

STAFF PAPER

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| Project | Extractive Activities | | |
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| Paper topic | Reserve and resource reporting | | |
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Background and objective

1. In Chapter 2 of the 2010 *Extractive Activities* Discussion Paper, the project team proposed using the following definitions of reserves and resources in a standard on extractive activities (see [September 2019 Agenda Paper 19B](#)):
 - (a) the mineral reserve and resource definitions established by the Committee for Minerals Reserves International Reporting Standards (the CRIRSCO Template). The Discussion Paper notes that the CRIRSCO Template forms the basis of market regulator disclosure requirements in most jurisdictions that have formalised mineral reserve and/or resource disclosure requirements; and
 - (b) the oil and gas reserve and resource definitions in the Petroleum Resource Management System (PRMS), as established by the Society of Petroleum Engineers Oil and Gas Reserves Committee (SPE OGRC) in conjunction with other industry bodies. The Discussion Paper noted that the PRMS is used by many oil and gas entities for internal resource management and it also corresponds closely to market regulator disclosure requirements in most jurisdictions that have formalised oil and gas reserve and/or resource disclosure requirements (including Canada and the USA).

2. Feedback to the Discussion Paper and from more recent outreach indicates that primary users of financial statements find reserve and resource information useful. However, feedback also indicates that reserve and resource reporting between jurisdictions, and entities in the same jurisdiction, (either as part of, or outside, the financial statements) is not consistent and comparable. In addition, regulatory requirements for the disclosure of reserve and resource information differ between jurisdictions. Hence information is not always publicly available for entities with extractive activities (see [March 2019 Agenda Paper 19](#) and [September 2019 Agenda Paper 19B](#)).
3. Consequently, the Board asked staff to investigate further the diversity in (see *Agenda Paper 19*):
 - (a) the reserve and resource classification systems used—ie whether the reserve and resource classification systems mandated for use by individual jurisdictions align to the widely accepted classification systems of CRIRSCO and PRMS; and
 - (b) the disclosure of reserve and resource information—ie the diversity of regulatory requirements for the disclosure of reserve and resource information between jurisdictions.
4. In particular, the purpose of this paper is to help the Board understand:
 - (a) what reserve and resource classification systems are and who uses them; and
 - (b) the extent of reserve and resource information that is publicly available either as part of, or outside, the financial statements.
5. This paper presents our research findings about current practice regarding the disclosure of reserve and resource information. We have not considered the merits of our research findings and whether we think they provide evidence that there is a problem that needs to be addressed by standard-setting. We will provide the Board with an analysis of all research findings when the Board is asked to decide on the scope of the research project to replace or amend IFRS 6 *Exploration for and Evaluation of Mineral Resources*.

Overview

6. This paper is structured as follows:
 - (a) Key findings (paragraphs 7-10);
 - (b) Reserve and resource classification systems (paragraphs 11-20);
 - (i) What is a reserve and resource classification system and who uses it? (paragraphs 11-12);
 - (ii) What is meant by ‘reserve’ and ‘resource’? (paragraphs 13-14);
 - (iii) Relationship between reserve and resource reporting and the financial statements (paragraphs 15-17);
 - (iv) Regulation of reserve and resource information disclosed to the public (paragraphs 18-20);
 - (c) Research findings (paragraphs 21-28);
 - (i) Reserve and resource classification systems (paragraphs 21-25);
 - (ii) Disclosure of reserve and resource information outside the financial statements (paragraphs 26-28);
 - (d) Feedback (paragraphs 29-33);
 - (i) Needs of primary users of financial statements (paragraphs 29-30);
 - (ii) Diversity of regulatory requirements for disclosure of reserve and resource information outside the financial statements (paragraphs 31-33);
 - (e) Question for the Board;
 - (f) Appendix A— Extract from Chapter 2 of the 2010 *Extractive Activities Discussion Paper*;
 - (g) Appendix B—Summary of stock exchange regulatory requirements.

Key findings

7. In line with feedback already considered by the Board, our research findings indicate that most jurisdictions have regulatory requirements for entities with extractive

activities that specify the use of a particular reserve and resource classification system. These classification systems generally align with the widely accepted reserve and resource classification systems of CRIRSCO and PRMS (see paragraphs 21-25).

8. Regulatory requirements for the disclosure of reserve and resource information outside the financial statements can differ significantly between jurisdictions (see paragraphs 26-28).
9. Users of financial statements rely on reserve and resource information, which is generally found outside the financial statements, to enhance their understanding of the financial statements of an entity with extractive activities. Feedback from users of financial statements also indicates that reserve and resource information disclosed often lacks comparability and consistency (both between entities in the same industry and between jurisdictions) which can affect their understanding of the financial statements (see paragraphs 29-33).
10. Overall, our research findings indicate that:
 - (a) the reserve and resource classification systems that jurisdictions require extractives entities to use generally align with the widely accepted reserve and resource classification systems of CRIRSCO (for minerals) and PRMS (for oil and gas);
 - (b) however, the regulatory requirements for the disclosure of reserve and resource information (prepared applying those classification systems) differ between jurisdictions.

Reserve and resource classification systems

What is a reserve and resource classification system and who uses it?

11. Reserve and resource classification systems establish standards for the public reporting of reserve and resource information—in other words, similar to IFRS Standards, classification systems act as a comprehensive framework for the preparation and disclosure of reserve and resource information.

12. Reserve and resource information prepared using a classification system is prepared by geologists (and other experts, such as metallurgists) for use by other geologists, mine engineers and specialist investors. This means that reserve and resource reports are scientific and technical reports prepared for subject matter experts, for example:
- (a) geologists and mine engineers can use the reserve and resource information to determine the best method for extraction; and
 - (b) specialist investors can use the reserve and resource information to estimate matters such as the life of the project (ie how long extraction can be sustained by an entity on an individual project), the quality of the minerals or oil and gas deposit, and the value of the minerals or oil and gas property.

What is meant by ‘reserve’ and ‘resource’?

13. Paragraph 2.4 of the Discussion Paper explained that the basic concepts of a ‘reserve’ and a ‘resource’ are (see also Appendix A):
- (a) reserves generally refer to the quantity of minerals or oil and gas that is estimated to be economically recoverable (ie reserve quantities are an estimate of the aggregate future production of minerals or oil and gas);
 - (b) resources generally refer to the quantity of minerals or oil and gas that has been discovered but is not yet capable of being classified as a reserve; and
 - (c) reserves and resources are generally classified into subcategories according to the level of confidence associated with the estimate of the reserve or resource quantities.
14. In paragraph 2.5 of the Discussion Paper, the project team also explained that the major differences in the various definitions of reserves and resources relate to the scope and specificity of those definitions and also to the assumptions that are used in estimating and classifying reserves and resources. However, since 2010, jurisdictions with significant extractives industries have been working towards the alignment of reserve and resource classification systems. As a result, our research indicates that many jurisdictional reserve and resource classification systems align with the widely

accepted reserve and resource classification systems of CRIRSCO and PRMS (see paragraphs 21-25).

Relationship between reserve and resource reporting and the financial statements

15. Only a limited amount of reserve and resource information prepared in accordance with a particular reserve and resource classification system is also used in preparing an entity's financial statements. For example, quantities of reserves and resources are used in impairment testing of extractive activities assets and in unit of production depreciation calculations for producing assets.

16. To comply with a reserve and resource classification system when estimating a reserve or resource, an entity must comply with the specific requirements of that classification system. This includes ensuring that all the relevant technical information (including the judgements and assumptions applied by the relevant experts such as geologists and engineers) that was used to develop an estimate of a reserve or resource complies with the requirements of the specific classification system. Technical reports of this nature can span over several hundred pages depending on the requirements of the relevant classification system and the size of the project. However, disclosure of all the relevant technical information is not required in the financial statements when using a reserve or resource estimate as an input for the preparation of financial statements.

17. Utilising reserve and resource information in the preparation of financial statements can require management judgement. For example, a geologist's estimate of a reserve will not be a single figure, but rather a statistical range in which the geologist is comfortable operating. More generally, geologists exercise conservatism because there is an inherent degree of uncertainty when estimating reserves and resources. Furthermore, technical reports of this nature are not required to be prepared on an annual basis and therefore assumptions may need to be made regarding changes as a result of, for example, extraction of minerals or oil and gas in the intervening period. Some stakeholders from recent outreach said that, in their view, reserve and resource information is relevant information for users of financial statements because entities

use some of that information in the preparation of their financial statements (see paragraph 15).

Regulation of reserve and resource information disclosed to the public outside the financial statements

18. Reserve and resource classification systems generally have minimum competency requirements that must be met by the lead geologist (or other expert) authorising or signing-off the reserve and resource information being disclosed to the public. In such cases, this ‘competent person’ is required to authorise all public disclosures an entity makes in relation to reserve and resource information and exploration results prepared in compliance with the classification system.

19. Reserve and resource classification systems can be treated as a minimum set of requirements for the disclosure of reserve and resource information outside the financial statements in particular jurisdictions. For example:
 - (a) in developing a reserve and resource classification system, some jurisdictions will add disclosure requirements to those required by the CRIRSCO or PRMS classification systems; and
 - (b) some jurisdictions have additional regulatory requirements outside the reserve and resource classification systems for the purpose of disclosing relevant and useful reserve and resource information (that complies with the required reserve and resource classification systems) to users of financial information that are not subject matter experts.

20. Regulation of reserve and resource information disclosed outside the financial statements differs jurisdictionally. For example:
 - (a) in some jurisdictions geologists or other experts are liable for the reserve and resource information they authorise or sign-off while acting as a ‘competent person’;
 - (b) some jurisdictions have additional regulatory requirements which require the ‘competent person’ to be independent of the entity; and
 - (c) some jurisdictions have no regulation which geologists or other experts preparing reserve and resource information would be subject to.

Research findings

Reserve and resource classification systems

21. The staff researched 177 jurisdictions (this was based on the jurisdictions analysed on the IFRS website at the time we commenced our research).
22. For each jurisdiction, staff researched the extent of the extractives industry in the jurisdiction and, if the extractives industry appeared to be significant to the jurisdiction, we then researched:
 - (a) whether entities in the jurisdiction were engaged in the extraction of minerals, oil or gas, or both;
 - (b) whether the jurisdiction has regulatory requirements (excluding local accounting standards) that require entities to apply a particular reserve and resource classification system and, if so, which reserve and resource classification system is required to be applied;
 - (c) whether the reserve and resource classification system required by (b) aligns with the reserve and resource classification systems as issued by CRIRSCO and PRMS; and
 - (d) whether the jurisdiction has regulatory requirements that require disclosure of reserve and resource information and, if so, where that information is required to be disclosed.
23. Of the 177 jurisdictions researched we were able to identify 46 jurisdictions that specify, as part of their local regulatory requirements, the reserve and resource classification system to be applied by entities with extractive activities. Of those 46 jurisdictions:
 - (a) twenty-eight require the application of a reserve and resource classification system that aligns with the widely accepted classification systems of CRIRSCO and PRMS¹. Specifically:

¹ Alignment with these classification systems was determined by reference to information available on the CRIRSCO and PRMS websites.

- (i) we observed 20 different reserve and resource classification systems that align with CRIRSCO (some jurisdictions allow the application of more than one classification system);
 - (ii) we observed 15 different reserve and resource classification systems that align with PRMS (this includes PRMS itself);
 - (b) of the remaining 18 jurisdictions we were unable to determine the extent of alignment between the reserve and resource classification system specified for use in the jurisdiction and the widely accepted classification systems of CRIRSCO and PRMS.
24. Thirty-six of the 177 jurisdictions researched either had no extractives industry or the extractives industry was considered to be insignificant compared to other industries in the economy.
25. For the remaining 95 jurisdictions researched, we were unable to find the information described in paragraph 22. We were unable to conclude whether this was because:
- (a) there are no regulatory requirements in the jurisdiction for entities with extractive activities to use a particular reserve and resource classification system; or
 - (b) regulatory requirements exist but we were unable to locate them, for example because no English translation was available or because the regulatory requirements are not available online.

Disclosure of reserve and resource information outside the financial statements

26. To assist the Board in developing an understanding of the diversity of disclosure requirements for reserve and resource information, and therefore the availability of the information for users, we also selected a sample of nine jurisdictions and focused on the regulatory requirements for minerals and oil and gas entities listed on the local stock exchange. The nine jurisdictions were selected because they include:
- (a) the three countries (Canada, the United Kingdom and the United States of America) on whose stock exchanges the majority (by market capitalisation) of entities with extractive activities are listed;

- (b) the other jurisdictions that helped develop the 2010 Discussion Paper and have important extractive industries (Australia, Norway and South Africa); and
 - (c) other jurisdictions in which extractive activities contribute significantly to the jurisdiction's economy (Brazil, China and Russia).
27. Based on the research we performed on these nine jurisdictions, we have made the following observations:
- (a) Regulatory requirements for the disclosure of reserve and resource information outside the financial statements for oil and gas entities appear to be more common than for minerals entities. In addition, they require more regular disclosure for oil and gas entities than for minerals entities. Specifically, we observed that oil and gas entities are generally required to publicly report specific reserve and resource information on an annual basis outside the financial statements whereas this is not always the case for minerals entities. Minerals entities instead are generally subject to continuous disclosure requirements which require the disclosure of reserve and resource information when that information is deemed to be material (ie both material to the market and also when then there is a material change to the reserve and resource information that has previously been disclosed to the public).
 - (b) More generally, regulatory requirements appear to focus on the reporting of reserve information whereas the reporting of resource information is more discretionary.
 - (c) The classification of the reserves (eg proved or proved and probable) and resources that are required to be disclosed can vary between jurisdictions.
 - (d) The extent of regulatory requirements for the disclosure of reserve and resource information outside the financial statements differ depending on how predominant the minerals or oil and gas industries are in the jurisdiction (for example, where a jurisdiction has a large minerals industry there will tend to be more detailed regulatory requirements for the

disclosure of minerals reserves and resources than for oil and gas reserves and resources).

- (e) A few jurisdictions do not mandate the disclosure of reserve and resource information outside the financial statements, or have very limited regulatory requirements.
 - (f) None of the regulatory requirements researched specify requirements for the disclosure of reserve and resource information as part of the financial statements. Some of the reserve and resource information required in the United States of America is supplementary information to the financial statements.
28. Appendix B summarises the stock exchange regulatory requirements related to reserve and resource information for each of the nine jurisdictions sampled (see paragraph 26).

Feedback

Needs of primary users of financial statements

29. Paragraphs 2.7 and 2.8 of the Discussion Paper summarise the financial reporting needs of users. In summary, the project team considered that in order for definitions of reserves and resources in an extractive activities standard to be useful, the standard would need to have definitions of minerals and oil and gas reserves and resources that are consistent and compatible with financial reporting methodologies and requirements.
30. As part of more recent outreach, staff spoke with investors and other users of financial statements of entities with extractive activities (see [September 2019 Agenda Paper 19A](#) and [June 2020 Agenda Paper 19A](#)). Feedback indicated that:
- (a) users rely on the reporting of non-IFRS information outside the financial statements by entities with extractive activities, such as an entity's reserve and resource information, to complement and enhance their understanding of the financial statements;

- (b) the non-IFRS information being reported often lacks comparability and consistency which can affect users' understanding of these entities; and
- (c) the non-IFRS information which users rely upon is not always publicly available for all entities with extractive activities.

Diversity of regulatory requirements for disclosure of reserve and resource information outside the financial statements

31. Feedback from recent outreach indicates that there is generally a regulatory requirement in place to use a particular reserve and resource classification system within each jurisdiction. Feedback also indicates that while most jurisdictions have their own requirements for the use of reserve and resource classification systems, these systems are updated periodically by reference to reserve and resource classification systems used in other jurisdictions.² This would be expected to result in reserve and resource classification systems that predominantly align across jurisdictions (see [March 2019 Agenda Paper 19](#) and [June 2020 Agenda Paper 19A](#)).
32. However, feedback also indicates that the disclosure requirements for reserve and resource information differs between jurisdictions (see [June 2020 Agenda Paper 19A](#) and paragraphs 26-28). In particular:
- (a) in some jurisdictions disclosure requirements for reserve and resource information are mandated by the stock exchange on which the entity is listed;
 - (b) in some jurisdictions the local stock exchange requires the use of a particular reserve and resource classification system only if an entity voluntarily discloses reserve and resource information;
 - (c) in some jurisdictions the local national standard-setter has specified requirements for the disclosure of reserve and resource information as part of, or supplementary to, the financial statements. For example:

² For example, recent updates to the *Classifications for Oil and Gas Resources and Reserves* and *Classifications for Mineral Resources and Mineral Reserves* in China and *SEC Industry Guide 7* in the United States of America.

- (i) the *Guidance Note on Accounting for Oil and Gas Producing Activities* issued by the Institute of Chartered Accountants of India requires entities to disclose oil and gas reserves in their financial statements;
 - (ii) Chinese Accounting Standard Chinese Accounting Standard, *ASBE 27 Extraction of Oil & Natural Gas* requires disclosure of oil and gas reserves by geography in entities’ financial statements; and
 - (iii) FASB Accounting Standards Codification® Topic 932 *Extractive Activities—Oil and Gas* in the United States of America requires disclosures of reserve and resource information as supplementary information to the financial statements;
- (d) in some jurisdictions there are no regulatory requirements for the disclosure of reserve and resource information.
33. Some stakeholders said that even if there are no regulatory requirements in their jurisdiction, it is industry practice to disclose information about an entity’s reserves and resources using widely accepted classification systems, such as those developed using the CRIRSCO and PRMS classification systems.

Question for the Board

Question

Does the Board have any comments on the disclosure of reserve and resource information?

Appendix A—Extract from Chapter 2 of the 2010 *Extractive Activities Discussion Paper*

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Chapter 2 – Definitions of reserves and resources

Introduction

2.1 Reserves and resources are either the most significant assets or amongst the most significant assets for most entities engaged in extractive activities. Assessing the financial position and performance of an entity engaged in extractive activities in order to make economic decisions therefore requires an understanding of the entity's minerals or oil and gas reserves and resources, which are the source of future cash flows. This chapter considers the definitions of reserves and resources that should be used in financial reporting in order to facilitate this assessment. Subsequent chapters of this discussion paper consider how reserve and resource information should be reflected in the financial statements and in the notes.

Reserves and resources

- 2.2 Broadly speaking, the underlying purpose of reserve and resource definitions is to communicate information about the quantity of minerals or oil and gas that is estimated to exist in a deposit and may be recoverable³. However, identifying the definitions of reserves and resources that should apply in the financial reporting of minerals and oil and gas extractive activities is not straightforward, primarily because there is no single, generally accepted definition of reserves and resources that applies both to minerals and to oil and gas.
- 2.3 Most definitions of reserves and resources share similar nomenclature and basic concepts. This is because these definitions mainly derive from a system recommended by VE McKelvey of the United States Geological Survey in the early 1970s (and commonly referred to as the 'McKelvey box' diagram).
- 2.4 The basic concepts of a 'reserve' and a 'resource' are as follows:
- (a) Reserves generally refer to the quantity of minerals or oil and gas that is estimated to be economically recoverable from the earth. In other words, reserve quantities are an estimate of the aggregate future production of minerals or oil and gas.
 - (b) Resources generally refer to the quantity of minerals or oil and gas that has been discovered but is not yet capable of being classified as a reserve⁴. This may be because:
 - (i) insufficient drilling, analysis and planning have been undertaken to indicate whether the minerals or oil and gas may be economically recoverable;

³ In the minerals industry, reserves and resources are usually quantified in terms of tonnages. In the oil and gas industry, reserves and resources are usually expressed in terms of volumes and quantified as barrels of oil or cubic feet of gas.

⁴ Particularly in the oil and gas industry, the term 'resources' can also be used to refer to quantities that have not yet been discovered.

- (ii) the minerals or oil and gas are not expected to be economically recoverable under current economic conditions, but there are reasonable prospects for such economic conditions to change and thereby allow for eventual economic extraction; or
 - (iii) development and production of the minerals or oil and gas deposit are contingent on other factors that may prevent timely development of the property, such as the need to develop a market for the production or to respond to environmental concerns.
- (c) Reserves and resources are generally classified into subcategories according to the level of confidence associated with the estimate of the reserve or resource quantities.

2.5 The major differences in the various definitions of reserves and resources relate to the scope and specificity of the definitions and also to the assumptions that are to be used in estimating and classifying reserves and resources. These differences in the detail of the definitions can be explained (at least in part) by two factors. First, although many of the definitions of mineral reserves and resources and oil and gas reserves and resources have common roots in the McKelvey box diagram, they have subsequently evolved largely independently of each other. This is not surprising given the different physical properties of minerals (solid) and oil and gas (typically fluid) and the fact that the minerals and oil and gas industries are typically regarded and organised as separate and distinct industries. Secondly, definitions of reserves and resources have been developed by various organisations around the world, such as industry and professional associations, securities regulators and other government and international agencies. In some cases, the definitions differ because they were developed to meet different information needs. For instance, for some commodities, there are differences in the definitions of reserves and resources used to report information on reserves (and sometimes resources) to investors, to the entity's management, and to governmental or international agencies for natural resource management purposes. In other cases, the definitions of reserves and resources differ between jurisdictions even though they are intended to meet the same information needs (eg to report reserve and resource information to investors).

2.6 Consequently, the definition of a 'reserve' and a 'resource' (or similar terms) can vary depending on the industry, the jurisdiction and the reason for preparing the estimate. This diversity in definitions can make it difficult to compare the reserve and resource information that has been reported by different entities. This is not helpful to users of financial reports.

Financial reporting needs

2.7 In defining reserves and resources in an IFRS for extractive activities, the project team considers that:

- (a) consistent definitions of minerals and oil and gas reserves and resources should be used; and
- (b) these definitions should be compatible with financial reporting methodologies and requirements.

2.8 Consistent definitions of minerals and oil and gas reserves and resources are needed as part of developing accounting and disclosure requirements that are comparable

within and across the two industries. As noted in Chapter 1, this is one of the research project's objectives.

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Appendix B—Summary of stock exchange regulatory requirements

B1. The following tables summarise the stock exchange regulatory requirements related to the disclosure of reserve and resource information outside the financial statements for each of the nine jurisdictions researched being Australia, Brazil, Canada, China, Norway, Russia, South Africa, the United Kingdom and the United States of America (see paragraphs 26-28).

Australia—minerals

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to CRIRSCO? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
|--|--|---|
| Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code) | ✓ | <p>Chapter 5 <i>Additional reporting on mining and oil and gas production and exploration</i> of the Australian Stock Exchange Listing Rules⁵</p> <ul style="list-style-type: none"> • a mining entity must include a mineral resources (inferred, indicated and measured) and ore reserves (proved and probable) statement in its annual report <ul style="list-style-type: none"> ○ must be split by information about quantity, grade and geography • specific requirements exist for (i) initial application / first time reporting; and (ii) material changes in reserves and resources of material mineral projects • requirements for exploration results (eg drilling) • prepared by a competent person (does not need to be external) |

⁵ See: <https://www.asx.com.au/documents/rules/Chapter05.pdf>.

Australia—oil and gas

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to PRMS? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
|---|---|---|
| PRMS | ✓ | <p>Chapter 5 <i>Additional reporting on mining and oil and gas production and exploration</i> of the Australian Stock Exchange Listing Rules</p> <ul style="list-style-type: none"> • an oil and gas entity that reports to the Securities and Exchange Commission of the USA (SEC) and files SEC compliant Forms 10-K and 20-F Reports with the SEC annually is not required to comply with the annual reserves statement requirements • subject to the above, an oil and gas entity must include a reserves statement in its annual report • reserves statement must include proved and probable reserves split by (i) developed and undeveloped; and (ii) product and geography • 2C contingent resources⁶ are permitted to be disclosed (but are not required) • reconciliation against previous year’s reserves holdings is required (which may include revisions to previous estimates, extensions and discoveries, acquisitions and divestments and production) • specific requirements exist for initial application / first time reporting and must include disclosure on reserves, contingent resources and prospective resources of material oil and gas projects • requirements for exploration results (eg drilling) |

⁶ The best estimate of quantities of hydrocarbons estimated to be potentially recoverable from known accumulations by the application of development projects not currently considered to be commercial owing to one or more contingencies.

| | | |
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| What reserve and resource system is mandated? | Is the reserve and resource system aligned to PRMS? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
| | | <ul style="list-style-type: none"> • prepared by qualified petroleum reserves evaluator (does not need to be external to the entity) |

Brazil—minerals

| <p>What reserve and resource system is mandated?</p> | <p>Is the reserve and resource system aligned to CRIRSCO?</p> | <p>Are entities listed on the local stock exchange required to disclose to the public reserve and resource information?</p> |
|--|--|--|
| <p>CBRR Guide for Reporting Exploration Results, Mineral Resources, and Mineral Reserves</p> | <p style="text-align: center;">✓</p> | <ul style="list-style-type: none"> • there are no requirements to report on reserve and resource information in the financial statements • however, the guidance indicates the minimum standard of information to be included when making this type of information public, as these will, indirectly, inform investors and potential investors |

Brazil—oil and gas

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to PRMS? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
|---|---|--|
| PRMS for ANP submission ⁷ | ✓ | <ul style="list-style-type: none"> • there are no requirements to report reserve and resource information in the financial statements • however, there are regulatory requirements in relation to this information. Companies are required to report to the National Petroleum, Natural Gas and Biofuels Agency of Brazil (Resolution ANP 47) their proved, probable and possible reserves and contingent resources for aggregation into an annual government bulletin of reserves (individual returns are not identified therefore this is not company reporting) |

⁷ The ANP legislation (local guidance) determines that the criteria used should be aligned with the PRMS, but it states that in case of conflict between the local legislation (Resolucao ANP 47/2014) and the PRMS, the ANP guidance should prevail.

Canada—minerals

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to CRIRSCO? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
|--|--|---|
| Canadian Institute for Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves ⁸ | ✓ | <p>National Instrument 43-101 <i>Standards of Disclosure for Mineral Projects</i>⁹</p> <ul style="list-style-type: none"> • applies to all reserve and resource disclosures made by reporting issuers to the public • prohibits entities from making any disclosure about resources that have not been classified as an inferred mineral resource, an indicated mineral resource, a measured mineral resource, a probable mineral reserve, or a proven mineral reserve unless specific conditions are satisfied • a technical report for all material projects must be filed (i) upon becoming a reporting issuer and (ii) to support scientific or technical information that relates to a mineral project on a property material to the issuer <ul style="list-style-type: none"> ○ not a 'total' reserve report (these are only required for material projects, individually) ○ needs to be prepared by qualified person but not necessarily independent - there are exemptions ○ split by quantity and grade per project ○ reserves (proved and probable) and resources (inferred, indicated and measured) |

⁸ Issuers incorporated in a foreign jurisdiction, or for properties in a foreign jurisdiction, may use an acceptable foreign code if the issuer also provides a reconciliation of the material differences to the CIM mineral resources and mineral reserve categories. An “acceptable foreign code” means the JORC Code, the PERC Code, the SAMREC Code, SEC Industry Guide 7, the Certification Code, or any other code, generally accepted in a foreign jurisdiction, that defines mineral resources and mineral reserves in a manner that is consistent with the CIM mineral resource and mineral reserve definitions and categories.

⁹ See: https://www.osc.gov.on.ca/documents/en/Securities-Category4/ni_20160509_43-101_mineral-projects.pdf.

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| <p>What reserve and resource system is mandated?</p> | <p>Is the reserve and resource system aligned to CRIRSCO?</p> | <p>Are entities listed on the local stock exchange required to disclose to the public reserve and resource information?</p> |
| | | <ul style="list-style-type: none"> • technical reports need to be updated whenever appropriate (eg when there is a material change) |

Canada—oil and gas

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to PRMS? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
|---|---|---|
| Canadian Oil and Gas Evaluation Handbook | ✓ | <p>National Instrument 51-101 <i>Standards of Disclosure for Oil & Gas Issuers</i>¹⁰</p> <ul style="list-style-type: none"> • applies to reporting issuers only • requires reporting issuers to annually report reserve data and other oil and gas information <ul style="list-style-type: none"> ○ subject to independent evaluator or auditor report ○ in addition to quantities, must disclose the after tax NPV of proved and probable reserves based on management forecasts of prices and costs and discounted using 0%, 5%, 10%, 15%, 20% ○ split proved developed producing, proved developed non-producing, proved undeveloped and probable and split by country (mandatory) ○ Possible reserves (voluntary) ○ Contingent resources (voluntary - 2C) ○ Prospective resources: (voluntary - best estimate) • any news releases including reserve information should follow the requirements for reporting such information • where there is a material change to the reserve information a reasonable expectation of the impact of this on reserves should be disclosed |

¹⁰ See: https://www.bcsc.bc.ca/-/media/PWS/Resources/Securities_Law/Policies/Policy5/51101-NI-July-1-2015.pdf.

China—minerals

| <p>What reserve and resource system is mandated?</p> | <p>Is the reserve and resource system aligned to CRIRSCO?</p> | <p>Are entities listed on the local stock exchange required to disclose to the public reserve and resource information?</p> |
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| <p>Classifications for Mineral Resources and Mineral Reserves GB/T 17766-2020</p> | <p>✓</p> | <p>No.18 <i>Format Instruction on Temporary Announcements of Listed Companies: Announcement on Acquisition & Transfer of Mineral Rights by Listed Companies</i></p> <ul style="list-style-type: none"> • listed companies should follow the industry general practice • disclose the factors that can demonstrate the value of mineral rights (including exploration rights and extraction rights), such as the area for exploration or extraction, quantities of reserves or resources (at least ‘the recoverable reserves’), the production capacity and the valid term of the mineral rights, and explain the specific meanings of all technical terms in the announcements • no additional disclosure requirements on reserves and resources, hence information on reserves and resources in their regular reports (eg annual reports) are provided on a voluntary basis |

China—oil and gas

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to PRMS? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
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| <p>Classifications for Oil and Gas Resources and Reserves GB/T 19492-2020¹¹</p> | <p>✓</p> | <p>Guidelines for Industry Information Disclosure of Listed Companies No. 8 - <i>Oil and Gas Exploitation</i></p> <ul style="list-style-type: none"> • information on key aspects of exploration and production activities and operations, including the quantity and value of reserves, exploratory wells and development wells, production volume, sales volume, exploration and production capital expenditure, and safety and environmental protection • the following information on oil and gas reserves as of the end of the reporting period (generally as part of the annual report): <ul style="list-style-type: none"> ○ general information, including the total number of proven reserves, proven developed reserves and proven undeveloped reserves by geographic areas and product types ○ information on changes in reserves, including changes in the number of reserves during the reporting period due to expansion and new discoveries, increased recovery, revisions to previous estimates, acquisition and disposal of oil and gas assets, and production and other factors • the following information on the value of oil and gas reserves as of the end of the reporting period: <ul style="list-style-type: none"> ○ general information, including the standardized measure of future net cash flows for the most recent two fiscal years calculated and disclosed based on the proven net |

¹¹ The Guideline does not specifically mention which reserve and resource classification system entities should apply, however common practice is to apply Classifications for Oil and Gas Resources and Reserves GB/T 19492-2020 or the US SEC Regulation S-K.

| <p>What reserve and resource system is mandated?</p> | <p>Is the reserve and resource system aligned to PRMS?</p> | <p>Are entities listed on the local stock exchange required to disclose to the public reserve and resource information?</p> |
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| | | <p>reserves, average prices of oil and gas, future production and development costs, income tax expenses, and discount coefficients</p> <ul style="list-style-type: none"> ○ information on changes in reserves, including standardized measure of discounted cash flow due to changes in sales prices and future production costs, changes in future development cost valuations, new discoveries and enhanced recovery rates, increased discounts, and changes in income taxes, and other factors ● the estimation standard followed in calculating oil and gas reserves, the internal control measures taken in the process of the estimation, and the qualifications of the key technicians responsible for the estimation |

Norway—minerals

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to CRIRSCO? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
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| <p>Permitted:</p> <p>JORC Code</p> <p>South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC)</p> <p>CIM Definition Standards for Mineral Resources and Mineral Reserves</p> <p>Pan European Resources Code (PERC)</p> <p>SME Guide for Reporting Exploration Results, Mineral Resources and Mineral Reserves</p> <p>Certification Code for Exploration Prospects, Mineral Resources and Ore Reserves</p> | <p>✓</p> | <p>Oslo Børs <i>Listing rules for equities</i>¹² and Oslo Børs <i>Continuing obligations of stock exchange listed companies</i>¹³</p> <ul style="list-style-type: none"> • companies that meet the definition of “mineral companies” in the <i>ESMA update of CESR’s recommendation on prospectuses</i> must provide a report on reserves (proved/probable) and resources (inferred, indicated/measured) prepared in accordance with the guidelines issued by Oslo Børs on listing (there is no annual requirement) |

¹² See: https://www.oslobors.no/ob_eng/Oslo-Boers/Regulations/Listing-Rules-for-equities-on-Oslo-Boers#path_array=96047/96062/96161

¹³ See: https://www.oslobors.no/ob_eng/Oslo-Boers/Regulations/Continuing-obligations-of-stock-exchange-listed-companies

Norway—oil and gas

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to PRMS? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
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| <p>PRMS</p> <p>SEC Regulations S-K and S-X</p> <p>Norwegian Petroleum Directorate</p> <p>Canadian Oil and Gas Evaluation Handbook</p> <p>Other classification systems are subject to approval by Oslo Børs</p> | <p>✓</p> | <p>Oslo Børs <i>Listing rules for equities</i> and Oslo Børs <i>Continuing obligations of stock exchange listed companies</i></p> <ul style="list-style-type: none"> • required to prepare a reserves statement annually (published at least simultaneously with the annual report) • key assumptions used in preparing the reserves statement must also be disclosed • must be split by developed and undeveloped, split by proved and probable and also split by geography or asset or field (as decided by the entity) • disclosure of possible reserves, contingent resources and prospective resources is voluntary |

Russia—minerals

| <p>What reserve and resource system is mandated?</p> | <p>Is the reserve and resource system aligned to CRIRSCO?</p> | <p>Are entities listed on the local stock exchange required to disclose to the public reserve and resource information?</p> |
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| <p>Russian Federation Classification Scheme (RFCS) JORC (2012)</p> | <p style="text-align: center;">✘</p> | <ul style="list-style-type: none"> • an annual report is mandatory, and it is common practice to include JORC compliant information in it however, reporting reserve and resource information is not mandatory in itself |

Russia—oil and gas

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to PRMS? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
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| Russian Federation Classification Scheme PRMS | × ✓ | <ul style="list-style-type: none"> “Issuers of securities” (listed companies) are required by the exchange regulator to include in their quarterly “issuer’s report” information on “proved reserves” if available, for their significant oil & gas fields. It is not mandated which reserve system is to be used for this information. However, it is common practice to include the reserve and resource information in it based on PRMS and/or (less often) US SEC classifications. |

South Africa—minerals

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to CRIRSCO? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
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| SAMREC | ✓ | <p>Section 12 <i>Mineral Companies</i> of the Johannesburg Stock Exchange Listing Rules¹⁴</p> <ul style="list-style-type: none"> • applies to all reserve and resource information made public by a listed company • authorised by competent person, does not need to be independent • must disclose information about reserves (proved and probable) and resources (measured, indicated, inferred) by quantity and grade as part of the annual report |

South Africa—oil and gas

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to PRMS? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
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| South African Oil and Gas Code (SAMOG) | ✓ | <p>Section 12 <i>Mineral Companies</i> of the Johannesburg Stock Exchange Listing Rules</p> <ul style="list-style-type: none"> • a company is only required to report on their reserves upon listing and Category 1 transactions |

¹⁴ See: <https://www.jse.co.za/content/JSERulesPoliciesandRegulationItems/JSE%20Listings%20Requirements.pdf>

United Kingdom—minerals

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to CRIRSCO? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
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| <p>CIM Definition Standards for Mineral Resources and Mineral Reserves</p> <p>PERC</p> <p>JORC Code</p> <p>Russian Federation Classification Scheme</p> <p>SAMREC</p> <p>SME Guide for Reporting Exploration Results, Mineral Resources and Mineral Reserves</p> <p>Certification Code for Exploration Prospects, Mineral Resources and Ore Reserves as published by the Instituto de Ingenieros de Minas de Chile</p> | <p>✓</p> | <p>No UK Listing Authority Listing Rules requirements</p> <p>AIM Note for Mining and Oil & Gas Companies (June 2009)¹⁵</p> <ul style="list-style-type: none"> • applies to all reserve and resources information disclosed by a listed entity • statement of reserves and, if applicable, resources (by quantity and grade) must be disclosed on registering with AIM/listing on the exchange (proved and probable reserves and measured, indicated and inferred resources) • drilling updates are required to be disclosed • a notified resource update must disclose the classification system being applied by the entity • no annual requirement |

¹⁵ See: https://www.lseg.com/sites/default/files/content/documents/AIM_note_miningoilgas.pdf

United Kingdom—oil and gas

| <p>What reserve and resource system is mandated?</p> | <p>Is the reserve and resource system aligned to PRMS?</p> | <p>Are entities listed on the local stock exchange required to disclose to the public reserve and resource information?</p> |
|--|---|---|
| <p>Canadian Oil and Gas Evaluation Handbook PRMS Norwegian Petroleum Directorate</p> | <p>✓</p> | <p>No UK Listing Authority Listing Rules requirements</p> <p>AIM Note for Mining and Oil & Gas Companies (June 2009)</p> <ul style="list-style-type: none"> • applies to all reserve and resources information disclosed by a listed entity • statement of reserves and, if applicable, resources (by quantity and grade) must be disclosed on registering with AIM/listing on the exchange (proved, probable and possible reserves, contingent resources and prospective resources) • drilling updates are required to be disclosed • a notified resource update must disclose the classification system being applied by the entity • no annual requirement <p>UK SORP <i>Accounting for Oil and Gas Exploration, Development, Production and Decommissioning Activities</i> did recommend annual reserve disclosures, but now withdrawn.</p> <p>Foreign Private Issuers listed in the US report under SEC classification rules in their London Stock Exchange reporting without also reporting an alternative classification measure.</p> |

United States of America—minerals

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to CRIRSCO? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
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| <p>SEC Industry Guide 7, soon to be superseded by subpart 1300 of Regulation S-K (the summary of requirements has been based on the new regulations)</p> | <p>✓</p> | <p><i>Subpart 229.1300—Disclosure by Registrants Engaged in Mining Operations</i> of SEC Regulation S-K¹⁶</p> <ul style="list-style-type: none"> • registrant engaged in mining operations must disclose its reserves and resources on an annual basis prepared by a qualified person (not necessarily independent) • was embedded in Industry Guide 7 which is soon to be withdrawn and from 2021 SEC regulations are now closer to CRIRSCO (price based on qualified person assessment of what is reasonable with detailed explanation) • summary reserves (probable and proven) and resources (inferred, indicated and measured) must be disclosed by quantity, grade and geography (country, states etc) • individual property information provided for material properties • where material new discovery or revision to material property resource information at year end, this must be accompanied by a technical report (technical report required for first time reporting of reserves or resources on a material property or when there is a material change to reserves or resources on a material property) |

¹⁶ See: https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=43703ca81ec1192385071bcb239d2d82&mc=true&n=pt17.3.229&r=PART&ty=HTML#sp17.3.229.229_11300

United States of America—oil and gas

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to PRMS? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
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| SEC Regulation S-K | ✓ | <p><i>Subpart 229.1200—Disclosure by Registrants Engaged in Oil and Gas Producing Activities of SEC Regulation S-K¹⁷</i></p> <ul style="list-style-type: none"> • Regulations (4-10) also refers to the disclosure requirements included in FASB Accounting Standards Codification® Topic 932 <i>Extractive Activities—Oil and Gas</i> • registrant engaged in material¹⁸ oil and gas activity must disclose its reserve quantities on an annual basis • must be based on 12-month historic average price (4-10 proved reserve definition) • disclose as supplementary information (alongside the annual financial statements) for significant oil and gas producing activities¹⁹ a standardised measure of NPV of proved reserves based on 12-month historic average price and a 10% discount rate |

¹⁷ See: https://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=43703ca81ec1192385071bcb239d2d82&mc=true&n=pt17.3.229&r=PART&ty=HTML#sp17.3.229.229_11200

¹⁸ Item 1200 of Regulation S-K requires reserve quantities that are material to be disclosed, whereas FASB Accounting Standards Codification® (ASC) 932-235-50 *Extractive Activities—Oil and Gas* requires reserves that are associated with “significant oil and gas producing activities” to be disclosed, as that is defined in ASC 932-235-50-20.

¹⁹ASC 932-235-50-20 states: “An entity is regarded as having significant oil- and gas-producing activities if it satisfies any of the following criteria. The criteria shall be applied separately for each year for which a complete set of annual financial statements is presented.

- a) Revenues from oil- and gas-producing activities, as defined in paragraph ASC 932-235-50-24 (including both sales to unaffiliated customers and sales or transfers to the entity's other operations), are 10 percent or more of the combined revenues (sales to unaffiliated customers and sales or transfers to the entity's other operations) of all of the entity's industry segments. An industry segment is a component of an entity engaged in providing a product or service or a group of related products or services primarily to external customers (that is, customers outside the entity) for a profit.

| What reserve and resource system is mandated? | Is the reserve and resource system aligned to PRMS? | Are entities listed on the local stock exchange required to disclose to the public reserve and resource information? |
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| | | <ul style="list-style-type: none"> • proved (developed and undeveloped) reserves must be disclosed, and by geography, where significant²⁰ (country or groups of countries/continent), unless prohibited by country government • permit (not require) probable and possible (developed and undeveloped) reserves to be disclosed |

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- b) Results of operations for oil- and gas-producing activities, including equity earnings or losses from oil- and gas- producing activities of equity method investees and excluding the effect of income taxes, are 10 percent or more of the greater of the following:
1. The combined operating profit (including equity earnings) of all industry segments that did not incur an operating loss
 2. The combined operating loss (including equity losses) of all industry segments that did incur an operating loss.
- c) The identifiable assets of oil- and gas-producing activities (tangible and intangible entity assets that are used by oil- and gas-producing activities, including an allocated portion of assets used jointly with other operations and the investment balance in the oil- and gas-producing activities of equity method investees) are 10 percent or more of the assets of the entity, excluding assets used exclusively for general corporate purposes.

²⁰ The definition of significant for disaggregation by geography is 15% of total proved reserves is located in that geography.