

Managed Land Proxy “Plus”

Final Submission – May 7, 2025

Managed Land Proxy “Plus”: Overview

The Managed Land Proxy (MLP) is an approach for quantifying and attributing fluxes of carbon dioxide to and from managed lands that has been thoroughly developed over the past several decades, and which remains the approach supported by the IPCC and the broader scientific community (as interpreted by the review of the scientific literature the authors of this proposal have engaged in – see pages 11-13). The foundation of this proposal is to maintain and improve the use of the MLP in the context of corporate GHG inventories. Our proposed improvements address the central concern with the use of the MLP, which to our understanding is based on the discrepancy between the results of the MLP and the results of models that have been used to calculate the global carbon budget consistent with 1.5- and 2-degree scenarios.

Discussions at the Technical Working Group (TWG) level have identified several concerns with the use of the MLP, including the discrepancy between the use of the MLP in inventories and the results of the global models used to calculate the carbon budget and net-zero targets. TWG members with reservations about building a system that relies on the MLP have made these concerns clear. This proposal, however, is based on the belief that maintaining the use of the MLP, while instituting several immediate safeguards and identifying future opportunities for improvements to mitigate these concerns, is the best path forward. Not only do we believe that this approach is aligned with the best available science, we also believe it is only way to produce a workable version of the Land Sector and Removals Standard (LSRS) on a timeline that this moment in climate action deserves.

The IPCC recently articulated a recommendation for reconciling anthropogenic land use emissions, which is to maintain the use of the MLP for the purpose of inventorying emissions, and then to address discrepancies in the context of communications, claim-making and target setting. Following this thesis, the Managed Land Proxy “Plus” (MLP+) proposal introduces safeguards to the implementation of the MLP, clarifies the need for additional counterfactual analysis for purposes of target-setting, and sets clear guardrails around reporting and claims to address the discrepancy between the MLP and global models. The resulting proposal will align the LSRS and the GHG Protocol with the current scientific approach, maintain consistency with the rest of the carbon accounting ecosystem, and enable companies around the world to implement the LSRS. Most importantly, it will establish a robust framework for protecting existing carbon stocks in forests, improving the management of working forests, and establishing new forests at scale, all of which are critical components of all 1.5-degree scenarios.

The MLP+ proposal requires three components to report the full and accurate impact of forests and forest products within a greenhouse gas (GHG) inventory report:

1. A physical inventory, which shall include the annual change in forest carbon stocks, reported as either net emissions or net removals. To attribute emissions or removals to anthropogenic activities, companies shall follow the 2022 draft Land Sector and Removals Guidance's methods, which are based on the managed land proxy and in alignment with the latest guidance from the IPCC¹. Emissions and/or removals calculated using this approach that meet the requirements of the final LSRS, including changes made since the 2022 draft and the additional forest-specific requirements described in this proposal, shall be reported within the scopes of a company's GHG inventory report.

In addition to the physical inventory, the MLP+ proposal a) requires companies to disaggregate targets for land-based removals from targets from fossil-based reductions, through the production of a forest impact statement; and b) clarifies that companies cannot combine forest-based removals with fossil-based emissions in order to make climate-related claims, through a forest claims disclaimer.

2. The forest impact statement complements the physical inventory with quantified information about the impact of forest management and/or other land-based interventions. To calculate this statement, companies should employ a consequential accounting approach (or approaches) to quantify the impact of forest management and land use in relation to historical practices and/or what is necessary to achieve net zero global emissions. Emissions and/or removals calculated using this approach should be reported within a company's GHG inventory report, but outside of the physical inventory. This proposal makes recommendations about how to develop a forest impact statement but stops short of providing a required methodology, given the remit of FCA TWG to focus on the physical inventory. These approach(es) will need to be developed after the work of this TWG, with leadership from the GHG Protocol², Science Based Targets initiative³, or another entity.
3. The forest claims disclaimer contextualizes the unique role of forest removals in carbon accounting. Companies shall meet certain safeguards when developing and communicating a GHG inventory report, as well as any related emissions reductions or target achievement claims, to ensure that companies with forests in their value chains do not misstate their role in supporting ambitious climate action. At a minimum, any GHG inventory report that includes forest carbon removals shall clearly state that net land-based removals reported within the physical inventory shall not be claimed as compensation for fossil-based emissions; and that, therefore, companies cannot balance their fossil-based emissions with forest carbon removals as a way of achieving carbon neutrality, negativity, net zero, or any other climate-related claim. This proposal outlines the core elements of such a disclaimer, but the full statement should be developed by the GHGP Secretariat and ISB, given their scope of responsibility over the entire LSRS and other GHG Protocol standards.

¹ IPCC (2024). [Report of the IPCC Expert Meeting on Reconciling Anthropogenic Land Use Emissions](#). Eds: Enoki T., Hayat M., Grassi G., Sanz M., Rojas Y., Federici S., Seneviratne S., Rupakheti M., Howden M., Sukumar R., Fuglestedt J., Itsoua Madzous G., Krug T., Romanowskaya A. Pub. IGES, Japan.

² GHG Protocol Standards Development Plan: [GHG Accounting and Reporting on the Impacts of Actions and Market Instruments](#)

³ Science Based Targets initiative: [Timber and Wood Fiber Pathway Revision Project](#)

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Managed Land Proxy “Plus”: Methodology

1 Carbon Pools

Component 1: Physical Inventory

Requirements included in the current version of the LSRS: When estimating net forest carbon stock change, companies shall include changes in living biomass, dead organic matter, and soils. If management practices do not significantly impact dead organic matter or soils, these categories are recommended, but optional.

- Living biomass: Includes aboveground and belowground biomass on forest lands
- Dead organic matter: Includes dead wood and litter
- Soil: Includes organic carbon in mineral and organic soils

Additional requirements of the MLP+ proposal: None

Recommendations: Companies should estimate the change in forest carbon stocks from all relevant pools using measurement-based approaches or calibrated model-based or remote sensing-based approaches. This should be done either through a stock change approach, in which stocks at T1 are measured and compared to stocks at T0, or through a gain-loss approach, in which activities are identified and then an emissions or removals factor is applied to estimate fluxes arising from those activities on managed lands. Scope 1 removals or emissions measurements from forest owning companies should use the stock change approach, whereas Scope 3 reporting may rely on a gain-loss approach, in which fluxes from attributable productive lands are estimated at the appropriate spatial resolution (see section 2). Measurement of certain pools (such as soil carbon) may utilize a gain-loss approach or assume no changes in carbon stocks where management does not significantly disturb soils, as these pools can be difficult and expensive to measure. All measurements shall still meet the data requirements (section 7).

Discussion: Carbon stored in or emitted from biogenic products shall not be included in the physical inventory of forest carbon emissions and removals. Under the MLP-based stock-change approach, all carbon is assumed to be emitted at the time of harvest, and must be “earned” back in a separate category if it remains stored in product carbon pools. To do this, biogenic product carbon stock changes are included in a separate category of the GHG inventory report under the category “product carbon storage” in scope 3 category 11. Product carbon storage is not fungible with emissions or removals in scope 3, and is subject to the traceability, data and monitoring requirements described in the current version of the LSRS.

Component 2: Forest Impact Statement

Recommendations: The same carbon pools included within the physical inventory should be included within the forest impact statement. Where this is not possible because the models required to conduct the consequential accounting do not include all the relevant carbon pools, any discrepancies should be justified and disclosed.

2 Spatial Boundary of Analysis

Component 1: Physical Inventory

Requirements included in the current version of the LSRS (scope 1): For the scope 1 portion of the physical inventory, companies shall define their spatial boundary as the lands they own or control, based on their selected consolidation approach.

Additional requirements of the MLP+ proposal (scope 1): In selecting the appropriate scope 1 spatial boundary for forest lands, companies shall apply the Managed Land Proxy (MLP), which defines managed land as “land where human interventions and practices have been applied to perform production, ecological or social functions including conservation and fire protection activities”⁴. Applying the MLP is the IPCC’s recommended approach for identifying direct and indirect anthropogenic effects on managed lands.

Requirements included in the current version of the LSRS (scope 3): For the scope 3 portion of the physical inventory, companies shall report the emissions or removals that are a consequence of their activities (purchasing, processing, using or selling products), but that occur on lands they do not directly own or control. The spatial boundary for these indirect emissions or removals shall depend on the level of traceability a company has to the lands where the products originated. The current requirements of the LSRS were built on the MLP’s identification of anthropogenic effects but have been adapted for a scope 3 context. The existing requirements (summarized below but made available to TWG members), along with the additional MLP+ requirements, are intended to support the decision-making criteria of the GHG Protocol while still maintaining alignment with the IPCC’s recommendation of employing the MLP.

The LSRS defines 5 levels of traceability: global, jurisdiction, sourcing region, land management unit (LMU) and harvested area (listed from most general to most specific). To apply a sourcing region, LMU, or harvested area as the scope 3 spatial boundary, companies must have physical traceability to the matching spatial boundary with their value chain. The level of traceability that a company should strive to establish for a given product, and the associated selection of a scope 3 spatial boundary, is context-specific and should enable accurate and precise accounting, credible allocation of emissions and removals, and effective and efficient climate change mitigation within value chains.

To report removals, companies shall achieve at least sourcing region-level traceability. If a company uses sourcing region-level traceability, they shall only include attributable productive forest lands within the spatial boundary, which excludes the following types of land:

- Non-productive forest lands that are not directly producing and/or not capable of producing the product sourced by the company
- Forest lands entirely producing other products not relevant to the product sourced by the company
- Forest lands with legal or regulatory restrictions on harvests in the reporting year
- Forest land with other protective status that prevent the harvest of products
- Note: A requirement to exclude land that sold GHG credits is included in the current version of the LSRS, but is altered in this MLP+ proposal for a forestry context (see additional requirements below)

⁴ IPCC (2024). [Report of the IPCC Expert Meeting on Reconciling Anthropogenic Land Use Emissions](#). Eds: Enoki T., Hayat M., Grassi G., Sanz M., Rojas Y., Federici S., Seneviratne S., Rupakheti M., Howden M., Sukumar R., Fuglestad J., Itsoua Madzous G., Krug T., Romanowskaya A. Pub. IGES, Japan. [Presentation](#)

If companies use LMU traceability, they shall include attributable productive forest lands but may also include relevant proximate and/or adjacent non-productive lands within the spatial boundary. Proximate and adjacent non-productive lands shall meet the following criteria:

- Owned or operated under a single land management plan
- Connected bio-physically, ecologically and/or socio-economically to the productive lands
- Removals and land emissions are accounted for using the same allocation method
- Double counting is avoided by providing justification that any removals were not accounting for by other companies at the same or similar tiers of the value chain or other GHG programs (e.g. credits)
- The non-productive land is next to or nearby the productive land, and does not exceed 10% of the size of the productive land

If companies choose a sourcing region spatial boundary to account for removals, they shall ensure the following safeguards are met when reporting removals:

- The spatial boundary only includes attributable productive forest lands (see above)
- Sampling or inventory approaches capture variability throughout the sourcing region
- Conservative assumptions of carbon stock changes are used to estimate removals
- Carbon stock changes are allocated using the same method across the sourcing region
- Double counting of removals is avoided between separate products sourced from the same land and between GHG credits generated in the sourcing region
- Reversals of previously reported removals are reported
- A consistent spatial boundary is used to account for land emissions and removals
- Removals accounted for using different levels of traceability are accounted for separately
- Information on the data and spatial boundaries is disclosed

If companies do not achieve LMU or harvested area traceability and are unable to accomplish the sourcing region safeguards, they shall not report land removals in the physical inventory. However, companies that do not achieve sourcing region traceability must still account for emissions at the global or jurisdiction level. To do this, companies shall apply similar safeguards to those described for removals to evaluate land management net biogenic CO₂ emissions. For example, if they only have country level traceability and are seeking emission factors that can quantify any CO₂ emissions from forest degradation in regions where forests are a net source of emissions, similar safeguards shall be applied to develop an appropriate emissions factor. In regions where this is not currently possible, GHG Protocol and companies shall jointly work with the appropriate data providers to develop accurate emissions factors. In such cases, products sourced from a region with declining carbon stocks shall report land management emissions in scope 3. In addition, determining if a sourcing region has stable or increasing carbon stocks (at the sourcing region level) is a prerequisite for other portions of the LSRS, including reporting biogenic combustion emissions and product carbon storage.

Additional requirements of the MLP+ proposal: In addition to the existing sourcing region safeguards, the following additional safeguards will apply to products sourced from forest lands:

- Companies shall disclose the total area from which it is possible that they sourced forest products
- Companies shall disclose the subset of the total area where it was not possible for them to achieve sourcing region traceability. For these areas, which may not claim any removals, companies shall provide information about how the global or jurisdiction-level emissions factors were developed.

- Companies shall also disclose the subset of the total area where they achieved sourcing region traceability or better. For this subset, companies shall disclose the percent of the area which achieved the sourcing region safeguards, and thus are eligible to report removals. Finally, companies shall provide information about why the sourcing region safeguards could not be met for the remaining portion of the area.

Furthermore, for attributable productive forest lands within scope 3, an additional exclusion shall apply:

- Forest lands designated as unmanaged by landowners or managers in the sourcing region

One difference between forests and agricultural land shall exist for the requirement to exclude land that sells GHG credits. Instead of excluding the *lands* that sold credits, the *credits* themselves shall be excluded from any removals or emissions. This is because forest lands can have background or “business as usual” removals that are distinct from the additional removals required to generate carbon credits.

Recommendations: In many parts of the developing world, land tenure is legally and operationally inconsistent. For example, legally granted land concessions to companies are often unable to be fully controlled due to illegal encroachment by local communities. For practical reasons, therefore, land that is legally owned may not be controlled nor managed in many parts of the world. In these instances, companies should only include land they control within their spatial boundary. Using operational control instead of financial control is recommended in these instances.

Discussion: In a scope 3 context, the managed land proxy attributes a portion of the change in carbon stocks within an area to the purchaser, processor, user or seller of biogenic products. If an area has increasing carbon stocks, the change may be reported as a removal (proportional to the amount of biogenic material a company sourced from the region) if all the removals requirements are met. Importantly, this does not enable companies to claim that their products are carbon neutral or carbon negative. Instead, it enables the collective action ecosystem of scope 3 accounting, which incentivizes purchasers or users of forest products to collaborate or co-invest in their supply chains to increase carbon stocks across the sourcing region landscape. Just as the scope 3 emissions are counted by multiple companies across a range of other applications, scope 3 removals can be counted by multiple companies, with the intention of sharing the economic costs of climate mitigation across multiple entities⁵.

In addition, removals in context of the scope 3 physical inventory are different from removals-based carbon credits in that they are not necessarily additional. Removals' inclusion in the physical inventory does not imply that companies can sell them as carbon credits nor net them against their emissions. Indeed, nothing in the MLP approach or the LSRS allows a company to “own” its scope 3 removals, and therefore there is no basis for monetizing them.

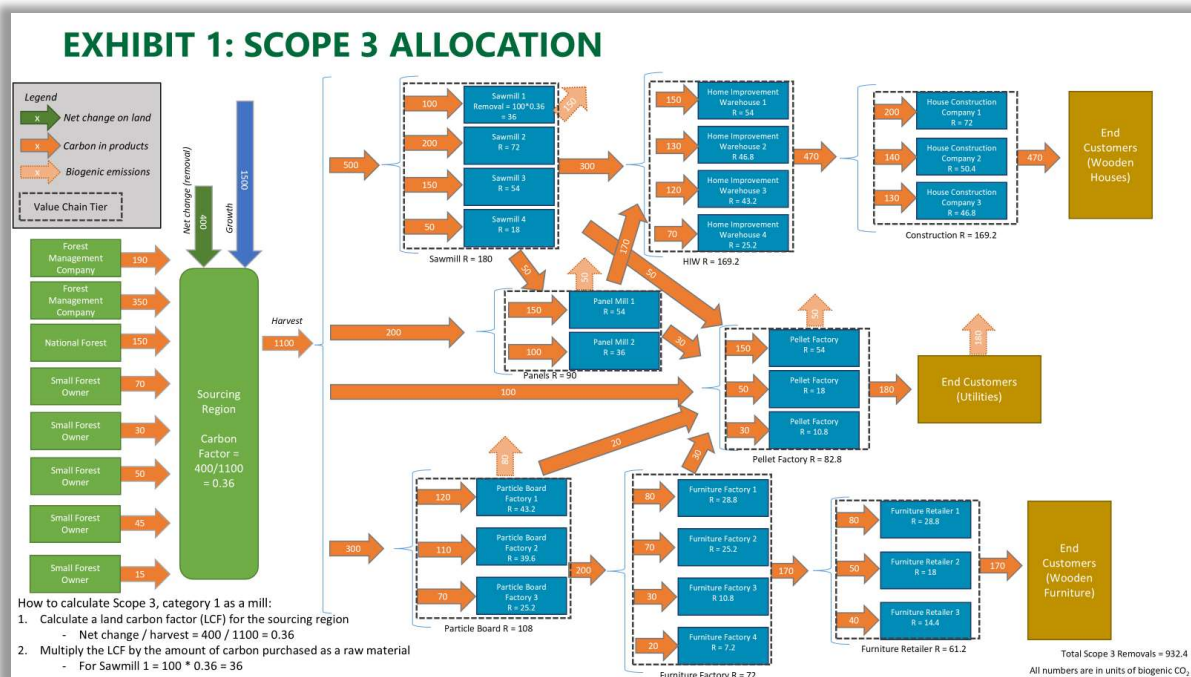
Case Study: In partnership with the National Council for Air and Stream Improvement (NCASI), and with funding from a Climate Smart Commodities Award, the American Forest Foundation (AFF) constructed a tool to enable the construction of sourcing regions and the calculation of a “land carbon accounting factor” that represents the amount of net emissions and/or removals occurring within a sourcing region per unit of forest product (the tool reports results per green ton, and this can be converted into other units using mill yield data). Currently, the tool (which exists in a beta version) requires users to choose a sourcing region within the

⁵ See questions 13 and 14 of the [Scope 3 FAQs](#) developed by the GHG Protocol

United States. This can be done by selecting U.S. regions, states, or counties; by analyzing a circle with a defined radius around a centralized location; or by explicitly drawing an uploading a shape file. The tool then analyzes Forest Inventory Analysis plots from within the region to approximate an annual land carbon accounting factor. Currently, the tool implements safeguards by relying on FIA's own designation of timberland (managed) vs. forestland (unmanaged). However, it may be possible to implement additional safeguards. For example, in the states of AL, MS, NC, SC and GA, there are 24,776 FIA plots representing timberland with a stand age between 0 and 130 that would be drawn into a supply shed analysis. It is possible to eliminate plots that are beyond 80 years of age, under the assumption that such forests are likely being managed for non-timber outcomes. That would remove 12% of the plots and reduce the chances that removals from lands where indirect anthropogenic effects predominate. There are likely other opportunities to further refine the approach, and to make it flexible enough to be applied to other forest types. Crucially, this tool – including the suggested amendment – is only appropriate for use in a scope 3 context.

Such methods could be replicated in other countries using either national forest inventories or, increasingly, by relying on remote sensing estimates. This tool is being further developed by a collaboration between AFF, the U.S. Endowment, and the U.S. Forest Service, with the idea that it will eventually constitute an “official” government tool for estimating the land carbon accounting factor and facilitating more precise estimation of emissions and removals within corporate or other inventories. Importantly, this approach will likely only observe stocks in above ground woody biomass. Inclusion of other pools will be included but will likely be based on modeled estimates.

Once a sourcing region has been selected, there is additional complexity in allocating the appropriate portion of emissions or removals to downstream manufacturers. The AFF tool operationalizes the MLP in a scope 3 context by developing a "land carbon factor" that enables a purchaser to attribute a portion of net change in a sourcing region to themselves, according to the percent of fiber they purchased compared to the overall harvest in that sourcing region. An exhibit is available below to supplement this description.



Component 2: Forest Impact Statement

Additional requirements of the MLP+ proposal: All companies with forest or forest product impacts within their GHG inventory boundary shall produce a forest impact statement as a complement to their physical inventory. The forest impact statement complements the physical inventory with quantified information about the impact of forest management and/or other land-based interventions. To calculate this statement, companies should employ a consequential accounting approach (or approaches) to quantify the impact of forest management and land use in relation to historical practices and/or what is necessary to achieve net zero global emissions. This should be used to provide guidance for companies to set targets which incorporate global models of land sector mitigation. It also enables companies to report the broader climate impacts of their forest management activities, including emissions reductions, avoided emissions, and contributions to nature-based climate solutions.

For target-setting purposes, companies shall align the spatial boundaries used for the forest impact statement with those of the physical inventory. The same spatial boundary shall be applied to both components, and any inclusions must be justified and documented. As an example of a justifiable inclusion, if the physical inventory spatial boundary is restricted to attributable productive forest lands and proximal and adjacent lands, a conservation set-aside could fall outside the physical inventory if, for example, the company transfers ownership to a land trust such that the land no longer meets requirements for proximal and adjacent lands. The mitigation results from establishing that set-aside should be reported in the forest impact statement, however, because they reflect the company's mitigation activities to help meet forest-based removal targets. This component incentivizes sustainable forest management of both productive and non-productive lands, even when these lands do not generate net carbon removals in the reporting period.

3 Temporal Boundary of Analysis

Component 1: Physical Inventory

Requirements included in the current version of the LSRS: Companies shall employ an annual temporal boundary when applying the MLP to align with the current LSRS, as well as all corporate GHG inventory accounting practices. Companies may annualize changes in inventory results over a longer monitoring period if necessary.

Additional requirements of the MLP+ proposal: None

Recommendations: For companies that source forest products, data from their sourcing regions is unlikely to be available in a timely manner (e.g. sourcing region emissions/removals factors may lag by 2-3 years before it can be applied to company sourcing data to calculate scope 3 emissions/removals). However, this should be mitigated by updating previously reported emissions/removals once more recent/appropriate data becomes available, as is common practice within scope 2 accounting.

Discussion: The goal of the physical inventory is to report the best estimate of physical emissions and removals attributable to company activities. Applying the MLP and determining forest carbon stock changes within an annual temporal boundary is the IPCC-supported method of accomplishing this goal.

The goal of the physical inventory is not to account for the carbon debt arising from past land use changes and/or to attribute removals to past management practices. Attempting to include these concepts within the physical inventory would require a fundamental rewrite of the LSRS at a time when that is neither necessary nor prudent.

Instead, acknowledging the limitation of the MLP in encompassing the long history and complexity of the land sector, the MLP+ proposal requires companies to employ consequential accounting as an additional component of the GHG inventory report. Accounting for past actions and events is highly dependent on what they were and when they happened. A prescriptive one-size-fits all ABA approach, would not allow for necessary case-by-case considerations to be incorporated. Including consequential accounting as a supplement to the MLP, with further development from the GHG Protocol and/or SBTi, acknowledges the concerns raised by proponents of the ABA approach, and addresses that concern while maintaining consistency with the foundations of inventory accounting used elsewhere in the GHG Protocol.

Component 2: Forest Impact Statement

Recommendations: The temporal boundary chosen for the forest impact statement should reflect the operating context and land ownership history for the land included within the boundary. For example, if a company has owned the same land for 20 years, they would have a greater ability to set a “historical practices” baseline compared to if they acquired the land last year. As an additional example, if the land experienced a natural disturbance 25 years ago, it would be important to include that within the temporal boundary so that forest regrowth since the disturbance would be included in both the observable results and the counterfactual, to ensure companies do not get credit for forest regrowth in the forest impact statement. Given these place-based nuances, companies should be allowed the flexibility to choose the temporal boundary that makes the most sense for their circumstances, but practical safeguards should be developed to ensure the forest impact statement is unbiased. Some suggested safeguards (which will need further development and pilot testing with real-world examples) include:

- The temporal boundary should be the average rotation age of the forests within the spatial boundary, or 20 years, whichever is longer.
- Where different temporal boundaries are applied within the forest impact statement, the choice of each temporal boundary should be justified, and the results of each assessment should be reported separately.

4 Separation of Direct and Indirect Anthropogenic Effects

Component 1: Physical Inventory

Requirements included in the current version of the LSRS: Companies shall not aggregate or net inventory categories for use in reporting, target setting, or claims. Specific cases of categories that shall not be added or netted include:

- Emissions and removals
- Land management removals & fossil fuel/industrial emissions
- Product carbon storage and emissions/removals

Additional requirements of the MLP+ proposal: None

Discussion: A physical inventory based on direct observations of carbon stock change cannot separate direct and indirect anthropogenic effects. However, this is an active area of scientific thought, and three mitigations were recommended at a 2024 IPCC expert meeting on this topic, which was attended by 111 experts from 46 countries, representing key communities involved in global carbon modeling, Earth observation, and national greenhouse gas inventories:

1. Improve the implementation of the MLP, particularly in the scope 3 context, which the MLP+ proposal suggests in section 2 (spatial boundary)
2. Estimate as supplementary information and transparently report the extent to which removals have been driven by indirect anthropogenic effects, which is one of the purposes of component 2 of the MLP+ proposal (forest impact statement)
3. Disaggregate climate target setting and claims from inventory reporting, which is one of the purposes of component 3 of the MLP+ proposal (forest claims disclaimer)

Below is a summary of the key research articles exploring the discrepancy between results of National Greenhouse Gas Inventories and results of the global models used to establish global net-zero goals. In every case, the recommendation is (as stated above) to maintain the MLP, improve it (particularly regarding transparency), and address the discrepancy within the context of communications, claim-making, policy and target setting.

Publication	Recommended approach to addressing discrepancies between the managed land proxy and global models
Intergovernmental Panel on Climate Change. (2024). <i>Report of the IPCC Expert Meeting on Reconciling Anthropogenic Land Use Emissions</i> (T. Enoki, M. Hayat, G. Grassi, M. Sanz, Y. Rojas, S. Federici, S. Seneviratne, M. Rupakheti, M. Howden, R. Sukumar, J. Fuglestedt, G. Itsoua Madzous, T. Krug, & A. Romanowskaya, Eds.). Institute for Global Environmental Strategies. https://www.ipcc-nggip.iges.or.jp/public/mtdocs/2407_EM_Land.html	"[T]here is no approach that may be considered superior to the other: due to differences in purpose and scope, the largely independent scientific communities that support the IPCC Inventory Guidelines (reflected in NGHGs) and the IPCC Assessment Reports have developed different approaches to identify anthropogenic GHG fluxes. Both approaches - like two "languages" - are valid in their own specific contexts (and have their own shortcomings), but they are not directly comparable. . . [B]oth global carbon modelling and NGHGI approaches have their justification and recommends that the approaches should continue to be operationally translated and both type of data be presented in GST, IPCC and other reports." The report goes on to recommend, ". . . [A]voiding framing that pits 'science vs. inventories' (as inventories are science-based) . . . and taking into account the differences between 'reporting' in national inventories . . . vs, 'accounting' towards the country climate targets." -pp. 11, 18, 6

Allen, M.R., Frame, D.J., Friedlingstein, P. <i>et al.</i> Geological Net Zero and the need for disaggregated accounting for carbon sinks. <i>Nature</i> 638, 343–350 (2025). https://doi.org/10.1038/s41586-024-08326-8	UNFCCC reporting is separate from target-setting: although countries should be encouraged to report emissions and CO₂ uptake on managed land, they do not need to treat these ‘biological’ removals as fungible with ‘geological’ fossil fuel emissions in climate targets. Indeed, accounting methods used by the Kyoto Protocol discouraged this. Accounting under the Global Stocktake and under Article 6 should learn from and improve on the Kyoto Protocol approaches to try to separate out what is ‘additional’ (the result of direct anthropogenic activity) in reported removals. A global effort to report passive CO₂ uptake separately in greenhouse gas inventories, analogous to separate specification of short-lived climate pollutants, would help . . . second, voluntary markets, standard-setters, and ambitious countries and corporations can go beyond the current UNFCCC requirements and exclude passive or indirect uptake from removal credits and net-zero claims.
Grassi, G., Schwingshackl, C., Gasser, T., Houghton, R. A., Sitch, S., Canadell, J. G., Cescatti, A., Ciais, P., Federici, S., Friedlingstein, P., Kurz, W. A., Sanz Sanchez, M. J., Abad Viñas, R., Alkama, R., Bultan, S., Ceccherini, G., Falk, S., Kato, E., Kennedy, D., Knauer, J., Korosuo, A., Melo, J., McGrath, M. J., Nabel, J. E. M. S., Poulter, B., Romanovskaya, A. A., Rossi, S., Tian, H., Walker, A. P., Yuan, W., Yue, X., and Pongratz, J.: Harmonising the land-use flux estimates of global models and national inventories for 2000–2020, <i>Earth Syst. Sci. Data</i>, 15, 1093–1114, https://doi.org/10.5194/essd-15-1093-2023	A more realistic way forward for countries is to continue with the current approach, based on the managed land proxy specified at the country level, while investing in a number of key improvements. First, NGHGs need to provide more transparent and traceable information on all their managed land (i.e. forest and non-forested areas), including maps of the considered areas (forest and non-forest) and information on the extent to which indirect and natural effects are included . . . Second, countries need to improve the accuracy and completeness of their NGHGs. Many NGHGs are still incomplete, especially for soil carbon and non-forest land categories, where observation-based estimates are often lacking. . . the majority of the difference in land CO₂ fluxes between global models and country reports is not due to differences in flux estimates in a given area but rather due to whether these fluxes are considered anthropogenic (and thus reported in NGHGs) or natural. By making estimates of BMs [global bookkeeping models] conceptually and quantitatively more comparable to NGHGs, our approach contributes to bridging the estimates of these two different communities and enables methodological improvements and consistency with global budgets that determine climate trajectories and pathways to net-zero emissions.
Gidden, M.J., Gasser, T., Grassi, G. <i>et al.</i> Aligning climate scenarios to emissions inventories shifts global benchmarks. <i>Nature</i> 624, 102–108 (2023). https://doi.org/10.1038/s41586-023-06724-y	The policy and scientific communities can take steps to meet this challenge by reconciling terms, definitions and estimates of land-based CO₂ fluxes in four concrete ways. First, climate targets can be formulated explicitly for areas of critical mitigation action, including gross CO₂ emission reductions without LULUCF, net land-based removals, engineered carbon removals and non-CO₂ GHG emission reductions, allowing for parties to define their expected contributions and to measure progress in each domain separately. Second, parties can clarify the nature of their deforestation pledges, because direct and indirect carbon fluxes vary greatly in different forest types. Third, scientific and practitioner communities can convene discussions on how to enhance monitoring, reporting and verification of LULUCF fluxes to better align estimates from both groups. Fourth, IAM [Integrated Assessment Modeling] teams can provide their individual assumptions and estimates for direct LULUCF emissions and removals, including the indirect flux component consistent with the NGHGs and their assumptions about the land-use contribution of NDCs and long-term strategies. Future IPCC assessments could either use such scenario data if available or use an approach such as that presented here to provide a holistic scenario assessment aligned with the NGHGs and better inform necessary collective action to meet global climate goals.
Schwingshackl, C., Obermeier, W. A., Bultan, S., Grassi, G., Canadell, J. G., Friedlingstein, P., Gasser, T., Houghton, R. A., Kurz, W. A., Sitch, S., & Pongratz, J. (2022). Differences in land-based mitigation estimates	To further improve the compatibility between report-based and model-based LULUCF flux estimates, UNFCCC reports of all countries should strive toward comprehensively and separately quantifying the anthropogenic and natural components of reported fluxes, include all relevant carbon pools, and provide full details on the used methodologies. Improving bookkeeping model estimates requires better representation of carbon sinks from afforestation

reconciled by separating natural and land-use CO ₂ fluxes at the country level. <i>One Earth</i> , 5(12), 1367–1376. https://doi.org/10.1016/j.oneear.2022.11.009	projects, better representation of spatially heterogeneous carbon stocks, and more accurate land-use data to reliably identify managed and unmanaged forests. Further, improved representation of wildfires and insect disturbances in DGVMs [Dynamic Global Vegetation Models] is crucial, as with progressing climate change, they may increasingly impact the <u>carbon cycle</u> . . . Using model data to reconcile estimates of LULUCF emissions in individual countries provides an important step toward a transparent assessment of LULUCF fluxes from UNFCCC reports. With further improvements in reporting and modeling (including complementary approaches, such as <u>atmospheric inversions</u> , this approach can be a valuable support for an operational and consistent comparison of collective country efforts with modeled global emission pathways, as intended for instance in the global stocktake in 2023, and facilitate a fair allocation of mitigation targets across countries.
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There is only one reference in the peer-reviewed literature MLP+ authors have been able to locate to a proposal to abandon the MLP and replace it with an entirely different inventory approach. However, that recommendation (Nabuurs et al. (2023)⁶) suggests reporting the carbon fluxes from *all* forest land using traditional inventory approaches, as opposed to adjusting inventory processes using an ABA approach.

It is notable that no suggestion of abandoning the MLP is made in the report of the IPCC’s 2024 meeting on this very topic. To quote directly from the notes of the breakout group comprised of global carbon modelers, which would be the group most inclined to oppose the continued use of the MLP to produce GHG inventories: “*The BOG concluded from the previous discussions that both global carbon modelling and NGHGI approaches have their justification and recommends that the approaches should continue to be operationally translated and both type of data be presented in GST, IPCC and other reports (page 18).*” The MLP+ proposal follows this recommendation by maintaining the physical inventory based on the MLP and by adding a requirement to produce a forest impact statement based on consequential approaches.

Component 2: Forest Impact Statement

Recommendation: Separation of direct and indirect anthropogenic effects should be taken up in the respective development of a target-setting counterfactual and in reporting of the impact of management decisions. In both cases, the methodologies and counterfactual models used should consider the impact of indirect anthropogenic effects so that companies’ reported impacts of specific interventions/management decisions exclude changes in carbon fluxes due to indirect anthropogenic effects.

Component 3: Forest Claims Disclaimer

Requirement: Companies shall include disclaimers in GHG inventory reports which include land-based removals that explain why net removals reported using the MLP approach should not be interpreted as the achievement of a state of net-zero. See “Additional Considerations” for more recommendations.

⁶ Nabuurs, GJ., Ciais, P., Grassi, G. et al. Reporting carbon fluxes from unmanaged forest. *Commun Earth Environ* 4, 337 (2023). <https://doi.org/10.1038/s43247-023-01005-y>

5 Baseline Considerations

Component 1: Physical Inventory

Requirements included in the current version of the LSRS: To select a baseline for the physical inventory, companies shall select a base year or base period by which to measure progress over time. For example, a base year of 2020 could be selected to compare the change in forest carbon stocks in 2020 to the stock change in 2025. Land sector companies may use a base period, rather than a single base year, given the significant interannual variability that can occur in land-based carbon pools.

To maintain an appropriate baseline, companies must also adhere to the permanence principle when accounting for removals in the physical inventory. This is operationalized through the following requirements:

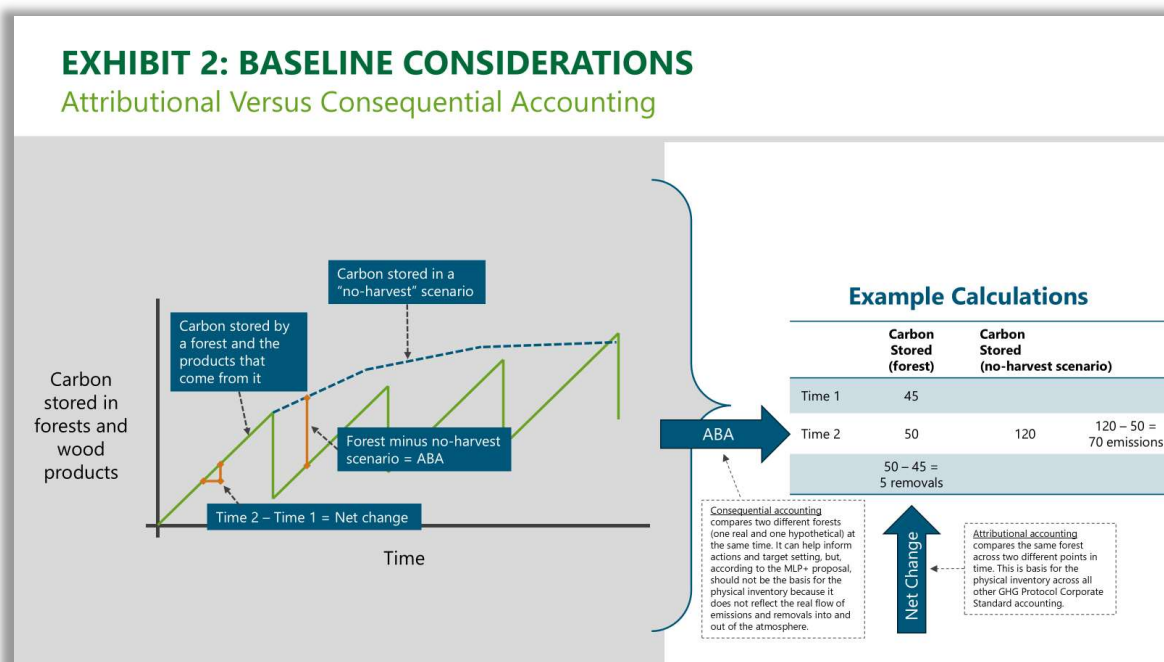
- Companies shall only report removals if an ongoing monitoring plan is in place to detect losses of stored carbon
- Losses of stored carbon shall be reported as either emissions (if the carbon pools remain in the spatial boundary) or reversals (if the carbon pools are no longer in the spatial boundary)
- Companies shall provide information about their monitoring plans, traceability systems, uncertainty ranges, carbon pools, and sourcing region safeguards relevant to their reported removals

Additional requirements of the MLP+ proposal: None

Recommendations: When measuring progress over time companies should use a consistent inventory boundary so that land management emissions/removals are comparable over time. In a scope 1 context, this will require companies to monitor owned or controlled land that previously was allocated emission/removals to measure progress over time. In a scope 3 context, this will require companies to continue monitoring the sourcing regions or forest management units where they procured raw material. Tools such as the one that has been developed by AFF, or next-generation tools that rely on DMRV, can make this process significantly easier and more effective.

Discussion: The baseline for the MLP-based physical inventory should be distinguished from the baseline in the ABA proposal, because they describe extremely different concepts. In the ABA, the baseline is a no-harvest counterfactual within the same time (i.e., a projection of an alternate, non-observable universe). In the MLP, the baseline is historical observations across time. Any base-year comparisons using the MLP-derived net change shall be supplemented with the forest impact statement for the purposes of target setting or informing actions.

Exhibit 2: Baseline considerations



Component 2: Forest Impact Statement

Recommendation: The purpose of including consequential accounting in the MLP+ proposal is to inform companies' decision-making and to incentivize adoption of management practices that enhance removals and reduce emission over time. Instead of the baseline of "no harvest" suggested by the ABA proposal, the MLP+ proposes one of two different baselines, which are more actionable by companies in determining how to best mitigate climate change. Neither method is intended to be fully developed by this TWG but could be taken up by other working groups. Importantly, forest management and/or other land-based interventions that protect carbon stocks in terrestrial ecosystems should be included in the forest impact statement and integrated into target-setting as part of a complete definition of net-zero.

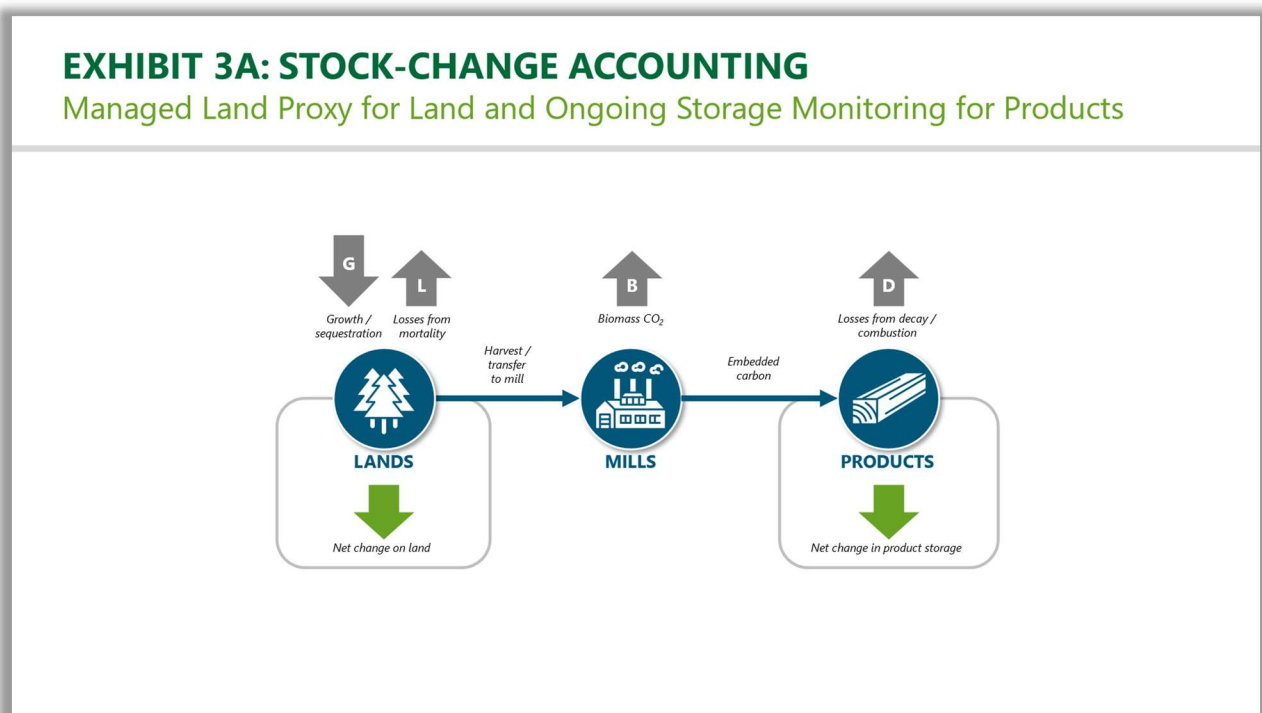
1. A counterfactual based upon some version of a historical baseline or standard management practices that would measure emissions reductions/enhanced removals resulting from specific changes in forest management. This would incentivize companies to invest in improved management practices that could be reported as progress towards climate goals. *This could be further developed in alignment with GHG Protocol's Actions and Market Instruments Technical Working Group.*
2. One approach would be based on the increased sequestration needed to align with a science-based net zero pathway to 1.5 degrees. Used in that way, a counterfactual would inform a company how far it is from being in line with the increased removals needed to meet global climate goals, thereby when used in conjunction with a net zero target would incentivize them to align with that emissions trajectory. *This could be further developed during the redevelopment of SBTi's Timber and Wood Fiber Pathway, which began recruitment April 2025.*

6 Methodology

Component 1: Physical Inventory

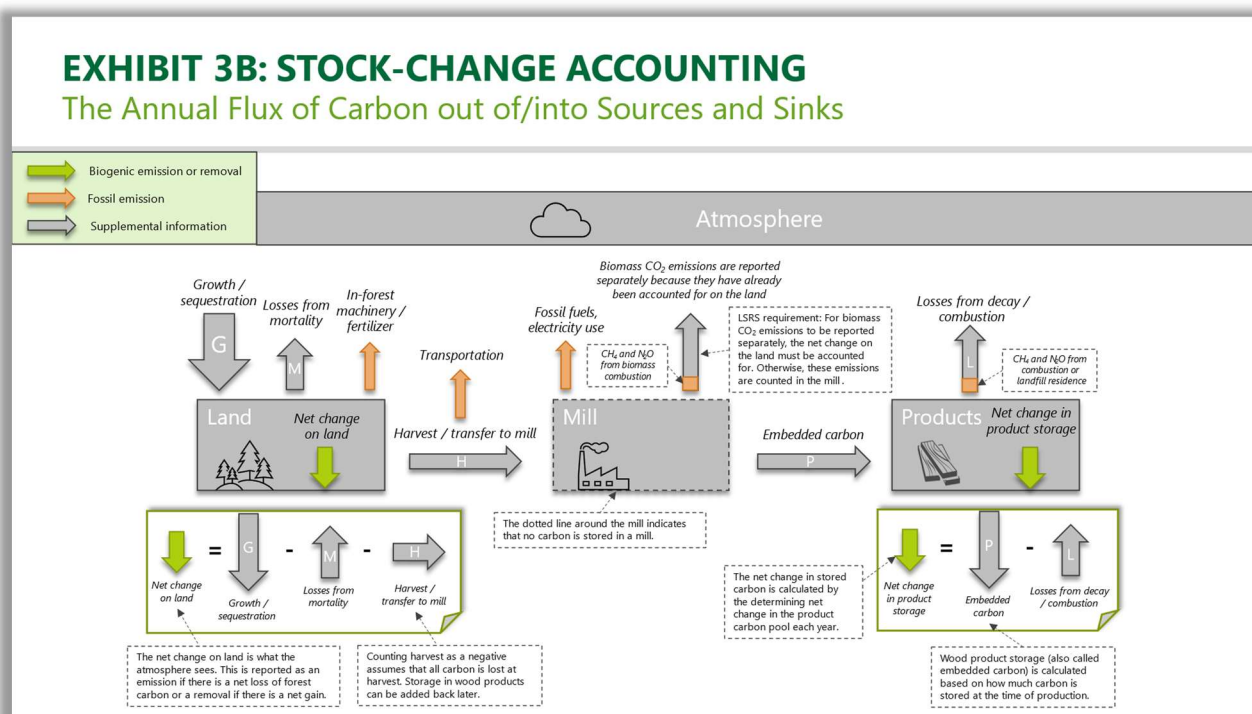
Recommendations: The methodologies for inventorying forest carbon stocks are well established. The quantification, in simplistic terms, would require that forest inventory data be translated to carbon data. For example, tree inventory data (in units of weight) can be multiplied by 0.5 to factor out water weight and 0.5 to account for the proportion of dry wood weight that is carbon (these are very rough approximations). Allometric equations to do this math are also well established in scientific literature to convert from diameter at breast height (DBH) to tree biomass, which can then be converted into live tree carbon. Based on live tree carbon, other forest carbon pools are estimated by forest type/age based on measurements or data in literature. In the United States, Smith et al. provide guidance on this topic⁷. Exhibits 3a and 3b, below, show summarized and detailed versions, respectively, of the flow of carbon in a forest carbon value chain using an MLP-derived net change approach.

Exhibit 3a: Stock-change accounting (simplified)



⁷ Smith, James & Heath, Linda & Skog, Kenneth & Birdsey, Richard. (2006). [Methods for Calculating Forest Ecosystem and Harvested Carbon with Standard Estimates for Forest Types of the United States](#).

Exhibit 3b: Stock-change accounting (detailed)



Discussion: AFF has constructed a quantification methodology (included in section 2: spatial boundary) that supports the application of the MLP in a scope 3 context. A key refinement to the methodology (or others) would be improved guidance around distinguishing between managed and non-managed land. The current version of the methodology allows the inclusion of land that does not meet the definition of attributable productive forest land described in section 2, so further development of the tool would be necessary to claim that it is GHG Protocol compliant. However, based on some preliminary FIA analysis, the impact is slight – in the Southeastern United States, the analysis suggests that approximately 12% of plots that would be included under the current definitions should be excluded. That percentage will likely be different based on the regional context of forest management.

Component 2: Forest Impact Statement

This component of a company's GHG inventory report will require multiple methodologies. However, the development of these methodologies is outside the scope of this FCA TWG and should be developed by other groups and standard development processes, in alignment with the end-to-end integrity framework.

7 Data Requirements

Component 1: Physical Inventory

Requirements included in the current version of the LSRS: Companies shall meet the requirements stipulated in the LSRS, including:

- using empirical data specific to sinks and pools where carbon is stored
- reporting on the quantitative uncertainty range
- using measurement-based approaches or calibrated model-based or remote sensing-based approaches
- providing justification for how selected values do not overestimate removals

Additional requirements of the MLP+ proposal: None

Discussion: To fully implement MLP across scopes, you need a) complete and accurate inventories of forest carbon stocks OR accurate and credible removals / emissions factors associated with management activities, and b) clear delineations of managed and non-managed lands. It should be said these data exist or are possible to derive in most contexts in the world when applying the Managed Land Proxy.

Component 2: Forest Impact Statement

The data requirements for this component of a company's GHG inventory will vary depending on the methodology. This is outside the scope of this TWG and should be considered by other ongoing groups and standard development processes. In alignment with the end-to-end integrity framework.

8 Additional Considerations

Component 1: Physical Inventory

The MLP benefits from having been developed in the context of the GHG Protocol and the LSRS and thus being aligned with its other provisions. It is also consistent with the other standards in development at the GHG Protocol, in particular with the Action and Market Instruments TWG. It was also designed to be consistent with IPCC country UNFCCC reporting.

The consistency of an approach based on net land carbon stock changes across all land uses is vital in enabling comparable reporting across the economy. In addition, introducing consequential accounting within the physical inventory would have unknown and dangerous consequences.

Component 2: Forest Impact Statement

To the best of our knowledge, the MLP+ proposal's requirement to develop a forest impact statement is in accordance with the latest scientific recommendation. However, we recognize that this realm of science is both complex and turbulent. Given the ongoing nature of these discussions, we believe that a forest impact statement, reported separately from the physical inventory, is an appropriate place for the GHG Protocol to land in 2025. We also believe that further research and deliberation are necessary in order to formalize the methodology for constructing the forest impact statement. This proposal wishes to "hand a baton" to the

next group who wishes to bring harmonization to the world of carbon accounting. We are passing the baton with many laps left to run, but we believe the approach we have described in the MLP+ is in the best interests of the GHG Protocol and of the shared ecosystem for climate action that we are striving towards.

Component 3: Forest Claims Disclaimer

Unlike most sectors, which need to reduce emissions to achieve net-zero, the AFOLU/FLAG sector needs to go from being a net source of emissions globally to a net sink. The latest IPCC report finds that improved forest and agricultural management practices could contribute as much as 11.3 gigatons of CO₂e/year in mitigation potential globally by both reducing emissions and enhancing sequestration/removals.

To realize that transition and for the land sector to fully contribute to net zero goals, companies in land-intensive sectors must maintain existing carbon stocks, reduce emissions and enhance sequestration.

As a result, companies in land-intensive industries, even if they measure and report net land-based removals, may not be operating in line with a science-based pathway to net zero. This is especially true in the forestry sector, where forests may continue to sequester carbon even under unimproved management techniques. Companies shall keep this in mind when setting targets and making claims about their climate performance. This is why it is critically important for companies to set targets that align with science, and, in the absence of targets or before achieving those targets, to avoid overstating their climate benefit. In all sectors, especially land-intensive ones, claims shall focus on highlighting the results of improved management practices instead of reflecting the status quo.

Therefore, component 3 **requires** that a claims disclaimer be included in the inventory for **any** company reporting forest-based removals. Here is an example of what such a disclaimer might look like, with final development and ratification of such a disclaimer to be completed by the GHGP Secretariat: “Land-based emissions and/or removals are separately reported from non-land emissions. Globally, the land sector has both emissions and removals but is a net sink. Meeting global net zero goals will require that the land sector becomes a greater sink by maintaining existing carbon stocks, reducing land-based emissions, and enhancing land-based sequestration.

The LSRS requires that land and fossil-based emissions be reported separately and not netted. Similarly, net land-based removals reported within the physical inventory shall not be claimed as compensation for fossil-based emissions. Therefore, companies cannot balance their fossil-based emissions with inventory forest carbon removals as a way of reaching net zero, achieving carbon or climate neutrality, or any other climate-related claim. Instead, companies seeking to make those claims must follow separate reporting and target-setting guidance.”