Credit rating process

Governance

BeZero

Credit rating process

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BeZero Carbon Rating analytical framework and process

A carbon credit is a contract certifying a commitment that 1 tonne of CO_2e (i.e. a tonne of carbon dioxide or an equivalent amount of other greenhouse gases) has been removed or avoided for a given period of time as a direct result of carbon project activities.

This commitment typically relies on 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 standards bodies, and in some instances have additional validation by industry initiatives such as the ongoing Integrity Council for the Voluntary Carbon Market. Some standards 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. 1 tonne of CO_2e avoided or removed, and credits are transacted and eventual climate claims made upon that basis.

However, in our view, solely relying on a binary assessment to understand carbon efficacy or carbon credit quality is insufficient. Whether or not 1 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. The heterogeneous nature of engineered and nature-based avoidance and removal projects also prohibits perfect fungibility.

In order to assess the CO_2e achieved with confidence, we believe that all carbon market participants (e.g. developers, investors, intermediaries, and end buyers) of carbon credits need information and tools to understand the risks and uncertainties present. This is equally important across the various phases of project development, from when a project has yet to issue any carbon credits to those parties interacting with credits that have been issued.

We have designed an approach to assessing the carbon efficacy risk for 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.

BeZero Carbon Rating definition

A BeZero Carbon Rating (BCR) represents our opinion on the likelihood of a carbon credit achieving 1 tonne of CO_2e avoided or removed. It is an opinion on the greenhouse gas efficacy of a carbon credit.

The BCR is conveyed using an eight-point alphabetical scale ranging from 'highest' to 'lowest' likelihood.

Table 1. BeZero Carbon Rating scale and definitions

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

The rating is not an assessment of:

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

- Other specific elements 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 sustainable development goals (SDG) claims. To the extent that such effects may compromise carbon efficacy, they would be taken into consideration, e.g. when considering stakeholder relations and the effect on non-permanence or leakage risk.

Steps in the rating process

The BeZero Carbon Rating analytical framework encompasses three broad elements:

- **Project governance assessment**: This pre-rating project analytics and governance screening includes: a review and standardisation of project data; governance screening of carbon accounts and issuance; verification against double counting; assessment of project claims; and application of our qualifying criteria to test eligibility for a BCR.
- **Carbon efficacy assessment**: A holistic review of all evidence across all risk factors in the BCR methodology.
- **Aggregated risk assessment:** this includes rating assignment and ongoing monitoring.

The following diagram shows our analytical framework.

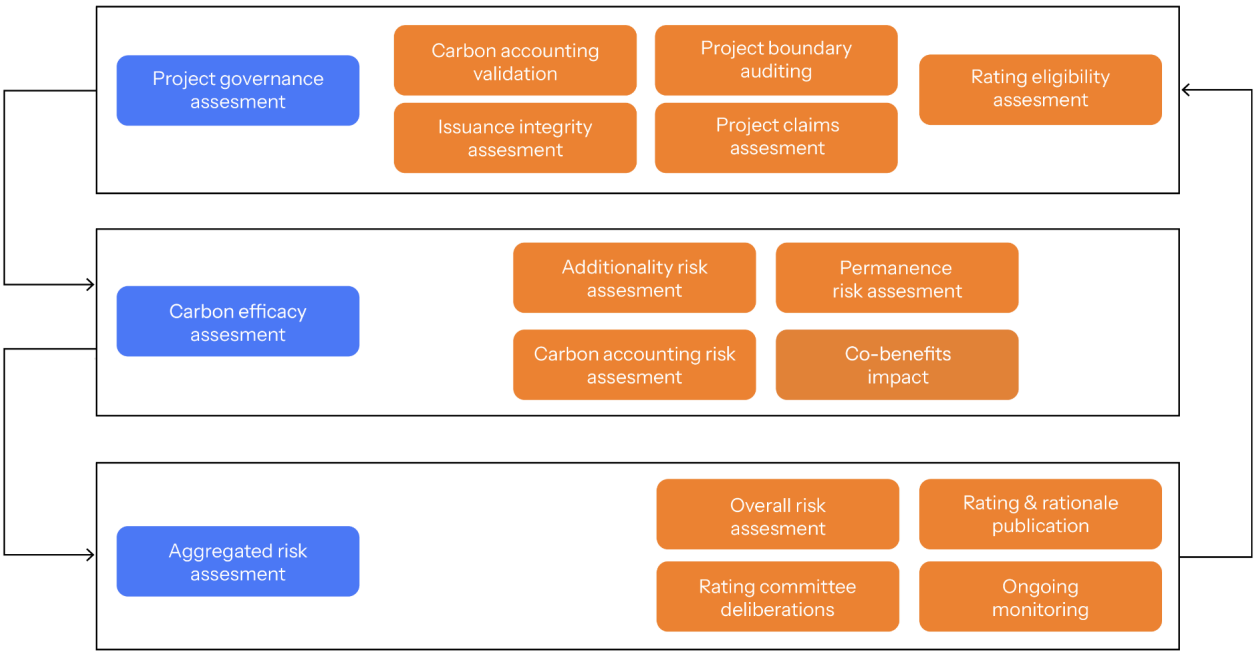

Figure 1. The various stages of the analytical framework that lead to a BeZero Carbon Rating.

Introduction to risk factor framework

The BCR follows a robust analytical framework involving a detailed assessment of three critical risk factors affecting the quality and carbon efficacy of credits issued by the project:

Additionality: The likelihood that a credit purchased and retired leads to a tonne of CO_2e being avoided or sequestered that would not have otherwise happened.

Carbon Accounting: The likelihood of having carbon accounting consistent with achieving a tonne of CO_2e avoided or removed.

Permanence: The likelihood that the carbon avoided or removed by the project will remain so for the time committed.

Across a carbon credit's lifecycle, BeZero Carbon's assessment of carbon efficacy risk looks at the same risk factors for ex post ratings, ex ante ratings, and the BeZero Scorecard. The following table summarises how and where risk factors overlap across the three products.

Table 2. The overlap of risk factor assessments across a carbon credit's lifecycle

Ex ante ratings	Ex post ratings
Additionality	Additionality
Carbon accounting	Carbon accounting
Permanence	Permanence
Project execution	*Not applicable*

Table 3. 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
Standalone carbon rating	**bbb (Moderate likelihood)**	**-**
Project execution	bb	n/a
BeZero Carbon Rating	**Be (Low likelihood)**	**BBB (Moderate likelihood)**

Holistic assessment

The assessment of a carbon credit's efficacy includes detailed project-specific, bottom-up, and top-down analysis to provide a comprehensive assessment of risk.

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.

BCR opinions, therefore, incorporate a comprehensive review of the fundamental drivers of risks associated with carbon efficacy at a project and vintage level, including, natural, technological, economic, social, legal, and regulatory factors.

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 top-down and bottom-up evidence, and how these interact with each other.

Our assessments are based on all available project documentation 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 10,000 sources as of July 2024.

Standards and methodology screening

The BeZero Carbon Rating is not an assessment of 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 they have been implemented by each project 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 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 VCM methodologies). Further to this, we consider all deviations from methodologies exhibited by projects. Moreover, we consider the risks associated with projects that apply older or invalid methodologies, for example, due to outdated emission factors and global warming potentials.

Monitoring of registry operations and credit tracking also form part of our analytical process. We screen registry and standards body rules and processes, and take into account any strengths or weaknesses, in our assessment of relevant risk factors. This includes reconciliation of data and risk buffer rules (see our report on buffer pools) and their potential implications for over-crediting and non-permanence risk, respectively. Further details can be found in the section on project governance assessment.

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, information from third-party sources, and data sourced using our internal models, notably including proprietary geospatial and Earth observation evidence and techniques where relevant.

Vintage-level assessments are made on two fronts:

- **Project reporting and crediting**: Our analysis ensures that, across each ratable vintage for a project, we identify whether projects correctly issued credits towards the market and buffer pool and that where credits are transferred, vintage labelling correctly maps onto cancellation certificates.

- **Risk factor assessments**: For each of our carbon efficacy risk factors, our analysis spans each ratable vintage of a project. This 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 Nature-Based Solutions (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, including but not limited to airborne and spaceborne LiDAR, synthetic-aperture radar, and multispectral measurements, with spatial resolutions ranging from centimetres to kilometres, and temporal frequency and coverage from days to decades.

Other geospatial inputs include data on road and river networks, human demographics, land ownership and governance, soil and climate data, and biodiversity. We also draw on our extensive database of ground-measured carbon, spanning thousands of forest inventory sites globally. These geospatial data 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.

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 more decisive. In all cases, non-spatial data (e.g. buffer pool contributions) provide essential context.

Project governance assessment

Data collection, assessment, and governance

A historical lack of top-down market standardisation on the reporting structure of carbon accounting has led to each project's public data and methods being reported in a unique way. Further, we find multiple examples where the calculations behind vintage-level credit issuance cannot be recreated from the information available in the public documentation.

To enable better governance of crediting data which is also fungible across the market, we have built a standardised model that can be applied to any project type and any standards body. The BeZero Carbon Accounting Template is a simple but powerful tool. It consists of the four key components required to calculate issuance:

- Baseline assumption
- Project net emissions
- Leakage
- Risk buffer allocation

In certain cases, a fifth component accounts for uncertainty discounts applied by a project, which is often the case for NBS projects. These building blocks are designed to be the highest level of categorisation that capture all elements that feed into the calculation of potential issuance while being applicable to all project types in the market.

Underlying each component are calculations ranging in complexity and depth depending on the project. For example, a zero baseline is assumed for many removal projects, whereas baseline assumptions for NBS projects may require multiple stages of cleaning and structuring by our data collection team. We collect each component at a vintage level given that variations can occur within a project's lifetime.

Aggregating these data is the first step to enable downstream assessments of project claims, auditing of project boundaries across the various vintages, verification of registry-reported data, and assessments of double counting.

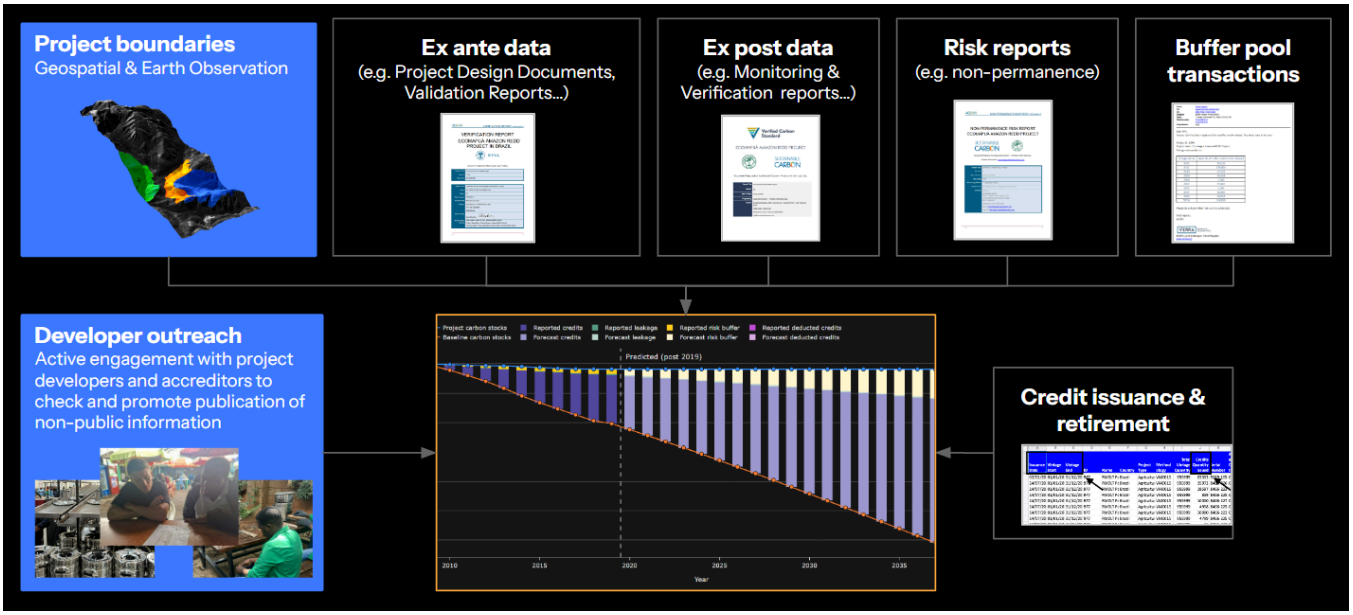

Figure 2. Aggregation of data to BeZero's standardised data template.

For each sub-sector, BeZero Carbon has built additional modules that supplement the basic Carbon Accounting Template.

For every project, we impose a strict governance structure that ensures data integrity. First, all project documentation is labelled according to its version and vintage. The project data are then cleaned and structured to fit the key components underlying potential issuance and the sub-sector Carbon Accounting Template modules. Data validation checks are made against the registry-reported issuance (see registry issuance) and a developer outreach process is initiated in cases where reported data do not reconcile or are poorly disclosed. Finally, each project's individual Carbon Accounting Template and associated modules are peer-reviewed by two data analysts, and the underlying data are stored in a central data store. Each project's Carbon Accounting Template is subject to continual updates to reflect changes in project documentation, new issuance, and cancellation of credits, for example, and at each instance, subject to peer review.

BeZero has developed an automated system that monitors existing, new, and deleted documents within four major standards bodies: American Carbon Registry, Climate Action Reserve, Gold Standard, and Verra. Changes are detected within 24 hours, and a notification to review the project and its documents is triggered. For rated projects outside of these standards bodies, a monthly manual check is performed.

Assessment of project claims

Once the project Carbon Accounting Template is created and approved at review, the data are used to assess project claims of emissions removals or avoidance. This step of our assessment is entirely project specific, and we assess claims at the vintage level. For example, we assess whether credits reported for each vintage within monitoring and verification documents correctly detail the baseline, leakage, and non-permanence assumptions laid out by the project, and accurately reflect registry issuance.

Where project claims cannot be verified or are incorrect, this informs our risk factor assessments and drives lower ratings. Where project claims deviate from ex ante forecasts, we identify the drivers of change.

Project boundary auditing

For all NBS projects, digital information on the spatial extent of carbon accounting is important for our independent assessment of carbon efficacy, both historically and in our assessment of future risk. Digital boundaries (e.g. KML, Shapefile, GeoPackage, GeoJSON) are required for the project area, and may also be required for the leakage belt and/or reference region(s), depending on the methodology.

To obtain these boundaries, we first check if they are published on the registry or elsewhere in the public domain (e.g. on a project proponent's website). We continuously monitor registry websites for updates (see data collection, assessment, and governance section). Where available, we audit the boundaries by comparison to images embedded in project documentation for the relevant vintage, and by reference to area units and locations stated in project documents.

We find that around 30% of nature-based projects do not make their project area boundaries available in digital formats, either on the registry or through the project proponent. Of those that do, around 20% require correction by BeZero, for example, because the project area has reduced or been extended since publication of the boundaries. Moreover, we find that over 90% of REDD projects do not make leakage belts and/or reference regions available in digital formats.

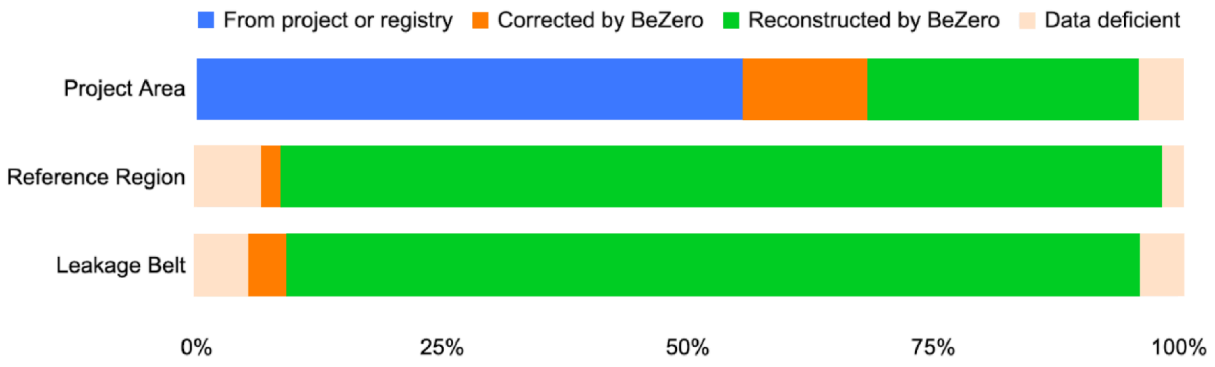

Figure 3. Public availability of digital boundary data for 177 nature-based projects rated by or in the vicinity of projects rated by BeZero Carbon (as of August 2023). Many project areas, and the majority of leakage belts and reference regions, require in-house correction or reconstruction by our geospatial analysts.

Our method for the correction or reconstruction of project boundaries, where necessary, starts with georeferencing control points (e.g. map features such as graticules, natural features such as coastlines or rivers, or man-made features such as road junctions) in images embedded in project documents. Our team then applies graphical techniques to filter and sharpen the available imagery, followed by algorithms to extract the project boundaries in a digital, vector format. Where these semi-automated procedures are insufficient, we may trace the boundary by hand. In some cases, sections of the boundaries may follow roads, rivers, political borders, concessions, or easements, or other spatial data, in which cases we draw on our geospatial database of such features to assist in accurate delineation. Similarly, we use high-resolution satellite or aerial imagery where boundary demarcations are clearly visible from above. In all cases, we check our results for consistency with the area units and depictions in project documents.

Where it is not possible to reliably reconstruct project boundaries through the techniques described above, we contact the standards body and/or project proponents to request that the required information be made publicly available. Any remaining uncertainty regarding the exact location of the project is considered in our interpretation of geospatial evidence and may influence our assessment of information risk.

Double counting

We audit project boundaries (for NBS) not only for the specific project being rated, but also for any project operating or under development within a radius of 50 km. This is important for the landscape context of common practice and baselines assessments, and also provides a spatial check on whether the same land is or has previously been included by more than one project, or by the same project across more than one standards body.

As part of BeZero's data collection, assessment, and governance process, we assess risks of double counting, which typically emanate from three key sources:

- **Transfer of projects between standards bodies:** Where projects transfer between accreditation entities, our data analysis evaluates whether credits have been accurately cancelled to facilitate the transfer. This assessment checks for credit transfer and cancellation certifications by vintage and credit quantity.
- **Allocation of credits towards national registry or buffer structure:** In certain instances, for projects to participate in the voluntary carbon market, a set allocation of their credits must be issued towards a national registry or buffer system to support national greenhouse gas targets or permanence safeguards, respectively.
- **Transformation of ex ante or provisional credits to ex post credits:** Under certain standards bodies, projects may be able to issue ex ante (also called provisional) credits and retire these. To ascertain that these credits are not double counted once project activities have materialised, we ensure that the credits associated with each vintage batch are retired in only a single instance.

Our double counting risk assessments interrogate whether projects have accurately reported, issued, and cancelled credits as part of the above three processes. Where there are data discrepancies or uncertainties, projects are deemed to have eligibility, over-crediting, and/or information risks. As part of our double counting assessments, we scrutinise the unique serial codes of each credit (and credit batch) on the registry of each standards body.

Registry issuance

Another important aspect of our pre-rating analytics and data governance assessment is a review of the integrity of reported issuance. This includes validation checks of project-reported data against registry issuance. Here, we evaluate four key variables:

- Project monitoring, reporting, and verification (MRV) crediting volumes and vintages align with registry issuance towards the market
- Project-reported buffer credits have been accurately deposited towards the buffer pool
- Credit status within the buffer pool for cancellations or ‘hold’
- Credit cancellations for the purpose of reversals or transfers

This step enables us to determine whether over-crediting risk exists due to elevated and undocumented issuance, whether permanence risk exists due to under-resourcing of the buffer pool or credit cancellations, or whether double-counting risks exist.

Rating eligibility

For projects to qualify for a BeZero Carbon Rating, they must meet our primary qualifying criteria. These criteria are centred around quality and transparency. These basic criteria alongside the BeZero Carbon Accounting Template allow us to build a standardised starting point for any project, registered to any standards body.

The primary criterion is that the project has applied an additionality test, or has otherwise provided sufficient information on how it is deemed additional. The other criteria centre on third-party auditing

and public disclosure of sufficient information to assess the project's claims. All three act as limiting factors for whether BeZero accepts a project to be rated at all.

Additionality - i.e. whether, in the absence of carbon revenues, the avoidance or removal activity would be viable - is the founding principle of a carbon credit project. Consistent with this, additionality is a limiting factor for the BeZero Carbon Rating from the outset of the analytical process: as of July 2023, 41 of 129 ineligible projects assessed to date were deemed not rateable due to poor additionality disclosure and/or reporting.

For all projects, sufficient public disclosure of project claims includes crediting calculations, registry issuance (inclusive of buffer pool allocations), project boundaries, and applied methodologies (and their versioning).

Through these primary eligibility criteria, we ensure that all project validation and verification documentation as well as registry operations related to the project are traceable and are governed by standards body processes for oversight. Where a project fails to be sufficiently transparent or conduct a third-party audit, these projects are considered ineligible for a rating.

Continuous monitoring of eligibility criteria

To ensure that our ratings remain up to date, we monitor if a project meets our eligibility criteria on an ongoing basis. This ensures that minimum criteria around project transparency and disclosure are continuously met.

Should the availability of documentation change once a project has been rated, BeZero Carbon has a robust due diligence process to understand the reason and if such changes are permanent. This includes the following steps:

- BeZero Carbon will contact the registry, certification bodies, and the project developer to identify underlying reasons for change in document disclosure, if data will be shared publicly again, and within what timeframe.

- BeZero provides these organisations two weeks to restore the availability and disclosure to levels consistent with our eligibility criteria.

- If documents remain unavailable after this two week period, the rating will be placed on 'rating watch'.

- BeZero will continue to make reasonable efforts to follow up with the project developer, registry, and certification bodies to determine if and when the documents will be made available in public domain. We will allow another four weeks for this process.

- If during this period, the relevant data and documents are shared again in the public domain, we will verify that these documents contain required information to meet our eligibility criteria. Where projects meet our criteria again, the rating will be removed from 'rating watch'.

- If the relevant documents and information are not restored in public domain within the aforementioned timeframe, the project will no longer be eligible for a BeZero Carbon Rating. Accordingly, BeZero Carbon will 'withdraw' the rating.

Aggregated risk assessment

Overall rating view and limiting factors

Rating Assignment

We make a preliminary view of carbon efficacy risks based on three core pillars (or risk factors). To assess the likely overall rating we combine the three risk factors multiplicatively and the Ratings Committee assigns a final rating with reference to the combined output score and rating boundary guidelines.

Steps in the rating assignment process:

1. For each risk factor, Ratings Analysts propose risk levels from 'aaa' to 'd'.
2. 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.
3. The BeZero Carbon rating committee assigns the final risk levels and overall carbon efficacy score, considering all available evidence presented by the analyst and discussed in committee.

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 credits issued by that project if that is deemed appropriate.

Internal peer review

The lead analyst completes their analysis and prepares a draft report. The draft analysis incorporates detailed input from the Geospatial and Data Analytics teams. This draft report is also peer-reviewed by at least two other analysts who have not worked on the assignment.

Peer review is an interactive process aimed at ensuring uncertainties are investigated further and conclusions are stress tested. Following completion of the peer review process, and when consensus is reached among the lead analyst, geospatial analysts, and peer reviewers, a final draft rating report is prepared.

The report thus finalised is submitted to the Rating Committee for consideration, which is the sole body that can assign BeZero Carbon Ratings (ex ante or ex post).

Rating Committee

The BeZero Carbon Rating Committee contains hundreds of years of scientific, carbon, and markets experience. We believe that full-time specialists scrutinising every rating decision gives the most rigorous assessment.

The Rating Committee is made up of members of the Ratings team and senior members of the Research team. The committee is subject to quorum requirements and is chaired by one of the senior members of the Ratings and Research organisation (e.g. the Director of Carbon Ratings or Chief Research Officer). Members of the Geospatial and Earth Observation team must attend in the case of NBS projects. Peer reviewers are also expected to attend committee meetings relevant to the projects that they have been assigned to.

All rating analysts are invited to attend and participate in the deliberations. At the committee, the lead analyst presents their analysis and rating recommendation. 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 resolved by the committee. Unanimous approval by the Rating Committee is required for a final rating to be assigned.

Updates and reviews*

Version number	Date	Description
1.00	01/06/22	Initial release
1.01	06/07/22	Updated to reflect changes in individual method documents
1.02	31/08/22	Updated to reflect inclusion of sector and portfolio review process and modified Risk Scoring Bucket designation
1.03	24/10/22	Updated to reflect new risk factor terminology
1.04	07/11/22	Updated to reflect new disclaimer and rating process text
1.05	22/11/22	Updated contact details
1.06	13/03/23	Rating scale transition from seven-point scale to eight-point scale
1.07	03/08/23	Updated to provide more detail and granularity to the existing methodology
1.09	21/12/23	Updated risk factors: removed weightings and perverse incentives. Introduction of the interaction between ex post and ex ante ratings
1.11	15/05/24	Updates to application of ratings watch

**Content extracted from the BeZero Carbon ex post Ratings methodology.*

Disclaimer

The BeZero Carbon Rating of voluntary carbon credits represents BeZero Carbon's current opinion on the likelihood that carbon credits issued by a project achieve a tonne of CO_2e avoided or removed. The BeZero Carbon Rating and other information made publicly available or available through the BeZero Carbon Markets platform ("Content") is made available for information purposes only. The Content and in particular the BeZero Carbon Rating sets out BeZero Carbon's opinion on a particular carbon credit or project based on publicly available information as at the date expressed and BeZero Carbon shall have no liability to anyone in respect of the Content, opinion and BeZero Carbon Rating. The Content is made available for information purposes only and you should not construe such Content as legal, tax, financial or investment advice. The Content 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. The Content is not a statement of fact and should not be relied upon in isolation. The Content is one of many inputs used by stakeholders to understand the overall quality of any given carbon credit. BeZero Carbon shall have no liability to you for any decisions you make in respect of the Content. If you have any questions about BeZero Carbon, the BeZero Carbon Rating, the BeZero Carbon Rating methodology, qualifying criteria, rating process, any element of Content, the BeZero Carbon Markets platform or otherwise please contact us at: commercial@bezerocarbon.com.