TPI Global Climate Transition Centre
Research and Data at **LSE**

LSE Global School of Sustainability

Net Zero Strategies assessment framework for oil and gas: 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.

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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 oil and gas sector, the framework is an evolution of the Net Zero Standards for Oil and Gas assessment framework, published by the TPI Centre in 2024 [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 oil and gas 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, we have aimed 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 oil and gas 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). Some indicators, however, can be met by satisfying one or more of multiple eligible criteria, referred to as "routes", and are also recorded as Yes/No scores. Finally, 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, indicators and routes defined for the oil and gas sector framework are set out below.

AREA: The NZS assessment framework for the oil and gas sector is organised into seven 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 oil and gas sector

The seven 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
	UP: Upstream	Assessment of a company's strategy related to aligning upstream oil and gas production with low-carbon scenarios
	MD: Midstream and downstream	Assessment of a company's strategy related to aligning midstream and downstream activities with low-carbon scenarios
	NM: Emissions neutralisation measures	Assessment of a company's strategy for the use of emissions neutralisation measures, such as carbon credits and carbon removal
	CS: Climate solutions	Assessment of a company's strategy for the development and scaling of low-carbon products and services that support the energy transition
	AD: Advanced disclosure	Assessment of the transparency and methodological consistency of a company's climate-related data and assumptions

INDICATOR: The areas consist of indicators, which serve as the scoring units. Each indicator in the NZS assessment framework for the oil and gas 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 oil and gas sector

The four indicator types			
Climate-related disclosures	**Decarbonisation levers**	**Capital expenditure and planning**	**Alignment**
Indicators assessing whether the company has disclosed certain climate-related data (e.g. AD.1) or taken steps towards quality data reporting (e.g. ME.1)	Indicators assessing the company's quantified targets for its decarbonisation levers (e.g. CS.1)	Indicators assessing the company's disclosure of capital expenditure (capex) and details of decarbonisation planning (e.g. CS.3)	Indicators assessing the alignment of the company's target for a specific decarbonisation lever with low-carbon scenarios (e.g. CS.a)
Yes/No binary	Yes/No binary	Yes/No binary	Alignment scores

ROUTE: In the climate solutions (CS) area, the NZS framework defines multiple routes (options) as companies may choose different strategies to increase their deployment of climate solutions. A company scores positively on the decarbonisation lever indicator (CS.1) if it scores 'Yes' on any of the defined routes (CS.1.i to CS.1.v). Scores for individual routes are not aggregated when calculating the total company score.

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 oil and gas sector

<table>
<tr><th>Sector</th><th>Area</th><th colspan="4">Indicator</th><th>Routes</th></tr>
<tr><td rowspan="2">Oil and gas</td><td rowspan="2">Thematic categories of the NZS framework for the oil and gas sector (e.g. CS. Climate solutions)</td><td colspan="4">Scoring units of the NZS framework for the oil and gas sector (e.g. CS.1). Categorised into four categories:</td><td rowspan="2">Multiple eligible criteria, any one of which a company can satisfy to score positively on an indicator (CS.1.i to CS.1.v)</td></tr>
<tr><td>Climate-related disclosures</td><td>Decarbonisation levers</td><td>Capital expenditure and planning</td><td>Alignment</td></tr>
</table>

Timeframes

Some indicators are assessed against specific 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, 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 area are applicable to all oil and gas companies.

Indicator OE.1 [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 clearly quantifies the total planned contribution of any 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, operational efficiencies, reductions in flaring and venting, and the use of low-carbon fuels and renewable electricity. 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 contribution 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.2 [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 clearly quantifies the total planned contribution of any 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, operational efficiencies, reductions in flaring and venting, and the use of low-carbon fuels and renewable electricity. 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 contribution 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.3 [Capital expenditure and planning]	Does the company disclose its capital expenditure on 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

Unless stated otherwise in the detailed indicator guidance, indicators in this area are applicable to all oil and gas companies.

Indicator ME.1 [Climate-related disclosures]	**Is the company a member of the Oil and Gas Methane Partnership 2.0, and has it publicly committed to achieving the 'Gold Standard' for continuous improvement in methane emissions measurement and reporting, covering all operated and non-operated assets in line with this initiative's framework?**
Detailed guidance	A company is assessed as 'Yes' if it is a member of the Oil and Gas Methane Partnership (OGMP) 2.0 and has publicly committed to achieving the initiative's Gold Standard Reporting status. The disclosure must confirm the company's participation in OGMP 2.0 and its commitment to continuous improvement in methane emissions measurement and reporting in line with the initiative's framework. The commitment must apply to both operated and non-operated assets. Confirmation through the OGMP 2.0 participant list maintained by the United Nations Environment Programme (UNEP) [2], together with confirmation that the company has achieved either Gold Standard Reporting or the Gold Standard Pathway, is sufficient to score 'Yes'. For more information about the OGMP Gold Standard, visit the OGMP FAQ webpage.
Indicator ME.2 [Climate-related disclosures]	**Has the company achieved a high level of compliance with the Oil and Gas Methane Partnership 2.0 levels 4 and 5?**
Detailed guidance	A company is assessed as 'Yes' if it adheres to the highest levels of OGMP disclosure. This requires that the company has received a 'Gold Standard Reporting' recognition from the UNEP's International Methane Emissions Observatory (IMEO) [3], and has achieved a minimum 50% compliance with level 5 and 75% compliance with levels 4 and 5 for its operated assets. This indicator is contingent on meeting indicator ME.1.
Indicator ME.3 [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 value, 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.4 [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. 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, it scores positively on this indicator.

Indicator ME.5 [Decarbonisation levers]	Has the company committed to achieving Zero Routine Flaring (ZRF) by 2030, in line with the World Bank and UN Zero Routine Flaring initiative, and to minimising non-routine flaring?
Detailed guidance	A company is assessed as 'Yes' if it commits to reducing routine flaring to zero by 2030 or earlier. In addition, the company must be a listed endorser on the World Bank's Zero Routine Flaring by 2030 (ZRF) Initiative website [4]. This indicator is scored as 'Not applicable' for companies without upstream oil and gas production.

Indicator ME.6 [Capital expenditure and planning]	Does the company clearly state its strategy to reduce methane emissions, referencing methane emissions sources, future mitigation actions and the use of best available measurement technologies?
Detailed guidance	A company is assessed as 'Yes' if it has a strategy to reduce methane emissions that references the major components listed below. Missing any of these components results in a 'No' score. 1. Contribution of and action on emissions sources: The disclosure must specify the contribution of, and measures taken to address, methane emissions from key operational sources, reported separately for each source. At a minimum, the sources must include venting, flaring and fugitive emissions. 2. Future actions: The disclosure must set out the actions the company intends to implement in the near term to mitigate methane emissions. These actions must be measurable and time-bound. 3. Best available measurement technologies: The disclosure must specify the methane measurement and detection technologies used by the company to monitor methane emissions across its operations. These can include, but are not limited to, satellite imaging, thermal cameras, aerial drones and ground-based robotic monitoring.

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.3 and ME.4. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [5]. 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.3 and ME.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'.

UP: Upstream

Indicators in this area are only applicable to companies with upstream oil and gas production.

Indicator UP.1 [Decarbonisation levers]	Does the company provide quantitative guidance on its expected annual oil production in the medium term?
Detailed guidance	A company is assessed as 'Yes' if it discloses medium-term annual oil production projections or targets that can be compared with oil production trajectories in low-carbon scenarios. Aggregate oil and gas production disclosures are not sufficient. 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 energy units or as a percentage or an absolute change from a stated base year value. Where the figure is expressed in terms of reduction, the disclosure must specify the base year and the percentage reduction. 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 UP.2 [Decarbonisation levers]	Does the company provide quantitative guidance on its expected annual oil production in the long term?
Detailed guidance	A company is assessed as 'Yes' if it discloses long-term annual oil production projections or targets that can be compared with oil production trajectories in low-carbon scenarios. Aggregate oil and gas production disclosures are not sufficient. 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 energy units or as a percentage or an absolute change from a stated base year value. Where the figure is expressed in terms of reduction, the disclosure must specify the base year and the percentage reduction. 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 UP.3 [Decarbonisation levers]	Does the company provide quantitative guidance on its expected annual gas production in the medium term?
Detailed guidance	A company is assessed as 'Yes' if it discloses medium-term annual gas production projections or targets that can be compared with gas production trajectories in low-carbon scenarios. Aggregate oil and gas production disclosures are not sufficient. 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 energy units or as a percentage or an absolute change from a stated base year value. Where the figure is expressed in terms of reduction, the disclosure must specify the base year and the percentage reduction. 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 UP.4 [Decarbonisation levers]	Does the company provide quantitative guidance on its expected annual gas production in the long term?
Detailed guidance	A company is assessed as 'Yes' if it discloses long-term annual gas production projections or targets that can be compared with gas production trajectories in low-carbon scenarios. Aggregate oil and gas production disclosures are not sufficient. 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 energy units or as a percentage or an absolute change from a stated base year value. Where the figure is expressed in terms of reduction, the disclosure must specify the base year and the percentage reduction. 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 UP.5 [Capital expenditure and planning]	Does the company disclose its upstream oil and gas 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 capex on upstream fossil fuel infrastructure. Disclosures must separate out the capex on upstream fossil fuel infrastructure from other fossil fuel infrastructure 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 upstream 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 UP.6 [Capital expenditure and planning]	Does the company disclose its exploration 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 exploration capex. The disclosure must cover projects in existing fields and all greenfield developments. Disclosures must separate out the capex targeting fossil fuel exploration 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 exploration 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 UP.7 [Climate-related disclosures]	Does the company provide guidance on the average breakeven cost (US$ per barrel) of its currently sanctioned oil and gas projects?
Detailed guidance	A company is assessed as 'Yes' if it discloses the average breakeven cost (e.g. US$ per barrel) for all its currently sanctioned oil and gas projects. The disclosure must clearly specify the set of projects covered and provide the average breakeven cost across those projects. The disclosure must also state the company's definition of breakeven cost (i.e. which costs are included). The costs included must be comprehensive and include the depreciation of capitalised investment (Earnings Before Interest and Tax or EBIT). The boundary used for cost disclosure (numerator) must align with production disclosure (denominator). Cost projections and scenario analyses are not sufficient to receive a 'Yes' score.
Indicator UP.8 [Capital expenditure and planning]	**Has the company committed to stop investing in the development of new oil and gas fields?**
Detailed guidance	A company is assessed as 'Yes' if it has clearly set out that it will no longer be approving the development of new oil and gas fields. The statement must specify the type of fuel (i.e. oil and/or gas) and cover all exploration activities as well as the development of new oil and gas fields. This indicator is designed in line with the implications of the IEA's net zero scenario, which shows that no new oil and gas fields are required beyond those already approved for development [6].[2] Please note that companies might choose to shift production from more carbon-intensive oil and gas fields to lower-carbon-intensity fields [7]. Such plans could be captured and acknowledged under indicator UP.9.
Indicator UP.9 [Capital expenditure and planning]	**Has the company set out a plan for decommissioning existing oil and gas fields?**
Detailed guidance	A company is assessed as 'Yes' if it discloses at least one existing oil or gas field that it plans to decommission as part of its decarbonisation strategy. The disclosure must specify the oil and gas fields the company is planning to close and provide the timeline and estimated decommissioning cost. The disclosure must distinguish the decommissioning due to the end of operational life and decommissioning that is part of the company's transition away from fossil fuels.

[2] See also International Energy Agency (IEA), The Implications of Oil and Gas Field Decline Rates (2025), which reinforces the conclusion that no new oil and gas fields are required in net zero aligned pathways.

Indicator UP.a [Alignment]	What is the company's oil production alignment with low-carbon scenarios over the medium and long term?
Detailed guidance	This indicator assesses the alignment of the company's oil production pathway with low-carbon scenarios. The pathway is derived from medium- and long-term production guidance assessed by indicators UP.1 and UP.2. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [5]. These are a '1.5°C' scenario, a 'Below 2°C' scenario and a 'National Pledges' scenario. The methodology used to derive oil 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 oil 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 UP.1 and/or UP.2. 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'.

Indicator UP.b [Alignment]	What is the company's gas production alignment with low-carbon scenarios over the medium and long term?
Detailed guidance	This indicator assesses the alignment of the company's gas production pathway with low-carbon scenarios. The pathway is derived from medium- and long-term production guidance assessed by indicators UP.3 and UP.4. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [5]. These are a '1.5°C' scenario, a 'Below 2°C' scenario and a 'National Pledges' scenario. The methodology used to derive gas 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 gas 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 UP.3 and/or UP.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'.

MD: Midstream and downstream

Indicators in this area are only applicable to companies with midstream and/or downstream oil and gas activities.

Indicator MD.1 [Decarbonisation levers]	Does the company quantify the expected impact of its liquefied natural gas (LNG) plans on its medium-term emissions target?
Detailed guidance	A company is assessed as 'Yes' if it clearly quantifies the expected impact of its LNG production and/or sales plans on its medium-term emissions reduction target. The disclosure must quantify the expected impact of its targeted LNG capacity across liquefaction and regasification facilities on its emissions reduction target. LNG capacity targets disclosed without an associated emissions impact do not receive a positive score. The disclosure must enable the calculation of the expected impact of LNG plans on the company's medium-term emissions reduction target. This includes, but is not limited to, the impact 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. This indicator is scored as 'Not applicable' for companies without current or planned LNG capacity.

Indicator MD.2 [Decarbonisation levers]	Does the company quantify the expected impact of its LNG plans on its long-term emissions target?
Detailed guidance	A company is assessed as 'Yes' if it clearly quantifies the expected impact of its LNG plans on its long-term emissions reduction target. The disclosure must quantify the expected impact of its targeted LNG capacity across liquefaction and regasification facilities on its emissions reduction target. LNG capacity targets disclosed without an associated emissions impact do not receive a positive score. The disclosure must enable the calculation of the expected impact of LNG plans on the company's long-term emissions reduction target. This includes, but is not limited to, the impact 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. This indicator is scored as 'Not applicable' for companies without current or planned LNG capacity.

Indicator MD.3 [Capital expenditure and planning]	**Does the company quantify its LNG 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 capex on LNG projects. Disclosures must separate out the capex for LNG projects from other capex (such as upstream gas 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 LNG capex 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 scored as 'Not applicable' for companies without current or planned LNG capacity.
Indicator MD.4 [Capital expenditure and planning]	**Does the company disclose a plan to decommission or repurpose its existing pipeline infrastructure in response to projected demand shifts under low-carbon scenarios?**
Detailed guidance	A company is assessed as 'Yes' if it discloses a plan to decommission or repurpose its existing oil and gas pipeline infrastructure at the asset level as part of its decarbonisation strategy. The disclosure must specify the pipelines to be decommissioned or repurposed, together with a clear timeline, the intended new use of the infrastructure and the associated capacity. The disclosure must distinguish between decommissioning due to the end of operational life and decommissioning that is part of the company's transition away from fossil fuels. For this indicator, repurposed pipelines include, but are not limited to, pipelines for CO_2 transport, low-carbon hydrogen, and blended natural gas with a specified mix of biogas, hydrogen or ammonia. This indicator is scored as 'Not applicable' for companies without pipeline infrastructure.

Indicator MD.5 [Capital expenditure and planning]	Does the company disclose a plan to decommission or repurpose its existing refining capacity in response to projected demand shifts under low-carbon scenarios?
Detailed guidance	A company is assessed as 'Yes' if it discloses a plan to decommission or repurpose its existing refineries at the asset level as part of its decarbonisation strategy. The disclosure must specify the refineries to be decommissioned or repurposed, together with a clear timeline, the intended new use of the facility and the associated capacity. The disclosure must distinguish between decommissioning due to the end of operational life and decommissioning that is part of the company's transition away from fossil fuels. For the purpose of this indicator, repurposed refineries include, but are not limited to, hydrogen, biofuel, energy storage and carbon capture, utilisation and storage (CCUS). Integration of petrochemical units to the existing refineries also satisfies this criterion. This indicator is scored as 'Not applicable' for companies without refining capacity.

NM: Emissions neutralisation measures

Indicators in this area are applicable to all oil and gas companies.

Indicator NM.1 [Decarbonisation levers]	Does the company quantify the total contribution of neutralising measures to its medium-term emissions targets?
Detailed guidance	A company is assessed as 'Yes' if it clearly quantifies the total planned contribution of any neutralising measures to its medium-term emissions reduction targets. Neutralising measures include carbon credits and carbon dioxide removal, both technology-based and nature-based solutions. References in the text to neutralising measures that are not accompanied by quantitative information are not sufficient to receive a score of 'Yes'. An explicit statement that the company does not intend to use neutralising measures (i.e. their contribution to the emissions reduction targets is zero) is considered sufficient to score on this indicator. The disclosure must enable the calculation of the contribution of neutralising measures to the company's medium-term emissions reduction target. This includes, but is not limited to, the contribution 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. Note that avoided emissions are not recognised as negative emissions. Therefore, while carbon avoidance credits may be disclosed separately, the use of avoided emissions to offset emissions within a target results in a negative score for this indicator.

Indicator NM.2 [Decarbonisation levers]	Does the company quantify the total contribution of neutralising measures to its long-term emissions targets?
Detailed guidance	A company is assessed as 'Yes' if it clearly quantifies the total planned contribution of any neutralising measures to its long-term emissions reduction targets. Neutralising measures include carbon credits and carbon dioxide removal, both technology-based and nature-based solutions. References in the text to neutralising measures that are not accompanied by quantitative information are not sufficient to receive a score of 'Yes'. An explicit statement that the company does not intend to use neutralising measures (i.e. their contribution to the emissions reduction targets is zero) is considered sufficient to score on this indicator. The disclosure must enable the calculation of the contribution of neutralising measures to the company's long-term emissions reduction target. This includes, but is not limited to, the contribution 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. Note that avoided emissions are not recognised as negative emissions. Therefore, while carbon avoidance credits may be disclosed separately, the use of avoided emissions to offset emissions within a target results in a negative score for this indicator.

Indicator NM.3 [Capital expenditure and planning]	Does the company disclose detailed information on the expected costs of carbon credits and the types of carbon credits it intends to use?
Detailed guidance	A company is assessed as 'Yes' if it discloses the details of its intended use of carbon credits, enabling the assessment of the credibility and financial implications of that use. The disclosure must provide information on the following aspects: 1. Assumed cost per tonne CO_2 equivalent (which, combined with targeted volumes, can be used to calculate total cost), and 2. Type of carbon credits and the amount of each type it intends to use. Where the company states in its disclosures that it does not intend to rely on carbon credits, this indicator is scored as 'Not applicable'.

Indicator NM.4 [Capital expenditure and planning]	Does the company disclose its capital expenditure on technology-based carbon removal solutions (CCUS, BECCS, and DAC) 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 allocated to technology-based carbon dioxide removal solutions that the company plans to deploy. These technologies are carbon capture, utilisation and storage (CCUS), bioenergy with carbon capture and storage (BECCS), and direct air carbon capture (DAC). The figures must be disclosed in a format consistent with the company's disclosed total capex to enable the calculation of ratios of technology-based carbon removal solutions 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. Where the company has no plans to rely on technology-based carbon removal solutions, this indicator is scored as 'Not applicable'.

CS: Climate solutions

Unless otherwise stated, indicators in this area are applicable to all oil and gas companies. In the oil and gas sector, climate solutions refer to technologies, activities, products or assets that support the low-carbon transition of the energy sector, and that are inherently low or zero carbon.

Indicator CS.1 [Decarbonisation levers]

Does the company disclose quantified targets for the climate solutions it plans to produce, distribute or offer as a service to third parties?

Detailed guidance

A company is assessed as 'Yes' if it discloses quantified targets for the climate solutions it plans to produce, distribute or offer as a service to third parties. This requirement is satisfied if the company scores 'Yes' on at least one of the climate solutions routes defined below (CS.1.i to CS.1.v).

The disclosure must specify a clear target year and be forward-looking over the medium and/or long term. The targets must be specified either in terms of installed capacity (e.g. gigawatts (GW), tonnes per year) or output levels in the target year (e.g. terawatt-hours (TWh), tonnes).

If the company has no diversification plan yet discloses a managed decline and sets medium- and long-term targets for oil and gas production (UP.1-4), this indicator is scored as 'Not applicable'.

CS.1.i Does the company disclose a quantified target to increase its renewable electricity generation?

A company is assessed as 'Yes' if it discloses a target to increase its renewable electricity generation. The target must be expressed as a combined figure or disaggregated by technology (e.g. solar and wind).

CS.1.ii Does the company disclose a quantified target to increase its low-carbon fuels production?

A company is assessed as 'Yes' if it discloses a target to increase its low-carbon fuels production. This can include, but is not limited to, biofuels, blue or green hydrogen, and green electrofuels.[3] The target must be expressed as a combined figure or disaggregated by technology.

CS.1.iii Does the company disclose a quantified target to increase the production of other climate solutions?

A company is assessed as 'Yes' if it discloses a target to increase its production of other climate solutions. This includes, but is not limited to, nuclear energy and technologies that leverage geological expertise, such as lithium mining or geothermal energy.

[3] Companies currently do not provide sufficient disclosure to differentiate the types of biofuels and low-carbon hydrogen they intend to produce. This disclosure gap is significant because the life cycle emissions of biofuels and blue hydrogen can be substantial depending on how they are produced, with some studies estimating no or limited carbon reductions relative to conventional oil and gas [12] [13] [14] [15] [16]. Without more granular disclosure, it is not possible to apply differentiated criteria. Additionally, the alignment benchmarks for indicator CS.a are based on IEA scenario data, which do not exclude conventional biofuels. Nonetheless, the IEA does anticipate that future biofuel growth will be predominantly from advanced biofuels in the NZE scenario [6]. This indicator represents an active area of research and may change in the future.

CS.1.iv Does the company disclose a quantified target to increase low-carbon energy distribution?

A company is assessed as 'Yes' if it discloses a target to expand low-carbon energy distribution. This includes, but is not limited to, the expansion of distribution infrastructure such as electric vehicle (EV) charging networks and hydrogen refuelling stations, as well as low-carbon energy retail such as renewable electricity and biofuels retail. Where electricity retail is included, sales of non-renewable electricity must be disclosed separately.

CS.1.v Does the company disclose a quantified target to provide CCUS as a service to third parties?

A company is assessed as 'Yes' if it discloses a target to provide carbon capture, utilisation and/or storage (CCUS) services to third parties. The disclosure must clearly specify the associated timeline and its planned annual CO_2 capture, transport, and storage capacities, as applicable.

Indicator CS.2 [Decarbonisation levers] Does the company quantify the contribution of climate solutions to its medium-term emission targets?

Detailed guidance

A company is assessed as 'Yes' if it clearly quantifies the total planned contribution of climate solutions it plans to produce, distribute or offer as a service to third parties, to its medium-term emissions reduction targets. The company must clearly identify and define what products and services it regards as climate solutions.

The disclosure must enable the calculation of the contribution of climate solutions to the company's medium-term emissions reduction target. This includes, but is not limited to, the contribution 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.

If the company has no diversification plan yet discloses a managed decline and sets medium- and long-term targets for oil and gas production (UP.1-4), this indicator is scored as 'Not applicable'.

Indicator CS.3 [Decarbonisation levers] Does the company quantify the contribution of climate solutions to its long-term emissions targets?

Detailed guidance

A company is assessed as 'Yes' if it clearly quantifies the total planned contribution of climate solutions it plans to produce, distribute or offer as a service to third parties, to its long-term emissions reduction targets. The company must clearly identify and define what products and services it regards as climate solutions.

The disclosure must enable the calculation of the contribution of climate solutions to the company's long-term emissions reduction target. This includes, but is not limited to, the contribution 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.

If the company has no diversification plan yet discloses a managed decline and sets medium- and long-term targets for oil and gas production (UP.1-4), this indicator is scored as 'Not applicable'.

Indicator CS.4 [Capital expenditure and planning]	Does the company disclose its climate solutions 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 capex on climate solutions, for the same set of products and services identified and defined by the company as climate solutions in indicators CS.2 and CS.3. Disclosures must separate out the capex on climate solutions 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 climate solutions to total capex. The disclosure 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. If the company has no diversification plan yet discloses a managed decline and sets medium- and long-term targets for oil and gas production (UP.1-4), this indicator is scored as 'Not applicable'.
Indicator CS.a [Alignment]	**What is the alignment of the company's low-carbon energy production trajectory with low-carbon scenarios over the medium and long term?**
Detailed guidance	This indicator assesses the alignment of the company's low-carbon energy production pathway with low-carbon scenarios. The pathway is derived from the low-carbon energy production targets provided in indicator CS.1 routes i, ii and iii. The scenarios are selected in accordance with the TPI Centre's Carbon Performance (CP) assessment methodologies [5]. These are a '1.5°C' scenario, a 'Below 2°C' scenario and a 'National Pledges' scenario. The methodology used to derive low-carbon energy 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 increase in low-carbon energy production 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'. This indicator is contingent on meeting indicator CS.1 routes i, ii and iii. 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'. If the company has no diversification plan, yet discloses a managed decline and sets medium- and long-term targets for oil and gas production (UP.1-4), this indicator is scored as 'Not applicable'.

AD: Advanced disclosures

Unless otherwise stated, indicators in this area are applicable to all oil and gas companies.

Indicator AD.1 [Climate-related disclosures]	**Does the company disclose all externally sold energy on both an equity and operational boundary, and on a primary basis with no fossil fuel equivalence (FFE) adjustments and excluding non-energy and financial trading?**
Detailed guidance	A company is assessed as 'Yes' if it discloses the total amount of energy it sells externally consistently across all forms of energy (low-carbon and fossil fuel). To meet this indicator, the disclosure must: 1. Provide two figures for total energy sold (on an equity and an operational accounting basis) 2. Either provide supporting text or disclosure elsewhere, explicitly stating: a. That it covers all externally sold energy. b. The figure excludes financial trading of energy products. c. The accounting treatment of renewables in the calculation (stating that no fossil fuel equivalence calculations have been used while determining the contribution of renewables or explicitly disclosing the impact of fossil fuel equivalence calculations on the figures). d. Adjusts, where appropriate, for non-energy sales.
Indicator AD.2 [Climate-related disclosures]	**Does the company disclose the assumptions it applies to non-energy use of energy products and the treatment of FFE?**
Detailed guidance	A company is assessed as 'Yes' if it transparently discloses the assumptions used to calculate energy sales and emissions intensity figures and targets. The company must meet both criteria set out below, where applicable. 1. **Non-energy use of oil and gas**: The disclosure must state assumptions regarding the downstream non-energy use of oil and gas products and the share of embodied carbon in sales assumed to be permanently stored. Where such assumptions are applied, their quantitative impact on reported non-energy use and on annual energy sales and emissions intensity figures must be disclosed, including the effect of any exclusions. This criterion is applicable only to companies with upstream oil and gas production. 2. **Fossil fuel equivalence (FFE) ratios**: The disclosure must state whether and how FFE ratios are applied when adjusting renewable energy generation in energy sales calculations and targets. These figures must be accompanied by a methodology that clearly shows how the FFE calculation took place and must allow for the calculation of the original figures. Where FFEs are used in targets, the assumptions used for both the base year and target year must be stated. If the company discloses that no FFEs are used in its current reporting AND its target calculation, this is considered sufficient to score on this indicator. This criterion is applicable only to companies with downstream renewable energy production or plans. Further information on fossil fuel equivalence factors is provided in [8].

Indicator AD.3 [Climate-related disclosures]	Does the company disclose gross and net emissions from all externally sold energy on the same organisational boundary used for energy, covering all emission scopes and greenhouse gases?
Detailed guidance	A company is assessed as 'Yes' if it discloses its total emissions on the same basis as the energy disclosure in AD.1. The disclosure must meet the following criteria: 1. Disclose, at least, Scope 1, 2 and 3 Category 11 emissions for the last reported financial or calendar year. 2. Disclose all emissions using a consistent accounting footprint aligned with the boundaries applied for financial reporting, production and energy consumption disclosures. The accounting boundary applied must be explicitly stated. 3. Disclose emissions figures on both a gross and a net basis. Where there is no difference between gross and net emissions, the disclosure must be accompanied by an explicit statement confirming that no carbon credits were retired. 4. Include methane emissions within the reported emissions figures.

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[9] International Energy Agency (IEA) (2025) *Global Methane Tracker 2025*. IEA, Paris, France.

[10] International Energy Agency (IEA) (2025) *World Energy Outlook 2025*. IEA, Paris, France.

[11] International Energy Agency (IEA) (2024) *World Energy Outlook*. IEA, Paris, France.

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[15] Howarth R and Jacobson M (2021) How green is blue hydrogen? Energy Science & Engineering 9: 1676-1687.

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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 [9] and World Energy Outlook 2025 [10].

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 "indexed absolute 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 [9].

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, 85% by 2035 and 99% by 2050 compared to the average 2019–2021 levels. Alternatively, on an intensity basis, the methane intensity should reach 0.2% no later than 2030, and 0.06% by 2050.

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 24% by 2030, 31% by 2035 and 51% by 2050 compared to the average 2019–2021 levels. Alternatively, on an intensity basis, the methane intensity should reach 0.7% by 2030, 0.6% by 2035 and 0.5% by 2050.

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

Oil production projections for each scenario, which are used to construct the benchmark pathways, are sourced from the IEA's World Energy Outlook 2024 [11]. Benchmarks are presented in Figure A.1 and Table A.1.

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

Figure A.1. Oil production benchmarks by scenario

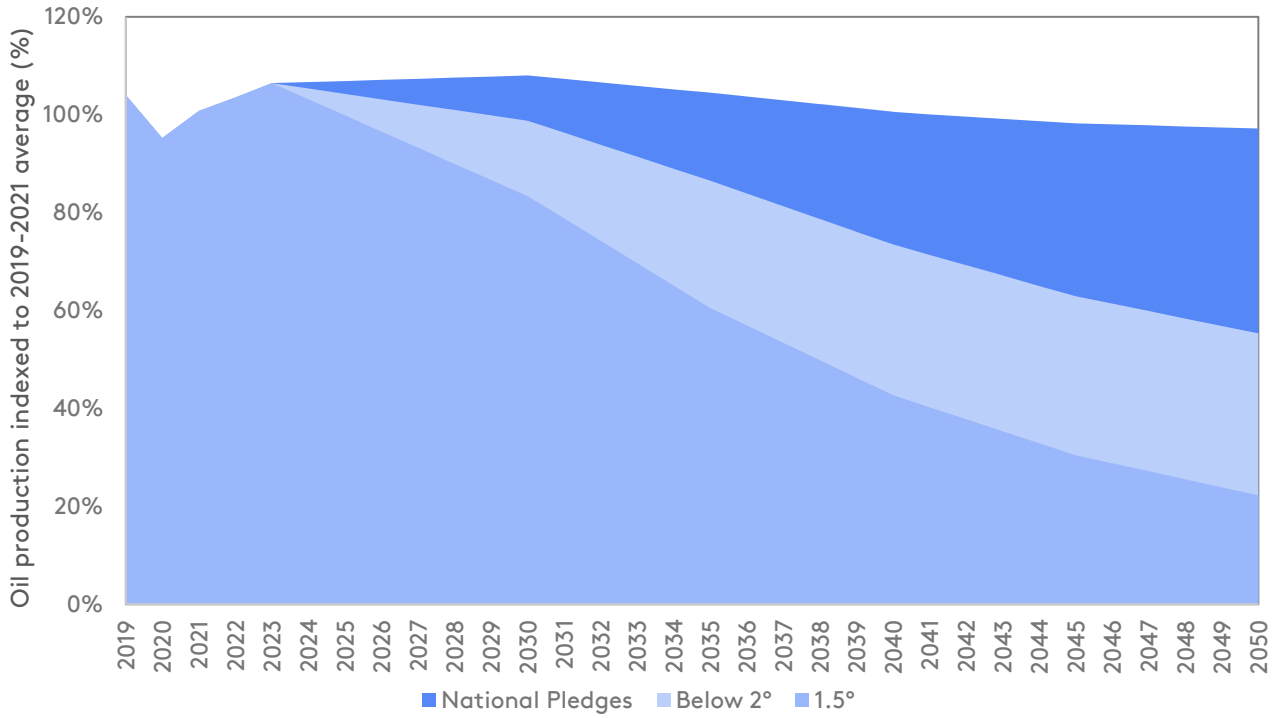

Table A.1. Data underlying the oil production benchmarks

Scenario	Benchmark	2019–2021 average	2030	2040	2050
National Pledges	Global oil production (EJ[4])	181	195	182	176
	Indexed oil production relative to the baseline (%)	100%	108%	101%	97%
Below 2°C	Global oil production (EJ)	181	178	133	100
	Indexed oil production relative to the baseline (%)	100%	99%	73%	55%
1.5°C	Global oil production (EJ)	181	151	77	40
	Indexed oil production relative to the baseline (%)	100%	83%	43%	22%

[4] EJ stands for 'exajoule', the unit of energy.

UP.b What is the company's gas production alignment with low-carbon scenarios over the medium and long term?

Gas production projections for each scenario, which are used to construct the benchmark pathways, are sourced from the IEA's World Energy Outlook 2024 [11]. Benchmarks are presented in Figure A.2 and Table A.2.

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

Figure A.2 Gas production benchmarks by scenario

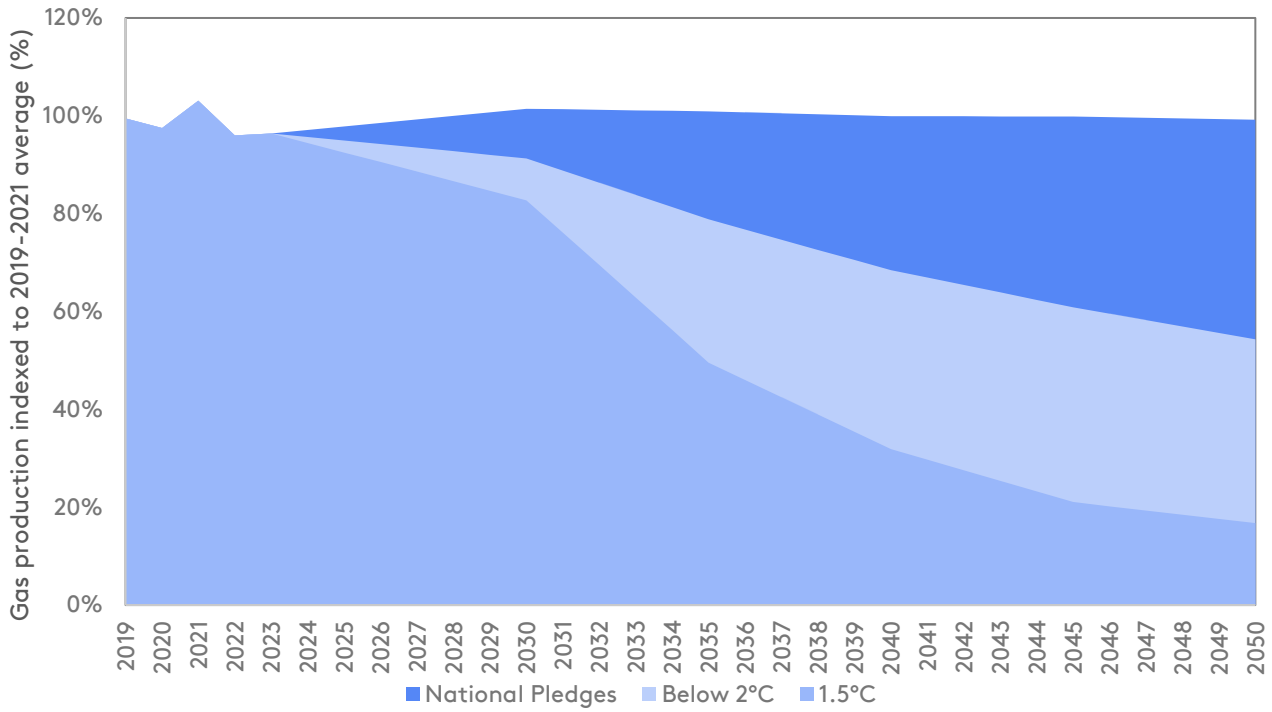

Table A.2 Data underlying the gas production benchmarks

Scenario	Benchmark	2019-2021 average	2030	2040	2050
National Pledges	Global gas production (EJ)	143	145	142	141
	Indexed gas production relative to the baseline (%)	**100%**	**101%**	**100%**	**99%**
Below 2°C	Global gas production (EJ)	143	130	98	77
	Indexed gas production relative to the baseline (%)	**100%**	**91%**	**68%**	**54%**
1.5°C	Global gas production (EJ)	143	118	45	24
	Indexed gas production relative to the baseline (%)	**100%**	**83%**	**32%**	**17%**

CS.a What is the alignment of the company's low-carbon energy production trajectory with low-carbon scenarios over the medium and long term?

Low-carbon energy production projections for each scenario, which are used to construct the benchmark pathways, are sourced from the IEA's World Energy Outlook 2024 [11]. Benchmarks are presented in Figure A.3 and Table A.3.

We use the "share of low-carbon production in total energy supply" as the measure for creating low-carbon energy pathways.

Figure A.3. Low-carbon energy benchmarks: share of low-carbon energy in total energy supply

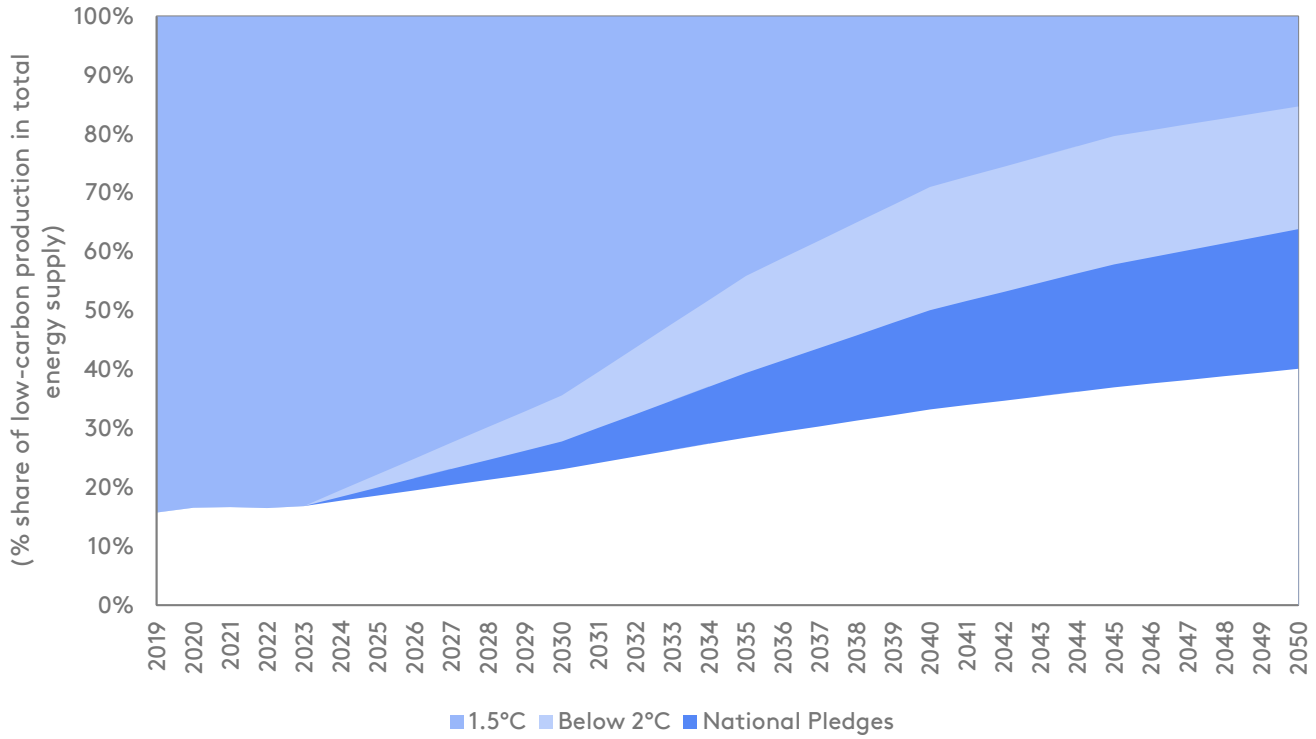

Table A.3. Data underlying the low-carbon energy production benchmarks

Scenario	Benchmark	2020	2030	2040	2050
National Pledges	Low-carbon energy supply* (EJ)	98	156	229	290
	Total energy supply (EJ)	536	676	691	722
	Share of low-carbon energy in total energy supply (%)	**17%**	**23%**	**33%**	**40%**
Below 2°C	Low-carbon energy supply* (EJ)	98	178	310	405
	Total energy supply (EJ)	536	641	620	635
	Share of low-carbon energy in total energy supply (%)	**17%**	**28%**	**50%**	**64%**
1.5°C	Low-carbon energy supply* (EJ)	98	209	382	478
	Total energy supply (EJ)	536	588	538	564
	Share of low-carbon energy in total energy supply (%)	**17%**	**36%**	**71%**	**85%**

* Sum of renewables (solar, wind, hydro and bioenergy), and nuclear energy.

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