

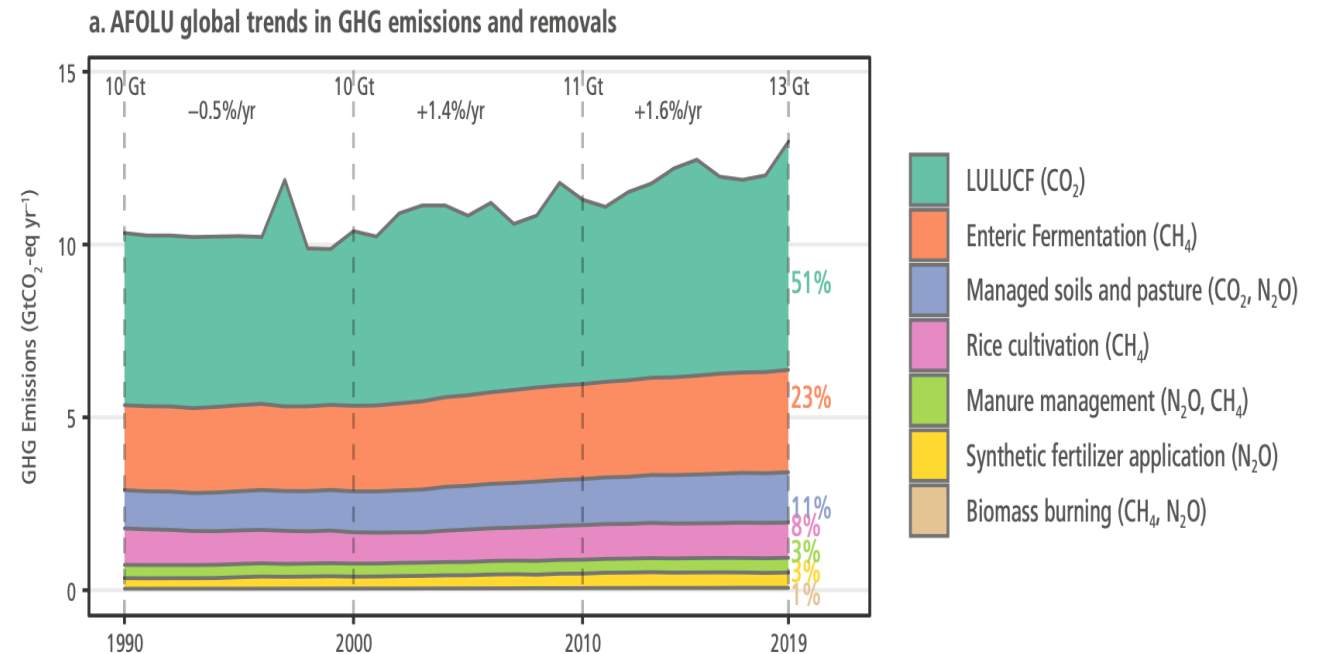
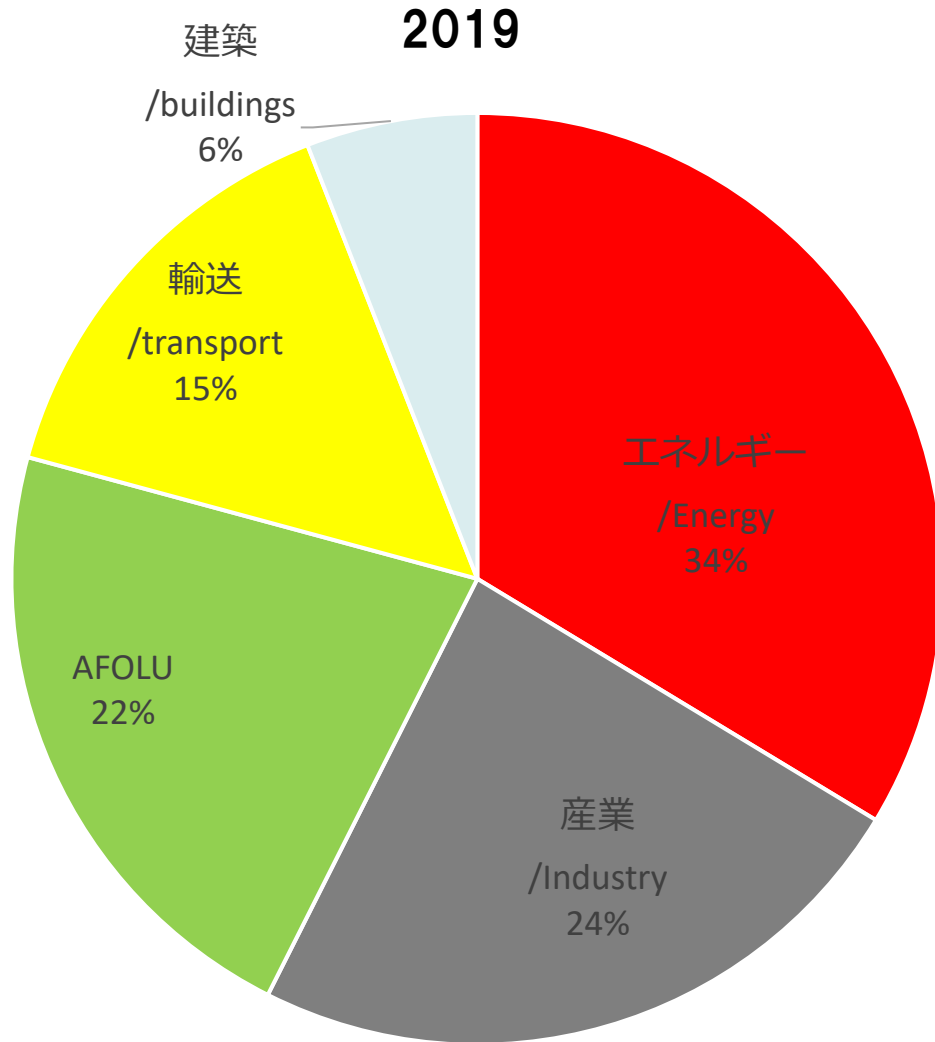


自然エネルギー財団
RENEWABLE ENERGY INSTITUTE

GHGプロトコル・SBTにおける バイオマス由来炭素の算定方法

自然エネルギー財団シニアコーディネータ 高瀬香絵

土地関連排出量はこんなに多い/How high Land-related emissions are

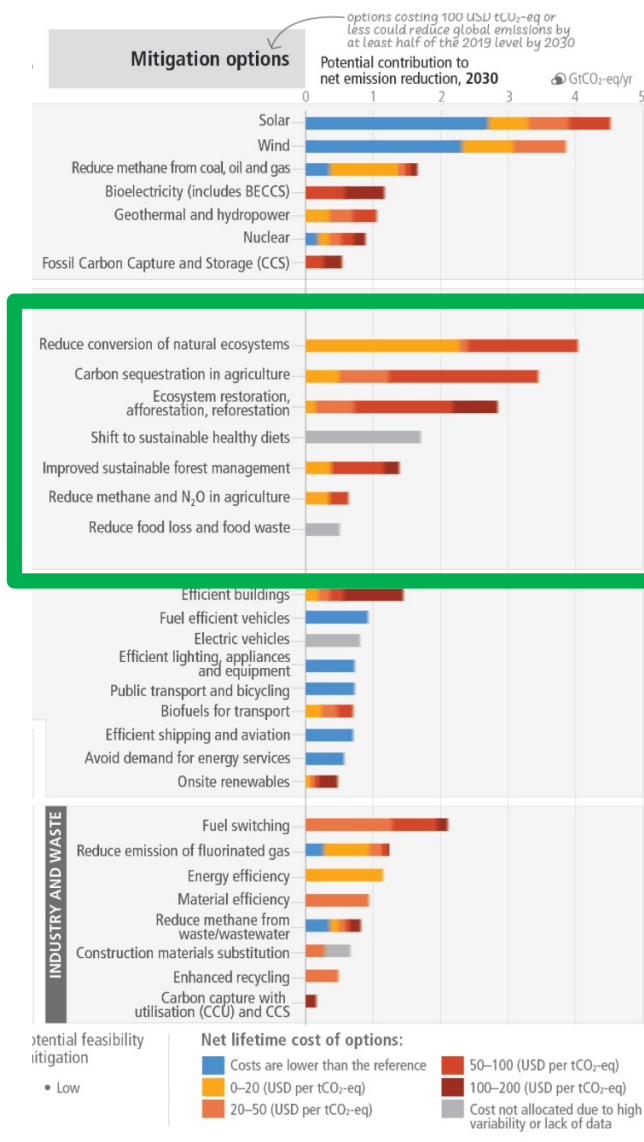


GHG年間排出量の22%
その多くが土地利用・土地利用変化 (LULUCF)
22% of annual GHG emissions
Much of this is land use and land use change (LULUCF)

Source: IPCC, Climate Change 2022: Mitigation of Climate Change (Chapter 7)

*AFOLU: Agriculture Forestry, and other Land Use

気候変動対策の20-30%は土地セクターで / 20-30% of climate action is in the land sector



■左図は2030年までの緩和ポテンシャルとそのコスト。The figure on the left shows mitigation potential and costs by 2030.

■土地セクターの対策は、100ドル以下で多くの対策が可能。Many measures in the land sector can be implemented for less than \$100.

以下の対策を進めることは重要

- 土地転換を減らす
- 農業における炭素隔離
- 生態系回復、植林、森林修復
- 持続可能な森林管理の進展

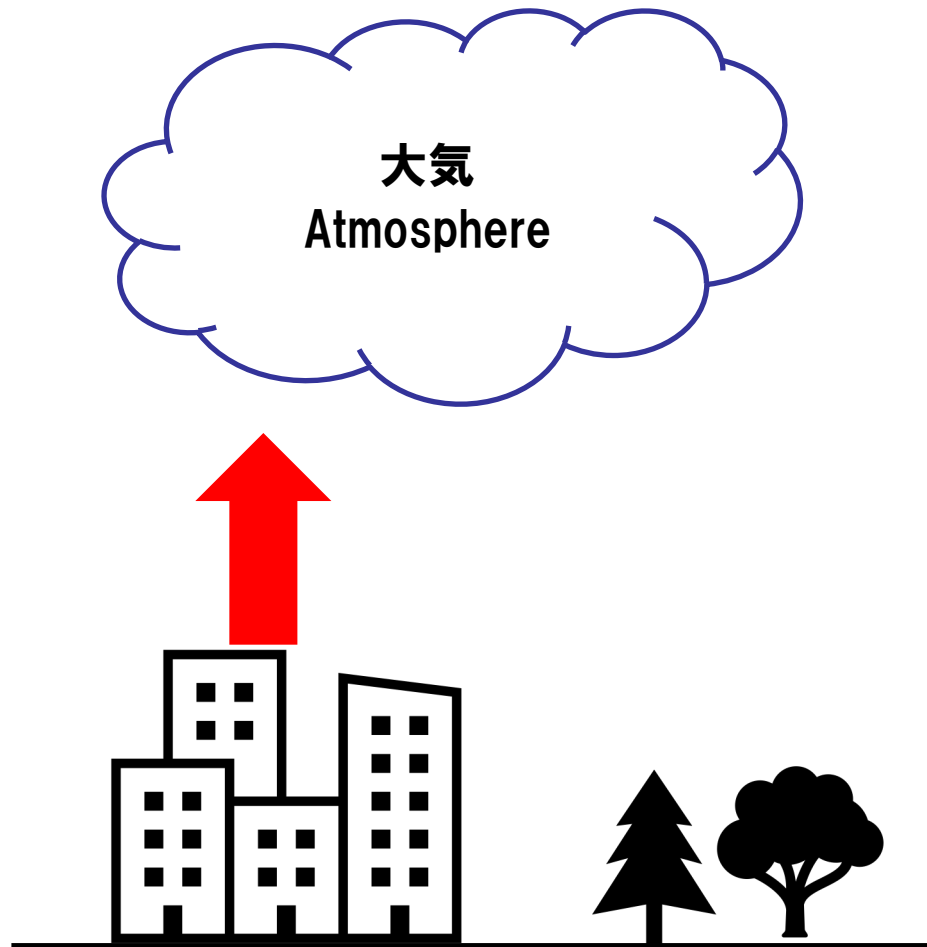
Important to promote :

- Reduce conversion
- carbon sequestration in agriculture
- Ecosystem restoration, afforestation, reforestation
- Improved sustainable forest management

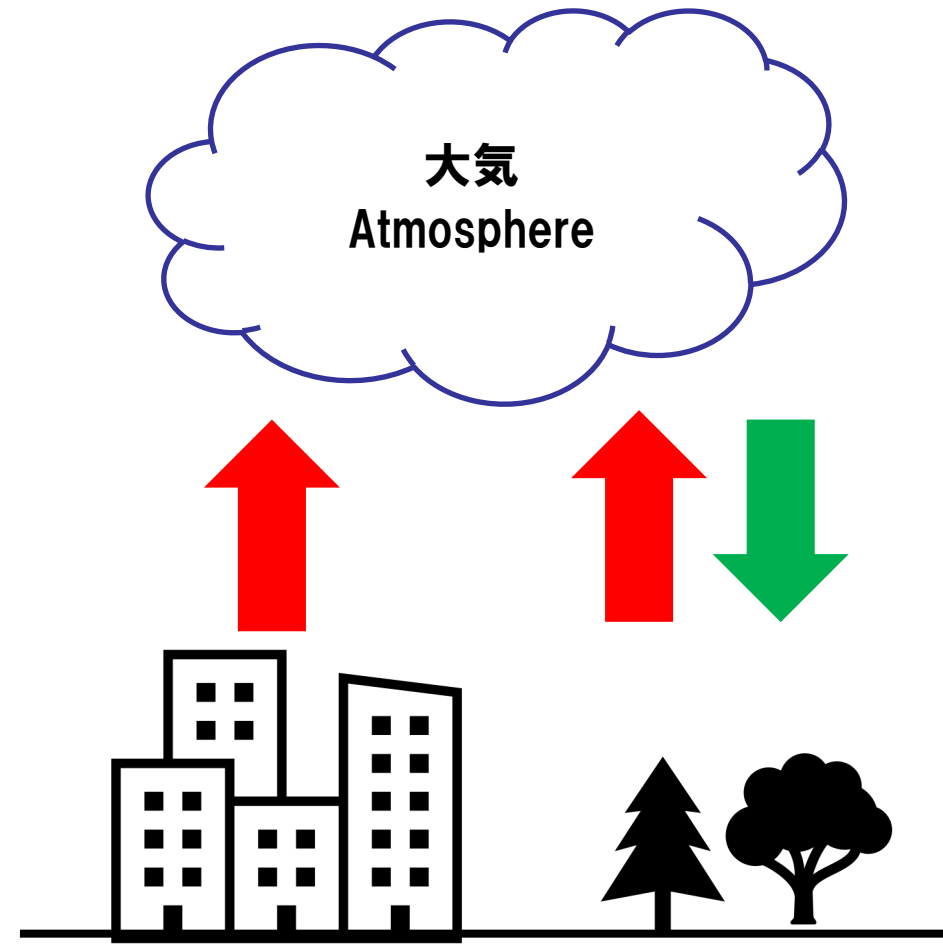
Source: IPCC, AR6 Synthesis Report, Climate Change2023

これまでとこれからの企業炭素会計/ Corporate Carbon Accounting: Past and Future

これまで (Past/current)



これから (Future)



新しい枠組み/What's new

■GHG排出量算定報告/GHG Inventory

■目標設定/Targets setting

Sponsor	 GREENHOUSE GAS PROTOCOL
Title	土地セクター&除去ガイダンス Land Sector & Removals Guidance
Developers	WRI, WBCSD
Status	現在 <u>ドラフト(案)</u> Currently in <u>draft</u>



森林、土地&農業 (FLAG)
ガイダンス
Forests, Land, & Agriculture
(FLAG) Guidance

WWF, SBTi

2022年9月に 公表
Released Sep 2022

The two projects have been funded by the Gordon & Betty Moore Foundation.

算定の考え方/Basics of Accounting Land Sector & Removal

- 全ての企業が算定/All companies must calculate
- 除去は任意/Removals are optional
- スコープ 1 ・ 2 ・ 3 を算定/Required to calculate scope 1,2,3
- 土地セクターと除去は、ストック変動算定（どれだけ貯留量が変わったか）。加えて、グロスでの排出量も開示。Land sector and removals are based on stock-change calculation. In addition to stock-change, gross emissions are needed to disclose.

スコープ 1・2・3 /scope 1,2,3

排出量の種類	スコープ	定義	例
直接	スコープ 1	報告企業が所有または支配する事業活動または土地からの排出量。	報告企業が所有または支配する牧草地の家畜からの排出量。
間接	スコープ 2	報告企業が購入または入手し、消費する電気、蒸気、温熱・冷熱の生産による排出量。	報告企業が購入した電気を作っている発電所からの排出量。
	スコープ 3	報告企業の活動の結果として、他の企業が所有または支配している事業あるいは土地で発生したすべての排出量（スコープ 2 に含まれないもの）。	報告企業が購入した飼料の生産に用いた土地からの排出量。

Emissions type	Scope	Definition	Example
Direct	Scope 1	Emissions from operations or lands owned or controlled by the reporting company.	Emissions from livestock on pastureland owned or controlled by the reporting company.
Indirect	Scope 2	Emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting company.	Emissions from a power plant generating electricity purchased by the reporting company.
	Scope 3	All emissions (not included in scope 2) that are a consequence of the activities of the reporting company but occur from operations or lands owned or controlled by another company.	Emissions on land used to grow feed purchased by the reporting company.

Source: [GHG Protocol, “Land sector and Removals Guidance \(draft\)”](#)

出典: [GHGプロトコル/環境省・みずほリサーチ&テクノロジーズ翻訳, 土地セクター・炭素除去ガイダンス パート1](#)

これからのGHG排出量算定/What should corporates disclose ?



- 主に、土地起源の純排出、製品・地中プールからの純排出を算定・開示。 Net land-based emissions and net emissions from products and geological pools should be calculated and disclosed.
- 純除去量については、開示は任意。 Removals are optional.
- 総排出量と総除去量も別途開示。 Gross emissions and removals should be separately disclosed.

Sample reporting template (Draft for Pilot Testing and Review, September 2022) Part 2: Greenhouse gas inventory data	Reporting categories			純排出量 Net emissions			純除去量(任意) Net Removals				総排出量と総除去量 Gross emissions and removals			過去の除去の反転 Reversal from previous removal							
	Emissions	Removals	Gross emissions and removals	Emissions			Removals** (net)				Land Tracking			Gross emissions and gross removals			Reversals (of previously reported removals)				
	Land use change emissions	Land management net CO ₂ emissions	Land management non-CO ₂ emissions	Net CO ₂ emissions from geologic storage	Net CO ₂ emissions from biogenic product storage	Net CO ₂ emissions from TCOR-based product storage	Land management net removals	Net biogenic removals with geologic storage	Net technological removals with geologic storage	Net biogenic removals with product storage	Net technological removals with product storage	Indirect land use change emissions	Carbon opportunity costs	Land occupation	Gross biogenic product CO ₂ emissions	Gross land biogenic CO ₂ removals and emissions	Gross technological CO ₂ removals and emissions	Gross CO ₂ emissions from geologic storage	Reversals from land-based storage	Reversals from geologic storage	Reversals from product storage*
Scope 1: Direct emissions – own				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Scope 2: Indirect emissions – purchased				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Scope 3: Indirect emissions in the value chain – Upstream																					
Category 1: Purchased goods and services				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 2: Capital goods				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 4: Upstream transportation and distribution				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 5: Waste generated in operations				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 6: Business travel				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 7: Employee commuting				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 8: Upstream leased assets				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Other				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Scope 3: Indirect emissions in the value chain – Downstream																					
Category 9: Downstream transportation and distribution				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 10: Processing of sold products				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 11: Use of sold products				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 12: End-of-life treatment of sold products				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 13: Downstream leased assets				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 14: Franchises				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Category 15: Investments				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA
Other				NA	NA	NA	NA	NA	NA	NA								NA	NA	NA	NA

これまでの算定対象

エネルギー/
産業排出量
Emissions
from
Energy/industry

純土地起
源純排出
量
Emissions
from land

製品・地中プ
ールからの純排
出量
Emissions
from products
and
geological
pool

3つのうち1つ
関連指標を開示
・ 間接的土地利
用変化による
排出量
・ 炭素機会コスト
・ 土地占有面積
Land tracking
metrics

Net emissions/removal = Gross emissions – Gross Removal (+ for net emissions, – for net removal)
純排出量/除去量 = 総排出量 – 総除去量 (+の場合、純排出、-の場合、純除去)

1. 自然林を人工林に (Transfer natural forest to plantation): 土地利用変化分、20年間計上/should account for LUC (land use change) emissions allocated for 20 years.
2. 人工林を伐採しペレットに加工/Cut woods, make pellets.: 土地所有・管理企業の土地ベース炭素ストックが減少し、純土地起源排出量が出る。/ Land-based carbon stocks decrease, resulting in net land-based emissions.
3. ペレットを輸入し燃焼/Import and burn pellets: 輸入企業・燃焼企業のスコープ1総排出量/Generation company's Scope 1 gross emissions (スコープ3カテゴリ3も該当/scope 3 category 3 should apply)
4. 電力を購入/Purchase electricity: 購入企業のスコープ2 (スコープ3カテゴリ3も該当/scope 3 category 3 should apply)

純排出量
Net emissions
 純除去量 (任意)
Net Removals
 総排出量と総除去量
Gross emissions and removals
 過去の除去の反転
Reversal from previous removal

	Emissions						Removals** (Net)				Land Tracking			Gross emissions and gross removals											
	Emissions (non-land)		Land emissions (net)		Net emissions of biogenic or TCDF CO ₂ stored in product* or geological carbon pools		Land management net removals	Net removals with geologic storage		Net removals with product storage*		Indirect land use change emissions	Carbon opportunity costs	Land occupation	Gross biogenic product CO ₂ emissions	Gross land biogenic CO ₂ removals and emissions	Gross technological CO ₂ removals and emissions	Gross TCDF-based product CO ₂ emissions	Gross CO ₂ emissions from geologic storage	Reversals from land-based storage	Reversals from geologic storage	Reversals from product storage*			
	Land use change emissions	Land management net CO ₂ emissions	Land management non-CO ₂ emissions	Net CO ₂ emissions from geologic storage	Net CO ₂ emissions from biogenic product storage	Net CO ₂ emissions from TCDF product storage	Land management net removals	Net biogenic removals with geologic storage	Net technological removals with geologic storage	Net biogenic removals with product storage	Net technological removals with product storage				Gross biogenic product CO ₂ emissions (e.g. from combustion)	Gross biogenic land CO ₂ emissions**	Gross biogenic land CO ₂ removals**	Gross technological CO ₂ removals**	Gross TCDF-based product CO ₂ emissions	Gross CO ₂ emissions from geologic storage	Reported as reversals if not captured in the emissions inventory because the carbon pools are no longer part of the inventory boundary in the reporting year	Reversals from geologic storage	Reversals from product storage*		
Scope 1: Direct emissions					NA	NA				NA	NA													NA	NA
Scope 2: Indirect emissions in the value chain - Upstream		NA			NA	NA	NA	NA	NA	NA	NA					NA	NA	NA		NA	NA	NA	NA	NA	NA
Category 1: Purchased goods and services					NA	NA	NA	NA	NA	NA	NA									NA	NA	NA	NA	NA	NA
Category 2: Capital goods					NA	NA	NA	NA	NA	NA	NA									NA	NA	NA	NA	NA	NA
Category 3: Fuel and energy-related activities (not included in scope 1 or scope 2)																									
Category 4: Upstream transportation and distribution					NA	NA	NA	NA	NA	NA	NA									NA	NA	NA	NA	NA	NA
Category 5: Waste generated in operations		NA																							
Category 6: Business travel					NA	NA	NA	NA	NA	NA	NA				NA	NA				NA	NA	NA	NA	NA	NA
Category 7: Employee commuting					NA	NA	NA	NA	NA	NA	NA									NA	NA	NA	NA	NA	NA
Category 8: Upstream leased assets					NA	NA	NA	NA	NA	NA	NA									NA	NA	NA	NA	NA	NA
Other																									
Scope 3: Indirect emissions in the value chain - Downstream					NA	NA	NA	NA	NA	NA	NA									NA	NA	NA	NA	NA	NA
Category 9: Downstream transportation and distribution					NA	NA	NA	NA	NA	NA	NA									NA	NA	NA	NA	NA	NA
Category 10: Processing of sold products																									
Category 11: Use of sold products					NA	NA	NA	NA	NA	NA	NA									NA	NA	NA	NA	NA	NA
Category 12: End-of-life treatment of sold products		NA																							
Category 13: Downstream leased assets																									
Category 14: Franchises					NA	NA	NA	NA	NA	NA	NA														
Category 15: Investments					NA	NA	NA	NA	NA	NA	NA														
Other					NA	NA	NA	NA	NA	NA	NA														

これまでの算定対象

エネルギー/
産業排出量
Emissions
from
Energy/industry

純土地起源純排出量

Emissions
from land

製品・地中プールからの純排出量
Emissions
from products
and
geological
pool

3つのうち1つ
関連指標を開示

- 間接的土地利用変化による排出量
- 炭素機会コスト
- 土地占有面積

Land tracking
metrics

Net emissions/removal = Gross emissions - Gross Removal
(+ for net emissions, - for net removal)
純排出量/除去量 = 総排出量 - 総除去量
(+の場合、純排出、-の場合、純除去)

除去量計上の際の要件/Criteria for Net Removal

基準	要件	Criteria	Requirement
貯留の継続的モニタリング	企業は、モニタリング計画の内容に従って該当の炭素プールの貯留を継続的にモニタリングしている場合に限り、炭素が引き続き貯留されていることを証明する、または貯留炭素の損失を検知するため、除去量を算定し、報告する必要がある。	Ongoing storage monitoring	Companies shall account for and report removals only if there is ongoing storage monitoring of the relevant carbon pool(s), as specified through a monitoring plan, to demonstrate that the carbon remains stored or to detect losses of the stored carbon.
トレーサビリティ	吸収源(大気中から大気以外のプールへ CO ₂ が移動する場所(例えば、樹木が成長している森林や大気中の CO ₂ を除去するダイレクト・エア・キャプチャ施設))から、炭素が貯留されている炭素プール(例えば、土壌中の炭素貯留量が増加している農場、長寿命の製品が使用されてその廃棄処分が行われる市場、地中貯留層)、および該当する場合には中間プロセスに至るまで、報告企業が CO ₂ 除去の経路全体にわたってトレーサビリティを保持している場合のみ、企業は除去量の算定および報告を行う必要がある。	Traceability	Companies shall account for and report removals only if the reporting company has traceability throughout the full CO ₂ removals pathway, including to the sink (where CO ₂ is transferred from the atmosphere to non-atmospheric pools, e.g., forest where trees are growing or direct air capture facility removing atmospheric CO ₂), to the carbon pools where carbon is stored (e.g., farms where increased soil carbon storage occurs, markets where long-lived products are used and their end-of-life treatment occurs, or geologic reservoirs), and to any intermediate processes, if relevant.
一次データ	企業は、報告企業の事業活動またはバリューチェーンにおいて炭素を貯留している吸収源およびプールに固有の経験的データを用いて炭素ストックのネット変動量を算定する場合に限り、除去量を算定し、報告する必要がある。	Primary data	Companies shall account for and report removals only if the net carbon stock changes are accounted for using empirical data specific to the sinks and pools where carbon is stored in the reporting company's operations or value chain.
不確実性	企業は、統計的に有意な除去量のみを算定・報告し、以下を含む除去量の量的不確実性推定値を提供する必要がある。 1) 除去量の値 2) 指定された信頼度に基づいて除去量の推定を行う不確実性の範囲 3) 選択した値がどのように除去量を過大評価しないかを説明する根拠の説明	Uncertainty	Companies shall only account for and report statistically significant removals and provide quantitative uncertainty estimates for removals including: 1) the removal value, 2) the uncertainty range for the removal estimate based on a specified confidence level, and 3) justification for how the selected value does not overestimate removals.
戻入算定	企業は、過去に報告された除去量の炭素ストックネット損失量を、以下のいずれかとして、発生した年に算定し、報告する必要がある。 • 報告年において炭素プールが GHG インベントリ境界に含まれる場合は CO ₂ ネット排出量、または • 報告年において炭素プールが GHG インベントリ境界に含まれていない場合は戻入。	Reversals accounting	Companies shall account for and report net carbon stock losses of previously reported removals in the year they occur, as either • Net CO ₂ emissions, if carbon pools are part of the GHG inventory boundary in the reporting year, or • Reversals, if carbon pools are no longer in the GHG inventory boundary in the reporting year.

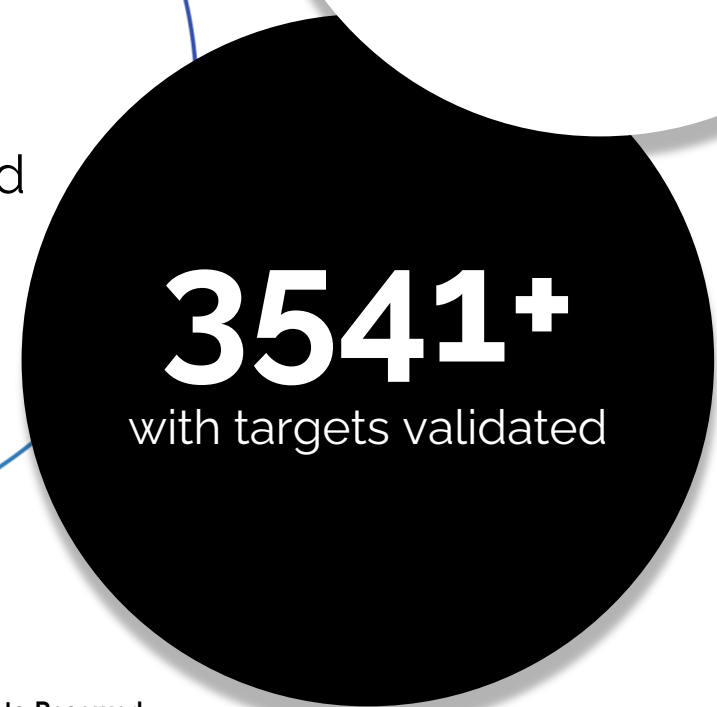
Source: [GHG Protocol, “Land sector and Removals Guidance \(draft\)”](#)

出典: [GHGプロトコル/環境省・みずほリサーチ&テクノロジーズ翻訳, “土地セクター・炭素除去ガイダンス パート1”](#)



SCIENCE
BASED
TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION



FLAG目標を設定しなくてはならない企業

1. 以下のセクターの企業:

- 森林&紙製品
- 食品生産 - 農業生産
- 食品生産 - 動物原料
- 食品・飲料の加工
- 食品・生活必需品の小売業
- タバコ

2. 他のセクターに分類されるが FLAG関連排出量が企業の全体のスコープ 1、2、3 排出量の20%を超える企業.

Who must set FLAG targets?

These sectors:

- Forest & Paper Products
- Food Production - Agricultural Production
- Food Production - Animal Source
- Food & Beverage Processing
- Food & Staples Retailing
- Tobacco

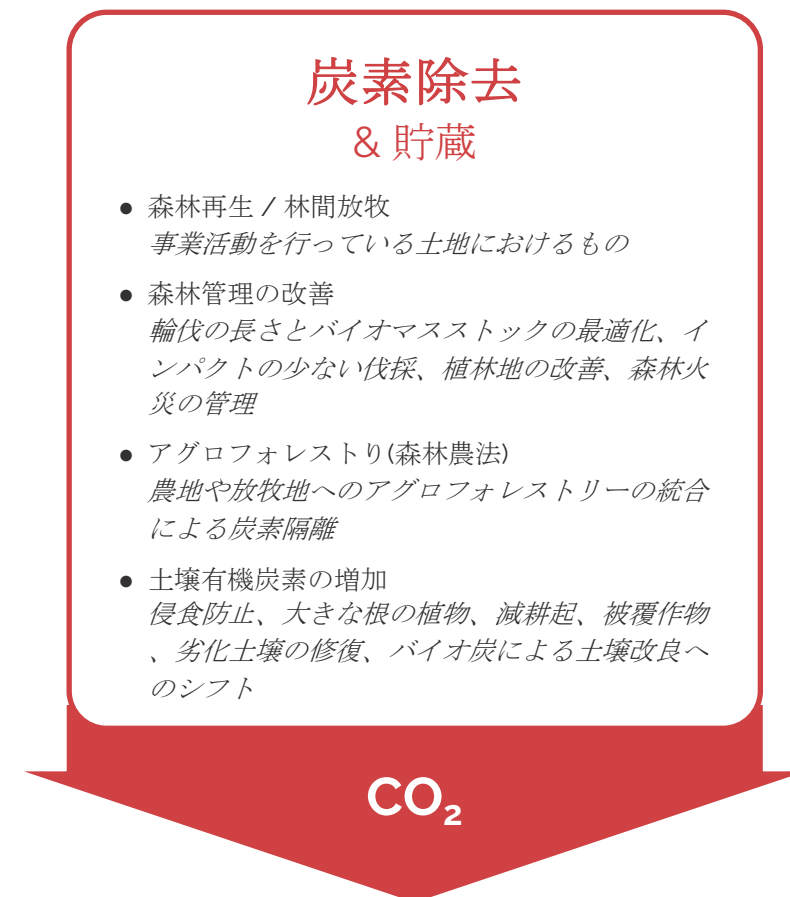
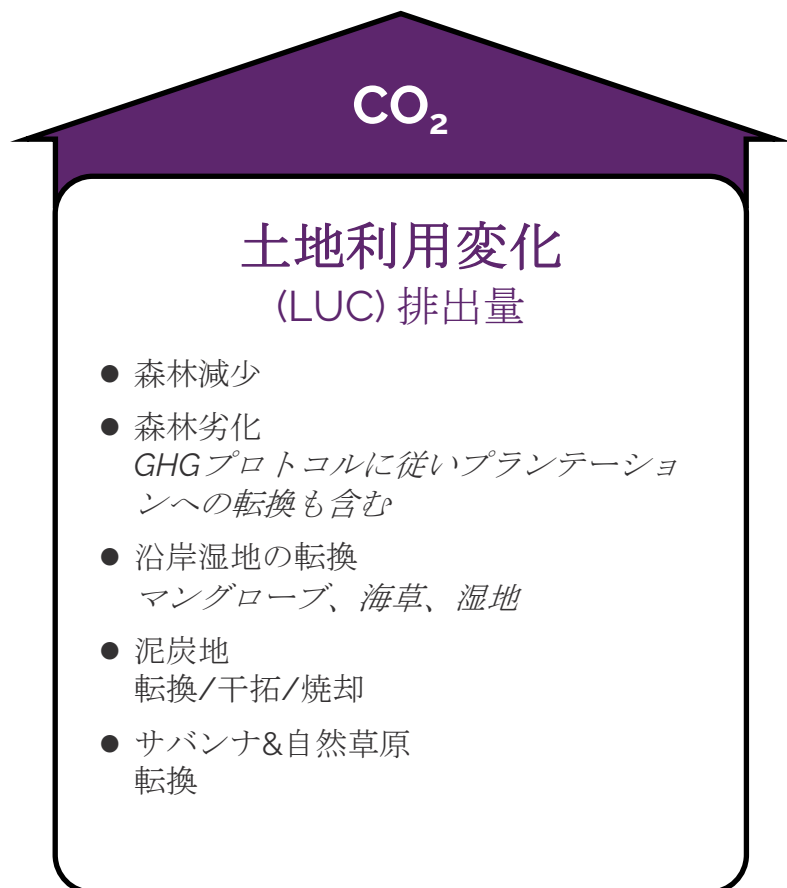
Companies in any other sectors that have FLAG related emissions totaling more than 20% of the company's overall emissions across scopes 1,2 and 3.

上記要件に当てはまらない企業もFLAG目標の設定を推奨している。FLAG目標を設定しない場合、通常のSBT目標に土地関連排出を含めなくてはならない。

SBTi recommend companies outside of condition above to set FLAG targets. If companies choose not to set a FLAG target: FLAG-related emissions must still be included in the overall target boundary and accounted for, together with energy/industry (non-FLAG) targets.

*FLAG: Forestry, land and agriculture

注) 技術的除去は含まれない。
Note) Technological removals are not included.



SBTにおけるバイオエネルギーの扱い/Bioenergy in SBT

■当面、通常SBTにおける現状の扱いを行う。

■バイオエネルギーの燃焼、加工、流通段階、そして原料に関する土地利用からの排出や除去について、インベントリと分けて報告だが、目標に含める。

■Until GHG Protocol publish its guidance, bioenergy will be treated as current non-FLAG SBT criteria.

■Emissions and removals from bioenergy combustion, processing, and distribution stages, as well as land use related to feedstock, will be reported separately from the inventory but included in the target.

*C10 — バイオ(生物起源)エネルギー算定: バイオエネルギーの燃焼、加工、流通段階での CO₂ 排出量、そしてバイオエネルギー原料に関連する土地利用からの排出や除去⁶については、企業の GHG インベントリと分けて報告することが必須です(shall)。さらに、バイオエネルギーの燃焼、加工流通段階での CO₂ 排出量、そしてバイオエネルギー原料に関連する土地利用からの排出や除去については、(スコープ 1, 2、そして/または該当する場合はスコープ 3 について)SBT を設定する際の目標バウンダリ、そして目標の進捗を報告する際のバウンダリに含めることが必須です(shall)。

土地関連排出量の算定については、直接的な土地利用変化 (LUC, land use change) による CO₂ 排出量と、土地利用管理からの N₂O と CH₄ 排出を含む非 LUC 排出を含むことが必須です (shall)。間接的な土地利用変化に関連する排出を含めるかは、任意です。

*C10 – Bioenergy accounting: CO₂ emissions from the combustion, processing and distribution phase of bioenergy – as well as the land use emissions and removals⁵ associated with bioenergy feedstocks – shall be reported alongside a company’s GHG inventory. Furthermore, these emissions shall be included in the target boundary when setting a science-based target (in scopes 1, 2 and/or 3, as required) and when reporting progress against that target.

Land-related emissions accounting shall include CO₂ emissions from direct land use change (LUC) and non-LUC emissions, inclusive of N₂O and CH₄ emissions from land use management. Including emissions associated with indirect LUC is optional.

Companies are expected to adhere to any additional GHG Protocol Guidance on bioenergy accounting when released in order to maintain compliance with criterion 10.

GHG Protocol発行(2024)後、再検討。すでに燃焼だけでなく、土地利用変化や加工・流通の排出量も目標に含めることになっている、
 Revisit after GHG Protocol finalize (2024). The target already includes not only combustion, but also emissions from land use change, processing and distribution.

SBT FLAG目標の特徴 / What SBT FLAG requires?

- 土地利用変化・土地管理による排出量を、シナリオにて定める水準以下に削減するという目標の場合、認定。なお、技術的除去は含まない。FLAG targets will be validated, if the submitted target is to reduce emissions from land use change and land management below the level derived from the scenario (does not include technological removals).
 - シナリオは、「Nature Climate Change」に掲載されたRoe et al. (2019) “Contribution of the Land Sector to a 1.5°C World”論文をベースに設定。Scenario set based on Roe et al. (2019) "Contribution of the Land Sector to a 1.5°C World" paper published in Nature Climate Change.
- 土地関連のスコープ1・2の95%、スコープ3の67%をカバー。Must cover 95% of FLAG scope 1 and 2 emissions, 67% of scope 3 emissions.
- 事業活動に使用している土地が対象。それ以外の土地における除去は考慮できない。Only for the working land. Should not include removals (nor credits) occurred outside the working land.
- 2025年12月以降バリューチェーン全体の「森林減少ゼロ」を約束しなければいけない。Must commit to “no deforestation” starting no later than December 2025.

まとめ

- これまで企業のGHG排出量算定に含まれなかった土地関連排出量について、含まれることになる。 Land emissions must be included in corporate GHG accounting.
- これはスコープ3も含むため、企業の調達責任も問われることになる。（自然林を転換した場合、それによる排出量を20年間計上） It includes scope 3, therefore companies' responsibility for procurement will be incorporated to GHG accountings.
- また、企業の目標設定についても、SBTでは関連企業はFLAG（森林・土地利用・農業）目標の設定が義務付けられる。関連が深くない企業は、通常のSBTに含めて管理する。 In SBT target setting, companies in relevant sector need to set separate FLAG SBT targets. Other companies also need to include FLAG emissions to their GHG inventories and targets.
- 今後、2024年に最終版が出るGHGプロトコル土地セクター除去ガイダンスに基づく報告が進み、またFLAG目標の設定と進捗報告が、ISSBにも含まれていくことが見込まれる。 Reporting based on the GHG Protocol Land Sector Removal Guidance, which will be finalized in 2024, and the establishment of FLAG targets and progress reporting are expected to be included in the ISSB.
- SBT設定を促し、GHGプロトコルに基づく算定報告を広めることが、グリーンウォッシュのない企業を評価する鍵となるだろう。 Encouraging to set SBTs and accounting aligning GHG Protocol will be key to evaluating companies without greenwashing.

參考資料

算定の基本的考え方/Basics of accounting (1/5)

- 従来の排出に加えて、土地関連排出（土地利用変化と土地管理）、地中貯留・生物起源製品貯留・技術ベース製品貯留からのネット（差引後）排出量
- Net emissions from land-related emissions (land use change and land management), geological storage, biogenic product storage, and technology-based product storage, in addition to conventional energy/industry emissions

Sample reporting template (Draft for Pilot Testing and Review, September 2022)
Part 1: Greenhouse gas inventory data

Notes:
Companies only have to report applicable categories
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Detailed category descriptions are hidden in Row 13; unhide to show more detail
Units = metric tonnes CO₂e per year
Refer to *Sample Reporting Template - Part 2* (Word file) for additional descriptive reporting

Reporting categories:

Emissions
Removals
Gross emissions and removals
Land tracking
Reversals

Net emissions/removal = Gross emissions - Gross Removal
(+ for net emissions, - for net removal)
純排出量/除去量 = 総排出量 - 総除去量
(+の場合、純排出、-の場合、純除去)

	純土地排出量 ^{Emissions} 生物起源/技術的, 製品や地中プールからの純排出量						
	Emissions (non-land)	Land emissions (net)			Net emissions of biogenic or TCDR CO ₂ stored in product* or geologic carbon pools		
		Land use change emissions	Land management net CO ₂ emissions	Land management non-CO ₂ emissions	Net CO ₂ emissions from geologic storage	Net CO ₂ emissions from biogenic product storage	Net CO ₂ emissions from TCDR-based product storage
Scope 1: Direct emissions from owned/controlled operations					NA	NA	
Scope 2: Indirect emissions from the use of purchased or acquired electricity, steam, heating, and cooling			NA		NA	NA	
Scope 3: Indirect emissions in the value chain - Upstream							
Category 1: Purchased goods and services					NA	NA	
Category 2: Capital goods					NA	NA	
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)					NA	NA	
Category 4: Upstream transportation and distribution					NA	NA	
Category 5: Waste generated in operations			NA		NA	NA	
Category 6: Business travel					NA	NA	
Category 7: Employee commuting					NA	NA	
Category 8: Upstream leased assets					NA	NA	
Other					NA	NA	
Scope 3: Indirect emissions in the value chain - Downstream							
Category 9: Downstream transportation and distribution					NA	NA	
Category 10: Processing of sold products			NA		NA	NA	
Category 11: Use of sold products					NA	NA	
Category 12: End-of-life treatment of sold products			NA				
Category 13: Downstream leased assets					NA	NA	
Category 14: Franchises					NA	NA	
Category 15: Investments					NA	NA	
Other					NA	NA	

例えば何を含むのか? (1/5)

エネルギー燃焼や産業プロセスからの排出量
emissions from combustion of fossil fuels, and industrial processing

土地利用変化による20年に分配した排出量
Emissions from land use change event, allocated to 20 years.

Reversals

農作物残渣の燃焼、農機具の使用など、土地管理関連のネットでのCO2排出量
Combustion of agricultural residuals, machinery use on farms, etc. (net CO2)

牛のゲップ(メタン)、肥料散布など、土地管理関連のネット非CO2排出量
Enteric emissions, Fertilizer application (net non-CO2)

BECCS*やDACCS**によって隔離したものを地中に入れたものからの漏出等
Net CO2 emissions from geologic storage

木材の燃焼等生物起源製品からのCO2排出
Net CO2 emissions from biogenic product storage

大気から隔離したCO2を使った燃料(合成メタンなど)やCCSによるCO2を隔離したコンクリートからのCO2排出などNet CO2 emissions from biogenic product storage

*BECCS: Bioenergy with Carbon Capture and Storage **DACCS: Direct air capture(DAC) with CCS(carbon capture and storage)

Sample reporting template (Draft for Pilot Testing and Review, September 2022)

Part 1: Greenhouse gas inventory data

Notes:

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Reporting categories should not be summed across columns

Detailed category descriptions are hidden in Row 13; unhide to show more detail

Units = metric tonnes CO₂e per year

Refer to Sample Reporting Template - Part 2 (Word file) for additional descriptive reporting

	Emissions						
	Emissions (non-land)		Land emissions (net)		Net emissions of biogenic product storage or geologic carbon pools		
	Emissions (non-land)	Land use change emissions	Land management net CO ₂ emissions	Land management non-CO ₂ emissions	Net CO ₂ emissions from geologic storage	Net CO ₂ emissions from biogenic product storage	Net CO ₂ emissions from TCDR-based product storage
Scope 1: Direct emissions from owned/controlled operations						NA	NA
Scope 2: Indirect emissions from the use of purchased or acquired electricity, steam, heating, and cooling			NA		NA	NA	NA
Scope 3: Indirect emissions in the value chain - Upstream							
Category 1: Purchased goods and services					NA	NA	NA
Category 2: Capital goods					NA	NA	NA
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)					NA	NA	NA
Category 4: Upstream transportation and distribution					NA	NA	NA
Category 5: Waste generated in operations			NA		NA	NA	NA
Category 6: Business travel					NA	NA	NA
Category 7: Employee commuting					NA	NA	NA
Category 8: Upstream leased assets					NA	NA	NA
Other					NA	NA	NA
Scope 3: Indirect emissions in the value chain - Downstream							
Category 9: Downstream transportation and distribution					NA	NA	NA
Category 10: Processing of sold products			NA		NA	NA	NA
Category 11: Use of sold products					NA	NA	NA
Category 12: End-of-life treatment of sold products					NA	NA	NA
Category 13: Downstream leased assets					NA	NA	NA
Category 14: Franchises					NA	NA	NA
Category 15: Investments					NA	NA	NA
Other					NA	NA	NA

地中炭素プール
Geological carbon pool

土地炭素プール
(Land carbon pool)

製品炭素プール
Product carbon pool

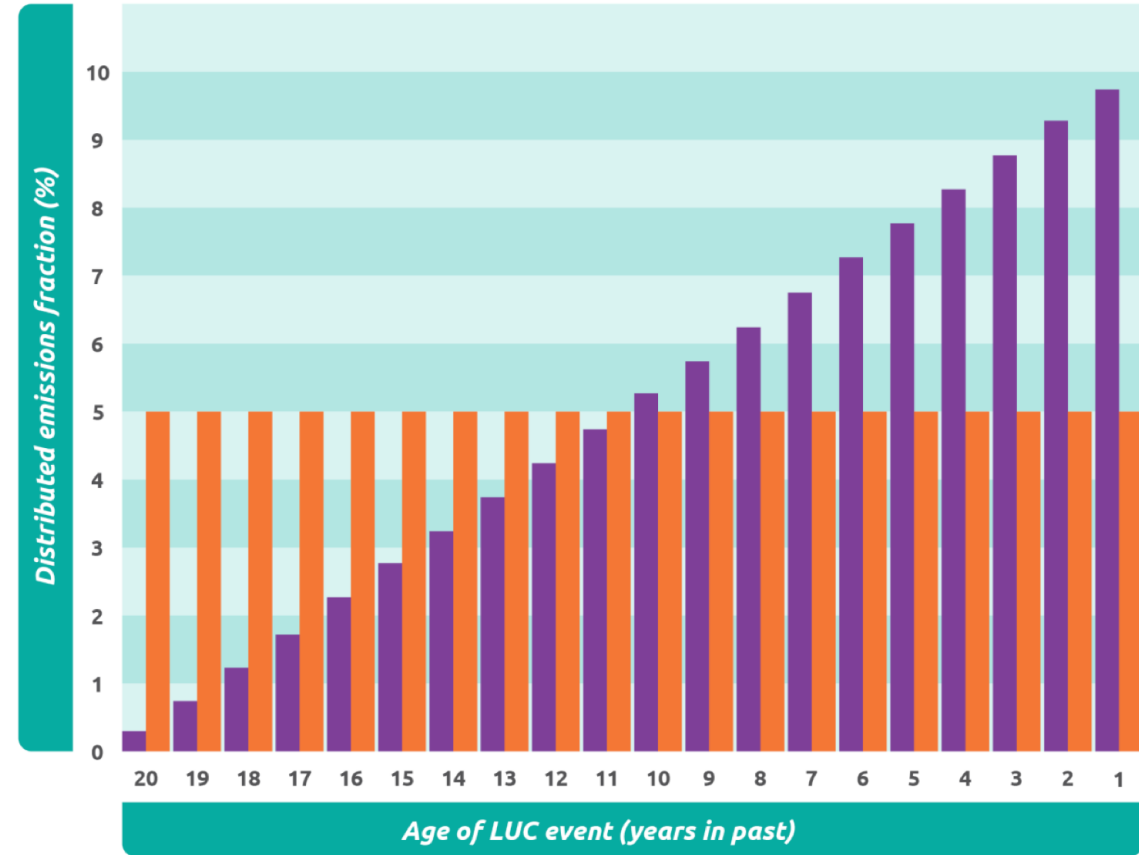
土地利用変化：20年配分して計上/ Land use change: allocated for 20 years from the event

		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 > C	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	Planted Forest	Grassland & Wetland Subcategories	Natural Ecosystem	Intensively Managed Land
	Natural Forest	NF > NF		NF > PF	Natural Ecosystem
Planted Forest	PF > NF	PF > PF	Intensively Managed Land	IML > NE	IML > IML

Key:

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



Key:

- Linear discounting
- Equal discounting

自然林を転換した土地における生産は、スコープ1・3ともに20年間排出量を計上(土地利用変化)

自然林からプランテーションへの転換は排出

算定の基本的考え方/Basics of accounting (2/5)

- ネット（差引後）除去については、任意報告。 Net removals are optional, for land management, geological storage, or product storage
- 土地管理、地中貯留、製品貯留での除去となっている場合、任意で報告。

*BECCS: Bioenergy with Carbon Capture and Storage **DACCS: Direct air capture(DAC) with CCS(carbon capture and storage)

Sample reporting template (Draft for Pilot Testing and Review, September 2022)
 Part 1: Greenhouse gas inventory data

Notes:
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 Units = metric tonnes CO₂e per year
 Refer to Sample Reporting Template - Part 2 (Word file) for additional descriptive reporting

森林や土壌での炭素ストックの純(net)増加。
 Biomass carbon stock increase on forest lands, soil carbon stock increases on croplands

左はBECCS*, 右はDACCS** による除去の純増

左は生物由来製品（木材建築等）にてストックの純増があった場合、右はCCSで隔離した炭素を吸収させたセメントなどの炭素ストック純増

On the left is the case where there is a net increase in stock due to biogenic products (e.g., wood construction), and on the right is the net increase in carbon stock such as cement that has absorbed the carbon sequestered by CCS.

Net emissions/removal = Gross emissions - Gross Removal
 (+ for net emissions, - for net removal)
 純排出量/除去量 = 総排出量 - 総除去量
 (+の場合、純排出、-の場合、純除去)

Scope 1: Direct emissions from owned/controlled operations
Scope 2: Indirect emissions from the use of purchased or acquired electricity, steam, heating, and cooling
Scope 3: Indirect emissions in the value chain - Upstream
Category 1: Purchased goods and services
Category 2: Capital goods
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)
Category 4: Upstream transportation and distribution
Category 5: Waste generated in operations
Category 6: Business travel
Category 7: Employee commuting
Category 8: Upstream leased assets
Other
Scope 3: Indirect emissions in the value chain - Downstream
Category 9: Downstream transportation and distribution
Category 10: Processing of sold products
Category 11: Use of sold products
Category 12: End-of-life treatment of sold products
Category 13: Downstream leased assets
Category 14: Franchises
Category 15: Investments
Other

Removals** (Net)				
Land management and management net removals	Net removals with geologic storage		Net removals with product storage*	
Land management and management net removals	Net biogenic removals with geologic storage	Net technological removals with geologic storage	Net biogenic removals with product storage	Net technological removals with product storage
			NA	NA
NA	NA	NA	NA	NA
	NA	NA	NA	NA
	NA	NA	NA	NA
NA	NA	NA	NA	NA
NA	NA	NA	NA	NA
NA	NA	NA	NA	NA
			NA	NA
			NA	NA
NA	NA	NA	NA	NA
NA	NA	NA	NA	NA
NA	NA	NA	NA	NA
			NA	NA
			NA	NA

地中炭素プール

Geological carbon pool

土地炭素プール
 (Land carbon pool)

製品炭素プール
 Product carbon pool

算定の基本的考え方/Basics of accounting (3/5)

- 間接的土地利用変化による排出量、炭素機会コスト、土地占有面積、のいずれかを報告。Need to track and disclose either of, indirect land use change emissions, carbon opportunity cost, or land occupation.

<i>Sample reporting template (Draft for Pilot Testing and Review, September 2022)</i>			
<i>Part 1: Greenhouse gas inventory data</i>			
<i>Notes:</i>			
Companies only have to report applicable categories			
Reporting categories should not be summed across columns			
Detailed category descriptions are hidden in Row 13; unhide to show more detail			
Units = metric tonnes CO ₂ e per year			
Refer to <i>Sample Reporting Template - Part 2</i> (Word file) for additional descriptive reporting			
	Land Tracking		
	Land tracking metrics		
	Indirect land use change emissions	Carbon opportunity costs	Land occupation
Scope 1: Direct emissions from owned/controlled operations			
Scope 2: Indirect emissions from the use of purchased or acquired electricity, steam, heating, and cooling			
Scope 3: Indirect emissions in the value chain - Upstream			
Category 1: Purchased goods and services			
Category 2: Capital goods			
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)			
Category 4: Upstream transportation and distribution			
Category 5: Waste generated in operations			
Category 6: Business travel			
Category 7: Employee commuting			
Category 8: Upstream leased assets			
Other			
Scope 3: Indirect emissions in the value chain - Downstream			
Category 9: Downstream transportation and distribution			
Category 10: Processing of sold products			
Category 11: Use of sold products			
Category 12: End-of-life treatment of sold products			
Category 13: Downstream leased assets			
Category 14: Franchises			
Category 15: Investments			
Other			

算定の基本的考え方/Basics of accounting (4/5)

■グロス（差引前）の排出と除去の内訳を開示。生物起源製品の燃焼等からの排出、土地関連生物起源CO2の排出と除去、技術的CO2の排出と除去、地中貯溜からの排出量/Report gross emissions and removals

Sample reporting template (Draft for Pilot Testing and Review, September 2022) Part 1: Greenhouse gas inventory data
Notes: Companies only have to report applicable categories Reporting categories should not be summed across columns Detailed category descriptions are hidden in Row 13; unhide to show more detail Units = metric tonnes CO ₂ e per year Refer to <i>Sample Reporting Template - Part 2</i> (Word file) for additional descriptive reporting
Scope 1: Direct emissions from owned/controlled operations
Scope 2: Indirect emissions from the use of purchased or acquired electricity, steam, heating, and cooling
Scope 3: Indirect emissions in the value chain - Upstream
Category 1: Purchased goods and services
Category 2: Capital goods
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)
Category 4: Upstream transportation and distribution
Category 5: Waste generated in operations
Category 6: Business travel
Category 7: Employee commuting
Category 8: Upstream leased assets
Other
Scope 3: Indirect emissions in the value chain - Downstream
Category 9: Downstream transportation and distribution
Category 10: Processing of sold products
Category 11: Use of sold products
Category 12: End-of-life treatment of sold products
Category 13: Downstream leased assets
Category 14: Franchises
Category 15: Investments
Other

Net emissions/removal = Gross emissions – Gross Removal
(+ for net emissions, - for net removal)
純排出量/除去量 = 総排出量 – 総除去量
(+の場合、純排出、-の場合、純除去)

Gross emissions and gross removals					
Gross biogenic product CO ₂ emissions	Gross land biogenic CO ₂ removals and emissions		Gross technological CO ₂ removals and emissions		Gross CO ₂ emissions from geologic storage
Gross biogenic product CO ₂ emissions (e.g. from combustion)	Gross biogenic land CO ₂ emissions**	Gross biogenic land CO ₂ removals**	Gross technological CO ₂ removals**	Gross TCDR-based product CO ₂ emissions	Gross CO ₂ emissions from geologic storage
	NA	NA	NA		NA
					NA
					NA
					NA
	NA	NA			NA
					NA
					NA
					NA
					NA
	NA	NA			NA
					NA
	NA	NA			NA

算定の基本的考え方/Basics of accounting (5/5)

■過去に「除去」と報告をした分で、要件を満たさなくなかった（モニタリングをやめた、等）分について、まだ企業報告範囲内の場合は「排出」に含め、**範囲外となっている場合は「反転」として報告。**

■Removal in previous year, which no longer meet the criteria(such as continuous monitoring) should be reported as removal if it is still in the boundary of the company, otherwise, should be reported as **reversal**.

Sample reporting template (Draft for Pilot Testing and Review, September 2022)
Part 1: Greenhouse gas inventory data

Notes:
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 Refer to *Sample Reporting Template - Part 2* (Word file) for additional descriptive reporting

	Reversals (of previously reported removals)			
	Reversals from land-based storage	Reversals from geologic storage	Reversals from product storage*	
	Reported as reversals if not captured in the emissions inventory because the carbon pools are no longer part of the inventory boundary in the reporting year			
Scope 1: Direct emissions from owned/controlled operations			NA	NA
Scope 2: Indirect emissions from the use of purchased or acquired electricity, steam, heating, and cooling	NA	NA	NA	NA
Scope 3: Indirect emissions in the value chain - Upstream				
Category 1: Purchased goods and services		NA	NA	NA
Category 2: Capital goods		NA	NA	NA
Category 3: Fuel- and energy-related activities (not included in scope 1 or scope 2)			NA	NA
Category 4: Upstream transportation and distribution	NA	NA	NA	NA
Category 5: Waste generated in operations	NA		NA	NA
Category 6: Business travel	NA	NA	NA	NA
Category 7: Employee commuting	NA	NA	NA	NA
Category 8: Upstream leased assets			NA	NA
Other				
Scope 3: Indirect emissions in the value chain - Downstream				
Category 9: Downstream transportation and distribution	NA	NA	NA	NA
Category 10: Processing of sold products	NA	NA	NA	NA
Category 11: Use of sold products		NA		
Category 12: End-of-life treatment of sold products	NA			
Category 13: Downstream leased assets			NA	NA
Category 14: Franchises			NA	NA
Category 15: Investments			NA	NA
Other				

SBT FLAG目標の事例 / FLAG TARGET SETTING EXAMPLES

COMPANY A

FOOD RETAIL COMPANY 食品小売 required to set a FLAG target

- Company A is a large Chinese food retail (**FLAG designated sector**) company that specializes in grocery items and general merchandise. A社は大規模な中国の食品小売企業 (**FLAG 指定セクター**) であり、食料品と日用雑貨を専門に扱っています。

A社はスコープ3FLAG温室効果ガス排出量を2019年比で2027年までに総量で24%削減することを約束します*

Company A commits to reduce absolute scope 3 FLAG GHG emissions by 24% by 2027 from a 2019 base year*.

*目標にはFLAG排出と除去が含まれます。The target includes FLAG emissions and removals.

2019	FLAG MtCO ₂ e	Energy/industry MtCO ₂ e	合計排出量 Total
Scope 1	0	1	1
Scope 2	0	0.015	0.015
Scope 3	20	30	50
合計	20	31.015	51.015

1. Purchased goods and services	20
2. Capital goods	0
3. Fuel and energy-related activities	0
4. Upstream transportation and distribution	0
5. Waste generated in operations	0
6. Business travel	0
7. Employee commuting	0
8. Upstream leased assets	0
9. Downstream transportation and distribution	0
10. Processing of sold products	0
11. Use of sold products	0
12. End of life treatment of sold products	0

SBT FLAG目標の事例 / FLAG TARGET SETTING EXAMPLES

COMPANY B

PALM OIL COMPANY パーム油企業
required to set a FLAG target

- Company B is a large palm oil company (**FLAG designated sector**) based in Indonesia.
- B社は大規模なパーム油製造企業 (**FLAG指定セクター**) であり、インドネシアに本拠地があります。

B社はスコープ1と3のFLAG温室効果ガス排出量を、2020年比で2030年までに総量で16%削減することを約束します。
Company B commits to reduce absolute scope 1 and 3 FLAG GHG emissions by 16 % by 2030 from a 2020 base year.*

*目標にはFLAG排出と除去が含まれます。The target includes FLAG emissions and removals.

2020	FLAG Million tCO ₂ e	Energy / Industry Million tCO ₂ e	Total Emissions
Scope 1	2.1	0.6	2.7
Scope 2*	0	0.010	0.010
Scope 3	0.55	0.23	0.78
Total	2.65	0.61	3.481

FLAG SCOPE 1

- Includes all emissions occurring from the company's oil palm plantations. Most of the company emissions comes from land conversion. ここには当社のアブラヤシプランテーションからの排出を全て含みます。ほとんどの排出は土地転換によるものです。

FLAG SCOPE 3

- Includes all land emissions occurring from external sources (25% of the company's processed fruits come from land partners). 外部からの調達による全ての土地関連排出を含む(この会社の加工果物の25%は土地パートナーから調達しています)。