SASB STANDARDS

Now part of IFRS Foundation

Oil & Gas – Exploration & Production

Sustainability Accounting Standard

EXTRACTIVES & MINERALS PROCESSING SECTOR

Sustainable Industry Classification System® (SICS®) EM-EP

Under Stewardship of the International Sustainability Standards Board

INDUSTRY STANDARD | VERSION 2023-12

IFRS® Sustainability

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ABOUT THE SASB STANDARDS

As of August 2022, the International Sustainability Standards Board (ISSB) of the IFRS Foundation assumed responsibility for the SASB Standards. The ISSB has committed to maintain, enhance and evolve the SASB Standards and encourages preparers and investors to continue to use the SASB Standards.

IFRS S1 *General Requirements for Disclosure of Sustainability-related Financial Information* (IFRS S1) requires entities to refer to and consider the applicability of disclosure topics in the SASB Standards when identifying sustainability-related risks and opportunities that could reasonably be expected to affect an entity's prospects. Similarly, IFRS S1 requires entities to refer to and consider the applicability of metrics in the SASB Standards when determining what information to disclose regarding sustainability-related risks and opportunities.

In June 2023, the ISSB amended climate-related topics and metrics in the SASB Standards to align them with the industry-based guidance accompanying IFRS S2 *Climate-related Disclosures*. In December 2023, the ISSB amended the non-climate-related topics and metrics in connection with the International Applicability of SASB Standards project.

Effective Date

This version 2023-12 of the Standard is effective for all entities for annual periods beginning or after January 1, 2025. Early adoption is permitted for all entities.

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INTRODUCTION

Overview of SASB Standards

The SASB Standards are a set of 77 industry-specific sustainability accounting standards ("SASB Standards" or "Industry Standards"), categorised pursuant to the Sustainable Industry Classification System® (SICS®).

SASB Standards include:

1. **Industry descriptions** – which are intended to help entities identify applicable industry guidance by describing the business models, associated activities and other common features that characterise participation in the industry.

2. **Disclosure topics** – which describe specific sustainability-related risks or opportunities associated with the activities conducted by entities within a particular industry.

3. **Metrics** – which accompany disclosure topics and are designed to, either individually or as part of a set, provide useful information regarding an entity's performance for a specific disclosure topic.

4. **Technical protocols** – which provide guidance on definitions, scope, implementation and presentation of associated metrics.

5. **Activity metrics** – which quantify the scale of specific activities or operations by an entity and are intended for use in conjunction with the metrics referred to in point 3 to normalise data and facilitate comparison.

Entities using the SASB Standards as part of their implementation of ISSB Standards should consider the relevant ISSB application guidance.

For entities using the SASB Standards independently from ISSB Standards, the *SASB Standards Application Guidance* establishes guidance applicable to the use of all Industry Standards and is considered part of the Standards. Unless otherwise specified in the technical protocols contained in the Industry Standards, the guidance in the SASB Standards Application Guidance applies to the definitions, scope, implementation, compilation and presentation of the metrics in the Industry Standards.

Historically, the *SASB Conceptual Framework* set out the basic concepts, principles, definitions and objectives that guided the SASB Standards Board in its approach to setting standards for sustainability accounting.

Use of the Standards

SASB Standards are intended to aid entities in disclosing information about sustainability-related risks and opportunities that could reasonably be expected to affect the entity's cash flows, its access to finance or cost of capital over the short, medium or long term. An entity determines which Industry Standard(s) and which disclosure topics are relevant to its business, and which associated metrics to report. In general, an entity should use the SASB Standard specific to its primary industry as identified in SICS® . However, companies with substantial business in multiple SICS® industries should refer to and consider the applicability of the disclosure topics and associated metrics in additional SASB Standards.

The disclosure topics and associated metrics contained in this Standard have been identified as those that are likely to be useful to investors. However, the responsibility for making materiality judgements and determinations rests with the reporting entity.

Industry Description

Oil & Gas - Exploration & Production (E&P) entities explore for, extract or produce energy products such as crude oil and natural gas, which comprise the upstream operations of the oil and gas value chain. Entities in the industry develop conventional and unconventional oil and gas reserves; these include shale oil or gas reserves, oil sands and gas hydrates. Activities covered by this standard include the development of both on-shore and off-shore reserves. The E&P industry creates contracts with the Oil and Gas Services industry to conduct several E&P activities and to obtain equipment and oilfield services.

Note: These disclosure topics are for 'pure-play' E&P activities or independent E&P entities. Integrated oil and gas entities conduct upstream operations but also may distribute, refine or market crude oil, natural gas or refined products. Separate standards exist for the Oil and Gas Midstream (EM-MD) and Refining & Marketing (EM-RM) industries. As such, integrated entities should also consider the disclosure topics and metrics from these Standards. A separate standard also exists for the Oil and Gas Services industry (EM-SV).

SUSTAINABILITY DISCLOSURE TOPICS & METRICS

Table 1. Sustainability Disclosure Topics & Metrics

TOPIC	METRIC	CATEGORY	UNIT OF MEASURE	CODE
Greenhouse Gas Emissions	Gross global Scope 1 emissions, percentage methane, percentage covered under emissions-limiting regulations	Quantitative	Metric tonnes CO_2-e (t), Percentage (%)	EM-EP-110a.1
	Amount of gross global Scope 1 emissions from: (1) flared hydrocarbons, (2) other combustion, (3) process emissions, (4) other vented emissions and (5) fugitive emissions	Quantitative	Metric tonnes CO_2-e	EM-EP-110a.2
	Discussion of long- and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets	Discussion and Analysis	n/a	EM-EP-110a.3
Air Quality	Air emissions of the following pollutants: (1) NO_x (excluding N_2O), (2) SO_x, (3) volatile organic compounds (VOCs), and (4) particulate matter (PM_{10})	Quantitative	Metric tonnes (t)	EM-EP-120a.1
Water Management	(1) Total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress	Quantitative	Thousand cubic metres (m^3), Percentage (%)	EM-EP-140a.1
	Volume of produced water and flowback generated; percentage (1) discharged, (2) injected, (3) recycled; hydrocarbon content in discharged water	Quantitative	Thousand cubic metres (m^3), Percentage (%), Metric tonnes (t)	EM-EP-140a.2
	Percentage of hydraulically fractured wells for which there is public disclosure of all fracturing fluid chemicals used	Quantitative	Percentage (%)	EM-EP-140a.3
	Percentage of hydraulic fracturing sites where ground or surface water quality deteriorated compared to a baseline [1]	Quantitative	Percentage (%)	EM-EP-140a.4

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[1] Note to **EM-EP-140a.4** – The entity shall disclose its policies and practices related to ground and surface water quality management.

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TOPIC	METRIC	CATEGORY	UNIT OF MEASURE	CODE
Biodiversity Impacts	Description of environmental management policies and practices for active sites	Discussion and Analysis	n/a	EM-EP-160a.1
	(1) Number and (2) aggregate volume of hydrocarbon spills, (3) volume in Arctic, (4) volume impacting shorelines with ESI rankings 8-10, and (5) volume recovered	Quantitative	Number, Barrels (bbls)	EM-EP-160a.2
	Percentage of (1) proved and (2) probable reserves in or near sites with protected conservation status or endangered species habitat	Quantitative	Percentage (%)	EM-EP-160a.3
Security, Human Rights & Rights of Indigenous Peoples	Percentage of (1) proved and (2) probable reserves in or near areas of conflict	Quantitative	Percentage (%)	EM-EP-210a.1
	Percentage of (1) proved and (2) probable reserves in or near indigenous land	Quantitative	Percentage (%)	EM-EP-210a.2
	Discussion of engagement processes and due diligence practices with respect to human rights, indigenous rights, and operation in areas of conflict	Discussion and Analysis	n/a	EM-EP-210a.3
Community Relations	Discussion of process to manage risks and opportunities associated with community rights and interests	Discussion and Analysis	n/a	EM-EP-210b.1
	(1) Number and (2) duration of non-technical delays	Quantitative	Number, Days	EM-EP-210b.2
Workforce Health & Safety	(1) Total recordable incident rate (TRIR), (2) fatality rate, (3) near miss frequency rate (NMFR), and (4) average hours of health, safety, and emergency response training for (a) direct employees and (b) contract employees	Quantitative	Rate, Hours (h)	EM-EP-320a.1
	Discussion of management systems used to integrate a culture of safety throughout the exploration and production lifecycle	Discussion and Analysis	n/a	EM-EP-320a.2

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TOPIC	METRIC	CATEGORY	UNIT OF MEASURE	CODE
Reserves Valuation & Capital Expenditures	Sensitivity of hydrocarbon reserve levels to future price projection scenarios that account for a price on carbon emissions	Quantitative	Million barrels (MMbbls), Million standard cubic feet (MMscf)	EM-EP-420a.1
	Estimated carbon dioxide emissions embedded in proved hydrocarbon reserves	Quantitative	Metric tonnes (t) CO_2-e	EM-EP-420a.2
	Amount invested in renewable energy, revenue generated by renewable energy sales	Quantitative	Presentation currency	EM-EP-420a.3
	Discussion of how price and demand for hydrocarbons or climate regulation influence the capital expenditure strategy for exploration, acquisition and development of assets	Discussion and Analysis	n/a	EM-EP-420a.4
Business Ethics & Transparency	Percentage of (1) proved and (2) probable reserves in countries that have the 20 lowest rankings in Transparency International's Corruption Perception Index	Quantitative	Percentage (%)	EM-EP-510a.1
	Description of the management system for prevention of corruption and bribery throughout the value chain	Discussion and Analysis	n/a	EM-EP-510a.2
Management of the Legal & Regulatory Environment	Discussion of corporate positions related to government regulations or policy proposals that address environmental and social factors affecting the industry	Discussion and Analysis	n/a	EM-EP-530a.1
Critical Incident Risk Management	Process Safety Event (PSE) rates for Loss of Primary Containment (LOPC) of greater consequence (Tier 1)	Quantitative	Rate	EM-EP-540a.1
	Description of management systems used to identify and mitigate catastrophic and tail-end risks	Discussion and Analysis	n/a	EM-EP-540a.2

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Production of: (1) oil, (2) natural gas, (3) synthetic oil, and (4) synthetic gas	Quantitative	Thousand barrels per day (Mbbl/day); Million standard cubic feet per day (MMscf/day)	EM-EP-000.A

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ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Number of offshore sites	Quantitative	Number	EM-EP-000.B
Number of terrestrial sites	Quantitative	Number	EM-EP-000.C

Greenhouse Gas Emissions

Topic Summary

Exploration & Production (E&P) activities generate significant direct greenhouse gas (GHG) emissions from a variety of sources. Emissions may be combusted, including those arising from flaring or power generation equipment, or uncombusted, including those emissions arising from gas processing equipment, venting, flaring and fugitive methane. Regulatory efforts to reduce GHG emissions in response to climate change related risks may result in additional regulatory compliance costs and risks for E&P entities. With natural gas production from shale resources expanding, the management of the emission of methane, a highly potent GHG, from oil and gas E&P systems has emerged as a major operational, reputational and regulatory risk for entities. Furthermore, the development of unconventional hydrocarbon resources may be more or less GHG-intensive than conventional oil and gas, with associated effects on regulatory risk. Energy efficiency, use of less carbon-intensive fuels, or process improvements to reduce fugitive emissions, venting and flaring, can provide direct benefits to E&P entities in the form of reduced costs or increased revenue.

Metrics

EM-EP-110a.1. Gross global Scope 1 emissions, percentage methane, percentage covered under emissions-limiting regulations

1 The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tonnes of carbon dioxide equivalent (CO_2-e) and calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP values is the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (2014).

1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits or other similar mechanisms that have reduced or compensated for emissions.

2 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).

2.1 These emissions include direct emissions of GHGs from stationary or mobile sources; these sources may include: equipment at well sites, production facilities, refineries, chemical plants, terminals, fixed site drilling rigs, office buildings, marine vessels transporting products, tank truck fleets, mobile drilling rigs, and moveable equipment at drilling and production facilities.

2.2 Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include:

2.2.1 *GHG Reporting Guidance for the Aerospace Industry* published by the International Aerospace Environmental Group (IAEG)

2.2.2 *Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources* published by the U.S. Environmental Protection Agency (EPA)

2.2.3 India GHG Inventory Program

2.2.4 ISO 14064-1

2.2.5 *Petroleum Industry Guidelines for reporting GHG emissions*, 2nd edition, 2011, published by Ipieca

2.2.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* published by Entreprises pour l'Environnement (EpE)

2.3 GHG emission data shall be consolidated according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the 'financial control' approach defined by the GHG Protocol as well as:

2.3.1 The financial approach detailed in Chapter 3 of the Ipieca/API/OGP *Petroleum Industry Guidelines for Reporting Greenhouse Gas Emissions*, 2nd Edition, 2011 (hereafter, the 'Ipieca GHG Guidelines')

2.3.2 *CDSB Framework for reporting environmental and social information*

3 The entity shall disclose the percentage of gross global Scope 1 emissions from methane emissions.

3.1 The percentage of gross global Scope 1 GHG emissions from methane emissions shall be calculated as the methane emissions in metric tonnes of carbon dioxide equivalents (CO_2-e) divided by the gross global Scope 1 GHG emissions in metric tons of carbon dioxide equivalents (CO_2-e).

4 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions covered under an emissions-limiting regulation or programme intended to limit or reduce emissions directly, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (for example, command-and-control approach) and permit-based mechanisms.

4.1 Examples of emissions-limiting regulations include:

4.1.1 California Cap-and-Trade (California Global Warming Solutions Act)

4.1.2 European Union Emissions Trading Scheme (EU ETS)

4.1.3 Quebec Cap-and-Trade (Quebec Environment Quality Act)

4.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO2-e) covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO_2-e).

4.2.1 For emissions subject to more than one emissions-limiting regulation, the entity shall not account for those emissions more than once.

4.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (for example, voluntary trading systems), as well as reporting-based regulations.

5 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was because of emissions reductions, divestment, acquisition, mergers, changes in output or changes in calculation methodology.

6 In the case that current reporting of GHG emissions to the CDP or other entity (for example, a national regulatory disclosure programme) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.

7 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations or mass balance calculations.

EM-EP-110a.2. Amount of gross global Scope 1 emissions from: (1) flared hydrocarbons, (2) other combustion, (3) process emissions, (4) other vented emissions and (5) fugitive emissions

1 The entity shall disclose the amount of direct greenhouse gas (GHG) emissions in CO_2-e from the following sources (1) flared hydrocarbons, (2) other combustion, (3) process emissions, (4) other vented emissions and (5) fugitive emissions from operations.

1.1 Flared hydrocarbons shall include all emissions emitted from flares and which are associated with the management and disposal of unrecoverable natural gas via combustion of hydrocarbon products from routine operations, upsets or emergencies.

1.2 Other combusted emissions shall include:

1.2.1 Emissions from stationary devices, which may include boilers, heaters, furnaces, reciprocating internal combustion engines and turbines, incinerators, and thermal/catalytic oxidisers

1.2.2 Emissions from mobile sources, which may include barges, ships, railcars and trucks for material transport; planes/helicopters and other entity vehicles for personnel transport; forklifts, all-terrain vehicles, construction equipment and other off-road mobile equipment

1.3 Other combusted emissions shall exclude those emissions disclosed as flared hydrocarbons.

1.4 Process emissions shall include those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations and are a result of some form of chemical transformation or processing step. Such emissions may include emissions from hydrogen plants, amine units, glycol dehydrators, fluid catalytic cracking unit and reformer generation, and flexi-coker coke burn.

1.5 Vented emissions shall include those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations, and which include:

1.5.1 Venting from crude oil, condensate or natural gas product storage tanks, gas-driven pneumatic devices, gas samplers, chemical injection pumps, exploratory drilling, loading/ballasting/transit and loading racks

1.5.2 Venting resulting from maintenance/turn-arounds, which may include decoking of furnace tubes, well unloading, vessel and gas compressor depressurising, compressor starts, gas sampling, and pipeline blowdowns

1.5.3 Venting from non-routine activities, which may include pressure relief valves, pressure control valves, fuel supply unloading valves and emergency shut-down devices

1.6 Vented emissions shall exclude those emissions disclosed as process emissions.

1.7 Fugitive emissions shall include those emissions that can be individually found and fixed to reduce emissions rates to near zero and which may include emissions from valves, flanges, connectors, pumps, compressor seal leaks, Cata-Dyne® heaters, and wastewater treatment and surface impoundments.

EM-EP-110a.3. Discussion of long- and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets

1 The entity shall discuss its long- and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.

1.1 Scope 1 emissions are defined and shall be calculated according to the methodology contained in *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (GHG Protocol), Revised Edition, March 2004, published by the World Resources Institute and the World Business Council on Sustainable Development (WRI/WBCSD).

1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

2 The entity shall discuss its emission reduction target(s) and analyse its performance against the target(s), including, if relevant:

2.1 The scope of the emission reduction target (for example, the percentage of total emissions to which the target is applicable);

2.2 Whether the target is absolute or intensity-based, and the metric denominator if it is an intensity-based target;

2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated towards the achievement of the target;

2.4 The time lines for the reduction activity, including the start year, the target year and the base year;

2.5 The mechanism(s) for achieving the target; and

2.6 Any circumstances in which the target or base year emissions have been, or may be, recalculated retrospectively, or the target or base year has been reset, which may include energy efficiency efforts, energy source diversification, carbon capture and storage, or the implementation of leak detection and repair processes.

3 The entity shall discuss the activities and investments required to achieve the plans or targets, and any risks or limiting factors that might affect achievement of the plans or targets.

4 The entity shall discuss the scope of its strategies, plans or reduction targets, such as whether they pertain differently to different business units, geographies or emissions sources.

4.1 Categories of emissions sources include:

4.1.1 Flared hydrocarbons, including all emissions emitted from flares and which are associated with the management and disposal of unrecoverable natural gas via combustion of hydrocarbon products from routine operations, upsets or emergencies

4.1.2 Other combusted emissions, which may include: (1) emissions from stationary devices, which may include boilers, heaters, furnaces, reciprocating internal combustion engines and turbines, incinerators, and thermal/catalytic oxidisers, (2) emissions from mobile sources, which may include barges, ships, railcars and trucks for material transport; planes/helicopters and other entity vehicles for staff transport; forklifts, all-terrain vehicles, construction equipment and other off-road mobile equipment, and (3) other combusted emissions shall exclude those emissions disclosed as flared hydrocarbons

4.1.3 Process emissions, which include those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations and are a result of some form of chemical transformation or processing step. Such emissions may include those from hydrogen plants, amine units, glycol dehydrators, fluid catalytic cracking unit and reformer generation, and flexi-coker coke burn

4.1.4 Vented emissions, including those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations, and which may include: (1) venting from crude oil, condensate or natural gas product storage tanks, gas-driven pneumatic devices, gas samplers, chemical injection pumps, exploratory drilling, loading/ballasting/transit and loading racks, (2) venting resulting from maintenance/turn-arounds, which may include decoking of furnace tubes, well unloading, vessel and gas compressor depressurising, compressor starts, gas

sampling, and pipeline blowdowns, and (3) venting from non-routine activities, which may include pressure relief valves, pressure control valves, fuel supply unloading valves and emergency shut-down devices

4.1.5 Fugitive emissions, which may include those emissions which can be individually found and 'fixed' to make emissions 'near zero' and which may include emissions from valves, flanges, connectors, pumps, compressor seal leaks, catadyne heaters, and wastewater treatment and surface impoundments

5 The entity shall discuss whether its strategies, plans, or reduction targets are related to, or associated with, emissions limiting or emissions reporting-based programmes or regulations (for example, the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international or sectoral programmes.

6 Disclosure of strategies, plans or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.

Air Quality

Topic Summary

Air emissions from Exploration & Production (E&P) operations other than greenhouse gas emissions include air pollutants and volatile organic compounds (VOCs), which can create significant and localised environmental or health risks. Of particular concern are sulphur dioxide, nitrogen dioxide and VOC emissions. The financial consequences entities face from air emissions vary depending on the specific locations of operations and the prevailing air emissions regulations. Impacts on human health may be exacerbated if E&P operations breach air emissions limits close to population centres. Amid increasing regulatory and public concerns about air quality, active air quality management through technological and process improvements could allow entities to mitigate adverse financial effects of regulations. Entities could benefit from operational efficiencies that may result in a lower cost structure over time.

Metrics

EM-EP-120a.1. Air emissions of the following pollutants: (1) NO_x (excluding N_2O), (2) SO_x, (3) volatile organic compounds (VOCs), and (4) particulate matter (PM_{10})

1 The entity shall disclose its emissions of air pollutants, in metric tonnes per pollutant, released into the atmosphere.

1.1 The scope of the disclosure includes air pollutants associated with the entity's direct air emissions resulting from all the entity's activities and sources of emissions, which may include stationary or mobile sources, production facilities, office buildings and transportation fleets.

2 The entity shall disclose emissions consistent with Ipieca/API/OGP *Sustainability reporting guidance for the oil and gas industry*, as noted below.

3 The entity shall disclose its emissions of (1) oxides of nitrogen (NO_x), reported as NO_x.

3.1 The scope of NO_X includes NO and NO_2 but excludes N_2O.

4 The entity shall disclose its emissions of (2) oxides of sulphur (SO_x), reported as SO_x.

4.1 The scope of SO_X includes SO_2 and SO_3.

5 The entity shall disclose its emissions of (3) non-methane volatile organic compounds (VOCs).

5.1 VOCs are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate and methane, that participates in atmospheric photochemical reactions, except those designated under applicable jurisdictional laws or regulations as having negligible photochemical reactivity.

5.2 If applicable regulatory definitions of VOCs conflict with this definition, the entity may define VOCs in accordance with the applicable jurisdictional legal or regulatory definition. In this case, the entity shall identify the source of the definition.

6 The entity shall disclose its emissions of (4) particulate matter 10 micrometres or less in diameter (PM_{10}), reported as PM_{10}.

6.1 PM_{10} is defined as any airborne finely divided solid or liquid material with an aerodynamic diameter less than or equal to a nominal 10 micrometres.

7 The entity may discuss the calculation method for its emissions disclosure, such as whether data is from continuous emissions monitoring systems (CEMS), engineering calculations or mass balance calculations.

Water Management

Topic Summary

Depending on the extraction technique, exploration and production operations may consume significant quantities of water, which may expose entities to the risk of reduced water availability, regulations limiting use, or related cost increases, particularly in water-stressed regions. Contamination of local water resources can result from incidents involving produced water, flowback water, hydraulic fracturing fluids and other well fluids. Historically, the possible impacts of hydraulic fracturing operations and the risk of groundwater supply contamination have raised concerns. Reducing water use and contamination through recycling, other water management strategies, and use of non-toxic fracturing fluids could create operational efficiency for entities and reduce their operating costs. Such strategies could also minimise the effects that regulations, water supply shortages and community-related disruptions have on operations.

Metrics

EM-EP-140a.1. (1) Total water withdrawn, (2) total water consumed; percentage of each in regions with High or Extremely High Baseline Water Stress

1 The entity shall disclose the amount of water, in thousands of cubic metres, withdrawn from all sources.

1.1 Water sources include surface water (including water from wetlands, rivers, lakes and oceans), groundwater, rainwater collected directly and stored by the entity, and water and wastewater obtained from municipal water supplies, water utilities or other entities.

2 The entity may disclose portions of its supply by source if, for example, significant portions of withdrawals are from non-freshwater sources.

2.1 Fresh water may be defined according to the local laws and regulations where the entity operates. If no legal definition exists, fresh water shall be considered to be water that has less than 1,000 parts per million of dissolved solids.

2.2 Water obtained from a water utility in compliance with jurisdictional drinking water regulations can be assumed to meet the definition of fresh water.

3 The entity shall disclose the amount of water, in thousands of cubic metres, consumed in its operations.

3.1 Water consumption is defined as:

3.1.1 Water that evaporates during withdrawal, use and discharge

3.1.2 Water that is directly or indirectly incorporated into the entity's product or service

3.1.3 Water that does not otherwise return to the same catchment area from which it was withdrawn, such as water returned to another catchment area or the sea.

4 The entity shall analyse all its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute's (WRI) Water Risk Atlas tool, Aqueduct.

5 The entity shall disclose water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.

6 The entity shall disclose water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.

EM-EP-140a.2. Volume of produced water and flowback generated; percentage (1) discharged, (2) injected, (3) recycled; hydrocarbon content in discharged water

1 The entity shall disclose the volume, in thousands of cubic metres, of produced water and flowback fluid generated during its activities.

2 Produced water is defined as water (brine) obtained from the hydrocarbon bearing formation strata during the extraction of oil and gas. Produced water can include formation water, injection water, and any chemicals added downhole or during the oil/water separation process.

3 Flowback is defined as the recovered hydraulic fracturing fluid that returns to the surface during a hydraulic fracturing operation that may often be mixed with produced water.

4 The entity shall calculate the percentage of produced water and flowback fluid that was:

4.1 Discharged directly to the environment or indirectly discharged through a third party, such as a local wastewater treatment plant

4.2 Injected

4.3 Recycled for use in other wells, in fracturing fluids or in other drilling and production processes

5 The entity shall disclose the amount, in metric tonnes, of hydrocarbons water discharged to the environment.

5.1 The scope of disclosure includes produced water, flowback, process water, storm water or other water discharged to the environment.

5.2 Measurements of hydrocarbon content should be made using test methods required or approved by applicable legal or regulatory authorities (or equivalent applicable standards).

EM-EP-140a.3. Percentage of hydraulically fractured wells for which there is public disclosure of all fracturing fluid chemicals used

1 The entity shall disclose the percentage of hydraulically fractured wells for which there is public disclosure of all fracturing fluid chemicals used.

1.1 The percentage shall be calculated as the number of hydraulically fractured wells for which it provides public disclosure of all the chemical content of fracturing fluid, divided by the total number of hydraulically fractured wells.

1.2 The entity shall include in the percentage only those wells for which all fluid chemicals are publicly disclosed, including the chemicals that meet the definition of a trade secret.

2 Public disclosure may include posting to a publicly accessible corporate website.

EM-EP-140a.4. Percentage of hydraulic fracturing sites where ground or surface water quality deteriorated compared to a baseline

1 The entity shall calculate the percentage as: the total number of hydraulic fracturing well sites for which it detected a deterioration in the ground or surface water surrounding the well site as compared to a baseline measurement, divided by the total number of hydraulic fracturing well sites.

2 Deterioration in water quality is, at a minimum, defined as occurring when testing indicates:

2.1 Presence of thermogenic gas or a mixture of thermogenic and biogenic gas not present in baseline testing.

2.2 An increase in methane concentration by more than 5.0 mg/l between sampling periods.

2.3 Benzene, toluene, ethylbenzene, xylenes (BTEX compounds) or total petroleum hydrocarbons (TPH) are present in higher concentrations as compared to the baseline.

3 The entity shall determine whether water quality deteriorated against a baseline through monitoring of ground and surface water surrounding hydraulically fractured well sites.

3.1 Determinations shall be consistent with Chapter 3 of the Wyoming Oil and Gas Conservation Commission (WOGCC) Rules and Regulations, the Colorado Oil and Gas Conservation Commission's (COGCC) Rule 609 — Statewide Groundwater Baseline Sampling and Monitoring, or a jurisdictional equivalent.

3.2 The entity shall disclose the jurisdictional standard, guideline or regulation used for its calculation.

4 The initial baseline sample shall occur:

4.1 Prior to drilling or before installation of a surface oil and gas facility on a location

4.2 Prior to re-stimulation of a well, if more than 12 months have passed since the initial pre-drilling sampling event or the most recent re-stimulation sampling event

5 Ongoing monitoring shall occur with at least the following frequency:

5.1 One subsequent sampling between 12 and 18 months after well completion or facility installation

5.2 A second subsequent sampling between 60 and 78 months after the previous sampling event. Dry holes are exempt from this requirement

6 The entity shall collect initial baseline samples and subsequent monitoring samples from all available water sources within a one-half mile radius of a proposed well, multi-well site, or dedicated injection well.

6.1 The entity shall follow sampling guidance from the WOGCC and COGCC or jurisdictional equivalent for the collection of samples, including for instances when few or no sampling sites exist or are accessible.

7 If the entity does not conduct baseline water quality assessments and ongoing monitoring for any of its well sites, then it shall disclose the percentage of wells for which there is no baseline or ongoing monitoring.

8 The entity may disclose whether results of baseline groundwater quality tests and ongoing monitoring are communicated to applicable jurisdictional legal or regulatory authorities (where not required by local law) or residents and business owners in proximity to hydraulic fracturing sites.

Note to **EM-EP-140a.4**

1 The entity shall describe its policies and practices related to its management of ground and surface water quality.

2 Applicable policies and practices may include:

2.1 Well design and well integrity management

2.2 Hydraulic fracturing procedures

2.3 Surface facility design, including the use of backflow preventers, storage tank design and impoundment design

2.4 Surface and groundwater quality and testing

2.5 Chemicals management

2.6 Water reuse, processing and disposal

Biodiversity Impacts

Topic Summary

The Exploration & Production (E&P) industry's activities can have significant impacts on biodiversity. Examples include habitat loss and alteration through land use for exploration, production, disposal of drilling and associated wastes, and decommissioning of onshore and offshore wells. Oil spills and leaks are a threat to species and habitats affected by hydrocarbon contamination. Biodiversity impacts of E&P operations can affect the valuation of oil and gas reserves and create operational risks. Because of increasing protection of ecosystems through popular consensus and legislation, the environmental characteristics of the land where reserves are located may lead to higher, or even prohibitive extraction costs. Entities could also face regulatory or reputational barriers to accessing reserves in ecologically sensitive areas. This may include new protection statuses afforded to areas where reserves are located. Examples of such areas include the Arctic and shorelines with mangroves and swamps, which are not only extremely ecologically sensitive, but also entail more complex and expensive clean-up operations for hydrocarbon spills or leaks. Depreciation in the future value of reserves may be mitigated by considering the proximity of reserves in or near protected areas as part of the decision-making process. Entities with a good reputation for minimising biodiversity impacts could gain a competitive advantage in accessing new reserves in or near protected areas. Ongoing E&P operations could be at risk in the absence of effective environmental management plans for various stages of the project lifecycle because of regulatory penalties, litigation, community protests and associated costs.

Metrics

EM-EP-160a.1. Description of environmental management policies and practices for active sites

1 The entity shall describe its environmental management plans implemented at active sites, including, if relevant:

1.1 the lifecycle stages to which the plans apply, such as: pre-bid (when the entity is considering acquisition of a site), exploration and appraisal, site development, hydrocarbon production, closure, decommissioning and restoration;

1.2 the topics addressed by the plans, such as ecological and biodiversity impacts, waste generation, noise, emissions to air, discharges to water, natural resource consumption and hazardous chemical use;

1.3 the underlying references for its plans, including whether they are codes, guidelines, standards or regulations; and

1.4 whether they were developed by the entity, an industry organisation, a third-party organisation (for example, a non-governmental organisation), a governmental agency or some combination of these groups.

2 The scope of the disclosure includes all terrestrial and offshore operations in which the entity is involved as an operator, partner or contractor, and that are in the exploration, development, production or decommissioning phases.

3 If applicable and relevant, the entity shall describe differences between policies and practices in terrestrial areas and in marine areas.

4 If environmental management policies and practices differ significantly by hydrocarbon resource, then the entity shall describe the relevant differences for each resource.

5 If applicable and relevant, the entity shall describe specific policies and practices that apply to areas with protected conservation status or areas of critical habitat, which are defined by the International Finance Entity (IFC) Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources* as:

5.1 areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered or Endangered species; (ii) habitat of significant importance to endemic or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species or congregatory species; (iv) highly threatened or unique ecosystems; or (v) areas associated with essential evolutionary processes.

6 If the management policies and practices do not apply to all the entity's sites or operations, it shall include the percentage of sites to which they were applied.

7 The entity shall disclose the degree to which its policies and practices are aligned with the IFC *Performance Standards on Environmental and Social Sustainability*, 2012, including:

7.1 Performance Standard 1, *Assessment and Management of Environmental and Social Risks and Impacts*;

7.2 Performance Standard 3, *Resource Efficiency and Pollution Prevention*;

7.3 Performance Standard 4, *Community Health, Safety, and Security*; and

7.4 Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*.

8 Additional relevant references may include:

8.1 Joint E&P Forum/UNEP, Environmental management in oil and gas exploration and production—An overview of issue and management approaches, 1997; and

8.2 World Bank Multistakeholder Initiative, *Towards Sustainable Decommissioning and Closure of Oil Fields and Mines: A Toolkit to Assist Government Agencies'*.

EM-EP-160a.2. (1) Number and (2) aggregate volume of hydrocarbon spills, (3) volume in Arctic, (4) volume impacting shorelines with ESI rankings 8-10, and (5) volume recovered

1 The entity shall disclose (1) the total number and (2) volume (in barrels) of hydrocarbon spills.

1.1 The entity shall disclose all spills greater than one barrel (1 bbl, or 159 litres) in volume.

1.2 The entity shall disclose spills that reached the environment, and exclude spills contained within impermeable secondary containment.

2 Consistent with Ipieca/API/OGP *Sustainability reporting guidance for the oil and gas industry* (hereafter, 'Ipieca Guidance'), the volume reported shall represent the total estimated amount spilled that reached the environment and should not be reduced by the amount of such hydrocarbon subsequently recovered, evaporated or otherwise lost.

3 Consistent with Ipieca Guidance, the scope of releases from operations and events includes:

3.1 above-ground and below-ground facilities;

3.2 sabotage, earthquakes or other events outside operational control;

3.3 entity-owned and operated transport; and

3.4 leakage over time, which is counted once at the time it is identified.

4 The entity may disclose spills to soil and water separately. A spill that qualifies as a spill to both soil and water should be reported as a single spill to water, with the volume of the spill properly apportioned between soil and water.

5 The entity shall disclose (3) the volume of spills, in barrels, that occurred in the Arctic, defined as the area north of the Arctic Circle at approximately 66° 33′ north latitude.

6 The entity shall disclose (4) the volume of spills impacting environmentally sensitive shorelines.

6.1 The scope of spills to environmentally sensitive shorelines shall include spills to water that reached the soil or spills directly to the soil of shorelines with Environmental Sensitivity Index (ESI) levels 8–10, defined according to Ipieca's *Sensitivity mapping for oil spill response*, for shoreline sensitivity mapping.

6.2 The entity may use alternative geospatial tools to assess whether a shoreline is environmentally sensitive for shoreline sensitivity mapping if the tools provide results and data interpretation consistent with the Ipieca Environmental Sensitivity Index 8–10, based on shoreline type, exposure to wave and tidal energy and general biological productivity and sensitivity.

6.2.1 The entity shall disclose the geospatial tools used to assess environmentally sensitive shorelines and why it chose those specific tools.

7 In accordance with Ipieca Guidance Indicator ENV-6, which defines 'recovered hydrocarbons', the entity shall disclose (5) the volume of spills recovered, which is calculated as the quantity of spilled hydrocarbons (in bbls) removed from the environment through short-term spill response activities, excluding:

7.1 amounts recovered during longer-term remediation at spill sites; and

7.2 amounts that have evaporated, burned or dispersed.

EM-EP-160a.3. Percentage of (1) proved and (2) probable reserves in or near sites with protected conservation status or endangered species habitat

1 The entity shall disclose (1) the percentage of its proved reserves, by volume, located in sites with protected conservation status or in endangered species habitat.

1.1 The percentage of proved reserves shall be calculated as the quantity (volume) of proved reserves located in areas with protected conservation status or endangered species habitat, divided by the total amount of proved reserves.

2 The entity shall disclose (2) the percentage of net probable reserves, by volume, located in sites either with protected conservation status or in endangered species habitat.

2.1 The percentage of probable reserves shall be calculated as the quantity (volume) of probable reserves located in areas with protected conservation status or endangered species habitat, divided by the total quantity of probable reserves.

3 Reserves are considered to be in areas of protected conservation status if they are located within:

3.1 International Union for Conservation of Nature (IUCN) Protected Areas (categories I–VI);

3.2 Ramsar Wetlands of International Importance;

3.3 United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Sites;

3.4 Biosphere Reserves recognised within the framework of UNESCO's Man and the Biosphere (MAB) Programme;

3.5 Natura 2000 sites; or

3.6 sites that meet the IUCN's definition of a protected area: 'A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values'.[2]

3.6.1 These sites may be listed in the World Database of Protected Areas (WDPA) and mapped on Protected Planet.

4 Reserves are considered to be in endangered species habitat if they are in or near areas where species on the IUCN Red List of Threatened Species that are classified Critically Endangered (CR) or Endangered (EN) are extant.

4.1 A species is considered extant in an area if it is a resident, present during breeding or non-breeding season, or if it makes use of the area for passage.

4.1.1 For the purposes of disclosure, 'passage' is defined as all areas of land or water that a migratory species inhabits, stays in temporarily, crosses or overflies at any time on its normal migration route.

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[2] IUCN, *Guidelines for Applying Protected Areas Management Categories*, 2008, pp.8–9.

5 For the purposes of this disclosure, 'near' is defined as within five kilometres (km) of the boundary of an area of protected conservation status or an endangered species habitat and the location of the entity's proved and probable reserves.

6 The entity shall follow guidance published in the Society of Petroleum Engineers' (SPE) Petroleum Resources Management System (PRMS) or jurisdictional equivalent for the classifying of reserves as proved or probable.

7 The entity may separately identify reserves in areas with additional ecological, biodiversity or conservation designations such as those listed by the Biodiversity A–Z resource prepared by the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC).

8 The entity may discuss reserves located in protected areas or endangered species habitats, but that present low risks to biodiversity or ecosystem services. The entity may provide similar discussion for reserves located in areas with no official designation of high biodiversity value, but that present high risks to biodiversity or ecosystem services.

Security, Human Rights & Rights of Indigenous Peoples

Topic Summary

Exploration & Production (E&P) entities face additional community-related risks when operating in conflict zones; in areas with weak or absent governance institutions, rule of law, or legislation to protect human rights; or in areas with vulnerable communities such as indigenous peoples. Entities using private or government security forces to protect their workers and assets may knowingly or unknowingly contribute to human rights violations, including the use of excessive force. Entities perceived as contributing to human rights violations or failing to account for indigenous peoples' rights may be affected by protests, riots or suspension of permits. These entities could face substantial costs related to compensation or settlement payments, and write-downs in the value of their reserves in such areas. In the absence of applicable jurisdictional laws or regulations to address such cases, several international instruments have emerged to provide guidelines for entities. These instruments include obtaining the free, prior and informed consent of indigenous peoples for decisions that affect them. Several countries have implemented specific laws protecting indigenous peoples' rights, creating increasing regulatory risk for entities that violate those rights.

Metrics

EM-EP-210a.1. Percentage of (1) proved and (2) probable reserves in or near areas of conflict

1 The entity shall disclose (1) the percentage of its proved reserves, by volume, located in or near areas of active conflict.

1.1 The percentage of proved reserves shall be calculated as the quantity (volume) of proved reserves located in or near areas of active conflict divided by the total quantity of proved reserves.

2 The entity shall disclose (2) the percentage of its probable reserves, by volume, located in or near areas of active conflict.

2.1 The percentage of probable reserves shall be calculated as the quantity (volume) of probable reserves located in or near areas of active conflict divided by the total quantity of probable reserves.

3 Active conflict is defined according to the Uppsala Conflict Data Program (UCDP) definition:

3.1 'A conflict, both state-based and non-state, is deemed to be active if there are at least 25 battle-related deaths per calendar year in one of the conflict's dyads.'

4 Reserves shall be considered to be in or near an area of active conflict if they are located in the same country as the active conflict.

4.1 If the entity can demonstrate that a conflict is contained to a region, state or designated area not proximate to its reserves, then it may exclude these from the scope of the disclosure.

4.2 If reserves are located in a country, region or state adjacent to an active conflict or can be reasonably expected to be operationally affected by the conflict, then these reserves shall be included in the scope of the disclosure.

5 The entity shall follow guidance published in the Society of Petroleum Engineers' (SPE) Petroleum Resources Management System (PRMS) or the applicable jurisdictional equivalent for the classifying of reserves as proved or probable.

EM-EP-210a.2. Percentage of (1) proved and (2) probable reserves in or near indigenous land

1 The entity shall disclose (1) the percentage of its proved reserves located, by volume, in or near areas considered to be indigenous peoples' land.

1.1 The percentage of proved reserves shall be calculated as the quantity (volume) of proved reserves located in or near indigenous land divided by the total quantity of proved reserves.

2 The entity shall disclose (2) the percentage of its probable reserves, by volume, located in or near areas considered to be indigenous peoples' land.

2.1 The percentage of probable reserves shall be calculated as the quantity (volume) of probable reserves located in or near indigenous land divided by the total quantity of probable reserves.

3 Indigenous peoples' lands are considered as those occupied by people who self-identify as indigenous in accordance with Article 33 of the United Nations *Declaration on the Rights of Indigenous Peoples* and the International Labour Organization Convention 169, and based on the working definition of 'Indigenous Peoples' adopted by the United Nations, probably have one or more of the following characteristics, such as:

3.1 historical continuity with pre-colonial or pre-settler societies;

3.2 strong link to territories and surrounding natural resources;

3.3 distinct social, economic or political systems;

3.4 distinct language, culture and beliefs;

3.5 form non-dominant groups of society; and

3.6 resolve to maintain and reproduce ancestral environments and systems as distinct peoples and communities.

4 For the purposes of this disclosure, 'near' is defined as within five kilometres of the recognised boundary of an area considered to be indigenous land and the location of the entity's proved and probable reserves.

5 The entity shall follow guidance published in the Society of Petroleum Engineers' (SPE) Petroleum Resources Management System (PRMS) or the applicable jurisdictional equivalent for the classifying of reserves as proved or probable.

EM-EP-210a.3. Discussion of engagement processes and due diligence practices with respect to human rights, indigenous rights, and operation in areas of conflict

1 The entity shall describe its due diligence practices and procedures with respect to indigenous rights of communities in which it operates or intends to operate, which may include:

1.1 upholding International Labour Organization (ILO) Convention 169;

1.2 use of free, prior and informed consent (or consultation) processes;

1.3 the establishment of project grievance mechanisms; and

1.4 the establishment of formal community agreements.

2 The entity shall describe its due diligence practices and procedures with respect to upholding the principles covered in human rights frameworks, such as the:

2.1 International Labour Organisation (ILO) *Declaration on Fundamental Principles and Rights at Work* and the fundamental ILO conventions on freedom of association (No. 87), collective bargaining (No. 98), forced labour (No. 29 and No. 105), child labour (No. 138 and No. 182), fair wages (No. 100), and discrimination (No. 111);

2.2 United Nations *Guiding Principles on Business and Human Rights*, specifically Human Rights Due Diligence (Principle 17a-c); and

2.3 Voluntary Principles on Security and Human Rights.

3 The entity shall discuss its practices and procedures while operating in areas of conflict, such as:

3.1 describing its approach with reference to the approaches listed in Ipieca's *Guide to operating in areas of conflict for the oil and gas industry*: 'do no harm', 'do something', and 'do something ++'.

4 An entity is considered to be operating in an area of conflict if it is conducting operations in the same country as an active conflict, or adjacent to an active conflict, if the conflict can reasonably be expected to affect the entity's operations.

5 Active conflict is defined according to the Uppsala Conflict Data Program (UCDP) definition:

5.1 'A conflict, both state-based and non-state, is deemed to be active if there are at least 25 battle-related deaths per calendar year in one of the conflict's dyads.'

6 The discussion shall include due diligence processes employed during all stages of project development (prior, during and post).

7 The discussion may include how local or regional factors are considered in the entity's engagement processes and due diligence practices with respect to human rights (and specifically indigenous rights, if applicable) as well as operations in areas of conflict.

8 The discussion may include governance mechanisms the entity puts in place to ensure that all levels of the organisation adhere to its policies and practices.

9 The discussion shall include how practices apply to business partners, such as contractors, subcontractors, suppliers and joint arrangement partners.

9.1 If practices do not apply to business partners, the entity may discuss factors that prevent the application of such practices.

Community Relations

Topic Summary

Exploration & Production (E&P) activities take place over many years and can have a wide range of adverse effects on communities. Community rights and interests may be affected by the environmental and social impacts of E&P operations, such as competition for access to local energy or water resources, air and water emissions, and waste. Entities frequently need support from local communities to obtain permits and leases and conduct their activities without disruptions. Entities may experience adverse financial impacts if the community interferes, or lobbies its government to interfere, with the rights of an E&P entity in relation to their ability to access, develop and produce reserves. In addition to community concerns about the direct impacts of projects, the presence of E&P activities may create associated socioeconomic concerns related to education, health, livelihoods and food security for the community. E&P entities engaging in rent-seeking and exploiting a community's resources without providing proportional socioeconomic benefits in return may be exposed to actions by host governments and communities that restrict their activities or impose additional costs. These could include imposition of ad hoc taxes and export restrictions. These risks vary depending on the country and could be higher in countries heavily reliant on oil and gas for their economic growth. Entities in the extractives industries can adopt various community engagement strategies in their global operations to manage risks and opportunities associated with community rights and interests, such as integrating community engagement into each phase of the project cycle. Entities are beginning to adopt a 'shared value' approach to provide significant socioeconomic benefits to communities and allow them to operate profitably.

Metrics

EM-EP-210b.1. Discussion of process to manage risks and opportunities associated with community rights and interests

1 The entity shall discuss its processes, procedures and practices to manage risks and opportunities associated with the rights and interests of communities in areas where it conducts business. Community rights and interests include:

1.1 economic rights and interests, which may include employment, fair wages, payment transparency and respect for infrastructure and agricultural land;

1.2 environmental rights and interests, which may include clean local air and water, as well as safe discharge and disposal of waste;

1.3 social rights and interests, which may include adequate health care, education and housing; and

1.4 cultural rights and interests, which may include protection of places of cultural significance (for example, sacred sites or burial sites).

2 The entity shall disclose, if relevant:

2.1 the lifecycle stages to which its practices apply, such as: pre-bid (when the entity is considering acquisition of a site), exploration and appraisal, site development, hydrocarbon production, closure, decommissioning and restoration;

2.2 the community rights and interests (enumerated above) specifically addressed by the entity's practices; and

2.3 the underlying references for its procedures, including whether they are codes, guidelines, standards or regulations and whether they were developed by the entity, an industry organisation, a third-party organisation (for example, a non-governmental organisation), a governmental agency or some combination of these groups.

3 Risks and opportunities may include: non-technical delays, availability and development of local content, availability and access to adequate infrastructure, community actions, and challenges associated with resettlement and access to land.

4 The entity shall disclose the degree to which its policies and practices are aligned with the International Finance Entity's (IFC) *Performance Standards on Environmental and Social Sustainability*, 2012, including:

4.1 Performance Standard 4, *Community Health, Safety, and Security*;

4.2 Performance Standard 5, *Land Acquisition and Involuntary Resettlement*; and

4.3 Performance Standard 8, *Cultural Heritage*.

5 The discussion shall include how practices apply to business partners such as contractors, subcontractors, suppliers and joint arrangement partners.

6 The entity may describe its efforts to eliminate or mitigate community risks or address community concerns, which may include:

6.1 the use of social impact assessment (SIA) that evaluates, manages and mitigates risks;

6.2 efforts to engage with stakeholders, build consensus and collaborate with communities; and

6.3 'shared' or 'blended' value projects that provide quantifiable benefits to the community and the entity.

7 The entity may quantify its community risks by calculating the aggregate estimated value at risk as the difference in value between a project free from country, regional or community risks (hereafter, country risk) and the value of a project adjusted for these risks.

7.1 This calculation may be conducted using an appropriate valuation model; variations of the Capital Asset Pricing Model (CAPM) are commonly used to assess country risk.

7.1.1 Value at risk can be calculated by applying an additional discount rate premium in calculating the net present value of a project using discounted cash flow (DCF) analysis.

7.1.2 Value at risk can be expressed as a reduction in the expected cash flows of a project because of country risk in calculating the net present value of a project using DCF.

7.1.3 If a project is insured for country risks, the value at risk can be expressed as a reduction in the cash flows of a project because of the cost of insurance in calculating the net present value of a project using DCF analysis.

7.2 Country, regional or community risks may include: corruption, business legal structure, political stability, regulation, ethnic conflict, stability of the local market, availability of a skilled labour force, resettlement and access to land, quality of access to infrastructure (for example, ports, roads, shipping channels), or general licence to operate.

7.2.1 These risks may vary by jurisdiction and project level.

7.2.2 These risks differ from sovereign risk, which is defined as the potential for a central bank or government-backed entity to willingly or unwillingly default on debt obligations, or significantly alter important economic variables such as currency exchange rates, import ratios and money supply.

7.3 The entity should identify and describe country risks specific to its projects and unique operating context.

7.3.1 This description may include the identification of country, regional and community risks or the discussion of specific projects.

7.3.2 This description may include discussion of how the entity has mitigated country risks (for example, through community engagement partnerships and blended value projects). The entity shall quantify this reduction in risk according to the methods described above.

7.3.3 This description may include discussion of how the entity has mitigated country risks (for example, through community engagement partnerships and blended value projects). The entity shall quantify this reduction in risk according to the methods described above.

7.4 The entity may describe the model or approach used to value capital expenditure projects such as adjusted discount rate, expected cash flow or other methods.

EM-EP-210b.2. (1) Number and (2) duration of non-technical delays

1 The entity shall disclose (1) the total number and (2) duration, in days, of site shutdowns or project delays because of non-technical factors.

2 The scope may include shutdowns and project delays resulting from pending regulatory permits, or other political delays, community or stakeholder resistance or protest, or armed conflict.

3 The entity may discuss specific delays including associated costs, root cause and corrective actions for resolved delays, and status of ongoing delays.

Workforce Health & Safety

Topic Summary

Workers involved in Exploration & Production (E&P) activities face significant health and safety risks because of the harsh working environments and the hazards of handling oil and gas. In addition to acute harms resulting from accidents, workers may develop chronic health conditions, including those caused by silica or dust inhalation, as well as mental health problems. A significant proportion of the workforce at oil and gas drilling sites consists of temporary workers and employees of oil and gas service entities. An entity's ability to protect employee health and safety, and to create a culture of safety and well-being among all employees, may prevent accidents, mitigate costs, reduce operational downtime and enhance workforce productivity. Additional health and safety protocols may be needed to protect groups such as women and minorities in regions where they continue to face discrimination.

Metrics

EM-EP-320a.1. (1) Total recordable incident rate (TRIR), (2) fatality rate, (3) near miss frequency rate (NMFR), and (4) average hours of health, safety, and emergency response training for (a) direct employees and (b) contract employees

1 The entity shall disclose (1) its total recordable incident rate (TRIR) for work-related injuries and illnesses.

1.1 An injury or illness is considered a recordable incident if it results in death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness. Additionally, a significant injury or illness diagnosed by a physician or other licensed health care professional is considered a recordable incident, even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid or loss of consciousness.

1.1.1 First aid is defined as emergency care or treatment for an ill or injured person before regular medical aid can be provided.

1.1.2 The entity may use applicable jurisdictional criteria for definitions of a recordable incident and a non-recordable incident such as first aid. The entity shall disclose the legal, regulatory or industry framework used as the source for these criteria and definitions.

2 The entity shall disclose (2) its fatality rate for work-related fatalities.

3 The entity shall disclose (3) its near miss frequency rate (NMFR) for work-related near misses.

3.1 A near miss is defined as an unplanned or uncontrolled event or chain of events that has not resulted in a recordable injury, illness, physical damage or environmental damage, but had the potential to do so in other circumstances.

3.2 The entity may disclose its process for classifying, identifying and reporting near misses.

4 All disclosed rates shall be calculated as: (statistic count × 200,000) / total number of hours worked by all employees in the year reported.

4.1 The '200,000' in the rate calculation represents the total number of hours 100 full-time workers working 40 hours per week for 50 weeks per year can provide annually.

5 The entity shall disclose (4) the average number of training hours it provided to its workforce for health, safety and emergency management training.

5.1 Training shall relate to topics such as the health, safety, or emergency preparedness of employees with respect to occupational risks or hazards to which employees are reasonably likely to be exposed and specific occupational risks or hazards.

6 The average number of hours of health, safety and emergency response training shall be calculated as: (total qualifying training hours provided by the entity) / (total number of employees).

6.1 The total number of employees is number of the entity's direct and contract employees at the end of the reporting period. If the total number of employees varied widely during the reporting period, the entity should discuss those variations to provide context.

7 The scope of the disclosure includes work-related incidents only.

7.1 Work-related incidents are injuries and illnesses resulting from events or exposures in the work environment.

7.2 The work environment is the establishment and other locations where one or more employees are working or are present as a condition of their employment.

7.3 The work environment includes not only physical locations, but also the equipment or materials used by the employee during the course of work.

7.4 Incidents that occur while an employee is travelling are work-related if, at the time of the injury or illness, the employee was engaged in work activities in the interest of the employer.

7.5 A work-related incident must be a new case, not a previously recorded injury or illness being updated.

8 The entity shall disclose the rates and average hours of training for each of these employee categories:

8.1 direct employees, defined as individuals on the entity's payroll, whether they are full-time, short service, part-time, executive, labour, salary, seasonal, migrant or hourly employees; and

8.2 contract employees, defined as individuals who are not on the entity's payroll, but whom the entity supervises or manages, including independent contractors and those employed by third parties (for example, temp agencies and labour brokers).

9 The scope of the disclosure includes all employees regardless of employee location or type of employment.

EM-EP-320a.2. Discussion of management systems used to integrate a culture of safety throughout the exploration and production lifecycle

1 The entity shall discuss how it integrates a culture of safety throughout the exploration and production lifecycle.

1.1 The discussion shall include how the entity integrates a culture of safety throughout its value chain, such as through technology, training, corporate culture, regulatory compliance, monitoring, testing and personal protective equipment.

1.2 The discussion may broadly consider the entity's safety management systems, but it shall specifically address systems used to maintain a safe working environment, including the prevention of incidents, fatalities and illnesses.

2 The entity shall include a description of how workforce safety management is coordinated among business partners (for example, contractors and subcontractors).

3 The exploration and production lifecycle phases may include geological and seismic surveys, site surveys, exploratory drilling, appraisal drilling, site development, production and decommissioning.

Reserves Valuation & Capital Expenditures

Topic Summary

Exploration and production (E&P) entities may be unable to extract a significant proportion of their proved and probable oil and gas reserves if greenhouse gas (GHG) emissions are controlled to limit global temperature increases. Entities with more carbon-intensive reserves and production and higher capital costs may face greater risks. Regulatory limits on GHG emissions, together with improved competitiveness of alternative energy technologies, could reduce global demand growth, and therefore reduce prices for oil and gas products. Extraction costs could increase with regulations that put a price on GHG emissions. These factors could affect the economic viability of oil and gas reserves. Regulatory actions that are more abrupt than anticipated, or those focusing on industries with high emissions, could impair asset values over a short period. Stewardship of capital resources and production decisions that consider near- and long-term trends related to climate change may mitigate potential asset impairment and maintain profitability and creditworthiness.

Metrics

EM-EP-420a.1. Sensitivity of hydrocarbon reserve levels to future price projection scenarios that account for a price on carbon emissions

1 The entity shall perform a sensitivity analysis of its reserves to determine how several future scenarios may affect the determination of whether the reserves are proved or probable.

2 The entity shall analyse the sensitivity of its current proven and probable reserves using the price trajectories published by the International Energy Agency (IEA) in its *World Energy Outlook* (WEO) publication, including:

2.1 Current Policies Scenario, which assumes no changes in policies from the mid-point of the year of publication of the WEO.

2.2 New Policies Scenario, which assumes that broad policy commitments and plans that have been announced by countries (including national pledges to reduce greenhouse gas emissions and plans to phase out fossil-energy subsidies), occur even if the measures to implement these commitments have yet to be identified or announced. This broadly serves as the IEA baseline scenario.

2.3 Sustainable Development Scenario, which assumes that an energy pathway occurs that is consistent with the goal of limiting the global increase in temperature to 1.5°C by limiting concentration of greenhouse gases in the atmosphere.

2.4 The entity shall consider the WEO scenarios as a normative reference; thus, any updates to the WEO made year-on-year shall be considered updates to this guidance.

3 The entity shall follow the applicable jurisdictional guidance for the following:

3.1 Classifying reserves as proved and probable

3.2 Conducting a reserves sensitivity analysis and disclosing, in the aggregate, an estimate of reserves for each product type based on various price and cost criteria, such as a range of prices and costs that may reasonably be achieved, including standardised futures prices or management's own forecasts

3.2.1 The entity shall disclose the price and cost schedules and assumptions on which disclosed values are based

3.3 Determining current (or base) case of reserve levels

4 The entity may use the following table format to summarise its findings:

Table 3. Sensitivity of reserves to prices by principal product type and price scenario

PRICE CASE	PROVED RESERVES			PROBABLE RESERVES		
(Scenario)	**Oil (MMbbls)**	**Gas (MMscf)**	**Product:A (measure)**	**Oil (MMbbls)**	**Gas (MMscf)**	**Product:A (measure)**
Current Policies Scenario (base)						
New Policies Scenario						
Sustainable Development Scenario						

5 The entity may disclose the sensitivity of its reserve levels in other price and demand scenarios in addition to those described above, particularly if these scenarios vary depending on the type of hydrocarbon reserves, regulatory environment in the countries or regions where exploration occurs, end-use of the entity's products, or other factors.

6 For additional sensitivity analyses, the entity should consider disclosing the following, per the Task Force on Climate- Related Financial Disclosures (TCFD) Recommendations Report Figure 8 as well as the Implementing the Recommendations of the TCFD Report, Section E:

6.1 The alternative scenarios used, including other 2°C or lower scenarios

6.2 Critical input parameters, assumptions and analytical choices for the climate-related scenarios used, particularly as they relate to key areas such as policy assumptions, energy deployment pathways, technology pathways and related timing assumptions

6.3 Time frames used for scenarios, including short-, medium- and long-term milestones (for example, how organisations consider timing of potential future implications under the scenarios used)

EM-EP-420a.2. Estimated carbon dioxide emissions embedded in proved hydrocarbon reserves

1 The entity shall calculate and disclose an estimate of the carbon dioxide emissions embedded in its proved hydrocarbon reserves.

1.1 This estimate applies a factor for potential CO_2 only and does not include an estimate for all potential greenhouse gas emissions, as these are dependent on downstream use (for example, utility electricity generation, industrial heating and electricity generation, residential heating and cooling, transportation, or use in petrochemicals, agrochemicals, asphalt and lubricants).

2 Estimated potential carbon dioxide emissions from proved hydrocarbon reserves shall be calculated according to the following formula, derived from Meinshausen et al.:

2.1 $E = R \times V \times C$, where:

2.1.1 E are the potential emissions in kilogrammes of carbon dioxide (kg CO_2);

2.1.2 R are the proved reserves in gigagrams (Gg);

2.1.3 V is the net calorific value in terajoules per gigagram (TJ/Gg); and

2.1.4 C is the effective carbon dioxide emission factor in kilogrammes CO_2 per terajoule (kg/TJ).

3 In the absence of data specific to the entity's hydrocarbon reserves, carbon content shall be calculated using default data for each major hydrocarbon resource published by the Intergovernmental Panel on Climate Change (IPCC) in its *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

3.1 The entity shall use default carbon content values per unit of energy listed in IPCC Table 1.3 Default Values of Carbon Content, Volume 2: Energy, Chapter 1.

3.2 The entity shall use calorific values per weight of hydrocarbon contained in IPCC Table 1.2 Default Net Calorific Values (NCVs) and Lower and Upper Limit of the 95% Confidence Intervals, Volume 2: Energy, Chapter 1.

4 The entity shall use engineering estimates to determine the weight of its hydrocarbon reserves in gigagrams.

5 For other assumptions required to estimate the carbon content of hydrocarbon reserves, the entity shall rely on guidance from the IPCC, the Greenhouse Gas Protocol or the International Energy Agency (IEA).

EM-EP-420a.3. Amount invested in renewable energy, revenue generated by renewable energy sales

1 The entity shall disclose the total amount spent, including capital and research and development expenditures, on renewable or alternative energy sources.

1.1 Such disclosure generally corresponds to the renewable energy technology areas per C-OG 9.6 of the CDP Climate Change Questionnaire.

2 The entity shall disclose the sales generated from renewable energy sources.

2.1 Such disclosure generally corresponds to the renewable energy strategic development areas Section C4.5a of the CDP Climate Change Questionnaire

3 Renewable energy is defined as energy from sources that are capable of being replenished quickly through ecological cycles, such as geothermal, wind, solar, hydro and biomass.

3.1 For the purposes of this disclosure, the scope of renewable energy from biomass sources is limited to materials certified to a third-party standard (for example, Forest Stewardship Council, Sustainable Forest Initiative, Programme for the Endorsement of Forest Certification or American Tree Farm System), materials considered 'eligible renewables' according to the Green-e Energy National Standard.

3.1.1 The entity shall consider the Green-e Energy National Standard as a normative reference; thus, any updates to the Standard made year-on-year shall be considered updates to this guidance.

4 The entity shall consider the CDP Climate Change Questionnaire a normative reference; thus, any updates made year-on-year shall be considered updates to the guidance.

EM-EP-420a.4. Discussion of how price and demand for hydrocarbons or climate regulation influence the capital expenditure strategy for exploration, acquisition and development of assets

1 The entity shall discuss how projections for price and demand for hydrocarbon products and the path of climate regulation influence the entity's capital expenditure (CAPEX) investment strategy.

1.1 This discussion should include the entity's projections and assumptions about future hydrocarbon prices and the likelihood that various price and demand scenarios occur.

2 The entity shall discuss the implications of how price and demand scenario planning (EM-EP-420a.1) may affect decisions to explore, acquire and develop new reserves.

3 The entity may discuss factors that materially influence its CAPEX decision making, which may include:

3.1 How the scope of climate change regulation—such as which countries, regions or industries are likely to be affected—may influence the type of hydrocarbon on which the entity focuses its exploration and development

3.2 Its view of the alignment between the time horizon over which price and demand for hydrocarbons may be affected by climate regulation and time horizons for returns on capital expenditures on reserves

3.3 How the structure of climate regulation—a carbon tax versus cap-and-trade—may differently affect price and demand, and thus the entity's capital expenditure decision making

4 The entity may discuss how these trends affect decision-making in the context of various types of reserve expenditures, including development of assets, acquisition of properties with proved reserves, acquisition of properties with unproved reserves, and exploration activities.

4.1 The entity shall discuss capital expenditures, regardless of the accounting method it uses (full cost or successful efforts).

Business Ethics & Transparency

Topic Summary

Managing business ethics and maintaining an appropriate level of transparency in payments to governments or individuals are significant issues for Exploration & Production (E&P) entities. Relationships with governments are especially important to entities in the E&P industry since entities compete for access to oil and gas reserves. Anti-corruption, anti-bribery, and payments transparency laws and initiatives globally create regulatory mechanisms to reduce the risk of misconduct. Violations of these could result in significant one-time costs or higher compliance costs, whereas successful compliance with such regulations could avoid adverse outcomes. Enforcement of these laws could affect an entity's social licence to operate. Entities with significant reserves or operations in corruption-prone countries could face increased risks. Entities must ensure their governance structures and business practices reduce the risks associated with corruption and wilful or unintentional participation in illegal or unethical payments, or with gifts to government officials or private individuals.

Metrics

EM-EP-510a.1. Percentage of (1) proved and (2) probable reserves in countries that have the 20 lowest rankings in Transparency International's Corruption Perception Index

1 The entity shall disclose (1) the percentage of its proved reserves, by volume, located in the countries with the 20 lowest rankings in Transparency International's Corruption Perception Index (CPI).

1.1 The percentage of proved reserves shall be calculated as the quantity (volume) of proved reserves located in countries that have the lowest 20 rankings in Transparency International's CPI divided by the total quantity (volume) of proved reserves.

2 The entity shall disclose (2) the percentage of its probable reserves, by volume, located in the countries with the 20 lowest rankings in Transparency International's CPI.

2.1 The percentage of probable reserves shall be calculated as the quantity (volume) of probable reserves located in countries that have the lowest 20 rankings in Transparency International's CPI divided by the total quantity (volume) of probable reserves.

3 The 20 lowest numerical ranks shall be used to generate the scope of countries. Because more than one country can share a single rank, the scope may include more than 20 countries.

4 The entity shall use the most current version of the CPI.

5 The entity may discuss operations located in countries with low rankings in the index but that present low business ethics risks; and may provide similar discussion for operations located in countries that do not have one of the 20 lowest rankings in the index but that present unique or high business ethics risks.

6 The entity shall follow guidance published in the Society of Petroleum Engineers' (SPE) Petroleum Resources Management System (PRMS) or the applicable jurisdictional equivalent for the classifying of reserves as proved or probable.

EM-EP-510a.2. Description of the management system for prevention of corruption and bribery throughout the value chain

1 The entity shall describe its management system and due diligence procedures for assessing and managing corruption and bribery risks within the scope of its own operations and those associated with business partners in its value chain.

1.1 Business partners may include customers, suppliers, contractors, subcontractors and joint arrangement partners.

1.2 Relevant aspects of a management system include, if relevant:

1.2.1 employee awareness programmes;

1.2.2 internal mechanisms for reporting and following up on suspected violations;

1.2.3 anti-corruption policies; and

1.2.4 application of the Extractive Industry Transparency Initiative (EITI) Standard, which may include provisions related to beneficial ownership and politically exposed persons, licences and contracts, social expenditures, project-level payments, subnational payments, data accessibility and multi-stakeholder engagement.

2 The entity may discuss its implementation of the following organisational guidelines:

2.1 Organisation for Economic Co-operation and Development (OECD) anti-corruption guidelines;

2.2 International Chamber of Commerce (ICC) *Rules of Conduct and Recommendations to Combat Extortion and Bribery*;

2.3 Transparency International *Business Principles for Countering Bribery*;

2.4 United Nations Global Compact 10th Principle; and

2.5 World Economic Forum (WEF) Partnering Against Corruption Initiative (PACI).

3 The entity may discuss laws or regulations related to payments transparency to which it is subject.

Management of the Legal & Regulatory Environment

Topic Summary

The Exploration & Production (E&P) industry is subject to numerous sustainability-related regulations and a rapidly changing regulatory environment. Entities in the industry regularly participate in the regulatory and legislative process on a wide variety of environmental and societal issues, and they may do so directly or through representation by an industry association. Entities may participate in these processes to ensure industry views are represented in the development of regulations affecting the industry, as well as to represent shareholder interests. However, such attempts to influence environmental laws and regulations may have an adverse effect on entities' reputations with stakeholders and ultimately affect the entity's social licence to operate. Entities that can balance these tensions may be better positioned to respond to medium-to-long-term regulatory developments.

Metrics

EM-EP-530a.1. Discussion of corporate positions related to government regulations or policy proposals that address environmental and social factors affecting the industry

1 The entity shall identify risks and opportunities related to legislation, regulation or rule-making (hereafter referenced collectively as the 'legal and regulatory environment') associated with environmental and social factors that may have significant financial consequences.

1.1 The scope shall include existing, emerging, and known future risks and opportunities.

1.2 The scope shall include risks and opportunities that exist domestically and internationally.

1.3 The regulatory environment related to relevant environmental and social factors includes those factors related to greenhouse gas emissions, other air emissions, water withdrawals and effluents, biodiversity impacts, community impacts, employee health and safety, natural resource governance, and business ethics and payments transparency.

2 Relevant risks to an entity may include risk of increased compliance costs, risk of policy reversal, risk of loss of financial incentives (for example, reduction or elimination of tax deductions associated with oil and gas exploration and production), risk to reputation because of the entity's stance and actions related to the legal and regulatory environment, risk that long-term strategy might be misaligned with the legal and regulatory environment, and risk of misalignment with the expectations of customers, investors and other stakeholders.

3 Relevant opportunities may include improved financial conditions (for example, through policies that incentivise oil and gas exploration and production activities), improved community relations because of the entity's stance and actions related to the legal and regulatory environment, and other benefits resulting from the entity's long-term strategic alignment with the legal and regulatory environment.

4 The entity shall discuss its efforts to manage risks and opportunities associated with each aspect of the legal and regulatory environment outlined in the SASB Oil & Gas—Exploration & Production Standard that are relevant to the entity's business and may have significant financial consequences.

5 The entity shall discuss its strategy to manage risks and opportunities associated with each aspect of the legal and regulatory environment it has identified, such as:

5.1 any changes it has made or plans to make to its business structure or business model;

5.2 the development of new technologies or services;

5.3 any changes it has made or plans to make to its operational processes, controls or organisational structures; and

5.4 influencing regulatory or legislative processes and outcomes through interactions with regulators, regulatory agencies, legislators, policymakers and any others involved in the regulatory or legislative process.

6 The entity may describe whether its stance aligns with or differs from the official stance of its industry organisations and discuss any relevant reasons for alignment or divergence.

Critical Incident Risk Management

Topic Summary

The Exploration & Production (E&P) industry faces significant hazards associated with exploration, development and production activities. Accidental releases of hydrocarbons or other hazardous substances can also have significant consequences for an entity's workforce, as well as negative social and environmental externalities. In addition to effective process safety management practices, many entities prioritise developing a culture of safety to reduce the probability of accidents and other health and safety incidents. If accidents and other emergencies do occur, entities with a strong safety culture are often able to detect and respond to such incidents more effectively. A culture that engages and empowers employees and contractors to work with management to safeguard their own health, safety and well-being and prevent accidents may help entities reduce production downtime, mitigate costs, ensure workforce productivity and maintain their licence to operate.

Metrics

EM-EP-540a.1. Process Safety Event (PSE) rates for Loss of Primary Containment (LOPC) of greater consequence (Tier 1)

1 The entity shall disclose Tier 1 process safety events rates (PSE), as defined by the International Association of Oil & Gas Producers (IOGP), for instances of loss of primary containment (LOPC) using terms and definitions from the IOGP Report 456, *Process safety—recommended practice on key performance indicators*.

2 A PSE is defined as a LOPC from a process that is recordable and meets the Tier 1 definition.

2.1 Drilling facilities are considered to be part of a process when operations are 'in-hole', defined as the 'period of time from when the drilling rig first spuds a well until drilling and completion activity has stopped and the well production tree (or well cap) is installed'.

2.2 Land or marine vessels (trucks and ships) are considered to be part of a process if they are physically connected to a production facility.

3 A LOPC is a type of event defined as an unplanned or uncontrolled release of any material from primary containment, including non-toxic and non-flammable materials (for example, steam, hot water, nitrogen, compressed CO_2 or compressed air). For drilling operations, any unplanned or uncontrolled release to the surface (seabed or ground level) should be included. An unplanned or uncontrolled release is an LOPC irrespective of whether the material is released into the environment, secondary containment or into other primary containment not intended to contain the material released under normal operating conditions.

4 A Tier 1 PSE is defined as a LOPC of the greatest consequence, resulting in one or more of these consequences:

4.1 an employee, contractor or subcontractor experiencing a 'days away from work' injury or fatality;

4.2 a hospital admission or fatality of a third party;

4.3 an officially declared community evacuation or community shelter-in-place;

4.4 a fire or explosion resulting in greater than, or equal to, US$25,000 of direct cost to the entity;

4.5 a pressure relief device (PRD) discharge to atmosphere, whether directly or via a downstream destructive device, that results in one or more of these four consequences:

4.5.1 liquid carryover;

4.5.2 discharge to a potentially unsafe location;

4.5.3 an onsite shelter-in-place; or

4.5.4 public protective measures (for example, road closure) and a PRD discharge quantity greater than the threshold quantities specified in IOGP Report 456 in any one-hour period; or

4.6 a release of material greater than the threshold quantities specified in IOGP Report 456 in any one-hour period.

5 The rate shall be calculated as (total Tier 1 PSE count / total hours worked) × 200,000.

5.1 Total hours worked includes hours worked by both employees and contractors.

EM-EP-540a.2. Description of management systems used to identify and mitigate catastrophic and tail-end risks

1 The entity shall describe its management systems used to identify and mitigate catastrophic and tail-end risks.

1.1 The scope of catastrophic and tail-end risks shall include low-probability, high-impact accidents and emergencies that could have catastrophic effects on human health, local communities and the environment.

1.2 The scope of the disclosure shall include how the entity integrates a culture of safety as well as management systems and technical controls to manage and mitigate catastrophic and tail-end risks.

1.3 The description may include employee training, the use of operating procedures, hot work permitting, pre-start-up safety reviews, mechanical integrity programmes, management of change, incident investigation, emergency planning and response, audits and other management systems.

2 The entity shall include a description of how critical risk management is coordinated among business partners (for example, contractors and subcontractors).

3 The scope of the disclosure includes all exploration and production lifecycle phases, which may include geological and seismic surveys, site surveys, exploratory drilling, appraisal drilling, site development, production and decommissioning.

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