

The Land Sector and Removals Guidance will change the way companies account for their greenhouse gas emissions.

So, what does this mean for your science-based targets?



*This post is written based on the draft Land Sector and Removals Guidance and therefore is subject to change under the finalized guidance

What is the new Land Sector and Removals Guidance?

Companies and other organizations who follow the Greenhouse Gas (GHG) Protocol's Corporate Standard and Scope 3 Standard and have land sector activities or removals in their value chains will soon have new guidance to help them accurately account for their GHG impacts – the drafted Land Sector and Removals Guidance.

Interpreting and implementing this guidance will be key for all industries with land sector activities, including agriculture, forestry, bioplastics, ethanol production, emerging technological carbon dioxide (CO₂) removals, and the buying and selling of associated carbon credits.

This new guidance aims to build consistency and transparency into corporate GHG emissions and removals reporting from land-use and management, biogenic products, and carbon removal technologies. Development of the document began in 2020 as part of a global multi-stakeholder process, in close consultation with a technical working group including South Pole. It is currently undergoing pilot testing by over 200 land sector companies.

How does the Land Sector and Removals Guidance relate to science-based targets?

Science-based targets (SBTs) are GHG reduction goals that align with limiting global warming to 1.5°C compared to preindustrial levels. The Land Sector and Removals Guidance provides the “how to” component of accounting for emissions and removals in order to reach your company's SBT.

Who needs to set a Forest, Land and Agriculture (FLAG) target?

To remain aligned with the SBT initiative (the SBTi), your company must set FLAG targets based on the Land Sector and Removals Guidance if you are in the FLAG sector. The FLAG sector includes forest and paper product producers, processors, distributors, and purchasers, agricultural producers, food and beverage processors and retailers, and the tobacco industry. Companies outside the FLAG sector may also have to set FLAG targets if their FLAG emissions within their value chain make up more than 20% of their total emissions. For example, a mining company may have significant land-use change emissions in their operations and therefore may be required to set a FLAG target. This is in addition to non-FLAG targets from other fossil-based emissions. FLAG-sector companies must set targets covering 95% of their scope 1 and 2 emissions and 67% of their scope 3 emissions.

What is the significance of FLAG-based targets in the context of climate change?

The FLAG sector emits 10–12 metric gigatons (Gt) of carbon dioxide equivalent (CO₂e) per year. This is equivalent to about a quarter of global net anthropogenic emissions (those resulting from human activity). Of those FLAG emissions, agriculture makes up about 50%, with land-use, land-use change, and forestry making up the remainder¹.

The FLAG sector also has potential to mitigate climate change.



Some research estimates that global croplands alone have the ability to sequester between 3.3 and 6.8 Gt CO₂e per year for a period of up to 20 years² by implementing improved management practices.







¹ <https://www.nature.com/articles/s41558-019-0591-9>

² <https://www.nature.com/articles/s41598-017-15794-8>

What are land-based emissions?

Land emissions occur from land-use change or land management practices that result in a flux of GHGs into the atmosphere. For example, land-use change from forest to cropland via deforestation results in land-based emissions from the loss of the carbon stored in biomass (trees, bushes, other vegetation, etc.), dead organic matter and soil. Land management can also result in emissions. For example, carbon dioxide (CO₂) and nitrogen-based emissions from soil tillage or methane (CH₄) emissions from prescribed burning or manure management.

Figure 1. Land-use change emissions

		Post-conversion land use category					
		Forest land	Grassland	Cropland	Wetland	Settlement	Other land
Pre-conversion land use category	 Forest land	F > F ●	F > G	F > F	F > W	F > S	F > O
	 Grassland	G > F	G > G ●	G > C	G > W	G > S	G > O
	 Cropland	C > F	C > G	C > C	C > W	C > S	C > O
	 Wetland	W > F	W > G	W > C	W > W ●	W > S	W > O
	 Settlement	S > F	S > G	S > C	S > W	S > S	S > O
	 Other land	O > F	O > G	O > C	O > W	O > S	O > O

● Forest subcategories	Natural forest		● Grassland & wetland subcategories	Natural ecosystem	
	Natural forest	Planted forest		Natural ecosystem	Intensively managed land
Natural forest	NF > NF	NF > PF	Natural ecosystem	NE > NE	NE > IML
Planted forest	PF > NF	PF > PF	Intensively managed land	IML > NE	IML > IML

Key

- Land use change with carbon stock losses (Chapter 7)
- Land use management and/or land use change with carbon stock again (chapter 8)
- Forest Subcategories
- Grassland & Wetland Subcategories

Figure 2. Land management emissions

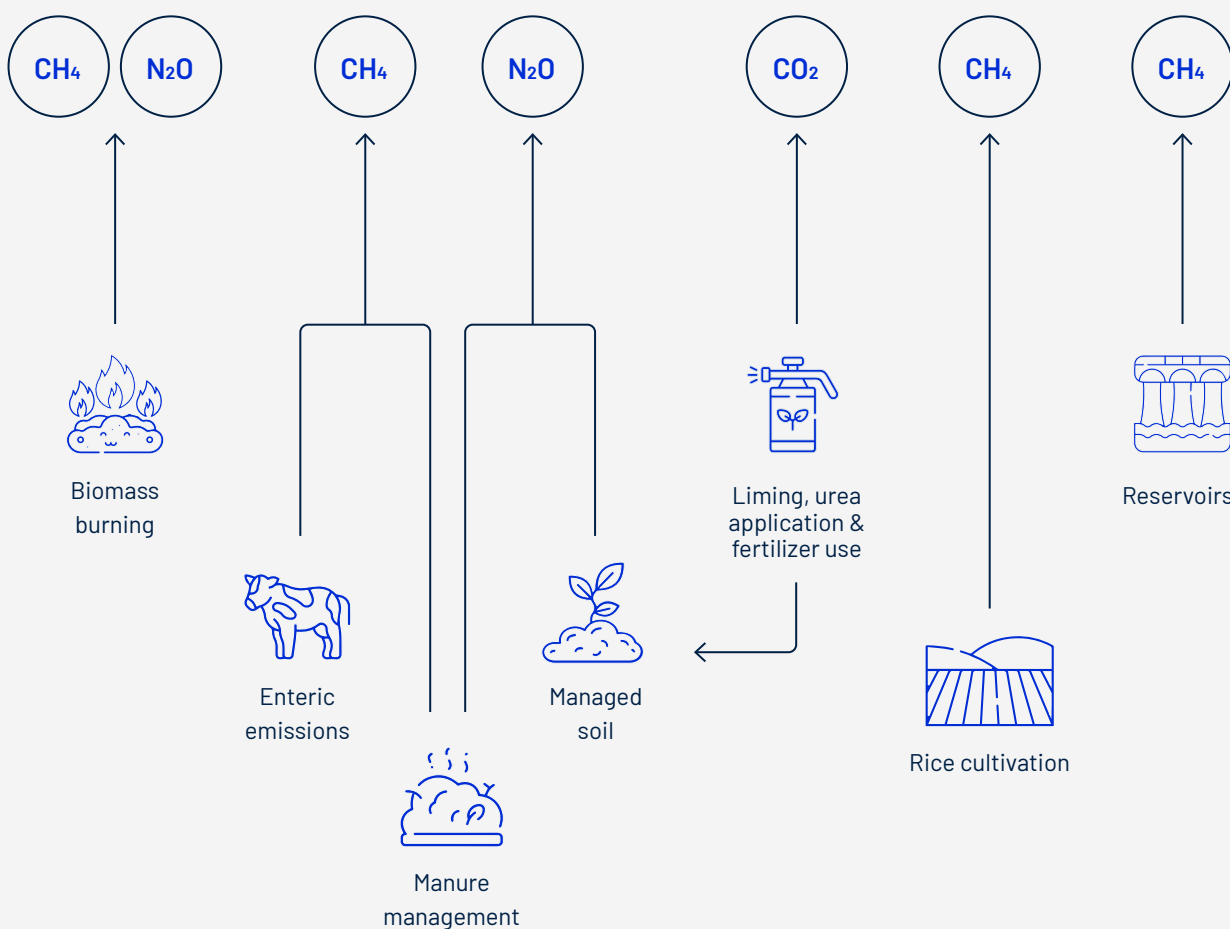
What land management activities can impact carbon stocks?

Management practices on lands remaining in the same land use such as:

- ✓ harvesting and forest rotation periods,
- ✓ replanting,
- ✓ species selection.
- ✓ fire management,
- ✓ site preparation,
- ✓ crop tillage and residue management,
- ✓ crop rotations or intercropping,
- ✓ soil amendments, and
- ✓ conservation buffers and set aside lands

can increase or decrease the total carbon stocks on land over time.

Land management non-CO₂ emissions

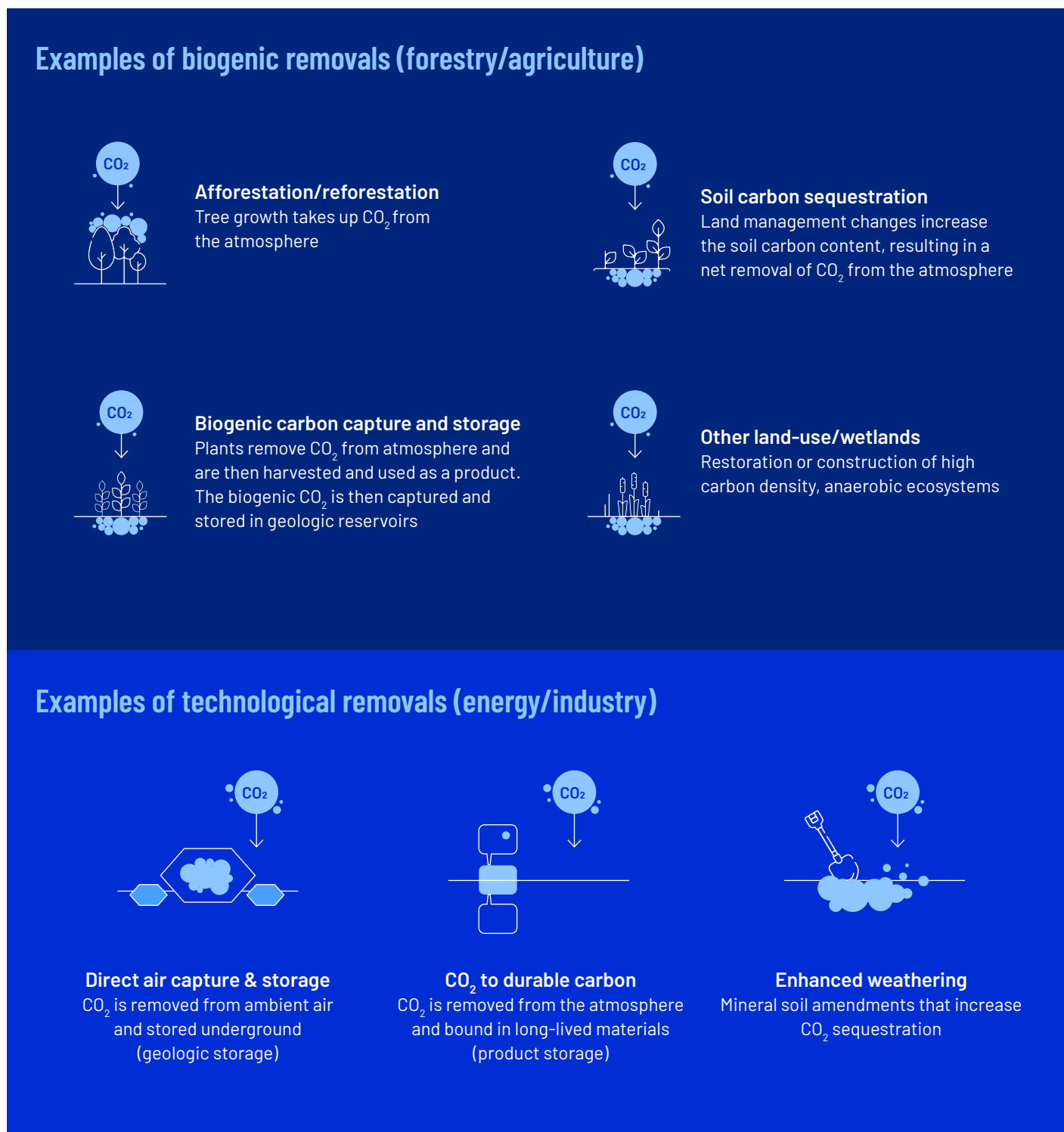


What are land-based removals?

This refers to the transfer of atmospheric CO₂ into land-based 'carbon pools' for long-term storage. There are two main types of removals – biogenic and technological.

Biogenic storage occurs from afforestation, reforestation, or soil carbon sequestration, where atmospheric CO₂ is transferred into biogenic carbon pools. Technological storage occurs through technology-based processes like enhanced weathering, direct air capture, and ocean alkalinity enhancement. While accounting for land-based emissions is obligatory, accounting for removals is optional.

Figure 3. Examples of removals



Why bother accounting for land-based removals?

The SBTi states that carbon offsets, such as purchased carbon credits, do not count towards reaching a company's SBT. However, companies can include removals within their supply chains to reduce their net carbon emissions within their FLAG targets. This is particularly advantageous for the FLAG sector, as many interventions can be implemented with increasing removals as the goal. For example, incorporating agroforestry practices in shade grown coffee production increases removals in an agricultural system, if managed correctly.

What lands in your company's value chain need to be included?

All managed lands within your company's scope 1, 2, and 3 inventories should be accounted for in emissions reporting. For scope 1 accounting, the current draft guidance allows companies to use multiple approaches to distinguish between managed and unmanaged lands. Companies may classify all lands as managed, or apply a consistent approach to classification. For example, you could distinguish between managed and unmanaged lands based on whether a management plan is active for a particular land unit.

The land classification decision has implications for inventory accounting. For example: a farmer has a conservation border around their cultivated land. If the border land is classified as 'managed', then the farmer can account for the removals that occur on that land, but the farmer must also account for potential emissions too, from fire for example. If the land is classified as 'unmanaged', removals cannot be accounted for.

How should land-based emissions and removals be accounted for in scope 2 and 3?

In scope 2 accounting, companies report indirect emissions from purchased electricity, steam, heating and cooling (e.g., biogenic emissions from combustion to produce electricity). Upstream emissions from electricity (e.g. methane emissions from hydropower) are accounted for under scope 1 or 3, depending on the position of a company in the value chain. There are no scope 2 removals. The removals that occur from the generation of electricity are reported under scope 3.

In scope 3 accounting, companies can only report removals from attributable managed lands. "Attributable" refers to land that is used to produce a specific product in the value chain. For example, a dairy-product processor can account for land removals that occur on the grazing lands of their suppliers; however, they are unable to account for removals associated with an area of land set aside for conservation, since this land does not contribute to the direct production of the dairy product. Conversely, if a supplier incorporated silvopasture into their land management practices, the dairy-product processor could account for potential removals associated with the biomass carbon stock increases from the tree growth on the grazing lands, which produce the product in their value chain.

South Pole's involvement in the development of the Land Sector and Removals Guidance

South Pole has been integral to the development of Land Sector and Removals Guidance. As a supporting partner, South Pole hosted eight workshop webinars and presented the guidance and its nuances to pilot-testing companies. South Pole also participated as a technical working group member, offering expert advice. Currently, South Pole is working with companies to develop case studies and unofficial pilots to evaluate forthcoming opportunities once the guidance is finalized.



Key takeaways from the Land Sector and Removals Guidance

1. Use stock-change accounting

The stock-change method for GHG accounting analyzes carbon stock changes in carbon pools, as opposed to emission and removal flows from sinks or sources, as in the flow accounting method. The stock-change approach accounts for net emissions and removals, while the flow approach accounts for gross emissions and removals. The intent behind requiring the stock-change accounting method as opposed to the flow method is to achieve transparency in emissions reporting. Land management non-CO₂ emissions should still be reported using the flow accounting method.

2. Report GHG emissions and removals by scope, gas, and carbon stock

To maintain transparency in inventories, companies are asked to separately report their emissions under scopes 1, 2, and 3. For example, a company who owns or controls farmland would report land emissions and removals in their scope 1 inventory. A company who purchases electricity from hydropower would report methane emissions from that land under scope 2. A wood processing company would report forest-based emissions and removals under scope 3 by GHG (for example, reporting the amount of CO₂, N₂O, CH₄ emitted from biomass burning) and by product (biomass, dead wood litter, and soil stocks).

3. Report all emission on managed lands

This includes emissions from natural disturbances for all lands within a company's organizational boundaries, including leased assets, franchises, and investments.

4. Report direct or statistical land-use change emissions

This includes all land-use change emissions with an assessment period of 20 years or higher.

A direct land-use change calculation is when companies have traceability to an area of production (usually an agricultural field, but also could be the conversion of a natural forest to a plantation forest, in which case traceability would be to the forest management unit). In this instance, companies are able to calculate the direct land-use change area that occurred due to an expansion for production.

A statistical land-use change calculation is when a company does not have traceability to the agricultural field or forest, but does know the region or country a product came from. In this case, a company would use a regional or national statistical estimation of land-use change to incorporate that value into their inventories. Companies may use a linear or equal discounting approach to account for these emissions over time.

5. Report one land tracking metric

One land tracking metric is land occupation, where a company would report an area value, which is required to produce products in their value chain. For example, a cotton gin accounting for their scope 3 emissions would estimate the acres of land needed to produce their annual volume of lint. Other land-tracking metrics include indirect land-use change and carbon opportunity cost.

6. Meet specific requirements to report removals

Ongoing storage monitoring, traceability, primary data, uncertainty, and reversal accounting are all required to meet a permanence principle, which ensures that the removals being reported are accurate. This includes reporting a storage monitoring plan, tracing removals from pools to storage, using primary, empirical data specific to a company's supply chain, and providing quantitative uncertainty analysis, such as error propagation or Monte Carlo simulations. Additionally, companies are asked to incorporate reversal accounting, meaning that if it is not possible to meet any of the above mentioned requirements anymore, the accounted removals will be reported as emissions. This is also the case for the sale of land and change of suppliers.

Projected challenges for corporates' inventory accounting

1. Supply chain traceability

The current draft guidance states that companies choosing to report scope 3 land removals should have traceability to the harvested area (the agricultural field or forest stand that sourced a product) or the land management unit (forest management unit, ranch, or farm).

This level of traceability poses a challenge for many companies, due to the lack of transparency in land sector value chains. As such, it will be increasingly important for companies to engage with their suppliers, consumers, and other members of their value chains in order to gain granular levels of traceability to harvested areas, land management units, or sourcing regions.

Notably, traceability requirements for removals are under review in the draft, presented as an open question (#3) that is currently gathering feedback on feasibility from pilot testing companies.

2. Incorporating primary data

While the current draft guidance allows for certain flexibility in emissions accounting approaches, companies that choose to account for removals are subject to calculation methods and data inputs that are more robust. For example, accounting for removals requires primary data specific to carbon stocks in a company's value chain. Primary data can consist of direct measurement taken every five years, or model-based approaches parameterised using direct measurements. Any secondary data used to support the calculations should be temporally and geographically representative of the carbon stocks of a company's value chain. Secondary data used to complement primary data should be based on peer-reviewed scientific literature or government statistics.

3. Spatial and temporal variability in sourcing

In land-based activities such as forestry and agriculture, lands that are managed for production may change over time. For example, for timber production, harvested areas change year by year. Similarly, in scope 3 accounting, processing companies or food retailers may source from different suppliers who manage different lands each year. According to the current draft guidance, companies sourcing from different regions between years would have to conduct reversal accounting for the removals they claim on lands they no longer include in their scope 3 accounting.

The bottom line

The Land Sector and Removals Guidance provides an opportunity for the private sector to achieve transparency and consistency in their land-related GHG accounting, SBT roadmaps, and overall climate goals.

It offers a robust framework, particularly for the food, fiber, and certain renewable energy sectors, to report their contributions to addressing climate change in removals accounting. Companies will be challenged to engage with their value chains, manage data across scopes and carbon pools, and set meaningful FLAG targets.

Whether your company or organization is well underway on its net-zero journey, or in the first stages of its sustainability roadmap, the Land Sector and Removals Guidance will impact how you account for, report on, and interact with your climate goals.

For an enhanced understanding of what this means for your reporting, and the opportunities this presents for you and your supply chain, contact South Pole today.

About the author



Olivia Novak

Associate Consultant, Agriculture Value Chains

Olivia works at the intersection of agriculture, emissions, and land use, understanding the interactions between these impacts from a scientific, policy, and business perspective. Prior to joining South Pole, she conducted sustainability assessments such as systems mapping and lifecycle assessments within the fishing industry and researched physical traceability and calculation method impacts of net carbon stock changes in US forest lands in reference to forest-based companies' scope 3 accounting. Olivia holds a Master of Science in Agriculture, Food, and Environment and a Master of Public Health in Biostatistics from Tufts University.

