SASB STANDARDS

Now part of IFRS Foundation

Oil & Gas – Refining & Marketing

Sustainability Accounting Standard

EXTRACTIVES & MINERALS PROCESSING SECTOR

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

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 - Refining & Marketing (R&M) entities refine petroleum products, market oil and gas products, or operate gas stations, all of which comprise the downstream operations of the oil and gas value chain. The types of refinery products and crude oil inputs influence the complexity of the refining process used, with varied expenditure needs and intensity of environmental and social impacts.

Note: The topics and metrics below are for 'pure-play' R&M activities or independent R&M entities. Integrated oil & gas entities conduct upstream operations and also are involved in the distribution, refining or marketing of products. Separate standards exist for the Oil & Gas - Exploration & Production (EM-EP) and Midstream (EM-MD) industries. As such, integrated entities also should consider the disclosure topics and metrics from those industries.

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 covered under emissions-limiting regulations	Quantitative	Metric tonnes (t) CO_2-e, Percentage (%)	EM-RM-110a.1
	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-RM-110a.2
Air Quality	Air emissions of the following pollutants: (1) NO_x (excluding N_2O), (2) SO_x, (3) particulate matter (PM_{10}), (4) H_2S, and (5) volatile organic compounds (VOCs)	Quantitative	Metric tonnes (t)	EM-RM-120a.1
	Number of refineries in or near areas of dense population	Quantitative	Number	EM-RM-120a.2
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-RM-140a.1
	Number of incidents of non-compliance associated with water quality permits, standards, and regulations	Quantitative	Number	EM-RM-140a.2
Hazardous Materials Management	(1) Amount of hazardous waste generated, (2) percentage recycled	Quantitative	Metric tonnes (t), Percentage (%)	EM-RM-150a.1
	(1) Number of underground storage tanks (USTs), (2) number of UST releases requiring clean up, and (3) percentage in jurisdictions with UST financial assurance funds	Quantitative	Number, Percentage (%)	EM-RM-150a.2
Workforce Health & Safety	(1) Total recordable incident rate (TRIR), (2) fatality rate, and (3) near miss frequency rate (NMFR) for (a) direct employees and (b) contract employees	Quantitative	Rate	EM-RM-320a.1
	Discussion of management systems used to integrate a culture of safety	Discussion and Analysis	n/a	EM-RM-320a.2

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TOPIC	METRIC	CATEGORY	UNIT OF MEASURE	CODE
Product Specifications & Clean Fuel Blends	Total addressable market and share of market for advanced biofuels and associated infrastructure	Quantitative	Presentation currency, Percentage (%)	EM-RM-410a.2
	Volumes of renewable fuels for fuel blending: (1) net amount produced, (2) net amount purchased	Quantitative	Barrels of oil equivalent (BOE)	EM-RM-410a.3
Pricing Integrity & Transparency	Total amount of monetary losses as a result of legal proceedings associated with price fixing or price manipulation [1]	Quantitative	Presentation currency	EM-RM-520a.1
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-RM-530a.1
Critical Incident Risk Management	Process Safety Event (PSE) rates for Loss of Primary Containment (LOPC) of greater consequence (Tier 1) and lesser consequence (Tier 2)	Quantitative	Rate	EM-RM-540a.1
	Challenges to Safety Systems indicator rate (Tier 3)	Quantitative	Rate	EM-RM-540a.2
	Discussion of measurement of Operating Discipline and Management System Performance through Tier 4 Indicators	Discussion and Analysis	n/a	EM-RM-540a.3

Table 2. Activity Metrics

ACTIVITY METRIC	CATEGORY	UNIT OF MEASURE	CODE
Refining throughput of crude oil and other feedstocks[2]	Quantitative	Barrels of oil equivalent (BOE)	EM-RM-000.A
Refining operating capacity[3]	Quantitative	Million barrels per calendar day (MBPD)	EM-RM-000.B

[1] Note to **EM-RM-520a.1** – The entity shall briefly describe the nature, context and any corrective actions taken because of monetary losses.

[2] Note to **EM-RM-000.A** – The total volume of crude oil and other feedstocks processed in the refinery system during the reporting period.

[3] Note to **EM-RM-000.B** – Operating (or operable) capacity is the amount of capacity that, at the beginning of the period, is: in operation; not in operation and not under active repair, but capable of being placed in operation within 30 days; or not in operation but under active repair that can be completed within 90 days. Operable capacity is the sum of the operating and idle capacity and is measured in barrels per calendar day.

Greenhouse Gas Emissions

Topic Summary

Refining & Marketing (R&M) operations generate significant direct greenhouse gas (GHG) emissions from a variety of sources. Emissions primarily consist of carbon dioxide and methane from stationary fossil fuel combustion for energy supply. Energy costs are a significant share of refinery operating costs. GHGs also are released from process emissions, fugitive emissions resulting from leaks, emissions from venting and flaring, and from non-routine events such as equipment maintenance. The energy intensity of production, and therefore the GHG emissions intensity, can vary significantly depending on the type of crude oil feedstock used and refined product specifications. Entities that cost-effectively reduce GHG emissions from their operations may capture operational efficiencies. Such reductions also may mitigate the effects of increased fuel costs from regulations that limit—or put a price on—GHG emissions.

Metrics

EM-RM-110a.1. Gross global Scope 1 emissions, 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 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 The approach provided by the Climate Disclosure Standards Board (CDSB) that is described in REQ-07, 'Organisational boundary,' of the *CDSB Framework for reporting environmental and social information*

3 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.

3.1 Examples of emissions-limiting regulations include:

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

3.1.2 European Union Emissions Trading Scheme (EU ETS)

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

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

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

3.3 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.

4 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.

5 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.

6 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-RM-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

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 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 may 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, including, but not limited to: (1) emissions from stationary devices, including, but not limited to boilers, heaters, furnaces, reciprocating internal combustion engines and turbines, incinerators, and thermal/catalytic oxidisers, (2) emissions from mobile sources, including, but not limited to 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, including, but not limited to 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 include, but are not limited to 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 include, but are not limited to: (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, including, but not limited to 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, including but not limited to pressure relief valves, pressure control valves, fuel supply unloading valves, and emergency shut-down devices

4.1.5 Fugitive emissions, including those emissions which can be individually found and 'fixed' to make emissions 'near zero' and which include, but are not limited to emissions from valves, flanges, connectors, pumps, compressor seal leaks, Cata-Dyne® 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

Non-greenhouse gas (GHG) air emissions from Refining & Marketing (R&M) operations include air pollutants, which can create significant and localised environmental or health risks. Specific emissions of concern include sulphur dioxide, nitrogen oxides, hydrogen sulphide, particulate matter and VOCs. Releases occur from stationary combustion sources, storage vessels, flares and equipment leaks, and may also occur because of accidents. Human health impacts and financial consequences may be exacerbated the closer a facility is to population centres. Active management of the issue—through technological and process improvements—may allow entities to mitigate the effect of regulations and benefit from operational efficiencies that could result in reduced costs.

Metrics

EM-RM-120a.1. Air emissions of the following pollutants: (1) NO_x (excluding N_2O), (2) SO_x, (3) particulate matter (PM_{10}), (4) H_2S, and (5) volatile organic compounds (VOCs)

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) particulate matter 10 micrometres or less in diameter (PM_{10}), reported as PM_{10}.

5.1 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.

6 The entity shall disclose (4) its emissions of hydrogen sulphide (H_2S).

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

7.1 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.

7.2 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.

8 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.

EM-RM-120a.2. Number of refineries in or near areas of dense population

1 The entity shall disclose the total number of its refineries located in or near areas of dense population, which are defined as urbanised areas in the local jurisdiction.

1.1 Generically, urbanised areas include densely developed residential, commercial and other non-residential areas with a population greater than 50,000. The entity may refer to the United Nations Statistics Division list of the various national definitions for the word 'urban' in its *Demographic Yearbook 2005*, Table 6.

2 The scope of the disclosure includes refineries located in a census tract or block considered to be in an urbanised area or those with boundaries within 49 kilometres of an urbanised area, which constitutes an exposed population likely to come into contact with a chemical during an accident depending on the exposure pathway.

3 Entities may use global population density data available from the NASA Socioeconomic Data and Applications Center's (SEDAC) *Gridded Population of the World* (GPW).

Water Management

Topic Summary

Refineries can use large quantities of water depending on their size and refining process complexity. This water use exposes them to the risk of water scarcity, depending on their location, and related costs. Extraction of water from water-stressed regions or water contamination also may create tensions with local communities. Refinery operations require wastewater treatment and disposal, often via on-site wastewater treatment plants before discharge. Reducing water use and contamination through recycling and other water management strategies may permit entities to capture operational efficiencies and reduce operating costs. They also could minimise regulatory, water supply shortages and community-related disruptions on operations.

Metrics

EM-RM-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-RM-140a.2. Number of incidents of non-compliance associated with water quality permits, standards, and regulations

1 The entity shall disclose the total number of instances of non-compliance, including violations of technology-based standard and exceedances of quality-based standards.

2 The scope of the disclosure includes incidents governed by applicable jurisdictional statutory permits and regulations, which may include the discharge of a hazardous substance, violation of pre-treatment requirements or total maximum daily load (TMDL) exceedances.

2.1 Typical parameters of concern include: hydrocarbons (including oil and grease), chemical oxygen demand (COD)/biochemical oxygen demand (BOD), sulphides, ammonia, phenols, total suspended solids (TSS) and total dissolved solids (TDS).

3 The scope of the disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).

3.1 Formal enforcement actions are defined as governmental actions that address a violation or threatened violation of water quality laws, regulations, policies or orders, and can result in administrative penalty orders, administrative orders and judicial actions, among others.

4 Violations shall be disclosed, regardless of their measurement method or frequency. These include violations for:

4.1 continuous discharges, with limitations, standards and prohibitions that are generally expressed as maximum daily, weekly and monthly averages; and

4.2 non-continuous discharges, with limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants.

Hazardous Materials Management

Topic Summary

As a by-product of their operations, Refining & Marketing (R&M) entities generate various forms of waste derived from the processing of petroleum products. Many of these substances are hazardous to human health and the environment and may be subject to regulation. Remediation of inactive or decommissioned sites may take many years to complete, and entities may accrue liabilities for past operations. Hazardous substance releases from underground storage tanks (USTs) used by refining facilities and gas stations can affect land redevelopment for abandoned or closed facilities. Spills and releases during operations can result in groundwater contamination and other negative impacts. R&M entities that reduce and recycle hazardous waste streams, as well as those that have effective and prompt clean-up and remediation measures in place for normal operations and decommissioned facilities, may reduce regulatory and litigation risks and associated costs.

Metrics

EM-RM-150a.1. (1) Amount of hazardous waste generated, (2) percentage recycled

1 The entity shall disclose (1) the total weight of hazardous waste generated, in metric tonnes.

1.1 Hazardous wastes are defined in accordance with the applicable jurisdictional legal or regulatory frameworks where the waste was generated.

2 The entity shall disclose (2) the percentage of hazardous waste recycled as the weight of hazardous waste generated that was recycled, divided by the total weight of hazardous waste generated.

2.1 Hazardous waste that is reused, reclaimed or remanufactured shall be considered within the scope of recycled.

2.2 Recycled, reused, reclaimed and remanufactured hazardous wastes are defined in accordance with the applicable jurisdictional legal or regulatory frameworks where the waste was generated.

2.3 Materials incinerated, including for energy recovery, shall not be considered within the scope of recycled.

2.3.1 Energy recovery is defined as the use of combustible waste to generate energy through direct incineration, with or without other waste, but with recovery of the heat.

2.3.2 The entity may separately disclose the percentage of hazardous waste generated that was incinerated.

3 The entity may use the United Nations Environmental Programme (UNEP) *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal* (Basel Convention) for the purposes of defining hazardous waste or recycled hazardous waste for operations located in jurisdictions that lack applicable legal or regulatory definitions.

4 The entity shall disclose the frameworks used to define hazardous waste and recycled hazardous waste, and the quantities and percentages defined in accordance with each applicable framework.

EM-RM-150a.2. (1) Number of underground storage tanks (USTs), (2) number of UST releases requiring clean up, and (3) percentage in jurisdictions with UST financial assurance funds

1 The entity shall disclose (1) the total number of underground storage tank systems (USTs) for petroleum and hazardous substances.

1.1 The scope of the disclosure includes, at a minimum, USTs as defined as any tank or combination of tanks (including connecting underground pipes) used to contain an accumulation of petroleum or hazardous substances, and the volume of which (including the volume of the connecting underground pipes) is 10% or more beneath the surface of the ground.

1.1.1 The definition of UST does not include: farm or residential tanks smaller than 5,000 litres used for motor fuel for non-commercial purposes; heating oil storage tanks; septic tanks; pipeline facilities including gathering lines; surface impoundments, pits, ponds or lagoons; storm-water or wastewater collection systems; flow-through process tanks; liquid traps or associated gathering lines directly related to oil or gas production; or storage tanks situated in an underground area if the storage tank is situated upon or above the surface of the floor. For the avoidance of doubt, USTs do not include pipes connected to any tank identified in the prior list.

1.2 The scope of the disclosure includes active USTs and those closed during the reporting period.

2 The entity shall disclose (2) the total number of UST releases (which may include leaks, spills, overfills and corrosion) for which the entity had some degree of clean-up responsibilities (including shared cost of remediation).

2.1 The scope of the disclosure includes new incidents that occurred during the reporting period as well as past events (for example, legacy clean-up) for which the entity was notified of responsibility during the reporting period.

2.2 The scope of the disclosure includes release from petroleum USTs and hazardous chemical USTs.

3 The entity shall disclose (3) the percentage of UST incidents that occurred in jurisdictions with UST financial assurance funds.

3.1 The entity shall further include any incidents that were legacy events in jurisdictions that do not provide coverage for past events and any incidents ineligible for coverage under the rules of applicable jurisdictional UST trust funds.

3.2 The entity shall calculate the percentage as the number of UST incidents that occurred in jurisdictions with UST financial assurance funds divided by the total number of UST incidents that occurred during the reporting period.

4 The entity may describe its effort to maintain jurisdictional UST regulatory compliance, including its method or process to prevent UST spills, overfills and corrosion.

Workforce Health & Safety

Topic Summary

Hazards associated with the operations of entities in the Refining & Marketing (R&M) industry may present risks to employee health and safety. Such hazards include the handling and processing of hydrocarbons, frequently at high temperatures and pressures during refining operations. Accidents or inadvertent exposures to chemicals and other hazards such as heat or noise may result in fatalities, severe injuries or illnesses. Releases of hydrocarbons or other hazardous substances resulting from accidents or leaks also can have negative consequences for neighbouring communities. An entity's ability to protect employee health and safety, and to create a culture of safety and well-being among employees at all levels, can help prevent accidents, mitigate costs and operational downtime, and enhance workforce productivity.

Metrics

EM-RM-320a.1. (1) Total recordable incident rate (TRIR), (2) fatality rate, and (3) near miss frequency rate (NMFR) 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 scope of the disclosure includes work-related incidents only.

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

5.2 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.

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

5.4 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.

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

6 The entity shall disclose the rates for each of these employee categories:

6.1 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

6.2 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).

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

EM-RM-320a.2. Discussion of management systems used to integrate a culture of safety

1 The entity shall discuss its management systems used to integrate a culture of safety.

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 and testing, and personal protective equipment.

1.2 The scope of discussion may focus broadly on safety management systems, but it shall address specifically the systems used to maintain a safe working environment, including preventing 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).

Product Specifications & Clean Fuel Blends

Topic Summary

Some regulatory jurisdictions have implemented product specifications and renewable fuel blends, which pose significant compliance and operational risks for Refining & Marketing (R&M) entities. Entities may face long-term reductions in revenue from fossil fuel-based products and services because of GHG mitigation policies such as renewable fuel mandates or standards, as well as competition from non-fossil fuel products. To ensure regulatory compliance and position themselves for long-term competitiveness, some entities are investing in clean fuel production or purchasing ethanol and other renewable biofuels. Advanced biofuels and fuel technologies have lower lifecycle impacts than traditional biofuels, and they can be used to minimise future regulatory risks and public pressure. Although short-term costs to find commercially viable technologies can be significant, investments in R&D for such technologies could serve to support R&M entities' long-term profitability.

Metrics

EM-RM-410a.2. Total addressable market and share of market for advanced biofuels and associated infrastructure

1 The entity shall provide an estimation of the total addressable market for advanced biofuels and associated infrastructure.

1.1 Total addressable market is defined as potential revenue should the entity capture 100% of the market share of the product category (for example, the global market for advanced biofuels and advanced biofuel infrastructure).

2 The entity shall disclose the share of the total addressable market for advanced biofuels or associated infrastructure it currently captures with its products.

2.1 Market share shall be calculated as revenue from these products divided by the size of the total addressable market.

3 Advanced biofuels are defined as biofuels other than ethanol derived from corn starch (kernels) and having 50% lower lifecycle greenhouse gas emissions relative to gasoline.

4 Revenue from advanced biofuel infrastructure includes that from the entity's retail operations (fuel stations), joint ventures with primary producers, or technologies that enable the production of advanced biofuels.

5 If a significant difference exists between the total addressable market and the market the entity can serve through its existing or planned capabilities, sales channels or products (the serviceable available market), then the entity may disclose this information.

6 The entity may provide a projection of growth of this market, where the projected addressable market is represented—based on a reasonable set of assumptions about changes in market conditions— as a percentage of year-on-year growth or as an estimate of the market size after a defined period (the market size in 10 years).

6.1 The entity may disclose its target three-year market share as a measurement of targeted growth, where the target is the percentage of the total addressable market that the entity plans to address over a three-year time horizon.

7 The entity may discuss other non-revenue generating initiatives it has undertaken to commercialise biofuels, such as partnerships (for example, pilot projects, research and development projects) with fleet operators (air, ground or marine transportation), airlines, vehicle manufacturers and governmental agencies.

EM-RM-410a.3. Volumes of renewable fuels for fuel blending: (1) net amount produced, (2) net amount purchased

1 The entity shall disclose the net volumes in barrels of oil equivalent of renewable fuels produced, including biofuel, cellulosic biofuel, ethanol, advanced biofuels, and other renewable fuels for use in fuel blending.

2 The entity shall disclose the net amounts of renewable fuels purchased.

3 Net amounts are defined as volumes produced or purchased for use in fuel blending, less amounts sold to independent third parties in arms-length transactions during the reporting period, either directly or indirectly.

4 Some jurisdictions permit volume 'double-counting' based on types of advanced renewable fuels used or alternative methods of production. For the purposes of this disclosure, an entity shall not double-count renewable fuel volumes.

5 The entity shall disclose the conversion factors and assumptions used to convert renewable fuel volumes to barrels of oil equivalent (BOE).

6 The entity may include an analysis of its biofuel production capacity and total renewable fuel production of: (1) renewable fuel, (2) advanced biofuel, (3) biomass-based diesel and (4) cellulosic biofuel in barrels of oil equivalent (BOE).

Pricing Integrity & Transparency

Topic Summary

Regulators are responsible for overseeing issues related to pricing integrity and transparency, which includes the potential for market manipulation by oil and gas entities, including Refining & Marketing (R&M) entities. Regulatory agencies focusing on refineries may investigate various competitive factors, including capacity utilisation and refinery maintenance decisions, product supply decisions, product margins, and capital planning, creating uncertainty regarding future enforcement. The focus of enforcement actions also may include prices reported to price index publishers, as well as potential price distortions through trading positions in physical transactions, and through swaps, futures and derivatives. Maintaining market integrity and ensuring transparency in product pricing can therefore reduce regulatory risks and liabilities for R&M entities and protect consumers from unfair pricing.

Metrics

EM-RM-520a.1. Total amount of monetary losses as a result of legal proceedings associated with price fixing or price manipulation

1 The entity shall disclose the total amount of monetary losses incurred during the reporting period resulting from legal proceedings associated with price gouging, price fixing or price manipulation.

2 The legal proceedings shall include any adjudicative proceeding involving the entity, whether before a court, a regulator, an arbitrator or otherwise.

3 The losses shall include all monetary liabilities to the opposing party or to others (whether as the result of settlement, verdict after trial or otherwise), including fines and other monetary liabilities incurred during the reporting period as a result of civil actions (for example, civil judgements or settlements), regulatory proceedings (for example, penalties, disgorgement or restitution) and criminal actions (for example, criminal judgements, penalties or restitution) brought by any entity (for example, governmental, business or individual).

4 The scope of monetary losses shall exclude legal and other fees and expenses incurred by the entity in its defence.

5 The scope of the disclosure shall include legal proceedings associated with the enforcement of applicable jurisdictional laws or regulations.

Note to **EM-RM-520a.1**

1 The entity shall briefly describe the nature (for example, judgement or order issued after trial, settlement, guilty plea, deferred prosecution agreement or non-prosecution agreement) and context (for example, price fixing or false price reporting) of all monetary losses resulting from legal proceedings.

2 The entity shall describe any corrective actions implemented in response to the legal proceedings. This may include specific changes in operations, management, processes, products, business partners, training or technology.

Management of the Legal & Regulatory Environment

Topic Summary

The Refining & Marketing (R&M) industry is subject to numerous sustainability-related regulations and an often rapidly changing regulatory environment. Changes to the legal and regulatory environment may result in material effects on shareholder value. Entities in the industry regularly participate in the regulatory and legislative process on a wide variety of environmental and societal issues. Such engagement can result from entities seeking to ensure industry views are represented in the development of regulations affecting the industry as well as to represent shareholder interests. At the same time, such engagement to influence environmental laws and regulations may adversely affect entities' reputations and ultimately affect an entity's social licence to operate.

Metrics

EM-RM-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 it faces related to legislation, regulation or rulemaking (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, hazardous materials management, employee health and safety, product specifications, and pricing integrity and 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, policies affecting import or export of crude oil or refined products, or policies affecting renewable fuel mandates), 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 which incentivise renewable fuel production or blending), 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 – Refining & Marketing 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 operations of Refining & Marketing (R&M) entities are often characterised by a high number of hazards, including the handling of flammable, volatile substances, the use of highly reactive chemicals, and the processing of fluids at high temperature and pressure. Accidental releases of hydrocarbons or other hazardous substances can have significant consequences for an entity's workforce, as well as external social and environmental consequences. In addition to effective process safety management practices, entities frequently prioritise developing a culture of safety to reduce the probability that accidents and other health and safety incidents will occur. If accidents and other emergencies do occur, entities with a strong safety culture often can detect and respond effectively to such incidents. 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-RM-540a.1. Process Safety Event (PSE) rates for Loss of Primary Containment (LOPC) of greater consequence (Tier 1) and lesser consequence (Tier 2)

1 The entity shall disclose Tier 1 process safety event (PSE) rates and Tier 2 PSE rates for instances of loss of primary containment (LOPC).

1.1 The entity shall refer to the terms and definitions from the ANSI/API *Recommended Practice 754 – Process Safety Performance Indicators for the Refining and Petrochemical Industries* (hereafter, ANSI/API RP-754).

2 A PSE is defined as an unplanned or uncontrolled LOPC of any material including non-toxic and non-flammable materials (for example, steam, hot condensate, nitrogen, compressed CO_2 or compressed air) from a process, or an undesired event or condition that, under slightly different circumstances, could have resulted in an LOPC of a material.

2.1 LOPC is a type of event.

2.2 An unplanned or uncontrolled release is an LOPC irrespective of whether the material is released into the environment, or into secondary containment, or into other primary containment not intended to contain the material released under normal operating conditions.

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

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

3.2 a hospital admission or fatality of a third party;

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

3.4 a fire or explosion resulting in greater than or equal to $100,000 in direct costs to the entity;

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

3.5.1 liquid carryover;

3.5.2 discharge to a potentially unsafe location;

3.5.3 an on-site shelter-in-place; or

3.5.4 public protective measures (for example, road closure) and a PRD discharge quantity greater than the threshold quantities specified by ANSI/API RP-754 in any one-hour period; or

3.6 a release of material greater than the threshold quantities specified in Table 1 of ANSI/API RP-754 in any one-hour period.

4 A Tier 2 PSE is defined as an LOPC of lesser consequence, not disclosed as a Tier 1 PSE, and resulting in one or more of these consequences:

4.1 an employee, contractor or subcontractor recordable injury;

4.2 a fire or explosion resulting in greater than or equal to $2,500 in direct costs to the entity;

4.3 a PRD discharge to atmosphere, whether directly or via a downstream destructive device that results in one or more of these four consequences:

4.3.1 liquid carryover;

4.3.2 discharge to a potentially unsafe location;

4.3.3 an on-site shelter-in-place; or

4.3.4 public protective measures (for example, road closure) and a PRD discharge quantity greater than the threshold quantities specified in Table 2 of ANSI/API RP-754 in any one-hour period; or

4.4 a release of material greater than the threshold quantities specified in Table 2 of ANSI/API RP-754 in any one-hour period.

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

6 The Tier 2 PSE rate shall be calculated as: (total Tier 2 PSE count / total hours worked) × 200,000.

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

EM-RM-540a.2. Challenges to Safety Systems indicator rate (Tier 3)

1 The entity shall disclose a rate of Tier 3 ‘challenges to safety systems’.

1.1 The entity shall refer to the terms, definitions and guidance from the ANSI/API RP-754 (Section 7.2). Tier 3 indicators may alternatively be referenced as 'near miss' events or 'high learning value' events.

2 A Tier 3 operational situation is defined as a flaw or weakness within internal technical safety systems that led to consequences that fall below the Tier 1 and Tier 2 loss of primary containment (LOPC) impact threshold, such as:

2.1 demands on safety systems, which are activations (non-manual) of safety systems designed to prevent or mitigate effects from losses of primary containment, such as mechanical shutdown equipment or pressure relief devices;

2.2 safe operating limit excursions, which are breaches of safe operating limits for processes beyond which manual or automatic systems return the process to a predetermined safe state;

2.3 primary containment inspections or testing results outside acceptable limits, which occur when inspection or testing shows that safe primary containment operating limits have been exceeded and require repairs, replacement or further testing of equipment; and

2.4 near miss incidents, which are incidents that had the potential to result in an LOPC, but that were avoided by circumstance.

3 The disclosure may include situations with no actual consequences but the recognition that, in other circumstances, further barriers could have been breached and a Tier 1 or Tier 2 PSE could have resulted.

4 The Tier 3 indicator rate shall be calculated as: (total Tier 3 indicator count / total hours worked) × 200,000.

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

EM-RM-540a.3. Discussion of measurement of Operating Discipline and Management System Performance through Tier 4 Indicators

1 The entity shall describe its approach to identifying, measuring and managing 'Operating Discipline and Management System Performance' or Tier 4 key performance indicators (KPIs).

1.1 Tier 4 indicators are metrics developed by the entity specific to its facilities, operations and safety priorities that measure leading, proactive measures to maintain and improve safety and manage risk.

1.2 Relevant Tier 4 KPIs may be focused on:

1.2.1 engineering and inherently safe design;

1.2.2 equipment maintenance, inspection and testing;

1.2.3 process hazard and major incident risk assessments;

1.2.4 quality of, and adherence to, operating procedures;

1.2.5 contractor capability and management;

1.2.6 audit improvement actions;

1.2.7 asset integrity and process safety initiatives;

1.2.8 workforce and management training and development; and

1.2.9 technical competence assessment and assurance.

2 The discussion may include the use of specific Tier 4 KPIs such as those suggested in ANSI/API RP-754. Examples of Tier 4 KPIs are:

2.1 number of process area retrospective and revalidation hazard evaluations completed on time;

2.2 percentage or number of past-due process safety actions; and

2.3 percentage of process safety required training sessions completed with skills verification.

3 The entity may exclude quantitative data or figures for its Tier 4 KPIs from the scope of the disclosure because they are generally unsuitable for peer-to-peer benchmarking and may not be relevant at a corporate level (they may be refinery-specific). If relevant, however, the entity may discuss:

3.1 trends in Tier 4 KPIs over time and how they are correlated with the frequency of Tier 1, Tier 2 and Tier 3 indicator rates (for example, that a focus on Tier 4 performance can be correlated with a decrease in the Tier 1 PSE rate); and

3.2 application and topical focus of Tier 4 KPIs for various facilities, business units, geographies and employee categories.

SASB STANDARDS

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