation)
- Does the proponent have any outstanding legal/regulatory issues against them, and if so what could be the potential impact of these issues on the project implementation and its credibility?
- Does the proponent have a sound financial standing and are they able and willing to support the project in case of financial stress?
- Does the proponent have a track record of supporting projects/ventures in the past, especially during financial stress?
- What is the economic/other incentive for the proponent to continue supporting the project in the event of a distress?

A note on event risk

Event risk represents unforeseen events that have not been factored into the project planning. Such events are also referred to as 'force-majeure' events and are rare in occurrence. Natural disasters such as floods, fire, drought, hurricanes, are all examples of event risk, as are riots or civil disturbance. Unforeseen changes in regulations, policies, 'bans', etc. are also event risks.

BeZero Carbon's risk assessment does not factor in event risk as it is difficult to predict and occurrences are, by definition, rare.

Analytical process

The ex ante rating analytical process incorporates a number of distinct steps:

Step 1: Information and data review

BeZero Carbon will review the information provided and confirm if it is sufficient to be able to assess the project. Additional information may be requested as required. In the instance when the customer is not able to provide the required information, BeZero Carbon will not be able to undertake the rating assignment. Please refer to Appendix 1 for examples of the information required.

Step 2: Information and data processing

BeZero Carbon will assign a team of analysts to work on the rating assignment. The team will work closely with the data analytics team to standardise the carbon accounts using the BeZero Carbon Accounting Template and curate the information to make it comparable to internal databases, reference sources etc. The team will also work with specialists in the Geospatial and Earth Observation and/or Research teams as necessary to carry out an independent assessment of proposed project boundaries, natural hazards, policy context, etc. as required.

If required, the team will then prepare a list of questions and clarifications required from the project stakeholders.

Step 3: Risk factor assessment & proposed rating

The ratings team will carry out a top-down and project-specific analysis of project activities, claims, characteristics, and carbon accounts. This will follow a detailed assessment of additionality, carbon accounting, permanence, and project execution risk, following the framework outlined in the previous section.

The team may also interact with the project team and other stakeholders to refine its understanding and to seek additional information and clarifications. The team may also visit the project site if it (or the project team) believes will aid the team's understanding of the project activities and inform the assessment. Any information risks will, where appropriate, be reflected in our assessment of the relevant risk factor.

Combining risk factors using a multiplicative approach

For each risk factor, Ratings Analysts propose risk levels from 'aaa' to 'd'. BeZero's rating model equates a numerical score to each proposed risk level and combines these scores multiplicatively to calculate an overall carbon efficacy score.

While the individual components of the rating are important indicators of project performance across our three core risk factors, the overall rating is not a simple average or linear combination of these. Instead, our rating methodology combines the underlying risk factor scores multiplicatively, which means that a lower score in any one area can exert a stronger downward influence on the overall rating.

Headline ratings coming out below any individual risk factor is not unusual - but it depends on the exact combination of risk factors. Importantly the relationship is non-linear i.e. in a multiplicative model risk compounds. To illustrate, consider the following mathematical comparison: 3 variables scored at 0.5 leads to a weighted average of 0.5. In a multiplicative model 0.5*0.5*0.5 equals 0.125. That's the logic of a model that is approximating to the probability or likelihood that a credit is achieving a tonne of CO_2e.

It is also worth noting that there are 512 potential permutations (or 56 possible combinations), when aggregating 3 risk factors with 8 possible scores each (aaa to d). This means there are multiple ways to achieve each headline rating. And there is an implicit range within each headline rating notch. Note the final rating, above all, reflects our opinion on the overall likelihood of the credit achieving a tonne (which is the rating definition).

This approach is designed to reflect the principle that a material weakness in any single pillar, even where the others perform relatively well, can materially impact overall credit quality. The final rating also reflects qualitative judgment by the Ratings Committee, incorporating all available evidence and discussion, to ensure we accurately reflect the risks according to the rating methodology.

Step 4: Assigning an ex ante rating

The team will analyse the information provided, may meet the project proponent and other stakeholders and visit the project site if deemed necessary.

The ratings team will complete their analysis and prepare a draft report. This report will be peer reviewed by at least two other analysts who have not worked on the assignment. It will then be reviewed by the sector lead as well as members of the Ratings leadership team. The report thus finalised will be submitted to the Rating Committee for consideration, which is the sole body that can assign BeZero Carbon Ratings (ex ante or ex post).

The Rating Committee deliberates on specific projects and assigns the final rating/rating action ensuring the consistency in the application of ratings criteria, methodologies, and comparability of ratings across sectors and countries.

The Rating Committee is made up of members of the Ratings team. The committee is subject to quorum requirement and is chaired by one of the senior members of the Ratings organisation. Members of the GEO team may attend in the case of NBS projects.

All rating analysts are invited to attend and participate in the deliberations. At the committee, the lead analyst presents their analysis and rating recommendations. The Rating Committee's role is to interrogate their recommendation by asking questions and/or seeking clarifications. If the Rating Committee requires additional information or clarification which cannot be addressed at the meeting, the rating cannot be assigned until all outstanding issues are deemed as resolved by the committee. Unanimous approval by the Rating Committee is required for a final rating to be assigned.

We will then communicate the ex ante rating along with a detailed report on its assessment of the various risk factors, as detailed in the methodology document. BeZero Carbon's analysts will be available to discuss/explain the analysis and answer any questions.

There is potential for BeZero Carbon to receive new information and/or additional clarifications in these post-rating discussions. In such a case, the ratings team will prepare and submit an update note to the rating committee for its consideration. The team will then communicate the updated decision to the customer.

At this stage, the initial rating process will be completed.

Step 5: Rating validity and periodic review

A BeZero Carbon ex ante rating is a point in time assessment. IE the rating and associated analysis reflect the information available and assessment at the time of publication.

Ex ante ratings are not subject to continuous monitoring by default. This means that the rating will not be reviewed unless BeZero is requested and commissioned to do so. This includes instances where material new information emerges such as changes in the project design, performance or implementation, changes in regulation, or other event risks.

The ex ante rating may be reviewed and updated periodically - subject to request - until all the carbon credits generated by the project are issued. This implies that projects could have both an ex ante rating and an ex post rating over its crediting period. Ex ante ratings are always assigned to future unissued vintages. Table 12 shows sample vintage splits and ratings over a sample project's 30-year crediting period.

Table 12. Illustrative ex ante and ex post ratings

Year	Stage	Ex ante rating (vintage)	Ex ante rating (rating)	Ex post rating (vintage)	Ex post rating (rating)
2023	Implementation	2025–2055	A.pre with moderately high execution risk	n/a	n/a
2025	Operational, no credits issued	2025–2055	A.pre with moderate execution risk	n/a	n/a
2030	1st crediting period - 5 years	2030–2055	A.pre with very low execution risk	2025–2030	A
2040	2nd crediting period	2040–2055	A.pre with	2025–2040	A

	- 10 years		lowest execution risk		
2050	3rd crediting period - 10 years	2050--2055	A.pre with lowest execution risk	2025--2050	A
2055	4th crediting period - 5 years (All credits issued)	n/a	n/a	2025--2055	A

Exhibit 2. Illustrative example of a 5-year project.

Year of project	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031+**
Phase of project	**Phase 1** Design At design stage	**Phase 2** Implementation Being implemented	**Phase 3** Pre-issuance Operational pre-issuance All credits are ex ante		**Phase 4** Issued Operational and 1st vintage 2026–2027 issuance completed			**5-year project completed** 2nd and final issuance of vintage 2028–2030 completed
Crediting period coverage	Ex ante applicable for all project lifespan 2026-2030				Ex post applicable for 2026--2027 vintage only			Ex post applicable for full project lifespan 2026--2030

The periodic review/update is subject to request and dependent upon timely submission of updated information by the customer or project proponent.

The customer is responsible for providing BeZero Carbon with all information (as per the information list) to facilitate the annual review. In addition, the customer should keep BeZero Carbon updated with any material updates/changes to the project which could potentially have an impact on the rating.

At the completion of the annual review, BeZero Carbon will issue an updated report along with the updated rating, as applicable. The review report will be valid on the date of the issue and will follow the same protocol as regards access and redistribution rights.

Appendix I: Analytical independence

BeZero Carbon acts as an independent third party and is not conflicted in delivering the ex ante rating for the following reasons:

- BeZero Carbon's analysis and the resulting ex ante rating is limited to our assessment of the risks associated with the information provided and expressed as a risk metric.
- BeZero Carbon does not provide any recommendations or advice on how to change or improve the project.
- BeZero Carbon does not create standards for, develop, invest, or transact in carbon projects. The only exception is the retirement of carbon credits for the explicit purpose of compensating for its own carbon footprint.
- BeZero Carbon does not verify, validate, sanction or in any way influence the number credits issued by the project.
- BeZero Carbon is not incentivised commercially or in any other sense to deliver a specific rating outcome at the time of assignment or at any time in the future.
- All members of BeZero's analytical team, including the committee members, are commercially independent of the assigned ratings – i.e. their compensation, benefits, or performance measures are not in any manner linked to the ratings assigned.
- All BeZero staff, including all members of the ratings team, adhere to strict compliance procedures, including, inter alia, prohibition from holding and/or dealing in carbon credits and annual reporting. These standards are akin to standards practised by financial market rating agencies.
- BeZero Carbon has implemented a Rating Committee process across ex ante rating and ex post ratings processes, which mitigates the undue influence of individuals on the overall ratings process outcome.

Appendix II: Information required

BeZero provides a detailed list of requested and required information for all projects subject to an ex ante rating assessment. The list is tailored to each sub-sector and is regularly reviewed and updated. Full details are available on request.

The information requirements span all relevant project information and data including those related to:

- Key project information such as a description of the project and timelines, project boundaries, and details of project proponents and key stakeholders
- Detailed information and documentation related to the project activities, methodologies used, implementation and feasibility.
- Legal and regulatory information including ownership and land rights, regulatory or licensing requirements and other policy or legal issues.
- Financial data including budgets, financial models, funding needs and plans.
- Key stakeholders and counterparties and details on stakeholder relationships including consent mechanisms.
- Detailed information on project fundamentals and proposed carbon accounting including MRV, baselines, leakage, risk buffers etc.

Appendix III: Comparison between Red Flag Report and Rating Report

BeZero Carbon offers two primary types of ex ante reports.

Ex ante red flag reports are an alternative to **ex ante ratings** for customers who need a less granular assessment or who wish a shorter turnaround time.

A **BeZero Carbon Red Flag Report (RFR)** provides a high-level, screening assessment of potential risks or red flags associated with a carbon project that is in development. Delivered on a rapid turnaround, there is an emphasis on identifying potential red flags and areas of outstanding uncertainty.

Although the same five risk factors are scored, the risk factors assessment and red flag report are less detailed and there are no ratings.
The table below summarises the difference between the three ex ante reports.

	Red flag report	**Ex ante rating report**
Executive summary	✔	✔
Carbon risk factor score and assessment	✔	✔
Detailed risk factor analysis	**Red flag screening**	**In-depth research**
BeZero Carbon ex ante rating	X	✔
Project execution risk	✔	✔

Appendix IV: Additional reading

Check out the ratings resources page on our website to find links to all of our published methodologies, in addition to our series of risk factor assessment frameworks, our frameworks for assessing project methodologies and country-level risks, deep dives on factors influencing the carbon efficacy of projects in various sectors, and more.

Appendix V: Methodology review policy

All BeZero methodologies are live and current, with versioning logs at the end of each document. The ex ante rating methodology is comprehensive and holistic and is not knowingly subject to major or structural shortcomings.

The methodology is subject to periodic review, and at least once annually. The need for revisions will consider a range of factors including:

- Methodology review and evaluation. BeZero continuously reviews emerging data and research on the carbon market. BeZero will assess any evidence indicative of structural weaknesses in the framework or systemic risks that are not appropriately captured.
- Evolution in the market dynamics and scientific best practice. Evolutions in the scientific consensus and market infrastructure that underpin carbon markets may warrant methodological revisions (e.g. the definitions or conventions used for vintages).
- External regulatory and asset framework shifts where relevant. Shifts in the legal basis, regulatory architecture or accounting conventions that underpin carbon markets may warrant methodological revisions (e.g. the definitions or conventions used for risk concepts such as additionality, durability or permanence).
- Periodic review. All active frameworks are reviewed periodically (at least annually) to ensure continued robustness and effectiveness.

Revisions to the methodology will be deemed material or non-material.

Non-material changes typically refer to minor updates such as administrative fixes, editorial clarifications that do not alter the underlying analysis. Other potential non-material changes may reflect an elaboration or expansion of the risk assessment framework. Non-material revisions are published routinely as needed.

Material changes typically refer to a fundamental shift in the analytical framework, scoring models, rating scope and definitions, or key rating assumptions that could reasonably alter an existing credit rating outcome. BeZero will undertake an impact assessment when material revisions are proposed. Impact assessments will evaluate the expected portfolio-wide impact, estimating the proportion of ratings that might migrate (upgrade or downgrade) as a result of the revised criteria.

Any change to the rating methodologies are led by our Lead Analytical Officer and approved by a formal Analytical Committee composed of senior personnel from the analytical team. We also consult with our external advisory board on such matters as required.

Changes to methodologies are tracked and logged. The version history of this methodology is available at the end of this document.

Stakeholder consultation

BeZero engages regularly with a wide range of market stakeholders. Feedback is welcome and will be considered as part of the periodic review process. BeZero in some cases may consult with stakeholders via ‘request for comment’ or equivalent processes when considering material methodology revisions.

Appendix VI: EU ESG ratings regulatory disclosures

The following summarises where in this document to find the minimum disclosure requirements under Regulation (EU) 2024/3005 on the transparency and integrity of Environmental, Social and Governance (ESG) rating activities. Information referenced below relates to the disclosures described in point 1 of Annex III to Regulation (EU) 2024/3005*.

Disclosure type	Disclosure requirement	Location(s)
Rating Product Disclosures	Ratings objectives	BeZero carbon ex ante rating definition (p5-6)
	Considering E/S/G factors	Beyond carbon and ESG (p14-15)
	Weighting E/S/G factors	Beyond carbon and ESG (p9)
	Topics included in E/S/G factors	Analytical framework (p11); Risk factor definitions (p12); Holistic assessment (p12-13); Beyond carbon and ESG (p14-15); Assessing carbon risk factors (p18-25)
	Ratings values	BeZero carbon rating definition (p5-6)
	Considering international agreements (including the Paris Agreement)	Holistic assessment (p12-13)
General Methodological Disclosures	Overview of methodologies	BeZero Carbon Rating Methodologies, BeZero carbon ex ante rating definition (p4-6); Holistic assessment (p12-13); Project-and vintage-specific analysis (p15); Updates and reviews (p39)
	Industry classifications	BeZero Carbon Sector Classification Methodology (p5)
	Overview of data sources	Holistic assessment (p12-13)
	How we use scientific evidence	Holistic assessment (p12-13)
	How we use AI	How BeZero Uses AI to Deliver Ratings (p13-14)
Limitations in data sources, methodologies and information	Limitations in data sources and methodologies	Data source and limitations (p12-13)
	Limitations on information available to BeZero	Data source and limitations (p12-13)

*Note: Other disclosure requirements can be found here.

Updates and reviews

Version number	Date	Description
1.00	14/07/23	Initial release
2.00	03/11/23	Addition of Appendix III
2.01	31/01/24	Revised information risk factor scoring; Formatting updates
2.02	03/09/24	Removal of information risk as a discount factor
3.0	17/02/25	Updated risk factor framework
4.0	22/07/25	Updated BeZero Carbon ex ante rating structure
4.01	18/05/26	Minor updates and clarification of delivery risk assessment and project execution risk
5.00	27/10/26	Formatting updates, edits and revisions to align with ESMA regulatory requirements including methodology review policy and required disclosures.

Disclaimer

This document (the "**Document**") is for information purposes only. The information in the Document has been provided to the best of BeZero Carbon's knowledge, without warranties of any kind, either express or implied, including, without limitation, warranties of merchantability, fitness for a particular purpose and non-infringement. BeZero Carbon shall not be liable for any errors or omissions in the information. BeZero Carbon has no liability to you for the correctness, timeliness, or completeness of the information. For the avoidance of doubt this Document doesn't constitute an offer. Under no circumstances, including but not limited to negligence, shall BeZero Carbon or its affiliates be liable for any direct, indirect, incidental, special or consequential damages, even if BeZero Carbon has been advised of the possibility of such damages.

The Document may contain information related to BeZero Carbon ex ante Rating. The BeZero Carbon ex ante Rating (the "**ex ante rating**") represents BeZero Carbon's opinion, as of the date of the rating report, on the likelihood that carbon credits which may be issued by a project will achieve a tonne of CO_2e avoided or removed. The ex ante rating (together with the rating report), sets out BeZero Carbon's opinion on a particular carbon credit or project based on information that has been provided to BeZero Carbon or information that is publicly available as at the date expressed and BeZero Carbon shall have no liability to anyone in respect of the ex ante rating. The ex ante rating (together with rating report) is a statement of opinion as at the date expressed and does not constitute a solicitation, recommendation or endorsement by BeZero Carbon or any third party to invest, buy, hold or sell a carbon credit and/or to invest in a specific project. The ex ante rating (together with the rating report) neither recommends nor will recommend how a project could achieve a particular carbon credit rating outcome. The ex ante rating may relate to future events, the outcomes of which are inherently uncertain and subject to a range of factors and risks which may alter the accuracy or relevance of the ex ante rating at any time. The ex ante rating should not be relied upon and is not a substitute for the use of your independent skill and judgement in relation to the making of investments or other business decisions.

If you have any questions about BeZero Carbon, the BeZero Carbon ex ante Rating, the BeZero Carbon ex ante Rating methodology, the BeZero Carbon Rating, the BeZero Carbon Rating methodology, qualifying criteria, rating process, the BeZero Carbon Markets platform or otherwise please contact us at: commercial@bezerocarbon.com.