

10 September 2025

Afforestation, Reforestation, and Revegetation (ARR)

FRC Feedback

-Answers to questions-

Carbon

1. How do you then assess a deforestation where the major forest change in the past (less than 10Y) is due to a wildfire?

- The Project Ineligibility component of the Over-crediting score aims to identify where intentional forest clearance to establish project activities occurred. If we detect any loss event in the 10 years prior, we will contact the developer to better understand the context. We can also visually inspect high-resolution imagery over the project area and use spatial fire history data to assess the extent of historic wildfires. Finally, if known major fire events have occurred within the country, we can also confirm with external reports.
- Intentional clearance is considered a severe risk. Ultimately, where significant loss is detected, Sylvera will endeavour to conduct additional analysis (high-resolution image analysis, developer engagement, land ownership history, etc.) to differentiate between intentional clearance and non-intentional loss from natural factors such as fires.

2. For the biomass tool, could the panelists elaborate on the functionality of the tool that allows it to not needing to rely on allometric equations? Additionally, for projects that have traditionally relied on allometric equations for biomass estimates, what adjustments or adaptations should they expect moving forward?



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- Sylvera collects MSL data to obtain credible, traceable, and highly accurate landscape-level estimates of above-ground biomass density (AGBD) to train their machine learning models. Multi-scale lidar (MSL) is a [peer-reviewed method](#) consisting of 3D-explicit modelling of individual tree biomass from terrestrial laser scanning (TLS) data at plot scale. These estimates are then upscaled with UAV-based laser scanned (UAV-LS) and airborne laser scanning (ALS) to cover tens of thousands of hectares. We believe that any model is as good as the reference data you use to train it. Our AGBD reference values are derived from 3D MSL technology, which allows AGBD estimation at high accuracy for areas as large as 65,000 ha without relying on conventional methods such as emission factors (EF) or allometries.
- Allometries are simple models that relate easily measured variables, such as stem diameter and tree height, to tree biomass. The shape of the models is usually a power function that tends to be linearised. Allometric models are often built using opportunistic samples of destructive measurements (harvested trees), which are usually biased towards smaller trees (as these are easier to harvest and weigh). This often results in models failing to accurately estimate the biomass of large trees (e.g., underestimating). MSL technology can estimate above-ground biomass (AGB) of trees with a 3% error and is unbiased compared to destructive measurements, while allometric estimates are usually biased ([Demol et al. 2022](#)), with differences up to 15% ([Burt et al., 2021](#)) or even 30% ([Calders et al., 2015; Gonzalez de Tanago et al., 2018](#)).
- This does not mean the developers should not rely on allometry, rather, they have to robustly choose them and justify why they choose those equations, make sure they are scientifically sound and they have done extensive field monitoring, including, where possible, remote sensing, which is encouraged under VM0047 under the area-based approach.

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3. Thank you for a very comprehensive overview of the new framework! I am curious about the biomass time-series data - what is the confidence level in the applicability of the biomass time-series data to projects which are in different geographic areas compared to where the data was collected (which I believe was in Africa)?

- Our multi-scale lidar (MSL) campaign in Mozambique (Africa) was our first full-fledged mission to collect the data that informs Sylvera's Biomass Time Series (BTS) data. Since then, we have collected MSL biomass data from different ecosystems and biomes across the globe, allowing us to cover most of the key biomes where nature-based solutions (NBS) projects from the voluntary carbon market (VCM) are located.
- We have collected data from the Amazon forest in Peru and Brazil, multiple sites in Tropical Australia, Temperate forest in North America, Humid tropical forest in Gabon and Belize, etc. Many other field campaigns are currently happening, or are in the planning/preparation phase (e.g. Brazil, India etc). For the areas in which we do not currently have the ability to use MSL data, our models will then be driven by GEDI biomass data or 3rd party biomass airborne laser scanning (ALS) datasets instead. These GEDI-powered models present higher uncertainty than our MSL-powered models (which is reflected in our uncertainty characterization).

4. Scalability: How do you envision implementing lidar at scale for projects composed of thousands of non-contiguous parcels, potentially spread across a country or region? In places like Nicaragua, where drone use is heavily restricted, that kind of data collection presents real practical challenges.

- Our multi-scale lidar (MSL) technology can measure biomass with incredible accuracy, but the amount of area we can cover and the number of times we can measure is limited by the amount of time we can spend collecting data and the cost of carrying out this activity (ca. tens of thousands of hectares per field campaign).
- The approach to modelling biomass is to collect data in representative biomes and regions across the globe. While MSL data may not be collected within a

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specific jurisdiction, the ecosystem being credited within that jurisdiction may be represented by data collected elsewhere, within the same or a similar ecosystem. Each MSL mission location is carefully chosen according to the priority of collecting the most impactful data - the intersection of where voluntary carbon market credits are, and the need for label data to build better global coverage of Sylvera's Biomass Time Series (BTS) data. The BTS product relies on MSL data and satellite imagery to scale up the estimations in the spatial and temporal domains.

5. Use of Field Inventory Data: Why not incorporate independently audited field-based forest inventories—which are already required by most ARR standards and are arguably the most accurate, project-specific data available? In many cases, these are now accompanied by geo-tagged and time-stamped photos to support verification. It seems like these could be a valuable complement (or even alternative) to remote sensing in some contexts.

- Forest inventory plots are measured over long periods of time (e.g., 5-year cycles) using different methodologies, sampling designs, sizes/shapes, and operators, which can lead to large discrepancies when assessing different projects and regions. Additionally, some projects might present high challenges due to inaccessibility and/or very high cost.
- Additionally, field-based inventories rely on tree allometries to estimate stand and forest-level biomass from diameter measurements alone. Allometries are simple models that relate easily measured variables, such as stem diameter and tree height, to tree biomass. The shape of these allometric models is usually a power function that tends to be linearised. Allometric models are often built using opportunistic samples of destructive measurements (harvested trees), which are usually biased towards smaller trees (as these are easier to harvest and weigh). This often results in large uncertainties and unknown biases. Multi-scale lidar (MSL) technology, which we use to power Sylvera's Biomass Time Series (BTS) data, can estimate above-ground biomass of trees with a 3% error and is unbiased compared to destructive

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measurements, while allometric estimates are usually biased (Demol et al. 2022), with differences up to 15% (Burt et al., 2021) or even 30% (Calders et al., 2015; Gonzalez de Tanago et al., 2018).

- We are very willing to analyse data provided by developers during our development engagement process. In the past, we have used local inventory data accompanied by geo-tagged and time-stamped photos as a complement to our assessment. However, the format and the quality of these can greatly differ from project to project. At the same time, this is not something that we can access/request from every project, as not all developers are open to sharing this type of data.

6. How are decisions around excluded pools (e.g. soil carbon, deadwood, harvested wood products) reflected in the rating? Many projects exclude them to remain conservative, but in doing so, may also underreport real climate benefits. Shouldn't there be some recognition of this conservative approach, especially given that including more pools can also increase risk?

- The carbon pool inclusion subcomponent of the ARR framework recognizes conservative exclusion of certain carbon pools.
- Above-ground biomass (AGB) is a mandatory carbon pool, providing clear, observable signals of carbon gains or losses, and similarly, below-ground biomass (BGB) must be included as a key carbon pool, with credible root-to-shoot ratios used where available. Soil organic carbon (SOC), however, can involve significant measurement uncertainty and may be excluded if not mandatory; it is required for mangrove ecosystems due to their substantial carbon changes, and when included, must rely on rigorous sampling and modeling methods. Deadwood and litter are dynamic and spatially variable, presenting measurement challenges; exclusion is generally recommended since this pool is often relatively small. Harvested wood products require assumptions regarding product half-life, decay rates, and substitution effects, and are frequently excluded or treated conservatively in methodologies.

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7. Attribution of Forest Loss: How does the framework distinguish between deforestation attributable to the project (or its participants) and unrelated landscape-level dynamics? For example, land acquired recently by a farmer may have had deforestation in the prior decade—but not by them. Most standards account for this nuance.

- The Project Ineligibility subcomponent of the framework distinguishes whether the current landowner of the project area was the same during the time period prior to project initiation. This information is taken into account in the scoring of Project Ineligibility to differentiate between intentional clearances to establish the project activities from non-intentional historic forest loss. Land that has significant forest clearance within the ten years prior to project start, and the same landowner, indicates a greater risk of intentional clearance than if the land was cleared in the past and the project area has since been acquired by the current owner.

8. Risk of Penalizing Proactive Projects: There's a risk that the framework inadvertently penalizes projects working in high-deforestation areas, even though these are exactly the kinds of interventions the world needs most. Projects intentionally targeting high-risk landscapes to reverse deforestation trends—often through community-based restoration—should be encouraged, not disadvantaged.

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- This issue touches on multiple aspects of crediting quality—baselines, perverse incentives, and additionality. This component aims to avoid perverse

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incentives in the market by identifying when forests have been intentionally cleared to establish project activities. Forest clearance creates a carbon "debt" to the atmosphere, as tree biomass has been lost. Replanting and crediting a project that had significant forest prior to project initiation ignores that debt, and that is why carbon standards generally include guardrails to mark projects with this type of forest clearance as ineligible.

- Intentional clearance is considered a severe risk; where significant loss is detected, Sylvera will always conduct additional analysis (high-resolution image analysis, developer engagement, land ownership history, etc.) to differentiate between intentional clearance and non-intentional loss from natural factors or background deforestation risk.

9. Peer assessment within Carbon Accounting score - will this scale? It assumes that the majority of similar projects are overcrediting (which they most likely are today) but over time, this metric should become irrelevant. Falling below the median claims made by other projects seems to only be relevant if it is known that most projects overcredit.

- The independent biomass benchmark using peer projects does not assume "the majority of similar projects are overcrediting". The assessed project is not benchmarked against peer project emission removal claims, as reported in registry documentation, but benchmarks the assessed project's removal claim against sequestration measured by Sylvera's independent Biomass Time Series (BTS) data within a group of peer projects. No assumptions are made about the distribution of this group. As such, benchmarking is independent of other projects' claims.
- Falling below the median simply means the project's emission removal claim is less than at least 50% of the sequestration rate (as benchmarked by BTS data) of its peers.

10. Project eligibility within over-crediting risk - why is 10 years the threshold for recent significant loss? (And what is 'significant' forest loss in this case?)

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- A ten-year lookback period within the project ineligibility subcomponent is used because that is the timeframe that is generally accepted to be long enough to prevent perverse incentives from deliberate deforestation, while still allowing reforestation on long-cleared land. It strikes a balance between additionality and integrity, without being impractically restrictive. The period mirrors the eligibility requirements of key carbon standards, such as the VCS.
- Significant loss is considered as forest loss covering >20% of the total project area.

11. Integrating Sylvera's industry-leading Biomass Time Series (BTS) data into Carbon Score:

It is impressive what has been done to develop the biomass time series however it is not clear how the models accurately capture the high variability of ARR projects (different planting designs, species composition, location, management) when they are based on specific areas that are then extrapolated. More specific questions related to this below. If a technical document is published, it may help to answer the questions.

- Capturing variability of ARR:
 - Has data been collected along different years to capture growth?
 - Is Sylvera's database (based on multi-scale LiDAR data and ground-truthing) capable of providing and validating accurate data across a wide range of tropical and subtropical regions, diversity of native species representative of the ecological variation and major forest types found in tropical countries?
 - Has the system been tested or proven to deliver reliable data for mixed-species plantation systems/projects? For example, has the model demonstrated a strong correlation with measurements of mean annual increment (MAI) for individual species and forest stands?
 - Is the system capable of effectively capturing vegetation growth during the first 3-4 years, particularly for native species?
- Variables of the model:

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- Wood density is one of the most important determinants of total tree biomass/carbon, even using a volumetric approach. LiDAR cannot measure or even estimate wood density. Allometric equations make generalisations about 3D structure of forests but often account for mixes of wood density (employing botanists to ID species, applying wood densities by species). Sylvera's approach accounts for the 3D structure well, but how is the approach regarding wood density? It is feasible that a project's estimates of biomass (using species-specific wood density + species specific allometric equations + site-specific measurements) could be more accurate than your regional models which heavily rely on 3D structure, and not species composition. Has this been tested?
- Would it be possible to use terrestrial LiDAR-derived datasets to enhance the calibration of existing, peer-reviewed allometric models (e.g. regions where robust equations are already available)?
- Error and uncertainty:
 - Having LiDAR at 3 different scales is great, but how do you account for error propagation through upscaling?
 - What is the degree of uncertainty associated with above-ground biomass and forest structure estimations?
 - Is there a dedicated uncertainty layer provided across the entire time-series dataset?"
- Peer-reviewed literature on the multiscale lidar (MSL) procedure is available in Demol et al. 2022. We are also preparing a technical document for the biomass time series product, which will be shared in due course. Response to specific questions below:
- Capturing variability of ARR:
 - MSL data is collected within one growing season at each site. Our sampling focus is spatial coverage rather than temporal. The large size of our missions (up to 60k ha) allows us to get representative samples of different types of vegetation, forest structures, and biomass levels.

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- Yes. We have already collected MSL data in a variety of tropical, subtropical, and temperate sites located in different countries. Our missions are targeted to biomes relevant for the NBS VCM. Sylvera's Biomass Time Series (BTS) uses regional biome-specific models derived from MSL data to provide accurate predictions across a variety of forest types and species. For areas where we lack MSL data, we use models powered by GEDI biomass L4A data. As the accuracy of the GEDI data is debatable due to the use of allometries and some questionable extrapolations, we have less confidence in those predictions, which is reflected in our uncertainty characterization
- The model does produce accurate annual above-ground biomass (AGB) stock for any given area/stand; however, it is not designed to calculate the mean annual increment of individual species in mixed stands.
- Sylvera's BTS predictions are currently restricted to canopy heights greater than 3 meters, regardless of stand age. We are currently scoping to lower that threshold with new reference data that better captures those early vegetation stages. The models are particularly suited to estimate the biomass of native vegetation as long as the vegetation reaches 3m of canopy height.
- Variables of the model:
 - We collect both terrestrial laser scanning (TLS) data and conventional forest inventory (incl. tree species determination) data. The TLS data is used for volumetric reconstructions of individual trees. The inventory data is used to calculate a basal-area weighted plot-average wood density (BAWWD) value. Wood densities are usually sourced from the Global Wood Density Database (GWDD), although we have collected increment cores in some locations. TLS-derived volumes are scaled to AGB with plot-specific BAWWD values. We are developing a method for tree-specific wood density attribution (whereby each TLS'd tree is

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paired with its inventory entry, and as such, a species-specific wood density value). More details can be found in our paper (Demol et al. 2024).

- In principle, yes, and it has been applied a few times already (e.g., this paper). However, a destructive measurement of AGB is still to be preferred over TLS-derived AGB for allometric model calibration. That is because not all sources of uncertainty in TLS-derived volume and AGB are fully understood. Sylvera has carried out a destructive validation experiment in Gabon and Peru to test these assumptions.
- The detailed methods are described in our paper (Demol et al, 2022), but essentially every scale has its associated uncertainty, which is used as input for upscaling.
- Our project-level uncertainty quantification accounts for sampling, residual variance, and spatial autocorrelation. Project-level uncertainty is dependent on the context – geographic, climatic, land use, species, etc. The average uncertainty of our AGB stock estimates at the project level is $\pm 15\%$ (66th percentile confidence interval). REDD+ projects show lower uncertainty levels (average $\pm 10\%$) due to their larger size, while IFM and ARR projects are at the other end (average $\pm 17\%$ and $\pm 22\%$ respectively) due to their small size and/or low biomass density.
- Yes, the uncertainty is spatially explicit.

12. Carbon accounting, gross emissions removals (pg 22): Sylvera estimates true removals comparing project estimation with their BTS model assuming the BTS is the reference of the true removals. Given that BTS model is built on data from specific locations and planting systems that is then extrapolated, a project carbon estimation that has looked for local data, has considered specific species mixed and management practices can still be more accurate than Sylvera's model. How is this taken into consideration when doing the comparison? And where does the uncertainty of the estimation of the model take place in this comparison?

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- One of the core aspects of above-ground biomass (AGB) modelling is a robust quantification of the uncertainty. Our uncertainty estimation accounts for sampling and residual uncertainty. Sampling uncertainty is estimated using a spatial k-fold cross-validation. Residual uncertainty is estimated at the pixel level and includes the uncertainty of our AGB reference data (MSL and GEDI) and modelling uncertainties. We account for spatial autocorrelation at the project level when estimating the uncertainty of our estimate.
- The model uncertainty is built into the comparison of project removal claims vs. Sylvera's BTS data. Specifically, the uncertainty propagation described above is used to calculate a 95% confidence interval, which we use as the threshold for comparison to the project removal claims.

13. Carbon accounting, biomass carbon accounting, model choices (pg26): Given that mortality rate data for native species in tropical regions is often unavailable, especially for those that are not commonly planted, can a project still get good score in modelling choices if it relies on alternative assumptions (e.g. similar ecosystems or species, functional groupings, or expert ecological input), and/or has established a robust protocol to measure mortality rates over time, even if it lacks historical evidence to validate its preliminary estimates?

- Mortality inclusion is not the only factor considered within the "Model choices" sub-component of the framework. It is one of four aspects investigated within the component. The others are "model quality", "species specificity," and "geographic specificity". Model choices scoring represents the combined view of all four aspects.
- Reasonable assumptions or monitoring methods to assess mortality risk are allowable under the framework, where local data may not be available.
- A project may still score well if some of the factors considered under Model choices carry a higher risk when considered alongside other elements of Carbon Accounting, and the potential scale of over-crediting associated with each component.

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14. Carbon accounting, over crediting risk, baseline quantification (pg 30): Dynamic baselines are considered good practice, however, many methodologies still don't adopt this approach and projects still can demonstrate robust estimation of the baseline. The recommendation is to reconsider the scoring on a case-by-case basis.

- Sylvera's frameworks are methodology agnostic. As suggested in the question, dynamic baselines are considered the best practice, and best practice is the driving force behind Sylvera's framework development.
- Adopting a case-by-case basis, based on methodology, would create a bias toward certain methodologies – penalizing certain projects that use one methodology vs. another. Investment-grade ratings can be achieved with static baselines.

15. It is not clear why project eligibility is part of over-crediting risk. And, project eligibility seems to miss whether a project is developed in wetlands.

- Project ineligibility is located within over-crediting risk, as projects that fail to meet eligibility criteria for crediting are, by default, over-credited. Intentional forest clearance creates a carbon "debt" to the atmosphere, as tree biomass has been lost. Replanting and crediting a project that had significant forest prior to project initiation ignores that debt and claims credits where no net biomass gain has been achieved, and that is why carbon standards generally include guardrails to mark projects with this type of forest clearance as ineligible. This component aims to stop perverse incentives in the market. However, it does touch on other aspects of credit quality, such as additionality, as credits claimed may also be considered non-additional if planting was the result of intentional clearance. Ultimately, Sylvera made the decision to categorise Project Ineligibility under Over-crediting, within the Carbon Accounting score, due to the fact that planting trees on intentionally cleared land results in no net biomass gain, and any credits claimed should be considered void and over-credited.
- We are investigating the inclusion of an accurate wetland ineligibility determination procedure. Specifically, we are investigating an accurate

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dataset to use for this determination. We plan to include a wetland ineligibility check in future releases of the framework; however, that is dependent on procuring a suitable wetlands dataset.

Additionality

16. Proponent Common Practice - interesting addition regarding proponent history of timber harvest and 'business-as-usual for project stakeholders'. Though does this not mean that proponent will be punished based on the more projects a proponent has successfully developed? What if they were good projects?

- Proponent Common Practice only considers whether the proponent or other relevant project stakeholders have undertaken similar activities outside of the Voluntary Carbon Market (VCM). If so, this may suggest that the activities were viable without carbon revenues.
- The assessment also considers the proponent's prior commercial experience and whether the project relies on substantial secondary revenue streams, which could indicate that the activity is commonly implemented for its commercial value.
- A proponent or developer with a portfolio of carbon projects that undertake similar activities and require VCM support would not be penalized under this score.

Permanence

17. For risk, would a project that works with a decentralized model (for example, spreading project activities across many smallholder lands in a project region where dropouts, risks can be balanced across landscapes and participants) score lower for risk?

- The Permanence score considers projects comprising several non-contiguous areas in two ways.

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- Under Anthropogenic risk, a project composed of multiple smallholder lands may have a higher risk of dropouts that could increase permanence risks if there are no mitigating factors or if additional smallholders are not brought into the project in new instances to make up for dropouts. Such dropouts have been observed in ARR projects involving several smallholders. The framework also considers the project design, measures to mitigate this risk, and any incentives for continued uptake of project activities when assessing the risk of dropout.
- Conversely, Physical risks (e.g., fire, drought, etc.) for a project with several non-contiguous land parcels spread out over the landscape are considered lower as disturbance events may be contained to individual areas and not affect a large portion of the project area.

18. Landscape Diversification: How does Sylvera's risk model consider the distribution of parcels across a landscape? A decentralized project spread across thousands of parcels is far less likely to experience catastrophic loss than a single-block project, particularly for risks like fire, pests, or storms.

- The Permanence score considers projects comprising several non-contiguous areas in two ways.
- Under Anthropogenic risk, a project composed of multiple smallholder lands may have a higher risk of dropouts that could increase permanence risks if there are no mitigating factors or if additional smallholders are not brought into the project in new instances to make up for dropouts. Such dropouts have been observed in ARR projects involving several smallholders. The framework also considers the project design, measures to mitigate this risk, and any incentives for continued uptake of project activities when assessing the risk of dropout.
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19. Community Co-benefits and Risk Reduction: Projects that generate lasting benefits for local people—especially those that support livelihoods—are more likely to be maintained and protected over time. Has Sylvera considered more directly integrating community benefits into the permanence rating, beyond treating them as safeguards? In many cases, they are core to the long-term durability of carbon gains.

- The Anthropogenic risk score considers community "buy-in" factors such as benefit-sharing mechanisms and land tenure security to assess the likelihood that project activities will be maintained over time. Issues such as poor engagement and community grievances are also considered under permanence to assess the risk of community dropouts. The weight given to these factors depends on the level of community involvement in project activities.
- Sylvera recognizes that community buy-in may be more complex than just benefit-sharing and land tenure; lasting benefits that incentivize project activities may include other livelihood support beyond revenue sharing. Sylvera is considering exploring more sophisticated connections between the Safeguarding and Cobenefits score and Anthropogenic risk score under future framework version updates in the second half of 2025.

20. It seems land rights are not considered in permanence. It is recommended to consider it as an important element that can negatively affect project permanence.

- Land ownership and land tenure considerations are factored into the Anthropogenic risk score under permanence. Where land tenure is weak or actively disputed, this can increase risks.

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Co-benefits

21. Under Safeguarding and co-benefits, a "good example" of a project references "natural regeneration of existing native ecosystems or planting of native species in polyculture"—how does Sylvera take a view on what constitutes "native" ecosystems? I've seen a few projects that claim to follow a native species reforestation design in ecosystems that are currently wet / dry savannahs, but claim that the area would naturally be a forest ecosystem if not for historical anthropogenic activities such as deforestation and slash and burn agriculture?

- Sylvera considers a project to be "natural regeneration" only when the project activities clearly fall under assisted natural regeneration and reforestation/revegetation that aims to replicate the native ecosystem of an area that was forested in the recent past (e.g., degraded forest land, degraded mangrove forest). Determination uses desk-based assessments of the project activities, alongside the historical land classification of the project area and the surrounding region.
- Active planting of "native species" or "polycultures" may include activities that are not considered natural regeneration (e.g., timber or orchard plantations of native species in mixed stands). Such activities would not fall under the "natural regeneration" category in our framework. The difference between the two is that natural regeneration must aim to replicate existing degraded or recently deforested forests.
- Planting can only be considered "reforestation" if there is evidence that the area was forested in the past. Planting would be considered "afforestation" if there is no evidence that the area was ever forested.
- Sylvera is considering incorporating Land Use and Land Use Change datasets in the Safeguarding and Co-benefits in future iterations to identify areas where planting on on-forest ecosystems may be inappropriate due to potential ecological harms, depending on the availability of high-quality datasets with worldwide coverage.

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22. Is project impact on Human health (SDG3) something that Sylvera is seeing emerge?

How projects positively impact health?

<https://www.wbcsd.org/resources/new-toolkit-for-health-outcomes-from-nature-based-solutions-now-available-via-ncsa-and-ncs-procurement-hub/>

- The Co-benefits and Safeguarding score only considers Sustainable Development Goal (SDG) contributions where project activities can be directly linked to an SDG target/indicator that can be monitored to ensure tangible and quantifiable impacts. If a project were able to provide a metric to track its impact on health benefits under SDG 3, then this would be considered a clear co-benefit. Although NBS projects can have broader benefits, such as health benefits related to ecosystem services, SDG 3 contributions would not always be applied to NBS projects without a clear link between project activities and a specific outcome.

23. Biodiversity - What about monitoring within the project design? There doesn't seem to be a consideration RE active biodiversity monitoring from the proponent (e.g., eDNA) within the project design.

- The Safeguarding and Co-benefits score generally considers if the project has a monitoring plan to quantify positive co-benefit impact over the project lifetime. Sylvera is considering adding biodiversity monitoring explicitly within the Biodiversity sub-score in the next minor version update in Q4 2025.

24. Biodiversity safeguards: it is recommended to include a check if the project activity needs an environmental assessment as per local regulations. The assessment should also include any environmental impact of land preparation, water usage, etc. In general, this safeguard is not only about biodiversity but more broadly environmental considerations to ensure sustainable and responsible project implementation aligned with local policies, permits, restrictions, etc.

- Sylvera considers biodiversity and environmental safeguards beyond what is required by regulations. If an Environmental Impact Assessment (EIA) is not



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required under a specific jurisdiction, Sylvera still considers it important to assess the impact that project activities may have on surrounding ecosystems, water systems, etc. As such, the score is currently regulation-agnostic.

- However, assessing environmental impacts involves many factors. Sylvera is considering developing an EIA framework to assess environmental and biodiversity safeguards more holistically in future iterations that would include more compliance-based checks, subject to research and development.

General Questions

25. How do the various pillars contribute to the overall score? Is there a weighting for the individual pillars?

- The pillars are combined in matrices to produce the overall Rating Grade. Full matrices are available to view on our User Guide, and will be published in the updated ARR whitepaper.
- Two matrices are used: Impact matrix; Ratings matrix.
- The Impact matrix combines the Additionality and Carbon score to provide the overall "real" carbon impact of a project (assuming a project has high impact if claimed reductions are both accurately accounted for and additional). The Impact score produces a "ceiling" rating (the highest possible rating if the carbon impact were permanent).
- The Ratings matrix combines the Impact score and the Permanence score, which determines the final rating, with Rating grades decreasing as permanence risk increases.

26. Interested in Sylvera's view on how well the market at large will compare against this new rubric. There are already very few well-rated ARR projects on the market - will the improved Framework reinforce that?



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- Sylvera's framework and Rating grades are designed to assess the likelihood that each claimed tonne of tCO₂e removed is accurately accounted, additional, and is removed for an atmospherically beneficial length of time.
- Ratings frameworks do not consider any project type to be inherently risky; no projects are given low ratings based on the nature of their project type. Sylvera has rated high-quality ARR projects as "Investment Grade" in the past (>BBB), and "Investment Grade" ratings were produced under the new framework from the batch of projects tested.
- During framework testing, a range of quality was found across the tested projects. ARR projects can achieve investment grades provided they score well in Carbon Accounting and Additionality and do not exceed moderate permanence risks. The Rating grades aim to identify those high-integrity ARR projects within the market and to drive quality in the market.

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