The IFM Framework was presented, and these answers provided, as at 3 October 2022. The answers do not necessarily reflect the current positions taken by the IFM Framework, which may have been updated following further internal review. Please reach out to your usual Sylvera contact, or to frameworks@sylvera.io, if you would like to discuss further.

Attendance at a Framework Review Committee meeting does not constitute an endorsement of Sylvera nor any Framework.

Framework Review Committee:

IFM Consultation

Attendees: AgVenture Lab; American Carbon Registry; Anew Climate; ASOCIACION PARA LA INVESTIGACION Y DESARROLLO INTEGRAL; Bain; Biofilica Investimentos Ambientals; BP; BRCarbon; Carbongrowth; Chevron; Climate Impact Exchange; Climate Impact Partners; ClimatePartner GmbH; Conservation International; Cultivo; Ecologi; EnBW Energie Baden-Wurttemberg AG; Engie; Equinor; Fauna & Flora International; Finitecarbon; Freepoint Commodities; GO2MARKETS; Gold Standard; Grayjaymgmt; Morgan Stanley; Nasdaq; NCX; Permian Global; Platform Partners Asset Management; Respira; RWE Supply and Training GmbH; Salesforce; Sasol Limited; Schneider Electric Global; Shell; South Pole; Temasek; Ureca; Verra; Volkswagen; Winrock International.

Question 1

How will the Sylvera framework be adapted as new IFM methodologies are developed?

Answer

We undertake annual updates to our frameworks. In this update, we research the latest methodologies that have been released and adjust the framework accordingly. As IFM is a project type with highly dispersive methodology approaches, it is likely new methodologies will result in significant updates and require additional analyses. If new methodologies result in a significant update to the framework, we will conduct another consultation via the Framework Review Committee.

Question 2

I am curious if there are next steps in this process. It is great that this public webinar exists, but will Sylvera be taking and making comments public in a written format for others to process and digest?

Answer

We will publish a recording of the full Framework Review Committee session, alongside written responses to all questions raised 14 days after the consultation both during the consultation and the offline comment period.
The Framework Review Committee exposes our draft frameworks to a group of stakeholders in order to gather feedback from experts across the voluntary carbon markets. We will use the feedback received to finalise the framework with an internal Framework Approval Committee. The scoring matrices are then tested against a primary batch of projects and will be published in full. Once all of these steps have been completed, we will apply the framework to produce project ratings.

Question 3

Is it clear what incomes are coming from traditional forest business and income from forestry carbon projects and that these projects are "financially additional"?

Answer

Unfortunately, very few projects disclose revenue projections and the revenue split between the VCM and non-VCM. When there is incomplete financial data, we perform a heuristic comparison that looks at non-VCM revenue between the project scenario and business-as-usual scenario, based on harvested wood amounts. This approach helps us to make a realistic benchmark based on traditional forest business revenue that excludes VCM revenue. If the non-VCM revenue in the project scenario is equal or higher than this benchmark, then the project is likely non-additional.

Question 4

You are only considering "above ground carbon"?

Answer

We do not assess "below ground carbon" independently since we cannot detect its changes with our current observational and ML approaches. Instead we consider the behavioural change of the forest (based on canopy cover), which we associate with changes in carbon stock of both below and above ground carbon. This is then compared against the project's claims.

Question 5

What is the level of difference between project observation and Sylvera observation that results in different rating on the scale?

Answer

This will be reflected in our final carbon score matrices, which will be determined following this consultation, after the IFM framework has been finalised. The matrices will be constructed taking into account the uncertainty in our ML predictions, and the range of agreement (or disagreement) against a sample set of projects. Generally, in our other nature-based frameworks most projects get approximately 100%, as under-reporting of emissions is a rarity. All scoring matrices will be published in full.

Question 6

With regards to gerrymandering - how does the model assess whether the project has simply removed all of the non-forested areas (roads, rock outcrops, grasslands, shrublands), vs. intentionally excluded low stocked but forested stands from the project areas. Some forest types are fairly sparse with merchantable forest cover and intermingle with non-forested shrub areas that need to be excluded from the project area as they are not considered forestland.

Answer

Our ML model allows us to predict canopy cover so we can see which areas have higher or lower canopy cover. To assess if the project area shows risks of gerrymandering of high stocked areas, we compare the canopy cover distribution of the area surrounding the project against the canopy cover distribution in the project area throughout the years. Those areas that are not relevant, such as roads, rivers and other non-applicable land-uses, are masked out of this comparison and are not considered in the analysis.
Non-forested areas or incomparable forest types with lower canopy covers will also be excluded from the analysis.
Additionally, tests for geomorphic factors (such as slope) and land designation factors (such as land ownership parcel shape) which may in turn influence the

project shape are conducted. Only if (a) the convolution cannot be explained by the geomorphic and land designation factors and (b) the adjacent area has forestland with evidently lower carbon stocks will a project be flagged as at over-crediting risk. This test will only be applied to US projects under the CAR methodologies.

Question 7

How does the model observe forest management activities such as single tree selection that do not drastically alter the overall canopy cover, and are difficult to detect through imagery? Remote sensing is good at detecting large disturbances such as clearcuts but notoriously struggles with less intensive management.

Answer

The inherent uncertainties in machine learning and the limitations of remote sensing mean that we are unable to accurately detect small incremental changes. As such, we have constructed the framework so that the carbon score will be predominantly measuring differences arising from egregious mismatches. This means that only relatively large disturbance events are taken into account. For example, when the project is reporting significant gains in carbon stock but Sylvera obseres large losses via clear cutting. We do not consider year-on-year change, but rather observe the net change in overall forest cover over the complete timeframe of the project to date. It is also worth noting that the ML predictions undergo a QA process, where a selection of pixel-level predictions are checked against high-resolution imagery. The imagery used is 1m resolution for the USA, and 4.8m resolution for Mexico - and this allows us to train for and detect gradual gain and loss of trees, such as thinning.

Question 8

How regularly do you ground truth the remote imagery analysis and machine learning with field plot measurements? Was that part of the initial design or is it an ongoing QA/QC process of continued accuracy?

Answer

We do not currently validate the remote imagery analysis or machine learning results with measurements directly from each project/plot. Instead, we validate our ML results using high-resolution remote sensing imagery, which allows the accurate determination of events taking place on the ground. This is done by generating a stratified sample of points within the project area. These are selected to represent the different types of activities (e.g., thinning or afforestation).
The model performance for each project is assessed by using a sample of points (between 100 and 1000) from within the project area, selected to represent the different levels of canopy cover change taking place in that project. These points are manually annotated based on the principal event (the event having the biggest impact on carbon storage) taking place at that point, by visually inspecting high-resolution imagery across a minimum of 5 years. A minimum of 4 people annotate each point in every project, and we compare model performance against only the points where agreement between annotators is above a defined threshold, ensuring robust reference data. The predictions from our model are compared against these annotations to give a measure of the overall uncertainty of the predictions for the project. We only publish projects where this uncertainty is deemed to be at a level to not negatively impact the rating of the project.

Question 9

Registries use different approaches to ensuring permanence through buffer pool contributions. Is the buffer pool that backs the project considered?

Answer

With our permanence score, we are seeking to assess the risk that the carbon stock in the project will be lost. It is not an assessment of whether the buffer pool is sufficient for covering any reversal that does take place. Sylvera does not consider buffer pool contributions as mitigative or preventative measures that lower the physical risk of carbon stock being lost. While a credit can still be considered 'permanent' in the sense that the buffer pool has balanced out the loss (at an atmospheric accounting level), this does not mitigate against the fact that the carbon stock at a project level is still gone.
With respect to registry balancing, we will surface buffer pool contributions in

our commentary to highlight the level of registry-wide insurance. However, a project that has suffered severe losses and had to draw on the buffer pool, represents a significant reputational risk, even if the integrity of the credits generated by that project has not been compromised at an atmospheric level.

Question 10

I am new to the Sylvera process in general. Is there a process through which discrepancies between Sylvera's analysis is shared with the project or registries to address concerns through discussion before the findings are published?

Answer

Sylvera engages with project proponents as part of the rating process for all projects.

To improve the quality and accuracy of our ratings, and to ensure fair process, we often seek clarification with proponents or request additional information. This could include asking for justification on the choice of a variable used to determine permitted credits to issue, requesting a shapefile (map) of an area of interest, or requesting comment on a press article relating to the project.

Once a proponent provides us with the supplementary information, we review and analyse the relevance and validity of it, before assessing what (if anything) to incorporate into the final rating. Incorporating this information in our rating ensures our content is up to date, accurate and detailed. Moreover, it ensures that Sylvera follows a fair process in generating its ratings by allowing project proponents to raise concerns, provide additional, relevant information or correct factual errors.

This process can lead to changes to subscores and hence the overall Sylvera rating as well. In light of this, Sylvera always attempts to engage with project proponents before publishing a rating, but if this isn't possible, then Sylvera will publish a rating with a warning that it is “pending review”.

Question 11

How do you evaluate the accuracy of the model detection in each project? What is the accuracy percentage?

Answer

The model performance for each project is assessed by using a sample of points (between 100 and 1000) from within the project area, selected to represent the different levels of canopy cover change taking place in that project. These points are manually annotated based on the principal event (the event having the biggest impact on carbon storage) taking place at that point, by visually inspecting high-resolution imagery across a minimum of 5 years. A minimum of 4 people annotate each point in every project, and we compare model performance against only the points where agreement between annotators is above a defined threshold, ensuring robust reference data. The predictions from our model are compared against these annotations to give a measure of the overall uncertainty of the predictions for the project. We only publish projects where this uncertainty is deemed to be at a level to not negatively impact the rating of the project. Overall, our approach has a clear-cutting specificity of 89%.

Question 12

Will you say a bit more about how these assessments apply to individual single projects vs aggregated projects vs methodologies? And for projects where the change in IFM behavior is expected over many years, how do you apply your assessment ex-post? E.g., do you do repeat measures annually?

Answer

Our rating is applied to a singular project that has generated issuance under a specific ID. That project may be made up of several areas, or several land owners. If there is an instance where several landowners are involved, but the business-as-usual scenarios are different, we would have to assess each case separately (if the geolocation data per landowner was available), but aggregated under one score. We do not assess methodologies, nor make inherent judgements on the basis of the methodologies, but we do take the implications of the methodology (i.e. the crediting mechanisms) into consideration when determining how to assess the project.

For the behavioral change implemented by a project, we assess their statement of performance through the listed change in Carbon Stored in Live

wood. Although this is typically listed annually ex-post, we compare the *total* change over the current lifetime of the project to the apparent behaviors determined from Sylvera ML observation, which are updated annually up until 2021, to determine if these align overall. We do not score annually.

Question 13

First, we believe the same formalized procedures and principles that define quality in carbon crediting registries have relevance to credit ratings agencies. While the Sylvera Frameworks and Processes Whitepaper suggests internal committee review, we suggest that a formalized and transparent external stakeholder consultation process is also developed. This process should include public comment and outside expert review (similar to the process implemented by crediting standards such as ACR or Verra) to ensure program rules and project attributes are being fairly interpreted and evaluated. We also suggest the public comment period is extended beyond just 7 days (30 to 60 days is typical), as such a narrow window of outreach will exclude many interested parties from commenting.

In a similar vein, published and publicly available assessment frameworks are necessary to ensure ratings are based on sound science and industry best practice. Carbon methodologies contain a level of information such that project development could reasonably be reproduced, and the same should be expected from a rating organization. Our current comments on the Sylvera approach stem from a review of a high-level Powerpoint slide deck, which glosses over many critical details necessary to ensure a consistent and objective approach. With numerous ratings organizations entering the space, transparency and objectivity will be necessary to avoid market confusion and achieve the ultimate goal of instilling buyer confidence.

Answer

The intention of the Framework Review Committee is to expose our frameworks to a diverse range of stakeholders from across the voluntary carbon markets. New and materially amended frameworks are all reviewed and scrutinised by the Framework Review Committee before they are applied to produce project ratings.

The Framework Review Committee comprises representatives of industry bodies and multilateral institutions; standards bodies; project developers; technical and scientific experts; exchanges and marketplace operators; financial institutions; and buyers / retirees of carbon credits. Separately, the ML models are scrutinised by an external technical advisory body, comprising

leading academic and industry experts in the field of remote sensing.

In order to facilitate meaningful discussion during the framework consultation, we distribute our frameworks ahead of the consultation. The window for offline comment is seven days, but we understand that this still might be too short for some interested stakeholders to engage. It is our intention to gather as much feedback as possible on our draft methodologies, and as such we will consider extending the comment window to encourage participation in future consultations.

Once the framework is finalised, we will publish a whitepaper that details the framework. All frameworks that have been developed today can be found in the Resources section of the website.

Question 14

Regarding the carbon score, we have concerns in comparing and awarding carbon scores against a proprietary and remotely sensed carbon estimate. This comparison inherently assumes that the Sylvera approach is an appropriate benchmark for assessing the quality of project carbon estimates. On the contrary, field-derived carbon estimates are based on well accepted statistical sampling theory and greater evidence is needed to support any conclusion that differences between remotely sensed canopy cover analysis (Sylvera method) and field-based estimates of carbon stocks (ACR and industry standard method) should be interpreted as erroneous on behalf of the project. Greater clarification is also needed as to how baseline decline is interpreted in the carbon score, and how the Sylvera framework performs across the variety of forested conditions in which carbon projects are developed. The current state of communication and transparency on these issues could be improved to establish Sylvera's approach as a credible rating tool.

Answer

We agree that our remote sensing and machine learning approach is not an alternate (or better) benchmark for measuring carbon stocks when compared to field-derived carbon measures. We do not attempt to measure carbon stock

and thus it is not a benchmark comparison in the score. We have constructed the framework such that the carbon score will be predominantly measuring differences arising from egregious mismatches, i.e., the project reporting significant gains in carbon stock but Sylvera observing large losses via clear cutting. We do not consider year-on-year change, but rather observe the larger changes over the complete timeframe of the project to date. We take into account the uncertainties in our ML models in the scoring, as well as scoring conservatively such that a low score can only arise from the aforementioned scenario. We expect that most projects will achieve 100%, as under-reporting of emissions is a rarity. As we are aware of the limitations of remotely sensed data for measuring carbon stocks, our ML models do not aim to quantify carbon directly, but rather to determine the dominant forest change activities in the area, which we use as a proxy for assessing the overall carbon stock change.

With regards to the performance of the ML models, the predictions from our model are compared against annotations on high resolution imagery to give a measure of the overall uncertainty of the predictions for this project. We only publish projects where this uncertainty is deemed to be at a level to not negatively impact the rating of the project.

Question 15

On additionality, ACR has concerns regarding Sylvera's interpretation of common practice. Forest management happens over multidecadal time scales and decision-making processes are dynamic, such that recent management of a given parcel is not necessarily a good metric for evaluating the additionality of a baseline scenario. This is because timber markets and financial needs/goals of a proponent fluctuate and land ownership changes frequently. We suggest reevaluating the proposed approach such that the likelihood of the baseline scenario is assessed in relation to common regional forest management practices, rather than an ownership specific assessment.

Answer

We agree - our framework scoring does not apply all common practice tests to all projects. We only apply tests that are applicable to a project (determined by

its proposed business-as-usual scenario, location and methodology, amongst other things). As such, if the project claims that during the project period, they would have chosen to begin harvesting aggressively due to evolving market conditions (having not done so in the past) then we would *not* seek to confirm the land parcel's history of harvesting, as it is not relevant. Therefore a lack of history of harvesting would not negatively impact the score. We would instead assess their reasoning and evidence behind the drivers of the behavior change claimed in the business-as-usual scenario, including regional market dynamics and projections.

Question 16

We also suggest that the Sylvera approach is reconsidered such that financial additionality isn't underpinned by a requirement that carbon finance must singularly "shift" project economics from negative to positive. In reality, considering the current price of carbon, IFM carbon project revenues often supplement forgone revenues and opportunity costs associated with undertaking the project and are typically one piece of a blended finance model to achieve carbon sequestration and other land management goals.

Answer

We agree with your sentiment. The concept underpinning financial additionality is not necessarily carbon finance shifting economics from negative to positive, but instead supplementing foregone revenue - which never would have otherwise chosen to be foregone without the existence of the VCM to supplement.

Question 17

The Sylvera method for assessing permanence seems to be addressing risk rather than the concept of permanence. It fails to recognize an important permanence safeguard of the voluntary carbon market that is already in place - the buffer pool. At the commencement of an IFM project a number of threats to carbon stocks are evaluated, taking into consideration regional scale ecological conditions. A respective percentage of credits is then deducted and deposited into program-wide buffer pools that ensure the

project's carbon integrity in the event of an unforeseen natural disturbance. Intentional reversals are insured through a contractual obligation between the project proponent and ACR. At the very least, Sylvera should take program-level risk mitigation measures into account in their permanence category scoring.

Answer

With our permanence score, we are seeking to assess the risk that the carbon stock in the project will be lost. It is not an assessment of whether the buffer pool is sufficient for covering any reversal that does take place. Sylvera does not consider buffer pool contributions as mitigative or preventative measures that lower the physical risk of carbon stock being lost. While a credit can still be considered 'permanent' in the sense that the buffer pool has balanced out the loss (at an atmospheric accounting level), this does not mitigate against the fact that the carbon stock at a project level is still gone.

With respect to registry balancing, we will surface buffer pool contributions in our commentary to highlight the level of registry-wide insurance. However, a project that has suffered severe losses and had to draw on the buffer pool, represents a reputational risk even if the integrity of the credits generated by that project has not been compromised at an atmospheric level.

Question 18

We appreciate that Sylvera's Framework focuses on assessing evidence of actual carbon stock change, making use of both data and technological advances. We are interested to learn more about how your models and assessments are built and work, and in particular, how they approach and address multiple sources of uncertainty. For example, will Sylvera provide benchmarks for its own models, which are then used to assess project results? We recommend you provide model diagnostics for Sylvera's tools.

Answer

The ML model is trained on Global Forest Canopy Cover (GFCC) labels, which was validated against open-source LiDAR data, over biannually updated 12-month Landsat-7 composites. Due to the limitations of the training data, we do not consider the predictions of absolute canopy cover accurate enough

and instead have chosen to use relative canopy cover change to measure overall forest behavior, as different levels of change in canopy cover are associated with different events taking place on the ground.

The model performance for each project is assessed by using a stratified sample of points (between 100 and 1000) from within the project area, selected to represent the different levels of canopy cover change (i.e. events, e.g. clear cutting) taking place in that project. These points are manually annotated based on the principal event (the event having the biggest impact on carbon storage) taking place at that point, by visually inspecting high-resolution imagery across a minimum of 5 years. A minimum of 4 people annotate each point in every project; we compare model performance against only the points where agreement between annotators is good, ensuring robust reference data. The predictions from our model are compared against these annotations to give a measure of the overall uncertainty of the predictions for this project. We only publish projects where this uncertainty is deemed to be at a level to not negatively impact the rating of the project. Overall, our approach has a clear-cutting specificity of 89%.

The uncertainty of the model is taken into account in two ways: we do not pass projects that fail to pass several different quality assurance (e.g. RMSE, MAE, bias) thresholds, and those that do pass do not impact the score within their bounds of uncertainty. We have constructed our scoring such that the matrix will only allow a score to be changed if the ML uncertainty is within a scoring matrix bound.

Question 19

When Sylvera applies its framework to projects which themselves are based on models, how will the uncertainty of the projects' models be assessed in relation to the uncertainty of Sylvera's own models? For example, what are the risks that uncertainty in Sylvera's model will result in an inconclusive or incorrect assessment of a project?

Answer

Similar to the previous question - the uncertainty of the ML model is taken into

account in two ways: we do not pass projects that fail to pass several different quality assurance thresholds (e.g. RMSE, MAE, bias), and those that do pass do not impact the score within their bounds of uncertainty. We have constructed our scoring such that the matrix will only allow a score to be changed if the ML uncertainty is within a scoring matrix bound.

As for the project uncertainty in their estimations, we construct the matrices such that this is also accounted for. We will not compare the Sylvera ML detected forest change to project estimation within their uncertainty bounds. As the carbon score is predominantly looking for extreme mismatches, we are quite sure the risk of uncertainties causing an incorrect assessment is minimized.

Question 20

A common criticism of IFM methodologies is that they do not account for carbon transferred to other pools, like harvested wood products. It seems that Sylvera's framework focuses exclusively on live wood. We recommend clarifying if or how the assessment framework evaluates whether a project accounts for carbon stored in other pools.

Answer

In our carbon score framework, we only consider live wood as it is the dominant carbon pool typically used for crediting, and our remote sensing capabilities restrict us to only considering above ground biomass. We conservatively assume that the accounting on all other carbon pools is accurate. We do not currently evaluate whether a project has chosen to include or exclude certain carbon pools, although this is something we are considering including in the over-crediting risk component as an indicator of conservatism.

Question 21

We agree that additionality is difficult to assess but critical to ensure high quality forest carbon credits. We recommend you provide more information on how your model and approach will allow you to quantify a project proponent's intention to harvest, as well as how you define common practice. Both values

are highly subjective and challenging to estimate, and have important implications for whether the framework is able to accurately assess which projects represent true financial additionality. We recommend providing more transparency about how your model assesses the baseline.
Answer Our evaluation of intention to harvest varies on a case-by-case basis. If a proponent's intention to harvest is a continuation of previous harvesting practices in the project area, then we would use our machine learning models to validate the presence of previous harvesting to confirm common practice. If a proponent's intention to harvest is on the basis of the evolving market dynamics incentivising liquidation of the project area, we investigate the market drivers present and whether liquidation of private forestlands has become common practice in the region over the proposed time frame. We will not be assessing the numerical baseline explicitly, as typically there is insufficient data available. Our focus will be on finding a range of evidence which corroborates the proposed business-as-usual scenario.

Question 22 **We agree that reversal risk is a serious problem of many current methodologies and is a barrier to quality improvement in IFM projects. As currently written, the draft IFM framework focuses exclusively on quantifying risk of loss events to assess 'long-term' permanence. First, given that all nature-based solutions are inherently impermanent, how does Sylvera define 'long-term'?**
Answer While all nature-based solutions are inherently impermanent, we use the industry standard benchmark of expected 100 year "permanence" and as such many of our climate models are run until 2100. If a project's crediting mechanism takes into account shorter timeframe "permanence", such as 30 years, we adjust our models accordingly.

Question 23

Second, we understand that Sylvera looks for other mitigation measures in use (e.g., buffer pools) when assessing permanence. We recommend your framework assess whether the buffer pool for a project's protocol is commensurate with the risk of non-delivery detected at the project level.

Answer

With our permanence score, we are seeking to assess the risk that the carbon stock in the project will be lost. It is not an assessment of whether the buffer pool is sufficient for covering any reversal that does take place. Sylvera does not consider buffer pool contributions as mitigative or preventative measures that lower the physical risk of carbon stock being lost. While a credit can still be considered 'permanent' in the sense that the buffer pool has balanced out the loss (at an atmospheric accounting level), this does not mitigate against the fact that the carbon stock at a project level is still gone.

With respect to registry balancing, we will surface buffer pool contributions in our commentary to highlight the level of registry-wide insurance. However, a project that has suffered severe losses and had to draw on the buffer pool, represents a reputational risk even if the integrity of the credits generated by that project has not been compromised at an atmospheric level.

Question 24

In addition, we feel that ex-post crediting–that is, issuing credits only after additional carbon storage has been delivered, and only representing the amount that has been fully delivered–is the most robust and transparent way to reduce risk and liability, and believe it should be valued highly in Sylvera's IFM assessment framework.

Answer

We do not currently award ex-post crediting, as this is typically a function of methodology/registry. As such, it is not necessarily a good predictor for the quality of an individual project. We would, however, flag delivery risk for projects that do ex-ante crediting.

Question 25

We note that your framework for assessing leakage appears to be fully contingent on the leakage values that are used by individual standards. We encourage a more data-driven approach that equally and objectively handles projects regardless of the certifying body.

Answer

We agree, and we are working to identify an appropriate data-driven independent assessment for leakage evaluation. For the first iteration of the framework, we will be benchmarking the conservatism of the leakage assumptions made. We would welcome a discussion on how to develop this part of the framework in the second iteration.

Question 26

We commend Sylvera for including a co-benefits score in its IFM Framework, as environmental and social benefits and tradeoffs are too often ignored in forest carbon projects. We recommend providing more information on how the co-benefits score is calculated and what information factors into the score beyond compliance with individual registry guidelines. We feel that in order to add value to an already confusing marketplace, the score should incorporate information beyond what verifiers typically collect anyway. In addition, as many more projects begin to claim social and environmental benefits, we recommend that Sylvera's framework take a rigorous and quantitative approach to assessing co-benefits. Ideally, the approach would reward projects that achieve measurable positive outcomes for biodiversity and communities, as opposed to simply reducing harm.

Answer

Thank you - we believe that co-benefits can be an essential quality differentiator. Our co-benefits framework is broken down into two core components: community and biodiversity.

Community: in this component we look at the activities in place by the project and assess any evidence of those activities contributing towards Sustainable Development Goals (SDGs). SDGs related to employment are considered of

particular relevance to IFM projects. We score each activity considering the scale of that activity relative to the size of the project, the durability of its impact and then evaluate the relative addition to the country's performance against that SDG. In addition, we incorporate information about safeguards and other activities that surface during our developer engagement process.

Biodiversity: in this component we consider the safeguards mandated by the methodology as the minimum benchmark. Beyond this, we consider the background level of biodiversity, leveraging several geospatial datasets alongside the project documentation. This background level of biodiversity is the benchmark against which we evaluate whether the project practices promote, protect or bring harm to it.

In both core components, we consider both additional positive outcomes, and the potential for harm.

Question 27

How does the model assess annual live tree CO2 growth (Live Wood Score)? Annual CO2 growth is driven by tiny increments in diameter and height growth (<.1" or <3 mm annual diameter growth) which is impossible to accurately assess with remote sensing on an annual basis based on changes in canopy cover in the absence of large disturbances. Remote sensing is valuable for assessing large scale disturbances such as harvests, fire, or windthrow events, but cannot assess tiny increments in annual live tree growth diameter growth, where inventory data coupled with growth and yield modeling is needed to make such estimates.

Answer

We do not directly assess the carbon stocks in our carbon score. We measure forest behavior (e.g. clear-cutting or afforestation) using canopy cover predictions and compare any extreme changes observed with the overall carbon stock changes reported by the project.

Question 28

Has the model performance been assessed (and compared against ground-truthed data) across many different forest types? Would Sylvera be interested in doing a detailed accuracy and uncertainty analysis on some of our projects, allowing the remote sensing team to assess the accuracy of the carbon scores?
Answer We appreciate the offer to test our data against your projects - however, we do not directly assess the carbon stocks in our carbon score. As such, we would not be able to validate it against your projects. The carbon score measures forest behavior (e.g. clear-cutting or afforestation) using canopy cover change predictions and compares any extreme changes observed with the overall carbon stock changes reported by the project.

Question 29 What biomass/volume equations are being used to estimate CO2 stocks? Applying different volume/biomass equations can yield large differences in the estimates of total CO2. Is the model being calibrated for the equations required by different methodologies in the carbon score?
Answer We do not estimate carbon stocks in our carbon score. We measure forest behavior (e.g. clear-cutting or afforestation) using canopy cover predictions.

Question 30 How do the model accuracy and uncertainties change on small projects (<5,000 acres / 2,000 hectares) vs. larger project areas? Does the carbon score change based on the size of the projects and uncertainties associated with the estimates? For instance, the model might have good accuracy for a large area, being able to capture variations of the area and producing a good average, but what about smaller properties/stands with a lot of model uncertainty?
Answer We benchmark our models against area-independent and project-specific uncertainties. As we assess the accuracy of every single project prediction, if a

project (either as a function of its size or other remote sensing limitations) has uncertainties which exceed a defined threshold, the project does not pass into our ratings production process.

Question 31

Why do the models incorporate LANDSAT 7 data and not Sentinel-2?

Answer

We use LandSat-7 to take advantage of the historical availability of the data. The Sentinel 2 data set is only available for a 5 year timeframe, and thus did not allow us to conduct the necessary historical checks on the project. In addition, we found that the Global Forest Canopy Cover (GFCC) training labels used were the limiting factor in model performance, rather than the choice of remote sensing data. We counter this by focussing on relative changes in canopy cover, rather than the absolute canopy cover values.

Question 32

Does the model incorporate publicly available Lidar data (especially in the United States, where a large amount of Lidar data is available), or is the only publicly available data associated with Lidar is GEDI?

Answer

The model does not directly incorporate Lidar. The publicly available Lidar data (such as from G-LiHT) does not have the geographic or biome coverage that is necessary to train the model over a complete range of IFM projects. However, we did use the publicly available Lidar to validate the Global Forest Canopy Cover (GFCC) labels used for training and the ML model predictions during testing.

Question 33

How exactly does the model incorporate ground-truthed data, and what is the source of the ground-truthed data? What volume/biomass equations are used for the CO2 estimates used to calibrate the model? Are there any adjustments to the models based on the CO2 quantification requirements of individual methodologies?

Answer

We do not estimate carbon stocks in our carbon score and as such, use no ground-truthed carbon stock data. We measure forest behavior (e.g. clear-cutting or afforestation) using canopy cover change predictions.

Question 34

How does Sylvera account for the model error/uncertainty in the scoring process? For instance, a percentage of net change on the canopy cover/height is likely due to the error of the model, how is it incorporated into the Carbon score?

Answer

The uncertainty of the model is taken into account in two ways. First, project assessments that fail to pass several different quality assurance (e.g. RMSE, MAE, bias) thresholds do not progress. Second, those that do pass do not impact the score within their bounds of uncertainty. We will construct our scoring such that the matrix will only allow a score to be changed if the ML uncertainty is within a scoring matrix bound. All scoring matrices will be shared when they have been finalized.

Question 35

When assessing baselines, it is important to remember that forest liquidation scenarios are not based on regional averages and occur on a case-by-case basis reflecting the landowner's current financial situation, as well as market conditions. While aggressive harvesting may not have occurred in the recent past, financial conditions, such as high energy costs and broad inflation, may pressure landowners into liquidating commercial forest stocks to generate revenue. Enrolling in a carbon project takes away the possibility of this liquidation scenario today and for 40-years to come, while providing the landowner with an incentive to increase carbon stocks to generate ongoing offset revenue.

If using historical lookbacks to assess baseline harvests, it is important to consider timescales of several decades. It is common for forests to be left to grow for multiple decades to allow trees to reach size thresholds that facilitate

generating higher-value wood products. Merchantable timber stocks will increase in value every year as more trees cross into higher diameter classes, and the increasing value of the timber will pressure to harvest each year greater than was experienced the year before. Even in cases where the project proponent does not have a demonstrable history of conducting intensive management, this does not dictate what will happen in the future.

Answer

We agree - our framework scoring does not apply all tests to all projects. We only apply tests that are applicable to a project (determined by its proposed business-as-usual scenario, location and methodology, amongst other things). Therefore, we seek to validate the presence of historical harvesting in the area *only* in those instances where historical harvesting continuing is the proposed business-as-usual scenario.

However, we are aware of the limited availability of remote sensing data (satellite imagery) before 1993 and will factor in the length of rotation cycles to determine whether or not this check impacts the score. For example, we would check the historic activity in the project area if a project started in 2005 and claims that the previous 40-year rotation cycle harvesting would have continued in the business-as-usual scenario.

As we only have approximately 12 years of satellite imagery to observe, if we are unable to validate the presence of harvesting within that time frame, this would not negatively impact the score as absence of evidence is not evidence against.

Question 36

Properties with high carbon stocks due to light historical timbering activity are often at most risk of being harvested because they have accumulated substantial volumes of high-value timber over the years where harvesting has been minimal. As such, if ratings punish landowners who have historically abstained from harvesting or harvested little, then it runs the risk of preferentially rewarding landowners who have historically harvested aggressively by granting them access to carbon revenues in addition to the historical timber revenues. Carbon markets should reward landowners who are protecting carbon stocks and give them an alternative source of revenue,

thereby avoiding aggressive harvests and financing ongoing sustainable forest management.

Answer

We agree - our framework scoring does not apply all common practice tests to all projects. We only apply tests that are applicable to a project (determined by its proposed business-as-usual scenario, location and methodology, amongst other things). As such, if the project claims that during the project period, they would have chosen to begin harvesting aggressively due to evolving market conditions (having not done so in the past) then we would *not* seek to confirm the land parcel's history of harvesting, as it is not relevant. Therefore a lack of history of harvesting would not negatively impact the score. We would instead assess their reasoning and evidence behind the drivers of the behavior change claimed in the business-as-usual scenario, including regional market dynamics and projections.

Question 37

The comparison of project (with carbon revenue) and baseline revenue streams to assess additionality may be inappropriate because in the absence of carbon project revenues, there is no alternative revenue stream besides harvesting. The purpose of forest carbon projects is to provide an incentive to practice forest management that is less profitable (without carbon revenue) than the more aggressive baseline harvesting. If the carbon revenues make the project activity more profitable than the baseline, then the carbon market is doing its job in incentivizing management that will maintain and/or increase the carbon in the trees and avoid heavy NPV- maximizing harvests. The recent ACR 2.0 methodology specifically was modified to note the following: "Since carbon revenue incentivizes the other-wise less profitable project activity, the with-project scenario's NPV does not need to account for the sale of carbon credits." Instead, additionality is assessed in the following manner: "The project must face capital constraints that carbon revenues can potentially address; or carbon funding must reasonably be expected to incentivize the project's implementation; or carbon revenues must be a key element to maintaining the project action's ongoing economic viability after its implementation."

Answer

We agree - financial additionality is not limited to carbon finance simply bridging the viability gap, it may well exceed it. Carbon finance could result in higher total revenue overall compared to the business-as-usual scenario, but as long as the foregone revenue from improved practices would have never been opted for in the absence of carbon finance, then we consider the project additional.

Question 38

How does Sylvera's economic model assess local market conditions? Such economic assessments require a robust understanding of regional economics and specific market conditions for the project area. Does Sylvera plan to engage with local experts to ensure that the economic analysis has adequately considered the local economic conditions?

Answer

Our financial additionality component will not attempt to recreate the complex regional market dynamics, which would indeed require local expertise. Instead, when applicable to the project (business-as-usual scenario dependent) we will validate the conditions and drivers for market change that the project describes as encouraging the business-as-usual scenario of project area liquidation.

Question 39

Assessment of Common Practice – the Framework places an emphasis on assessing the project proponent's current and historical management practices as the "common practice". However, as the ACR Methodology requires, we believe this should be an assessment of "the predominant forest management practices occurring on comparable sites of the region that have not been enrolled in a carbon offset project (e.g., similar forest type, landowner type, ecological condition, species/product mixture).

Answer

We agree - our framework scoring does not apply all tests to all projects. We only apply tests that are applicable to a project (determined by its proposed

business-as-usual scenario, location and methodology amongst other things) Therefore, if the project's proposed business-as-usual scenario has nothing to do with the current proponent (e.g., when the alternative is TIMOs purchasing the land), then the project proponent's activity would not be appropriate for the assessment. Instead we'd assess the common practice of the business-as-usual proponent(s) (e.g., TIMOs) in the region.

Question 40

How exactly does the rating assess whether emissions reductions are above and beyond what would have occurred in the "business as usual" as a direct result of revenue from carbon offsets?

Answer

We do not believe this is something that can be measured as a binary true or false. Our additionality score captures the likelihood of whether the emissions reductions or removals are beyond the BAU by taking consideration of the compounding evidence across its three constituent pillars: financial additionality, policy & regulatory and common practice.

Question 41

It is unclear what risk gerrymandering plays in over-crediting. Gerrymandering is an over- crediting risk when the project utilizes a programmatic baseline that compares the project stocks to a regional common practice average stocking. Isolating high stocked areas in a programmatic baseline does create over-crediting risk. However, in ACR IFM projects the project and the baseline start at the same stocking at the Start Date, so excluding low stocked areas that are capable of producing merchantable timber will not result in any increased crediting, and if anything will reduce crediting in the long term because there are fewer growing acres over the 40-year crediting period. As such, gerrymandering is only an over-crediting risk for programmatic baselines, and should not factor into ACR IFM projects.

Answer

Our framework scoring does not apply all tests to all projects. We only apply tests that are applicable to a project (determined by its proposed

business-as-usual scenario, location and methodology amongst other things). As such, analysing the gerrymandering risk within the over-crediting analysis will not be conducted on ACR IFM projects.

Question 42

We hope that the Sylvera over-crediting analysis will factor in the conservative 40% leakage rate in ACR IFM projects as well as other conservative measures such as the exclusion of the soil carbon pool. Aggressive baseline harvesting would have a big negative impact on soil carbon stocks, so omitting this carbon pool is a very conservative element of the program.

Answer

Our leakage assessment within over-crediting risk will take into account the measures that a project has taken to minimize that over-crediting risk - this includes relative magnitudes of leakage accounted for. The higher the assumed leakage and subsequent credit reductions, the lower the risk score unless strong justifications for lower leakage assumptions are provided.

Question 43

It is unclear in the assessment of the Permanence Framework how much the Rating will factor in the strength of the Registry's buffer pool that the project is registered within. If the buffer pool is diversified and large (as is ACR's) then there is little risk that the buffer pool will be unable to insure against risks identified in the Framework.

One of the main strengths of the ACR program is the diversified buffer pool aggregated from different project types, which insures against the risk of events highlighted in the Framework. Floods, fire and other natural disasters are realities of forests, and we need to protect the integrity of the climate benefits achieved by the projects in those events. Buffer pools generally require that projects dedicate credits commensurate with about 20% of the emissions reductions associated with each credit issuance. This is as a collective backstop against carbon loss due to calamitous natural events. Like any insurance policy, we believe that a diversified approach to buffer credits such as ACRs makes a lot of sense, and guards against permanence risk.

It's also important to note that the buffer pool does not apply if a landowner does something within their control, such as over-harvesting. Those credit reversals are the landowner's responsibility to replace, and the program penalties are significant.

Answer

With our permanence score, we are seeking to assess the risk that the carbon stock in the project will be lost. It is not an assessment of whether the buffer pool is sufficient for covering any reversal that does take place. Sylvera does not consider buffer pool contributions as mitigative or preventative measures that lower the physical risk of carbon stock being lost. While a credit can still be considered 'permanent' in the sense that the buffer pool has balanced out the loss (at an atmospheric accounting level), this does not mitigate against the fact that the carbon stock at a project level is still gone.

With respect to registry balancing, we will surface buffer pool contributions in our commentary to highlight the level of registry-wide insurance. However, a project that has suffered severe losses and had to draw on the buffer pool, represents a reputational risk even if the integrity of the credits generated by that project has not been compromised at an atmospheric level.

Question 44

It is unclear how the co-benefits will be assessed, as many of the categories assessed will not have any public information on the community benefits. Community Benefits such as gender equality, education, or health and well-being will likely be internal policies with no public references to such policies. Will project ratings be negatively impacted if there is no mention of public information supporting the project co-benefit categories? It should be noted that all ACR projects with commercial harvesting are required to have forest certification which will offer environmental safeguards on the harvesting practices.

Answer

We will account for the safeguards and other requirements that a methodology has when considering the relative co-benefits impact of the project. However, we are also seeking to measure what the project is doing beyond the minimum

methodology-mandated levels. If a project provides evidence that they are going above and beyond those levels, then it will achieve a high score. However, if there is no evidence provided of that, they will not necessarily receive a low score - so long as they have met the requirements of the methodology.
Our co-benefits scoring has to be comparable across project types, so some project types that do not involve private entities may engage in additional activities more and therefore generally achieve higher scores. As there is an inherent link to project type in terms of achievable co-benefits, co-benefits does not factor into the Sylvera rating. The rating solely reflects the carbon impact of the project.