



## Discussion paper on **Draft sector metrics**

December 2023  
For market consultation and feedback

### **SASB sectors:**

Apparel and textiles (CG.1)  
Construction materials (EM.2)  
Infrastructure (IF.2)  
Real estate (IF.3)

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**F D** Taskforce on Nature-related  
Financial Disclosures



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# Introduction

[The TNFD Recommendations](#) provide companies and financial institutions of all sizes with a risk management and disclosure framework to identify, assess, manage and, where appropriate, disclose nature-related issues. This includes a set of recommended metrics to support organisations' assessment and disclosure of nature-related dependencies, impacts, risks and opportunities.

The Taskforce's approach to metrics is anchored in the principles that metrics should be:

- **Science-based** and provide insights into the consequences of business and finance activities;
- **Be sensitive** enough to reflect change on an annual basis;
- **Relevant** to the business model and value chain of report preparers, recognising that issues within sectors, business models and value chains can vary significantly;
- **Proportionate**, reflecting the practical capacity and cost constraints of report preparers to assemble, assess and report information on an annual reporting cycle;
- **Decision-useful** to the primary users of corporate sustainability reports, offering current insights and comparability within and across sectors;
- **Subjectable to independent limited assurance** in the medium term; and
- **Aligned to global and national policy goals and targets**, such as the indicators and metrics in the Kunming-Montreal Global Biodiversity Framework (GBF) and other international treaties – as organisations are now aligning to the Paris

Agreement and net zero targets with respect to their climate-related corporate disclosures – as well as other standards and target setting frameworks.<sup>1</sup>

The TNFD recognises that the scope, consistency and accessibility of some nature-related data currently available to some market participants means that it is challenging to achieve all these principles simultaneously.<sup>2</sup> To reconcile the large number of indicators associated with nature-related issues, and the needs of market participants for a small set of indicators that can be compared and subjected to third-party assurance on an annual basis as a key requirement for disclosure, the TNFD has adopted a leading indicators approach to measurement.

The TNFD's metrics approach includes different categories of metrics (Figure 1). These include:

- A small set of core metrics – 'core global metrics' that apply to all sectors and 'core sector metrics' for each sector – to be disclosed on a comply or explain basis; and
- A larger set of additional metrics, which are recommended for disclosure, where relevant, to best represent an organisation's material nature-related issues, based on their specific circumstances.

Sector-specific metrics form an important part of this approach. This reflects the diversity of business models across value chains and their interface with nature across and within sectors. Sector-specific metrics help financial institutions to compare organisations within the same sector, which often face similar nature-related issues.

1 Including the GBF, ISSB IFRS-S1 and S2 standards; TCFD; Carbon Disclosure Standards Board (CDSB) and Sustainability Accounting Standards Board (SASB); GRI, CDP and the European Financial Reporting Advisory Group (EFRAG); and corporate target setting methods developed by the Science Based Targets Network (SBTN).

2 Taskforce on Nature-related Financial Disclosures (2022) [A landscape assessment of nature-related data and analytics availability](#).

For the sectors shown in Figure 2, this discussion paper presents:

- Proposed guidance on how to apply the TNFD core global disclosure metrics in each sector, where relevant;
- Proposed core sector disclosure metrics: Organisations in these sectors would be expected to disclose these metrics on a comply or explain basis once they are finalised in 2024 and incorporated into TNFD additional guidance; and
- Proposed additional sector disclosure metrics: Metrics that an organisation may use, where relevant, to best represent its material nature-related issues, based on its specific circumstances.

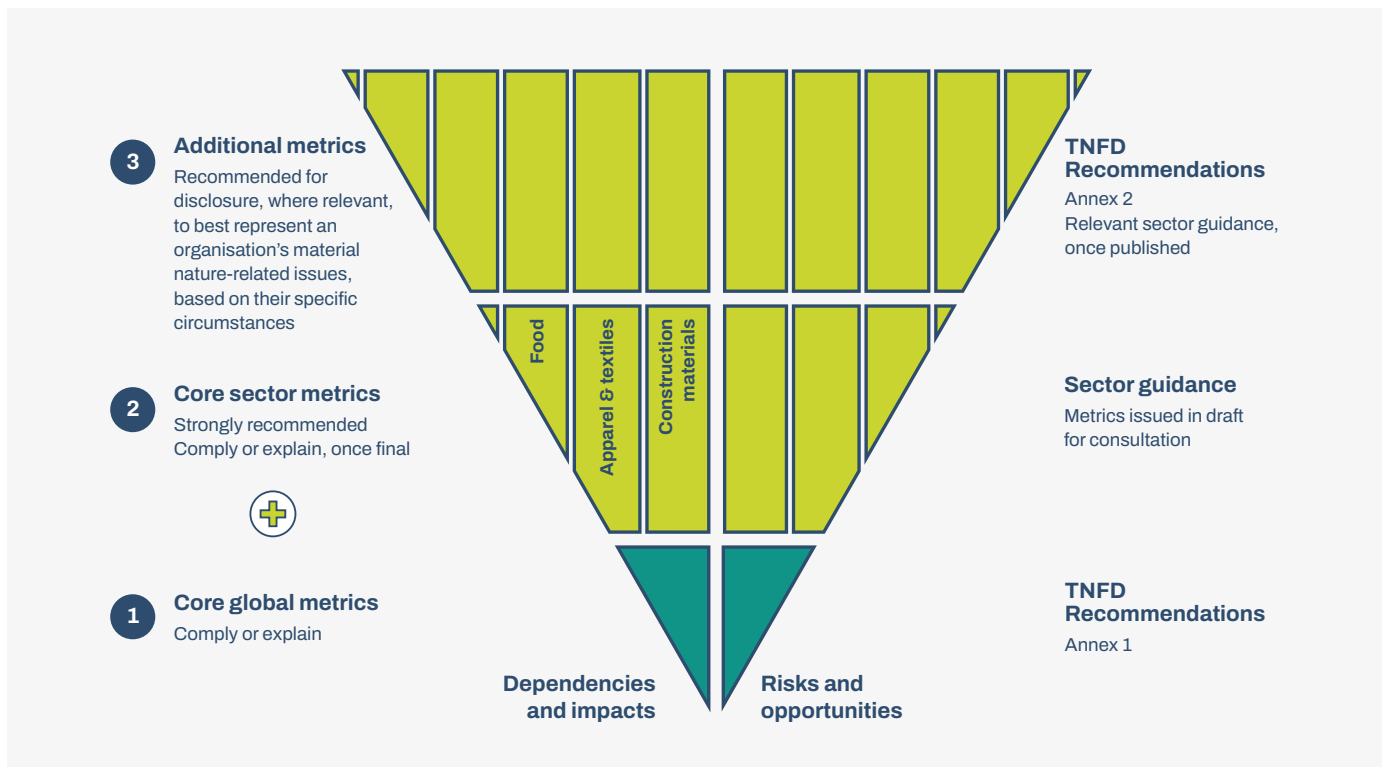
The proposed metrics and guidance have been developed in consultation with key stakeholders, including market participants, industry associations and knowledge partners. They have been structured around SASB’s Sustainable Industry Classification System and

draw on sector metrics previously developed by GRI, SASB and others.

Through this discussion paper, the TNFD aims to gather feedback on this guidance and metrics in order to assist organisations in specific sectors to make disclosures in line with the [TNFD Recommendations](#). Proposed disclosure metrics for financial institutions are detailed separately in the [Additional Guidance for Financial Institutions](#), as part of guidance on the financial institution-specific context for the recommended disclosures.

This document is a revision of the discussion paper on sector metrics published in September 2023. The proposed metrics for most of the sectors covered in that document are now available in the respective [draft sector guidance documents](#). The proposed metrics for the remaining sectors are presented here for market consultation and feedback.

**Figure 1: The TNFD metrics architecture**







## Open for consultation

The TNFD welcomes feedback from market participants and other stakeholders on the proposed approach to sector metrics outlined in this discussion paper and in the [Additional Guidance for Financial Institutions](#). The Taskforce will continue its open innovation approach to finalise its sector metrics and sector guidance, which will include TNFD Forum member briefings and consultation workshops. Details on consultation activities will be shared with Forum members and on the TNFD website. Comments can be provided to the Taskforce through its website until **Friday 29 March 2024**.

The Taskforce plans to expand its coverage to other sectors that have been identified as having significant dependencies and impacts on nature (Figure 2). Organisations in sectors not yet covered can seek guidance from industry best practice and guidance from organisations such as GRI or SASB.

Further details on the TNFD metrics architecture and the core global disclosure metrics can be found in Section 4 and Annex 1 of the [TNFD Recommendations](#).

### Box 1: Feedback questions on sector metrics

The Taskforce welcomes feedback on the following questions:

- How can the draft guidance to support application of the core global metrics in each sector be improved, in line with the principles above? Is any further additional guidance required? What should it cover?
- Are the proposed core sector metrics meaningful and decision-useful for report users?
- Are the proposed core sector metrics proportionate, reflecting the capacity and cost constraints of report preparers?
- What other sector metrics should be considered by the Taskforce? Should they be core or additional?
- What other, if any, positive impact metrics and opportunity metrics are relevant in each sector?
- What data and assurance issues or challenges should the Taskforce consider in relation to the metrics proposed?

**Further questions at an individual sector level are provided at the start of some sections of this document.**





# Draft sector metrics

For market consultation and feedback – December 2023



Taskforce on Nature-related Financial Disclosures

Figure 2: Coverage of the TNFD sector guidance, based on SASB’s SICs classification

- Sectors with proposed metrics in this discussion paper
- See [TNFD Additional Guidance for Financial Institutions](#)
- Other TNFD priority sectors
- [Draft metrics published in additional draft sector guidance](#)

Consumer goods	Extractives & minerals processing	Financials	Food & beverage	Health care	Infrastructure	Renewable resources & alternative energy	Resource transformation	Services	Technology & communications	Transportation
<b>Apparel &amp; textiles</b>	<b>Coal</b>	<b>Capital markets</b>	<b>Food</b>	<b>Biotechnology &amp; pharmaceuticals</b>	<b>Utilities</b>	<b>Alternative energy</b>	<b>Industrials</b>	<b>Media</b>	<b>Technology</b>	<b>Air transportation</b>
Apparel, accessories & footwear	<a href="#">Coal operations</a>	Asset management & custody activities	<a href="#">Agricultural products</a>	<a href="#">Biotechnology &amp; pharmaceuticals</a>	<a href="#">Electric utilities &amp; power generators</a>	Biofuels	Aerospace & defence	Advertising & marketing	Electronic manufacturing services & original design manufacturing	Airlines
<b>Consumer discretionary products</b>	<b>Construction materials</b>	Investment banking & brokerage	<a href="#">Meat, poultry &amp; dairy</a> <a href="#">Aquaculture</a>	<b>Health care retail</b>	Gas utilities & distributors	Fuel cells & industrial batteries	Containers & packaging	Media & entertainment	Hardware	Air freight & logistics
Appliance manufacturing	Construction materials	Security & commodity exchanges	<a href="#">Processed foods</a>	Drug retailers	Water utilities & services	Solar technology & project developers	Electrical & electronic equipment	<b>Hospitality &amp; recreation</b>	Software & IT services	<b>Automobiles</b>
Building products & furnishings	<b>Metals &amp; mining</b>	<b>Corporate &amp; retail banking</b>	<b>Beverages</b>	<b>Health care providers</b>	<b>Infrastructure</b>	Wind technology & project developers	Industrial machinery & goods	Casinos & gaming	<b>Internet media &amp; services</b>	Automobiles
Household & personal products	<a href="#">Iron &amp; steel producers</a>	Commercial banks	Alcoholic beverages	Health care delivery	Engineering & construction services	<b>Forestry &amp; paper</b>	<b>Chemicals</b>	Hotels & lodging	Internet media & services	Auto parts
Toys & sporting goods	<a href="#">Metals &amp; mining</a>	Consumer finance	Non-alcoholic beverages	Health care distributors	<b>Real estate</b>	<a href="#">Forestry management</a>	<a href="#">Chemicals</a>	Leisure facilities	<b>Semiconductors</b>	Car rental & leasing
<b>Consumer goods retail</b>	<b>Oil &amp; gas</b>	Mortgage finance	<b>Food &amp; beverage retail</b>	Managed care	Home builders	<a href="#">Pulp &amp; paper products</a>		<b>Consumer services</b>	Semiconductors	<b>Marine transportation</b>
Multiline and speciality retailers & distributors	<a href="#">Oil &amp; gas – exploration &amp; production</a>	<b>Insurance</b>	<a href="#">Food retailers &amp; distributors</a>	<b>Medical technology</b>	Real estate			Education	<b>Telecommunications</b>	Cruise lines
E-commerce	<a href="#">Oil &amp; gas – midstream</a>	Insurance	<b>Restaurants</b>	Medical equipment & supplies	Real estate services			Professional & commercial services	Telecommunication services	Marine transportation
	<a href="#">Oil &amp; gas – refining and marketing</a>		<a href="#">Restaurants</a>		<b>Waste management</b>					<b>Land transportation</b>
	<a href="#">Oil &amp; gas – services</a>		<b>Tobacco</b>		Waste management					Rail transportation
			Tobacco							Road transportation



# Consumer goods

## Apparel & textiles

The value chain components for Apparel & textiles are categorised by tier. Tier 0 corresponds to direct operations, and Tiers 1-4 correspond to different levels of upstream components. For tiering definitions, see World Research Institute (2021) [Roadmap to Net Zero: Delivering Science-Based Targets in the Apparel Sector](#).

Organisations should refer to Annex 1 of the [TNFD Recommendations](#) for further information on the core global disclosure metrics.

### Proposed guidance on the application of the core global disclosure metrics

Apparel & textiles				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
<b>Driver of nature change: Climate change</b>				
	GHG emissions	Refer to IFRS S2 Climate-related Disclosure Standard.	No further guidance.	
<b>Driver of nature change: Land/freshwater/ocean-use change</b>				
C1.0	Total spatial footprint	Total spatial footprint (km <sup>2</sup> ) (sum of): <ul style="list-style-type: none"> <li>Total surface area controlled/ managed by the organisation, where the organisation has control (km<sup>2</sup>);</li> <li>Total disturbed area (km<sup>2</sup>); and</li> <li>Total rehabilitated/restored area (km<sup>2</sup>).</li> </ul>	No further guidance.	



Apparel & textiles				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C1.1	Extent of land/freshwater/ocean-use change	Extent of land/freshwater/ocean ecosystem use change (km <sup>2</sup> ) by: <ul style="list-style-type: none"> <li>Type of ecosystem;<sup>3</sup> and</li> <li>Type of business activity.</li> </ul>	<b>Tier 4, Upstream</b>  Land-use change to report under the core global disclosure metric should include: <ul style="list-style-type: none"> <li>Agriculture-driven terrestrial natural ecosystem conversion since 2020,<sup>4</sup> including, at least, conversion of primary forests, other naturally regenerating (second-growth) forests and freshwater natural ecosystems, linked to land owned, leased operated, financed or sourced from.</li> </ul>	Refer to Food and agriculture metrics
		Extent of land/freshwater/ocean ecosystem conserved or restored (km <sup>2</sup> ), split into: <ul style="list-style-type: none"> <li>Voluntary; and</li> <li>Required by statutes or regulations.</li> </ul>	<b>Tier 4, Upstream</b>  The extent conserved or restored under the core global disclosure metric should include: <ul style="list-style-type: none"> <li>Area reforested in direct operations or in the supply chain of the corporation; and</li> <li>Area of wetlands rewetted in direct operations or supply chain of the corporation.</li> </ul>	Refer to Food and agriculture metrics
		Extent of land/freshwater/ocean ecosystem that is sustainably managed (km <sup>2</sup> ) by: <ul style="list-style-type: none"> <li>Type of ecosystem;<sup>5</sup> and</li> <li>Type of business activity.</li> </ul>	No further guidance.	

3 When disclosing on ecosystem types, refer to the International Union for Conservation of Nature [Global Ecosystem Typology](#).

4 Or other regional or sectoral cutoff dates.

5 When disclosing on ecosystem types, refer to the International Union for Conservation of Nature [Global Ecosystem Typology](#).





Apparel & textiles				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
<b>Driver of nature change: Pollution/pollution removal</b>				
C2.0	Pollutants released to soil split by type	Pollutants released to soil (tonnes) by type, referring to sector-specific guidance on types of pollutants	<p><b>Tier 4, Upstream</b></p> <p>Pollutants to report under the core global disclosure metric should include:</p> <ul style="list-style-type: none"> <li>• Pesticides used by toxicity hazard level (either extremely hazardous, highly hazardous, moderately hazardous, slightly hazardous, or unlikely to present an acute hazard) against baseline.</li> <li>• Nitrogen balance:               <ul style="list-style-type: none"> <li>• Nitrogen input from livestock manure and fertilisers; and</li> <li>• Nitrogen output.</li> </ul> </li> <li>• Phosphorus balance:               <ul style="list-style-type: none"> <li>• Phosphorus input; and</li> <li>• Phosphorus output.<sup>6</sup></li> </ul> </li> <li>• If relevant, balances for potassium and other nutrients (e.g. micronutrients).</li> </ul>	Refer to Food and agriculture metrics

<sup>6</sup> To calculate the nutrient balance minus nutrient inputs with outputs. A negative value indicates risk of soil fertility degradation and a positive value signals pollution risk.



Apparel & textiles				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C2.1	Wastewater discharged	<p>Volume of water discharged (m<sup>3</sup>), split into:</p> <ul style="list-style-type: none"> <li>• Total;</li> <li>• Freshwater; and</li> <li>• Other.<sup>7</sup></li> </ul> <p>Including:</p> <ul style="list-style-type: none"> <li>• Concentrations of key pollutants in the wastewater discharged, by type of pollutant, referring to sector-specific guidance for types of pollutants; and</li> <li>• Temperature of water discharged, where relevant.</li> </ul>	<p><b>Tier 0, Direct operations</b></p> <p>Pollutants to report under the core global disclosure metric should include:</p> <ul style="list-style-type: none"> <li>• Nutrients (nitrogen and phosphorus);</li> <li>• Pesticides;</li> <li>• Organic loading (including crop and livestock excreta);</li> <li>• Allergenic dyes;</li> <li>• Pathogens;</li> <li>• Metals; and</li> <li>• Other and emerging pollutants (including antimicrobials and other veterinary medicines).</li> </ul>	Adapted from TNFD Food and agriculture metrics, FAIRR Index, FAO (2017)

<sup>7</sup> Freshwater: (≤1,000 mg/L Total Dissolved Solids). Other: (>1,000 mg/L Total Dissolved Solids). Reference: GRI (2018) [GRI 303-4 Water discharge](#).



Apparel & textiles				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C2.2	Waste generation and disposal	<p>Weight of hazardous and non-hazardous waste generated by type (tonnes), referring to sector-specific guidance for types of waste.</p> <p>Weight of hazardous and non-hazardous waste (tonnes) disposed of, split into:</p> <ul style="list-style-type: none"> <li>• Waste incinerated (with and without energy recovery);</li> <li>• Waste sent to landfill; and</li> <li>• Other disposal methods.</li> </ul> <p>Weight of hazardous and non-hazardous waste (tonnes) diverted from landfill, split into waste:</p> <ul style="list-style-type: none"> <li>• Reused;</li> <li>• Recycled; and</li> <li>• Other recovery operations.</li> </ul>	<p><b>Tier 0, Direct operations</b></p> <p>In reporting the core global disclosure metric, an organisation should include:</p> <ul style="list-style-type: none"> <li>• Weight and percentage of apparel products and fabric waste by type in the company's direct operations, disaggregated by destination (e.g. landfill or incineration).</li> </ul> <p>In reporting the core global disclosure metric, an organisation should:</p> <ul style="list-style-type: none"> <li>• Refer to the Sustainable Apparel Coalition's Higg Facility Environmental Module (FEM) for types of production hazardous waste (e.g. empty chemical drums and containers, expired/used/unused chemicals).</li> </ul>	Sustainable Apparel Coalition (2022)
C2.3	Plastic pollution	<p>Plastic footprint as measured by total weight (tonnes) of plastics (polymers, durable goods and packaging) used or sold broken down into the raw material content.<sup>8</sup></p> <p>For plastic packaging, percentage of plastics that is:</p> <ul style="list-style-type: none"> <li>• Re-usable;</li> <li>• Compostable;</li> <li>• Technically recyclable; and</li> <li>• Recyclable in practice and at scale.</li> </ul>	<p><b>Tier 0, Direct operations</b></p> <p>In reporting the core global disclosure metric, an organisation should include:</p> <ul style="list-style-type: none"> <li>• Total weight of plastic material (primary, secondary and tertiary) used for textile products.</li> </ul>	TNFD

<sup>8</sup> Raw material content: % of virgin fossil-fuel feedstock; % of post-consumer recycled feedstock; % of post-industrial recycled feedstock; % of virgin renewable feedstock.

Apparel & textiles				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C2.4	Non-GHG air pollutants	<p>Non-GHG air pollutants (tonnes) by type:</p> <ul style="list-style-type: none"> <li>• Particulate matter (PM<sub>2.5</sub> and/or PM<sub>10</sub>);</li> <li>• Nitrogen oxides (NO<sub>2</sub>, NO and NO<sub>3</sub>);</li> <li>• Volatile organic compounds (VOC or NMVOC);</li> <li>• Sulphur oxides (SO<sub>2</sub>, SO, SO<sub>3</sub>, SO<sub>x</sub>); and</li> <li>• Ammonia (NH<sub>3</sub>).</li> </ul>	<p><b>Tier 0, Direct operations</b></p> <p>In determining additional pollutants to report under the core global disclosure metric, an organisation should refer to the Sustainable Apparel Coalition's Higg Facility Environmental Module (FEM)'s Air Emissions 2022.</p>	SASB and Sustainable Apparel Coalition (2022)
Driver of nature change: Resource use/replenishment				
C3.0	Water withdrawal and consumption from areas of water scarcity	Water withdrawal and consumption <sup>9</sup> (m <sup>3</sup> ) from areas of water scarcity, including identification of water source. <sup>10</sup>	No further guidance.	
C3.1	Quantity of high-risk natural commodities sourced from land/ocean/freshwater	Quantity of high-risk natural commodities <sup>11</sup> (tonnes) sourced from land/ocean/freshwater, split into types, including proportion of total natural commodities.	No further guidance.	

9 Water consumption is equal to water withdrawal less water discharge. Reference: GRI (2018) [GRI 303-5](#).

10 Surface water; groundwater; seawater; produced water; third-party water. Reference: GRI (2018) [GRI 303-3](#).

11 Users should refer to the Science Based Targets Network (SBTN) High Impact Commodity List (HICL) and indicate what proportion of these commodities represent threatened and CITES listed species.

Apparel & textiles				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C3.1	Quantity of high-risk natural commodities sourced from land/ocean/freshwater	Quantity of high-risk natural commodities <sup>12</sup> (tonnes) sourced under a sustainable management plan or certification programme, including proportion of total high-risk natural commodities.	<p><b>Tier 4, Upstream</b></p> <p>In reporting the core global disclosure metric, an organisation should include:</p> <ul style="list-style-type: none"> <li>Natural fibre or raw material products on the SBTN High Impact Commodity List (i.e. cotton, leather, wool) certified to a relevant third-party environmental, social, and/or animal welfare standard such as Textile Exchange’s Responsible Wool Standard (RWS), Responsible Down Standard (RDS), Responsible Mohair Standard (RMS), or Responsible Alpaca Standard (RAS).</li> </ul> <p>The organisation should specify which certification applies and the percentages of certified fibres or raw materials by category.</p>	Adapted from SASB textile
Driver of nature change: Invasive alien species and other				
C4.0	Placeholder indicator: Measures against unintentional introduction of invasive alien species (IAS) <sup>13</sup>	Proportion of high-risk activities operated under appropriate measures to prevent unintentional introduction of IAS, or low-risk designed activities.	No further guidance.	

<sup>12</sup> Users should refer to the Science Based Targets Network (SBTN) High Impact Commodity List (HICL) and indicate what proportion of these commodities represent threatened and CITES listed species.

<sup>13</sup> Due to the measurement of levels of invasive species for organisations being a developing area, the chosen indicator focuses on whether an appropriate management response is in place for the organisation. The additional sets of metrics contain measurement of the level of invasive species within an area. The TNFD intends to do further work with experts to define ‘high-risk activities’ and ‘low-risk designed activities’.





Apparel & textiles				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
State of nature				
C5.0	Placeholder indicator: Ecosystem condition	<p>For those organisations that choose to report on state of nature metrics, the TNFD encourages them to report the following indicators, and to refer to the <a href="#">TNFD additional guidance on measurement of the state of nature in Annex 2 of the LEAP approach</a>:</p> <ul style="list-style-type: none"> <li>Level of ecosystem condition by type of ecosystem and business activity;</li> <li>Impacts on mean species extinction risk.</li> </ul> <p>There are a number of different measurement options for these indicators. The TNFD does not currently specify one metric as there is no single metric that will capture all relevant dimensions of changes to the state of nature and a consensus is still developing.</p> <p>The TNFD will continue to work with knowledge partners to increase alignment.</p>	No further guidance.	
	Placeholder indicator: Species extinction risk		No further guidance.	



**Proposed core sector disclosure indicators and metrics – Apparel & textiles**

Metric category	Metric subcategory	Indicator	Proposed core sector disclosure indicator or metric	Source
Impact driver	Land/freshwater/ocean-use change	Extent of land/freshwater/ocean-use change	<b>Tier 4, Upstream</b>  Percentage of production volume from land owned, leased, managed or sourced from determined to be deforestation-free, by product.	Refer to Food and agriculture metrics
			<b>Tier 4, Upstream</b>  Percentage of land managed or sourced from that deploys practices with measurable regenerative or sustainable outcomes. An organisation should describe and disclose the definition of regenerative or sustainable agriculture used for disclosure. <sup>14</sup>	Refer to Food and agriculture metrics
		Management of chemicals	<b>Tier 0–4, Upstream and direct operations</b>  Percentage of chemical products used in facilities that are certified by the Zero Discharge of Hazardous Chemicals Manufacturing Restricted Substances List (ZDHC MRSL) or equivalent relevant program such as 4S CHEM (CHEM 4sustainability protocol).	Adapted from SASB CG-AA-250a.1
	Resource use/replenishment	Quantity of high-risk natural commodities sourced from land/ocean/freshwater	<b>Tier 4, Upstream</b>  Percentage of natural fibre or raw material products produced or sourced from regions with high or extremely high baseline water stress.	Adapted from SASB textile

<sup>14</sup> The measures start when a baseline has been undertaken for the corporation to track regeneration of environmental assets against, as disclosure data for the metric.

**Proposed additional sector disclosure indicators and metrics – Apparel & textiles**

Metric category	Metric subcategory	Indicator	Proposed additional sector disclosure indicator or metric	Source
Impact driver	Pollution/pollution removal	Waste	Percentage of unsold apparel products in all selling points that are recycled or given away (%).	TNFD
		Plastic pollution	Total weight of plastics (tonnes) commonly classified as problematic (PS, PVC, EPC, multilayer plastic packaging, undetectable carbon black).	TNFD
Response	Dependency, impact, risk and opportunity management	Dependency, impact, risk and opportunity assessment	Company's fibre and raw material product composition (tonnes) and the share (%) of priority material (e.g. cotton, leather, wool, polyester), indicating whether each is from recycled sources.	Textile Exchange Corporate Benchmark
		Voluntary conservation, restoration and regeneration	Area (km <sup>2</sup> ) of land used (for agriculture, grazing and/ or forestry) that employs regenerative practices with measurable regenerative outcomes, referencing the definition used (e.g. from OP2B or Textile Exchange).	Related to GBF target 10
State of nature	Ecosystem extent and condition	Ecosystem condition	Concentration of key pollutants around key water basins in which the company is operating, by type (m <sup>3</sup> or equivalent): nutrients (nitrogen and phosphorus levels), pesticides, organic loading (including crop and livestock excreta), pathogens, metals, other and emerging pollutants (including antibiotics and other veterinary medicines).	Adapted from FAIRR (2022), FAO (2017)

# Extractives & minerals processing

## Construction materials

The TNFD recognises the important contributions from this sector to habitat fragmentation and noise pollution. The TNFD encourages organisations to measure these impact drivers and would welcome feedback on industry best practices. In particular:

- How can metrics like the [Singapore Index](#) be applied in a corporate reporting context in this sector?
- How do organisations in this sector currently measure noise pollution? At what times of day? Is pitch also monitored?

- What noise metrics would be most appropriate to understand the impact of human noise generation on nature?

Organisations should refer to Annex 1 of the [TNFD Recommendations](#) for further information on the core global disclosure metrics.

### Proposed guidance on the application of the core global disclosure metrics

Construction materials				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
<b>Driver of nature change: Climate change</b>				
	GHG emissions	Refer to IFRS S2 Climate-related Disclosure Standard.	No further guidance.	
<b>Driver of nature change: Land/freshwater/ocean-use change</b>				
C1.0	Total spatial footprint	Total spatial footprint (km <sup>2</sup> ) (sum of): <ul style="list-style-type: none"> <li>• Total surface area controlled/managed by the organisation, where the organisation has control (km<sup>2</sup>);</li> <li>• Total disturbed area (km<sup>2</sup>); and</li> <li>• Total rehabilitated/restored area (km<sup>2</sup>).</li> </ul>	The land footprint under the core global disclosure metric should include land owned, leased or managed in the exploration, development and production, or quarry/mine closure, and post-closure project phases.	GRI 304-1



Construction materials				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C1.1	Extent of land/freshwater/ocean-use change	Extent of land/freshwater/ocean ecosystem use change (km <sup>2</sup> ) by: <ul style="list-style-type: none"> <li>• Type of ecosystem;<sup>15</sup> and</li> <li>• Type of business activity.</li> </ul>	In reporting the core global disclosure metric, land-use change should cover the gross area disturbed in the reporting period. This includes land in the exploration, development and production, or quarry/mine closure, and post-closure project phases.	SASB (2019) EM-CM-160a.2; GRI 304-3
		Extent of land/freshwater/ocean ecosystem conserved or restored (km <sup>2</sup> ), split into: <ul style="list-style-type: none"> <li>• Voluntary; and</li> <li>• Required by statutes or regulations.</li> </ul>	The extent conserved or restored reported under the core global disclosure metric should include only activity within the value chain.	TNFD
		Extent of land/freshwater/ocean ecosystem that is sustainably managed (km <sup>2</sup> ) by: <ul style="list-style-type: none"> <li>• Type of ecosystem;<sup>16</sup> and</li> <li>• Type of business activity.</li> </ul>	No further guidance.	

15 When disclosing on ecosystem types, refer to the International Union for Conservation of Nature [Global Ecosystem Typology](#).

16 When disclosing on ecosystem types, refer to the International Union for Conservation of Nature [Global Ecosystem Typology](#).





Construction materials				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
<b>Driver of nature change: Pollution/pollution removal</b>				
C2.0	Pollutants released to soil split by type	Pollutants released to soil (tonnes) by type, referring to sector-specific guidance on types of pollutants.	No further guidance.	TNFD
C2.1	Wastewater discharged	<p>Volume of water discharged (m<sup>3</sup>), split into:</p> <ul style="list-style-type: none"> <li>• Total;</li> <li>• Freshwater; and</li> <li>• Other.<sup>17</sup></li> </ul> <p>Including:</p> <ul style="list-style-type: none"> <li>• Concentrations of key pollutants in the wastewater discharged, by type of pollutant, referring to sector-specific guidance for types of pollutants; and</li> <li>• Temperature of water discharged, where relevant.</li> </ul>	<p>Reporting of water discharged under the core global disclosure metric should additionally be broken down by destination:</p> <ul style="list-style-type: none"> <li>• Surface water;</li> <li>• Groundwater;</li> <li>• Seawater; and</li> <li>• Third-party water, and the volume of this total sent for use to other organisations.</li> </ul> <p>Pollutants and water quality metrics to report under the core global disclosure metric include:</p> <ul style="list-style-type: none"> <li>• pH;</li> <li>• TSS (Total Suspended Solids);</li> <li>• TDS (Total Dissolved Solids);</li> <li>• Mercury;</li> <li>• TPH (Total Petroleum Hydrocarbons);</li> <li>• BOD (Biochemical Oxygen Demand);</li> <li>• Dissolved solids; and</li> <li>• Suspended solids.</li> </ul>	GRI 303-4; ENCORE

<sup>17</sup> Freshwater: (≤1,000 mg/L Total Dissolved Solids). Other: (>1,000 mg/L Total Dissolved Solids). Reference: GRI (2018) [GRI 303-4 Water discharge](#).

Construction materials				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C2.2	Waste generation and disposal	<p>Weight of hazardous and non-hazardous waste generated by type (tonnes), referring to sector-specific guidance for types of waste.</p> <p>Weight of hazardous and non-hazardous waste (tonnes) disposed of, split into:</p> <ul style="list-style-type: none"> <li>• Waste incinerated (with and without energy recovery);</li> <li>• Waste sent to landfill; and</li> <li>• Other disposal methods.</li> </ul> <p>Weight of hazardous and non-hazardous waste (tonnes) diverted from landfill, split into waste:</p> <ul style="list-style-type: none"> <li>• Reused;</li> <li>• Recycled; and</li> <li>• Other recovery operations.</li> </ul>	<p>Types of waste to report under the core global disclosure metric include:</p> <ul style="list-style-type: none"> <li>• Slags, dusts, sludges, used oil, other solid waste that meet the TNFD definition of waste.</li> </ul>	<p>SASB (2018) construction materials: EM-CM-150a.1</p> <p>GRI (2022) GRI Standards Glossary</p>
C2.3	Plastic pollution	<p>Plastic footprint as measured by total weight (tonnes) of plastics (polymers, durable goods and packaging) used or sold broken down into the raw material content.<sup>18</sup></p> <p>For plastic packaging, percentage of plastics that is:</p> <ul style="list-style-type: none"> <li>• Re-usable;</li> <li>• Compostable;</li> <li>• Technically recyclable; and</li> <li>• Recyclable in practice and at scale.</li> </ul>	No further guidance.	

<sup>18</sup> Raw material content: % of virgin fossil-fuel feedstock; % of post-consumer recycled feedstock; % of post-industrial recycled feedstock; % of virgin renewable feedstock.



Construction materials				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C2.4	Non-GHG air pollutants	<p>Non-GHG air pollutants (tonnes) by type:</p> <ul style="list-style-type: none"> <li>• Particulate matter (PM<sub>2.5</sub> and/or PM<sub>10</sub>);</li> <li>• Nitrogen oxides (NO<sub>2</sub>, NO and NO<sub>x</sub>);</li> <li>• Volatile organic compounds (VOC or NMVOC);</li> <li>• Sulphur oxides (SO<sub>2</sub>, SO, SO<sub>3</sub>, SO<sub>x</sub>); and</li> <li>• Ammonia (NH<sub>3</sub>).</li> </ul>	<p>Additional pollutants to report under the core global disclosure metric include:</p> <ul style="list-style-type: none"> <li>• Carbon monoxide (CO);</li> <li>• Dioxins/furans, including but not limited to the sum of the 17 congeners of polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) that contain chlorine; and</li> <li>• Heavy metals (includes mercury (Hg), cadmium (Cd), thallium (Tl), antimony (Sb), arsenic (As), lead (Pb), chromium (Cr), cobalt (Co), copper (Cu), manganese (Mn), nickel (Ni) and vanadium (V).</li> </ul>	TNFD





Construction materials				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
<b>Driver of nature change: Resource use/replenishment</b>				
C3.0	Water withdrawal and consumption from areas of water scarcity	Water withdrawal and consumption <sup>19</sup> (m <sup>3</sup> ) from areas of water scarcity, including identification of water source. <sup>20</sup>	<p>In reporting the core global disclosure metric, an organisation should include:</p> <ul style="list-style-type: none"> <li>• Total freshwater (<math>\leq 1000</math> mg/l of Total Dissolved Solids) withdrawal, including from natural open sources such as rivers, lakes, natural ponds, streams, creeks; from groundwater (wells, boreholes, water below soil surface); from municipal and/or from third parties; from quarry dewatering used in operations;</li> <li>• Total non-freshwater (<math>&gt; 1000</math> mg/l of Total Dissolved Solids) withdrawal, including from sources of high salinity or pollutants; and</li> <li>• Harvested rainwater: Volume of precipitation (rainwater or snowmelt) that is collected onsite (e.g. settling ponds, inactive quarry area that has not yet reached the groundwater table).</li> </ul> <p>Water from quarry dewatering that is not used should be reported separately.</p> <p>An organisation should differentiate withdrawal from groundwater sources that are recharged and non-recharged.</p>	<p>GCCA (2019)</p> <p>GRI-303-4</p> <p>GRI-G4 Construction &amp; Real Estate Disclosures EN8-EN9</p> <p>SASB Real Estate IF-RE-140a.1., IF-RE-140a.2., IF-RE-140a.3. Recharged groundwater from GRI, as above</p>

19 Water consumption is equal to water withdrawal less water discharge. Reference: GRI (2018) [GRI 303-5](#).

20 Surface water; groundwater; seawater; produced water; third-party water. Reference: GRI (2018) [GRI 303-3](#).



<b>Construction materials</b>				
<b>Metric no.</b>	<b>Core global indicator</b>	<b>Core global metric</b>	<b>Proposed guidance for this sector</b>	<b>Source</b>
C3.1	Quantity of high-risk natural commodities sourced from land/ocean/freshwater	Quantity of high-risk natural commodities <sup>21</sup> (tonnes) sourced from land/ocean/freshwater, split into types, including proportion of total natural commodities.	Commodities to report under the core global disclosure metric include: limestone chalk marl, silica correctives, alumina and ferrous, natural gypsum, pozzolan, primary aggregates, sand, and coal.	TNFD; GRI-G4 Real Estate & Construction, G4-EN1; SBTN High Impact Commodity list
		Quantity of high-risk natural commodities <sup>22</sup> (tonnes) sourced under a sustainable management plan or certification programme, including proportion of total high-risk natural commodities.		
<b>Driver of nature change: Invasive alien species and other</b>				
C4.0	Placeholder indicator: Measures against unintentional introduction of invasive alien species (IAS) <sup>23</sup>	Proportion of high-risk activities operated under appropriate measures to prevent unintentional introduction of IAS, or low-risk designed activities.	No further guidance.	TNFD; GRI-G4 Real Estate & Construction, G4-EN1; SBTN High Impact Commodity list

21 Users should refer to the Science Based Targets Network (SBTN) High Impact Commodity List (HICL) and indicate what proportion of these commodities represent threatened and CITES listed species.

22 Users should refer to the Science Based Targets Network (SBTN) High Impact Commodity List (HICL) and indicate what proportion of these commodities represent threatened and CITES listed species.

23 Due to the measurement of levels of invasive species for organisations being a developing area, the chosen indicator focuses on whether an appropriate management response is in place for the organisation. The additional sets of metrics contain measurement of the level of invasive species within an area. The TNFD intends to do further work with experts to define 'high-risk activities' and 'low-risk designed activities'.





Construction materials				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
State of nature				
C5.0	Placeholder indicator: Ecosystem condition	<p>For those organisations that choose to report on state of nature metrics, the TNFD encourages them to report the following indicators, and to refer to the <a href="#">TNFD additional guidance on measurement of the state of nature in Annex 2 of the LEAP approach</a>:</p> <ul style="list-style-type: none"> <li>• Level of ecosystem condition by type of ecosystem and business activity;</li> <li>• Species extinction risk.</li> </ul>	No further guidance.	
	Placeholder indicator: Species extinction risk	<p>There are a number of different measurement options for these indicators. The TNFD does not currently specify one metric as there is no single metric that will capture all relevant dimensions of changes to the state of nature and a consensus is still developing.</p> <p>The TNFD will continue to work with knowledge partners to increase alignment.</p>		



**Proposed core sector disclosure indicators and metrics – Construction materials**

Metric category	Metric subcategory	Indicator	Proposed core sector disclosure indicator or metric	Source
Impact driver	Pollution/pollution removal	Spills	Volume of spills of diesel, paints, solvents and toxic chemicals (m <sup>3</sup> ), by national or company spill classification scheme and by type of ecosystem affected.	GRI 303-4; ENCORE



**Proposed additional sector disclosure indicators and metrics – Construction materials**

Metric category	Metric subcategory	Indicator	Proposed additional sector disclosure indicator or metric	Source
Impact driver	Pollution/ pollution removal	Disturbances	Average light pollution levels, measured, for example by: <ul style="list-style-type: none"> <li>Night sky light pollution levels on the Sky Quality Meter (SQM) Scale or Bortle scale;</li> <li>Percentage of light fixtures that fully cut-off or fully shielded or below 60W; or</li> <li>Outdoor lighting (lumen/ha).</li> </ul>	IUCN (2023) Urban Nature Indexes
Response	Dependency, impact, risk and opportunity management	General	Proportion of materials used that are recycled and reused input materials by significant categories of raw materials, renewable materials and manufactured products (%);  or  Share of total mass of materials, products and components/systems for the new build/refurbishment/fit-out that have been reused, repurposed or remanufactured, either from the building undergoing demolition, refurbishment, fit-out or from other buildings, third parties etc. (%).	GRI: G4-EN2 Percentage of materials used that are recycled input materials  UK Green Building Council (2023)
Response	Dependency, impact, risk and opportunity management	General	Total volume of water volume that has been sustainably supplied, purified and/or conserved in the same watershed where the freshwater was withdrawn. This includes volume of water from watershed protection and restoration projects, from water access and sanitation to community projects and from water efficient agriculture and water efficient irrigation practices.	TNFD



# Infrastructure

## Infrastructure; Real estate

The TNFD recognises the important contributions from this sector to habitat fragmentation and noise pollution. The TNFD encourages organisations to measure these impact drivers and would welcome feedback on industry best practices. In particular:

- How can metrics like the [Singapore Index](#) be applied to a corporate reporting context in this sector?

- How do organisations in this sector currently measure noise pollution? At what times of day? Is pitch also monitored?
- What noise metrics would be most appropriate to understand the impact of human noise generation on nature?

Organisations should refer to Annex 1 of the [TNFD Recommendations](#) for further information on the core global disclosure metrics.

### Proposed guidance on the application of the core global disclosure metrics

Engineering & construction services; Home builders; Real estate; Real estate services				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
<b>Driver of nature change: Climate change</b>				
	GHG emissions	Refer to IFRS S2 Climate-related Disclosure Standard.	No further guidance.	
<b>Driver of nature change: Land/freshwater/ocean-use change</b>				
C1.0	Total spatial footprint	Total spatial footprint (km <sup>2</sup> ) (sum of): <ul style="list-style-type: none"> <li>• Total surface area controlled/ managed by the organisation, where the organisation has control (km<sup>2</sup>);</li> <li>• Total disturbed area (km<sup>2</sup>); and</li> <li>• Total rehabilitated/restored area (km<sup>2</sup>).</li> </ul>	<b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b>  The land footprint under the core global disclosure metric should include land owned, leased or managed.	GRI 304-1

Engineering & construction services; Home builders; Real estate; Real estate services				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C1.1	Extent of land/freshwater/ocean-use change	Extent of land/freshwater/ocean ecosystem use change (km <sup>2</sup> ) by: <ul style="list-style-type: none"> <li>Type of ecosystem;<sup>24</sup> and</li> <li>Type of business activity.</li> </ul>	<p><b>Engineering &amp; construction services; Home builders</b></p> <p>Land-use change reported under the core global disclosure metric should distinguish land-use changes by original land uses: brownfield sites, undeveloped land, farmland, wetland etc.</p> <p><b>Real estate; Real estate services</b></p> <p>No further guidance.</p>	<p>SASB (2019) EM-CM-160a.2; GRI 304-3</p> <p>Land-use change – Adapted from SITES v2 Rating System for Sustainable Land Design and Development</p>
		Extent of land/freshwater/ocean ecosystem conserved or restored (km <sup>2</sup> ), split into: <ul style="list-style-type: none"> <li>Voluntary; and</li> <li>Required by statutes or regulations.</li> </ul>	<p><b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b></p> <p>The extent conserved or restored under the core global disclosure metric should include only activity within the value chain.</p>	<p>TNFD</p>
		Extent of land/freshwater/ocean ecosystem that is sustainably managed (km <sup>2</sup> ) by: <ul style="list-style-type: none"> <li>Type of ecosystem;<sup>25</sup> and</li> <li>Type of business activity.</li> </ul>	<p><b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b></p> <p>No further guidance.</p>	

<sup>24</sup> When disclosing on ecosystem types, refer to the International Union for Conservation of Nature [Global Ecosystem Typology](#).

<sup>25</sup> When disclosing on ecosystem types, refer to the International Union for Conservation of Nature [Global Ecosystem Typology](#).



Engineering & construction services; Home builders; Real estate; Real estate services				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
<b>Driver of nature change: Pollution/pollution removal</b>				
C2.0	Pollutants released to soil split by type	Pollutants released to soil (tonnes) by type, referring to sector-specific guidance on types of pollutants	<p><b>Engineering &amp; construction services; Home builders</b></p> <p>No further guidance.</p> <p><b>Real estate; Real estate services</b></p> <p>Pollutants to report under the core global disclosure metric include:</p> <ul style="list-style-type: none"> <li>• Volume of pesticides used by toxicity hazard level (either extremely hazardous, highly hazardous, moderately hazardous, slightly hazardous, or unlikely to present an acute hazard) against baseline;</li> <li>• Chemical nitrogen fertilisers input by source (tonnes of nitrogen);</li> <li>• Mineral phosphorus fertilisers input by source (tonnes of phosphorus); and</li> <li>• Total manure and compost input.</li> </ul>	TNFD; WHO (2019)





Engineering & construction services; Home builders; Real estate; Real estate services				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C2.1	Wastewater discharged	<p>Volume of water discharged (m<sup>3</sup>), split into:</p> <ul style="list-style-type: none"> <li>• Total;</li> <li>• Freshwater; and</li> <li>• Other.<sup>26</sup></li> </ul> <p>Including:</p> <ul style="list-style-type: none"> <li>• Concentrations of key pollutants in the wastewater discharged, by type of pollutant, referring to sector-specific guidance for types of pollutants; and</li> <li>• Temperature of water discharged, where relevant.</li> </ul>	<p><b>Engineering &amp; construction services; Home builders</b></p> <p>Reporting of water discharged under the core global disclosure metric should additionally be broken down by destination:</p> <ul style="list-style-type: none"> <li>• Surface water;</li> <li>• Groundwater;</li> <li>• Seawater; and</li> <li>• Third-party water, and the volume of this total sent for use to other organisations.</li> </ul> <p><b>Real estate; Real estate services</b></p> <p>Reporting of water discharged under the core global disclosure metric should additionally be broken down by destination:</p> <ul style="list-style-type: none"> <li>• Surface water;</li> <li>• Groundwater;</li> <li>• Seawater; and</li> <li>• Third-party water, and the volume of this total sent for use to other organisations.</li> </ul> <p>Pollutants to report under the core global disclosure metric include:</p> <ul style="list-style-type: none"> <li>• Dissolved solids; and</li> <li>• Suspended solids.</li> </ul>	GRI 303-4; ENCORE

<sup>26</sup> Freshwater: (≤1,000 mg/L Total Dissolved Solids). Other: (>1,000 mg/L Total Dissolved Solids). Reference: GRI (2018) GRI 303-4 Water discharge.



Engineering & construction services; Home builders; Real estate; Real estate services				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C2.2	Waste generation and disposal	<p>Weight of hazardous and non-hazardous waste generated by type (tonnes), referring to sector-specific guidance for types of waste.</p> <p>Weight of hazardous and non-hazardous waste (tonnes) disposed of, split into:</p> <ul style="list-style-type: none"> <li>• Waste incinerated (with and without energy recovery);</li> <li>• Waste sent to landfill; and</li> <li>• Other disposal methods.</li> </ul> <p>Weight of hazardous and non-hazardous waste (tonnes) diverted from landfill, split into waste:</p> <ul style="list-style-type: none"> <li>• Reused;</li> <li>• Recycled; and</li> <li>• Other recovery operations.</li> </ul>	<p><b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b></p> <p>Types of waste to report under the core global disclosure metric include:</p> <ul style="list-style-type: none"> <li>• Slags, dusts, sludges, used oil, other solid waste that meet the TNFD definition of waste.</li> </ul>	<p>SASB (2018) construction materials: EM-CM-150a.1</p> <p>GRI (2022) GRI Standards Glossary</p>





<b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b>				
<b>Metric no.</b>	<b>Core global indicator</b>	<b>Core global metric</b>	<b>Proposed guidance for this sector</b>	<b>Source</b>
C2.3	Plastic pollution	<p>Plastic footprint as measured by total weight (tonnes) of plastics (polymers, durable goods and packaging) used or sold broken down into the raw material content.<sup>27</sup></p> <p>For plastic packaging, percentage of plastics that is:</p> <ul style="list-style-type: none"> <li>• Re-usable;</li> <li>• Compostable;</li> <li>• Technically recyclable; and</li> <li>• Recyclable in practice and at scale.</li> </ul>	<p><b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b></p> <p>No further guidance.</p>	
C2.4	Non-GHG air pollutants	<p>Non-GHG air pollutants (tonnes) by type:</p> <ul style="list-style-type: none"> <li>• Particulate matter (PM<sub>2.5</sub> and/or PM<sub>10</sub>);</li> <li>• Nitrogen oxides (NO<sub>2</sub>, NO and NO<sub>3</sub>);</li> <li>• Volatile organic compounds (VOC or NMVOC);</li> <li>• Sulphur oxides (SO<sub>2</sub>, SO, SO<sub>3</sub>, SO<sub>x</sub>); and</li> <li>• Ammonia (NH<sub>3</sub>).</li> </ul>	<p><b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b></p> <p>No further guidance.</p>	

<sup>27</sup> Raw material content: % of virgin fossil-fuel feedstock; % of post-consumer recycled feedstock; % of post-industrial recycled feedstock; % of virgin renewable feedstock.



Engineering & construction services; Home builders; Real estate; Real estate services				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
<b>Driver of nature change: Resource use/replenishment</b>				
C3.0	Water withdrawal and consumption from areas of water scarcity	Water withdrawal and consumption <sup>28</sup> (m <sup>3</sup> ) from areas of water scarcity, including identification of water source. <sup>29</sup>	<p><b>Engineering &amp; construction services; Home builders</b></p> <p>In reporting the core global metric, an organisation should include:</p> <ul style="list-style-type: none"> <li>• Known or metered water withdrawal and consumption in addition to listing non-metered sources (e.g. seepage of ground water in tunnels); and</li> <li>• Water withdrawal from: greywater, blackwater, treated wastewater, desalination plants and other water sources, as well as total water withdrawal and consumption.</li> </ul> <p>This should cover all water purchased and sourced but may include itemisation of water allocated to other parties as the end user. The organisation should differentiate between water withdrawal from groundwater sources that are recharged and non-recharged.</p>	<p>GRI-303-4</p> <p>GRI-G4 Construction &amp; Real Estate Disclosures EN8-EN9</p> <p>SASB Real Estate IF-RE-140a.1., IF-RE-140a.2., IF-RE-140a.3. Recharged groundwater from GRI, as above</p>

28 Water consumption is equal to water withdrawal less water discharge. Reference: GRI (2018) [GRI 303-5](#).

29 Surface water; groundwater; seawater; produced water; third-party water. Reference: GRI (2018) [GRI 303-3](#).



Engineering & construction services; Home builders; Real estate; Real estate services				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
			<p><b>Real estate; Real estate services</b></p> <p>In reporting the core global metric, an organisation should include:</p> <ul style="list-style-type: none"> <li>• The share of total floor area for which water withdrawal data have been obtained;</li> <li>• Water withdrawal by portfolio area with data covered; and</li> <li>• Water withdrawal from: greywater, blackwater, treated waste water, desalination plants and other water sources, as well as total water withdrawal and consumption.</li> </ul> <p>This should cover all water purchased and sourced, but may include itemisation of water allocated to other parties as the end user. The organisation should differentiate between water withdrawal from groundwater sources that are recharged and non-recharged.</p>	



Engineering & construction services; Home builders; Real estate; Real estate services				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
C3.1	Quantity of high-risk natural commodities sourced from land/ocean/freshwater	Quantity of high-risk natural commodities <sup>30</sup> (tonnes) sourced from land/ocean/freshwater, split into types, including proportion of total natural commodities.	<p><b>Engineering &amp; construction services; Home builders</b></p> <p>Commodities to report under the core global disclosure metric include:</p> <ul style="list-style-type: none"> <li>Natural commodities: aluminium, copper, gypsum, iron, lead, sand and timber; and</li> <li>Manufactured commodities: brick, cement, concrete, carpet, glass, insulation products, rubber and steel.</li> </ul> <p><b>Real estate; Real estate services</b></p> <ul style="list-style-type: none"> <li>No further guidance.</li> </ul>	GRI-G4 Real Estate & Construction G4-EN1, SBTN High Impact Commodity list
		Quantity of high-risk natural commodities <sup>31</sup> (tonnes) sourced under a sustainable management plan or certification programme, including proportion of total high-risk natural commodities.		
Driver of nature change: Invasive alien species and other				
C4.0	Placeholder indicator: Measures against unintentional introduction of invasive alien species (IAS) <sup>32</sup>	Proportion of high-risk activities operated under appropriate measures to prevent unintentional introduction of IAS, or low-risk designed activities.	<p><b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b></p> <p>No further guidance.</p>	

30 Users should refer to the Science Based Targets Network (SBTN) High Impact Commodity List (HICL) and indicate what proportion of these commodities represent threatened and CITES listed species.

31 Users should refer to the Science Based Targets Network (SBTN) High Impact Commodity List (HICL) and indicate what proportion of these commodities represent threatened and CITES listed species.

32 Due to the measurement of levels of invasive species for organisations being a developing area, the chosen indicator focuses on whether an appropriate management response is in place for the organisation. The additional sets of metrics contain measurement of the level of invasive species within an area. The TNFD intends to do further work with experts to define 'high-risk activities' and 'low-risk designed activities'.





Engineering & construction services; Home builders; Real estate; Real estate services				
Metric no.	Core global indicator	Core global metric	Proposed guidance for this sector	Source
<b>State of nature</b>				
C5.0	Placeholder indicator: Ecosystem condition	For those organisations that choose to report on state of nature metrics, the TNFD encourages them to report the following indicators, and to refer to the <a href="#">TNFD additional guidance on measurement of the state of nature in Annex 2 of the LEAP approach</a> :	<b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b>  No further guidance.	
	Placeholder indicator: Species extinction risk	<ul style="list-style-type: none"> <li>Level of ecosystem condition by type of ecosystem and business activity;</li> <li>Species extinction risk.</li> </ul> <p>There are a number of different measurement options for these indicators. The TNFD does not currently specify one metric as there is no single metric that will capture all relevant dimensions of changes to the state of nature and a consensus is still developing.</p> <p>The TNFD will continue to work with knowledge partners to increase alignment.</p>	<b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b>  No further guidance.	



**Proposed core sector disclosure indicators and metrics –  
Engineering & construction services; Home builders; Real estate; Real estate services**

Metric category	Metric subcategory	Indicator	Proposed core sector disclosure indicator or metric	Source
Impact driver	Land/ freshwater/ ocean-use change	Change to connectivity	<b>Engineering &amp; construction services</b>  Length (km) of linear infrastructure (e.g. rail, road, fencing) built outside urban areas by type, width (e.g. number of lanes or tracks; metres) and surfacing.	TNFD
Impact driver			<b>Engineering &amp; construction services</b>  Number of fragmentation mitigation measures (e.g. animal crossing points) constructed for linear infrastructure (count).	TNFD
Impact driver	Pollution/ pollution removal	Spills of pollutants	<b>Engineering &amp; construction services; Home builders</b>  Volume of spills of diesel, paints, solvents, and toxic chemicals (m <sup>3</sup> ), by national or company spill classification scheme and by type of ecosystem affected.	GRI 303-4; ENCORE
Impact driver	Resource use/ replenishment	Quantity of high- risk natural commodities sourced from land/ocean/ freshwater	<b>Engineering &amp; construction services; Home builders</b>  Percentage of timber procured that is from threatened species.	Based on SITES v2 Rating System for Sustainable Land Design and Development, 5.1



**Proposed additional sector disclosure indicators and metrics –  
Engineering & construction services; Home builders; Real estate; Real estate services**

Sector	Metric category	Metric subcategory	Indicator	Proposed additional sector disclosure indicator or metric	Source
<b>Engineering &amp; construction services; Home builders</b>	Impact driver	Land/ freshwater/ ocean-use change	Land-use change	Soil erosion on sites (m <sup>3</sup> ), measured as the average change in soil depth, multiplied by the area under management.	TNFD
<b>Engineering &amp; construction services; Home builders</b>	Impact driver	Land/ freshwater/ ocean-use change	Land-use change	Area of soil restored to a minimum depth of 30.48 cm following disturbance by construction activities (m <sup>2</sup> ).	SITES Rating system 7.3 and 7.4
<b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b>	Impact driver	Pollution/ pollution removal	Disturbances	Average light pollution levels, measured, for example, by: <ul style="list-style-type: none"> <li>Night sky light pollution levels on the Sky Quality Meter (SQM) Scale or Bortle scale;</li> <li>Percentage of light fixtures that fully cut-off or fully shielded or below 60W; or</li> <li>Outdoor lighting (lumen/ha).</li> </ul>	IUCN (2023) Urban Nature Indexes
<b>Engineering &amp; construction services; Home builders; Real estate; Real estate services</b>	Impact driver	Invasive species and other	Biological alterations	Area of land owned, controlled, managed or leased cleared of invasive species during reporting period (km <sup>2</sup> ).	TNFD



Sector	Metric category	Metric subcategory	Indicator	Proposed additional sector disclosure indicator or metric	Source
<b>Engineering &amp; construction services; Home builders; Real estate; Real estate service</b>	State of nature	Ecosystem extent and condition	Urban green space created.	<p>Potential measures could include:</p> <ul style="list-style-type: none"> <li>• Green plot ratio;</li> <li>• Urban greening factor;</li> <li>• Area of tree planting (m<sup>2</sup>);</li> <li>• Area of a building on which plants are planted (m<sup>2</sup>);</li> <li>• Share of area above threshold for normalised difference vegetation index; and</li> <li>• Number of areas of sections of planted trees of more than 100m<sup>2</sup> created.</li> </ul>	Ong (2003); The Ecology Consultancy (2017); IUCN Urban Nature Indexes; HTT Tokyo Green Building Program for New Buildings
<b>Engineering &amp; construction services; Home builders; Real estate; Real estate service</b>	Response	Dependency, impact, risk and opportunity management	General	<p>Proportion of materials used that are recycled and reused input materials by significant categories of raw materials, renewable materials and manufactured products (%);</p> <p>or</p> <p>Share of total mass of materials, products and components/systems for the new build/refurbishment/fit-out that have been reused, repurposed or remanufactured, either from the building undergoing demolition, refurbishment, fit-out or from other buildings, third parties etc. (%).</p>	GRI: G4-EN2; UK Green Building Council (2023)

# Glossary

Term	Definition
<b>Deforestation</b>	<p>The conversion of forest to other land use independently of whether human-induced or not.</p> <p>Explanatory notes:</p> <ol style="list-style-type: none"> <li>1. Includes permanent reduction of the tree canopy cover below the minimum 10% threshold.</li> <li>2. Includes areas of forest converted to agriculture, pasture, water reservoirs, mining and urban areas.</li> <li>3. The term specifically excludes areas where the trees have been removed as a result of harvesting or logging, and where the forest is expected to regenerate naturally or with the aid of silvicultural measures.</li> <li>4. The term also includes areas where, for example, the impact of disturbance, overutilisation or changing environmental conditions affects the forest to an extent that it cannot sustain a canopy cover above the 10% threshold.</li> <li>5. The concept of long-term is central to this definition and is defined as ten years.</li> <li>6. Note that to determine whether the removal of trees from an area is classed as deforestation, it is necessary to predict the future development of the area. If new forest trees are established in the near future, the land is classified as forest throughout the regeneration period. This regrowth is considered ‘reforestation’ and the full process ‘conversion’. If, on the other hand, a sufficient density of trees is not established in the near future, or if land is converted to other land use, the area should be considered deforested.</li> </ol> <p>Food and Agriculture Organization (2020) <a href="#">Forest Resources Assessment Terms and Definitions</a>, Food and Agriculture Organization (2000) <a href="#">Forest Resources Assessment Definitions of Forest Change Processes</a>.</p>

Term	Definition
<p><b>Deforestation-free / No deforestation</b></p>	<p>Commodity production, sourcing or financial investments that do not cause or contribute to deforestation (as defined by the Accountability Framework).</p> <ul style="list-style-type: none"> <li>No-deforestation refers to no gross deforestation of natural forests, which the Accountability Framework specifies as the appropriate policy and goal on this topic for companies and supply chains.</li> <li>In the context of the Accountability Framework, deforestation refers to the loss of natural forest (see definition of deforestation).</li> <li>The AFi recognises the High Carbon Stock Approach (HCSA) as a practical tool to implement no-deforestation in the tropics, in contexts where the tool has been validated.*</li> <li>The terms ‘no-deforestation’ and ‘deforestation-free’ are used in favour of ‘zero deforestation’ because ‘zero’ can imply an absolutist approach that may be at odds with the need sometimes to accommodate minimal levels of conversion at the site level in the interest of facilitating optimal conservation and production outcomes (see definition for minimal level of deforestation or conversion).</li> </ul> <p>Accountability Framework Initiative (2020) <a href="#">Terms and Definitions</a>.</p>
<p><b>Forest</b></p>	<p>Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10%, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.</p> <p>Food and Agriculture Organization (2020) <a href="#">Forest Resources Assessment – Terms and Definitions</a>.</p>
<p><b>Highly hazardous pesticides</b></p>	<p>Pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or GHS or their listing in relevant binding international agreements or conventions. In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be highly hazardous and treated as such.</p> <p>Food and Agriculture Organization and World Health Organisation (2016) <a href="#">International Code of Conduct on Pesticide Management: Guidelines on highly hazardous pesticide</a>.</p> <p>For toxicity hazard classification refer to the World Health Organization (2019) <a href="#">The WHO Recommended Classification of Pesticides by Hazard and guidelines to classification</a>.</p>





Term	Definition
<b>Load</b>	<p>The rate at which a pollutant such as nutrients is delivered to a receiving water, specified in units of mass per time (e.g. kg P/day).</p> <p>Science Based Target Network (2023) <a href="#">SBTN Glossary of Terms</a>.</p>
<b>Medically important antimicrobials</b>	<p>Antimicrobial classes used in human medicine, and therefore listed on the WHO CIA List where they are categorised according to specified criteria, as “important”, “highly important” or “critically important” for human medicine.</p> <p>Categorisation criteria, definitions for the categories and a complete list of medically important antimicrobials are available on the WHO website.</p> <p>World Health Organisation (2017) <a href="#">WHO Guidelines on Use of Medically Important Antimicrobials in Food-Producing Animals</a>.</p>
<b>Nitrogen use efficiency (NUE)</b>	<p>The ratio between the amount of fertiliser (nitrogen) applied and the amount of nitrogen removed with the harvest (OECD). Note that NUE is not easily comparable across regions and the scale (temporal and spatial) at which NUE analysis is carried out should be specified.</p> <p>OECD (2010) <a href="#">Nitrogen Use Efficiency as an Agro-Environmental Indicator</a>.</p>
<b>Nutrient balance</b>	<p>The nutrient balance is defined as the difference between the nutrient inputs entering a farming system (mainly livestock manure and fertilisers) and the nutrient outputs leaving the system (the uptake of nutrients for crop and pasture production). A nutrient deficit (negative value) indicates declining soil fertility. A nutrient surplus (positive data) indicates a risk of polluting soil, water and air.</p> <p>Organisation for Economic Co-operation Development (2018) <a href="#">OECD Glossary of Statistical terms</a>.</p>

Term	Definition
<p><b>Primary forest</b></p>	<p>Naturally regenerated forest of native tree species, where there are no clearly visible indications of human activities, and the ecological processes are not significantly disturbed.</p> <p>Explanatory notes:</p> <ol style="list-style-type: none"> <li>1. Includes both pristine and managed forests that meet the definition.</li> <li>2. Includes forests where Indigenous Peoples engage in traditional forest stewardship activities that meet the definition.</li> <li>3. Includes forests with visible signs of abiotic damages (such as storm, snow, drought and fire) and biotic damages (such as insects, pests and diseases).</li> <li>4. Excludes forests where hunting, poaching, trapping or gathering have caused significant native species loss or disturbance to ecological processes.</li> <li>5. Examples of key characteristics of primary forests: <ul style="list-style-type: none"> <li>• they show natural forest dynamics, such as natural tree species composition, occurrence of dead wood, natural age structure and natural regeneration processes;</li> <li>• the area is large enough to maintain its natural ecological processes;</li> <li>• there has been no known significant human intervention, or the last significant human intervention was long enough ago to have re-established natural species composition and processes.</li> </ul> </li> </ol> <p>Food and Agriculture Organization (2000) <a href="#">Forest Resources Assessment – Terms and Definitions.</a></p>
<p><b>Toxicity hazard level</b></p>	<p>For toxicity hazard levels refer to the World Health Organization (2019) <a href="#">The WHO Recommended Classification of Pesticides by Hazard and guidelines to classification.</a></p>
<p><b>Regenerative agriculture</b></p>	<p>There is no scientific consensus definition of regenerative agriculture; rather there are process (use of cover crops, reduced tillage, etc.), principle and outcome-based definitions (improved soil health, etc.). As the TNFD adopts an outcome-based opportunity definition, based on business activities that deliver nature-positive outcomes, a business should as a minimum use a definition of regenerative agriculture that allows it to capture the nature-positive outcomes in terms of improvements to environmental assets and flows in ecosystem services based on producing or sourcing from the regenerative farm practices. The most cited outcomes as part of a definition of regenerative agriculture in scientific literature include improved soil health, increased carbon sequestration and increase in biodiversity.</p> <p>Newton et al. (2020) <a href="#">What is Regenerative Agriculture? A Review of Scholar and Practitioner Definitions Based on Processes and Outcomes</a>, Front Syst. Food Syst.</p>



Term	Definition
<b>Reforestation</b>	<p>Reforestation is the re-growth of forests after a temporary (&lt; 10 years) condition with less than 10% canopy cover due to human-induced or natural perturbations.</p> <p>Food and Agriculture Organization (2000) <a href="#">On Definitions of Forest and Forest Change</a>.</p>
<b>Rewetted</b>	<p>All deliberate actions that aim to bring the water table of a drained peatland (i.e. the position relative to the surface) back to that of the original, peat-forming peatland. When this goal has been reached, the peatland is ‘rewetted’.</p> <p>Ramsar Convention (2021) <a href="#">Global guidelines for peatland rewetting and restoration</a>.</p>
<b>Soil fertility</b>	<p>The ability of a soil to sustain plant growth by providing essential plant nutrients and favourable chemical, physical and biological characteristics as a habitat for plant growth.</p> <p>Food and Agriculture Organization. <a href="#">Global Soils Partnership</a>.</p>
<b>Sludge</b>	<p>A solid type of aquaculture waste which contains nitrogenous compound, phosphorus and other dissolved organic carbon that could affects the environment negatively when the concentration present is higher than usual. Sludge is formed due to large quantities of excessive feed and organic degradation matters.</p> <p>Jasmin, M. Y. et al. (2020) <a href="#">Potential of bioremediation in treating aquaculture sludge: Review article</a>. Aquaculture 519.</p>
<b>Water stressed (region)</b>	<p>Water stressed (region): defined in three levels: 25%, below which no water scarcity exists; 60%, indicating approaching scarcity; 75%, above which strong water scarcity is identified. Anything above the 60% figure, approaching scarcity, is considered ‘water stressed’.</p> <p>Adapted from UN Water (2021) <a href="#">Summary Progress Update 2021: SDG 6 — water and sanitation for all</a>.</p>

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