TPI Global Climate Transition Centre
Research and Data at LSE

LSE Global School of Sustainability

Net Zero Strategies assessment framework for diversified mining: methodology note

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The TPI Global Climate Transition Centre at LSE

The TPI Global Climate Transition Centre (TPI Centre) is an independent, authoritative source of research and data on the progress of corporate and sovereign entities in transitioning to a low-carbon economy. It is part of the Global School of Sustainability at the London School of Economics and Political Science (LSE). The TPI Centre is the academic partner of the Transition Pathway Initiative (TPI), a global initiative led by asset owners and supported by asset managers, aimed at helping investors and other stakeholders assess company, bank and sovereign preparedness for the transition to a low-carbon economy and supporting efforts to address climate change. More than 155 investors globally, representing approximately US$90 trillion[1] combined Assets Under Management and Advice, have pledged support for TPI. The TPI Centre is also the academic research expert of Assessing Sovereign Climate-related Opportunities and Risks (ASCOR).

The TPI Centre provides data on listed equities, corporate bond issuers, banks and sovereign bond issuers. The TPI Centre's company data:

- Assess the quality of companies' governance and management of their carbon emissions and of risks and opportunities related to the low-carbon transition
- Evaluate if companies' current and planned future emissions align with international climate targets and national climate pledges, including those made as part of the Paris Agreement
- Form the basis for the Climate Action 100+ Net Zero Company Benchmark Disclosure Framework assessments
- Provide detailed assessments of companies' transition plans in high-emitting and hard-to-abate sectors
- Are published alongside the methods online. They are public and free to use for non-commercial purposes and available at www.transitionpathwayinitiative.org.

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[1] This figure is subject to market-price and foreign-exchange fluctuations and, as the sum of self-reported data by TPI supporters, may double-count some assets.

Contents

1. Introduction to TPI's Net Zero Strategies assessment frameworks

Background and purpose

The Net Zero Strategies (NZS) assessment frameworks are sector-specific frameworks developed and applied by the TPI Centre to evaluate companies' transition plans and decarbonisation strategies across their business segments. The frameworks systematically assess decarbonisation levers and capital expenditure plans, comprehensively evaluating how companies are planning to reach their decarbonisation targets.

In 2025, the Institutional Investors Group on Climate Change (IIGCC) launched its *Engage series*, followed by the publication of a set of *Primers* and *Tools for engagement*. The TPI Centre's NZS assessment frameworks are designed to align with the sector-specific requirements of the Engage series, providing investors with a comprehensive view of companies' decarbonisation plans to inform and support company dialogue.

The frameworks are also designed to complement other investor engagement initiatives, including the Climate Action 100+ (CA100+) benchmarks and the Net Zero Investment Framework, by offering more granular analysis of the indicators and criteria addressed by these initiatives, including decarbonisation plans, capital allocation and other key transition topics.

For the diversified mining sector, the framework is an evolution of the Net Zero Standards for Diversified Mining, published by the CA100+ initiative and coauthored by the IIGCC, the Investor Group on Climate Change (IGCC) and the TPI centre in 2023 [1], with refinements to streamline and adapt the framework for use in the Net Zero Strategies assessment.

Structure of the note

This note first describes the design principles applied in the development and iteration of the NZS frameworks. It then introduces the structure of the NZS assessment framework for the diversified mining sector, including its thematic areas and indicator types. Finally, it presents the full set of indicators, alongside an associated assessment methodology.

2. Design principles behind the frameworks' development

The TPI Centre's NZS assessments are guided by the key design principles of transparency, accountability and robustness, which are essential for ensuring the credibility of the assessment process. The assessment principles in full are:

1. Assessments must be based solely on publicly available company disclosures. Transparency in how companies disclose the key elements of their decarbonisation plans is critical to the TPI Centre's ability to assess them and enables users to understand and verify assessment outcomes. The use of publicly available information ensures that companies are assessed consistently and fairly.
2. Indicators are assessable objectively using a transparent methodology. For clarity, comparability and ease of interpretation, the frameworks prioritise 'Yes' or 'No' indicators, which are complemented, where relevant, by quantitative alignment assessments that compare companies' pathways with low-carbon scenario benchmarks. Materials related to the frameworks, including this methodology note, are open-access and available on the TPI Centre website.
3. The assessment frameworks are relevant for all types of companies within a sector, reflecting the diversity of business models in each sector and incorporating business-segment-specific indicators where relevant.
4. The assessment frameworks are designed to capture different decarbonisation strategies, recognising that companies may follow a range of transition pathways, such as diversifying into low-carbon products or undertaking a managed wind-down of existing carbon-intensive products. The frameworks do not privilege any particular decarbonisation lever; instead, they seek clarity on the contribution of each lever to companies' emissions targets and the disclosure of resources allocated to support their implementation.
5. Indicators are clear, useful and accessible to users, including those with limited resources to assess climate change. To create an easy-to-use framework, efforts have been taken to minimise the number of topics and focus on the most important aspects of climate risks and opportunities.

3. Net Zero Strategies assessment framework for the diversified mining sector

The NZS frameworks are designed to assess companies' transition strategies. They are organised into areas covering sector-specific business segments and cross-cutting transition topics. Within each area, companies are assessed through a set of indicators. Most indicators are scored as either meeting the specific scoring criteria (Yes) or not (No). Alignment indicators, which measure whether the elements of a company's transition strategy are aligned with low-carbon scenarios, are recorded not as Yes/No scores but as alignment scores (e.g., Below 2°C). The areas and indicators defined for the diversified mining sector framework are set out below.

AREA: The NZS assessment framework for the diversified mining sector is organised into nine thematic areas, each representing a key dimension of companies' transition strategies and relevant business segments, as listed in Table 3.1.

Table 3.1. Areas of the NZS assessment framework for the diversified mining sector

The nine assessment areas	OE: Operational emissions	Assessment of a company's strategy to reduce Scope 1 and Scope 2 emissions from its operations
	ME: Methane emissions	Assessment of a company's strategy for measuring, disclosing, and mitigating methane emissions from its operations
	TC: Thermal coal	Assessment of a company's strategy related to aligning thermal coal production with low-carbon scenarios
	MC: Metallurgical coal	Assessment of a company's strategy related to aligning metallurgical coal production with low-carbon scenarios
	IO: Iron Ore	Assessment of a company's strategy to reduce emissions across the iron ore value chain
	BA: Bauxite and alumina	Assessment of a company's strategy to reduce emissions across the bauxite and alumina value chain
	KT: Key transition materials (KTMs)	Assessment of a company's strategy and disclosures related to the production of materials critical to the energy transition
	SH: Shipping of products	Assessment of a company's strategy to reduce emissions from the shipping of its products
	JT: Just transition	Assessment of a company's commitments and plans related to just transition principles

INDICATOR: The areas consist of indicators, which serve as the scoring units. Each indicator in the NZS assessment framework for the diversified mining sector is categorised under one of the indicator types listed in Table 3.2.

Table 3.2 Indicator types in the NZS assessment framework for the diversified mining sector

The five indicator types				
Climate-related disclosures	**Decarbonisation levers**	**Capital expenditure and planning**	**Just transition**	**Alignment**
Indicators assessing whether the company has disclosed certain climate-related data (e.g. KT.1)	Indicators assessing the company's quantified targets for its decarbonisation levers (e.g. KT.3)	Indicators assessing the company's disclosure of capital expenditure (capex) and details of decarbonisation planning (e.g. KT.4)	Indicators assessing how the company integrates just transition principles into its transition plans (e.g. JT.1)	Indicators assessing the alignment of the company's target for a specific decarbonisation lever with low-carbon scenarios (e.g. KT.a)
Yes/No binary	Yes/No binary	Yes/No binary	Yes/No binary	Alignment scores

The structure of the framework is summarised in Table 3.3. The units of assessment are listed in order of granularity.

Table 3.3. Structure of the NZS assessment framework for the diversified mining sector

Sector →	Area →	Indicator				
Diversified mining	Thematic categories of the NZS framework for the diversified mining sector (e.g. KT. Key transition materials)	Scoring units of the NZS framework for the diversified mining sector (e.g. KT.1). Categorised into five categories:				
		Climate-related disclosures	Decarbonisation levers	Capital expenditure and planning	Just transition	Alignment

Timeframes

Some indicators within the framework are associated with time horizons. Indicators relating to decarbonisation levers are primarily assessed over the medium and long term, while certain capital expenditure and planning indicators require forward-looking disclosure of companies' planned investments. Unless otherwise specified in this methodology note, the timeframes applied in the assessment are as follows:

- Medium term for decarbonisation levers: 2029–2035
- Long term for decarbonisation levers: 2036–2050
- Forward-looking timeframe for capital expenditure indicators: a minimum of three years

Alignment indicators are also assessed on different time horizons. Following the construction of company-specific pathways, the alignment of companies' decarbonisation levers is evaluated in the years 2030 and 2050 (or 2040 for indicator KT.a), as these are the most commonly stated target years at the time of publication of this version of the methodology.

4. Assessment methodology

OE: Operational emissions

Indicators in this section are applicable to all diversified mining companies.

Indicator OE.1 [Climate-related disclosures]	**Does the company disclose the operational emissions intensity of its individual mined products that together account for more than 80% of its total operational emissions?**
Detailed guidance	A company is assessed as 'Yes' if it discloses operational emissions intensity figures for each of its individually mined products as production-weighted averages across all mines producing the same product. If it only discloses absolute emissions, it must also disclose the corresponding production data required to calculate intensities for each of its individually mined products. Collectively, the products for which emissions figures are disclosed must account for more than 80% of the company's total operational emissions. Operational emissions refer to Scope 1 and Scope 2 emissions associated with mining activities. The calculation methodology and system boundaries applied, including whether on-site processing is included, must be disclosed.
Indicator OE.2 [Climate-related disclosures]	**Does the company disclose its total energy consumption, broken down by fuel and electricity source, on a reporting boundary consistent with its emissions disclosure?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its total energy consumption and provides a quantified breakdown by individual fuel type (e.g. natural gas, coal, oil, biofuels) and electricity consumption separately, such that the disclosed components account for total energy consumption. The disclosure must report energy consumption for all fuel types (e.g. gas, oil) and electricity, reported in energy units. The disclosure must also use a reporting boundary consistent with that applied to the company's emissions disclosures.
Indicator OE.3 [Climate-related disclosures]	**Does the company clearly disclose the impact of any acquisitions, divestments or other changes in its reporting boundary on its emissions?**
Detailed guidance	A company is assessed as 'Yes' if it transparently discloses the impact of acquisitions, divestments or other changes to business structure on its emissions reporting, including clear information on the timing of such changes. The disclosure must provide details of how each change to business structure is reflected in its emissions accounting. This must include the specific assets, timing of change and the type of change (e.g. divestment). The disclosure must also quantify the overall impact of these changes on reported emissions.

Indicator OE.4 [Decarbonisation levers]	Does the company quantify the contribution of operational emissions reduction levers to its medium-term emissions target?
Detailed guidance	A company is assessed as 'Yes' if it quantifies the total planned contribution of operational emissions reduction levers to its medium-term emissions reduction target. Operational emissions reduction levers refer to measures implemented to reduce Scope 1 and Scope 2 emissions from the company's operations. Relevant measures may include, but are not limited to, electricity-related measures such as the procurement of renewable electricity or electrification interventions, methane reduction measures (for companies mining coal), emissions reduction from mining vehicles and other mine-site or processing emissions reductions. The disclosure must enable the calculation of the contribution of operational emissions reduction levers to the company's medium-term emissions reduction target. This includes, but is not limited to, the contributions being quantified either as a percentage relative to the base year or to the overall emissions reductions, or in absolute terms. If the figure is expressed as a range, the disclosure is only sufficient to score if the range is narrower than 10% of the base-year value.

Indicator OE.5 [Decarbonisation levers]	Does the company quantify the contribution of operational emissions reduction levers to its long-term emissions target?
Detailed guidance	A company is assessed as 'Yes' if it quantifies the total planned contribution of operational emissions reduction levers to its long-term emissions reduction target. Operational emissions reduction levers refer to measures implemented to reduce Scope 1 and Scope 2 emissions from the company's operations. Relevant measures may include, but are not limited to, electricity-related measures such as the procurement of renewable electricity or electrification interventions, methane reduction measures (for companies mining coal), emissions reduction from mining vehicles and other mine-site or processing emissions reductions. The disclosure must enable the calculation of the contribution of operational emissions reduction levers to the company's long-term emissions reduction target. This includes, but is not limited to, the contributions being quantified either as a percentage relative to the base year or to the overall emissions reductions, or in absolute terms. If the figure is expressed as a range, the disclosure is only sufficient to score if the range is narrower than 10% of the base-year value.

Indicator OE.6 [Capital expenditure and planning]	Does the company disclose capital expenditure on its operational emissions reduction levers for the most recent financial year, and provide forward-looking guidance?
Detailed guidance	A company is assessed as 'Yes' if it discloses its total current and forward-looking capital expenditure (capex) on operational emissions reduction levers. Disclosures must separate out the capex for operational emissions reduction levers from other decarbonisation capex and disclose this as an independent figure. The figures must be disclosed in a format consistent with the company's disclosed total capex to enable the calculation of ratios of operational emissions reduction levers to total capex. Disclosures must state the value in the current year of disclosure and a forward-looking value at least three years in the future, specifying the number of years included. The disclosure must allow the calculation of annual capex over the period covered by the capex guidance. This includes, but is not limited to, capex figures being reported either on a total budget basis with the number of years covered specified, on an average annual basis, or as a percentage of sales, conditional on the provision of annual sales guidance.

ME: Methane emissions

Indicators in this area are only applicable to companies with coal production.

Indicator ME.1 [Climate-related disclosures]	**Does the company disclose its total methane emissions on both an absolute and an intensity basis?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its total operational methane emissions on both an absolute and an intensity basis. Absolute methane emissions figures must be expressed in terms of either tonnes of methane (CH_4) or carbon dioxide equivalent (CO_2e). Where emissions are disclosed in CO_2e, the disclosure must also state the global warming potential (GWP) value and time horizon used to calculate the CO_2e conversion. Methane intensity values must be disclosed as a production-weighted average across coal mines (e.g. tonnes of CH_4 per megatonne of coal produced).
Indicator ME.2 [Climate-related disclosures]	**Does the company disclose methane emissions at the mine level?**
Detailed guidance	A company is assessed as 'Yes' if it disaggregates its coal mining methane emissions at the mine level. The disclosure must provide the following information: 1. Mine-by-mine methane emissions on an absolute basis (in tonnes of CH_4 or CO_2e). Where CO_2e is used, GWP time horizon and value must also be disclosed; and 2. Mine-by-mine methane intensity as a production-weighted average. Note that this indicator covers mines over which the company has operational control, as well as non-operated assets (e.g. minority equity interests).
Indicator ME.3 [Climate-related disclosures]	**Does the company disclose the methodology used to report methane emissions, including the roles of direct measurement and emission factors, at the mine level?**
Detailed guidance	A company is assessed as 'Yes' if it discloses the methodology used to report methane emissions at the mine level. The disclosure must specify the measurement and estimation procedures for methane emissions applied at the mine level, including the emission factors used where applicable
Indicator ME.4 [Decarbonisation levers]	**Does the company disclose a quantified medium-term methane emissions reduction target with an interim milestone?**
Detailed guidance	A company is assessed as 'Yes' if it has set a medium-term methane emissions reduction target as a part of its emissions reduction plans. The disclosure must specify a medium-term methane emissions reduction target with a defined base year and target year, base year value and target year reduction, coverage of activities and an interim milestone. The stated figure must be expressed either as a reduction relative to methane emissions in a base year or relative to a physical methane intensity metric.

Indicator ME.5 [Decarbonisation levers]	Does the company disclose a quantified long-term methane emissions reduction target?
Detailed guidance	A company is assessed as 'Yes' if it has set a long-term methane emissions reduction target as a part of its emissions reduction plans. The disclosure must specify a long-term methane emissions reduction target with a defined base year and target year, base year value and target year value, and coverage of activities. The stated figure must be expressed either as a reduction relative to methane emissions in a base year or relative to a physical methane intensity metric. If the company has set a company-wide long-term net zero target that explicitly covers all methane emissions from coal mining, it scores positively on this indicator.
Indicator ME.6 [Capital expenditure and planning]	**Does the company set out a clear methane reduction strategy, covering pre-mining, active operations and post-mining phases, and prioritising abatement at its highest-emitting coal mines?**
Detailed guidance	A company is assessed as 'Yes' if it discloses a strategy to reduce methane emissions, covering the different stages of mining operations and the prioritisation of abatement efforts. The disclosure must describe how it will mitigate methane emissions at different stages. For underground mines, this must include pre-, during- and post-mining measures. For surface mines, only pre-mining measures must be disclosed. The disclosure must also explain how it prioritises methane abatement across its mines. This includes, but is not limited to, reference to a marginal abatement cost curve, a ranking of mines by methane emissions or other criteria used to allocate mitigation efforts.
Indicator ME.a [Alignment]	**What is the company's methane emissions pathway alignment with low-carbon scenarios over the medium and long term?**
Detailed guidance	This indicator assesses the alignment of the company's methane emissions reduction pathway with low-carbon scenarios. The pathway is derived from medium- and long-term methane emissions reduction targets provided in indicators ME.4 and ME.5. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [2]. These are a '1.5°C' scenario, a 'Below 2°C' scenario and a 'National Pledges' scenario. The methodology used to derive methane emissions projections for each scenario, which form the benchmark pathways, is explained in the Appendix. The company's alignment score in a given year is determined by identifying the most ambitious scenario for which the company's methane emissions reduction trajectory meets or exceeds the reduction required under that scenario. If the company does not meet the reduction required under any scenario, it is scored as 'Not aligned'. This indicator is contingent on meeting indicators ME.4 and ME.5. Where these indicators are not met, the indicator is scored as 'No target'. Where these indicators are met, but insufficient data are disclosed to calculate the emissions pathway, the indicator is scored as 'No or unsuitable disclosure'.

TC: Thermal coal

Indicators in this area are only applicable to companies with thermal coal production.

Indicator TC.1 [Climate-related disclosures]	**Does the company disclose its Scope 3 Category 11 (use of sold products) emissions, separately identifying those attributable to thermal coal?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its Scope 3 Category 11 (use of sold products) emissions and separately identifies the portion attributable to thermal coal sales, expressed either in absolute terms or as a percentage of total Category 11 emissions.
Indicator TC.2 [Climate-related disclosures]	**Does the company disclose its total thermal coal production, sales and profits?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its total thermal coal production (in physical units), sales and profits (in monetary units). The disclosure must include thermal coal production, sales and profits as distinct figures, clearly separated from other production, sales and profit data. For the purposes of this indicator, "profit" refers to operating profit or an equivalent measure (e.g. EBITDA, gross profit) attributable to thermal coal activities, clearly labelled as such in company disclosures.
Indicator TC.3 [Decarbonisation levers]	**Does the company disclose a medium-term Scope 3 Category 11 (use of sold products) emissions target or production pathway specifically for its thermal coal activities?**
Detailed guidance	A company is assessed as 'Yes' if it has set a medium-term Scope 3 Category 11 emissions reduction target or production pathway specific to its thermal coal activities. The disclosure must satisfy one of the following: 1) Disclose a medium-term Scope 3 Category 11 emissions reduction target for its thermal coal activities, including a clearly defined base year and target year, the corresponding base-year and target-year values, and clear coverage of relevant activities. The target must be expressed in either absolute terms or as a percentage change from a stated base year value; or 2) Disclose a medium-term thermal coal production pathway, expressed in energy or production units or as a percentage or absolute change from a stated base year value. Aggregate coal production figures do not satisfy this requirement. Where the target is expressed as a reduction, the base year and percentage reduction must be disclosed. If the figure is expressed as a range, the disclosure is only sufficient to score if the range is narrower than 10% of the base-year value.

Indicator TC.4 [Decarbonisation levers]	Does the company disclose a long-term Scope 3 Category 11 (use of sold products) emissions target or production pathway specifically for its thermal coal activities?
Detailed guidance	A company is assessed as 'Yes' if it has set a long-term Scope 3 Category 11 emissions reduction target or production pathway specific to its thermal coal activities. The disclosure must satisfy one of the following: 1) Disclose a long-term Scope 3 Category 11 emissions reduction target for its thermal coal activities, including a clearly defined base year and target year, the corresponding base-year and target-year value, and clear coverage of relevant activities. The target must be expressed in either absolute terms or as a percentage change from a stated base year value; or 2) Disclose a long-term thermal coal production pathway, expressed in energy or production units or as a percentage or absolute change from a stated base year value. Aggregate coal production figures do not satisfy this requirement. Where the target is expressed as a reduction, the base year and percentage reduction must be disclosed. If the figure is expressed as a range, the disclosure is only sufficient to score if the range is narrower than 10% of the base-year value. If the company has set a company-wide long-term net-zero target that explicitly covers all Scope 3 Category 11 emissions from thermal coal, it scores positively on this indicator.

Indicator TC.5 [Capital expenditure and planning]	Does the company disclose its thermal coal capital expenditure for the most recent financial year and provide forward-looking guidance?
Detailed guidance	A company is assessed as 'Yes' if it discloses its total current and forward-looking thermal coal capex. The disclosure must separate out the thermal coal capex from other capex and disclose this as an independent figure. The figures must be disclosed in a format consistent with the company's disclosed total capex to enable the calculation of ratios of thermal coal to total capex. Disclosures must state the value in the current year of disclosure and a forward-looking value at least three years in the future, specifying the number of years included. The disclosure must allow the calculation of annual capex over the period covered by the capex guidance. This includes, but is not limited to, capex figures being reported either on a total budget basis with the number of years covered specified, on an average annual basis or as a percentage of sales, conditional on the provision of annual sales guidance.

Indicator TC.6 [Capital expenditure and planning]	Does the company disclose capital expenditure on new thermal coal capacity for the most recent financial year and provide forward-looking guidance?
Detailed guidance	A company is assessed as 'Yes' if it discloses its total current and forward-looking capex on new thermal coal mines. New coal capacity refers to new mines, expansions, or acquisitions. The disclosures must separate out the capex for new thermal coal capacity and disclose this as an independent figure. The figures must be disclosed in a format consistent with the company's disclosed total capex to enable the calculation of ratios of new thermal coal mine capacity to total capex. Disclosures must state the value in the current year of disclosure and a forward-looking value at least three years in the future, specifying the number of years included. The disclosure must allow the calculation of annual capex over the period covered by the capex guidance. This includes, but is not limited to, capex figures being reported either on a total budget basis with the number of years covered specified, on an average annual basis, or as a percentage of sales, conditional on the provision of annual sales guidance. This indicator is designed in line with the implications of the IEA's net zero scenario, which suggests that no new coal mines or mine extensions are required beyond those already approved for development [3].

Indicator TC.7 [Capital expenditure and planning]	Has the company committed to refraining from investing in new thermal coal capacity, including new mines, mine extensions and mine acquisitions?
Detailed guidance	A company is assessed as 'Yes' if it has set out a clear plan to stop investing in new thermal coal capacity. The disclosure must include a clear commitment to cease investment in new thermal coal capacity. This commitment must cover new coal mines, mine extensions and mine acquisitions. A commitment to stop investing in thermal coal is sufficient to score positively. Any investment that expands the capacity or planned output of thermal coal constitutes a breach of this commitment and results in a 'No' score. A statement that the company intends to close existing mines is not sufficient unless it is accompanied by an explicit commitment to refrain from future investment in new thermal coal capacity. This indicator is designed in line with the implications of the IEA's net zero scenario, which suggests that no new coal mines or mine extensions are required beyond those already approved for development [3].

Indicator TC.a [Alignment]	What is the company's thermal coal production alignment with low-carbon scenarios over the medium and long term?
Detailed guidance	This indicator assesses the alignment of the company's thermal coal production reduction pathway with low-carbon scenarios. The pathway is derived from thermal coal production reduction targets provided in indicators TC.3 and TC.4. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [2]. These are a '1.5°C' scenario, a 'Below 2°C' scenario and a 'National Pledges' scenario. The methodology used to derive thermal coal production projections for each scenario, which form the benchmark pathways, is explained in the Appendix. The company's alignment score in a given year is determined by identifying the most ambitious scenario for which the company's thermal coal production reduction meets or exceeds the reduction required under that scenario. If the company does not meet the reduction required under any scenario, it is scored as 'Not aligned'. This indicator is contingent on meeting indicators TC.3 and/or TC.4. Where these indicators are not met, the indicator is scored as 'No target'. Where these indicators are met, but insufficient data are disclosed to calculate the emissions pathway, the indicator is scored as 'No or unsuitable disclosure'.

MC: Metallurgical coal

Indicators in this area are only applicable to companies with metallurgical coal production.

Indicator MC.1 [Climate-related disclosures]	**Does the company disclose its Scope 3 Category 11 (use of sold products) emissions, separately identifying those attributable to metallurgical coal?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its Scope 3 Category 11 (use of sold products) emissions and discloses the portion attributable to metallurgical coal sales, expressed either in absolute terms or as a percentage of total Category 11 emissions. Some companies report the emissions from the sold metallurgical coal in Category 10 (processing of sold products). In this case, the company scores 'Yes' if it discloses its Scope 3 Category 10 emissions and discloses the portion attributable to metallurgical coal sales, expressed either in absolute terms or as a percentage of total Category 10 emissions.
Indicator MC.2 [Climate-related disclosures]	**Does the company disclose its total metallurgical coal production, sales and profits?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its total metallurgical coal production (in physical units), sales and profits (in monetary units). The disclosure must include metallurgical coal production, sales and profits as distinct figures, clearly separated from other production, sales and profit data. For the purposes of this indicator, "profit" refers to operating profit or an equivalent measure (e.g. EBITDA, gross profit) attributable to thermal coal activities, clearly labelled as such in company disclosures.
Indicator MC.3 [Decarbonisation levers]	**Does the company disclose a medium-term Scope 3 Category 11 (use of sold products) emissions target or production pathway specifically for its metallurgical coal activities?**
Detailed guidance	A company is assessed as 'Yes' if it has set a medium-term Scope 3 Category 11 emissions reduction target or production pathway specific to its metallurgical coal activities. The disclosure must satisfy one of the following: 1) Disclose a medium-term Scope 3 Category 11 emissions reduction target for its metallurgical coal activities, including a clearly defined base year and target year, the corresponding base-year and target-year values, and clear coverage of relevant activities. The target must be expressed in either absolute terms or as a percentage change from a stated base year value; or 2) Disclose a medium-term metallurgical coal production pathway, expressed in energy or production units or as a percentage or absolute change from a stated base year value. Aggregate coal production figures do not satisfy this requirement. Where the target is expressed as a reduction, the base year and percentage reduction must be disclosed. If the figure is expressed as a range, the disclosure is only sufficient to score if the range is narrower than 10% of the base-year value. Some companies report the emissions from the sold metallurgical coal in Category 10 (processing of sold products). In this case, a company scores 'Yes' if it discloses a medium-term Scope 3 Category 10 emissions target or production pathway specifically for metallurgical coal activities that satisfies the above criteria.

Indicator MC.4 [Decarbonisation levers]	Does the company disclose a long-term Scope 3 Category 11 (use of sold products) emissions target or production pathway specifically for its metallurgical coal activities?
Detailed guidance	A company is assessed as 'Yes' if it has set a long-term Scope 3 Category 11 emissions reduction target or production pathway specific to its metallurgical coal activities. The disclosure must satisfy one of the following: 1) Disclose a long-term Scope 3 Category 11 emissions reduction target for its metallurgical coal activities, including a clearly defined base year and target year, the corresponding base-year and target-year values, and clear coverage of relevant activities. The target must be expressed in either absolute terms or as a percentage change from a stated base year value; or 2) Disclose a long-term metallurgical coal production pathway, expressed in energy or production units or as a percentage or absolute change from a stated base year value. Aggregate coal production figures do not satisfy this requirement. Where the target is expressed as a reduction, the base year and percentage reduction must be disclosed. If the figure is expressed as a range, the disclosure is only sufficient to score if the range is narrower than 10% of the base-year value. If the company has set a company-wide long-term net-zero target that explicitly covers all Scope 3 Category 11 emissions from metallurgical coal, it scores positively on this indicator. Some companies report the emissions from the sold metallurgical coal in Category 10 (processing of sold products). In this case, a company scores 'Yes' if it discloses a long-term Scope 3 Category 10 emissions target or production pathway specifically for metallurgical coal activities that satisfies the above criteria.

Indicator MC.5 [Capital expenditure and planning]	Does the company disclose its metallurgical coal capital expenditure for the most recent financial year and provide forward-looking guidance?
Detailed guidance	A company is assessed as 'Yes' if it discloses its total current and forward-looking metallurgical coal capex. The disclosure must separate out the metallurgical coal capex from other capex and disclose this as an independent figure. The figures must be disclosed in a format consistent with the company's disclosed total capex to enable the calculation of ratios of metallurgical coal to total capex. Disclosures must state the value in the current year of disclosure and a forward-looking value at least three years in the future, specifying the number of years included. The disclosure must allow the calculation of annual capex over the period covered by the capex guidance. This includes, but is not limited to, capex figures being reported either on a total budget basis with the number of years covered specified, on an average annual basis, or as a percentage of sales, conditional on the provision of annual sales guidance.

Indicator MC.6 [Capital expenditure and planning]	Does the company disclose capital expenditure on new metallurgical coal capacity for the most recent financial year and provide forward-looking guidance?
Detailed guidance	A company is assessed as 'Yes' if it discloses its total current and forward-looking capex on new metallurgical coal mines. New coal capacity refers to new mines, expansions or acquisitions. The disclosure must separate out the capex for new metallurgical coal capacity from other capex and disclose this as an independent figure. The figures must be disclosed in a format consistent with the company's disclosed total capex to enable the calculation of ratios of new metallurgical coal capacity to total capex. Disclosures must state the value in the current year of disclosure and a forward-looking value at least three years in the future, specifying the number of years included. The disclosure must allow the calculation of annual capex over the period covered by the capex guidance. This includes, but is not limited to, capex figures being reported either on a total budget basis with the number of years covered specified, on an average annual basis, or as a percentage of sales, conditional on the provision of annual sales guidance. This indicator is designed in line with the implications of the IEA's net zero scenario, which suggests that no new coal mines or mine extensions are required beyond those already approved for development [3].

Indicator MC.7 [Capital expenditure and planning]	Has the company committed to refraining from investing in new metallurgical coal capacity, including new mines, mine extensions and mine acquisitions?
Detailed guidance	A company is assessed as 'Yes' if it has set out a clear plan to stop investing in new metallurgical coal capacity. The disclosure must include a clear commitment, with a defined timeline, to cease investment in new metallurgical coal capacity. This commitment must cover new coal mines, mine extensions and mine acquisitions. A commitment to stop investing in any type of coal mine automatically satisfies this indicator and is sufficient to score positively. Any investment that expands the capacity or planned output of metallurgical coal constitutes a breach of this commitment and results in a 'No' score. A statement that the company intends to close existing mines is not sufficient unless it is accompanied by an explicit commitment to refrain from future investment in new coal capacity. This indicator is designed in line with the implications of the IEA's net zero scenario, which suggests that no new coal mines or mine extensions are required beyond those already approved for development [3].

Indicator MC.8 [Climate-related disclosures]	Does the company disclose the proportion of its metallurgical coal production supplied to steelmaking facilities with publicly disclosed carbon capture and storage (CCS) plans?
Detailed guidance	A company is assessed as 'Yes' if it discloses the proportion of its total metallurgical coal production supplied to steelmaking facilities with publicly disclosed CCS plans. The disclosure must report the share of its metallurgical coal production supplied to steelmaking facilities that have CCS plans in place at the individual facility level, with a specified implementation timeline. Disclosure of the production share supplied to companies that have CCS plans at a corporate level is not sufficient.
Indicator MC.a [Alignment]	**What is the company's metallurgical coal production alignment with low-carbon scenarios over the medium and long term?**
Detailed guidance	This indicator assesses the alignment of the company's metallurgical coal production reduction pathway with low-carbon scenarios. The pathway is derived from metallurgical coal production reduction targets provided in indicators MC.3 and MC.4. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [2]. These are a '1.5°C' scenario, a 'Below 2°C' scenario and a 'National Pledges' scenario. The methodology used to derive metallurgical coal production projections for each scenario, which form the benchmark pathways, is explained in the Appendix. The company's alignment score in a given year is determined by identifying the most ambitious scenario for which the company's metallurgical coal production reduction meets or exceeds the reduction required under that scenario. If the company does not meet the reduction required under any scenario, it is scored as 'Not aligned'. This indicator is contingent on meeting indicators MC.3 and/or MC.4. Where these indicators are not met, the indicator is scored as 'No target'. Where these indicators are met, but insufficient data are disclosed to calculate the emissions pathway, the indicator is scored as 'No or unsuitable disclosure'.

IO: Iron ore

Indicators in this area are only applicable to companies with iron ore production.

Indicator IO.1 [Climate-related disclosures]	**Does the company disclose its Scope 3 Category 10 (processing of sold products) emissions, separately identifying those attributable to iron ore?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its Scope 3 Category 10 (processing of sold products) emissions and separately identifies the portion attributable to iron ore sales, expressed either in absolute terms or as a percentage of total Category 10 emissions.
Indicator IO.2 [Decarbonisation levers]	**Does the company disclose a target to reduce its Scope 3 Category 10 (processing of sold products) emissions from iron ore?**
Detailed guidance	A company is assessed as 'Yes' if it has set a Scope 3 Category 10 (processing of sold products) emissions reduction target specific to its iron ore activities. The disclosure must include a Scope 3 Category 10 emissions reduction target for its iron ore activities, specifying a defined base year and target year, the corresponding base-year and target-year values, and coverage of activities. Where more than 90% of the company's Scope 3 Category 10 emissions are attributable to iron ore, a general Scope 3 Category 10 target is considered sufficient to score 'Yes' on this indicator. If the company has set a company-wide long-term net-zero target that explicitly covers all Scope 3 Category 10 emissions from iron ore, it scores positively on this indicator.
Indicator IO.3 [Capital expenditure and planning]	**Has the company set out a strategy for decarbonisation measures to reduce its Scope 3 Category 10 (processing of sold products) emissions from iron ore?**
Detailed guidance	A company is assessed as 'Yes' if it has a strategy to reduce its Scope 3 Category 10 (processing of sold products) emissions from iron ore. The disclosure must specify the measures the company is taking to reduce these emissions, explain how the proposed measures are expected to contribute to emissions reduction, and disclose the planned timeline for implementation.
Indicator IO.4 [Capital expenditure and planning]	**Does the company disclose details of projects and partnerships with customers to reduce its Scope 3 Category 10 (processing of sold products) emissions from iron ore, including the associated abatement potential, milestones and timelines?**
Detailed guidance	A company is assessed as 'Yes' if it discloses details of projects and partnerships undertaken with customers to reduce its Scope 3 Category 10 (processing of sold products) emissions from iron ore. The disclosure must provide details of each project and/or partnership, including the associated abatement potential, key milestones and implementation timelines.

Indicator IO.5 [Climate-related disclosures]	**Does the company disclose the current proportion of its direct iron ore sales to customers that have set net zero targets for 2050 or earlier?**
Detailed guidance	A company is assessed as 'Yes' if it discloses the current proportion of its direct iron ore sales to customers with publicly stated net-zero targets for 2050 or earlier. The proportion can be expressed as a percentage of total direct iron ore sales or as an equivalent production or revenue share.
Indicator IO.6 [Climate-related disclosures]	**Does the company disclose the proportion of its iron ore production that is DR-grade (Fe ≥ 66%)?**
Detailed guidance	A company is assessed as 'Yes' if it discloses the proportion of its iron ore production that meets direct reduction (DR) grade specifications. DR-grade refers to iron ore products suitable for the direct reduction steelmaking route. These products include pellets and lump ore, as well as pellet feed meeting specifications for pellet production. Direct reduction steelmaking requires higher-grade iron ore than blast furnaces, and DR-grade iron ore is defined as having an iron (Fe) content of 66% or more [4]. The disclosure must report the share of its total iron ore production that is DR-grade, expressed as a percentage of total production or as an absolute production figure.
Indicator IO.7 [Capital expenditure and planning]	**Does the company disclose capital expenditure on Scope 3 Category 10 (processing of sold products) emissions reduction initiatives for iron ore in the most recent financial year, and provide forward-looking guidance?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its total current and forward-looking capex on Scope 3 Category 10 emissions reduction initiatives for iron ore. The disclosures must separate out the capex for these initiatives from other capex and disclose this as an independent figure. The figures must be disclosed in a format consistent with the company's disclosed total capex to enable the calculation of ratios of Scope 3 Category 10 emissions reduction initiatives for iron ore to total capex. Disclosures must state the value in the current year of disclosure and a forward-looking value at least three years in the future, specifying the number of years included. The disclosure must allow the calculation of annual capex over the period covered by the capex guidance. This includes, but is not limited to, capex figures being reported either on a total budget basis with the number of years covered specified, on an average annual basis, or as a percentage of sales, conditional on the provision of annual sales guidance.

Indicator IO.a [Alignment]	What is the alignment of the company's Scope 3 Category 10 (processing of sold products) emissions pathway from iron ore with low-carbon scenarios over the medium and long term?
Detailed guidance	This indicator assesses the alignment of the company's Scope 3 Category 10 (processing of sold products) emissions pathway from iron ore with low-carbon scenarios. The pathway is derived from the Scope 3 Category 10 iron ore emissions reduction target provided in indicator IO.2. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [2]. These are a '1.5°C' scenario, a 'Below 2°C' scenario and a 'National Pledges' scenario. The methodology used to derive Scope 3 Category 10 emissions projections from iron ore for each scenario, which form the benchmark pathways, is explained in the Appendix. The company's alignment score in a given year is determined by identifying the most ambitious scenario for which the company's implied Scope 3 Category 10 emissions reduction meets or exceeds the reduction required under that scenario. If the company does not meet the reduction required under any scenario, it is scored as 'Not aligned'. This indicator is contingent on meeting indicators IO.1 and IO.2. The company requires both a medium and long-term target aligned with the criteria in IO.2 to score. Where these indicators are not met, the indicator is scored as 'No target'. Where a company discloses only a long-term target, the indicator is scored as 'No medium-term target'. Where these indicators are met, but insufficient data are disclosed to calculate the emissions pathway, the indicator is scored as 'No or unsuitable disclosure'.

BA: Bauxite and alumina

Indicators in this area are only applicable to companies that externally sell bauxite or alumina.

Indicator BA.1 [Climate-related disclosures]	**Does the company disclose its Scope 3 Category 10 (processing of sold products) emissions, separately identifying those attributable to bauxite and alumina?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its Scope 3 Category 10 (processing of sold products) emissions and separately identifies the portion attributable to bauxite and alumina sales, expressed either in absolute terms or as a percentage of total Category 10 emissions.
Indicator BA.2 [Decarbonisation levers]	**Does the company disclose a target to reduce its Scope 3 Category 10 (processing of sold products) emissions from bauxite and alumina?**
Detailed guidance	A company is assessed as 'Yes' if it has set a Scope 3 Category 10 (processing of sold products) emissions reduction target specific to its bauxite and alumina activities. The disclosure must include a Scope 3 Category 10 emissions reduction target for its bauxite and alumina activities, specifying a defined base year and target year, the corresponding base-year and target-year values, and coverage of activities. Where more than 90% of the company's Scope 3 Category 10 emissions are attributable to bauxite and alumina, a general Scope 3 Category 10 target is considered sufficient to score yes on this indicator. If the company has set a company-wide long-term net-zero target that explicitly covers all Scope 3 Category 10 emissions from bauxite and alumina, it scores positively on this indicator.
Indicator BA.3 [Capital expenditure and planning]	**Has the company set out a strategy for decarbonisation measures to reduce its Scope 3 Category 10 (processing of sold products) emissions from bauxite and alumina?**
Detailed guidance	A company is assessed as 'Yes' if it has a strategy to reduce its Scope 3 Category 10 (processing of sold products) emissions from bauxite and alumina. The disclosure must specify the measures the company is taking to reduce these emissions, explain how the proposed measures are expected to contribute to emissions reduction, and disclose the planned timeline for implementation.
Indicator BA.4 [Capital expenditure and planning]	**Does the company disclose details of projects and partnerships with customers to decarbonise its Scope 3 Category 10 (processing of sold products) emissions from bauxite and alumina, including the associated abatement potential, milestones and timelines?**
Detailed guidance	A company is assessed as 'Yes' if it discloses details of projects and partnerships undertaken with customers to reduce its Scope 3 Category 10 (processing of sold products) emissions from bauxite and alumina. The disclosure must provide details of each project and/or partnership, including the associated abatement potential, key milestones and implementation timelines.

Indicator BA.5 [Climate-related disclosures]	**Does the company disclose the current proportion of its direct bauxite and alumina sales to customers that have set net zero targets for 2050 or earlier?**
Detailed guidance	A company is assessed as 'Yes' if it discloses the current proportion of its direct bauxite and alumina sales to customers with publicly stated set net zero targets for 2050 or earlier. The proportion can be expressed as a percentage of total direct bauxite and alumina sales or as an equivalent production or revenue share. As most emissions in the aluminium value chain occur at the smelting stage, net-zero targets disclosed by alumina refiners (where these are the direct customers of bauxite miners) are only sufficient if they explicitly cover the refiners' downstream Scope 3 emissions.
Indicator BA.6 [Capital expenditure and planning]	**Does the company disclose capital expenditure on Scope 3 Category 10 (processing of sold products) emissions reduction initiatives for bauxite and alumina in the most recent financial year, and provide forward-looking guidance?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its total current and forward-looking capex on Scope 3 Category 10 emissions reduction initiatives for bauxite and alumina. The disclosures must separate out the capex for these initiatives from other capex and disclose this as an independent figure. The figures must be disclosed in a format consistent with the company's disclosed total capex to enable the calculation of ratios of Scope 3 Category 10 emissions reduction initiatives for bauxite and alumina to total capex. Disclosures must state the value in the current year of disclosure and a forward-looking value at least three years in the future, specifying the number of years included. The disclosure must allow the calculation of annual capex over the period covered by the capex guidance. This includes, but is not limited to, capex figures being reported either on a total budget basis with the number of years covered specified, on an average annual basis, or as a percentage of sales, conditional on the provision of annual sales guidance.

Indicator BA.a [Alignment]	What is the alignment of the company's Scope 3 Category 10 (processing of sold products) emissions pathway from bauxite and alumina with low-carbon scenarios over the medium and long term?
Detailed guidance	This indicator assesses the alignment of the company's Scope 3 Category 10 (processing of sold products) emissions pathway from bauxite and alumina with low-carbon scenarios. The pathway is derived from the Scope 3 Category 10 emissions reduction target from bauxite and alumina provided in indicator BA.2. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [2]. These are a '1.5°C' scenario, a 'Below 2°C' scenario and a 'National Pledges' scenario. The methodology used to derive Scope 3 Category 10 emissions projections from bauxite and alumina for each scenario, which form the benchmark pathways, is explained in the Appendix. The company's alignment score in a given year is determined by identifying the most ambitious scenario for which the company's implied Scope 3 Category 10 emissions reduction meets or exceeds the reduction required under that scenario. If the company does not meet the reduction required under any scenario, it is scored as 'Not aligned'. This indicator is contingent on meeting indicators BA.1 and BA.2. The company requires both a medium and long-term target aligned with the criteria in BA.2 to score. Where these indicators are not met, the indicator is scored as 'No target'. Where a company discloses only a long-term target, the indicator is scored as 'No medium-term target'. Where these indicators are met, but insufficient data are disclosed to calculate the emissions pathway, the indicator is scored as 'No or unsuitable disclosure'.

KT: Key transition materials (KTMs)

Indicators in this area are only applicable to companies with KTM production. KTMs refer to raw materials that are essential for technologies enabling the transition to a low-carbon economy. Also referred to by the International Energy Agency (IEA) as global critical minerals, these materials are copper, lithium, nickel, cobalt, graphite and rare earth elements [2][5].

Indicator KT.1 [Climate-related disclosures]	Does the company disclose the production volumes of each KTM it produces?
Detailed guidance	A company is assessed as 'Yes' if it discloses production volumes, in units of mass, for each KTM it produces. The disclosure must report the production volumes separately for each KTM. An aggregated production figure across multiple KTMs is not sufficient.
Indicator KT.2 [Climate-related disclosures]	**Does the company disclose the operational emissions and/or emissions intensity associated with the mining and processing of each KTM it produces?**
Detailed guidance	A company is assessed as 'Yes' if it discloses either operational emissions intensity or absolute operational emissions associated with the mining and processing of each KTM is produces.. If it only discloses absolute emissions, it must also disclose the corresponding production data required to calculate intensity for its KTM mining and processing activities. Operational emissions refer to Scope 1 and Scope 2 emissions associated with mining activities. The calculation methodology and system boundaries applied, including whether on-site processing is included, must be disclosed.
Indicator KT.3 [Decarbonisation levers]	**Does the company disclose forward-looking guidance for the production of any of the KTMs?**
Detailed guidance	A company is assessed as 'Yes' if it discloses forward-looking production guidance for any one of the KTMs it produces that can be compared with KTM production projections under low-carbon scenarios. The disclosure must provide a forward-looking annual production figure for at least one KTM it currently mines or plans to produce. Aggregate KTM production figures are not sufficient. The guidance must extend to the medium term. The disclosure must enable the calculation of the percentage change relative to a stated base year. The stated figure must therefore be expressed either in production volume or as a percentage or an absolute change from a stated base year value. Where the figure is expressed in terms of increase, the disclosure must specify the base year and the percentage increase. If the figure is expressed as a range, the disclosure is only sufficient to score if the range is narrower than 10% of the base-year value.

[2] The IEA defines rare earth elements as lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium, scandium and yttrium.

Indicator KT.4 [Capital expenditure and planning]	Does the company disclose its total investment (including organic capital expenditure and acquisitions) in the production of each KTM for the most recent financial year, and provide forward-looking guidance?
Detailed guidance	A company is assessed as 'Yes' if it discloses its total current and forward-looking capex on the production of each KTM. The disclosure must separate out the capex for each KTM from other capex and disclose this as an independent figure. The figures must be disclosed in a format consistent with the company's disclosed total capex to enable the calculation of ratios of each KTM to total capex. Disclosures must state the value in the current year of disclosure and a forward-looking value at least three years in the future, specifying the number of years included. The disclosure must allow the calculation of annual capex over the period covered by the capex guidance. This includes, but is not limited to, capex figures being reported either on a total budget basis with the number of years covered specified, on an average annual basis, or as a percentage of sales, conditional on the provision of annual sales guidance.
Indicator KT.a [Alignment]	**What is the company's KTMs production alignment with low-carbon scenarios over the medium and long term?**
Detailed guidance	This indicator assesses the alignment of the company's KTM production pathway(s) with low-carbon scenarios. The pathway(s) is derived from KTM production guidance provided in indicator KT.3. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [2]. These are a '1.5°C' scenario, a 'Below 2°C' scenario and a 'National Pledges' scenario. The methodology used to derive the KTM production projections for each scenario, which form the benchmark pathways, is explained in the Appendix. The company's alignment score in a given year is determined by identifying the most ambitious scenario for which the company's implied KTM production increase meets or exceeds the increase required under that scenario. If the company does not meet the increase required under any scenario, it is scored as 'Not aligned'. If the company discloses guidance for multiple KTMs, the company is scored individually for each. This indicator is contingent on meeting indicator KT.3. Where this indicator is not met, the indicator is scored as 'No target'. Where these indicators are met, but insufficient data are disclosed to calculate the emissions pathway, the indicator is scored as 'No or unsuitable disclosure'.

SH: Shipping of products

Indicators in this section are applicable to all diversified mining companies.

Indicator SH.1 [Climate-related disclosures]	**Does the company disclose its Scope 3 Categories 4 and 9 emissions from shipping of its products?**
Detailed guidance	A company is assessed as 'Yes' if it discloses its Scope 3 Categories 4 and 9 (upstream/downstream transportation and distribution) emissions and separately identifies the portion attributable to shipping of its products, expressed either in absolute terms or as a percentage of total Categories 4 and 9 emissions.
Indicator SH.2 [Decarbonisation levers]	**Does the company disclose a target to reduce its Scope 3 Categories 4 and 9 emissions from shipping of its products?**
Detailed guidance	A company is assessed as 'Yes' if it has set a Scope 3 Categories 4 and 9 (upstream/downstream transportation and distribution) emissions reduction target specific to the shipping of its products. The target must cover emissions from directly chartered shipping and specify a Scope 3 Categories 4 and 9 emissions reduction target from shipping of products with a defined base year and target year, base year value, target year value and coverage of activities. Where a company sets a target for only one category (either Scope 3 Category 4 or Scope 3 Category 9), this is sufficient only where the targeted category accounts for more than 95% of the company's total upstream and downstream shipping emissions. If the company has set a company-wide long-term net zero target that explicitly covers all Scope 3 Categories 4 and 9 emissions from shipping, it scores positively on this indicator.
Indicator SH.3 [Capital expenditure and planning]	**Does the company disclose a strategy to reduce its Scope 3 Categories 4 and 9 emissions from shipping of its products, detailing the role of different decarbonisation levers and the impact of actions on emissions reduction?**
Detailed guidance	A company is assessed as 'Yes' if it has a strategy to reduce its Scope 3 Categories 4 and 9 (upstream/downstream transportation and distribution) emissions from the shipping of its products. The disclosure must clearly describe the decarbonisation levers the company intends to use to reduce shipping-related emissions, explain how these actions are expected to contribute to emissions reduction, and outline the planned timeline for implementation. This can include, but is not limited to, measures related to vessel efficiency, fuel switching, operational improvements, contractual arrangements or collaboration with shipping providers.

Indicator SH.a [Alignment]	What is the alignment of the company's Scope 3 Categories 4 and 9 emissions pathway from shipping of its products with low-carbon scenarios over the medium and long term?
Detailed guidance	This indicator assesses the alignment of the company's Scope 3 Categories 4 and 9 emissions pathway from the shipping of its products with low-carbon scenarios. The pathway is derived from the emissions reduction target and projections provided in indicator SH.2. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [2]. These are a '1.5°C' scenario, a 'Below 2°C' scenario and a 'National Pledges' scenario. The methodology used to derive the KTM production projections for each scenario, which form the benchmark pathways, is explained in the Appendix. The company's alignment score in a given year is determined by identifying the most ambitious scenario for which the company's implied Scope 3 Categories 4 and 9 emissions reduction meets or exceeds the reduction required under that scenario. If the company does not meet the reduction required under any scenario, it is scored as 'Not aligned'. This indicator is contingent on meeting indicators SH.1 and SH.2. The company requires both a medium- and long-term target aligned with the criteria in SH.2 to score. Where these indicators are not met, the indicator is scored as 'No target'. Where a company discloses only a long-term target, the indicator is scored as 'No medium-term target'. Where these indicators are met, but insufficient data are disclosed to calculate the emissions pathway, the indicator is scored as 'No or unsuitable disclosure'.

JT: Just transition

Indicators in this area are applicable to all diversified mining companies. Indicators in this area are applicable regardless of whether the company has stated a commitment to just transition principles.

Indicator JT.1 [Just transition]	**Does the company have a mine closure plan and disclose associated financial provisioning for environmental rehabilitation, covering both existing and new mines?**
Detailed guidance	A company is assessed as 'Yes' if it has disclosed a company-wide mine closure plan or policy that includes environmental rehabilitation, and has disclosed associated financial provisioning for environmental rehabilitation, covering both existing and new mines. Disclosures must state commitments that include: 1) A company-wide mine closure plan or policy that applies across all existing and new mines, and includes environmental rehabilitation as a clear and explicit component; and 2) Financial provisioning for environmental rehabilitation activities. Disclosures should ideally include both forward-looking budgets and expenditure reported for the most recent financial or calendar year. However, disclosure of a forward-looking budget alone is sufficient to score 'Yes', provided a monetary amount is specified, and its intended use for environmental rehabilitation is clearly explained.
Indicator JT.2 [Just transition]	**Has the company committed to achieving independent, responsible mining certification for all mines and has it disclosed a timeline to do so?**
Detailed guidance	A company is assessed as 'Yes' if it has committed to achieving independent, responsible mining certification for all mines over which it has operational control and has disclosed a clear timeline for achieving certification. The framework recognises the Initiative for Responsible Mining Assurance (IRMA) as a prime example of an independent responsible mining certification[3]. Alternative certification schemes are sufficient to score where an independent third-party body issues a site-level certification or accreditation to the mine. Validation or assurance of a company's self-assessment is not sufficient to score.

[3] The IRMA is a multi-stakeholder coalition that developed a comprehensive Standard for Responsible Mining in 2018. IRMA's governance centres the voices of affected workers and communities through equal voting rights for six stakeholder types [12]. A systematic overview of global mining standards found IRMA to have among the highest quality of governance structure, auditing and transparency [13].

Indicator JT.3 [Just transition]	Has the company committed that new mines or other projects will not proceed without the free, prior and informed consent of affected Indigenous Peoples?
Detailed guidance	A company is assessed as 'Yes' if it has explicitly stated that new mines or other projects on traditionally held land will not proceed without the free, prior and informed consent (FPIC) of affected Indigenous Peoples. This commitment must reflect the company's approach to respecting the internationally recognised rights of Indigenous Peoples (ideally referencing the United Nations Declaration on the Rights of Indigenous Peoples [UNDRIP]), and commitment to obtain FPIC through consultation prior to the development of new mines or projects, the undertaking of early and sustained consultation, and recognition of the right of Indigenous Peoples to withhold consent.

References

[1] Climate Action 100+ (2023) *Net Zero Standard for Diversified Mining*.

[2] Jahn V, Ingham R and Dietz S (2023) *TPI's Methodology Report: Management Quality and Carbon Performance - Version 5.0*. London: Transition Pathway Initiative Centre, London School of Economics and Political Science.

[3] International Energy Agency (IEA) (2021) *Net Zero by 2050: A Roadmap for the Global Energy Sector*. Paris: IEA.

[4] Nicholas S and Basirat S (2022) *Solving Iron Ore Quality Issues for Low-Carbon Steel: Technology Solutions Are Under Development*. Institute for Energy Economics and Financial Analysis (IEEFA).

[5] International Energy Agency (IEA) (2025) *Global Critical Minerals Outlook 2025*. Paris: IEA.

[6] International Energy Agency (IEA) (2025) *Global Methane Tracker 2025*. Paris: IEA.

[7] International Energy Agency (IEA) (2025) *World Energy Outlook 2025*. Paris: IEA.

[8] International Energy Agency (IEA) (2024) *World Energy Outlook 2024*. Paris: IEA.

[9] Dietz S, Amin A, Cho H and Scheer A (2024) *Carbon Performance assessment of steelmakers: note on methodology*. London: Transition Pathway Initiative Centre, London School of Economics and Political Science.

[10] Dietz S, Commarmond S, Jahn V and Scheer A (2023) *Carbon Performance Assessment of Aluminium Producers Methodology Note*. London: Transition Pathway Initiative Centre, London School of Economics and Political Science.

[11] Dietz S, Hastreiter N, Scheer A and Silva F (2024) *Carbon Performance assessment of international shipping: note on methodology*. London: Transition Pathway Initiative Centre, London School of Economics and Political Science.

[12] Scheer A and Robins N (2024) *Unjust minerals: investing in the changes needed for a just transition in the mining sector*. London: Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science.

[13] Erdmann M and Franken G (2022) *Sustainability Standard Systems for Mineral Resources: A Comparative Overview*. Hannover: Bundesanstalt für Geowissenschaften und Rohstoffe.

Appendix. Benchmarks for alignment indicators

ME.a What is the company's methane emissions pathway alignment with low-carbon scenarios over the medium and long term?

Methane emissions projections for each scenario, which are used to construct the benchmark pathways, are sourced from the methane benchmarks published by the IEA in the Global Methane Tracker 2025 [6] and World Energy Outlook 2025 [7].

Depending on the company's target type, either an absolute or an intensity measure is used to construct methane emissions pathways. We define the absolute measure as "the reduction in methane emissions relative to 2019–2021 levels". The intensity measure is defined as "total methane emissions from upstream operations divided by marketed fuel production", in line with the definition used by the IEA [6].

The company's methane emissions reduction target is aligned with the '1.5°C' scenario, if the implied absolute methane emissions reduction target is no less than 75% by 2030, 87% by 2035 and 97% by 2050 compared to the average 2019-2021 levels. Alternatively, on an intensity basis, the methane intensity should reach 0.5% no later than 2030.

The company's methane emissions reduction target is aligned with the 'National Pledges' scenario, if the implied absolute methane emissions reduction target is no less than 12% by 2030, 23% by 2035 and 58% by 2050 compared to the average 2019-2021 levels. Alternatively, on an intensity basis, the methane intensity should reach 1.1% no later than 2030.

TC.a What is the company's thermal coal production alignment with low-carbon scenarios over the medium and long term?

Thermal coal production projections for each scenario, which are used to construct the benchmark pathways, are sourced from the International Energy Agency's World Energy Outlook 2024 [8]. The benchmarks are presented in Figure A.1 and Table A.1.

We use the "indexed thermal coal production relative to 2019–2021 levels" as the measure for creating thermal coal production pathways. To assess alignment, the company's thermal coal production pathway and the benchmark pathways are indexed to the average production level over the 2019–2021 period.

Figure A.1 Thermal coal production benchmarks by scenario

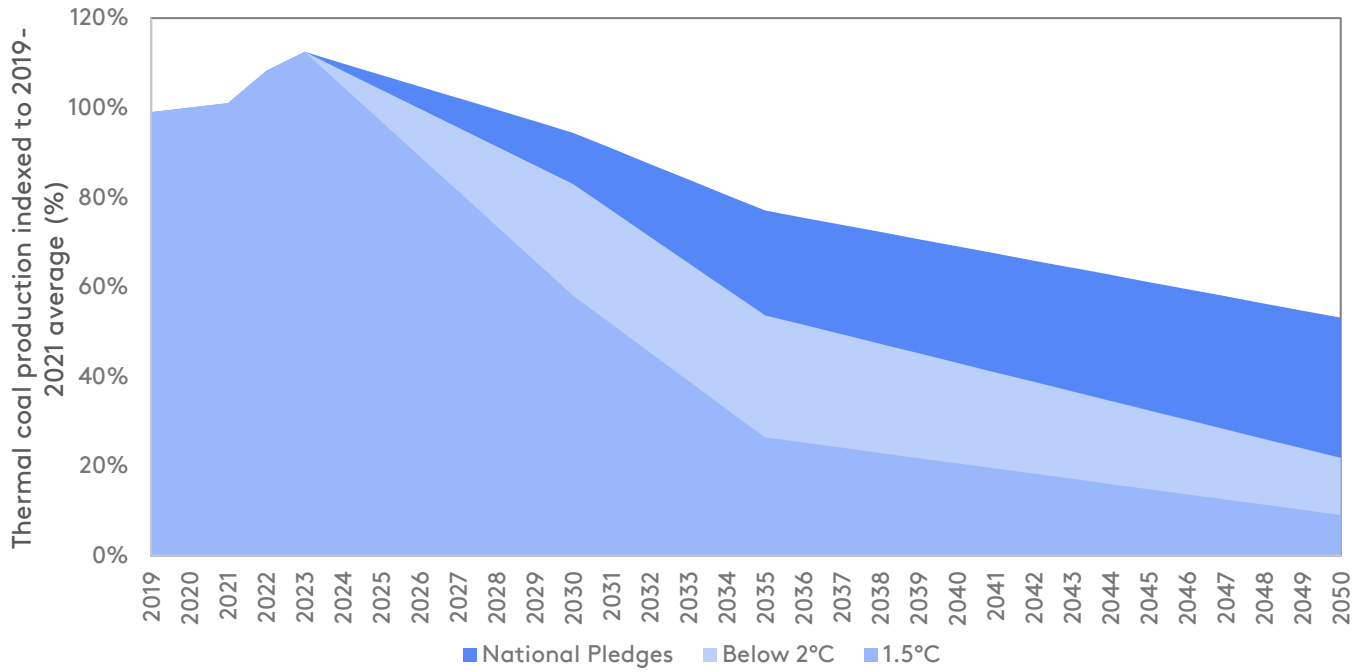

Table A.1 Data underlying the thermal coal production benchmarks

Scenario	Benchmark	2019-2021 average	2030	2040	2050
National Pledges	Global thermal coal production (Mt)	4,515	4,262	3,119	2,398
	Indexed thermal coal production relative to the baseline (%)	100%	94%	69%	53%
Below 2°C	Global thermal coal production (Mt)	4,515	3,743	1,944	985
	Indexed thermal coal production relative to the baseline (%)	100%	83%	43%	22%
1.5°C	Global thermal coal production (Mt)	4,515	2,619	931	409
	Indexed thermal coal production relative to the baseline (%)	100%	58%	21%	9%

MC.a What is the company's metallurgical coal production alignment with low-carbon scenarios over the medium and long term?

Thermal coal production projections for each scenario, which are used to construct the benchmark pathways, are sourced from the International Energy Agency's World Energy Outlook 2024 [8]. The benchmarks are presented in Figure A.2 and Table A.2.

We use the "indexed metallurgical coal production relative to 2019–2021 levels" as the measure for creating metallurgical coal production pathways. To assess alignment, the company's metallurgical coal production pathway and the benchmark pathways are indexed to the average production level over the 2019–2021 period.

Figure A.2 Metallurgical coal production benchmarks by scenario

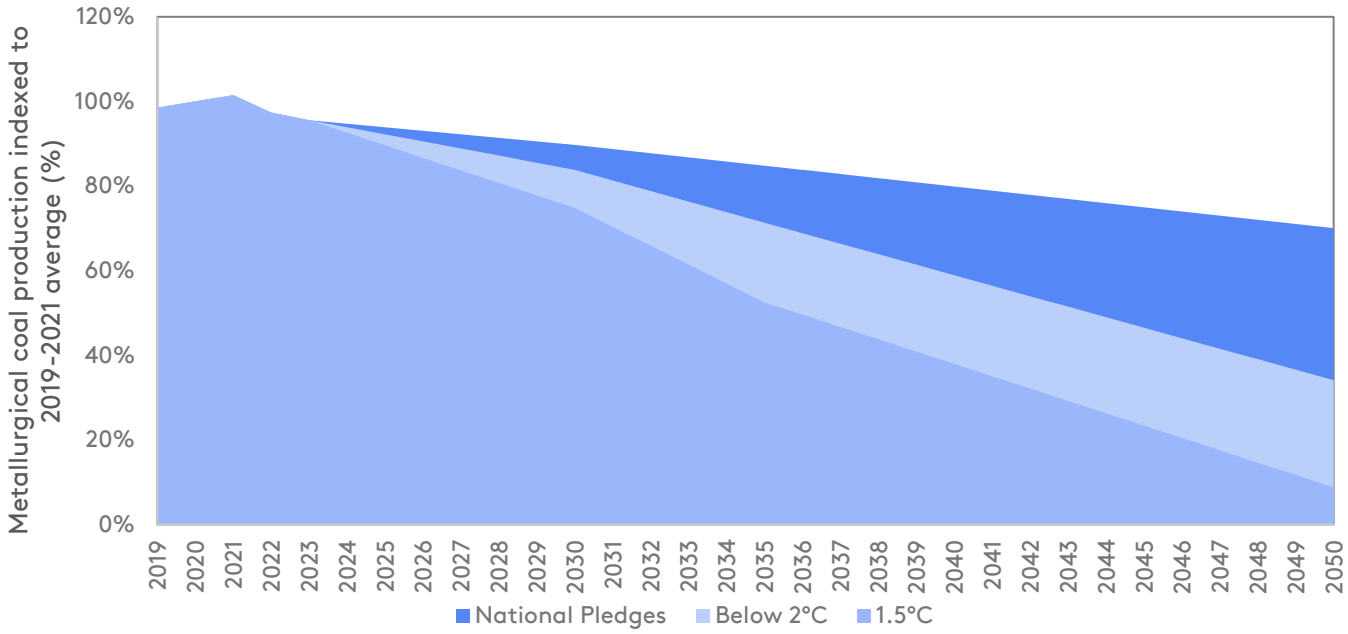

Table A.2 Data underlying the metallurgical coal production benchmarks

Scenario	Benchmark	2019-2021 average	2030	2040	2050
National Pledges	Global metallurgical coal production (Mt)	1,015	911	811	711
	Indexed metallurgical coal production relative to the baseline (%)	**100%**	**90%**	**80%**	**70%**
Below 2°C	Global metallurgical coal production (Mt)	1,015	851	598	346
	Indexed metallurgical coal production relative to the baseline (%)	**100%**	**84%**	**59%**	**34%**
1.5°C	Global metallurgical coal production (Mt)	1,015	759	385	89
	Indexed metallurgical coal production relative to the baseline (%)	**100%**	**75%**	**38%**	**9%**

KT.a What is the company's key transition materials (KTMs) production alignment with low-carbon scenarios over the medium and long term?

KTM production projections for each scenario, which are used to construct the benchmark pathways, are sourced from the International Energy Agency's Global Critical Minerals Outlook 2025 [5]. The benchmarks for copper production are included as an example, presented in Figure A.3 and Table A.3

We use the "indexed copper production relative to 2019–2021 levels" as the measure for creating copper production pathways. To assess alignment, the company's copper production pathway and the benchmark pathways are indexed to the average production level over the 2019–2021 period.

Figure A.3 Copper production benchmarks by warming scenario

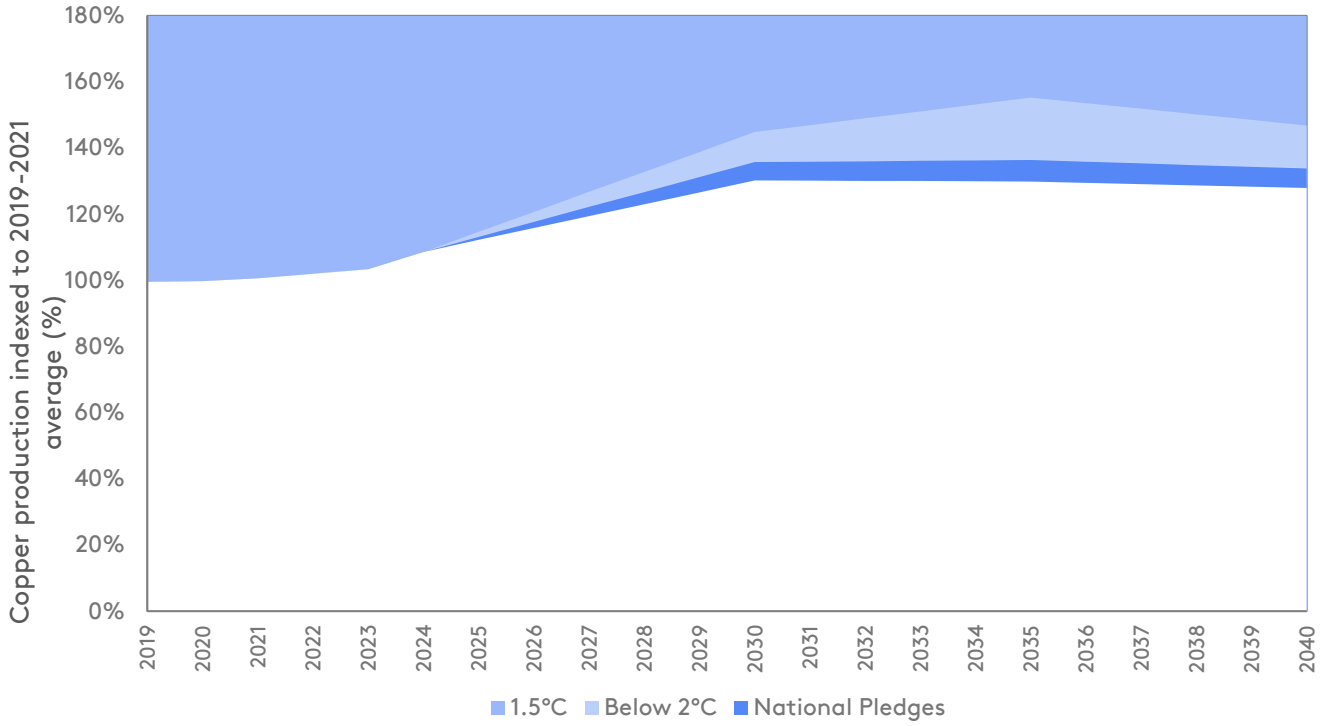

Table A.3 Data underlying the copper production benchmarks

Scenario	Benchmark	2019-2021 average	2030	2040
National Pledges	Global copper production (Mt)	20.7	27.0	26.5
	Indexed copper production relative to the baseline (%)	**100%**	**130%**	**128%**
Below 2°C	Global copper production (Mt)	20.7	28.1	27.7
	Indexed copper production relative to the baseline (%)	**100%**	**136%**	**134%**
1.5°C	Global copper production (Mt)	20.7	30.0	30.4
	Indexed copper production relative to the baseline (%)	**100%**	**145%**	**147%**

IO.a What is the alignment of the company's Scope 3 Category 10 (processing of sold products) emissions pathway from iron ore with low-carbon scenarios over the medium and long term?

Iron ore processing emissions projections for each scenario, which are used to construct the benchmark pathways, are sourced from the International Energy Agency's World Energy Outlook 2024 [8].

The measure is chosen in line with the TPI Centre's Carbon Performance assessment of steelmakers [9]. We define the measure as the "indexed downstream emissions from the processing of iron ore relative to 2019–2021 levels".

BA.a What is the alignment of the company's Scope 3 Category 10 (processing of sold products) emissions pathway from iron ore with low-carbon scenarios over the medium and long term?

Bauxite and alumina processing emissions projections for each scenario, which are used to construct the benchmark pathways, are sourced from the International Energy Agency's World Energy Outlook 2024 [8].

The measure is chosen in line with the TPI Centre's Carbon Performance assessment of aluminium producers methodology [10]. We define the measure as the "indexed downstream emissions from the processing of bauxite and alumina relative to 2019–2021 levels".

SH.a What is the alignment of the company's Scope 3 Categories 4 and 9 emissions pathway from shipping of its products with low-carbon scenarios over the medium and long term?

Shipping emissions projections for each scenario, which are used to construct the benchmark pathways, are sourced from the International Energy Agency's World Energy Outlook 2024 [8].

The measure is chosen in line with the TPI Centre's Carbon Performance assessment of international shipping methodology [11]. Depending on the company's target type, either an absolute or an intensity measure is used to construct shipping emissions pathways. We define the absolute measure as the "indexed value chain shipping emissions relative to 2019–2021 levels". The intensity measure is defined as "total tank-to-wheel value chain shipping emissions divided by total shipped tonne-kilometres".

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