Discussion paper

Defining carbon credit quality in the voluntary carbon markets

Sylvera

Executive summary

- Defining carbon credit quality is not an easy feat — it is complex, often dynamic, and requires nuance to properly assess different carbon project types. However, it is not unsolvable, and cannot be ignored if high-integrity carbon markets are to meaningfully contribute to combating climate change.

- Sylvera defines a high quality carbon credit as a unit representing **one tonne of CO_2e emissions** avoided or removed from the atmosphere for an **environmentally significant period of time, as a direct impact of project activities.**

- This definition of high quality is reflected in the three core pillars of our ratings:
  1) Robust Carbon Accounting
  2) Additionality
  3) Permanence
  We also give additional consideration to community and biodiversity co-benefits, which are incredibly important and require their own analysis.

- After conducting rigorous field research, analyzing vast amounts of data, building advanced machine learning models and peer-reviewed methodologies we have been able to assess nearly 200 carbon projects against these quality criteria.

- We share our learnings about carbon credit quality with case studies and insights from projects across six major project types.

- When compared to other ratings providers and integrity initiatives, we find broad consensus on the key principles of credit quality, but divergence in how they are evaluated. This paper highlights why we are confident in the methods Sylvera uses to identify credits that meet high-quality standards.

- It is critical to move beyond criticisms of poor quality credits. The market now has the tools to identify high-quality credits and to raise standards across the board. These tools should be embraced by buyers, developers, policy-makers and commentators in order to ensure finance is channeled to impactful climate action

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Introduction

Context

Voluntary carbon markets (VCMs) exist to fund activities which reduce or remove greenhouse gas (GHG) emissions, therefore combatting the climate crisis. This is done through the sale of carbon credits to buyers who can then use these credits to compensate for their emissions or make other claims about their climate impacts.

VCMs, however, are not yet achieving their potential impact, or the impact that is needed to meaningfully contribute to a net zero world. A major reason for this, identified by a number of bodies such as the UK Climate Change Committee and the Taskforce for Scaling VCMs, is that there is huge variability in the quality of carbon credits. This means that not all credits achieve the impacts they claim.

This paper outlines the key components of credit quality, and how they can be assessed. Although this is a complex task, carbon credit ratings can reliably identify quality. This paper explains how we rate carbon credits and why we have chosen this approach, demonstrating the depth and rigor of Sylvera's carbon credit ratings. Policy makers and market participants should embrace this data as a solution to many of the most significant criticisms facing VCMs.

What is a carbon credit?

A carbon credit is a tradable unit representing one tonne of carbon dioxide (CO_2), or an equivalent amount of another greenhouse gas (GHG)(CO_2e), avoided or removed from Earth's atmosphere.

A carbon credit is created through a carbon project, which conducts an activity that avoids or removes GHG emissions from the atmosphere. These emissions must be avoided or removed as a direct result of the carbon project.
An example of an avoidance project is replacing a fossil fuel power plant with renewables like wind, solar, or hydroelectric. An example of a removals project is planting a forest that will absorb CO_2 as it grows.

What are carbon markets?

Carbon credits are bought and sold in carbon markets. There are different types of carbon markets:

- Compliance carbon markets: participation in these markets is mandated by law. For example in the EU and UK, all businesses in certain sectors, such as electricity generation and heavy industry, must participate in a cap and trade system called an Emissions Trading Scheme (ETS).
- Voluntary carbon markets (VCMs): participation is optional. Buyers choose to buy credits in order to advance toward their climate targets.
- International markets: under Article 6 of the Paris Agreement, countries are allowed to trade emissions in order to meet their national objectives.

This paper focuses on credits generated primarily for VCMs, through standards such as Verra and the Gold Standard. However, it should be noted that in some instances these credits can be used in compliance markets.

Why does quality matter?

Not all carbon projects genuinely deliver the impact they claim. Therefore the credits they issue do not genuinely represent a tonne of CO_2e. When these credits are used for offsetting or to make other climate claims, they undermine global efforts to decarbonize and deflect effort and funding away from other essential actions.

Confounding this problem is the fact that, historically, it has been challenging for buyers to determine the quality of credits. Buyers have therefore not been able to reliably purchase only high quality credits.

This has shaken confidence in the market and discouraged participation, especially with high profile exposés of problematic credits becoming more common across the media. Until buyers are confident in the quality of the credits they buy, VCMs will struggle to scale to the level needed for climate mitigation.

A number of organizations and initiatives have been founded to try and solve this problem, including ratings providers like Sylvera, the Integrity Council for the VCM and the Carbon Credit Quality Initiative.

Section 1:

Defining quality

Sylvera's definition of quality

Defining credit quality links explicitly back to the definition of carbon credits: a unit representing **one tonne of CO_2e emissions** avoided or removed from the atmosphere for an **environmentally significant period of time**, as a **direct impact of project activities**.

Carbon is therefore the primary metric by which we assess the quality of credits. This definition also leads to the three components of quality that feed into our headline rating:

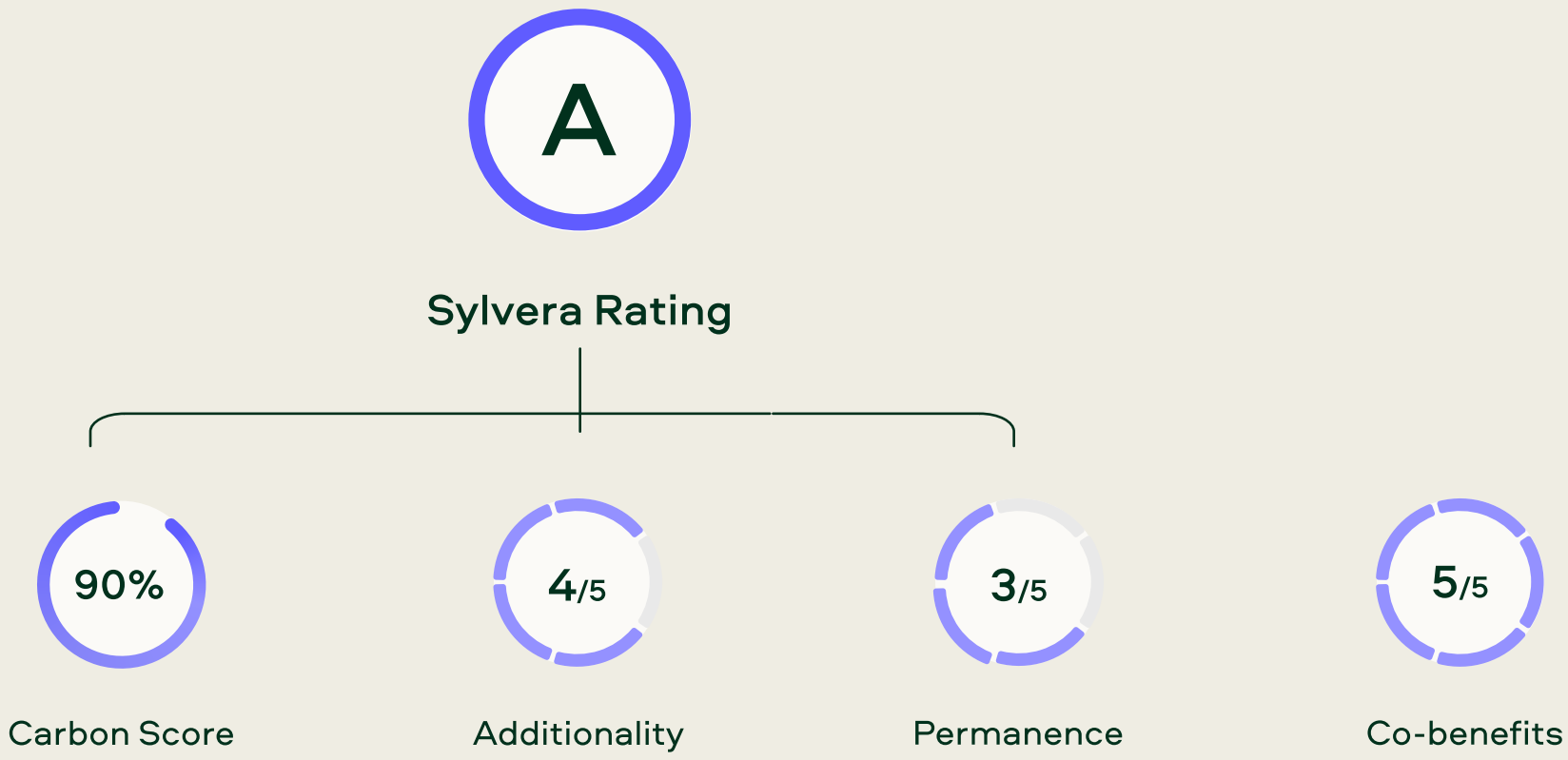
1. **Carbon score** - Sylvera's confidence, based on its assessment of both public and proprietary data, that the project's carbon impact claims are correct. 100% represents no evidence against the project claims.

2. **Additionality** - the likelihood that the carbon impacts would not have happened without the project activity and the revenue from credit sales.

3. **Permanence** - the confidence that the GHG avoided or removed will remain out of the atmosphere to the end of the century, in line with IPCC pathway projections.

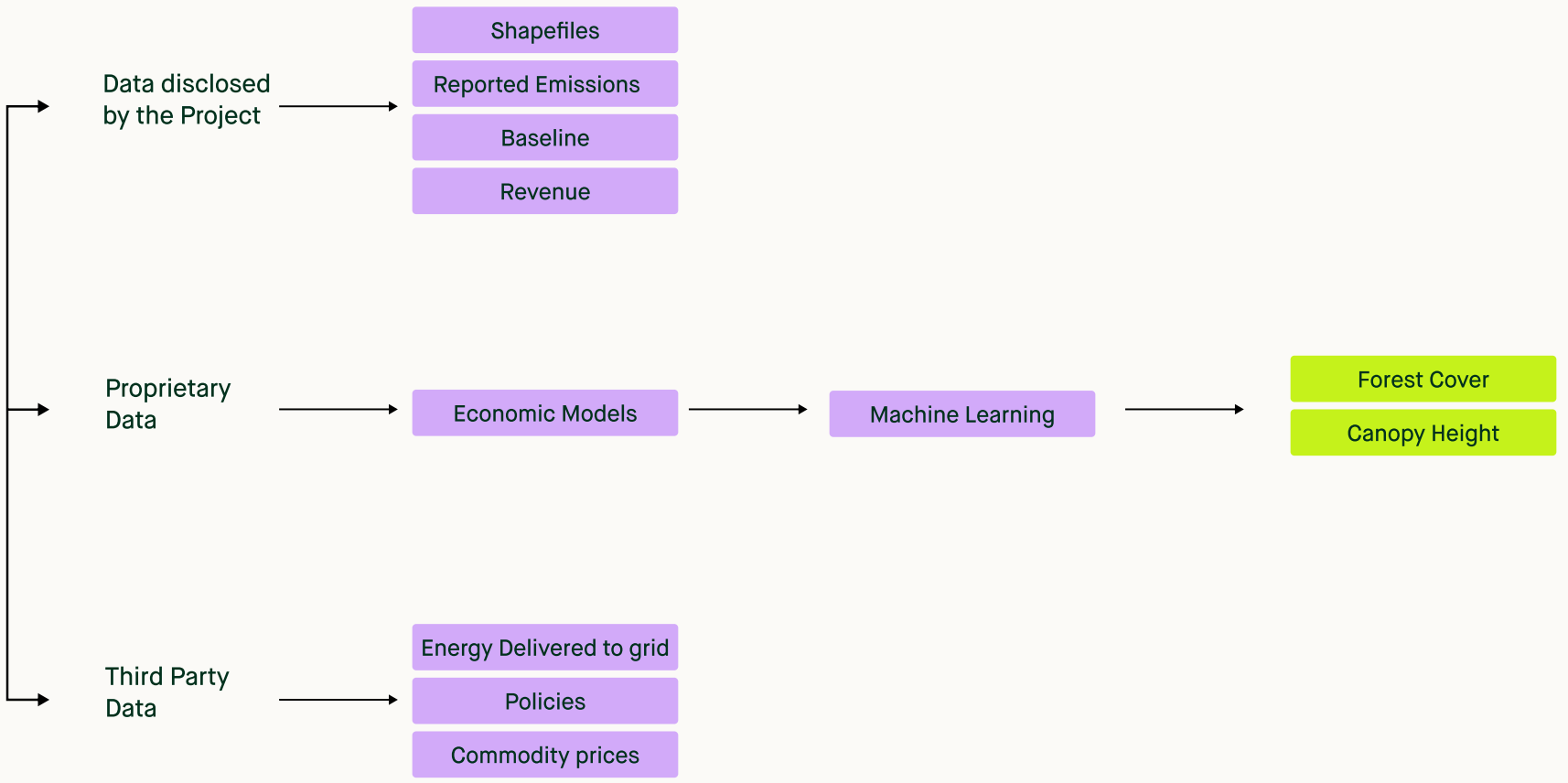
We recognize that carbon credits may deliver additional benefits, which we assess in our separate co-benefits rating. We also recognize that projects must reach certain minimum criteria in regard to their non-carbon impacts: free, prior, and informed consent must be obtained and no harm should be caused to Indigenous Peoples and Local Communities (IPLCs).

This fourth sub-score, co-benefits, does not feed into the main rating as it does not assess the metric of carbon. However, the considerations addressed are integral to the overall quality of the credit.



How we assess quality

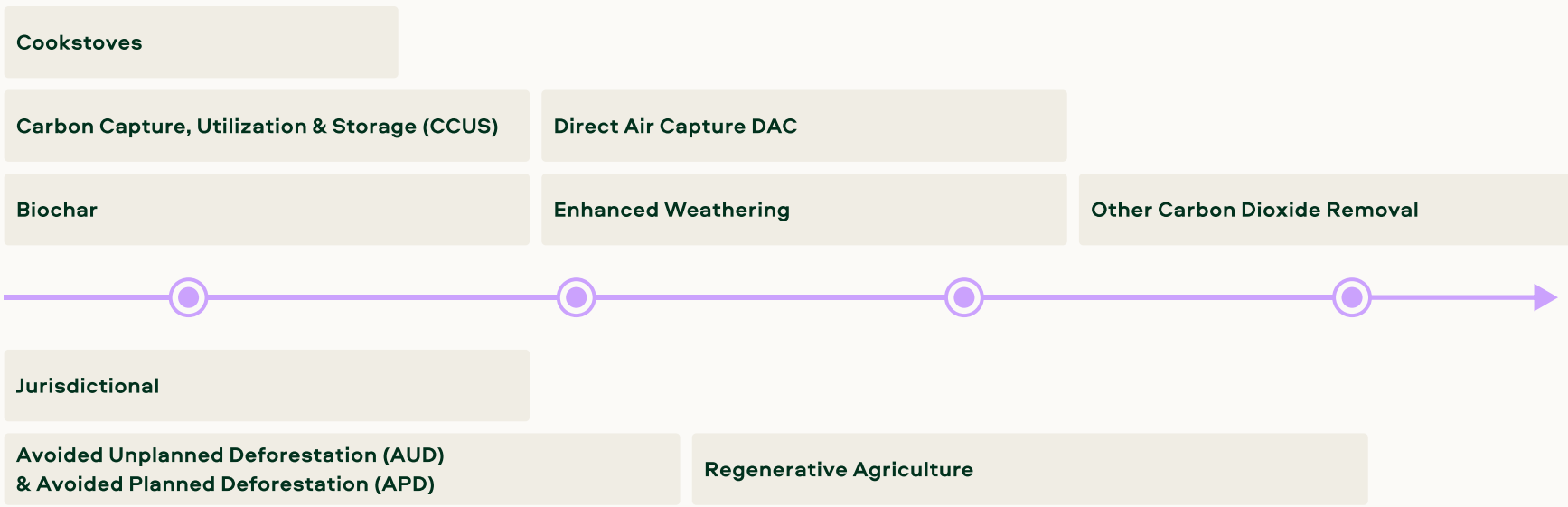
In order to assess quality in each of the areas, we use a combination of project-reported data, proprietary data and third-party data.



There are many types of projects that generate carbon credits. To date, we have rated projects from:

- REDD+ (reducing emissions from deforestation and forest degradation);
- Regenerative agriculture
- ARR (afforestation, reforestation and revegetation);
- IFM (improved forest management);
- CCUS (carbon capture, usage and storage);
- Improved cookstoves; and
- Renewable energy.

Section 1: Defining quality



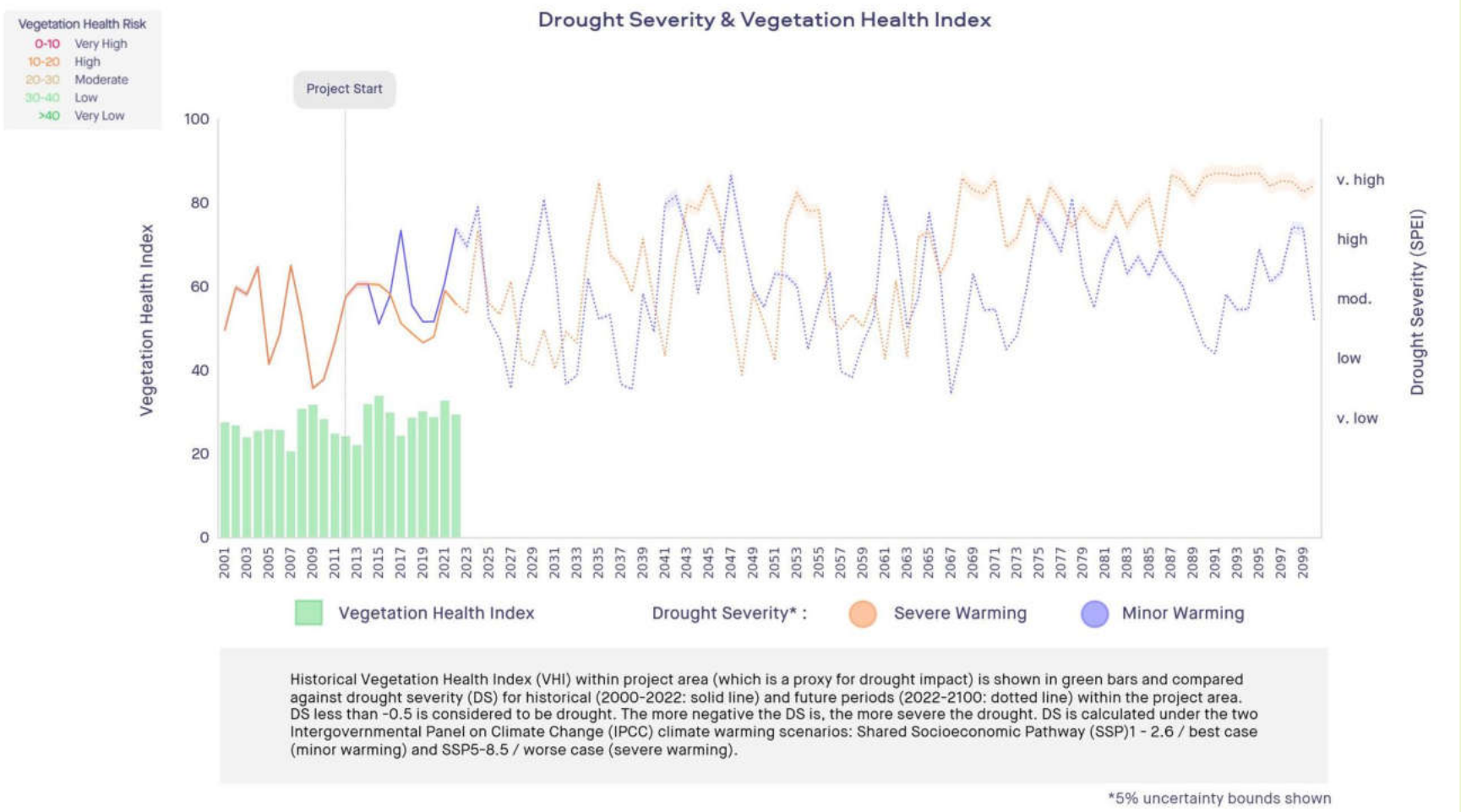
Depending on the type of project activity, the data and tests that are needed to assess quality vary. Sylvera therefore develops ratings frameworks tailored to each project type. This allows us to conduct the most appropriate tests to assess each component of quality for each type of project activity.

Case Study

Third party data for IFM projects

The complexity of IFM projects results in the need to do more validation with third party data. We use a number of global data sets that provide quantitative data that feeds into our ratings, including from OECD and the World Bank.

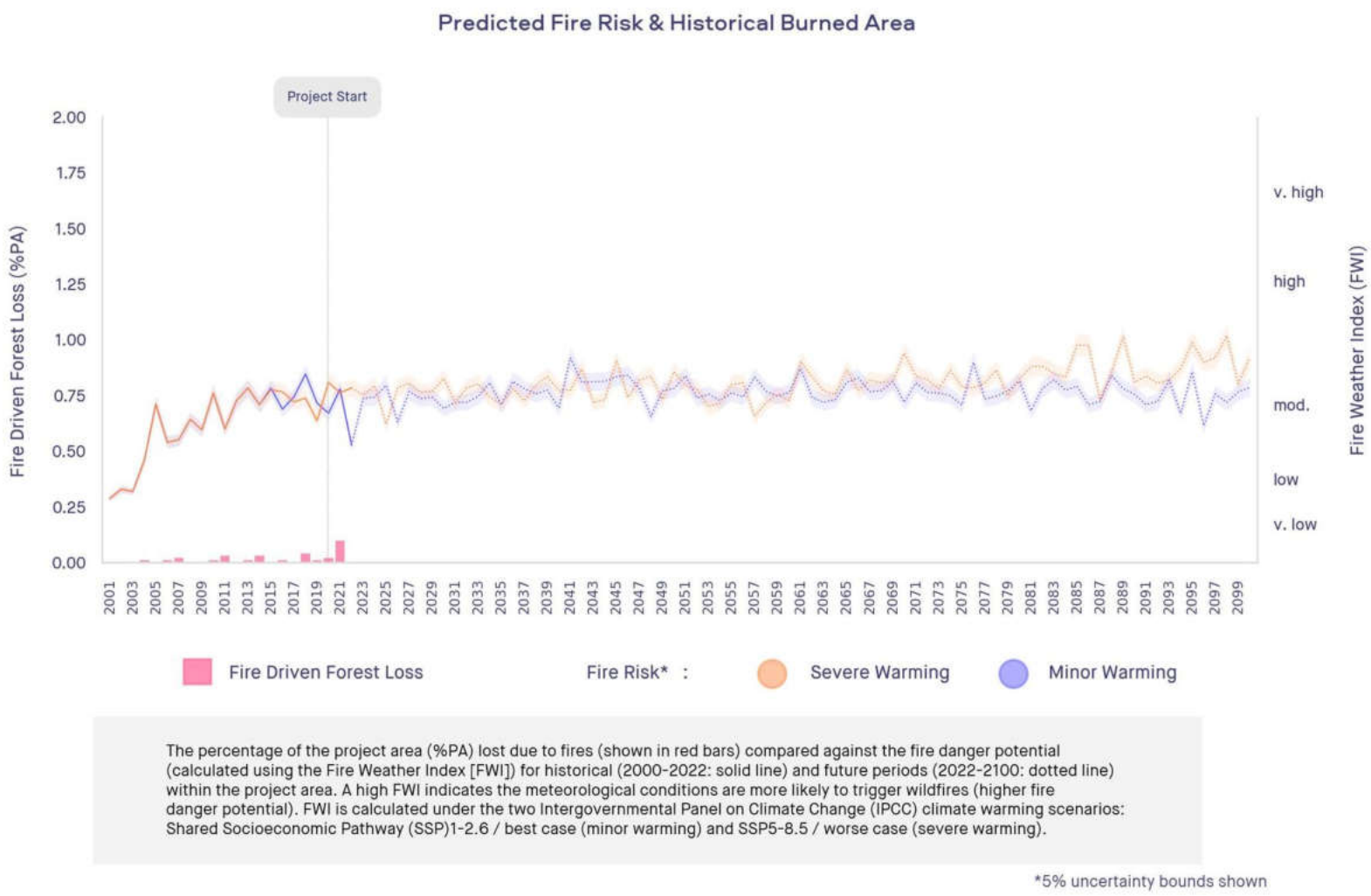
Permanence assessments in particular rely on data sources for climate risks feeding as well into our proprietary climate models. As part of our ratings process we also conduct scientific literature review for relevant information to the project and region, as well as public policy and regulation documents.



Historical Vegetation Health Index (VHI) within project area (which is a proxy for drought impact) is shown in green bars and compared against drought severity (DS) for historical (2000-2022: solid line) and future periods (2022-2100: dotted line) within the project area. DS less than -0.5 is considered to be drought. The more negative the DS is, the more severe the drought. DS is calculated under the two Intergovernmental Panel on Climate Change (IPCC) climate warming scenarios: Shared Socioeconomic Pathway (SSP)1 - 2.6 / best case (minor warming) and SSP5-8.5 / worse case (severe warming).

*5% uncertainty bounds shown

Section 1: Defining quality



The percentage of the project area (%PA) lost due to fires (shown in red bars) compared against the fire danger potential (calculated using the Fire Weather Index [FWI]) for historical (2000-2022: solid line) and future periods (2022-2100: dotted line) within the project area. A high FWI indicates the meteorological conditions are more likely to trigger wildfires (higher fire danger potential). FWI is calculated under the two Intergovernmental Panel on Climate Change (IPCC) climate warming scenarios: Shared Socioeconomic Pathway (SSP)1-2.6 / best case (minor warming) and SSP5-8.5 / worse case (severe warming).

*5% uncertainty bounds shown

The following chapters outline each of these four pillars, how we assess them, and some insights on these aspects of quality from our data

To learn more about how Sylvera's ratings frameworks and processes, read our white paper.

Section 2:

Carbon score

Section 2: Carbon score

What is it?

As 1 carbon credit represents 1 tonne of CO_2e emissions, we need to know exactly how many tonnes of CO_2e emissions have been avoided or removed by a project's activities to know how many credits it should be permitted to issue.

Sylvera independently assesses whether projects have accurately reported emissions reductions or removals. This is reflected in the carbon score given to each project.

Why is carbon score important?

Accurate carbon accounting underpins the validity of a project's issuance. **Material under- or over-reporting of emissions calls into question the number of credits that have been issued.**

Ultimately, if the project has over-reported its impact, there is a significant risk that the credits generated from that project do not represent a full 1 tonne of CO2e. This has implications for how the credits are used. For example, if an offsetting claim was made using these credits the buyer would not actually be making a tonne-for-tonne compensation for their emissions.

Note: This score assumes the baseline and carbon stock assumptions are appropriate. Therefore, the carbon score must always be considered alongside our additionality score to understand the overall climate impact of the project.

How does Sylvera assess carbon score?

We perform a number of tests to assess the carbon score of a project. Exactly which tests are performed depends on the type of project activities. The data used to determine the test outcomes also varies by project type. For example, nature-based (NBS) projects use geospatial data and our proprietary machine learning.

Specifically, this is how we assess carbon score for each of the four projects types we have fully rated to date:

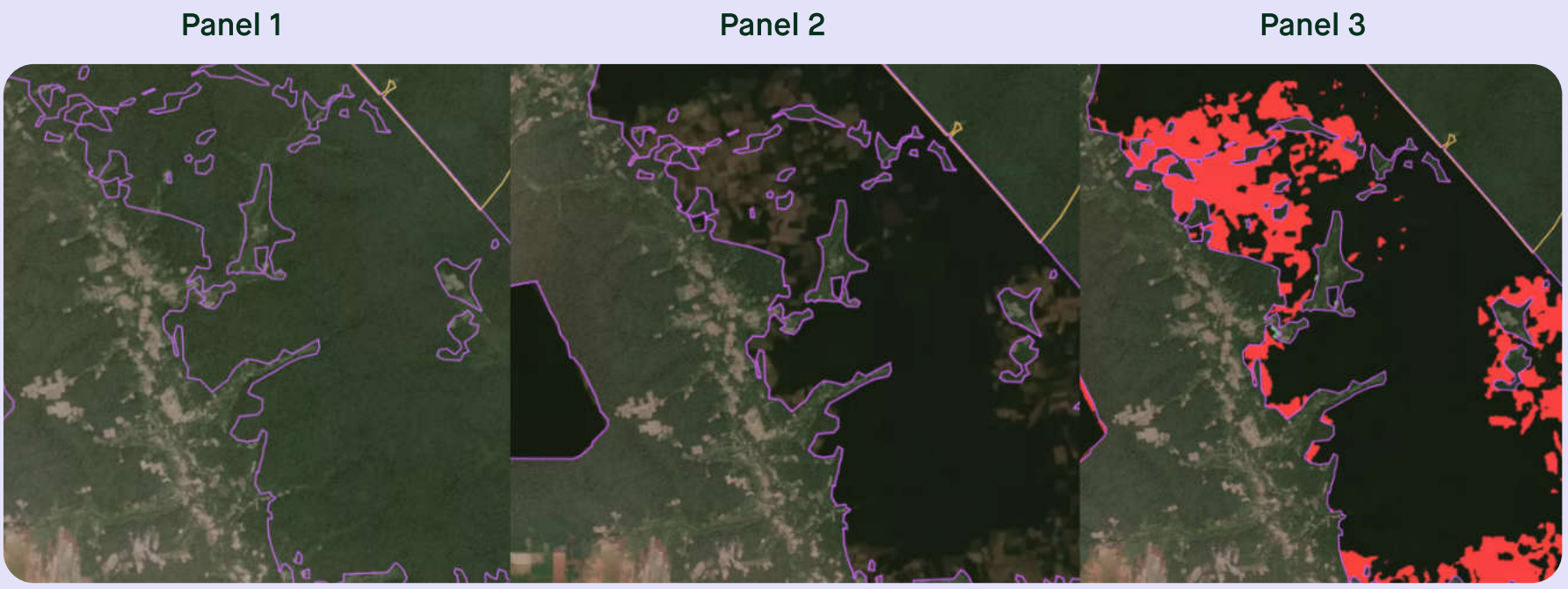
- For REDD+: monitoring levels of deforestation in the project area using machine learning interpretations of satellite imagery.
- For ARR: monitoring planting, survival, and growth rates of trees across the project area.
- For IFM: monitoring forest change and harvesting using machine learning interpretations of satellite imagery.
- For renewables: auditing net power generated using data from grid operators, energy regulators, and offtakers.

The results of these tests are aggregated into a percentage score, which reflects Sylvera's assessment of the number of credits which have been issued as a proportion of the credits that should have been issued.

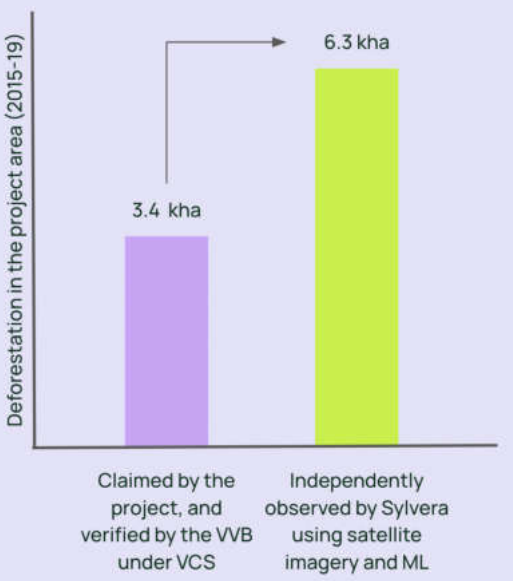
Case Study

Using satellite imagery and machine learning to detect unreported deforestation in REDD+ project areas.

This REDD+ project has been given our lowest rating, D, as it has a carbon score of 0%. Our analysis of satellite imagery across the project area shows large amounts of deforestation since the project started, which has not been accurately reported by the project. This forest loss exceeded the expected baseline rate of deforestation in the area, and therefore the project cannot demonstrate any positive impact on carbon emissions.



The first panel shows geospatial images of the project area at the start of the project (1) and the second shows images for the most recent carbon credit vintage (2). Panel 3 illustrates deforestation in red detected by machine-learning in the project area.



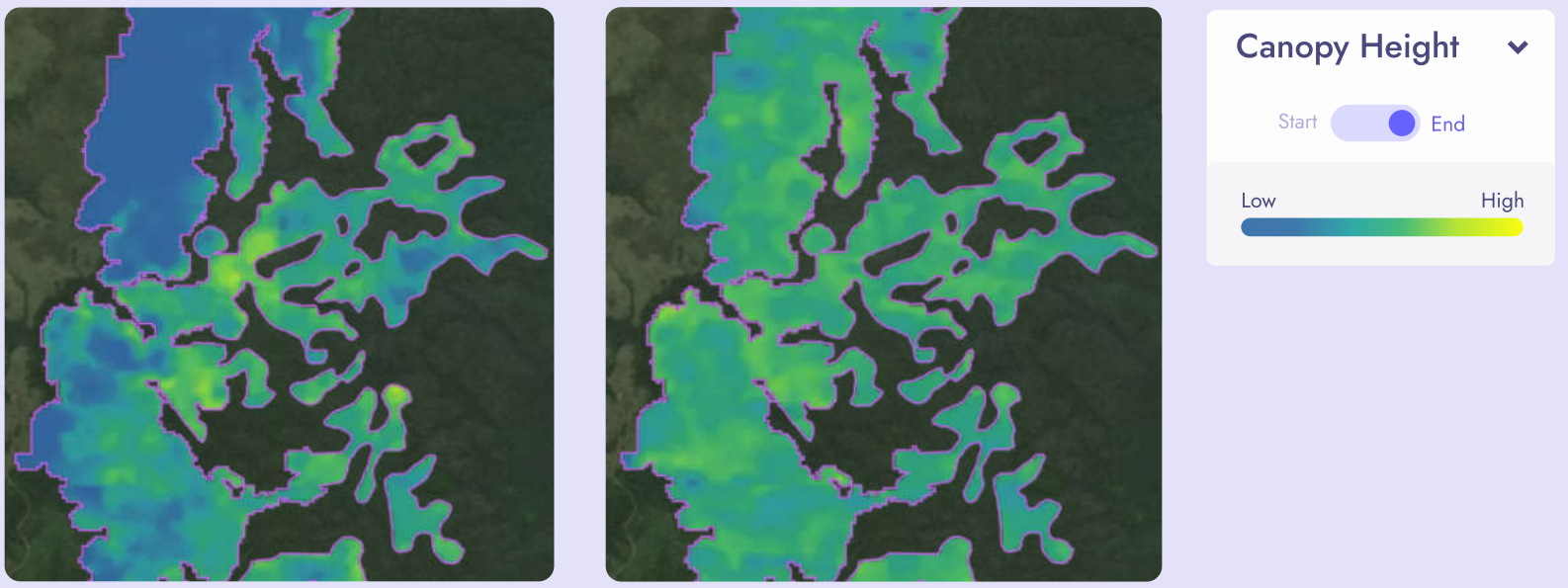
Case Study

Using multi-modal Earth Observation (EO) data and machine learning to monitor forest growth in ARR projects

The carbon impact of ARR projects relies on the growth of trees and vegetation. Optical satellite imagery shows the presence or absence of vegetation, but it can be challenging to infer its growth.

By using a combination of different modalities of EO data, including SAR and Lidar, to feed out proprietary machine learning algorithms, we are able to monitor canopy height throughout the project duration. This is a useful proxy for the growth and therefore carbon sequestration of trees and vegetation in the project area.

These images show the increase in canopy height of trees in an ARR project. **The project achieved a carbon score of 70%,** as Sylvera has detected that the project over-reported the planting area.



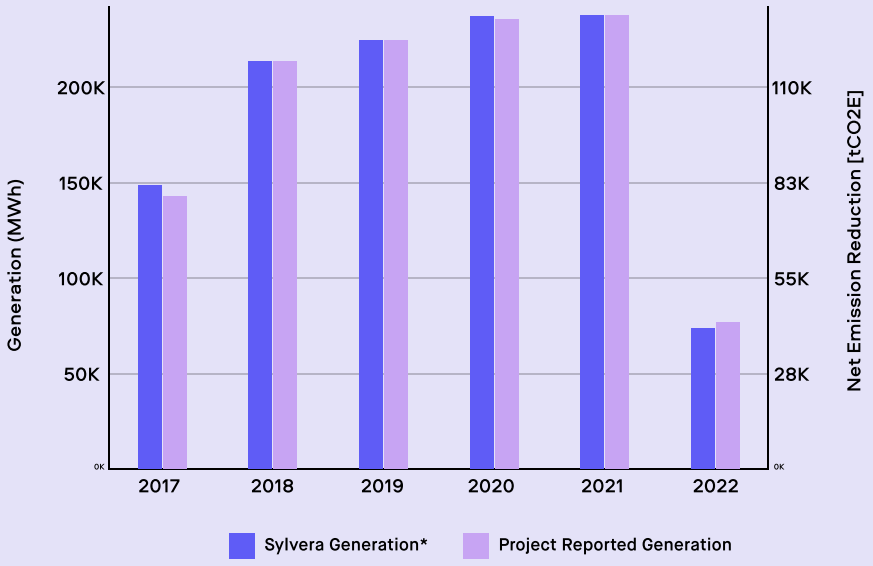
Canopy height in the project area at the start of the project (panel 1) and for the most recent vintage (panel 2).

Case Study

Using third party data to audit a renewables project

For renewables projects, we cannot use geospatial data to assess carbon score. Instead, we use third party data to audit the reported energy delivered to the grid.

In this example, we use data from the host country's energy exchange to verify the project's claims about how much electricity had been delivered to the grid. The graph below shows a comparison between the reported values and the verified values for each calendar year. For this project the reporting was accurate and the carbon score was 100%.

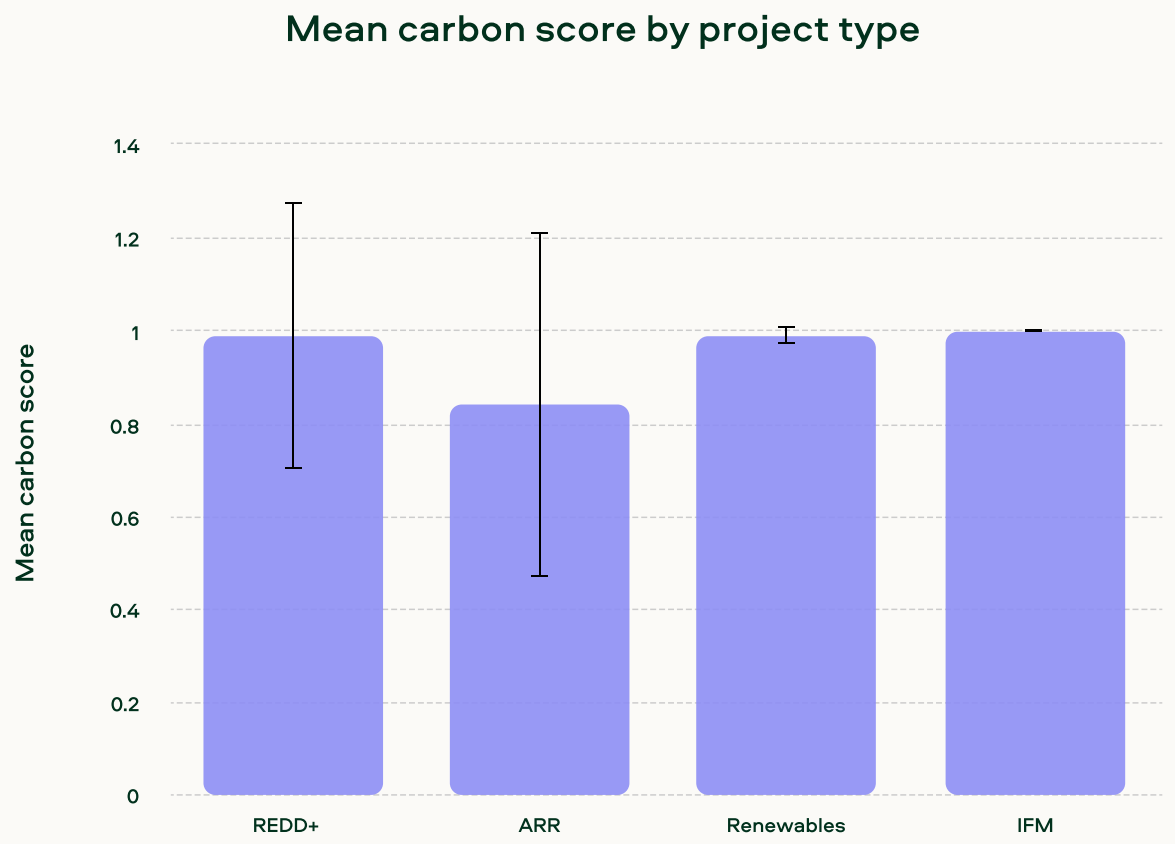


*This generation data is sourced from EXIST Energy Exchange Istanbul

Power Generation & Emission Reductions Breakdown
Credit Issuance Period: April 21, 2017 - April 30, 2022

Data Source	Power Generation (MWh)	Net Emission Reduction (tCO2e)
Project Reported	1,131,782	624,059
Third-Party Data Used by Sylvera	1,130,851	623,561

Data insights



Our analysis across different project types shows that on average, both REDD+ and renewables projects score close to 100%. However, an interesting difference is the range of scores given.

In contrast, REDD+ projects have a much wider spread. Some projects score 0% as deforestation in the project area has exceeded the baseline. Others score well above 100%, reflecting a significant under-issuance of credits.

Interestingly, ARR projects are the only removals projects we have assessed to date. This data challenges the notion, held by some in the market, that removals projects are inherently better quality than avoidance projects.

Renewables projects' carbon scores are tightly distributed between 94-104%, reflecting that Sylvera's audit using third party data shows energy delivery to the grid is very close to the reported figures.

ARR projects achieve the lowest average carbon score, although again there was a wide spread in scores. Lower scores were largely driven by over-reporting of planting area, and unreported loss events.

Carbon score insights

Over three years of rating projects, we have gained valuable insights into the common pitfalls and markers of success for different types of projects. We have also identified areas that may introduce uncertainty to judgments of quality.

The issues below can guide buyers to the main considerations when identifying high-quality credits to purchase.

Project Type	High quality indicators	Red flags	Sources of uncertainty
REDD+	• Reporting of loss events matches detected	• Use of out of date/ inappropriate forest monetarizing data for both project and leakage area monitoring	• Quantifying biomass carbon • Observing degradation
ARR	• Reporting of assumed and observed mortality rates • Accurate reporting of extent of planting • Accurate reporting of loss events (both planned and unplanned; eg thinning and fire)	• Under-planting • Unreported loss events	• Quantifying biomass carbon • Inaccurate shapefiles reported to registries • Poor reporting on harvesting regimes
IFM	• Robust reporting of harvested wood, clearcutting and carbon pool changes	• Under-reported harvesting regime and/or loss events	• Quantifying biomass carbon • Observing degradation/small scale activities • Poor reporting on harvesting regimes • Generally less disclosure around activities; crediting typically based on obscure modeling and calculation of carbon pools • High error shapefiles
Renewables	• Net electricity generation (mWh) reported by third-party consistent with project reports	• Net electricity generation (mWh) reported by third-party inconsistent with project reports	• Not all jurisdictions have centralized net electricity generation tracked or reported

Section 3:

Additionality

What is it?

For a project to justify the issuance of carbon credits, it must show that the emissions reductions or removals it is claiming were a direct result of the project's activities.

For example, REDD+ projects, which prevent deforestation, must be able to demonstrate that without that project the forest would have been lost. Otherwise, credit buyers are spending money on protecting a forest that actually was not under threat and would not have been cut down anyway.

Additionality is considered through two lenses:

Additionality of activities

This considers whether activities go beyond business as usual (BAU), and whether carbon credit revenue was needed to achieve these impacts.

Over-crediting risk

This considers what would have happened without the project and carbon credit revenue, and whether the project has claimed the correct impact as a result of its activities.

Why is additionality important?

If credits are not additional, then they are not representing any positive climate impact beyond BAU. Therefore if buyers are using non-additional credits to make claims such as offsetting, their net impact is no better than if they had not purchased any credits.

How does Sylvera assess additionality?

Additionality is not a binary measure. It is complex to assess, based on theoretical, counterfactual scenarios of what would have happened without the project. Our score therefore reflects a metric of risk.

Projects are rated on a scale of 1-5. A score of 5/5 reflects high confidence that the project's activities are additional and a low risk of over-crediting. A score of 1 reflects that activities were very unlikely to be additional, and/or a high risk of significant over-crediting.

The tests that we perform vary significantly by project type. For example, for REDD+ projects the over-crediting risk is largely determined by an assessment of the deforestation baseline: using a number of proxies and indicators to project what deforestation would have happened without the project. For renewables projects, the baseline is more certain: electricity would have been produced by other energy infrastructure in the region with higher emissions, which we can calculate. So the threat to the additionality of renewables projects is from poor additionality of activities.

Section 3: Additionality

The main tests we perform for each project type we have fully rated to date are detailed in this table:

Project Type	To assess additionality of activities	To assess over-crediting risk
REDD+	• For unplanned deforestation: is the projecting implementing activities not previously in place • For planned deforestation: are the threats to the forest economically and legally legitimate? • Is the forest already protected by law or policy? Is this enforced usually? • Are activities viable without credit revenue?	• Strength of baseline: geospatial and quantitative tests to see if the baseline is appropriate • Leakage: modeling and geospatial analysis to detect increased deforestation outside project area
ARR	• Does revenue from carbon credits facilitate activities above BAU? • Are there existing policy or regulatory incentives to facilitate the project? • Do these activities usually happen in the local area anyway?	• Was the project area deliberately cleared recently? • Has the project reported information about the project area accurately?
IFM	• Does revenue from carbon credits facilitate activities above BAU? • Are there existing policy or regulatory incentives to facilitate the project? • Do these activities usually happen in the local area anyway?	• Strength of baseline: validating the project's claims about BAU emissions • Gerrymandering: is the project area disingenuously selected to inflate carbon impact? • Leakage: are emissions displaced from the project area?
Renewables	• Is revenue from carbon credits needed to make this project economically viable? • Are there existing policy or regulatory incentives to facilitate the project? • Are renewable energy projects widespread in the area without carbon credit revenue?	• Does third party data validate the reported emissions baseline? • Were emissions from the project construction accurately reported? • Is there a risk of double counting?

Case Study

Financial additionality of renewables projects

A common threat to the quality of renewables projects is financial additionality. For grid-connected renewables projects in middle-income countries, the revenue from carbon credits is insignificant compared to the revenue from selling electricity to the grid. This, in addition to policy and regulatory incentives, means that project viability is unlikely to hinge on carbon credit revenue.

Sylvera assesses the contribution of carbon credit revenue to revenue under different credit price scenarios. In this example, even with a high credit price (at the time of project inception), **credit revenue would have contributed a maximum of 3.75% of revenue**. The project developer reported the BAU scenario to be subeconomic in its documentation, but Sylvera's economic analysis shows that BAU was economical and did not require any additional revenues from carbon offsets. This signals a significant risk that credits issued by this project do not represent additional emissions reductions above what would have taken place in the BAU scenario.

Financial Additionality Analysis

Sylvera's proprietary independent economic analysis

Financial Metric	Sylvera	Project
Levelized cost of Energy (US$/MWh)	52.23	-
Hurdle Rate* (%)	12.47	18.82
BAU IRR (%)	7.77 ●	4.22 ●
Project IRR with carbon offset revenue (%) (low carbon offset price scenario - US$1)	8.09 ●	-
Project IRR with carbon offset revenue (%) (medium carbon offset price scenario - US$2)	8.42 ●	-
Project IRR with carbon offset revenue (%) (high carbon offsets price scenario - US$3)	8.78 ●	

● Economic ● Sub - Economic

*Hurdle rate is the IRR (%) required for the project to be sanctioned as an economic endeavour

Case Study

REDD+ strength of baseline assessments

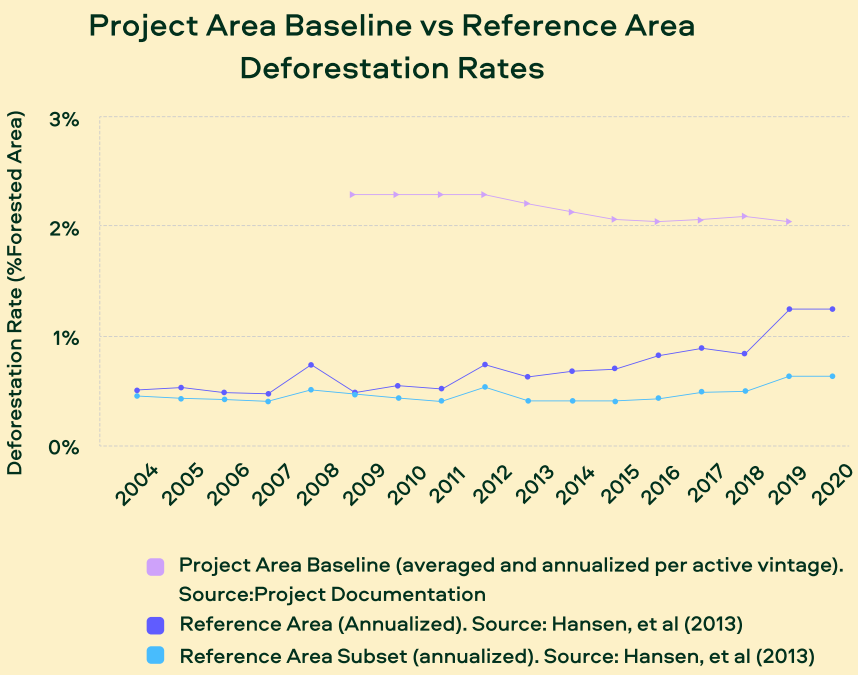
As highlighted by recent media reports, baseline inflation is a real threat to the additionality of REDD+ projects. This is when projects overstate the risk of deforestation in the project area in order to justify the issuance of more carbon credits.

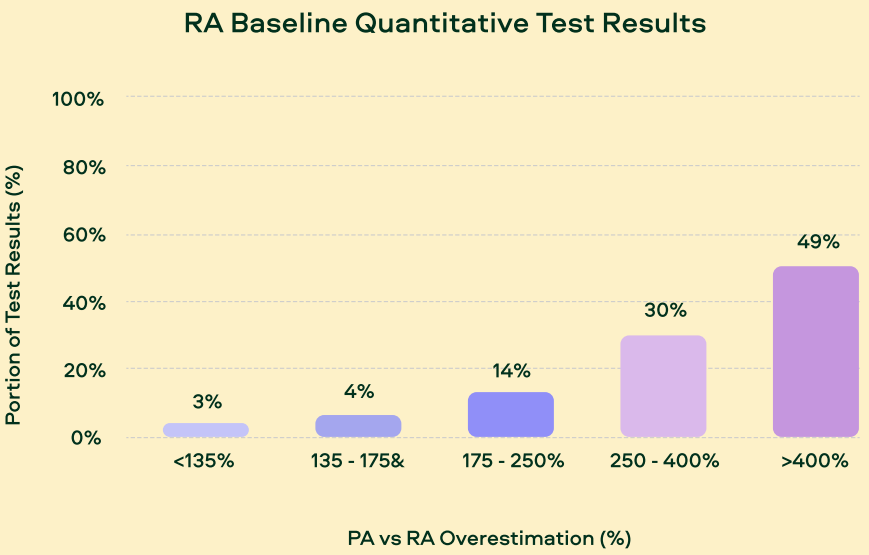
Sylvera conducts a number of geospatial and quantitative tests to assess whether the baseline has been reasonably estimated. This includes looking at historical deforestation trends, comparisons to deforestation in the reference area (an area selected to be a proxy for the project area in the absence of project activities), and whether the reference area is a reasonable match to the project area.

To assess the validity of the reference area, the main drivers of deforestation are compared. This includes population density, distance to roads and rivers, commercial activity, any legal protection, and land tenure. We may also consider subsets of the reference area in our assessments, which allows us to consider areas which are more closely matched in these regards.

If the reference area is a valid match to the project area, we are able to use geospatial data to assess deforestation in the reference area and compare this to the project's baseline. Statistic tests can then be used to determine whether the baseline is appropriate, or overestimates deforestation in the absence of project activities.

In this example, the baseline deforestation rate, which averaged at 2.21%, significantly exceeded the reference area deforestation average rate of 0.87%. When using quantitative tests to determine the risk of overestimation of the baseline, the largest portion (49%) of tests suggests potential baseline inflation of over four times.





Additionality insights

As above, this table details the insights into the common pitfalls and markers of success for different types of projects we have learned over the three years we have rated projects. We have also identified areas that may introduce uncertainty to judgments of quality.

These issues can guide buyers to the main considerations when identifying high-quality credits to purchase.

Project Type	High quality indicators	Red flags	Sources of uncertainty
REDD+	• Conservative baselines • Well matched reference areas • Appropriate selection and modeling of activity shifting leakage	• Inflated baseline • Poorly matched RA • Commercial forest companies managing AUD projects	• Counterfactual baseline • Appropriateness of data sources • BAU data for avoided planned deforestation
ARR	• Non-commercial models of planting • Multiple native species planted • Observable absence of planted forests in region	• Commercial harvesting of monoculture stands • Prevalence of planted forests in the region • Strong historical & current policy & regulatory incentives for the project activity	• Lack of financial data • High error shapefiles for small-holder projects
IFM	• Accessible project area and proximal to market • Proximal to aggressively managed forests	• Shift from voluntary to compliance eligible can lead to arbitrary jump in carbon stock • Harvest regimes failing to demonstrate regulatory surplus • Geographic	• Inconsistent reporting of financial parameters and common practice
Renewables	• Sub-economic project without carbon credits • Economic project with carbon credits • Third-party grid emissions factors consistent with-project reported baseline	• No prior consideration of carbon credit revenues • Economic project without carbon credits • Sub-economic project with carbon credits • Third-party grid emissions factors inconsistent with project reported baseline	• Investment parameters - capex, opex, debt, ROI hurdle rate, carbon credit price • Emissions factors for displaced electricity generation

Section 4:

Permanence

What is it?

Permanence refers to the confidence that the GHG emissions avoided or removed from the atmosphere by the project will be kept out of the atmosphere. To truly understand permanence, we need to think in geological time, not human time. The GHGs released today will remain in the atmosphere and continue to influence the climate for up to 1,000 years.

The best carbon offset projects assure that the carbon they sequester or avoid will remain out of the atmosphere for at least 100 years. Typically, 100 years is considered the benchmark that allows a project to brand itself as 'permanent'. This is different from the scientific definition of permanence (until infinity), but is a more practical definition in the real-life setting of carbon offsetting projects.

Why is permanence important?

Carbon credits have value because the tonne of CO_2e avoided or removed from the atmosphere has an impact on the climate. If that tonne only stays out of the atmosphere for a few years, the positive impact on mitigating climate change will be minimal. Buyers therefore cannot make any kind of impact claim on the basis of purchasing a credit with low permanence.

How does Sylvera assess permanence?

Sylvera awards each project a score between 1 and 5. 5 represents high confidence, or even certainty, that the GHG emissions avoided or removed will be kept out of the atmosphere for 100 years or more. 1 represents a high likelihood of reversals.

The threats to GHGs staying out of the atmosphere depend on how the emissions were avoided or removed in the first place. For example, REDD+ projects depend on the protected trees staying standing and continuing to store carbon, whereas for renewables projects the emissions avoided cannot be reversed as there is no carbon stored.

In order to assess permanence, Sylvera therefore performs specific tests to assess the risks to the stored carbon, and what actions the project is taking to mitigate these risks.

NBS projects

For NBS forestry projects like REDD+, ARR, and IFM, we assess the risks to the trees storing carbon. These include:

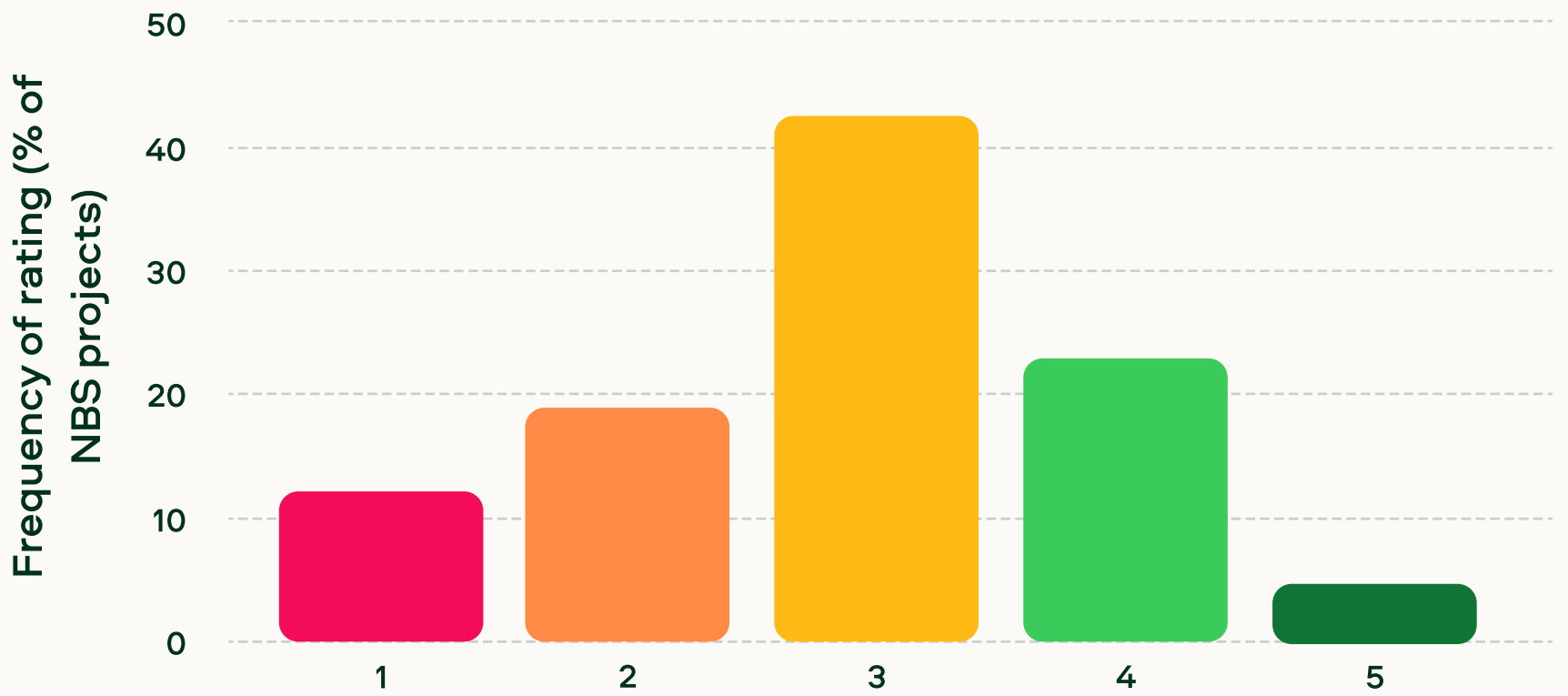
- Fire risk - using geospatial data to track the historical, frequency and severity of fires in and around the project area, and combine this with climate models to project future risk
- Drought and flood risk - using paleoclimate modeling
- Pest risk - assessment of the presence of invasive species
- Human risks - deforestation drivers assessed using socioeconomic data and modeling, also considering political instability and rule of law
- Mitigative activities: assessment of whether the project is implementing activities to address significant causes of permanence risk

Section 4: Permanence

There is a perception that permanence is a threat to all NBS projects. While it is true that there is a higher risk to NBS projects than many technological solutions, this does not mean that the quality of all such projects is fundamentally limited.

Our analysis shows that a small proportion (<5%) of NBS projects have the lowest risk category for permanence. However, a quarter of projects achieve a rating of ⅘ or higher, and 70% achieve ⅗ or higher.

This suggests that although permanence is an important concern for NBS projects, it is not a reason to discount the quality of them all. Instead, it should be carefully analyzed on a project-by-project basis.



Renewables projects

For renewables projects, all projects score 5/5 for permanence. Why? Because as discussed above, none of the avoided emissions are stored by the project. Instead, the emissions avoidance comes from displacing demand for more GHG-intensive electricity generation. No stored carbon means no risk of reversals - the GHGs won't be released back into the atmosphere in the future.

Case Study

Risks of project abandonment

This project was due to run from 2012 until 2042. However, in 2022 the project was terminated and the landowner is now planning to deforest a legal maximum of 20% of the project area for agricultural production.

The project is no longer permitted to issue any more credits, but some credits are still available in the secondary market from earlier vintages. These credits clearly do not represent any long-term avoidance of emissions. This case study demonstrates the importance of buyers conducting due diligence on credits on an ongoing basis.

The mitigative activities protecting the rest of the project area will also be halted, leaving the forest vulnerable to threats such as fire. This resulted in a ratings downgrade to the lowest possible rating, D.

This example also demonstrates the value of carbon credit revenue as a conservation incentive. There are very real conversion pressures, and unless credit prices are sufficiently high landowners are incentivized to clear the forest.

Permanence insights

These common pitfalls and markers of success can guide buyers to the main considerations when identifying high-quality credits to purchase.

Project types	High quality indicators	Red flags	Sources of uncertainty
REDD+	• Mitigative activities implemented	• Fire events • Poor community engagement	• Land tenure and community land rights
ARR	• Mix of native species to build resilience • Mitigative activities for physical loss risks	• Monoculture stands • Diminishing incentives to maintain carbon sink when long-term average is reached and/or timber market conditions	• Unreliable disclosure of mitigative practices and post-crediting period plans
IFM	• Evidence of mitigative activities	• Located in an area with severe fire incidents and historic carbon stock loss from fire related causes	• Unreliable disclosure of mitigative practices
Renewables	• N/A	• N/A	• N/A

Section 5:

Co-benefits

Sylvera

Section 5: Co-benefits

What are co-benefits?

Co-benefits are additional benefits that go beyond GHG avoidance and removal, such as contributing to achieving the UN's Sustainable Development Goals (SDGs) and or protecting and enhancing biodiversity.

Why do co-benefits matter?

Many credit buyers care about the impact of their carbon credits beyond purely GHG emissions.

A poorly designed project can negatively impact local communities and biodiversity. For example, ARR projects that plant monocultures may achieve significant carbon impacts but fail to contribute to restoring local biodiversity.

Conversely, well designed projects can enhance local communities and natural resources. These additional benefits are often considered worth paying a premium for by credit buyers.

Why do co-benefits not contribute to Sylvera's headline rating?

This fourth sub-score does not feed into the main rating as it does not assess the metric of carbon. Ultimately carbon is the commodity being traded and so the core rating reflects this. A high co-benefits score could inflate a rating, which would be problematic, particularly when a project is underperforming in other key areas: carbon, additionality, and permanence.

However, the considerations addressed in the co-benefits score are integral to the overall quality of the credit. The separate rating allows credit buyers to consider it independently of carbon, based on their own priorities and use-case.

How does Sylvera assess co-benefits?

We evaluate a project's impact on both community and biodiversity.

For biodiversity impacts we assess:

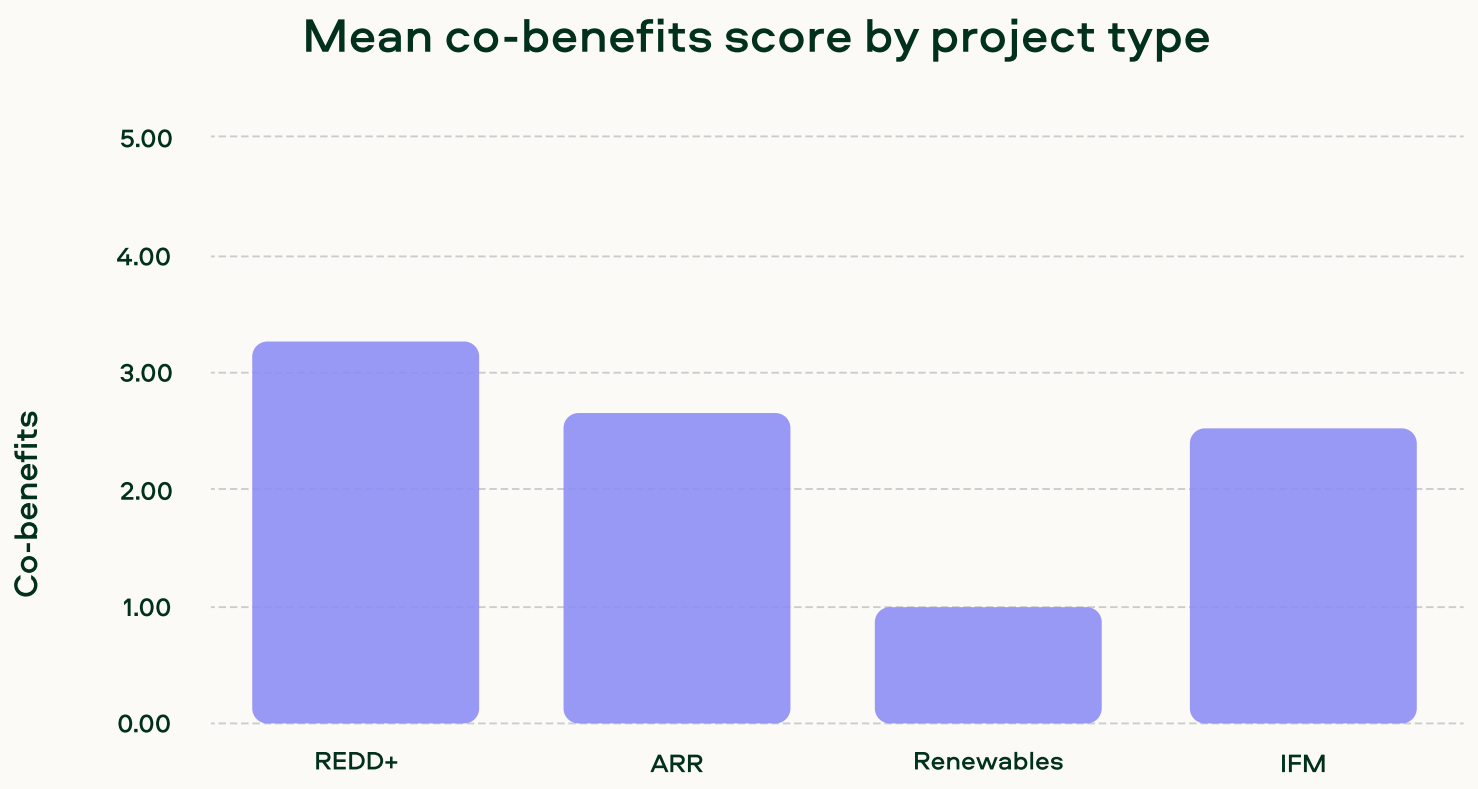
- The richness and diversity of species in the project area, using IBAT data
- Threats, such as poaching
- Management, protection, and commitments to mitigate pressure on biodiversity
- Partners such as NGOs and research institutions

For community impacts we map which UN Sustainable Development Goals (SDGs) are progressed by the project, the scale of the impact in terms of the number of people who benefit, and the progress achieved.

We then aggregate these results into an overall ratings score from 1 - 5. 5/5 indicates exceptional progression on targeted SDGs, as well as extraordinary species richness and high-quality activities to reduce pressure on biodiversity. 1/5 indicates very limited or no progression on targeted SDGs, very low species richness and a lack of activities to reduce pressure on biodiversity.

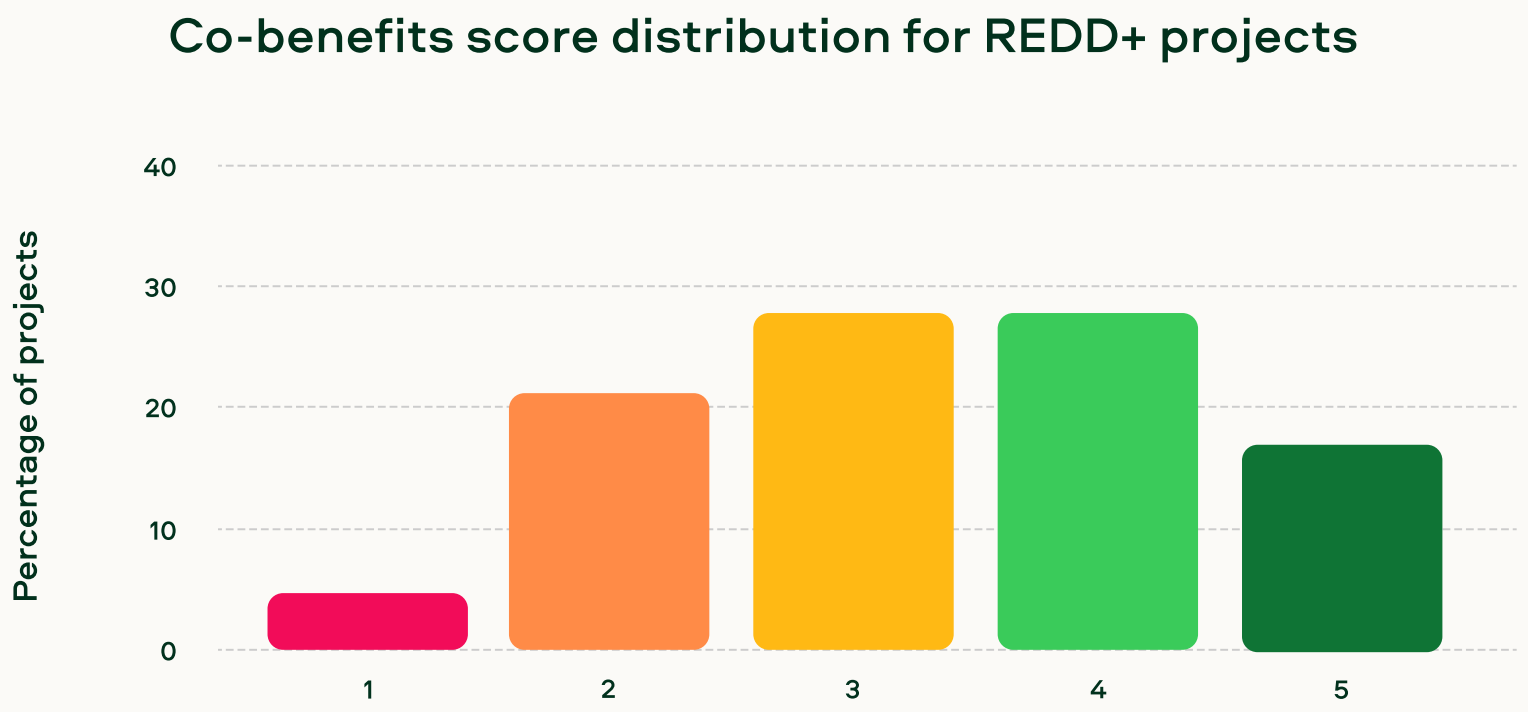
Data insights

NBS projects in particular are commonly associated with strong co-benefits, as natural carbon sinks are often also biodiverse habitats. Across all projects which Sylvera has rated to date, we see that NBS projects have higher average co-benefits scores.



On average renewables projects score only ⅕ for co-benefits, whereas REDD+ projects score over ⅗. However, there is still a wide spread in co-benefits ratings of NBS projects.

Even for REDD+ projects, approximately a quarter of projects score only 1 or 2 for co-benefits. It is important to consider projects on a case-by-case basis, rather than assume all NBS projects deliver valuable co-benefits.



Case Study

Co-benefits of REDD+ projects

One project in south-east Asia provides an excellent example of the potential co-benefits of REDD+ projects on both biodiversity and the local community. It is located in a key biodiversity area, home to a number of threatened species.

Many of these species are high-value, attracting poaches. The project has collaborated with the host country's Ministry of Environment and NGOs to train wildlife rangers to protect the project area from poachers.

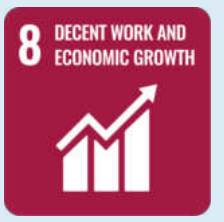
Furthermore, the project has well-designed community programs which reach a large number of local people. These programs include employment and training in sustainable agricultural systems, improving school infrastructure and providing student scholarships, and establishing Indigenous Communal Title and Community Protected Areas.

ACTIVITIES:

Economic empowerment through training/ support

ACTIVITIES:

Borehole construction



ACTIVITIES:

Full-time employment

Workshops/training on activities that enable community members to generate income

However, not all REDD+ projects achieve such positive impacts. Projects must be able to demonstrate active protection of biodiversity and genuine impacts of community programs.

One Brazilian project protecting an area of the Amazon rainforest, fails to implement activities which offer robust protection against threats to biodiversity. Furthermore, although the project claims to implement some community activities such as employing local people and improving access to schools, these are either temporary or reach a very small number of people. The project provides no evidence of impact.

Co-benefits insights

The tests we perform to assess co-benefits are more similar between project types than for the other sub-scores. However, we have still developed some project type-specific insights through our analysis over 3 years.

These considerations can guide buyers where to focus their due diligence before purchasing credits.

Project types	High quality indicators	Red flags	Sources of uncertainty
REDD+	• Engagement and partnership with community organizations • Variety and depth of community activities aligned with SDGs • Biodiversity survey and monitoring plans	• Failure to invest carbon revenues in community • Poor consultation coverage	• Reporting in project documentation • Opacity of community consultation practices and validation sampling design
ARR	• Wages above local minimum • Employment opportunities beyond cyclical planting & harvest cycles • Relative gender diversity of workforce	• Heavy use of glyphosate and other herbicides and insecticides (above EU limitations)	• Lack of reporting for workforce wages and gender composition • Inconsistent reporting of herbicide and insecticide usage
IFM	• Explicit biodiversity plans • Evidence of community engagement for smallholder projects • Variety and depth of community activities aligned with SDGs	• Biodiversity not explicitly reported	• Poor reporting on ancillary activities
Renewables	• Variety and depth of community activities aligned with SDGs	• Biodiversity not explicitly reported	• Poor reporting of energy uses and biodiversity risk mitigation

Section 6:

What is quality not?

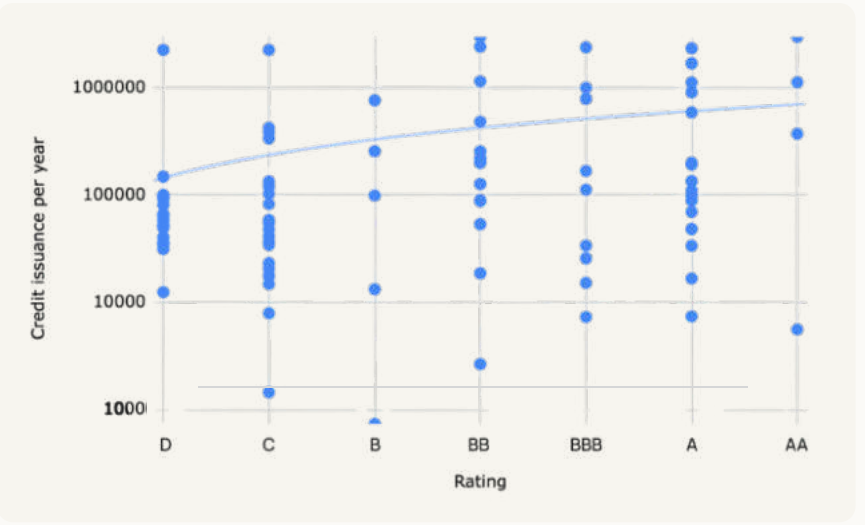
(False)proxies for quality

Prior to the availability of reliable credit quality ratings, credit buyers used a number of proxies for credit quality. The included project type, project size, credit vintage, credit price, methodology...

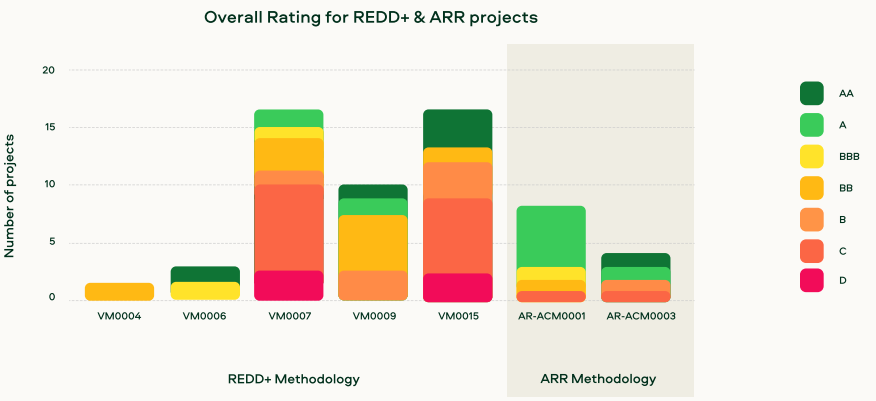
Spoiler alert: none of these criteria identify only high quality credits.

For all NBS projects there is a wide spread in ratings. All renewables projects we have rated to date are rated either C or D.

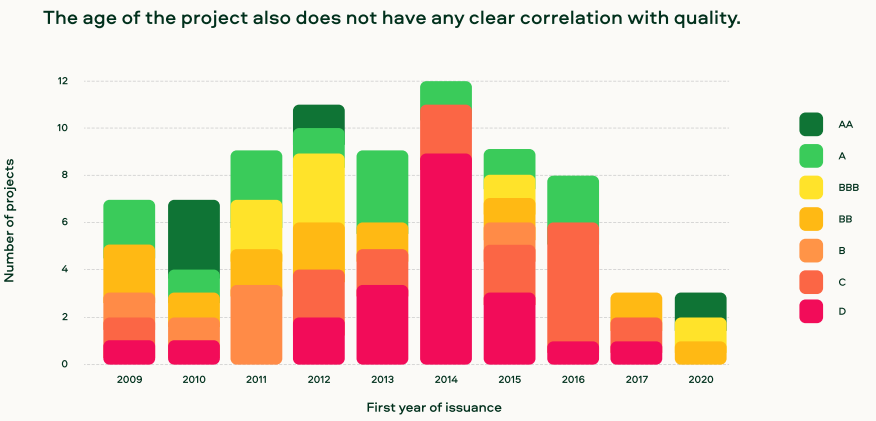
For example, the correlation between project size and rating is so weak (r=0.13) it cannot be considered to identify a significant trend.



Likewise, any methodology where we have rated multiple projects shows a spread of both highly rated and poorly rated projects.

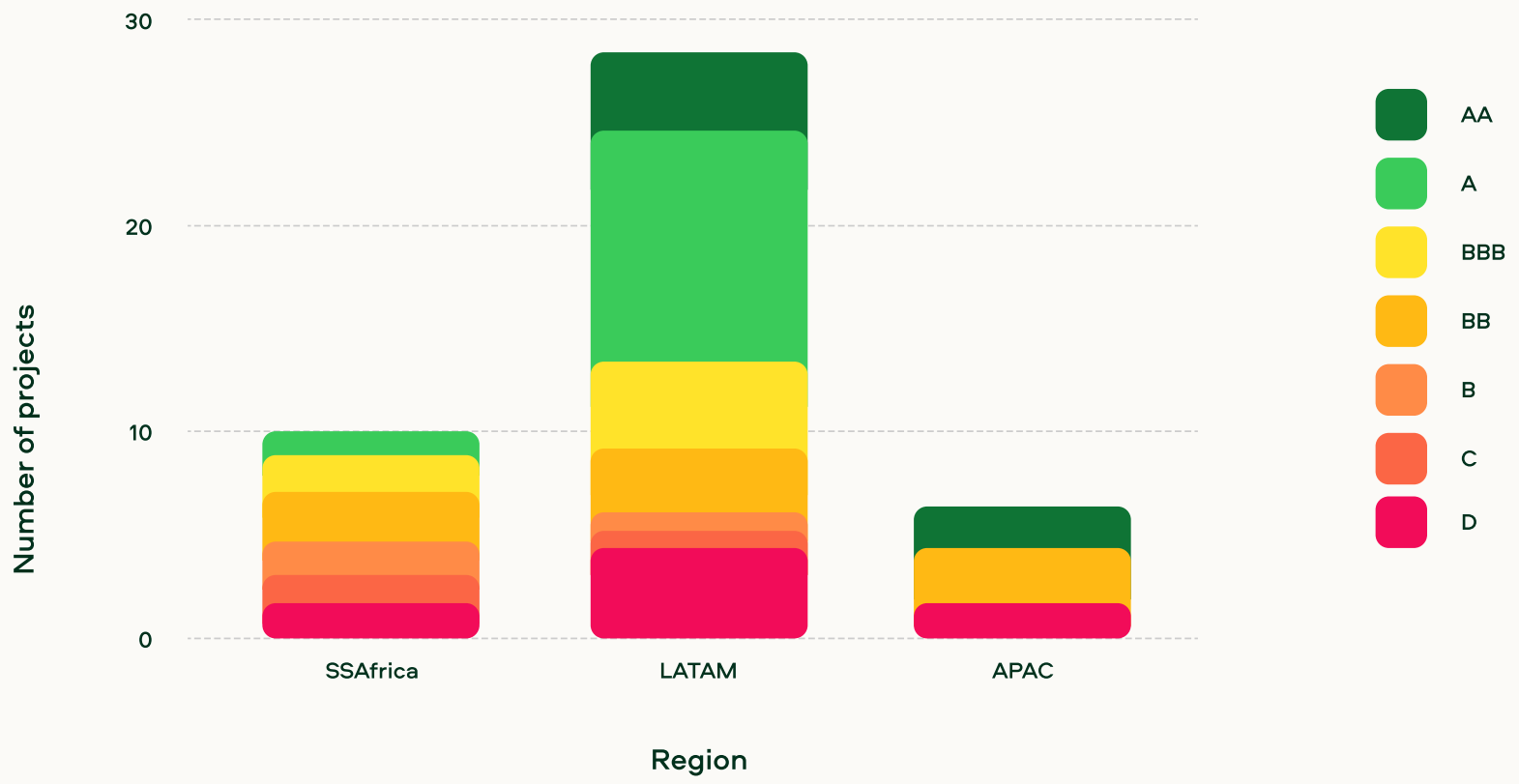


The age of the project also does not have any clear correlation with quality.



Section 6: What is quality not?

And neither does the host country or region.



The clear takeaway here is that for buyers to confidently identify only high quality credits, they must consider quality at the project level. Reliance on other proxies for quality introduces a significant risk of purchasing credits which do not deliver on their claims.

Section 7:

Wider context

How do others think about quality?

Across VCMs there are now a number of ratings agencies and initiatives assessing quality. Not all these assessments align.

Why?

It's less to do with how quality is defined, and more to do with how those considerations are assessed.

We find that although the exact language used may vary, credit ratings agencies and market initiatives are generally well aligned in the components of quality they identify.

	Ratings agencies				Market initiatives	
	Sylvera	Other ratings agencies			ICVCM	CCQI
Mapped against Sylvera criteria	**Carbon score** Includes: • Audit claims with independent data • Leakage	Project Emissions		Verification	8 - Robust quantification of emission reductions and removals	Robust determination of the GHG emission impact
		Leakage	Leakage	Leakage	2 - Mitigation activity information	
	Additionality Includes: • Strength of baseline • Overcrediting • Common practice • Policy • Finance	Additionality	Additionality	Additionality	1 - Additionality	
		Baseline	Policy	Baseline		
		Overlapping claims	Perverse incentives			
			Overcrediting			
	Permanence Includes: • Pests • Fire, flood, drought • Anthropogenic	Permanence	Non-permanence	Permanence	4 – Permanence	Addressing non-permanence
	Co-benefits Includes: • Biodiversity • SDGs	SDG impact claim*	Non-permanence	Permanence	9 - Sustainable development impacts and safeguards	Environmental and social impacts
Not included in Sylvera ratings (not project level criteria)					3 - No double counting	Avoiding double counting
						Host country ambition
	Indirectly - see text below				5 - Programme governance	Strong institutional arrangements and processes
					6 - Registry	
	Indirectly - see text below				7 - Robust independent third-party validation and verification	
					10 - Transition towards net-zero emissions	Facilitating transition towards net zero emissions

Ex-post vs ex-ante analysis

One fundamental difference in approaches is the stage at which quality assessments are performed.

Sylvera performs ex-post analyses. That is, we verify the results that have already been achieved by the project in order to assess the quality of the credits they have issued.

Other organizations perform ex-ante assessments. This is when the integrity of the governance and processes leading to the issuance of credits is assessed. The assumption is that strong methodologies and standards will lead to high quality credits.

Level of assessment

As previously discussed, Sylvera assesses credits based on the performance of the project that issued them.

Initiatives such as IC-VCM and CCQI assess at a different level. They assess credits at a higher level, such as assessing the carbon crediting standard such as Verra's VCS, the methodologies, or the credit category.

The criteria needed to assess at these different levels varies, explaining some of the differences in quality criteria between different organizations.

By assessing project performance ex-post, Sylvera is able to identify limitations to credit quality that might result from poor standard- or methodology-level integrity, such as over-crediting or poor additionality.

Building market consensus on quality

Urgent action on climate change is needed. VCMs can be part of the solution, if they are both high integrity and large scale. To achieve this, both understanding and visibility of credit quality are needed. This will ensure high quality projects are supported, and money is not diverted to projects not achieving their claimed impact.

There is justified concern about the number of low quality credits available in the market. Attempts at addressing this, namely ratings agencies and market initiatives like IC VCM, are now reaching a point of maturity. The market has reached a broad consensus on what a high quality credit is, and as demonstrated in this report, we now have the tools to identify them.

We therefore argue that focus should move away from simply highlighting that a large number of poor quality credits exist, to a more solutions-orientated approach. For those that are keen to deploy every possible tool to combat climate change, a priority should be to ensure VCMs have maximum impact through integrating quality assessments into every stage of the market.

Policy makers should embed a requirement for high quality into their oversight and regulation of VCMs. Rather than turning away from VCMs, corporate actors should be increasing demand for high quality credits which transparently report on their impact and take steps to improve. Standards and developers should use the lessons learned to improve their processes and verification to raise the bar across all their projects.

In this way we can restore confidence in VCMs, continue to scale their impacts, and accelerate progress towards global net zero.

Rather than being an existential threat to VCMs, the issue of credit quality is one with existing, effective solutions. Sylvera is proud to be contributing to building a more effective VCM. We hope to continue to work with partners such as IC VCM and CCQI on raising quality across the market and achieving the goals of the Paris Agreement.

Sylvera

Contact us to learn more.

Sylvera's mission is to be a source of truth for carbon markets.

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