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Item 11 – GRI Standards Project for Sector Standards Alignment with new and revised Topic Standards – Exposure drafts of aligned topics

For GSSB discussion and approval

Date	05 March 2025
Meeting	20 March 2025
Project	GRI Standards Project for Sector Standards Alignment with new and revised Topic Standards
Description	This document sets out the exposure drafts of the Sector Standards topics aligned with the new and revised GRI biodiversity, climate change, and energy Topic Standards. The affected Sector Standards are those published to date: *GRI 11: Oil and Gas Sector 2021*, *GRI 12: Coal Sector 2022*, *GRI 13: Agriculture, Aquaculture and Fishing Sectors 2022* and *GRI 14: Mining Sector 2024.* The topics exposed for public comment reflect necessary alignments to maintain coherence between the GRI and Sector Standards. Public feedback is only requested for the affected topics within the Sector Standards, covering GHG emissions, climate adaptation, resilience and transition, biodiversity, and natural ecosystem conversion. To facilitate reading, the changes made to the reporting sections are marked in red strikethrough for removed reporting expectations (assessed as covered by the new and revised Topic Standard contents) and in green for new disclosures (replacing previous reporting expectations and/or assessed as relevant for the sector). Rationales for the changes introduced in the exposure draft can be found in the explanatory memorandum (see Item 10).

Contents

GRI 11: Oil and Gas Sector 2021

Topic 11.1 Climate change and just transition

The single biggest contributor to climate change is greenhouse gas (GHG) emissions, the impacts of which are occurring at an accelerated rate. Organizations have a responsibility to contribute to climate change mitigation and adaptation, including by developing and implementing transition and adaptation plans that align with the principles of just transition. This topic covers GHG emissions, transition to less GHG-emissions intensive economic activities, and climate change adaptation, including impacts on workers, local communities, and Indigenous Peoples.

The oil and gas sector's activities and use of its products are responsible for a large portion of two major greenhouse gas (GHG) emissions: carbon dioxide (CO_2) and methane (CH_4). Globally, it is estimated that the sector is responsible for a quarter of all anthropogenic emissions of CH_4, which has a notably higher global warming potential than CO_2. Recent measurements indicate that available figures on CH_4 emissions from the sector could be underestimated. Other GHGs from oil and gas activities include nitrous oxide (N_2O), hydrofluorocarbons (HCFs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

Signatories of the Paris Agreement have committed to keeping global warming well below 2°C above pre-industrial levels while pursuing efforts to limit global temperature rise to 1.5ºC [58]. However, available fossil fuel reserves far exceed the consumption limit needed to stay within these limits [78]. This means organizations in the oil and gas sector need to set GHG emissions reduction targets, modify their business models, and invest in renewable energy, as well as adopt technologies to remove CO_2 from the atmosphere [68], and nature-based solutions to mitigate climate change, such as reforestation, afforestation, and coastal and wetland restoration.

GHG emissions from oil and gas activities are classified as Scope 1 GHG emissions in the case of sources owned or controlled by the organization or Scope 2 GHG emissions in the case of purchased and acquired electricity, heating, cooling, and steam consumed by the organization. Currently, 15% of the world's energy-related GHG emissions come from producing and distributing oil and gas [36].

Scope 1 GHG emissions come from fuel combustion during production, process emissions, such as those during loading and tankage, and fugitive emissions, such as those from piping and equipment leaks. A substantial source of the sector's Scope 1 GHG emissions is flaring and venting, which aims to dispose of gas that cannot be contained or handled otherwise for safety, technical, or economic reasons. These practices occur during oil and gas production, storage, and refining.

Box 1. Flaring and venting

When gas needs to be disposed of, it may be flared (burned off) or vented (released without being burned). Flaring converts gas to CO_2 while venting releases CH_4 directly into the atmosphere. Given that CH_4 has a higher global warming potential than CO_2, routing associated gases to an efficient flare system instead of venting is considered best practice and there is wide agreement that routine venting should be eliminated.

Flaring also represents a major source of GHG emissions. While large amounts of gases resulting from oil and gas activities are used or conserved, flaring still routinely occurs. According to the World Bank, routine flaring occurs "during normal oil production operations in the absence of sufficient facilities or amenable geology to re-inject the produced gas, utilize it on-site, or dispatch it to a market". Increases in shale oil production have further contributed to volumes of flaring.

The amount of natural gas flared in 2018 resulted in emissions of approximately 275 megatons of CO_2, as well as CH_4, black carbon, and N_2O.

See references [34], [46], and [48] in the Bibliography.

Scope 2 GHG emissions originate from stationary and mobile sources (e.g., transportation of materials, products, or waste) and the activities of extraction, oil refining, liquefaction and regasification of natural gas, and operation of facilities and equipment. The depletion of traditional oil and gas resources has led the sector to move production to more difficult settings, which may involve more complex extraction methods such as offshore deep-water drilling or oil sands mining. Despite improvements in production efficiency, extracting these oil and gas resources can increase the amount of energy used during production and transportation and result in higher GHG emissions.

The sector also faces expectations to address Scope 3 GHG emissions related to the use of oil and gas products. These constitute the most significant GHG emissions for the sector and over half of global CO_2 emissions [33]. The majority of Scope 3 GHG emissions originate from combustion processes related to construction, electricity and heat generation, manufacturing, and transportation. These emissions can increase with higher energy demands.

Actions to reduce Scope 1 and Scope 2 GHG emissions linked to extracting and distributing oil and gas offer important and immediate opportunities for the sector to contribute to reducing global GHG emissions. Actions to reduce Scope 3 GHG emissions can include changing the portfolio of products and services from high-carbon products and services towards low-carbon alternatives.

Transitioning to less GHG emissions-intensive economic activities creates uncertainty about the future demand for oil and gas [67] [68]. A decrease in demand will translate into lower utilization of existing production facilities and decreased development of reserves. Depending on the rate of this transition, some fields and facilities may need to be re-evaluated or written off prematurely, becoming stranded assets. This will have impacts on workers, especially when jobs are terminated, and may create challenges related to employability and desirable re-employment opportunities.

The transition may affect employment, government revenues, and economic development in regions where the sector operates. More frequent closures are less likely to be counterbalanced by openings, as has been the case in the past. Closure of operations without adequate provisions for decommissioning and rehabilitation may also result in an economic burden for governments and local communities (see also topic 11.7 Closure and rehabilitation), particularly in countries where oil and gas production provide a large percentage of revenues.

According to the International Labor Organization, a just transition involves greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities, and leaving no one behind. Achieving a just transition requires recognizing the different dependency levels of workers, local communities, and national economies on the oil and gas sector [79]. Actions that contribute to a just transition include providing adequate advance notice of closures, collaborating with governments and unions, advocating for climate-consistent policy (see also topic 11.22 Public policy), up- and re-skilling and redeploying workers, and making alternative investments in the affected communities. Meaningful engagement with stakeholders early on, including Indigenous Peoples and local communities, is also critical to achieving a just transition.

Reporting on climate change and just transition

If the organization has determined climate change and just transition to be a material topic, this sub-section lists the disclosures identified as relevant for reporting on the topic by the oil and gas sector.

STANDARD	DISCLOSURE	SECTOR STANDARD REF #
Management of the topic		
GRI 3: Material Topics 2021	Disclosure 3-3 Management of material topics *Additional sector recommendations* ~~• Describe policies, commitments, and actions of the organization to prevent or mitigate the impacts of the transition to a low-carbon economy on workers and local communities.~~ ~~• Report the level and function within the organization that has been assigned responsibility for managing risks and opportunities due to climate change.~~ ~~• Describe the board's oversight in managing risks and opportunities due to climate change.~~ ~~• Report whether responsibility to manage climate change-related impacts is linked to performance assessments or incentive mechanisms, including in the remuneration policies for highest governance body members and senior executives.~~ ~~• Describe the climate change-related scenarios used to assess the resilience of the organization's strategy, including a 2°C or lower scenario.~~ • Describe actions taken to manage flaring and venting and the effectiveness of actions taken.	11.1.1
Topic Standard disclosures		
GRI 102: Climate Change and Just Transition 2025	Disclosure 102-1 Transition plan for climate change mitigation ~~Disclosure 201-2 Financial implications and other risks and opportunities due to climate change~~ *Additional sector recommendations* ~~• Report the emissions potential for proven and probable reserves.[1]~~ ~~• Report the internal carbon-pricing and oil and gas pricing assumptions that have informed the identification of risks and opportunities due to climate change.~~ • Describe how climate change-related risks and opportunities affect or could affect the organization's operations or revenue, including: – development of currently proven and probable reserves; – potential write-offs and early closure of existing assets; – oil and gas production volumes for the current reporting period and projected volumes for the next five years.	11.1.2
	Disclosure 102-2 Climate change adaptation plan	11.1.3

~~[1] The definition of reserves used by the organization for this additional sector recommendation should be the same as the definition used in its consolidated financial statements or equivalent documents.~~

	Disclosure 102-3 Just transition	11.1.4
	Disclosure 102-4 GHG emissions reduction targets and progress ~~Disclosure 305-5 Reduction of GHG emissions~~ ~~*Additional sector recommendations*~~ • ~~Report how the goals and targets for GHG emissions are set, specify whether they are informed by scientific consensus, and list any authoritative intergovernmental instruments or mandatory legislation the goals and targets are aligned with.~~ • ~~Report the Scopes (1, 2, 3) of GHG emissions, activities, and business relationships to which the goals and targets apply.~~ • ~~Report the baseline for the goals and targets and the timeline for achieving them.~~	11.1.5
	~~Disclosure 305-1 Direct (Scope 1) GHG emissions~~ Disclosure 102-5 Scope 1 GHG emissions *Additional sector recommendations* • ~~Report the percentage of gross direct (Scope 1) GHG emissions from CH_4.~~ • Report the breakdown of gross Scope 1 GHG emissions by type of source (e.g., stationary combustion, process, fugitive).	11.1.6
	~~Disclosure 305-2 Energy indirect (Scope 2) GHG emissions~~ Disclosure 102-6 Scope 2 GHG emissions	11.1.7
	~~Disclosure 305-3 Other indirect (Scope 3) GHG emissions~~ Disclosure 102-7 Scope 3 GHG emissions	11.1.8
	~~Disclosure 305-4 GHG emissions intensity~~ Disclosure 102-8 GHG emissions intensity	11.1.9
	Disclosure 102-9 GHG removals in the value chain Report net mass of CO_2 in metric tons captured and removed from the atmosphere (CO_2 stored less the GHG emitted in the process).[2]	11.1.10
	Disclosure 102-10 Carbon credits	11.1.11
GRI 103: Energy 2025	Disclosure 103-1 Energy policies and commitments	11.1.12
	~~Disclosure 302-1 Energy consumption within the organization~~ Disclosure 103-2 Energy consumption and self-generation within the organization	11.1.13
	~~Disclosure 302-2 Energy consumption outside of the organization~~ Disclosure 103-3 Upstream and downstream energy consumption	11.1.14
	~~Disclosure 302-3 Energy intensity~~	11.1.15

[2] The mass of the CO_2 captured using carbon capture and storage less the mass of CO_2 emitted as a result of or during the process, is sometimes known as 'net reduction of emissions' [69].

	Disclosure 103-4 Energy intensity	
Additional sector disclosures		
~~Describe the organization's approach to public policy development and lobbying on climate change, including:~~ • ~~the organization's stance on significant issues related to climate change that are the focus of its participation in public policy development and lobbying, and any differences between these positions and its stated policies, goals, or other public positions;~~ • ~~whether it is a member of, or contributes to, any representative associations or committees that participate in public policy development and lobbying on climate change, including:~~ – ~~the nature of this contribution;~~ – ~~any differences between the organization's stated policies, goals, or other public positions on significant issues related to climate change; and the positions of the representative associations or committees.[6]~~ Report the percentage of capital expenditure (CapEx) that is allocated to investments in: – prospection, exploration, and development of new reserves; – energy from renewable sources (by renewable energy source); – technologies to remove CO_2 from the atmosphere and nature-based solutions to mitigate climate change; – other research and development initiatives that can address the organization's climate change risks.		11.1.16

Topic 11.4 Biodiversity

Biodiversity is the variability among living organisms. It includes diversity within species, between species, and of ecosystems. Biodiversity not only has intrinsic value, but is also vital to human health, food security, economic prosperity, and mitigation of climate change and adaptation to its impacts. This topic covers impacts on biodiversity, including genetic diversity, animal and plant species, and ecosystems.

Oil and gas activities typically require large-scale developments that have impacts on biodiversity and ecosystem services. These impacts can limit the availability and accessibility of natural resources or degrade their quality. Impacts on biodiversity and ecosystem services may also affect the well-being and livelihoods of local communities and Indigenous Peoples (see also topic 11.15 Local communities and topic 11.17 Rights of Indigenous Peoples).

Direct drivers of biodiversity loss influence biodiversity and ecosystem processes, leading to impacts such as degradation of ecosystems, habitat fragmentation, and animal mortality. Oil and gas activities may contribute to the direct drivers through land and sea use change, which can result in soil erosion and sedimentation of waterways, exploitation of natural resources, climate change, pollution, and the introduction of invasive alien species.

Impacts can result from onshore and offshore activities, including land clearance; seismic testing and well drilling; construction of facilities, pipelines and roads; transportation; water discharge; disposal of drilling waste; and spills and leaks. Threats to biodiversity will increase as easily accessible oil and gas resources are depleted and oil and gas activities move into more remote areas. Impacts on biodiversity can be more significant when oil and gas activities occur in or near ecologically sensitive areas and may extend well beyond the geographic boundaries and the lifetime of sites (see also topic 11.7 Closure and rehabilitation).

The sector's activities can also contribute to cumulative impacts on biodiversity. For example, the expansion of onshore oil and gas activities, along with the installation of new access routes, leads to land clearance, causing habitat fragmentation and ecosystem conversion. This can increase the area's use or attract other sectors to operate in the same area, further intensifying impacts. Changes to land use to accommodate the sector's activities can exacerbate the effects of climate change if they result in the removal of carbon sinks. In turn, climate change is likely to alter species' distribution, functioning, and interactions, reducing ecosystems' capacity to adapt. Impacts can worsen with increasing temperatures (see also topic 11.1 Climate change and just transition).

To limit and manage their impacts on biodiversity, many oil and gas organizations use the mitigation hierarchy tool to help inform their actions to balance or outweigh negative impacts on biodiversity. The mitigation hierarchy follows avoidance, minimization, restoration and rehabilitation, and offset. Actions to avoid negative impacts are prioritized, as is minimizing those impacts when avoidance is not possible. Restoration and rehabilitation measures should be implemented when negative impacts cannot be avoided or minimized. Offsetting measures may be applied to residual negative impacts after all other measures have been applied. [118]

Reporting on biodiversity

If the organization has determined biodiversity to be a material topic, this sub-section lists the disclosures identified as relevant for reporting on the topic by the oil and gas sector.

STANDARD	DISCLOSURE	SECTOR STANDARD REF #
Management of the topic		
GRI 3: Material Topics 2021	Disclosure 3-3 Management of material topics ~~*Additional sector recommendations*~~ ~~Report whether application of the mitigation hierarchy has informed actions to manage biodiversity-related impacts.~~	11.4.1
Topic Standard disclosures		
GRI 101: Biodiversity 2024	Disclosure 101-1 Policies to halt and reverse biodiversity loss ~~304-1 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas~~ *Additional sector recommendations* Report whether the organization's policies and commitments to halt and reverse biodiversity loss apply to future operations and to operations beyond ecologically sensitive areas.	11.4.2
	Disclosure 101-2 Management of biodiversity impacts	11.4.3
	Disclosure 101-4 Identification of biodiversity impacts	11.4.4
	Disclosure 101-5 Locations with biodiversity impacts ~~Disclosure 304-2 Significant impacts of activities, products and services on biodiversity~~ ~~*Additional sector recommendations*~~ • ~~Report significant impacts on biodiversity with reference to affected habitats and ecosystems.~~	11.4.5
	Disclosure 101-6 Direct drivers of biodiversity loss	11.4.6
	Disclosure 101-7 Changes to the state of biodiversity ~~Disclosure 304-3 Habitats protected or restored~~	11.4.7
	Disclosure 101-8 Ecosystem services ~~Disclosure 304-4 IUCN Red List species and national conservation list species with habitats in areas affected by operations~~	11.4.8

GRI 12: Coal Sector 2022

Topic 12.1 Climate change and just transition

The single biggest contributor to climate change is greenhouse gas (GHG) emissions, the impacts of which are occurring at an accelerated rate. Organizations have a responsibility to contribute to climate change mitigation and adaptation, including by developing and implementing transition and adaptation plans that align with the principles of just transition. This topic covers GHG emissions, transition to less GHG-emissions intensive economic activities, and climate change adaptation, including impacts on workers, local communities, and Indigenous Peoples.

Studies show that approximately half of the total anthropogenic carbon dioxide (CO_2) emissions since 1750 have occurred in the last 40 years, mostly due to the increased use of fossil fuels, including coal [42]. Besides CO_2, coal operations also cause the emission of methane (CH_4), nitrous oxide (N_2O), and ozone (O_3). CH_4 has a significantly higher global warming potential than CO_2; when considering its impact over 100 years, one ton of CH_4 is equivalent to 28 to 36 tons of CO_2 [49] [61]. Coal mining is estimated to be responsible for 11% of global anthropogenic CH_4 emissions [54], although recent measurements indicate that CH_4 emissions from energy production could be underestimated [53].

Signatories of the Paris Agreement have committed to keeping global warming well below 2°C above pre-industrial levels while pursuing efforts to limit temperature rise to 1.5°C. However. available fossil fuel reserves far exceed the consumption limit needed to stay within these limits [83]. This means organizations in the sector need to set GHG emissions reduction targets, close operations, modify their business models to reduce the reliance on thermal coal, invest in new technologies to remove CO_2 from the atmosphere, and create carbon sinks.

Coal mining activities consume significant amounts of energy. Unless renewable energy sources provide the necessary power, mining operations generate CO_2 emissions. These are classified as Scope 1 GHG emissions in the case of sources owned or controlled by the organization or Scope 2 GHG emissions in the case of purchased and acquired electricity, heating, cooling, and steam consumed by the organization.

The amount of energy used in coal mining and the resulting CO_2 emissions depend on several factors, such as the method of mining, mine depth, geology, mine productivity, and degree of refining required. The most energy-consuming activities include transportation, exploration, drilling, excavation, extraction, grinding, crushing, milling, pumping, and ventilation. Extraction and transportation in underground mines might require more energy than surface mining due to, for example, greater requirements for hauling, ventilation, and water pumping. Use of explosives for blasting, mine fires and other incidents, and closure and rehabilitation activities are also sources of GHG emissions.

CH_4 emissions from coal mines are released into the atmosphere during and after the mining process. Coal mine methane (CMM) can be released via degasification systems and ventilation air from underground coal mines. CMM can also be released through seepage from abandoned or closed mines through vent holes or cracks in the ground, coal seams of surface mines, and fugitive emissions from storage and transportation. Underground mines are responsible for most of the Scope 1 GHG emissions from CH_4 due to the higher gas content of deeper seams.

For coal, end-use activities are responsible for the most significant GHG emissions, classified as Scope 3 GHG emissions. These emissions mostly originate from electricity and heat generation, steel production, and cement manufacturing. Of all energy sources, coal has the highest GHG emissions intensity when combusted and is the single largest source of global CO_2 emissions. Thermal coal, which is mainly used for electricity generation, typically releases more than twice the amount of GHGs

than natural gas per unit of electricity produced [57]. Steel production uses metallurgical coal, with three-quarters of the energy demand being met by coal [59].

Since coal emits the largest amount of CO_2 and has the highest intensity of emissions per unit of energy among fossil fuels, burning coal is commonly the first activity governments seek to suppress in fulfilling their commitments under the Paris Agreement. The transition to less GHG emissions-intensive economic activities has commenced, resulting in a declining trend in coal consumption. [76] While alternatives for electricity generation exist, steelmakers currently still lack an economically feasible alternative for coal, leading to a longer transition timeline. Technological solutions are being tested that removes, or captures, the GHGs from burning coal, such as carbon capture and storage. However, the technology is not progressing at the rate necessary to meet the emissions reductions needed to limit global temperature rise to 1.5ºC, its environmental impacts are still to be assessed, and new investment remains scarce.

Transitioning to less GHG emissions-intensive economic activities can have substantial negative impacts on organizations, workers, and local communities reliant on coal activities. The transition may also affect employment, government revenues, and economic development in regions where the sector operates. More frequent closures are less likely to be counterbalanced by openings, as has been the case in the past. This will have impacts on workers, especially when jobs are terminated, and may create challenges related to employability and desirable re-employment opportunities. The lack of adequate provisions for closure and rehabilitation may also result in an economic burden for governments and local communities, particularly in countries where coal production provides a large percentage of revenues.

To address the impacts associated with transition risks, coal organizations can diversify away from coal, invest in technological solutions, drive innovation through collaborative sectoral partnerships, and focus on market segments expected to remain operational for longer. However, selling existing coal assets to other entities to reduce an organization's GHG emissions, instead of closing operations, can be detrimental to climate change mitigation efforts. Offloading coal assets to organizations that continue to extract coal does not reduce overall GHG emissions but can instead increase them. If an organization shifts closure and rehabilitation responsibilities to less accountable and inexperienced operators, this may also weaken the management of environmental and socioeconomic impacts from eventual closure (see also topic 12.3 Closure and rehabilitation).

According to the International Labor Organization, a just transition involves greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities, and leaving no one behind. In the coal sector, achieving a just transition requires recognizing the different dependency levels of workers, local communities, and national economies on the coal sector. Actions that contribute to a just transition include providing adequate advance notice of closures, collaborating with governments and unions, advocating for climate-consistent policy (see also topic 12.22 Public policy), up- and re-skilling and redeploying workers, and making alternative investments in the affected communities. Meaningful engagement with stakeholders early on, including Indigenous Peoples and local communities, is also critical to achieving a just transition.

213 # Reporting on climate change and just transition

214 If the organization has determined climate change and just transition to be a material topic, this sub-
215 section lists the disclosures identified as relevant for reporting on the topic by the coal sector.

STANDARD	DISCLOSURE	SECTOR STANDARD REF #
Management of the topic		
GRI 3: Material Topics 2021	Disclosure 3-3 Management of material topics *Additional sector recommendations* ~~• Describe policies, commitments, and actions of the organization to prevent or mitigate the impacts of the transition to a low-carbon economy on workers and local communities.~~ ~~• Report the level and function within the organization that has been assigned responsibility for managing risks and opportunities due to climate change.~~ ~~• Describe the highest governance body's oversight in managing risks and opportunities due to climate change.~~ ~~• Report whether responsibility to manage climate change-related impacts is linked to performance assessments or incentive mechanisms, including in the remuneration policies for highest governance body members and senior executives.~~ ~~• Describe the climate change-related scenarios used to assess the resilience of the organization's strategy, including a 2°C or lower scenario.~~	12.1.1
Topic Standard disclosures		
GRI 102: Climate Change and Just Transition 2025	Disclosure 102-1 Transition plan for climate change mitigation ~~Disclosure 201-2 Financial implications and other risks and opportunities due to climate change~~ *Additional sector recommendations* • Report whether the organization has a transition plan in place. If so, report whether it is a scheduled resolution item at annual general meetings of shareholders (AGM), if applicable. ~~• Report the emissions potential for proven and probable reserves.3~~ ~~• Report the internal carbon pricing and coal pricing assumptions that have informed the identification of risks and opportunities due to climate change.~~ • Describe how climate-change related risks and opportunities affect or could affect the organization's operations or revenue, including: – development of currently proven and probable reserves; – potential write-offs and early closure of existing assets; – coal production volumes for the current reporting period and projected volumes for the next five years. • Report planned, ongoing, or completed divestments of coal assets. For each divestment:	12.1.2

~~3 The definition of reserves used by the organization for this additional sector recommendation should be the same as the definition used in its consolidated financial statements or equivalent documents.~~

	– describe how the organization considered its policy commitments for responsible business conduct;[4] – report whether there are provisions in place to ensure that negative impacts from closure are addressed, and that existing closure and rehabilitation plans are followed by the entity acquiring the asset(s).	
	Disclosure 102-2 Climate change adaptation plan	12.1.3
	Disclosure 102-3 Just transition	12.1.4
	Disclosure 102-4 GHG emissions reduction targets and progress ~~Disclosure 305-5 Reduction of GHG emissions~~ ~~*Additional sector recommendations*~~ • ~~Report how the goals and targets for GHG emissions are set, specify whether they are informed by scientific consensus, and list any authoritative intergovernmental instruments or mandatory legislation the goals and targets are aligned with.~~ • ~~Report the Scopes (1, 2, 3) of GHG emissions, activities, and business relationships to which the goals and targets apply.~~ • ~~Report the baseline for the goals and targets and the timeline for achieving them.~~	12.1.5
	~~Disclosure 305-1 Direct (Scope 1) GHG emissions~~ Disclosure 102-5 Scope 1 GHG emissions *Additional sector recommendations* • ~~Report the percentage of gross direct (Scope 1) GHG emissions from CH_4.~~ • Report the breakdown of gross Scope 1 GHG emissions by type of source (e.g., stationary combustion, process, fugitive).	12.1.6
	~~Disclosure 305-2 Energy indirect (Scope 2) GHG emissions~~ Disclosure 102-6 Scope 2 GHG emissions	12.1.7
	~~Disclosure 305-3 Other indirect (Scope 3) GHG emissions~~ Disclosure 102-7 Scope 3 GHG emissions	12.1.8
	~~Disclosure 305-4 GHG emissions intensity~~ Disclosure 102-8 GHG emissions intensity	12.1.9
	Disclosure 102-9 GHG removals in the value chain • Report net mass of CO_2 in metric tons captured and stored,[5] broken down by: - Carbon captured at the point source;[6]	12.1.10

[4] Policy commitments for responsible business conduct and commitment to respect human rights are reported in Disclosure 2-23 Policy commitments in *GRI 2: General Disclosures 2021*.

[5] ~~Organizations should report the mass of the CO2 captured using carbon capture and storage less the mass of CO2 emitted as a result of or during the process, sometimes also known as 'net reduction of emissions' [71].~~

[6] ~~Point sources include industrial and energy related sources.~~

	- Carbon captured directly from the atmosphere.	
	Disclosure 102-10 Carbon credits	12.1.11
GRI 103: Energy 2025	Disclosure 103-1 Energy policies and commitments	12.1.12
	~~Disclosure 302-1 Energy consumption within the organization~~ Disclosure 103-2 Energy consumption and self-generation within the organization	12.1.13
	~~Disclosure 302-2 Energy consumption outside of the organization~~ Disclosure 103-3 Upstream and downstream energy consumption	12.1.14
	~~Disclosure 302-3 Energy intensity~~ Disclosure 103-4 Energy intensity	12.1.15
Additional sector disclosures		
~~Describe the organization's approach to public policy development and lobbying on climate change, including:~~ • ~~the organization's stance on significant issues related to climate change that are the focus of its participation in public policy development and lobbying, and any differences between these positions and its stated policies, goals, or other public positions;~~ • ~~whether it is a member of, or contributes to, any representative associations or committees that participate in public policy development and lobbying on climate change, including:~~ – ~~the nature of this contribution;~~ – ~~any differences between the organization's stated policies, goals, or other public positions on significant issues related to climate change; and the positions of the representative associations or committees.~~[6] Report the percentage of capital expenditure (CapEx) that is allocated to investments in: ▪ prospection, exploration, acquisition, and development of new reserves; ▪ expansion of current coal mines; ▪ energy from renewable sources (by type of source); ▪ technologies to remove CO_2 from the atmosphere and nature-based solutions to mitigate climate change; ▪ research and development initiatives that can address the organization's risks related to climate change.		12.1.16

Topic 12.5 Biodiversity

Biodiversity is the variability among living organisms. It includes diversity within species, between species, and of ecosystems. Biodiversity not only has intrinsic value, but is also vital to human health, food security, economic prosperity, and mitigation of climate change and adaptation to its impacts. This topic covers impacts on biodiversity, including on genetic diversity, animal and plant species, and ecosystems.

Coal activities typically require large-scale developments that have impacts on biodiversity and ecosystem services. These impacts can limit the availability and accessibility of natural resources or degrade their quality. Impacts on biodiversity and ecosystem services may also affect the well-being and livelihoods of local communities and Indigenous Peoples (see also topics 12.9 Local communities and 12.11 Rights of Indigenous Peoples).

Direct drivers of biodiversity loss influence biodiversity and ecosystem processes, leading to impacts such as degradation of ecosystems, habitat fragmentation, and animal mortality. Coal activities may contribute to the direct drivers of biodiversity loss through land and sea use change, for example, in the form of land clearance for mining, access routes, and waste management facilities, which can result in soil erosion and sedimentation of waterways; exploitation of natural resources by withdrawing and consuming water; through the introduction of invasive alien species; and pollution from, for example, effluent discharges, acid mine drainage, tailings ponds, or overburden piles (see also topics 12.6 Waste and 12.7 Water and effluents).

Different mining methods present distinct impacts on biodiversity. Open-pit mines generate more severe impacts than underground mines due to the progressive deepening and widening of the mining site, increasing the affected areas over time. Open-pit mining is a prominent cause of deforestation, while underground mining can have negative impacts resulting from ground subsidence and groundwater contamination. Impacts on biodiversity can be more significant when coal activities occur in or near ecologically sensitive areas and may extend well beyond the geographic boundaries and the lifetime of sites (see also topic 12.3 Closure and rehabilitation).

The sector's activities can also contribute to cumulative impacts on biodiversity. For example, the expansion of coal activities, along with the installation of new access routes, leads to land clearance, causing habitat fragmentation and ecosystem conversion. This can increase the area's use or encourage other sectors operate in the same area, further intensifying impacts. Changes to land use to accommodate open-pit mining can exacerbate the effects of climate change if they result in the removal of carbon sinks. In turn, climate change is likely to alter species' distribution, functioning, and interactions, reducing ecosystems' capacity to adapt. The impacts are anticipated to worsen with increasing temperatures (see also topic 12.1 Climate change and just transition).

To limit and manage their impacts on biodiversity, many coal organizations use the mitigation hierarchy tool to help inform their actions to balance or outweigh negative impacts on biodiversity. The mitigation hierarchy follows avoidance, minimization, restoration and rehabilitation, and offset. Actions to avoid negative impacts are prioritized, as is minimizing those impacts when avoidance is not possible. Restoration and rehabilitation measures should be implemented when negative impacts cannot be avoided or minimized. Offsetting measures may be applied to residual negative impacts after all other measures have been applied. [121].

Reporting on biodiversity

If the organization has determined biodiversity to be a material topic, this sub-section lists the disclosures identified as relevant for reporting on the topic by the coal sector.

STANDARD	DISCLOSURE	SECTOR STANDARD REF #
Management of the topic		
GRI 3: Material Topics 2021	Disclosure 3-3 Management of material topics ~~*Additional sector recommendations*~~ ~~Report whether application of the mitigation hierarchy has informed actions to manage biodiversity-related impacts.~~	12.4.1
Topic Standard disclosures		
GRI 101: Biodiversity 2024	Disclosure 101-1 Policies to halt and reverse biodiversity loss ~~304-1 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas~~ *Additional sector recommendations* Report whether the organization's policies and commitments to halt and reverse biodiversity loss apply to future operations and to operations beyond ecologically sensitive areas.	12.4.2
	Disclosure 101-2 Management of biodiversity impacts	12.4.3
	Disclosure 101-4 Identification of biodiversity impacts	12.4.4
	Disclosure 101-5 Locations with biodiversity impacts ~~Disclosure 304-2 Significant impacts of activities, products and services on biodiversity~~ ~~*Additional sector recommendations*~~ • ~~Report significant impacts on biodiversity with reference to affected habitats and ecosystems.~~	12.4.5
	Disclosure 101-6 Direct drivers of biodiversity loss	12.4.6
	Disclosure 101-7 Changes to the state of biodiversity ~~Disclosure 304-3 Habitats protected or restored~~	12.4.7
	Disclosure 101-8 Ecosystem services ~~Disclosure 304-4 IUCN Red List species and national conservation list species with habitats in areas affected by operations~~	12.4.8

GRI 13: Agriculture, Aquaculture, and Fishing Sectors 2022

Topic 13.1 Emissions

This topic addresses emissions into the air, including greenhouse gases (GHG), ozone-depleting substances (ODS), nitrogen oxides (NO_x), sulfur oxides (SO_x), and other significant air emissions regarded as pollutants. Emissions can have negative impacts on air quality, ecosystems, and on human and animal health. GHG emissions are the single biggest contributor to climate change.

Agriculture is responsible for a large portion of greenhouse gas (GHG) emissions. From 2007 to 2016, the sector accounted for approximately 13% of carbon dioxide (CO_2), 44% of methane (CH_4), and 82% of nitrous oxide (N_2O) emissions from human activities globally, which was 23% of the total net anthropogenic emissions of GHGs over this period [46].

In agriculture and aquaculture, the highest share of total emissions is associated with land use change, including the conversion of land from a natural ecosystem for use by the sectors [46] (see also topic 13.4 Natural ecosystem conversion). Forests contribute to the reduction of CO_2 by absorbing more carbon than they release, making them a carbon sink. Clearing forests or grasslands results in large amounts of CO_2 being released. Soil and pasture management practices can contribute to the capacity of soil to store carbon or adversely accelerate the release of carbon from the soil into the atmosphere (see topic 13.5 Soil health). Restoring and preserving carbon sinks, such as natural ecosystems and soils, plays an integral role in mitigating climate change (see also topic 13.2 Climate adaptation).

Land management for crop production produces emissions through soil cultivation, including tillage, crop residue decomposition, and burning vegetation and crop residues. This results in the production of CO_2, N_2O, and particulate matter. Fertilizers, pesticides, and fuels used to power machinery and vehicles also release GHG emissions.

Ruminant livestock produce GHG emissions during respiration and digestion. Animal manure also emits gases, such as CH_4, N_2O, and CO_2. Livestock on managed pastures and rangelands was estimated to account for over half of total anthropogenic N_2O emissions from agriculture [46]. CH_4 and N_2O emissions have a higher global warming potential than CO_2.

In animal production and aquaculture, emissions are also associated with animal and fish feed sourcing. These emissions can be caused by natural ecosystem conversion and the feed's production, processing, and transportation. In aquaculture land-based farms, emissions are also released from the combustion of fuel to generate the energy needed to regulate water temperature and circulation.

Fishing activities produce emissions from burning fuels, such as diesel, marine fuel oils, and intermediate fuel oils. These fuels provide the power to fishing vessels to access marine stocks and power onboard fish processing facilities, including freezing or refrigerating fish. Fishing vessels are not necessarily optimized for fuel efficiency, further contributing to emissions. The combustion of fuels also produces localized air pollution, while the use of refrigerants to store fish products can result in the emission of ozone-depleting substances.

Signatories of the Paris Agreement have committed to keeping global warming well below 2°C above pre-industrial levels while pursuing efforts to limit global temperature rise to 1.5ºC This means organizations in the agriculture, aquaculture and fishing sectors need to set GHG emissions reduction

targets consistent with the cumulative carbon budgets that set sectoral caps for the total allowed CO_2 emissions [42].

Organizations in the sectors can reduce emissions by, for example, implementing measures to reduce methane (CH_4) emitted by ruminants through better management of feed and manure, or in crop production, using culture-specific production practices, such as growing rice using alternate wetting and drying methods that reduce CH_4 production.

Reporting on emissions

If the organization has determined emissions to be a material topic, this sub-section lists the disclosures identified as relevant for reporting on the topic by the agriculture, aquaculture, and fishing sectors.

STANDARD	DISCLOSURE	SECTOR STANDARD REF #
Management of the topic		
GRI 3: Material Topics 2021	Disclosure 3-3 Management of material topics	13.1.1
Topic Standard disclosures		
GRI 102: Climate Change and Just Transition 2025	Disclosure 102-1 Transition plan for climate change mitigation	13.1.2
	~~Disclosure 305-5 Reduction of GHG emissions~~ Disclosure 102-4 GHG emissions reduction targets and progress	13.1.3
	~~Disclosure 305-1 Direct (Scope 1) GHG emissions~~ Disclosure 102-5 Scope 1 GHG emissions *Additional sector recommendations* • When reporting gross Scope 1 GHG emissions, include land use change emissions.[7]	13.1.4
	~~Disclosure 305-2 Energy indirect (Scope 2) GHG emissions~~ Disclosure 102-6 Scope 2 GHG emissions	13.1.5
	~~Disclosure 305-3 Other indirect (Scope 3) GHG emissions~~ Disclosure 102-7 Scope 3 GHG emissions *Additional sector recommendations* • When reporting gross Scope 3 GHG emissions, include land use change emissions.	13.1.6
	~~Disclosure 305-4 GHG emissions intensity~~ Disclosure 102-8 GHG emissions intensity	13.1.6
	Disclosure 102-9 GHG removals in the value chain	13.1.7
	Disclosure 102-10 Carbon credits	13.1.8
GRI 305: Emissions 2016	Disclosure 305-6 Emissions of ozone-depleting substances (ODS)	13.1.9
	Disclosure 305-7 Nitrogen oxides (NO_X), sulfur oxides (SO_X), and other significant air emissions	13.1.10

[7] Land use change refers to a change in the use or management of land by humans, which may lead to a change in cover; for instance, when cropland is converted to grassland or when forests are converted to cropland. This includes natural ecosystem conversion [48] (see also topic 13.4 Natural ecosystem conversion).

Topic 13.2 Climate adaptation

Organizations contribute to climate change and are simultaneously affected by it. Climate adaptation refers to how an organization adjusts to actual and potential climate-related events and their impacts.

Major impacts of climate change include an increase in extreme weather events and long-term shifts in climate patterns. As a consequence, crop yields and biogeographic suitability have been negatively affected in recent decades.

In agriculture, crops can be damaged and harvests lost due to increased volatility, intensity, and duration of extreme weather events. Warmer winters related to climate change affect fruits and vegetables that need a period of colder weather to produce viable harvests. Land degradation exacerbated by global warming can also lead to increased frequency and severity of flooding, drought, pest prevalence, diseases, heat stress, dry spells, wind, sea-level rise, wave action, and permafrost thaw.

Aquaculture and fishing operations are likely to be affected by water temperature increases, oxygen deficit, sea-level rise, decreased pH levels, and changes in productivity patterns. Higher ocean temperatures also means continued losses of marine habitats and species. Aquaculture and inland fishing activities are also affected by changes in precipitation and water management, increased stress on freshwater resources, and the frequency and intensity of extreme weather events. In tropical and less developed regions, small-scale fishers are particularly vulnerable to climate change-related impacts.

An organization's failure to adapt to climate change-related impacts can lead to disruptions in operations, increased occupational health and safety impacts, loss of livelihood, and food insecurity. These disruptions can affect an organization's workers, suppliers, customers, as well as smallholder farmers, fishers, Indigenous Peoples, and local communities. Disruptions in food production mean that between 34 and 600 million more people could suffer from hunger by 2080, depending on how climate change-related scenarios unfold [53] (see also topic 13.9 Food security).

Organizations can respond to climate change-related impacts by taking adaptation actions, including technological solutions. For example, in agriculture, low or no-till farming can reduce soil erosion, leading to improved soil and water quality. Another important adaptation strategy for the sectors is the diversification in production through a wider genetic base with improvements in the tolerance of heat and drought. Mitigating food loss (see also topic 13.9 Food security) is another measure that contributes to less land and fewer natural resources being needed to produce the same output, thereby reducing GHG emissions.

Preserving indigenous and local knowledge of biodiversity can also be a contributing factor in enhancing adaptation to climate change. Indigenous and local knowledge often focuses on preserving ecosystems and offers adaptive strategies to cope with unfavorable conditions in local areas.

Reporting on climate adaptation

If the organization has determined climate adaptation to be a material topic, this sub-section lists the disclosures identified as relevant for reporting on the topic by the agriculture, aquaculture, and fishing sectors.

STANDARD	DISCLOSURE	SECTOR STANDARD REF #
Management of the topic		
GRI 3: Material Topics 2021	Disclosure 3-3 Management of material topics	13.2.1
Topic Standard disclosures		
GRI 102: Climate Change and Just Transition 2025	~~Disclosure 201-2 Financial implications and other risks and opportunities due to climate change~~ Disclosure 102-2 Climate change adaptation plan ~~*Additional sector recommendations*~~ • ~~Describe the climate change-related scenarios used for identifying the risks and opportunities posed by climate change.~~	13.2.2

Topic 13.3 Biodiversity

Biodiversity is the variability among living organisms. It includes diversity within species, between species, and of ecosystems. Biodiversity not only has intrinsic value, but is also vital to human health, food security, economic prosperity, and mitigation of climate change and adaptation to its impacts. This topic covers impacts on biodiversity, including genetic diversity, animal and plant species, and ecosystems.

Biodiversity is essential for food production and provides a wide range of ecosystem services.

Direct drivers of biodiversity loss influence biodiversity and ecosystem processes, leading to impacts such as degradation of ecosystems, habitat fragmentation, and animal mortality, and can lead to species loss or extinction. Agriculture, aquaculture, and fishing activities may contribute to the direct drivers of biodiversity loss through land and sea use change, mainly in the form of natural ecosystem conversion, such as deforestation (see also topic 13.4 Natural ecosystem conversion), which can result in soil erosion and sedimentation of waterways, exploitation of natural resources by extracting species, and pollution. Biodiversity generally declines as agriculture, aquaculture, or fishing activities intensify.

Biodiversity can be negatively affected by monoculture. Growing the same crops or rearing the same animal species year after year may increase production but it also decreases agrobiodiversity on farms and plantations. Impacts on biodiversity can also extend beyond farms and plantations. In crop production, continuous monocropping can result in a buildup of pests and diseases, usually requiring higher volumes of pesticides, which can be toxic to non-target species, including pollinators. About 40% of invertebrate pollinator species face extinction, particularly bees and butterflies [71].

Animal production can be a major source of surplus nitrogen and phosphorous pollution, leading to eutrophication in adjacent lakes and rivers, rendering them uninhabitable for aquatic organisms (see also topic 13.7 Water and effluents). Aquaculture activities have similar impacts due to a buildup of fish excrement in waterbodies. These impacts can negatively affect the availability of fishery resources and food for local communities.

Aquaculture can also result in negative impacts on local biodiversity through escapes from aquaculture farms, which can compete with the area's native species. Poor feeding practices can result in excess or insufficient feed for fish, adding to disease outbreaks and aquatic pollution. The presence of extra feed can attract wild fish and predators to the water column.

Fishing is one of the most significant causes of declining marine biodiversity. This is largely due to overfishing, bycatch, and illegal, unreported, and unregulated fishing (IUU). From 1974 to 2017, the proportion of the world's fish stocks classified as overfished increased to 34.2%, with only about two-thirds of global fish stocks deemed as biologically sustainable [65] [68].

Overfishing can change the composition of species, which in turn can lead to changes in predator-prey relationships and cause shifts in trophic structures. Overfishing can be more difficult to prevent in international waters, where efforts to manage stock sustainably are further complicated when fish move across country borders.

Fishmeal and fish oil are rich in protein and are typically used as fish and animal feed ingredients. Fishing products used for feed can be derived from forage fish or fishing by-products, including trimmings and offcuts. Overfishing forage fish stocks used for feed increases pressure on the wild trophic structures. In aquaculture, further pressure on fish stocks can also be driven by using juvenile seeds captured in the wild.

Certain fishing practices, for example, bottom trawling in ecologically sensitive areas, can damage the seabed's physical structure, affecting bottom plants, corals, sponges, fish, and other aquatic organisms. This practice can profoundly change how natural benthic ecosystems function or lead to their destruction. Seabed damage can also result in carbon dioxide (CO_2) emissions.

A phenomenon known as ‘ghost fishing’ can threaten both target and non-target species, potentially killing endangered and protected species and damaging underwater habitats. This phenomenon occurs when fishing gear is lost or discarded and can continue to trap species indiscriminately. Lost or discarded fishing gear also contributes to marine plastic pollution (see also topic 13.8 Waste).

About 80% of terrestrial biodiversity is found in Indigenous Peoples’ lands and forests [76]. Respecting Indigenous Peoples’ rights to land and natural resources can also make a profound contribution to biodiversity conservation (see topic 13.14 Rights of Indigenous Peoples and topic 13.13 Land and resource rights).

Reporting on biodiversity

If the organization has determined biodiversity to be a material topic, this sub-section lists the disclosures identified as relevant for reporting on the topic by the agriculture, aquaculture, and fishing sectors.

STANDARD	DISCLOSURE	SECTOR STANDARD REF #
Management of the topic		
GRI 3: Material Topics 2021	Disclosure 3-3 Management of material topics *Additional sector recommendations* The following additional sector recommendation is for organizations in the aquaculture sector: • Describe the approach to preventing and managing escapes of farmed aquatic organisms.	13.3.1
Topic Standard disclosures		
GRI 101: Biodiversity 2024	Disclosure 101-1 Policies to halt and reverse biodiversity loss	13.3.2
	Disclosure 101-2 Management of biodiversity impacts	13.3.3
	Disclosure 101-3 Access and benefit-sharing	13.3.4
	Disclosure 101-4 Identification of biodiversity impacts	13.3.5
	Disclosure 101-5 Locations with biodiversity impacts ~~Disclosure 304-1 Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas~~	13.3.6
	Disclosure 101-6 Direct drivers of biodiversity loss ~~Disclosure 304-2 Significant impacts of activities, products and services on biodiversity~~ ~~*Additional sector recommendations*~~ ~~Report significant impacts on biodiversity with reference to affected habitats and ecosystems.~~	13.3.7
	Disclosure 101-7 Changes to the state of biodiversity ~~Disclosure 304-3 Habitats protected or restored~~	13.3.8
	Disclosure 101-8 Ecosystem services ~~Disclosure 304-4 IUCN Red List species and national conservation list species with habitats in areas affected by operations~~	13.3.9

The following additional sector disclosures are for organizations in the aquaculture sector: • For each species of aquatic organisms produced, report: - species scientific name; - volume in metric tons; - farming methods; - production site. • For juvenile seeds stocks captured in the wild that are used as input to aquaculture production, report: - species scientific name; - volume in metric tons; - fishing methods; - locations of origin; - stock status, including the stock status assessments or systems used.[8] • Report the use of fishing products in feed, including the following: - species scientific name; - whether the whole fish or fish waste (trimmings, offcuts, and offal) is used; - locations of origin; - stock status, including the stock status assessments or systems used.	13.3.10
The following additional sector disclosure is for organizations in the fishing sector:[9] • For each species of aquatic organisms harvested, including non-target species, report: - species scientific name; - volume in metric tons; - fishing methods; - locations of origin; - stock status, including the stock status assessments or systems used.[10]	13.3.11

[8] The organization can use any stock status assessments or systems that are relevant to the location of origin and species.

[9] Requirement 101-6-b-i in *GRI 101: Biodiversity 2024* requires information on wild species harvested at the organization's sites with the most significant impacts on biodiversity, where its activities lead or could lead to the exploitation of natural resources. This information can support the reporting for additional sector disclosure 13.3.11.

[10] The organization can use any stock status assessments or systems that are relevant to the location of origin and species.

Topic 13.4 Natural ecosystem conversion

Natural ecosystem conversion refers to the human-induced change of a natural ecosystem to another use or a profound change in a natural ecosystem's species composition, structure, or function. This topic covers impacts related to natural ecosystem conversion, including land clearance, severe degradation, or the introduction of management practices that lead to substantial and sustained change in natural ecosystems' former species composition, structure, or function.

Natural ecosystems offer important ecosystem services, including absorbing and storing vast quantities of carbon dioxide (CO_2). When natural ecosystems are converted, stored carbon can be released into the atmosphere, contributing to greenhouse gas (GHG) emissions and climate change. Estimates show that the loss of primary tropical forests in 2019 resulted in the release of more than 2 billion tons of CO_2 [86] (see topics 13.1 Emissions and 13.2 Climate adaptation). Conversion of natural ecosystems can also lead to the loss of biodiversity acceleration of soil erosion, and increased runoff and water pollution (see also topics 13.3 Biodiversity, 13.5 Soil health and 13.7 Water and effluents).

In agriculture and aquaculture sectors, natural ecosystem conversion can occur when terrestrial and aquatic ecosystems are used for animal breeding, grazing, crop production, aquaculture production, and ancillary activities. This can occur rapidly, with a substantial change taking place in a short time, or gradually, with incremental changes over a long time.

Conversion of terrestrial ecosystems can include the conversion of forests, grasslands, woodlands, or savannas. Deforestation occurs when primary and secondary forests are cleared, often by burning. Deforestation in tropical rainforests can have severe impacts because they provide habitats for many of the world's species.

Aquaculture operations can result in clearing mangroves, salt marshes, and wetlands or profound and sustained changes to the coastal, lake, and river ecosystems to make them fit for aquatic farming sites. Aquaculture also relies heavily on crops, such as soy, for fish feed, which can contribute to the conversion of terrestrial ecosystems. Feed ingredients need to be traceable to identify and prevent the potential negative impacts associated with conversion (see topic 13.23 Supply chain traceability).

The rate of deforestation and other forms of conversion in the agriculture sector has been increasing to give way to plantations and pastures [91]. Deforestation and other forms of conversion occur in the supply chains of beef, soy, palm oil, cocoa, coffee, rubber, and other products. To be deemed deforestation- and conversion-free, products must be assessed as not causing or contributing to natural ecosystem conversion after an appropriate cut-off date.

People can be displaced due to physical changes to the landscapes surrounding their communities or degradation and depletion of natural resources or other ecosystem services that the community relies on (see also topic 13.12 Local communities and topic 13.13 Land and resource rights). Loss of natural ecosystems and resources can also cause food insecurity. For Indigenous Peoples, natural ecosystem conversion can result in the loss of cultural and spiritual heritage and livelihoods and affect the rights to self-determination and self-governance (see also topic 13.14 Rights of Indigenous Peoples).

Reporting on natural ecosystem conversion

If the organization has determined natural ecosystem conversion to be a material topic, this sub-section lists the disclosures identified as relevant for reporting on the topic by the agriculture, aquaculture, and fishing sectors.

STANDARD	DISCLOSURE	SECTOR STANDARD REF #
Management of the topic		

GRI 3: Material Topics 2021	Disclosure 3-3 Management of material topics
	
	Additional sector recommendations
	• Describe policies or commitments to reduce or eliminate natural ecosystem conversion, including target[11] and cut-off dates[12], for the following:
	  - the organization's own production;
	  - sourcing of terrestrial animal and fish feed;
	  - products sourced by the organization for aggregation, processing, or trade.
	• Describe how the organization ensures that its suppliers comply with its natural ecosystem conversion policies and commitments, including through sourcing policies and contracts.
	• Report the organization's participation in multi-stakeholder, landscape[13], or sectoral initiatives intended to reduce or eliminate natural ecosystem conversion.
	• Describe the tools and systems used to monitor natural ecosystem conversion in the organization's activities, supply chain, and sourcing locations.
		13.4.1

Additional sector disclosures		
Report the percentage of production volume from land owned, leased or managed by the organization determined to be deforestation- or conversion-free, by product, and describe the assessment methods used.[14]		13.4.2
For products sourced by the organization, report the following by product: • the percentage of sourced volume determined to be deforestation- or conversion-free, and describe the assessment methods used.		13.4.3

[11] A target date is defined by the Accountability Framework as "the date by which [the organization] intends to have fully implemented its commitment or policy" [92].

[12] Cut-off dates may differ between commodities and regions. Appropriate cut-off dates can be selected based on sector-wide or regional cut-off dates, or those specified in certification programs, legislation, voluntary initiatives, or be based on the availability of monitoring data. More guidance on identifying appropriate cut-off dates can be found in the Accountability Framework initiative Operational Guidance on Cutoff Dates [93].

[13] Landscapes refer to natural and/or human-modified ecosystems, often with a characteristic configuration of topography, vegetation, land use, and settlements. Landscape initiatives refer to how organizations in the production and sourcing of agricultural products need to work beyond their own supply chains to address sustainability issues and support positive outcomes for the people and sourcing locations. These definitions are based on Food and Agriculture Organization, Landscape approaches: key concepts [84] and Proforest, Landscape initiatives [88].

[14] Assessment methods can include monitoring, certification, sourcing from low-risk jurisdictions with no or negligible recent conversion, or sourcing from verified suppliers.

• the percentage of sourced volume for which origins are not known to the point where it can be determined whether it is deforestation- or conversion-free, and describe actions taken to improve traceability.	
Report the size in hectares, the location, and the type[15] of natural ecosystems converted since the cut-off date on land owned, leased, or managed by the organization.[16]	13.4.4
Report the size in hectares, the location, and the type of natural ecosystems converted since the cut-off date by suppliers or in sourcing locations.[17]	13.4.5

[15] ~~Natural ecosystem type can be characterized by biome, vegetation type, or high conservation value status relevant to the region and regulatory context.~~ The organization can report ecosystem types using the biomes or ecosystem functional groups in the IUCN Global Ecosystem Typology. Alternatively, the organization can report according to another global classification, national classification, or register. If the organization cannot use ecosystem classifications, it can use land use classifications (e.g., Globio land use categories) instead.

[16] Requirement 101-6-a-i in *GRI 101: Biodiversity 2024* requires information on natural ecosystems converted at the organization's sites with the most significant impacts on biodiversity where its activities lead or could lead to land and see use change. This information can support in compiling the information for additional sector disclosure 13.4.4.

[17] 'Requirement 101-6-e in *GRI 101: Biodiversity 2024* requires information on natural ecosystems converted for products and services in its supply chain with the most significant impacts on biodiversity where its activities lead or could lead to land and see use change. This information can support in compiling the information for additional sector disclosure 13.4.5.

GRI 14: Mining Sector 2024

Topic 14.1 Climate change and just transition

The single biggest contributor to climate change is greenhouse gas (GHG) emissions, the impacts of which are occurring at an accelerated rate. Organizations have a responsibility to contribute to climate change mitigation and adaptation, including by developing and implementing transition and adaptation plans that align with the principles of just transition. This topic covers GHG emissions, transition to less GHG-emissions intensive economic activities, and climate change adaptation, including impacts on workers, local communities, and Indigenous Peoples.

Mining activities are energy-intensive and contribute to greenhouse gas (GHG) emissions. The primary GHG emitted through the sector's activities is carbon dioxide (CO_2). Other GHGs from mining activities include methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

To combat climate change, signatories to the Paris Agreement have committed to transition to less GHG emissions-intensive economic activities. Organizations in the mining sector are increasingly expected to set GHG emissions reduction targets and reduce GHG emissions in line with the latest scientific evidence on the effort needed to limit global warming to 1.5°C above pre-industrial levels [42].

Most GHG emissions from mining activities are associated with the use of fossil fuel-powered vehicles in excavation and material transfer, for example, and the consumption of self-generated and purchased electricity. Therefore, most emissions in the mining sector are Scope 1 GHG emissions from sources owned or controlled by the organization, and Scope 2 GHG emissions from the generation of purchased or acquired electricity, heating, cooling, and steam.

Mining organizations are also under increasing scrutiny over Scope 3 GHG emissions in their upstream and downstream value chains. For organizations mining gold and other precious metals, the most substantial Scope 3 GHG emissions tend to originate upstream, namely, from purchased goods and services. Where minerals require extensive refining, such as smelting, most Scope 3 GHG emissions tend to originate downstream, namely from processing of sold products, where coal is used as an energy source. Examples include the manufacture of steel, aluminum, and cement.

The amount of energy used at a mine and the resulting GHG emissions depends on several factors, such as mining method, mine depth, geology, mine productivity, and the degree and method of processing required. For example, most of the energy needs of open pit mines are associated with extensive soil and rock movement and longer haul distances, while underground mines have greater pumping, ventilation, cooling, and hoisting-related energy requirements. Beyond the total energy consumption, the GHG emissions intensity of mining activities can vary according to mine design and planning, operational practices, and the energy source used. Coal as a fuel source has the highest GHG emissions intensity compared to other fossil fuels, typically releasing more than twice the amount of GHGs than natural gas per unit of electricity produced.

GHG emissions can also increase due to human-induced changes in the use or management of land, which may lead to a change in land cover. For instance, when forests are cleared to enable mineral extraction and the supporting infrastructure (see also topic 14.4 Biodiversity). Land use change emissions are more prevalent in surface mining due to the greater land use requirements and often lower-grade ores. Methane (CH_4) can also be released through extraction, venting, or as fugitive emissions. Closure activities can further contribute to GHG emissions. However, the rehabilitation of mine sites can be used to capture CO_2 with appropriate reclamation and post-reclamation strategies.

To reduce Scope 1 and Scope 2 GHG emissions, mining organizations can implement energy efficiency measures, electrify equipment, and switch to renewable or low-carbon fuel sources. In some cases, GHG emissions reduction initiatives such as the electrification of a mine may also bring shared power to local communities and businesses. However, it can pose additional challenges to communities, including increased pressure on regional and national energy grids, energy supply disruptions, job losses, or new environmental challenges (see also topics 14.8 Closure and rehabilitation and 14.9 Economic impacts).

Changing climatic conditions, rising sea levels, and increasing intensity and frequency of extreme weather events can have negative impacts on workers, suppliers, local communities, Indigenous Peoples, and infrastructure. Climate change has been found to aggravate the impacts of mining on the local environment, disrupting biodiversity (see also topic 14.4 Biodiversity), affecting water quality and quantity, and exacerbating water stress (see also topic 14.7 Water and effluents). Climate change also heightens the risks of tailings storage facility failures due to increased rainfall (see also topic 14.6 Tailings and 14.15 Critical incident management). Rising temperatures can have negative impacts on air quality through the retention of particulate matter, which can exacerbate the impacts of air pollution (see also topic 14.3 Air emissions), while creating drier conditions in mining areas. These impacts can have implications for the health, safety, well-being, and livelihoods of local communities, Indigenous Peoples, and workers. They can also increase competition for natural resources, which disproportionately affects women [70] (see also topic 14.10 Local communities).

Beyond reducing GHG emissions, mining organizations can help local communities adapt to climate change. This includes planning for post-mining land use, preserving natural resources for agriculture, promoting climate change-resilient economic growth, and enhancing emergency preparedness. They can also help improve access to energy and water by partnering with governments on shared renewable energy projects, implementing energy-saving programs, and sharing water resources.

The transition to less GHG emissions-intensive economic activities is expected to increase demand for critical minerals needed for clean energy technologies, such as cobalt, copper, lithium, nickel, and rare earth elements. If managed well, this can present opportunities for mineral-rich countries through positive economic development (see also topic 14.9 Economic impacts). However, an increase in negative impacts on the environment and human rights is recognized as a major risk. Many minerals that face rising demand are extracted from regions vulnerable to political instability, institutional weakness, and human rights violations. Mining in these areas can trigger or exacerbate conflict, corruption, environmental damage, and labor abuses (see also topic 14.25 Conflict-affected and high-risk areas).

Reporting on climate change and just transition

If the organization has determined climate change and just transition to be a material topic, this sub-section lists the disclosures identified as relevant for reporting on the topic by the mining sector.

STANDARD	DISCLOSURE	SECTOR STANDARD REF #
Management of the topic		
GRI 3: Material Topics 2021	Disclosure 3-3 Management of material topics ~~• Describe the climate change-related scenarios used to assess the resilience of the organization's strategy, including a well-below 2°C, preferably 1.5°C, scenario.[18]~~ ~~• Report whether the organization has a climate change adaptation plan in place, and if so, provide a summary of the plan and the progress made in implementing the plan, and describe how engagement with stakeholders has informed the plan.~~	14.1.1
Topic Standard disclosures		
GRI 102: Climate Change and Just Transition 2025	Disclosure 102-1 Transition plan for climate change mitigation	14.1.2
	Disclosure 102-2 Climate change adaptation plan ~~Disclosure 201-2 Financial implications and other risks and opportunities due to climate change~~ *Additional sector recommendations* • Describe how changes to the organization's operations, revenue, or expenditures due to climate change affect or could affect its contributions to economic development and its payments to governments.	14.1.3
	Disclosure 102-3 Just transition	14.1.4
	Disclosure 102-4 GHG emissions reduction targets and progress	14.1.5
	Disclosure 102-5 Scope 1 GHG emissions ~~Disclosure 305-1 Direct (Scope 1) GHG emissions~~ *Additional sector recommendations* • When reporting the gross Scope 1 GHG emissions, include land use change emissions.[19]	14.1.6

~~18 The Paris Agreement aims at holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels [67]. Scientific evidence released after the Paris Agreement came into force shows that limiting global warming to 1.5°C 'would substantially reduce projected losses and damages related to climate change in human systems and ecosystems compared to higher warming levels' [64].~~

[19] Land use change refers to a change in the use or management of land by humans, which may lead to a change in land cover. It covers changes to terrestrial ecosystems, such as when forests are converted to enable mineral extraction and supporting infrastructure. Guidance on calculating land use change emissions can be found in the IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry [59] and its 2019 updates [60].

	• Report a breakdown of the gross Scope 1 GHG emissions by mine site.	
	~~Disclosure 305-2 Energy indirect (Scope 2) GHG emissions~~ Disclosure 102-6 Scope 2 GHG emissions *Additional sector recommendations* • Report a breakdown of the gross location-based Scope 2 GHG emissions by mine site. • If applicable, report a breakdown of the gross market-based Scope 2 GHG emissions by mine site.	14.1.7
	~~Disclosure 305-3 Other indirect (Scope 3) GHG emissions~~ Disclosure 102-7 Scope 3 GHG emissions	14.1.8
	~~Disclosure 305-4 GHG emissions intensity~~ Disclosure 102-8 GHG emissions intensity • Report a breakdown of emissions intensity by mine site.	14.1.9
	Disclosure 102-9 GHG removals in the value chain	14.1.10
	Disclosure 102-10 Carbon credits	14.1.11
GRI 103: Energy 2025	Disclosure 103-1 Energy policies and commitments	14.1.12
	~~Disclosure 302-1 Energy consumption within the organization~~ Disclosure 103-2 Energy consumption and self-generation within the organization	14.1.13
	~~Disclosure 302-2 Energy consumption outside of the organization~~ Disclosure 103-3 Upstream and downstream energy consumption	14.1.14
	~~Disclosure 302-3 Energy intensity~~ Disclosure 103-4 Energy intensity	14.1.15