DECEMBER 2021

Energy Matters

2021 REPORT

ASC
Alberta Securities Commission


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Just as the industry is evolving, our focus at the ASC is evolving and this report reflects that.

Each year the ASC issues four reports: the Annual Report, the Alberta Capital Markets Report, the Energy Matters Report (formerly the Oil and Gas Review Report) and the Corporate Finance Disclosure Report. These reports are created to provide timely and relevant information for market participants and reporting issuers. They can be found at albertasecurities.com.

I am pleased to share the Alberta Securities Commission (ASC)'s 2021 Energy Matters Report (**Report**). This report both incorporates and expands on our prior Oil and Gas Review Reports.

The ASC is proud to continue its leadership role within the Canadian Securities Administrators (**CSA**) with respect to the review of oil and gas-related disclosure. The ASC's Energy Group is a specialized team within the ASC's Corporate Finance division and is comprised of experienced and knowledgeable engineers, geologists and other professionals who understand the industry and its challenges. However, Alberta's oil and gas industry continues to evolve and in many cases the industry is supplementing its important traditional activities with alternative energy and cleantech initiatives. The industry has also shown leadership in its response to investor interest in environmental, social and governance (**ESG**) matters.

Just as the industry is evolving, our focus at the ASC is evolving and this report reflects that.

We are taking steps to ensure we have the necessary technical expertise in the oil and gas sector as well as in alternative energy sources and energy-related technology developments (e.g. carbon capture and sequestration) relevant to the Alberta capital market. Further, as reporting issuers (**RIs**) are increasingly providing technical ESG disclosure such as scope 1, 2 and 3 greenhouse gas (**GHG**) emissions, and as work continues within the CSA with respect to climate-related disclosure rules, we also need to ensure we have the expertise to review and assess that technical disclosure. The ASC's Energy Group continues to expend considerable effort to ensure technical expertise also exists to assess these broader energy-related matters.

As with prior Oil and Gas Review Reports, the Energy Group prepared this Report to provide a review of oil and gas disclosure from RIs over the past year, identify areas of concern and provide statistics on financing efforts by these issuers. This year however, the report has been expanded to include information on other energy-related matters such as the production of helium, hydrogen and lithium (from brines), and carbon capture, utilization and storage (**CCUS**). It also includes the very informative results of the Energy Group's review of certain GHG emissions and other ESG-related matters by RIs in the oil and gas sector.

We are committed to working with, and providing assistance to RIs in their efforts to meet securities law requirements, to ultimately protect investors.

This year Tom Graham, who served as ASC Director, Corporate Finance for many years, left to pursue new adventures. I want to acknowledge and thank Tom for the significant role he played in guiding the ASC's Corporate Finance division and in imagining the new broader scope for the Energy Group. I'm excited to take on this new mandate.

We provide these reports to assist RIs and their advisers to ensure balanced, reliable, accurate and timely disclosure that helps provide investors with the information they need to make informed investment decisions. Our goal is that this Report is helpful. We welcome your feedback to help us achieve that objective.

We look forward to engaging with all of you in the future, including during our upcoming Corporate Finance presentation to be held in January 2022.

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1. Introduction

1.1 GENERAL

The ASC administers Alberta securities laws and is the lead regulator on oil and gas-related disclosure within the CSA, the umbrella group of Canada's securities regulators.

Alberta securities laws are comprised of the *Securities Act* (Alberta) (**Act**) and the rules, regulations and decisions made under the Act. Alberta securities laws are intended to protect investors and foster a fair and efficient capital market. ASC staff endeavour to ensure investors have access to the disclosure necessary to make informed investment decisions and that it is balanced, authentic, relevant and reliable.

The Energy Group is part of the ASC's Corporate Finance division, which is responsible for overseeing disclosure from RIs for which the ASC is the principal regulator (**AB RIs**). The Energy Group provides specialized expertise related to the monitoring and oversight of oil and gas-related disclosure as well as certain other technical disclosure attributed to energy-related AB RIs. It also provides assistance to certain other securities regulators within the CSA.

With the ongoing evolution of Alberta's energy industry to include a multitude of energy-related matters beyond oil and gas, and accelerating efforts to meaningfully reduce GHG emissions, the Energy Group's responsibilities have also evolved. In addition to oil and gas, which remains a core responsibility, the Energy Group is now applying its technical expertise to disclosure from the broader energy industry.

The Energy Group's specific responsibilities include:

- Review of oil and gas disclosure, including reserves and resources other than reserves, from issuers that report under National Instrument 51-101 *Standards of Disclosure For Oil and Gas Activities* (**NI 51-101**);
- Development of policy and guidance related to NI 51-101;
- Review of energy-related disclosure from other RIs for which the ASC is the principal regulator;
- Monitoring of energy-related trends and the development of alternative energy sources and clean technology, including technological and process developments related to GHG emissions, and their relationship to Alberta's capital market;
- Review of disclosure concerning energy-related environmental liabilities;
- Monitoring and technical reviews of GHG emissions disclosure;
- Engagement with other ASC Corporate Finance division staff to develop policy and guidance related to GHG emissions disclosure;
- Engaging with Alberta capital market participants through our advisory committees, publications, webinars, presentations, inquiries and other outreach.

As stated above, the Energy Group's mandate now includes energy disclosure from the broader energy industry attributed to RIs for which the ASC is the principal regulator. The following is included in this mandate:

- Oil and gas activities as defined in NI 51-101;
- Oil and gas midstream (including pipelines) and oil and gas services;
- Petrochemicals;
- Renewable energy via wind, solar, hydro and geothermal;
- Nuclear energy;
- Exploration and development of helium;
- Hydrogen;

- Green hydrocarbons, often referred to as "renewable hydrocarbons;"
- CCUS and related technologies;
- Lithium recovered from oilfield brines (used in batteries);
- Electrical generation, transmission and storage;
- Energy-related environmental liabilities;
- GHG emissions, monitoring and reporting;
- Green or transition financing initiatives; and
- Energy-related services.

This Report replaces our prior Oil and Gas Review Report. It provides information about oil and gas, in addition to other energy-related subjects. The information includes:

- Oil and gas disclosure from RIs engaged in oil and gas activities;
- Disclosure from other energy-related RIs for which the ASC is the principal regulator that are involved in oil and gas services and oil and gas midstream (including pipelines), exploration and development of helium, recovery of lithium from oilfield brines, GHG emissions, and CCUS;
- Results of reviews of specific ESG-related disclosure in respect of RIs engaged in oil and gas activities, e.g. whether or not specific environmental information has been provided;
- Energy and the Alberta capital market; and
- Energy Group activities.

1.2 OVERVIEW

The oil and gas industry remains of significant importance globally and to Alberta and Canada. In Canada, the industry has a major economic impact and continues to demonstrate exceptional innovative technical expertise and leadership. This is particularly important as it responds to significant challenges attributed to energy diversification and increasing scrutiny and accountability with respect to ESG concerns.

During 2021, the Energy Group continued to be responsible for reviewing general and required annual oil and gas disclosure to assess compliance with securities law disclosure requirements, including NI 51-101 and its related forms. Under section 2.1 of NI 51-101, oil and gas RIs are required to file the following with the securities regulatory authority on an annual basis:

- Form 51-101F1 *Statement of Reserves Data and Other Oil and Gas Information* (**Form 51-101F1**);
- Form 51-101F2 *Report on [Reserves Data][,] [Contingent Resources Data] [and] [Prospective Resources Data] by Independent Qualified Reserves Evaluator or Auditor* (**Form 51-101F2**); and
- Form 51-101F3 *Report of Management and Directors on Oil and Gas Disclosure* (**Form 51-101F3**).

In addition, specific circumstances may necessitate the filing of:

- Form 51-101F4 *Notice of Filing of 51-101F1 Information* (**Form 51-101F4**), or
- Form 51-101F5 *Notice of Ceasing to Engage in Oil and Gas Activities*.

NI 51-101 sets out the general disclosure standards and specific annual disclosure requirements for RIs engaged in oil and gas activities. Per NI 51-101, disclosure must be prepared in accordance with the Canadian Oil and Gas Evaluation Handbook (**COGE Handbook**), which is maintained and distributed by the Society of Petroleum Evaluation Engineers (**SPEE**) (Calgary Chapter) (www.speecanada.org). The COGE Handbook is amended from time to time and oil and gas RIs must ensure that their disclosure complies with changes upon publication.

The disclosure reviewed by staff since the last report was generally compliant with securities law disclosure requirements, including NI 51-101 and its technical standard, the COGE Handbook. This Report contains observations and analyses concerning key areas identified by staff for improvement. These involve the following:

- **Development timing for undeveloped reserves**
  - Disclosure per item 5.1 of Form 51-101F1, which requires discussion of the plans for development of proved undeveloped reserves and probable undeveloped reserves
- **Qualified reserves evaluators and qualified reserves auditors**
  - Disclosure must be prepared or audited by a qualified reserves evaluator or auditor
- **Form 51-101F2**
  - Errors and material modifications to the report filed in accordance with Form 51-101F2
- **Form 51-101F4**
  - Absence of the notice of filing required per section 2.3 of NI 51-101 if an RI has filed the information required by section 2.1 in its annual information form (**AIF**)
- **Reserves reconciliations**
  - Disclosure per item 4.1 of Form 51-101F1, which requires annual accounting of changes in reserves estimates

Also included are data and discussion concerning the quality of oil and gas reserves estimates required to be disclosed under section 2.1 of NI 51-101.

This Report then presents information concerning the following emerging energy-related subjects:

- **Helium**
  - Disclosure under NI 51-101 and otherwise
- **Hydrogen**
- **Lithium recovered from oilfield brines**
  - Disclosure under National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (**NI 43-101**)
- **Carbon capture, utilization and storage**

Finally, this Report contains data and commentary concerning ESG, a summary of proposed National Instrument 51-107 *Disclosure of Climate-related Matters* (**Proposed NI 51-107**) and its companion policy, which addresses disclosure of climate-related matters, and statistics and commentary regarding Alberta's capital market as it pertains to energy-related endeavours.

1.3 ENERGY GROUP YEAR IN REVIEW

The Energy Group's principal activities to the end of September 2021 included the completion of 135 screening reviews of the required annual oil and gas filings, including 113 for RIs for which the ASC is the principal regulator and 22 for which another Canadian jurisdiction is the principal regulator.

Staff also completed 135 screening reviews concerning ESG disclosure, that is, one review for each RI engaged in oil and gas activities. These reviews consisted of a basic assessment, including the presence of specific environmental disclosure, including GHG emissions and liabilities. These reviews are discussed in detail in section 4 of this Report.

To the end of September 2021, staff reviewed 12 prospectuses from RIs engaged in oil and gas activities, including 11 for RIs for which the ASC is the principal regulator and one for which the principal regulator is the British Columbia

Securities Commission. In addition, staff reviewed 10 prospectuses from other energy-related RIs, six of which were from RIs for which the ASC is the principal regulator.

Staff conducted approximately 1,050 press release screening reviews and 35 full press release reviews, 31 of which were for RIs for which the ASC is the principal regulator.

In addition, staff completed 22 other disclosure reviews to the end of September 2021. Further information on review types is contained in sections 2 and 3 of this Report.

Figure 1: Number of select completed disclosure reviews

REVIEW TYPE	JURISDICTION	2021 YTD	2020	2019	2018
Prospectus	AB	11	3	5	12
	Other	1	0	1	2
Oil & Gas Screening	AB	113	129	132	138
	Other	22	41	45	57
Press Release	AB	31	21	26	15
	Other	4	2	5	0
ESG Technical Screening	AB	113	-	-	-
	Other	22	-	-	-
Other	AB	9	12	20	37
	Other	12	0	3	1

"-" Review type not yet initiated
Information is included to the end of September for the current year, referred to as "YTD," and subsequently updated to the full year in future reports.

Staff also assisted the SPEE (Calgary Chapter) in its efforts regarding the COGE Handbook, including consideration of energy-related information beyond oil and gas, and worked with other ASC and CSA staff on Proposed NI 51-107 and its companion policy, which would introduce disclosure requirements regarding climate-related matters for most RIs (other than investment funds).

As part of its commitment to engagement with capital market participants, the ASC published the 2020 Oil and Gas Review Report in October 2020. It was also emailed to approximately 983 subscribers. In January 2021, staff hosted the 2021 Corporate Finance Information Sessions, which included the NI 51-101 Oil and Gas Review Information Session. Due to the COVID-19 pandemic, the event did not include a simultaneous in-person seminar, as it has previously. The event had 434 registered participants and 322 registered attendees. See https://asc.ca/news-and-publications/events for information concerning future seminars and webinars.

Between October 2020 and the end of September 2021, the Energy Group responded to 37 inquiries. These included 15 from firms that evaluate oil and gas reserves and resources other than reserves, nine from legal firms, eight from RIs, four from other Canadian regulators, and one from an investment bank.

The Energy Group can be reached at your convenience through the contact information in section 8 of this Report. Please let us know how we can help.

2. Oil and gas disclosure commentary

2.1 INTRODUCTION

This section discusses key areas of oil and gas disclosure by RIs engaged in oil and gas activities that staff have identified for improvement, as well as data, analysis and discussion concerning the quality of oil and gas reserves estimates. It incorporates observations and analyses drawn primarily from reviews of 2021 disclosure attributed to oil and gas activities that were mostly conducted in 2020 (accounting for variation in financial year-end dates).

In its role as the lead regulator on oil and gas-related disclosure within the CSA, the Energy Group applies a rigorous review process to assess compliance with oil and gas securities disclosure regulatory requirements. While this process primarily focuses on RIs for which the ASC is the principal regulator, staff also routinely review disclosure from RIs engaged in oil and gas activities for which other Canadian jurisdictions are the principal regulator in an effort to assist these jurisdictions.

The type of review conducted by staff will often determine specifically what will be reviewed. Reviews may incorporate disclosure required by section 2.1 of NI 51-101 (including the statement specified in Form 51-101F1 and related reports), management discussion and analyses, press releases, prospectuses, investor presentations, and websites, along with material used to prepare disclosure, such as evaluations of oil and gas reserves and resources other than reserves.

2.1.1 Types of reviews

The Energy Group conducts and participates in the following types of reviews:

- **Screening**
  - Oil and gas
    - Includes the required annual oil and gas filings, which are the statement specified in Form 51-101F1, and reports in accordance with Form 51-101F2 and Form 51-101F3.
    - Depending on findings, it may result in the initiation of a compliance, technical or continuous disclosure review (see below).
  - Press release
    - Includes the press release under review and other disclosure, as needed.
    - Depending on findings, it may result in the initiation of a press release review (see below).
  - ESG technical
    - Includes environmentally-focused ESG and related disclosure, as needed (does not cover social and governance disclosure).
    - These focus on the assessment of certain baseline information, such as:
      - Whether or not disclosure has been made;
      - The timing and frequency of disclosure;
      - How the disclosure has been prepared;
      - The medium or method of disclosure; and
      - Whether or not specific environmental information has been disclosed.
    - Depending on findings, it may result in the initiation of a continuous disclosure review (see below).

- **Press release**
  - More in-depth than a screening review.
  - Includes press releases and other disclosure, as needed.
  - Typically culminates in a letter sent to the RI.
  - Depending on findings, it may result in the initiation of a compliance, technical or continuous disclosure review.
- **Technical**
  - Includes evaluations of oil and gas reserves and resources other than reserves and associated disclosure.
  - Depending on findings, it may result in the initiation of a continuous disclosure review.
- **Continuous disclosure**
  - Includes all oil and gas and other disclosure contained in regulatory and voluntary filings, as needed.
  - Depending on findings, it may result in the initiation of a compliance review.
- **Prospectus (short-form, long-form and shelf)**
  - Includes evaluations of oil and gas reserves and resources other than reserves and associated disclosure for long-form prospectuses (e.g. initial public offerings), and as needed for short-form and shelf prospectuses.
  - Includes other disclosure, as needed.
  - Depending on findings, it may result in the initiation of a compliance review.
- **Notice of intent to be qualified to file a short form prospectus**
  - Includes oil and gas and other disclosure contained in the prospectus and continuous disclosure, as needed.
- **Cease trade order revocation**
  - Includes oil and gas and other disclosure contained in the required filings, as needed.
- **Compliance**
  - These are initiated as a result of a specific issue identified in another review that exceeds the scope of the original review, or via files referred from elsewhere within the ASC or another CSA jurisdiction.
  - Includes oil and gas disclosure, as needed.

Outcomes of reviews will vary depending on the specific circumstances. Possible outcomes include:

- no action necessary
- advisory comment(s) intended to improve disclosure
- identification of deficiencies, including errors and omissions that may be misleading, with results that include:
  - requirement to correct and refile
  - issuer placed in default
  - management cease trade order
  - cease trade order
  - referral to the ASC Enforcement division

2.1.2 Disclosure expectations

RIs are required to ensure that their disclosure is not misleading and does not omit a required fact or a fact necessary to make a statement not misleading[1], focuses on material information, i.e. information that would likely influence a decision by a reasonable investor to buy, hold or sell a security of an RI[2] and otherwise complies with securities law disclosure requirements.

RIs that are uncertain whether their disclosure is compliant with securities law, including NI 51-101 and its technical standard, the COGE Handbook, should seek the advice of an appropriate professional advisor.

General guidance and examples of misrepresentations and misleading statements are provided in section 2(a)(i)(A) of CSA Staff Notice 51-327 *Revised Guidance on Oil and Gas Disclosure* (**CSA SN 51-327**).

2.2 DEVELOPMENT TIMING FOR UNDEVELOPED RESERVES

Concern: Inadequate disclosure regarding item 5.1 of Form 51-101F1, which requires discussion of the plans, including timing, for development of proved undeveloped reserves and probable undeveloped reserves.

This is a recurring issue that was discussed in the 2017, 2018 and 2019 Oil and Gas Review Reports. We repeat the prior material and supplement it with new information in an effort to educate readers and reduce the chances of disclosure issues arising.

Disclosure under item 5.1 of Form 51-101F1 is intended to inform readers about an RI's undeveloped reserves disclosed under item 2.1 of Form 51-101F1, including:

- Volumes of proved undeveloped reserves and probable undeveloped reserves first attributed in each of the three most recent financial years, and
- Specific details concerning the RI's proved undeveloped reserves and probable undeveloped reserves.

Item 5.1.1(b) and 5.1.2(b) of Form 51-101F1 specifically address the latter, requiring a discussion of the basis of attributing proved undeveloped reserves or probable undeveloped reserves, the plans including timing and the reasons for deferring development of particular proved undeveloped reserves and probable undeveloped reserves beyond two years. Instruction 2 of item 5.1 clarifies that the discussion must enable a reasonable investor to assess the efforts made by the RI to convert the undeveloped reserves disclosed under item 5.1 to developed reserves.

It is important that the discussion be meaningful and specific to an RI's circumstances and that it separately address the proved undeveloped reserves and the probable undeveloped reserves. Staff often find that the disclosure is too general and lacking the detail necessary to enable a reader to adequately understand an RI's development plans, including timing and, if applicable, the reasons for deferring development beyond two years. The instruction refers to "deferring," we interpret this as referring to the scheduling of development of undeveloped reserves beyond two years, and not a decision to subsequently defer the development of previously attributed undeveloped reserves.

Staff expect the disclosure to be clear concerning why an RI has scheduled the development of its undeveloped reserves in the manner that it has. Some RIs simply refer to or quote information from the COGE Handbook. This is insufficient.

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[1] No person or company shall make a statement that the person or company knows or reasonably ought to know
  (a) in any material respect and at the time and in the light of the circumstances in which it is made,
    (i) is misleading or untrue, or
    (ii) does not state a fact that is required to be stated or that is necessary to make the statement not misleading,
and
  (b) would reasonably be expected to have a significant effect on the market price or value of a security, a derivative or an underlying interest of a derivative.

[2] Section 1.4(2) of NI 51-101

Figure 2 presents information concerning compliance with items 5.1.1(b) and 5.1.2(b). The information is drawn from disclosure by RIs for which the ASC is the principal regulator and attributed to oil and gas activities primarily conducted in 2020. The RIs were grouped using production disclosed per item 6.9 of Form 51-101F1, as follows:

- "seniors" being those RIs with >100,000 BOE per day (based on a conversion ratio of six thousand cubic feet of gas for one barrel of oil) of production;
- "intermediates" being those RIs with 10,000 to 100,000 BOE per day of production; and
- "juniors" being those RIs with <10,000 BOE per day of production.

The RIs ranked highest by production were selected from each group, incorporating 10 senior, 20 intermediate and 50 junior RIs.

As indicated below, 30 per cent of disclosure from the seniors and juniors, and 35 per cent from the intermediates, did not meet the requirements concerning development timing. The majority of the deficiencies involved inadequate discussion of an RI's development plans, including timing, for both proved undeveloped reserves and probable undeveloped reserves.

Figure 2: Compliance with items 5.1.1(b) and 5.1.2(b), for AB RIs

	Unsatisfactory disclosure	
	NUMBER	**PER CENT**
Seniors	3	30
Intermediates	7	35
Juniors	15	30

EXAMPLE OF DISCLOSURE THAT *DID NOT* MEET OUR EXPECTATIONS

The company plans to develop its undeveloped reserves over the next three to five years. Timing may change based upon factors such as commodity prices, availability of capital, access to processing facilities and transportation, regulatory approval and new reservoir data.

Staff's concerns with this disclosure include:

- *It does not differentiate proved undeveloped reserves and probable undeveloped reserves, as required by item 5.1.*
- *It is not meaningful and specific to the circumstances of the RI, such that it would enable a reasonable investor to assess the efforts made by the RI to convert undeveloped reserves to developed reserves, as noted in instruction (2) of item 5.1.*
- *The reasons for development of the proved undeveloped reserves and probable undeveloped reserves being deferred beyond two years are absent. This disclosure is required by item 5.1.*
- *The factors referenced as potentially impacting development timing are factors that would often directly influence project commerciality. A project must be commercial for reserves to be assigned or to remain assigned. This suggests that reserves may have been inappropriately assigned, as the factors cited may impact commerciality.*

EXAMPLE OF DISCLOSURE THAT *DID* MEET OUR EXPECTATIONS

The company plans to develop all of its proved undeveloped reserves over the next two years. These reserves are attributed to the company's ABC and DEF properties. The majority of its probable undeveloped reserves are attributed to its ABC, DEF and GHI properties and are scheduled to be developed over the next five years. The remaining probable undeveloped reserves are attributed to the JKL property and are scheduled to be developed within seven years. Approximately 50 per cent of the company's probable undeveloped reserves are expected to be developed within the next two years. The remainder have been deferred beyond two years due to the availability of processing capacity within the company-owned 123 facility and higher-priority opportunities.

CSA Staff Notice 51-324 *Revised Glossary to NI 51-101 Standards of Disclosure for Oil and Gas Activities* (**CSA SN 51-324**) discusses development timing. It states that determination of commerciality must consider a number of things, including:

> [E]vidence to support a reasonable timetable for development. A reasonable time frame for the initiation of development depends on the specific circumstances and varies according to the scope of the project. Although five years is recommended as a maximum time frame for classification of a project as commercial, a longer time frame could be applied where, for example, development of economic projects are deferred at the option of the producer for, among other things, market-related reasons or to meet contractual or strategic objectives. [*COGE Handbook*] [Emphasis added]

While the development timetable can extend beyond five years, it must still be reasonable and be supported by evidence. If a project is not commercial, reserves cannot be attributed. Reserves attribution must consider the ongoing significant challenges facing the oil and gas industry.

Section 1.4.7.2.1.8 of the COGE Handbook discusses development timing for undeveloped reserves:

> For Undeveloped Reserves, development should normally proceed within five years unless there is appropriate justification with adequate explanation.

> For large projects, where significant capital is required for field development or infrastructure construction, significant capital expenditures should commence within three years for assignment of Proved Undeveloped Reserves. For the assignment of Probable Undeveloped Reserves, significant capital spending should commence within five years.

This section also provides examples where it may be appropriate to exceed this development timing. Regarding ongoing resource play development, it states:

> For Resource plays where drilling programs have been underway for a few years and are expected to continue for some time due to a large inventory of locations that qualify for assignment as Reserves, it is reasonable to have Proved Undeveloped Reserves assigned for five years of development drilling and Probable Undeveloped Reserves extending out for ten years of development drilling.

For gas processing facilities, it may be reasonable to schedule the drilling of wells for up to five years from facility start-up for proved undeveloped reserves and 10 years for proved plus probable undeveloped reserves.

The COGE Handbook allows for exceptions to the above, but only if there is compelling justification and clear disclosure.

We expect development timing for undeveloped reserves to not exceed five years unless there is compelling justification with adequate explanation within the evaluation and the RI's disclosure. RIs should consider the information included in the evaluation when preparing their disclosure under item 5.1.1(b) and 5.1.2(b). This information may also be helpful for preparation of disclosure under item 5.2 of Form 51-101F1, which concerns identification and discussion of significant factors or uncertainties that affect certain components of the reserves data disclosed in Form 51-101F1.

During technical reviews, we may request additional information if development timing is not adequately explained in an evaluation. An evaluation that does not include clear documentation may be considered to have not been prepared in accordance with the COGE Handbook, in which case, disclosure from the evaluation would not be permitted under NI 51-101.

Figure 3 presents information concerning development timing for undeveloped reserves, based on disclosure per items 5.1.1(b) and 5.1.2(b). The selection and grouping criteria are consistent with that used for Figure 2. As indicated, the average development timing for proved undeveloped reserves is four years for the seniors, five for the intermediates and three for the juniors. For probable undeveloped reserves the averages are respectively nine years, seven years and four years.

Figure 3: Development timing for proved undeveloped and probable undeveloped reserves for AB RIs

	Average timing (years)	
	PROVED	**PROBABLE**
Seniors	4	9
Intermediates	5	7
Juniors	3	4

Section 2(b) of CSA SN 51-327 discusses general standards and responsibilities with regard to qualified reserves evaluators (**QREs**) and qualified reserves auditors (**QRAs**). Section 2(b)(ii) states regarding misrepresentations and misleading statements:

> An evaluation scenario, whether provided to the evaluator for review by the Oil and Gas Issuer or developed by the evaluator, should be reasonable with regard to timing and cost. […]

Section 2(b)(iii) states regarding the COGE Handbook and other guides:

> [T]hey should be used appropriately in the exercise of fulfilling the general, as well as specific, obligations of Canadian securities legislation.

KEY POINTS

- Per item 5.1 of Form 51-101F1, the discussion of an RI's development plans for its proved undeveloped reserves and probable undeveloped reserves must:
  - Be meaningful and specific to the RI's circumstances.
  - Refer separately to its proved undeveloped reserves and probable undeveloped reserves.
- Reserves have a chance of commerciality that is effectively 100 per cent; effectively no risk.
  - A project must be commercial for reserves to be attributed.
  - Commerciality assessment must consider the significant oil and gas industry challenges.
- Development timing for undeveloped reserves must be reasonable and supported by evidence.

The ASC will continue to pay particular attention to deficiencies and other concerns involving development timing in its reviews and will continue to address these concerns with RIs and their professional advisors.

2.3 QUALIFIED RESERVES EVALUATORS AND QUALIFIED RESERVES AUDITORS

Concern: Inadequate understanding of the requirements to be considered a QRE or QRA, resulting in disclosure not meeting NI 51-101 requirements.

Staff have concerns that some disclosure is not being prepared or audited by a QRE or QRA, as required by NI 51-101. Staff have identified individuals that do not possess the requisite qualifications. It is important to note that experience in the practice of engineering, geology, geophysics, or other discipline of physical science, by itself is not necessarily sufficient to be considered a QRE or QRA.

We expect RIs to ensure that any individual they appoint to perform the tasks of a QRE or QRA for the purposes of NI 51-101 satisfies the requirements. To be clear, QREs and QRAs are considered specialists within their respective fields.

To assist RIs in complying with their obligations, we discuss below the role of a QRE or QRA with respect to NI 51-101 and provide further information regarding their respective qualifications.

QREs and QRAs are fundamental to NI 51-101. An RI must engage a QRE or QRA in respect of the following disclosure:

- Reserves and other information of a type specified in Form 51-101F1 must be prepared or audited by a QRE or QRA (section 5.2).
- Disclosure of anticipated results from resources not currently classified as reserves, which includes an estimate of a quantity in which the RI has an interest or intends to acquire an interest, or an estimated value attributable to an estimated quantity must be prepared by a QRE or QRA (section 5.9).
- Disclosed analogous information must indicate whether it was prepared by a QRE or QRA. (section 5.10).

An RI must engage a QRE or QRA as follows in respect of the RI's annual disclosure:

- An RI must appoint one or more independent QREs or QRAs and direct each to report to the board of directors on the reserves data disclosed in Form 51-101F1 (section 3.2).
- An RI must have the independent QRE or QRA execute the report filed in accordance with Form 51-101F2 (section 2.1).

An RI must report in accordance with Form 51-101F3, that the QRE or QRA that evaluated or audited its reserves data, contingent resources data and prospective resources data disclosed in the statement of the reserves data and other information, was independent (section 2.1). An individual that represents themselves as a QRE or QRA under NI 51-101 must fully comply with the respective requirements and as necessary, demonstrate this compliance.

QRE and QRA are defined terms in NI 51-101[3]. A QRE is an individual who:

> (a) in respect of particular *reserves data, resources* or related information, possesses professional qualifications <u>and</u> experience appropriate for the estimation, *evaluation* and *review* of the *reserves data, resources* and related information; and
>
> (b) is a member in good standing of a *professional organization*; [Emphasis added]

A QRA is an individual who:

> (a) in respect of particular *reserves data, resources* or related information, possesses professional qualifications <u>and</u> experience appropriate for the estimation, *evaluation, review* and *audit* of the *reserves data, resources* and related information; and
>
> (b) is a member in good standing of a *professional organization*;

An important element of both definitions is that the individual has qualifications and experience in the estimation, evaluation and review of reserves data, resources and related information. The COGE Handbook provides additional information regarding the experience and qualifications for QREs and QRAs[4]. A QRE must have a minimum of five years of practical petroleum experience, with at least three recent years of evaluation experience. A QRA must have a minimum of 10 years of practical petroleum experience, with at least five recent years of evaluation experience. The evaluation experience needs to occupy the majority of the practical petroleum experience during the three and five years, respectively. Very few petroleum professionals will satisfy the QRE qualifications. Fewer will satisfy the QRA qualifications that permit them to perform audits[5].

An evaluation[6] is:

> [T]he process whereby an economic analysis is made of a *property* to arrive at an estimate of a range of net present values of the estimated *future net revenue* resulting from the *production* of the *reserves* or *resources other than reserves* associated with the *property*. [*COGE Handbook*]

An audit[7] is:

> [T]he process whereby an *independent qualified reserves auditor* caries out procedures designed to allow the *independent qualified reserves auditor* to provide reasonable assurance, in the form of an opinion that the *reporting issuer's reserves data* (or specific parts thereof) have in all *material* respects, been determined and presented in accordance with the *COGE Handbook* and are, therefore, free of *material* misstatement. […] [*COGE Handbook*]

[3] Section 1.1 of NI 51-101
[4] Section 5.4.3.1 of the COGE Handbook
[5] Section 5.4.3.1 of the COGE Handbook
[6] CSA SN 51-324
[7] CSA SN 51-324

The COGE Handbook[8] requires evaluation reports to be prepared by or under the direct supervision of a QRE. The QRE must possess appropriate professional qualifications and experience for the tasks contemplated in NI 51-101 and be a member in good standing of a professional organization[9].

The main evaluation steps[10] include:

- Determining volumes and values;
- Classifying the volumes and values according to the COGE Handbook;
- Reporting on the results of the evaluation in accordance with regulatory requirements.

The main objective of an audit is to give an opinion on the reasonableness of an evaluation. An audit does not replicate the original evaluation in whole or in part but instead addresses the quality of the evaluation. An audit can only be performed by a QRA[11].

In addition to professional qualifications and appropriate experience, a QRE or QRA must be a member in good standing of a professional organization[12]. Per NI 51-101[13], a professional organization is considered a self-regulating organization of engineers, geologists, other geoscientists or other professionals, whose professional practice includes reserves evaluations or reserves audits. The CSA recognizes a number of such organizations, including the Association of Professional Engineers and Geoscientists of Alberta (**APEGA**) and SPEE, in respect of Members, Honorary Life Members and Life Members.

RIs should satisfy themselves that any person they appoint as a QRE or QRA is qualified with respect to the reserves data to be reported on[14]. Additionally, a QRE or QRA who signs a report prepared in accordance with Form 51-101F2 represents that they possess the expertise to carry out the evaluation being reported under NI 51-101 and that they will only undertake work that they are competent to perform by virtue of their qualifications and experience[15].

KEY POINTS

- A QRE or QRA must have professional qualifications and experience in the estimation, evaluation and review of reserves data, resources and related information.
  - The qualifications and experience must relate to NI 51-101 and by extension, the COGE Handbook, which is mandated as its technical standard.
- A QRE or QRA must be a member in good standing of a professional organization whose practise includes reserves evaluations and reserves audits and the evaluation and audit of reserves data.
- The preparation of an evaluation involves the determination and classification of volumes and values and the reporting of these results, prepared by or under the direct supervision of a QRE or QRA.
- A QRA meets the qualifications of a QRE, while a QRE is not necessarily a QRA. A QRA can conduct audits, while a QRE cannot.
- RIs are responsible for ensuring the qualifications of the QREs and QRAs that they appoint.
- QREs and QRAs are specialists within their respective fields; they are qualified for their roles.

The ASC will continue to pay particular attention to concerns regarding QREs and QRAs in its reviews and will continue to address these concerns with RIs and their professional advisors.

[8] Section 5.6 of the COGE Handbook
[9] Section 1.1(6) of 51-101CP
[10] Section 1.1.4 of the COGE Handbook
[11] Section 5.3.3 of the COGE Handbook
[12] Section 1.1(5) of 51-101CP
[13] Section 1.1 of NI 51-101
[14] Section 1.1(6) of 51-101CP and section 5.4.3 of the COGE Handbook
[15] CSA SN 51-327 section 2(b)

2.4 FORM 51-101F2

Concern: The report filed in accordance with Form 51-101F2 does not meet the requirements due to the presence of errors or material modification.

Staff have observed a variety of issues in recent years with the reports required by Form 51-101F2. Specifically, we have noted the following:

- The signature(s) for the individual independent qualified reserves evaluator(s) or qualified reserves auditor(s) is:
  - absent, or
  - replaced with the name of the reserves evaluation firm engaged by the RI.
- The effective date for the evaluation/audit/review report is:
  - absent, or
  - incorrect.
- The estimates of net present value of future net revenue:
  - do not match disclosure in the statement specified in Form 51-101F1,
  - appear in the incorrect column that differentiates audited/evaluated/reviewed estimates, or
  - total incorrectly.
- The contingent resources data, prospective resources data or both are excluded despite their disclosure in the statement specified in Form 51-101F1.
- The engagement agreement between an RI and their contracted reserves evaluation firm is provided rather than the Form 51-101F2.
- The report required by Form 51-101F2:
  - is filed for reasons unrelated to the annual filing requirements per section 2.1 of NI 51-101, or
  - has been materially modified.

An RI must file[16] the following with the securities regulatory authority, no later than the date on which it is required by securities legislation to file audited financial statements for its most recent financial year:

1. A statement of the reserves data and other information specified in Form 51-101F1, as at the last day of the RI's most recent financial year and for the financial year then ended;
2. A report in accordance with Form 51-101F2 included in, or filed concurrently with, the statement described in 1; and
3. A report in accordance with Form 51-101F3 contained in, or filed concurrently with, the statement described in 1.

The report required under Form 51-101F2 must[17] be executed by one or more qualified reserves evaluators or auditors, each of whom is independent of the reporting issuer. Further, the report must in all material respects be in the required form.

Although flexibility[18] is permitted with respect to what information is disclosed and how it is presented with Form 51-101F1, this is not the case with Form 51-101F2.

The representations specified by Form 51-101F2 should not be modified or removed. Further, additional representations should not be provided, e.g. disclosing or referencing possible reserves, discovered resources, undiscovered resources or in-place estimates, or referring to the Petroleum Resources Management System, in place of, or in addition to, the COGE Handbook.

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[16] Section 2.1 of NI 51-101
[17] Section 2.1.2(b)
[18] General instructions 3, 4 and 5 refer to this flexibility.

2.5 FORM 51-101F4

Concern: Absence of a notice of filing in accordance with Form 51-101F4 *Notice of Filing of 51-101F1 Information* in situations where an RI has satisfied the requirements of section 2.1 of NI 51-101, by filing the specified information in its annual information form (AIF).

Staff have identified an ongoing problem with Form 51-101F4 not being filed when it is required to be.

Per section 2.1 of NI 51-101, an RI is required to file a statement of the reserves data and other information specified in Form 51-101F1, as at the last day of the RI's most recent financial year and for the financial year then ended. Additionally, reports in accordance with Form 51-101F2 and Form 51-101F3 are to be included in, contained in, or filed concurrently with the statement.

Section 2.3 of NI 51-101 states that the requirements of section 2.1 can be satisfied by including the specified information in an AIF filed within the time specified within section 2.1. If an RI chooses to do this, it must file a notice of filing in accordance with Form 51-101F4 concurrently with the filing of its AIF.

Section 2.4(1) of 51-101CP indicates that an AIF can be a completed Form 51-102F2 *Annual Information Form* or, in the case of an SEC issuer (as defined in NI 51-102), a completed Form 51-102F2 or an annual report or transition report under the *1934 Act* on Form 10-K, Form 10-KSB or Form 20-F.

As also set out in 51-101CP, if an RI elects to set out in full in the AIF the information required by section 2.1 of NI 51-101, it does not need to also file that information again in a separate document. However, the RI would then need to concurrently file a Form 51-101F4 via SEDAR.

Failure to file a notice of filing can result in:

- Difficulty in locating the disclosure required by section 2.1.
- The incorrect assumption that the required information has not been disclosed.

2.6 RESERVES RECONCILIATIONS

Concern: Incorrect disclosure regarding item 4.1 of Form 51-101F1, which requires disclosure of an annual reserves reconciliation.

Staff have identified the following:

- Mismatched opening balance and closing balance.
- Negative volumes where they should not occur.
- Erroneous and potentially misleading uses of reserve change categories, particularly "technical revisions."
- Erroneous reserves additions and reductions due to the use of incorrect dates for acquisitions and dispositions.
- Incorrect production volumes.
- Missing or inconsistent units of measure.
- Incorrect reserve change categories.
- Absence of explanations regarding disclosure in each reserve change category.
- Incorrect summation.

Incorrect reserves reconciliation disclosure is a recurring concern, with deficiencies attributed to RIs of all sizes. Some deficiencies are readily identifiable, while others require detailed analyses of the disclosure and associated reserves evaluations. In some cases, incorrect disclosure may be misleading, such as the erroneous use of reserve change categories, particularly "technical revisions."

Item 4.1 of Form 51-101F1 requires disclosure of an annual reconciliation of changes in estimates of gross proved reserves (in total), gross probable reserves (in total) and gross proved plus probable reserves (in total). This disclosure is required by country, product type specified in item 4.1.2(b) and reserve change category specified in item 4.1.2(c). In addition, item 4.1.2(c) requires an explanation concerning disclosure that occurs in each reserve change category.

Product types are specified in item 4.1.2(b), as follows:

(i) *bitumen*;
(ii) *coal bed methane*;
(iii) *conventional natural gas*;
(iv) *gas hydrates*;
(v) *heavy crude oil*;
(vi) *light crude oil* and *medium crude oil* combined;
(vii) *natural gas liquids*;
(viii) *shale gas*;
(ix) *synthetic crude oil*;
(x) *synthetic gas*;
(xi) *tight oil*;

Substances such as oil, condensate, liquids, gas, solution gas, associated gas and non-associated gas, are not product types.

Reserve change categories specified in item 4.1.2(c) are:

(i) extensions and improved recovery;
(ii) technical revisions;
(iii) discoveries;
(iv) acquisitions;
(v) dispositions;
(vi) economic factors;
(vii) *production*.

Instruction (4) of item 4.1 requires reserves changes attributed to infill drilling to either be included in “extensions and improved recovery” or in a separate reserve change category labelled “infill drilling.”

The reconciliation per item 4.1 compares reserves data at the effective date for the current financial year (for the year the disclosure is being prepared), with the corresponding estimates at the last day of the preceding financial year, which is the reconciliation’s “opening balance.” The “closing balance” is the result of this comparison.

Effective date is defined in section 1.1 of NI 51-101 as:

> [T]he date as at which, or for the period ended on which, the information is provided;

Information regarding reserves reconciliations is provided in section 4.6.2 of the COGE Handbook, including preparation and terminology. Please note that regardless of this information, the disclosure must meet the requirements of NI 51-101 and item 4.1 of Form 51-101F1. Additional information concerning reserves reconciliations is contained in section 2.7(6) of 51-101CP.

Staff note the following common disclosure deficiencies with respect to the reserves reconciliation required by item 4.1, along with corrective information:

- **Opening balance** - Volumes for the current year do not match the closing balance from the previous financial year for the same country, product type and reserves category. These should match.
- **Extensions and improved recovery, infill drilling and discoveries** - The erroneous recording of negative volumes. Once a volume has been assigned to these reserve change categories, subsequent changes to the estimate should be identified as technical revisions or economic factors and accounted for in their respective reserve change categories, except as noted in section 4.6.2.4 of the COGE Handbook.
- **Technical revisions** - The erroneous recording of negative volumes that exceed 100 per cent of the opening balance and the misattribution of reserves changes as technical revisions.

> Technical revisions show changes in existing *reserves* estimates, in respect of carried-forward *properties*, over the period of the reconciliation and are the result of new technical information, not the result of capital expenditure[19].

It is impossible to remove a volume in excess of the opening balance through a technical revision. Therefore, a negative technical revision that exceeds 100 per cent of the opening balance is erroneous.

It is not appropriate to account for changes in reserves estimates resulting from capital expenditures as technical revisions. Doing so may result in misleading disclosure. Acknowledging in disclosure that technical revisions have been done in this manner (and are therefore incorrectly attributed), does not absolve an RI of its responsibility to ensure that the disclosure is not misleading. The ASC will continue its efforts to identify misattributed technical revisions.

- **Acquisitions** - The use of incorrect dates to account for reserves additions through acquisitions. As stated previously, reserves are reconciled at the effective date for the current financial year. The date to reconcile changes in acquired reserves is the effective date, which is the effective date of the RI's most recent financial year.

> [T]he *reserves* estimate to be used in the reconciliation is the estimate of *reserves* at the *effective date*, not at the acquisition date, plus any *production* since the acquisition date. This *production* must be included as *production* in the reconciliation. If there has been a change in the *reserves* estimate between the acquisition date and the *effective date* other than that due to *production*, the *reporting issuer* should explain this as part of the reconciliation in a footnote to the reconciliation table[20].

The term "acquisition date" is not defined nor clarified in NI 51-101 and related forms, 51-101CP or staff notices. Staff consider it to mean the date at which the RI has attained a direct or indirect ownership, working or royalty interest in reserves. Ownership is discussed in section 1.4.4.2 of the COGE Handbook.

Reserves estimates attributed to activities that occur on an acquired property subsequent to the acquisition date of the reserves and prior to the effective date of the RI's most recent financial year, other than those due to production, are to be accounted for in the appropriate reserve change category. Such activities would typically involve the drilling or recompletion of a well and related pursuits. The results would be reflected in reserve change categories "extensions and improved recovery," "discoveries" or "infill drilling," not reserve change category "acquisitions." Provide the reasons for disclosure in these categories. Staff suggest that these explanations be considered alongside the previously noted explanations required by item 4.1(2)(c), which are explained below under "Explanations."

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[19] 2.7(6)(c) of 51-101CP
[20] Section 2.7(6)(c) of 51-101CP

In summary, the reserves estimates to be used in the reserve change category “acquisitions” are the sum of:

- The estimates of the reserves data by product type attributed to the acquisition at the effective date of the current financial year; and
- The production by product type that has occurred from the acquisition, accrued from the date ownership was attained, to the effective date for the current financial year.

Although reserves estimates may be determined at any point during a particular financial year, reserves are only reconciled for the purposes of item 4.1 at the last day of the most recent financial year.

Reconciliation steps:

1. **Evaluate** all of the RI’s reserves at the effective date of the RI’s most recent financial year. This evaluation will include properties, wells, etc. acquired <u>during</u> the most recent financial year.
2. **Determine** the RI’s share of the gross production volume, by product type, derived from the acquisition. This includes production that has occurred from the date that ownership was attained to the effective date of the most recent financial year.
3. **Add** the results from step 2 to the acquired properties, wells, etc. evaluated in step 1. This exercise is mechanical and is not impacted by estimates from an evaluation of the acquisition at or around the date that ownership was attained, if such an evaluation was prepared.
4. **Enter** the results from step 3 into the reconciliation table under reserve change category “acquisitions,” adjacent to the appropriate product type.
5. **Assign** to the appropriate reserve change category, reserves estimates originating from activity occurring on the acquired property, wells, etc. (typically the drilling or recompletion of a well or related activities) subsequent to attainment of ownership and prior to the effective date of the most recent financial year. These reserves estimates are not to be accounted for under reserve change category “acquisitions.”

- **Dispositions** - The use of incorrect dates to account for reserves reductions through dispositions. As discussed in section 4.6.2 of the COGE Handbook, disposed reserves are recorded at the disposition date, which is the date at which ownership by the RI has ceased. Production that has occurred subsequent to the last day of the preceding financial year, to the disposition date, is accounted for under reserve change category “production.”
- **Production** - Volumes do not match those disclosed under item 6.9.1(a) of Form 51-101F1 for the same country and product type. These volumes are expected to match, unless production from entities that do not have reserves assigned is included. If they do not match, an explanation must be provided.
- **Closing balance** - Volumes do not match those disclosed for the same country, product type and reserves category under item 2.1.1 of Form 51-101F1. These should match.
- **Units of measure** - These are missing or inconsistent. Although no particular unit of measure is specified in Form 51-101F1, consistency of units is addressed in general instruction (8), which advises against switching between Imperial units and Système International (SI) units without a compelling reason. If switching does occur, we would generally expect disclosure of the reason.
- **Reserve change categories** - The use of categories not specified in item 4.1.2(c) or instruction (4) of item 4.1, which is incorrect. An RI must use the specified categories, and if necessary, explain unusual circumstances. Please note that although section 4.6.2.2 of the COGE Handbook provides recommended “change categories” (equivalent to “reserve change categories”), not all change categories have equivalent reserve change categories.

- **Summation** - Volumes do not correctly sum. The closing balance for each disclosed product type must equal the sum of the volumes disclosed in each associated reserve change category. Additionally, the gross proved plus probable reserves (in total) for each product type, must equal the sum of the gross proved reserves (in total) and the gross probable reserves (in total). This is true for disclosure in each reserve change category, as well as the opening balance and closing balance. Incorrect summation may result from mathematical error or incorrect preparation of the reconciliation. The latter is frequently seen with respect to technical revisions.

- **Explanations** - The absence of required explanations accompanying disclosure in individual reserve change categories. These are expected to provide information concerning the disclosure. Item 4.1.2(c) of Form 51-101F1 requires separate identification and explanation of disclosure in each reserve change category. Without an explanation, a change may occur that cannot be easily understood. For example, a large technical revision, an acquisition, or a re-categorization of reserves from probable reserves to proved reserves may have occurred. In the absence of an explanation for the latter, the re-categorization could go unnoticed if the proved plus probable reserves (in total) remains unchanged.

Instruction (5) of item 4.1 of Form 51-101F1 discusses reconciliation requirements for RIs that become engaged in oil and gas activities after the last day of their preceding financial year. Remember, the opening balance of the reserves reconciliation is equivalent to the associated estimates at the last day of the preceding financial year, known as the closing balance. If an RI had reserves at the effective date of the preceding financial year, but an evaluation of these reserves is unavailable, reserves estimates will not be available for the opening balance. A zero opening balance is not appropriate in such a situation. Therefore, a reconciliation in such a situation cannot be undertaken and disclosed. Instead, the RI must disclose the reason for the absence of the reconciliation.

Additional information concerning preparation of the reserves reconciliation is provided in 51-101CP. For example, section 2.7(6)(a) discusses a scenario in which an RI has reserves at the effective date for its current financial year, but had no reserves at the start of the current financial year (at which time the RI was presumably engaged in oil and gas activities). If the added reserves are material to the RI, a reconciliation must be disclosed. The opening balance will be zero, reflecting the lack of reserves at the start of the financial year. Section 5.10(4) of 51-101CP discusses reserves reconciliations with respect to initial public offerings.

2.7 INSIGHT INTO OIL AND GAS RESERVES ESTIMATES

Analysis of an RI's reserves estimates and their variability, can provide insight into the activities undertaken by the RI, and the quality of the initial and current estimates. The annual reserves reconciliation required to be disclosed per item 4.1 of Form 51-101F1 is instrumental in this.

For example, an RI's pursuit of new reservoirs or its efforts to expand or increase recoveries from existing reservoirs, can be assessed through disclosure in the reserve change categories "discoveries," and "extensions and improved recovery," respectively. The quality of reserves estimates can be judged through a review of disclosure in reserve change category "technical revisions." This can help determine whether estimates have been meeting the certainty levels for the associated reserves categories and have therefore been assigned in accordance with the COGE Handbook, as required. This process of "reserves validation" is described in section 4.6.1 of the COGE Handbook.

With appropriate sampling and analysis, insights into activities and reserves quality can also be determined for groups of issuers that report under NI 51-101. Figure 4 (on the following page) presents a series of aggregated reserves reconciliations for AB RIs that demonstrate changes in grouped and summed gross proved plus probable reserves (in total), disclosed by reserve change category.

Figure 4 includes the disclosure under item 4.1 of Form 51-101F1 made by AB RIs and reflects oil and gas activities disclosed in 2021, yet mostly conducted in 2020 (accounting for variations in financial year-end dates). An AB RI's contribution to its group reconciliation is based solely on the reserves volumes it has disclosed in each reserve change category. While generalized, these reconciliations inform an assessment of the quality of reserves data disclosed by AB RIs, grouped by production, through an understanding of the changes between the opening and closing balances of 2020 for each group.

The following steps were taken to generate the reconciliations in Figure 4:

1. All AB RIs engaged in oil and gas activities at the end of 2020 were ranked by their annual average gross daily production volumes. Disclosure of these volumes is discussed in item 6.9 of Form 51-101F1. They are required to be stated by quarter, country and product type, for the most recent financial year.

2. These quarterly average gross daily production volumes were obtained for each AB RI and summed to obtain an annual production volume for each AB RI.

3. The AB RIs were then categorized into groups based on production as follows:
   a. "seniors" being those RIs with >100,000 BOE per day of production (based on a conversion ratio of six thousand cubic feet of gas for one barrel of oil);
   b. "intermediates" being those RIs with 10,000 to 100,000 BOE per day of production; and
   c. "juniors" being those RIs with <10,000 BOE per day of production.

4. The AB RIs ranked highest by production were selected from each group, incorporating 10 senior, 20 intermediate and 50 junior RIs.

5. Within each group of selected RIs, volumes disclosed by each RI in each applicable reserve change category specified in item 4.1.2(c) of Form 51-101F1 for gross proved plus probable reserves (in total), were summed. These were neither weighted nor adjusted in any way.

6. The per cent change between the opening balance of 2020 (the closing balance of 2019) and the closing balance of 2020 was calculated. Figure 4 illustrates these results. Positive and negative changes fall to the right and left of the opening balance (denoted as 0 per cent), respectively.

Figure 4: 2020 Reconciliations of summed gross proved plus probable reserves (in total) for AB RIs, by production grouping

Figure 4a: Seniors

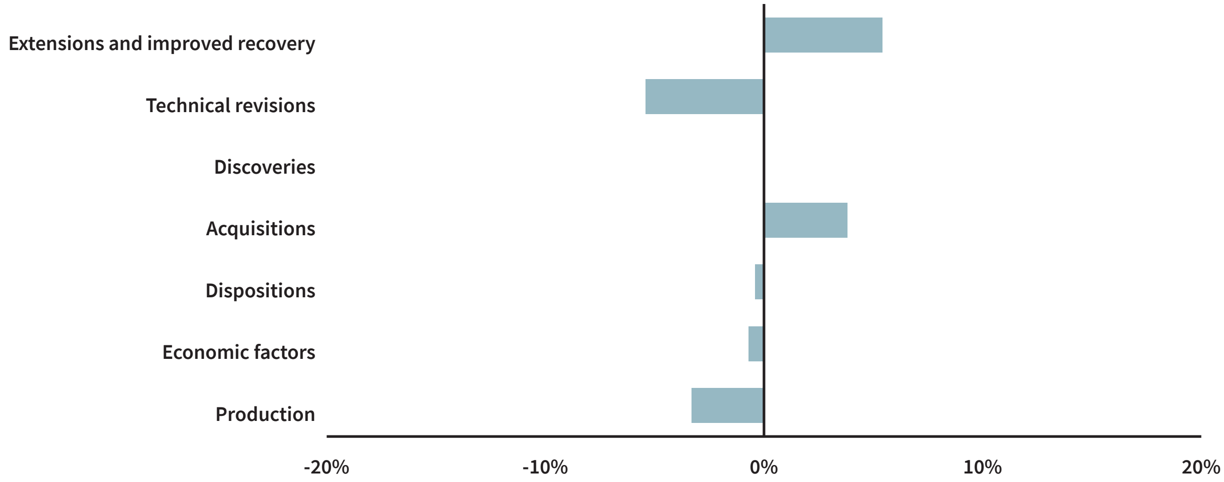


Figure 4b: Intermediates

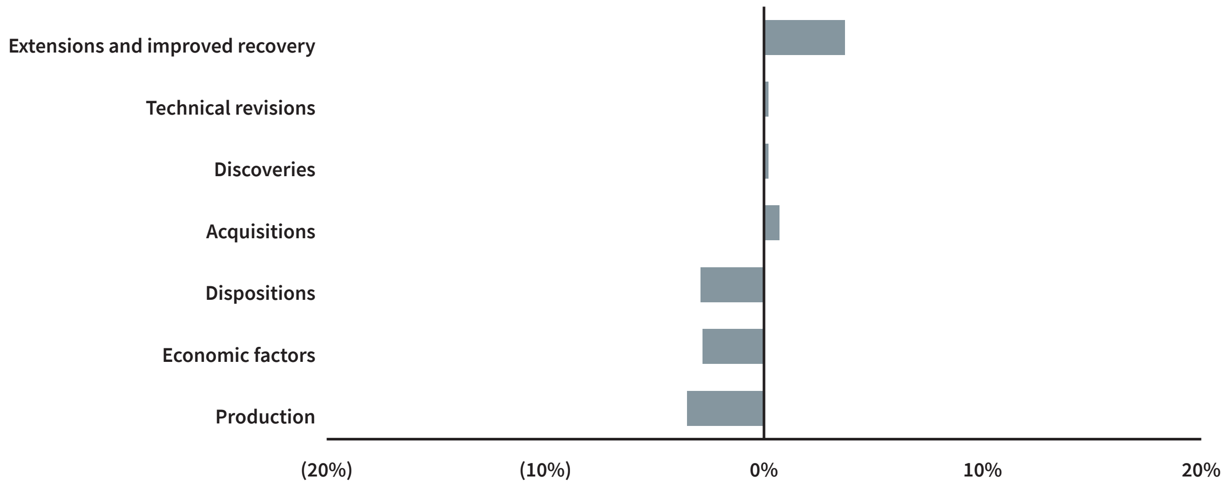
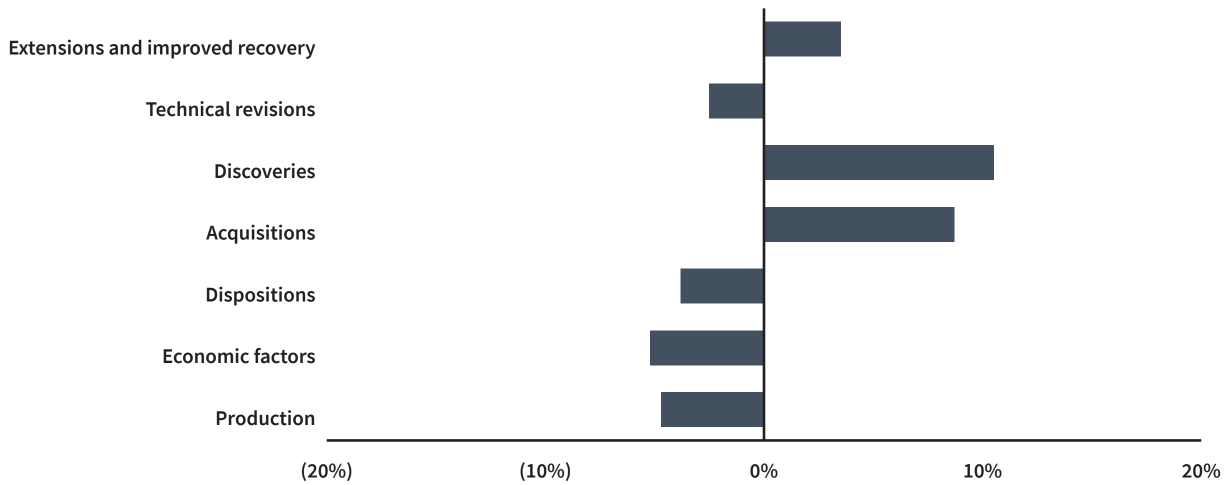


Figure 4c: Juniors



As illustrated in Figure 4, changes in extensions and improved recovery, which result from capital expenditures for step-out drilling in previously discovered reservoirs, as well as capital expenditures associated with the installation of improved recovery schemes, range from four per cent for the intermediates and juniors, to five per cent for the seniors. All seniors recorded extensions and improved recovery, with two of them accounting for 68 per cent of the group change. All but one of the intermediates recorded extensions and improved recovery, with four accounting for 50 per cent of the total for the group and three accounting for less than one per cent each. Only 23 of the juniors recorded extensions and improved recovery, with eight recording less than one per cent and five accounting for 69 per cent of the group total.

Regarding technical revisions, positive and negative revisions are generally attributed to better or poorer reservoir performance, respectively, than initially forecast. For a given entity, proved reserves should be adjusted positively over time, while proved plus probable reserves should remain relatively constant. Technical revisions in Figure 4 are negative five per cent for the seniors, neutral for the intermediates and negative three per cent for the juniors. Five of the seniors recorded negative technical revisions, with two of these accounting for 85 per cent of the group total. Eleven intermediates recorded negative technical revisions, while 28 juniors did, with three of these RIs accounting for 47 per cent of the change for the group.

No discoveries were recorded by the seniors. Three RIs account for all of the intermediate group's discoveries, including one that accounts for 72 per cent, while four RIs account for all of the junior group's discoveries, including two that account for 61 per cent and 37 per cent of the group change, respectively.

Changes in acquisitions are four per cent for the seniors, one per cent for the intermediates and nine per cent for the juniors. Five seniors, seven intermediates and 12 juniors recorded acquisitions.

Changes in dispositions are negligible for all of the groups. Two seniors, seven intermediates and 13 juniors recorded dispositions.

All three groups show small negative adjustments for economic factors.

Figures 5 through 7 illustrate changes in the reserve change categories "extensions and improved recovery," "discoveries" and "technical revisions," respectively, for gross proved plus probable reserves (in total), for each group of RIs from 2014 to 2020. While generalized, the purpose is to illustrate the multi-year changes in each reserve change category.

Figure 5: Summed extensions and improved recovery for gross proved plus probable reserves (in total) for AB RIs, by production grouping

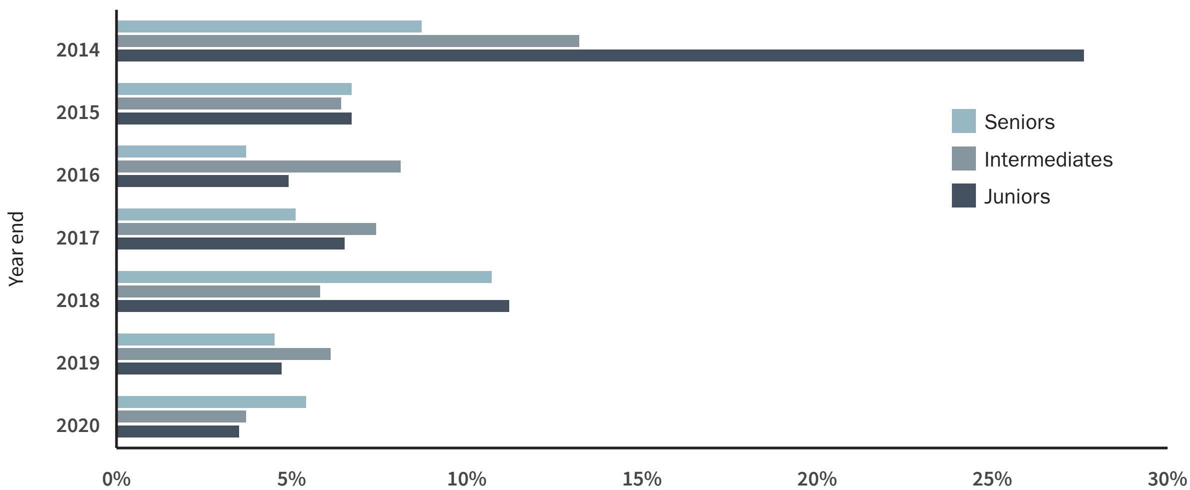


Figure 6 illustrates the multi-year average percentage change in aggregated discoveries for each group of AB RIs. The percentage change for the juniors increased in 2020 for the second consecutive year. The change is attributed to two RIs that account for all of the change. The percentage change for the intermediates remained static for the third year in row, while no percentage change was recorded for the seniors for the second consecutive year.

Figure 6: Summed discoveries for gross proved plus probable reserves (in total) for AB RIs, by production grouping

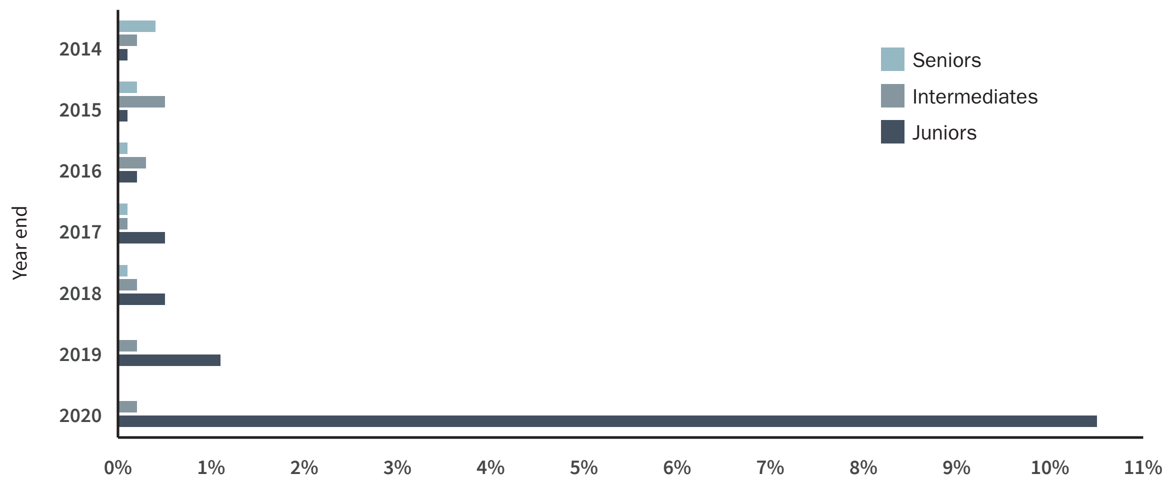
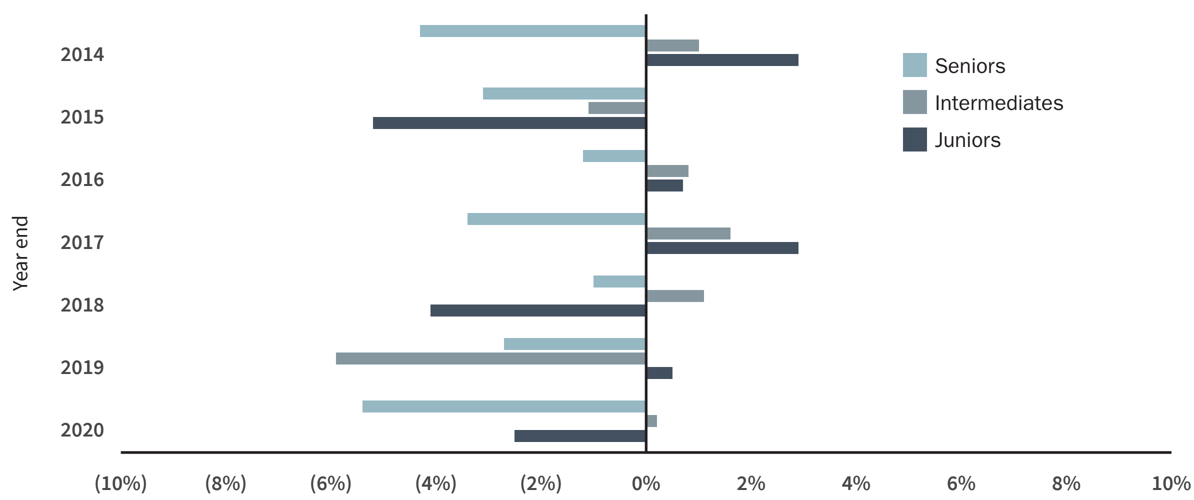


Figure 7 illustrates the multi-year average percentage change for the aggregated technical revisions for each group of RIs. Although the reserves quality varies for individual RIs within each group, the changes in gross proved plus probable reserves (in total) have remained relatively constant for the juniors and intermediates and appear to approximate the associated certainty levels described in the COGE Handbook. The changes for the seniors have been slightly negative for each of the years, with the percentage in 2020 being the largest since 2014. This suggests that the certainty levels for proved plus probable reserves are not being met. The ASC will continue to pay particular attention to negative technical revisions in its reviews of disclosure and will continue to address these concerns with RIs.

Figure 7: Summed technical revisions for gross proved plus probable reserves (in total) for AB RIs, by production grouping



3. Emerging energy-related disclosure commentary

3.1 INTRODUCTION

This section discusses disclosure regarding emerging energy-related subjects, including sources of low-carbon alternative energy, clean technology associated with emissions reduction, energy storage and helium. It is intended for both RIs and issuers that are not yet RIs that intend to file a prospectus or other disclosure documents that incorporates prospectus requirements, as well as their professional advisors. As these energy-related subjects are emerging in public markets, there is limited history of disclosure. While general securities regulatory principles relating to balanced, accurate and reliable disclosure with a focus on materiality, will apply, there are no specific disclosure standards like NI 51-101.

The Alberta capital market is experiencing increasing activity in emerging energy-related matters. New RIs are appearing, while existing RIs, such as those engaged in oil and gas activities and those involved in oil and gas services and oil and gas midstream, are increasingly involved in non-traditional energy-related areas. These include exploration and development of helium, renewable hydrocarbons, hydrogen, recovery of lithium from oilfield brines (used in batteries), GHG emissions reduction, including CCUS and related technologies, co-generation, and renewables, such as wind, solar and geothermal. This section focuses on helium, hydrogen, lithium recovered from oilfield brines and CCUS. Determination of an RI's involvement in these was facilitated by the Energy Group's ongoing reviews of disclosure.

Similar to its approach with respect to RIs engaged in oil and gas activities, the ASC has developed a rigorous review process concerning these and other emerging energy-related subjects to assess compliance with securities disclosure regulatory requirements. While this process primarily focuses on RIs for which the ASC is the principal regulator, staff also review select disclosure from RIs for which other Canadian jurisdictions are the principal regulator.

3.2 HELIUM

The exploration for and development of helium is closely related to that of oil and gas. This is because helium is typically associated with subsurface hydrocarbon accumulations and subject to the same drilling, completion and production techniques, while some of the same equipment and facilities is used. Furthermore, most helium situated in subsurface hydrocarbon accumulations occurs in trace amounts and is recovered as a by-product of natural gas. The production stream containing helium requires specialized processing to remove impurities like water, carbon dioxide (CO_2), hydrogen sulphide, high molecular weight hydrocarbons and methane. The helium is then subjected to purification.

Interest in helium exploration and development has grown in recent years, resulting from increased prices and uncertainty regarding the U.S. Federal Helium Reserve. In Western Canada, interest has mostly been attributed to issuers seeking to establish themselves as pure-play helium exploration and development companies. However, the majority of helium identified to date in Western Canada is associated with natural gas. An RI that encounters natural gas while exploring for or developing helium may be subject to NI 51-101.

At the end of September 2021, there were six RIs involved in the exploration for and development of helium, with two of them being AB RIs. Helium was determined to be a by-product of natural gas for several of these RIs, resulting in these RIs being deemed to be engaged in oil and gas activities and subject to NI 51-101, including specific requirements that apply to by-product disclosure.

Section 1.3 of NI 51-101 states that NI 51-101 applies only to RIs engaged directly or indirectly in oil and gas activities. Per section 1.4, however, NI 51-101 only applies to information that is material, as defined in section 1.4 and CSA SN 51-324.

Per section 1.1, oil and gas activities includes the following:

> (a) searching for a *product type* in its natural location;
>
> (b) acquiring *property* rights or a *property* for the purpose of exploring for or removing *product types* from their natural locations;
>
> (c) any activity necessary to remove *product types* from their natural locations, including construction, drilling, mining and production, and the acquisition, construction, installation and maintenance of *field* gathering and storage systems including treating, field processing and field storage;
>
> (d) producing or manufacturing of *synthetic crude oil* or *synthetic gas*;
>
> but does not include any of the following:
>
> (e) any activity that occurs after the *first point of sale*;
>
> (f) any activity relating to the extraction of a substance other than a *product type* [emphasis added] and their *by-products*;
>
> (g) extracting *hydrocarbons* as a consequence of the extraction of geothermal steam.

Per section 1.1, product type includes any of the following:

> (a) *bitumen*;
> (b) *coal bed methane*;
> (c) *conventional natural gas*;
> (d) *gas hydrates*;
> (e) *heavy crude oil*;
> (f) *light crude oil* and *medium crude oil* combined;
> (g) *natural gas liquids*;
> (h) *shale gas*;
> (i) *synthetic crude oil*;
> (j) *synthetic gas*; or
> (k) *tight oil*.

Section 1.1 defines by-product as:

> A substance that is recovered as a consequence of producing a *product type*.

Per section 1.1, property includes:

> (a) fee ownership or a *lease*, concession, agreement, permit, licence or other interest representing the right to extract *oil* or *gas* subject to such terms as may be imposed by the conveyance of that interest;
>
> (b) royalty interests, *production* payments payable in oil or gas, and other non-operating interests in *properties* operated by others; and
>
> (c) an agreement with a foreign government or authority under which a *reporting issuer* participates in the operation of *properties* or otherwise serves as "producer" of the underlying *reserves* (in contrast to being an independent purchaser, broker, dealer or importer).
>
> A *property* does not include supply agreements, or contracts that represent a right to purchase, rather than extract, *oil* or *gas*.

Section 1.1 defines first point of sale as:

> [T]he first point after initial *production* at which there is a transfer of ownership of a *product type*.

KEY POINTS

- RIs engaged directly or indirectly in oil and gas activities are subject to NI 51-101, which:
  - Addresses disclosure of oil and gas activities; NI 51-101 should not be used for disclosure that does not pertain to oil and gas activities.
  - Applies in respect of information that is material prior to the first point of sale.
- A property is where an RI conducts or intends to conduct oil and gas activities involving the search for, acquisition of, or removal of product types and their by-products from their natural locations before the first point of sale.
- Per NI 51-101:
  - Helium is not a product type, but a by-product if it is recovered via a product type.
  - Only product types can have reserves, resources other than reserves or future net revenue, as these terms are defined in NI 51-101.
  - By-products are addressed in sections 5.4 and 5.5, plus item 2.1.3(c) of Form 51-101F1.
    - Prepare disclosure of by-product helium using:
      - The COGE Handbook for estimation.
      - Do not use COGE Handbook terminology concerning resource categories and classification, such as proved reserves, probable reserves, contingent resources and prospective resources, as these cannot be disclosed with respect to helium under NI 51-101. Under NI 51-101, these terms apply specifically to oil and gas and their use otherwise could result in misleading disclosure.
      - Ensure that all technical terminology used is clearly defined and explained.
      - Ensure all material information is disclosed.
- In situations where helium is not a by-product, do not use NI 51-101, as a product type is not transferred at a first point of sale.
    - Prepare disclosure of helium using:
      - The COGE Handbook for estimation.
      - Do not use COGE Handbook terminology concerning resource categories and classification, such as proved reserves, probable reserves, contingent resources and prospective resources, as these cannot be disclosed with respect to helium under NI 51-101. Under NI 51-101, these terms apply specifically to oil and gas and their use otherwise could result in misleading disclosure.
      - Ensure that all technical terminology used is clearly defined and explained.
      - Ensure all material information is disclosed.
      - The principles of NI 51-101 may be useful to consider for preparing disclosure.
      - Adhere to all applicable disclosure requirements; ensure material information is disclosed.

Note that in assessing whether energy-related disclosure is material to an RI, staff will generally assume that disclosure featured prominently in investor presentations, promotional materials or news releases, is material.

Please contact staff with questions concerning helium disclosure.

3.3 HYDROGEN

The utilization of hydrogen as an energy source has been garnering increased attention. At present, most hydrogen is produced via separation from feedstock that includes natural gas, coal and water. However, there are efforts to identify economic, natural, subsurface accumulations of free hydrogen. Alberta is Canada's largest hydrogen producer, relying on natural gas and coal feedstock. The abundance of natural gas in Alberta positions it favorably in what may be an important emerging energy source.

Hydrogen is predominantly consumed as fuel in power generation, used in fertilizer manufacturing, pharmaceutical, steel and plastic production, and for sulphur removal in oil refining. Comparatively speaking, hydrogen is considered a clean fuel, producing only water when consumed.

Hydrogen is categorized on the basis of its feedstock:

- Brown/black hydrogen is derived from coal.
- Grey hydrogen is attributed to natural gas from which CO_2 emissions have not been captured.
- Blue hydrogen is attributed to natural gas from which CO_2 emissions have been captured.
- Green hydrogen is produced from the electrolysis of water using renewable electricity sources.

At the end of September 2021, there were three RIs involved with hydrogen for which the ASC was the principal regulator. This included two engaged in oil and gas activities and one involved in oil and gas midstream. All three are either currently or planning to produce hydrogen from feedstock or planning to consume hydrogen produced from feedstock in industrial processes.

Similar to the discussion regarding helium, an RI exploring for or developing natural, subsurface accumulations of free hydrogen, would need to determine whether or not it is engaged in oil and gas activities, as defined in section 1.1 of NI 51-101. Only RIs engaged directly or indirectly in oil and gas activities are subject to NI 51-101.

While hydrogen is not a product type under section 1.1, it would be considered a by-product if recovered as a consequence of producing a product type. However, under NI 51-101, only product types can have reserves, resources other than reserves or future net revenue, as each of these is defined in NI 51-101. In other words, if a by-product is disclosed under NI 51-101, reserves, resources other than reserves or future net revenue specifically attributed to the hydrogen cannot be disclosed. By-product disclosure is addressed in sections 5.4 and 5.5 of NI 51-101, plus item 2.1.3(c) of Form 51-101F1.

In situations where hydrogen is a by-product, prepare disclosure using the COGE Handbook for estimation, as it contains suitable evaluation criteria for such purpose. However, do not use COGE Handbook terminology concerning resource categories and classification, such as proved reserves, probable reserves, contingent resources and prospective resources, as these cannot be disclosed with respect to hydrogen under NI 51-101. Under NI 51-101, these terms apply specifically to oil and gas and their use otherwise could result in misleading disclosure. Ensure that all technical terminology used is clearly defined and explained. Also ensure that all material information is disclosed.

In situations where hydrogen is not a by-product, such as when it is recovered from a subsurface accumulation unrelated to oil and gas, its production via separation from feedstock, or efforts related to its subsequent processing, transportation or storage, NI 51-101 is not to be used for disclosure, unless the RI is engaged in oil and gas activities and the hydrogen information relates specifically to those activities. In other words, unless hydrogen is determined to be a by-product under NI 51-101, do not use NI 51-101 for its disclosure, although the principles of NI 51-101 may be useful to consider for preparing the disclosure.

To prepare such disclosure, use the COGE Handbook for estimation, as it contains suitable evaluation criteria for such purpose. However, do not use terms defined in the COGE Handbook, nor the classification system contained therein, for disclosure of volumes and values of hydrogen. These pertain specifically to oil and gas and their use could result in misleading disclosure. Do not disclose this information with reference to NI 51-101. RIs must adhere to all applicable disclosure requirements and ensure that all material information is disclosed.

Please contact staff with questions concerning hydrogen disclosure.

3.4 LITHIUM RECOVERED FROM OILFIELD BRINES

With the increasing use of rechargeable batteries in electric vehicles and various commercial and consumer products, there is a growing demand for battery component materials. These materials include metals such as lithium, nickel, cobalt and manganese, and the non-metal graphite. Lithium is of particular interest in Alberta due to its presence in deep subsurface brines, often associated with or in the vicinity of oil and gas reservoirs. These are referred to as "oilfield brines." Recent technological developments involve the application of extractive processes to these brines and reinjection of waste fluids.

Alberta is considered a potential major, stable source of lithium, due to the vast presence of accessible oilfield brines. Other global sources of lithium involve igneous rocks, which require intensive mining and milling processes, and other types of brines that are subjected to evaporative processes.

The assessment of lithium potential in Western Canada has been facilitated by its long history of oil and gas activities, including the drilling of hundreds of thousands of exploration and development wells. Fluids have been recovered and analyzed from many of these wells, and while most of these efforts have not specifically focused on brines nor lithium, some characterization of these has occurred. The much larger benefit, however, is the widespread distribution of a large number of otherwise costly wells that provide access to brines for assessment purposes, enhanced by the potential to repurpose oil and gas infrastructure, and the presence of substantial technical expertise.

At the end of September 2021, there were three RIs involved with recovery of lithium from oilfield brines, including one for which the ASC was the principal regulator. However, there are several active non-RIs operating in Alberta that are pursuing lithium.

Disclosure of lithium recovered from all sources is addressed in NI 43-101 and the Ontario Securities Commission Staff Notice 43-704 *Mineral Brine Projects* and National Instrument 43-101 *Standards of Disclosure for Mineral Projects*. Evaluation of lithium brines specifically, for disclosure under NI 43-101, is discussed in the CIM Best Practice Guidelines for Resource and Reserve Estimation for Lithium Brines, published by the Canadian Institute of Mining, Metallurgy and Petroleum, effective November 1, 2012. RIs are reminded to adhere to all applicable securities disclosure regulatory requirements and ensure material information is disclosed.

Please contact staff with questions concerning lithium disclosure.

3.5 CARBON CAPTURE, UTILIZATION AND STORAGE

Ongoing attention concerning climate change has resulted in increased focus on CO_2 emissions and various efforts to reduce them, particularly those attributed to or related to the oil and gas industry. This section discusses aspects of these efforts, including their capture, utilization and storage.

Carbon capture is the process by which CO_2 is:

- Intercepted and prevented from escaping from a particular source (point source).
- Removed from a non-constrained location, such as the atmosphere or hydrosphere, by natural or anthropogenic means (non-point source).

An example of point source capture is interception from an industrial facility, such as collection of waste gases and particulates from a coal fired electrical generation plant. The CO_2 is separated from the other gases and particulates, then typically compressed and liquefied.

An example of natural, non-point source capture is the removal of CO_2 from the atmosphere by plants via respiration. The separation of CO_2 from atmospheric air through a process termed "direct air capture," is an anthropogenic example of non-point source capture. Post capture, the CO_2 is typically compressed and liquefied.

Carbon storage is simply the containment of CO_2, either temporarily or permanently, by natural or anthropogenic means. Via respiration, plants remove CO_2 from the atmosphere and deposit some of the associated carbon as organic material, including wood and leaves, storing or "sequestering" the carbon. In the absence of human intervention, natural processes will result in most of this carbon returning to the atmosphere as CO_2, via biodegradation or oxidation reactions. Some of this carbon could become stored longer term in soils and sediments and perhaps eventually be incorporated into hydrocarbons.

Carbon dioxide captured from point or non-point sources is transported to storage or manufacturing facilities via pipelines or other means. With storage facilities, the CO_2 is injected into underground reservoirs, sequestering the CO_2 molecules. Underground storage often involves oil reservoirs. The injected CO_2 can increase oil recoveries from some reservoirs, a process referred to as "enhanced oil recovery." Carbon sequestration in Alberta has historically been associated with enhanced oil recovery, with multiple pilots and commercial projects implemented since the 1980s. Carbon dioxide transported to manufacturing facilities can be converted into carbon-based products.

The Western Canadian Sedimentary Basin is ideal for carbon storage, due to a multitude of geological intervals with appropriate characteristics, the widespread presence of oil and gas infrastructure, such as wells and pipelines, technical expertise, and data. Much of this data is publicly available and readily accessible. There are also numerous CO_2 point sources in industrialized areas of Western Canada, particularly in Alberta and Saskatchewan, that may be candidates for carbon capture.

Major current CCUS projects in Western Canada include:

- Alberta Carbon Trunk Line, consisting of various carbon capture, transportation, utilization and storage aspects, owned and operated by a consortium of companies;
- Boundary Dam Carbon Capture Project, located near Estevan, Saskatchewan, operated by SaskPower;
- Quest project located near Edmonton, operated by Shell Canada Limited; and
- Weyburn Unit in southeast Saskatchewan, operated by Whitecap Resources Inc.

RIs engaged in oil and gas activities for which the ASC is the principal regulator are involved in these projects in various capacities, be it capturing, utilizing or storing CO_2, or developing related technologies. In addition, several other RIs are involved in CCUS projects in various stages of development.

Both federal and provincial governments have been encouraging the development of CCUS projects. For example, in December 2020, the Government of Canada proposed development of a comprehensive CCUS strategy, while the 2021 federal budget proposed the introduction of an investment tax credit to begin in 2022.

In May 2021, the Government of Alberta issued Information Letter 2021-19, which concerns carbon sequestration tenure management, and discusses the issuance of carbon sequestration rights to encourage the development of carbon storage hubs. It is anticipated that this will facilitate carbon storage projects that do not involve enhanced oil recovery.

On January 1, 2020, the *Technology Innovation and Emissions Reduction Implementations Act* (Alberta) and accompanying regulation, came into effect. This Government of Alberta initiative includes formation of the Technology Innovation and Emissions Reductions fund, which will invest in the Industrial Energy Efficiency and Carbon Capture Utilization and Storage Grant Program. This program is intended to reduce emissions from large emitters, increase competitiveness, lower carbon compliance costs and improve energy efficiency through technology and equipment upgrades. Seven funded projects were announced in November 2021.

NI 51-101 is not intended to be used for disclosure concerning CCUS and related technologies, unless the RI is engaged in oil and gas activities and the CCUS information relates specifically to these activities. All disclosure concerning CCUS and related technologies must adhere to applicable securities regulatory requirements, provide material information and avoid being misleading. RIs must ensure material information, including risks, opportunities and related financial impacts are disclosed. The disclosure must be relevant, clear, understandable and RI-specific, and provide investors with useful information.

Please contact staff with questions concerning disclosure of CCUS and related technologies.

4. Environmental, social and governance (ESG) disclosure

There is growing interest in GHG emissions, climate risks, and ESG and sustainability matters amongst capital market stakeholders. Investors are increasingly demanding disclosure and RIs are responding. Securities legislation requires disclosure of climate risks, as outlined in CSA Staff Notice 51-358 *Reporting of Climate Change-related Risks*, published in August 2019. However, Canadian securities legislation does not currently mandate GHG emissions disclosure or specify a framework for ESG disclosure.

On October 18, 2021, the CSA published Proposed National Instrument 51-107 *Disclosure of Climate-related Matters* and its companion policy, for a 90-day comment period. This instrument is intended to:

- Improve issuer access to global capital markets by aligning Canadian disclosure standards with expectations of international investors;
- Assist investors in making more informed investment decisions by enhancing climate-related disclosures; and
- Facilitate an “equal playing field” for all issuers through comparable and consistent disclosure, remove the costs associated with navigating and reporting to multiple disclosure frameworks, as well as reduce market fragmentation.

Proposed NI 51-107 is discussed in detail in section 5 of this Report.

In consideration of preparation and disclosure of ESG information, RIs are reminded of the broader Canadian securities disclosure framework and the various requirements and guidance.

As discussed in section 2 of this Report, the ASC has a rigorous review process to assess compliance with oil and gas securities regulatory requirements. This process was expanded in 2021 to include the review of certain aspects of ESG disclosure from RIs engaged in oil and gas activities and those involved in other energy-related endeavours. These are referred to as “ESG Technical Screening Reviews” and focus on the assessment of basic information attributed to an RI, such as:

- Whether or not certain ESG disclosure has occurred;
- The timing and frequency of disclosure;
- How the disclosure has been prepared;
- The method of disclosure;
- Whether or not specific environmental information has been disclosed.

These reviews do not assess whether or not specific social or governance information is being disclosed.

Information concerning these screening reviews is provided in this Report for the first time, attributed to RIs engaged in oil and gas activities for which the ASC is the principal regulator. It is intended to inform regarding the current status of ESG disclosure by these RIs and the provision of some basic, yet important criteria. As there are currently no specific securities requirements respecting ESG disclosure, specifically GHG emissions, the quality of such disclosure is not addressed in this Report.

The timing of ESG disclosure is often irregular and does not typically conform to an RI’s financial year. As a result, information in this section incorporates disclosure from current RIs that has occurred during the last several years, up to the end of September 2021.

As shown in Figure 8, 42 per cent of current RIs engaged in oil and gas activities and for which the ASC is principal regulator, have provided ESG disclosure in recent years. Thirty-three per cent have provided this disclosure through a stand-alone report, while nine per cent have provided this information only on their website. The disclosure methodology is important. ESG information disclosed on websites is typically less informative than that disclosed in stand-alone reports. Furthermore, ESG information found on the websites of RIs that do not publish stand-alone reports tends to be more aspirational, with a focus typically on corporate philosophy concerning ESG matters.

Figure 8: ESG disclosure methodology and occurrences for AB RIS engaged in oil and gas activities

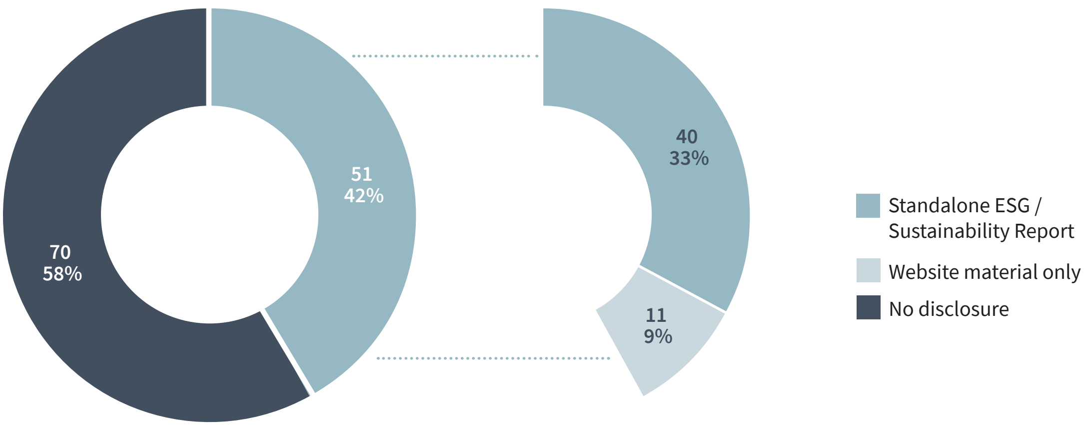


Figure 9 illustrates the information presented in Figure 8 by production grouping. The RIs were grouped using production disclosed per item 6.9 of Form 51-101F1, as follows:

- “seniors” being those RIs with >100,000 BOE per day of production (based on a conversion ratio of six thousand cubic feet of gas for one barrel of oil);
- “intermediates” being those RIs with 10,000 to 100,000 BOE per day of production; and
- “juniors” being those RIs with <10,000 BOE per day of production.

The RIs ranked highest by production were selected from each group, incorporating 10 senior, 20 intermediate and 50 junior RIs.

As shown in Figure 9, all of the seniors have published a stand-alone report containing ESG information. Seventeen intermediates (85 per cent) have done the same, with two RIs (10 per cent) providing this information only on their website and one doing neither (five per cent). Of the juniors, three RIs (six per cent) have published a report, six (12 per cent) provide this information on their website and 41 RIs (82 per cent) do neither.

Figure 9: ESG disclosure methodology and occurrences for AB RIs engaged in oil and gas activities, by production grouping

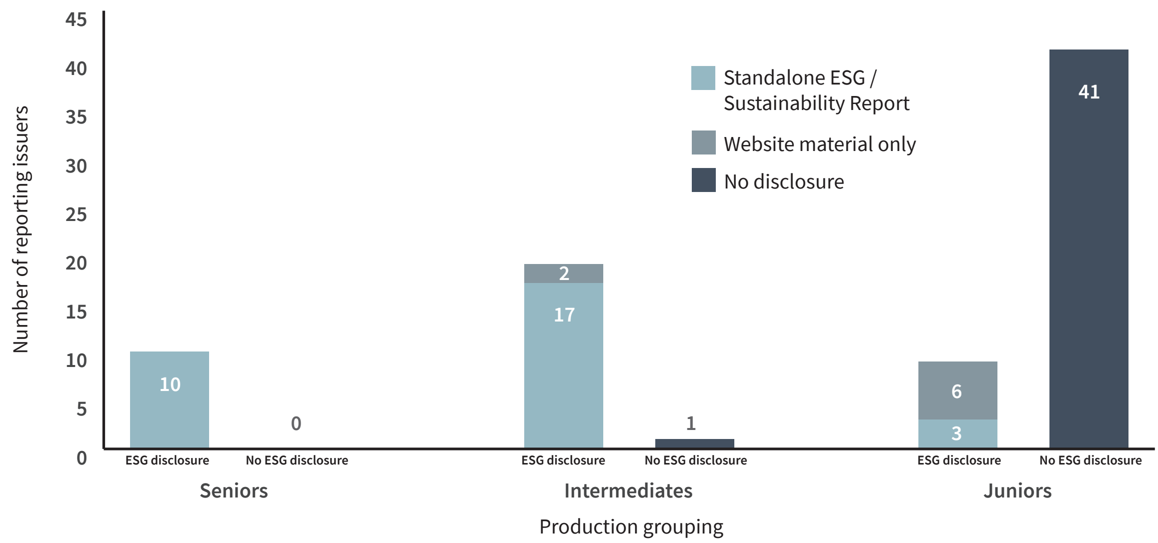


Figure 10 indicates the ESG reporting frameworks used by the RIs, by production grouping, to prepare their ESG disclosure. The frameworks are the:

- Task Force on Climate-related Financial Disclosure's (**TCFD**) Recommendations of the Task Force on Climate-related Financial Disclosures.
- Global Reporting Initiative's (**GRI**) GRI Standards.
- Sustainability Accounting Standards Board's (**SASB**) SASB Standards.

Many RIs use more than one system. None of the RIs that only provide ESG information on their website disclose a reporting framework.

As shown, most RIs that disclose ESG information prepare it using more than one framework. In fact, four senior RIs (40 per cent) and 10 intermediate RIs (50 per cent) use all three frameworks.

Figure 10: Reporting frameworks used to prepare ESG disclosure for AB RIS engaged in oil and gas activities, by production grouping

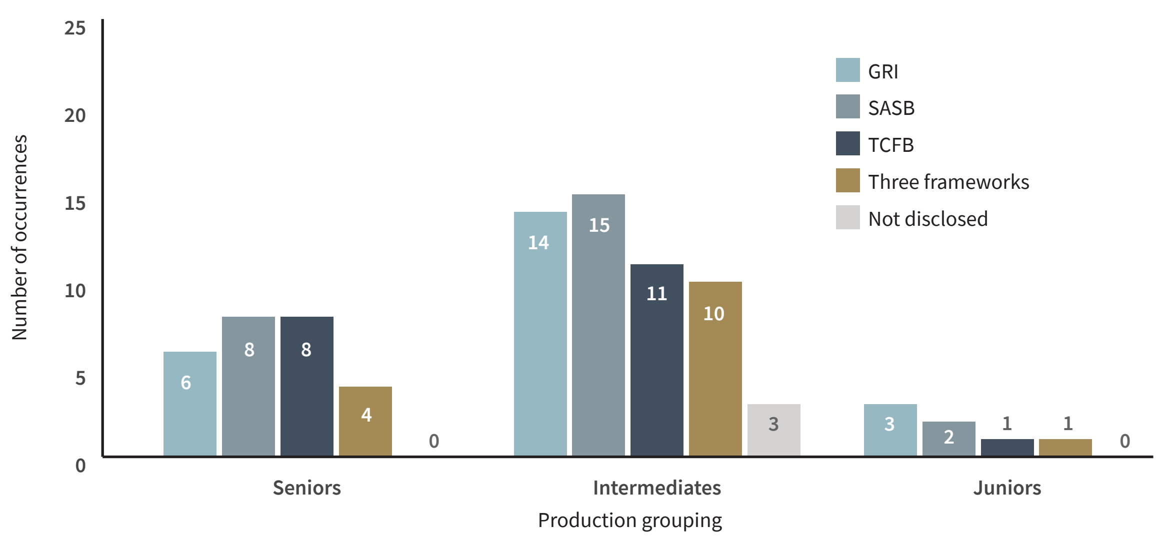


Figure 11 illustrates emissions disclosure occurrences by the RIs, by production grouping. "Scope 1," "Scope 2" and "Scope 3" refer to carbon dioxide equivalent emissions, which includes carbon dioxide, methane and nitrous oxide. The terms are defined within each framework, but broadly mean:

- Scope 1: all direct emissions owned or otherwise controlled by the RI (**Scope 1**).
- Scope 2: all indirect emissions attributed to energy acquired by the RI (electricity, heat or steam) (**Scope 2**).
- Scope 3: all other indirect emissions attributed to the value chain of the RI (**Scope 3**).

As shown, all of the seniors, 18 (90 per cent) of the intermediates and two (four per cent) of the juniors, disclosed Scope 1 emissions. All of the seniors, 18 (90 per cent) of the intermediates and one (two per cent) of the juniors, disclosed Scope 2, while two (20 per cent) of the seniors, five (25 per cent) of the intermediates and none of the juniors, disclosed Scope 3.

"Other Air Emissions" include nitrogen oxides, sulphur dioxide, volatile organic compounds and particulate matter.

Figure 11: Emissions disclosure occurrences by AB RIs engaged in oil and gas activities, for RI group

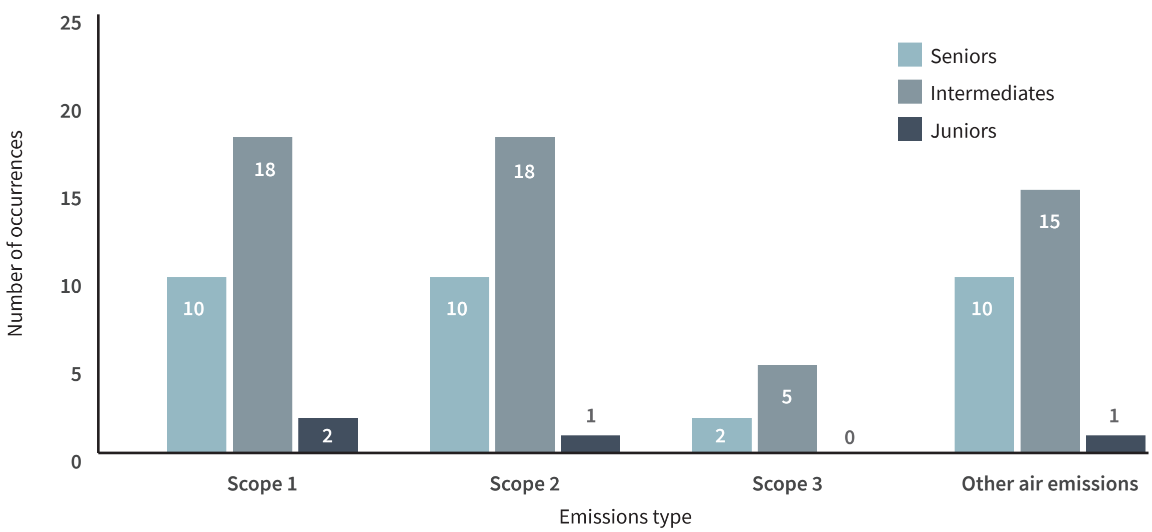
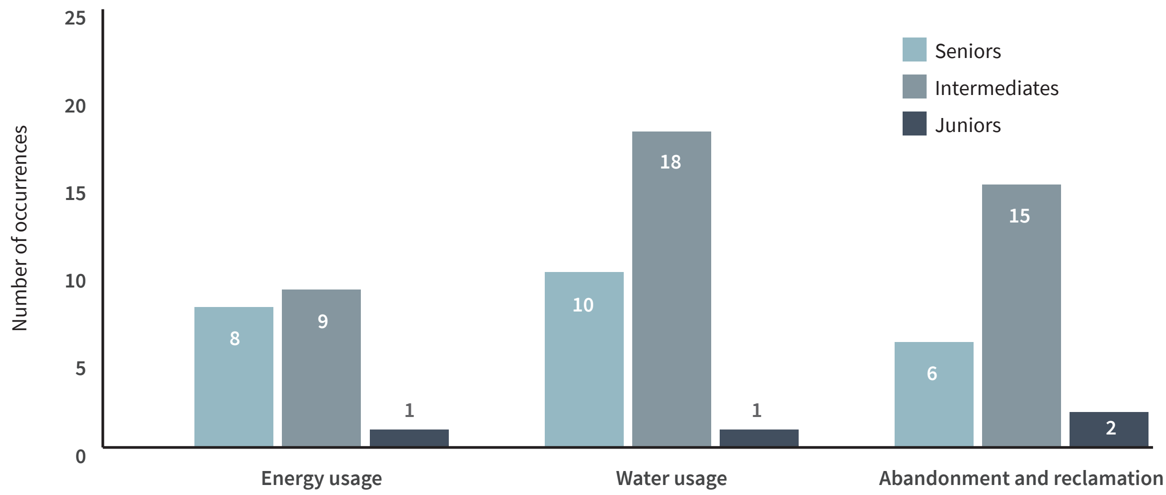


Figure 12 illustrates other environmental disclosure occurrences by the RIs, by production grouping. Of the three categories, abandonment and reclamation disclosure may be of most interest to readers of this Report, due to related disclosure requirements in NI 51-101. Six (60 per cent) of the seniors, 15 (75 per cent) of the intermediates and two (four per cent) of the juniors, provide this information in their ESG disclosure.

Figure 12: Other environmental disclosure occurrences for AB RIs engaged in oil and gas activities, by production grouping



5. Proposed National Instrument 51-107 *Disclosure of Climate-related Matters*

Climate-related disclosure, particularly that relating to GHG emissions, has been increasingly provided in recent years by RIs engaged in oil and gas activities. Institutional investors are increasingly seeking more useful and comparable disclosure and securities regulators can address this. On October 18, 2021, the CSA published Climate-related Disclosure Update and CSA Notice and Request for Comment Proposed National Instrument 51-107 *Disclosure of Climate-related Matters* (**Notice and Request for Comment**). The Notice and Request for Comment introduces and discusses Proposed National Instrument 51-107 *Disclosure of Climate-related Matters* and its companion policy (**Proposed 51-107CP**), and initiates a 90-day comment period.

Proposed NI 51-107 would require RIs to disclose certain climate-related information in compliance with the recommendations of the TCFD, subject to certain modifications. The TCFD framework has four core elements:

1. Governance
2. Strategy
3. Risk Management
4. Metrics and Targets

If adopted, Proposed NI 51-107 would require RIs to disclose Scope 1, 2 and 3 GHG emissions[21] and the related risks, or the reasons for not disclosing this information. Requiring disclosure on a "comply or explain" basis will provide RIs with the flexibility to disclose one or more of the GHG emissions categories or provide reasons for not doing so.

Guidance set out in Proposed 51-107CP provides that if RIs were required to disclose their Scope 1 GHG emissions under an existing GHG emissions reporting program, including the Government of Canada's Greenhouse Gas Reporting Program, they would be expected to also disclose Scope 1 GHG emissions under Proposed NI 51-107.

CONSULTATION INQUIRY

As an alternative, the CSA is consulting on mandatory disclosure of Scope 1 GHG emissions (a) when that information is material or (b) in all cases. With this alternative, disclosure of Scope 2 and 3 GHG emissions would remain on a "comply or explain basis".

The climate-related disclosure requirements relating to governance would typically be contained in an RI's information circular. Those relating to strategy, risk management, and metrics and targets, would typically be included in an RI's AIF.

Proposed NI 51-107 contemplates a phased-in transition of the disclosure requirements. These include a one-year period for non-venture issuers and a three-year period for venture issuers. Assuming the instrument comes into force on December 31, 2022 and an RI has a December 31 year-end, the first mandatory climate-related disclosure would appear in the RI's filings made for the financial year ended December 31, 2023, filed in 2024, and December 31, 2025, filed in 2026, respectively.

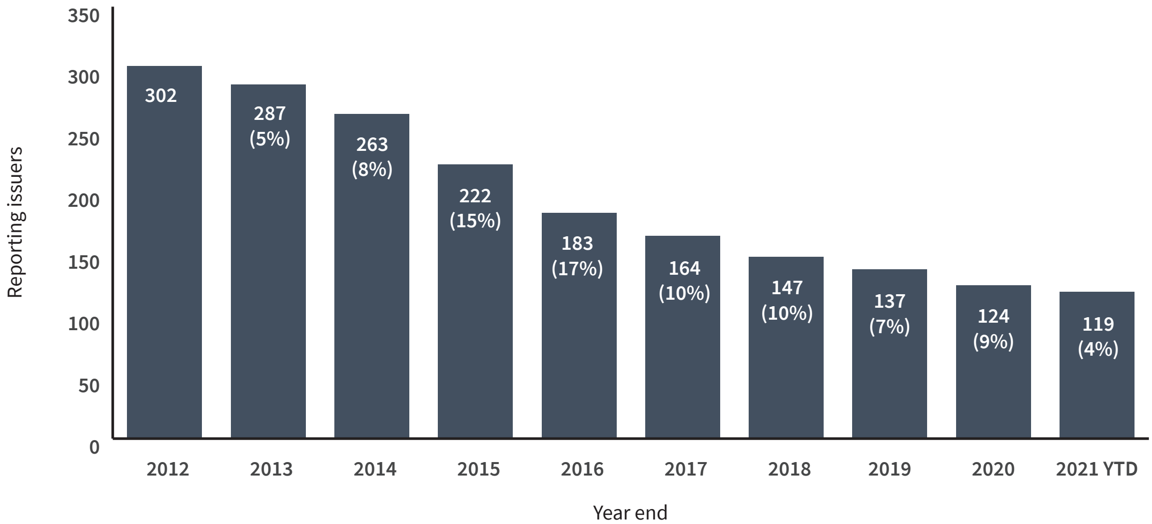
The CSA is requesting comments on Proposed NI 51-107, the associated companion policy and has raised specific questions as set out in the Notice and Request for Comment. **The ASC encourages Alberta stakeholders to provide written comments by January 17, 2022, as set out in the Notice and Request for Comment.**

[21] All GHG emissions must be reported in accordance with a GHG emissions reporting standard, which is the GHG Protocol, or a reporting standard for calculating and reporting GHG emissions if it is comparable with the GHG Protocol.

6. Energy and the Alberta capital market

There has been a steady decrease in the number of RIs engaged in oil and gas activities in recent years. As illustrated in Figure 13, there were 124 for which the ASC was the principal regulator at the end of 2020, down from 137 at the end of 2019 (-9 per cent) and down from 302 at the end of 2012 (-59 per cent). At the end of September 2021, there were 119, representing a 61 per cent decrease since 2012.

Figure 13: Number of AB RIs engaged in oil and gas activities



Information is included to the end of September for the current year, referred to as "YTD," and subsequently updated to the full year in future reports.

As shown in Figure 14, the reduction in RIs has disproportionately affected junior RIs, although intermediate RIs have experienced a notable decline since 2015. However, the number of senior RIs has remained steady since 2014. To construct this figure, RIs were grouped as follows, using production disclosed per item 6.9 of Form 51-101F1:

- “seniors” being those RIs with >100,000 BOE per day of production (based on a conversion ratio of six thousand cubic feet of gas for one barrel of oil);
- “intermediates” being those RIs with 10,000 to 100,000 BOE per day of production; and
- “juniors” being those RIs with <10,000 BOE per day of production.

The RIs ranked highest by production were selected from each group, incorporating 10 senior, 20 intermediate and 50 junior RIs.

Figure 14: Number of AB RIs engaged in oil and gas activities, by production grouping

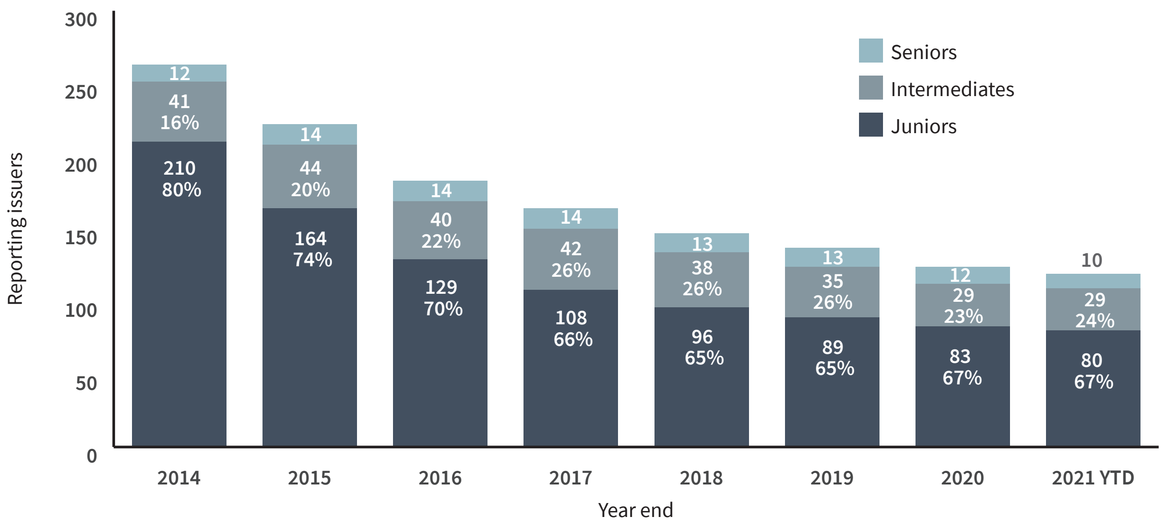


Figure 15 categorizes the reasons for the decrease in RIs from the end of 2020 to the end of September 2021, by production grouping. As shown, the majority of changes in RI count are attributed to junior RIs.

Figure 15: Net change in AB RIs engaged in oil and gas activities, by production grouping

NUMBER OF REPORTING ISSUERS[1]				REASON FOR CHANGE
Seniors	Intermediates	Juniors	TOTAL	
–	–	(1)	**(1)**	receivership/bankruptcy
–	–	–	**–**	change in industry/acquired by a company in another industry
–	–	(4)	**(4)**	privatized/acquired by a non-AB RI/ceased to be AB RI
(2)	(1)	(2)	**(5)**	acquired by AB RI
–	–	(2)	**(2)**	cease trade order
–	–	7	**7**	new AB RI
(2)	**(1)**	**(2)**	**(5)**	net change in AB RIs

1 Does not capture changes due to movement between RI groups.
2 "-" = no occurences.

Figure 16 presents a snapshot of energy-related RIs by their respective industry, for which the ASC was the principal regulator, at the end of September 2021. “Utilities” includes RIs that are involved in electrical generation from traditional or renewable means or both, and in many cases, transmission and distribution of electricity. “Other” includes RIs involved in energy minerals, which includes uranium and lithium at present, energy services, clean technology and green or “renewable” hydrocarbons.

Many RIs in “Oil and Gas Midstream” (includes pipelines) and “Engaged in Oil and Gas Activities,” are increasingly pursuing projects beyond their traditional energy expertise. For example, some “Oil and Gas Midstream” RIs are developing renewable electrical generation projects that are the typical domain of RIs in “Utilities,” while many “Engaged in Oil and Gas Activities” RIs are pursuing non-traditional projects that involve CCUS and related technologies, renewable hydrocarbons, co-generation, wind energy and various clean technologies.

Figure 16: Number of energy-related AB RIs, by industry

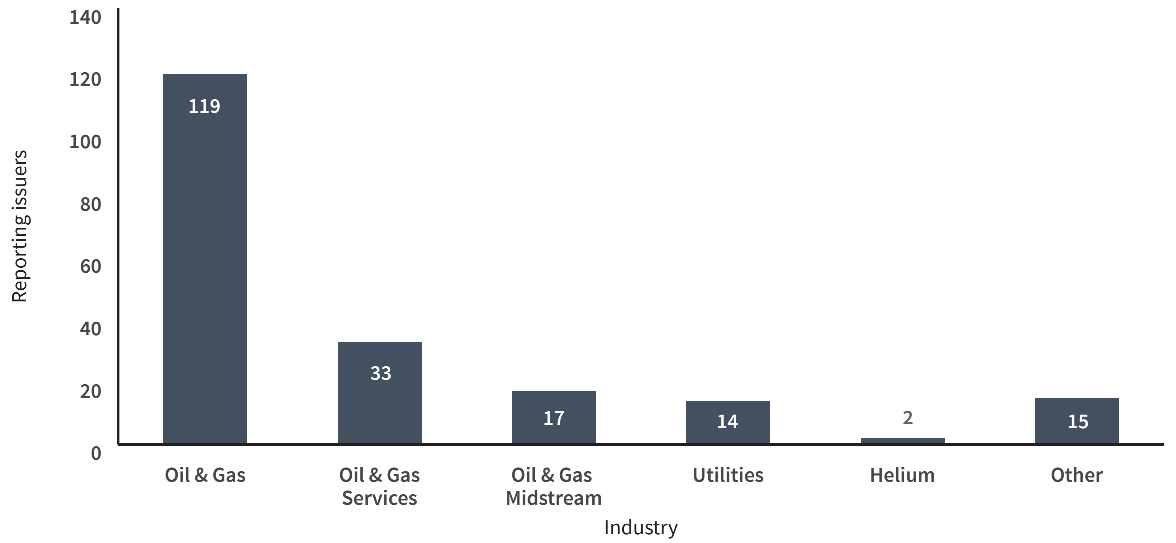


Figure 17 illustrates the market capitalization of the energy-related industries presented in Figure 16, at the end of September 2021.

Figure 17: Market capitalization of energy-related AB RIs, by industry

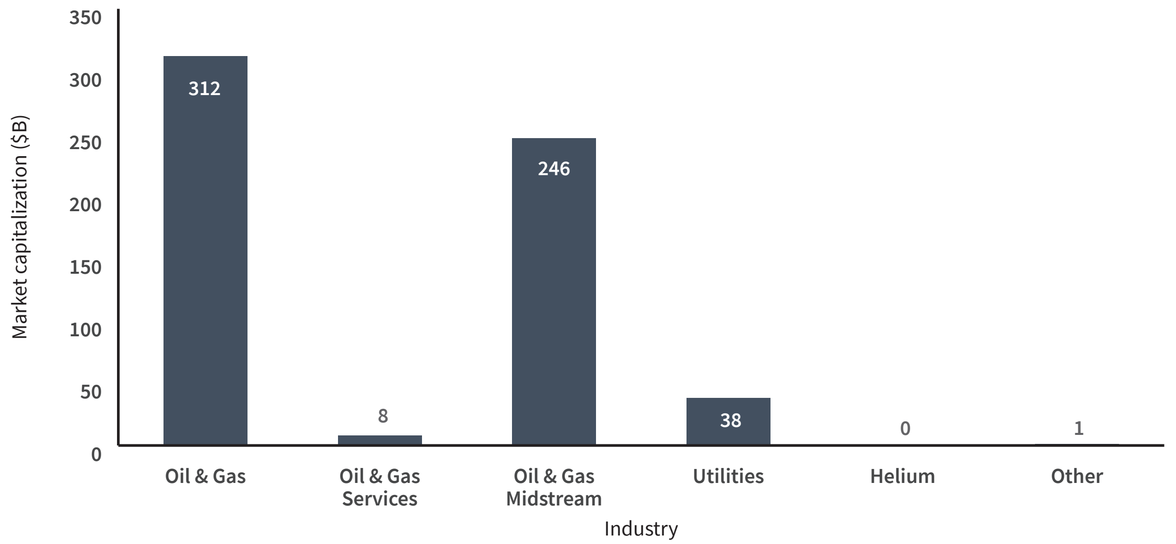


Figure 18 shows the amount of capital raised through prospectus offerings by RIs engaged in oil and gas activities for which the ASC was the principal regulator, from 2016 to the end of September 2021. The offerings include various types of equity and debt securities, such as common shares, units, debentures, convertible debentures, rights, subscription receipts and notes. The 2021 year to date activity consists of 11 offerings by nine RIs. Absent a prospectus exemption, capital would of course be raised through securities issuance via prospectus.

Figure 18: Capital raised through prospectus offerings and the number of offerings, for AB RIs engaged in oil and gas activities

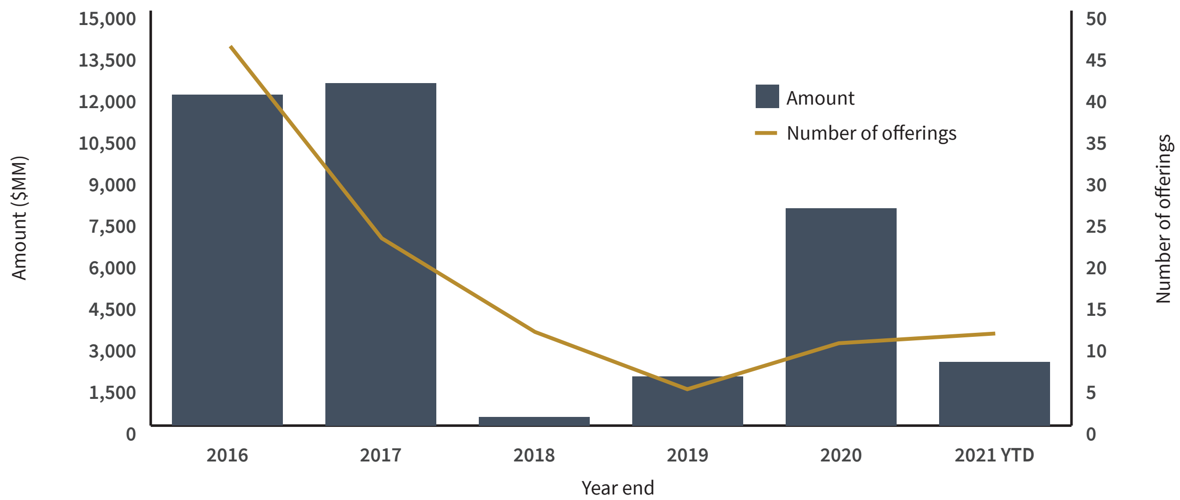


Figure 19 attributes the amount of raised capital presented in Figure 18 to production grouping.

Figure 19: Capital raised through prospectus offerings and the number of offerings, for AB RIs engaged in oil and gas activities, by production grouping

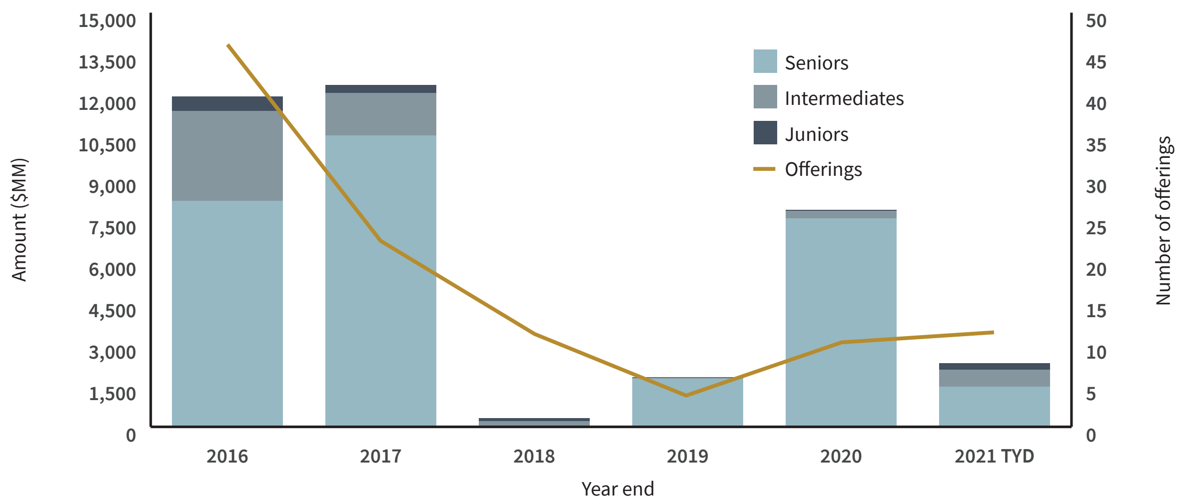


Figure 20 attributes the amount of raised capital presented in Figure 19 to securities category, be it equity, debt or both.

Figure 20: Capital raised through prospectus offerings and the number of offerings for AB RIs engaged in oil and gas activities, by debt or equity

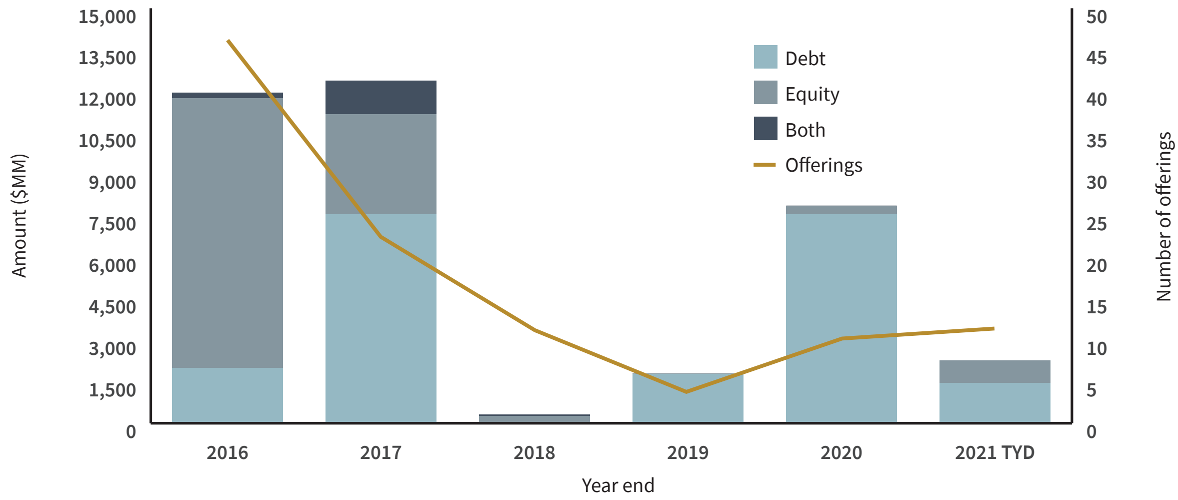
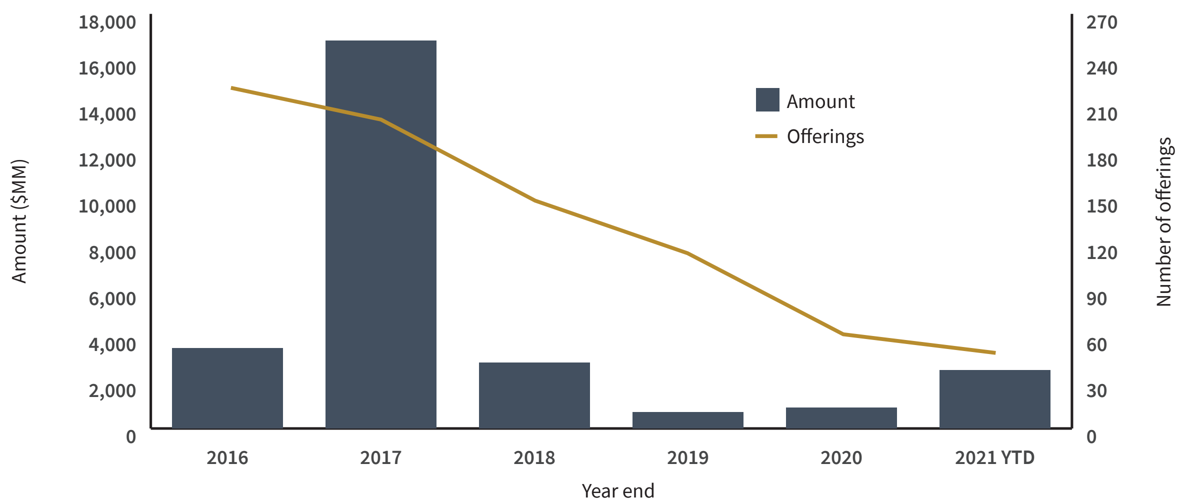


Figure 21 shows the amount of capital raised under exemptions from the prospectus requirement (not raised via prospectus) by RIs engaged in oil and gas activities for which the ASC was the principal regulator, from 2016 to the end of September 2021. The offerings include various equity and debt securities.

Figure 21: Capital raised in the exempt market and the number of offerings for AB RIs engaged in oil and gas activities



There are a number of prospectus exemptions available, most of which are set out in National Instrument 45-106 *Prospectus Exemptions*. Both RIs and non-RIs rely on prospectus exemptions to raise capital. Most prospectus exemptions used for capital raising purposes are required to be reported to applicable securities regulators using Form 45-106F1 *Report of Exempt Distribution*. Reports filed with the ASC are required to report on the distributions made in Alberta and may not report sales to investors in other jurisdictions.

Figure 22 attributes the amount of raised capital from Figure 21 to RI group.

Figure 22: Capital raised in the exempt market and the number of offerings for AB RIs engaged in oil and gas activities, by production grouping

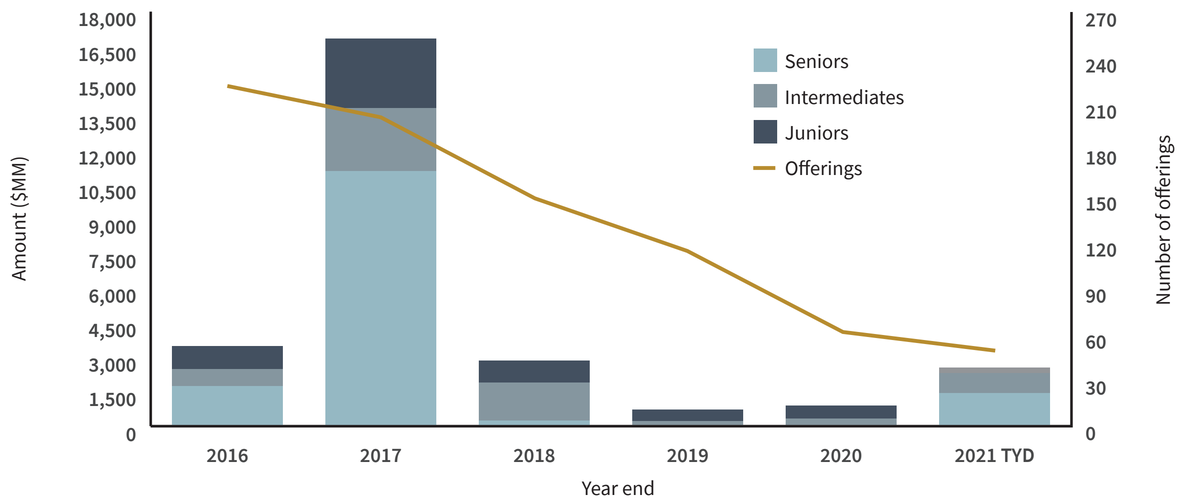


Figure 23 includes information presented in Figure 20 and Figure 21, for comparison.

Figure 23: Capital raised through prospectus offerings and in the exempt market, and the number of offerings from each, for AB RIs engaged in oil and gas activities

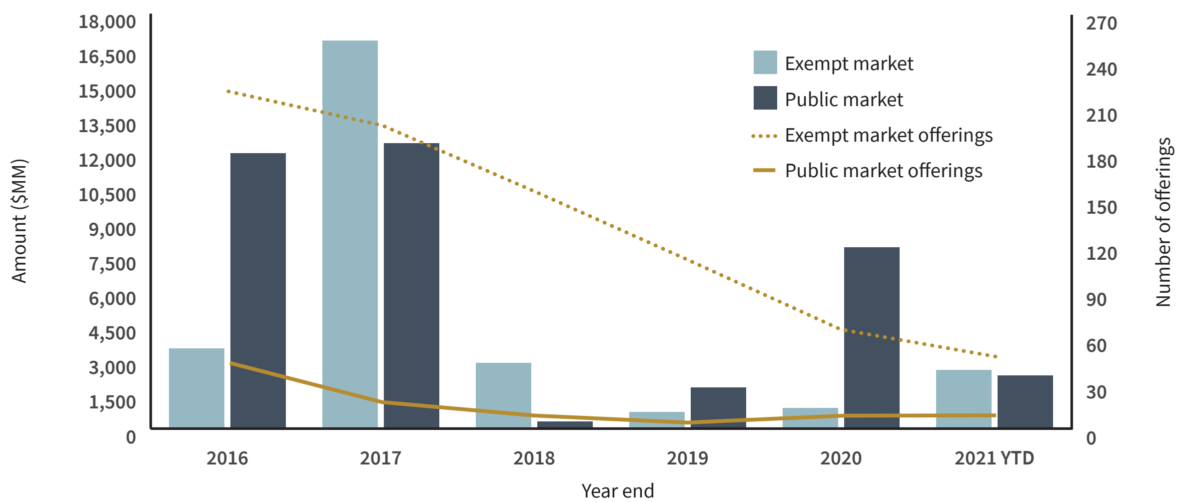


Figure 24 illustrates the amount of capital raised and the number of offerings conducted in Alberta, by oil and gas issuers that are not RIs, from 2016 to the end of September 2021. This is based on information reported to the ASC and is incomplete, as some offerings are not required to be reported (e.g. issuers relying on the private issuer prospectus exemption).

Figure 24: Capital raised in the exempt market and the number of offerings, for oil and gas issuers based in Alberta that are not RIs

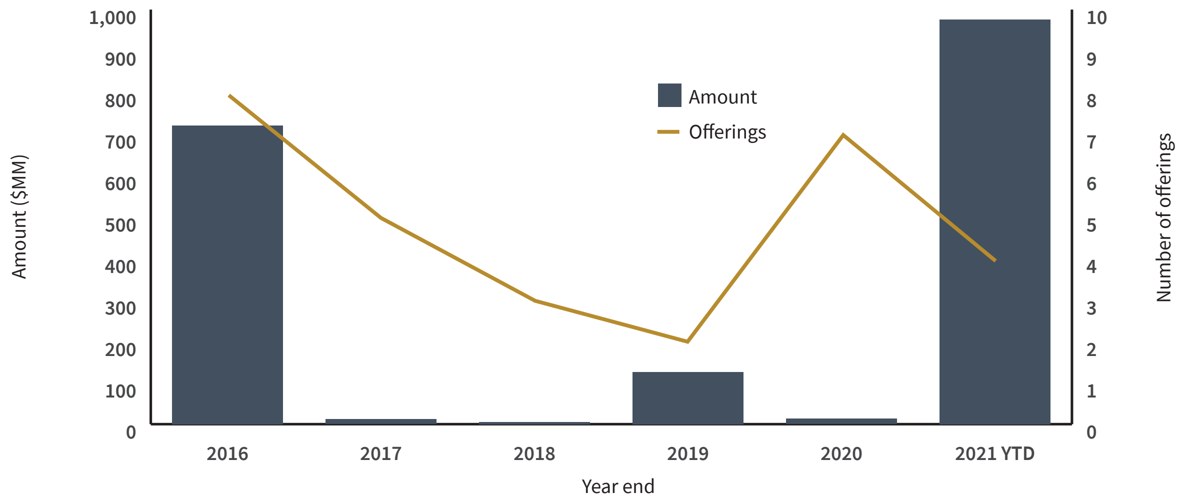


Figure 25 shows the amount of capital raised through prospectus offerings by RIs involved in oil and gas midstream and oil and gas services, for which the ASC was the principal regulator from 2016 through to the end of September 2021. The offerings include various types of equity and debt securities. The 2021 year to date activity consists of four offerings by three oil and gas midstream RIs and one offering by one oil and gas services RI.

Figure 25: Capital raised through prospectus offerings and the number of offerings, for RIs involved in oil and gas midstream and oil and gas services, principally regulated by the ASC

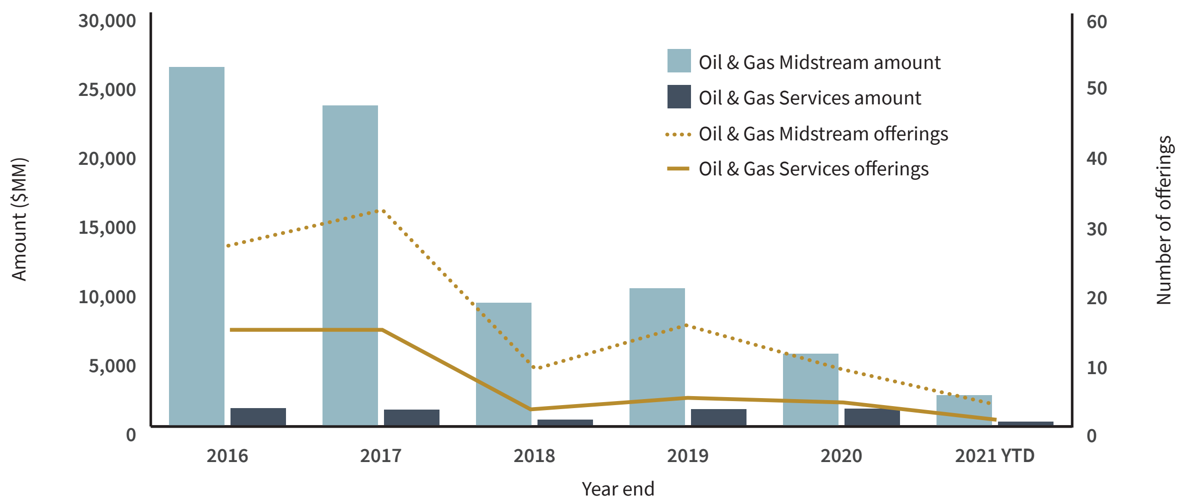


Figure 26 attributes the amount of raised capital presented in Figure 25 to securities category, be it equity, debt or both.

Figure 26: Capital raised through prospectus offerings and the number of offerings, for RIs involved in oil and gas midstream and oil and gas services, principally regulated by the ASC, by securities category

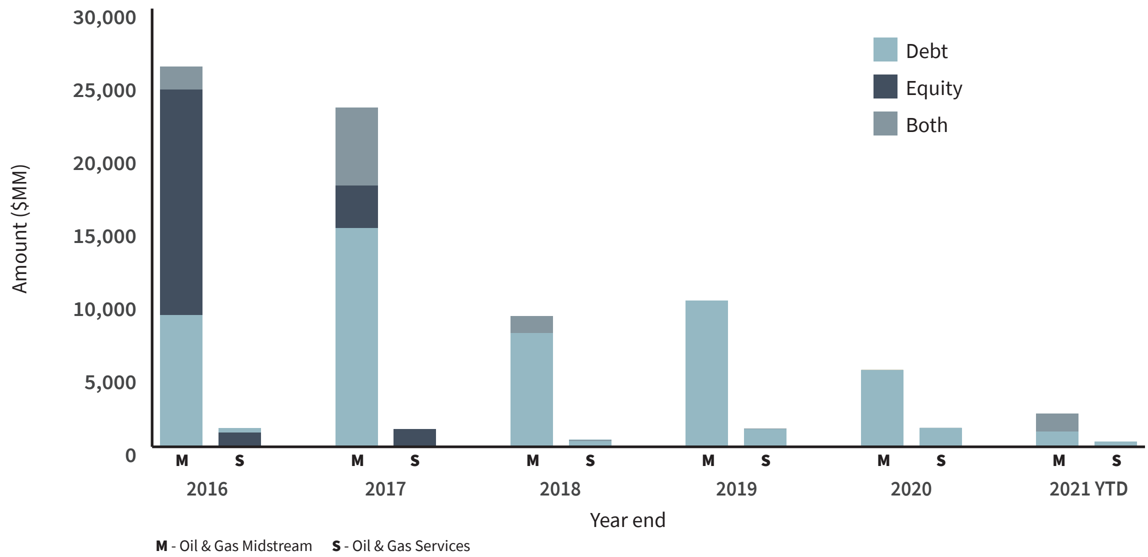


Figure 27 includes information presented in Figure 18 and Figure 26, for comparison

Figure 27: Capital raised through prospectus offerings and the number of offerings, for RIs engaged in oil and gas activities and involved in oil and gas midstream and oil and gas services, principally regulated by the ASC

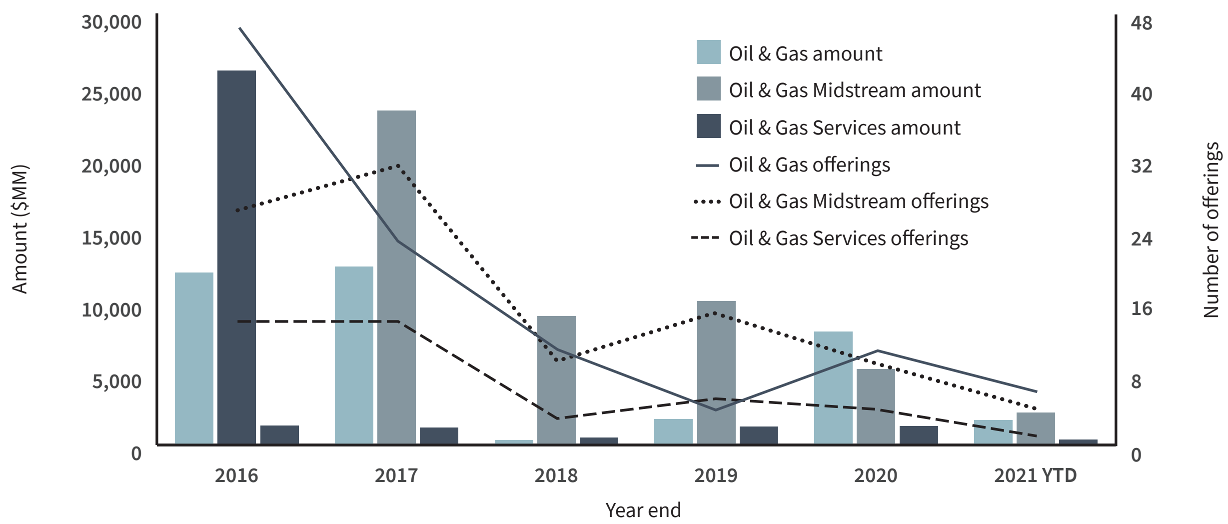
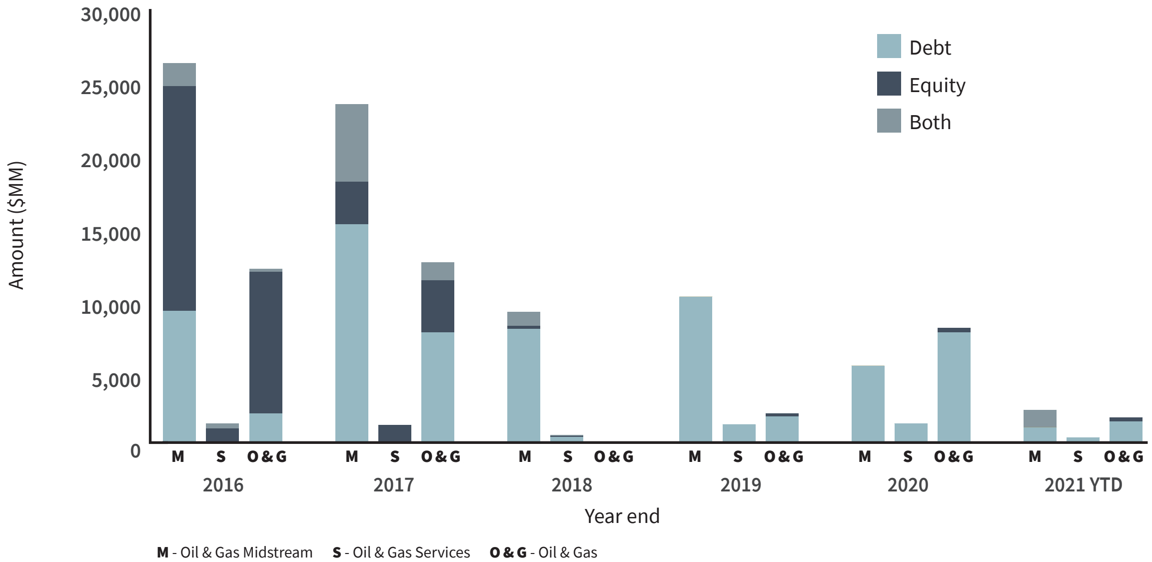


Figure 28 combines information presented in Figure 20 and Figure 26, for comparison.

Figure 28: Capital raised through prospectus offerings and the number of offerings, for RIs engaged in oil and gas activities and involved in oil and gas midstream and oil and gas services, principally regulated by the ASC, by securities category



Investors have been more interested in the financial performance of RIs in recent years than the respective resource base sizes of these RIs. In response, RIs have been less inclined to optionally disclose contingent resources data and prospective resources data. Figure 29 illustrates the number of occurrences of disclosure of contingent resources data and prospective resources data in the statement of reserves data and other information specified in Form 51-101F1, from 2014 to 2020. Disclosure occurrences for both decreased slightly in 2020 over 2019, following relatively consistent occurrences during the preceding three years, but an overall downward trend over the time period.

Figure 29: Disclosure occurrences of contingent resources data, prospective resources data or both, for AB RIs engaged in oil and gas activities

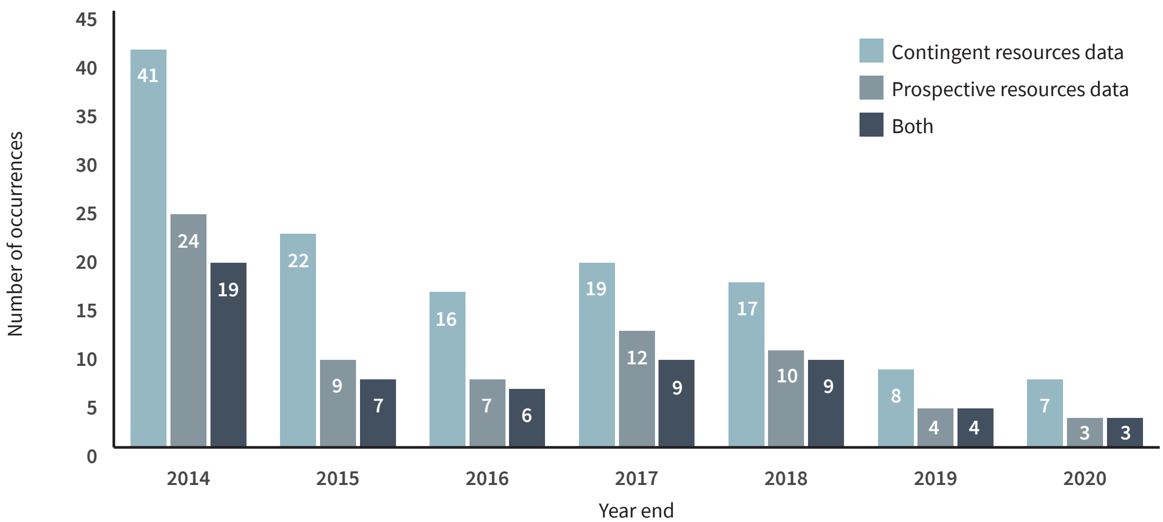


Figure 30 illustrates the information shown in Figure 29 by production grouping.

Figure 30: Disclosure occurrences of contingent resources data, prospective resources data or both, for AB RIs engaged in oil and gas activities, by production grouping

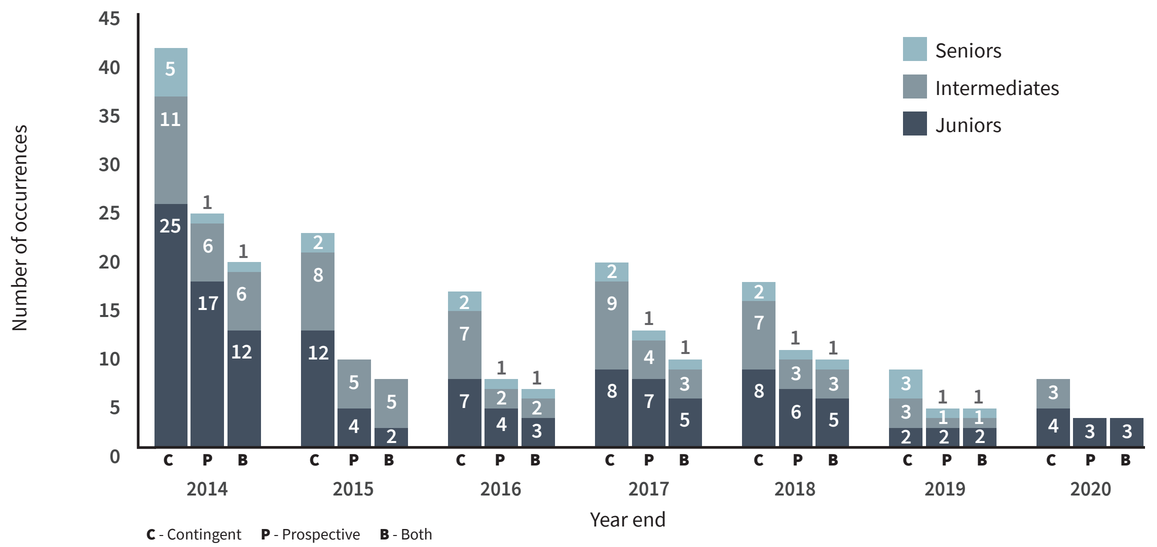
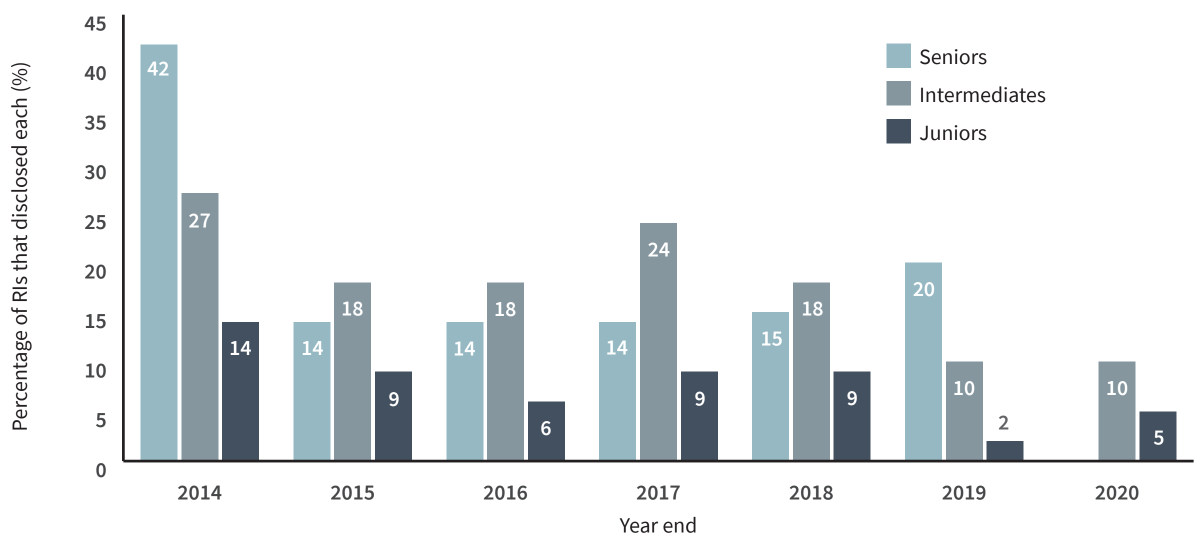


Figure 31 shows the percentage of RIs engaged in oil and gas activities for which the ASC is the principal regulator, that disclosed contingent resources data, prospective resources data or both, in the statement of reserves data and other information specified in Form 51-101F1, from 2014 to the end of 2020. As shown, the disclosure percentage has typically been highest for the intermediates, and lowest for the juniors. In 2020, the percentage for the intermediates remained the same as it was for 2019 and more than doubled over 2019 for the juniors. For the seniors, no RI disclosed this information in 2020. However, there has been an overall downward trend in this disclosure over the time period, resulting from reduced investor interest in this information.

Figure 31: Percentage of AB RIs engaged in oil and gas activities, that disclosed contingent resources data, prospective resources data or both, by production grouping



7. Petroleum Advisory Committee

The Petroleum Advisory Committee (**PAC**) is an important source of information and advice for the ASC on oil and gas and other energy-related matters. PAC is comprised of volunteer members (**PAC Members**) with energy-related backgrounds that are appointed to three-year terms. Meetings are normally held three times per year and attended by Members, observers and select ASC staff.

PAC's mandate is to:

- Review and provide feedback on issues and current developments regarding the:
  - Evaluation of oil and gas reserves and resources other than reserves.
  - Disclosure concerning oil and gas activities.
  - Evaluation and disclosure regarding other energy-related matters.
- Comment on related current and proposed Alberta securities laws and regulatory policies.
- Provide informal advice to staff.

Topics discussed in the last year include current challenges faced by RIs, including those related to the COVID-19 pandemic and their impact on RI's activities and disclosure, current resource evaluation and disclosure considerations, the Energy Group's mandate, NI 51-101 considerations as they relate to GHG emissions and net zero, and emerging energy-related subjects, including helium.

The ASC thanks the Members for their contributions.

Current Members:

Caralyn P. Bennett, P.Eng.
GLJ Ltd.

Shannon M. Gangl, B.Comm., LLB
Burnet, Duckworth & Palmer LLP

Steven J. Golko, P.Eng.
Sproule

David Haugen, P.Eng.
Ryder Scott Company – Canada

Nicole Labrecque, P.Eng.
Cenovus Energy Inc.

Dr. John Lacey, P.Eng.
Enjay Holdings Alberta Ltd.

Ian McDonald, P.Eng.
CNOOC International

Rob Morgan, P.Eng.
Strathcona Resources Ltd.

James Surbey, B.Eng., LLB
Birchcliff Energy Ltd.

Michael Verney, P.Eng.
McDaniel & Associates Consultants Ltd.

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GLOSSARY OF TERMS CONCERNING OIL AND GAS ACTIVITIES

The following terms and respective definitions are sourced from section 1.1 of NI 51-101 *Standards of Disclosure For Oil and Gas Activities* and CSA Staff Notice 51-324 *Revised Glossary to NI 51-101 Standards of Disclosure for Oil and Gas Activities*.

"**anticipated results**" means information that may, in the opinion of a reasonable person, indicate the potential value or quantities of resources in respect of the reporting issuer's resources or a portion of its resources and includes:

(a) estimates of volume;

(b) estimates of value;

(c) areal extent;

(d) pay thickness;

(e) flow rates; or

(f) hydrocarbon content.

"**commercial**" means when a project is commercial this implies that the essential social, environmental, and economic conditions are met, including political, legal, regulatory, and contractual conditions. Considerations with regard to determining commerciality include:

- economic viability of the related development project;
- a reasonable expectation that there will be a market for the expected sales quantities of production required to justify development;
- evidence that the necessary production and transportation facilities are available or can be made available;
- evidence that legal, contractual, environmental, governmental, and other social and economic concerns will allow for the actual implementation of the recovery project being evaluated;
- a reasonable expectation that all required internal and external approvals will be forthcoming. Evidence of this may include items such as signed contracts, budget approvals, and approvals for expenditures, etc.
- evidence to support a reasonable timetable for development. A reasonable time frame for the initiation of development depends on the specific circumstances and varies according to the scope of the project. Although five years is recommended as a maximum time frame for classification of a project as commercial, a longer time frame could be applied, where, for example, development of economic projects are deferred at the option of the producer for, among other things, market-related reasons or to meet contractual or strategic objectives.

"**contingent resources data**" means:

(a) an estimate of the volume of contingent resources, and

(b) the risked net present value of future net revenue of contingent resources.

"**effective date**" in respect of information, means the date as at which, or for the period ended on which, the information is provided.

"**evaluation**" means, in relation to reserves data or resources other than reserves, the process whereby an economic analysis is made of a property to arrive at an estimate of a range of net present values of the estimated future net revenue resulting from the production of the reserves or resources other than reserves associated with the property..

"**forecast prices and costs**" means future prices and costs that are:

(a) generally accepted as being a reasonable outlook of the future;

(b) if, and only to the extent that, there are fixed or presently determinable future prices or costs to which the reporting issuer is legally bound by a contractual or other obligation to supply a physical product, including those for an extension period of a contract that is likely to be extended, those prices or costs rather than the prices and costs referred to in subparagraph (a).

"**future net revenue**" means a forecast of revenue, estimated using forecast prices and costs or constant prices and costs, arising from the anticipated development and production of resources, net of the associated royalties, operating costs, development costs, and abandonment and reclamation costs.

"**gas**" includes natural gas, conventional natural gas, coal bed methane, gas hydrates, shale gas, and synthetic gas.

"**gross**"

(a) In relation to a reporting issuer's interest in production or reserves, its "company gross reserves", which are the reporting issuer's working interest (operating or non-operating) share before deduction of royalties and without including any royalty interests of the reporting issuer.

(b) In relation to wells, the total number of wells in which a reporting issuer has an interest.

(c) In relation to properties, the total area of properties in which a reporting issuer has an interest.

"**net**"

(a) In relation to a reporting issuer's interest in production or reserves, the reporting issuer's working interest (operating or non-operating) share after deduction of royalty obligations, plus the reporting issuer's royalty interests in production or reserves.

(b) In relation to a reporting issuer's interest in wells, the number of wells obtained by aggregating the reporting issuer's working interest in each of its gross wells.

(c) In relation to a reporting issuer's interest in a property, the total area in which the reporting issuer has an interest multiplied by the working interest owned by the reporting issuer.

"**oil**" includes crude oil, bitumen, tight oil and synthetic crude oil.

"**oil and gas activities**" includes the following:

(a) searching for a product type in its natural location;

(b) acquiring property rights or a property for the purpose of exploring for or removing product types from their natural locations;

(c) any activity necessary to remove product types from their natural locations, including construction, drilling, mining and production, and the acquisition, construction, installation and maintenance of field gathering and storage systems including treating, field processing and field storage;

(d) producing or manufacturing of synthetic crude oil or synthetic gas;

but does not include any of the following:

(e) any activity that occurs after the first point of sale;

(f) any activity relating to the extraction of a substance other than a product type and their by-products;

(g) extracting hydrocarbons as a consequence of the extraction of geothermal steam.

"**property**" includes:

(a) fee ownership or a lease, concession, agreement, permit, licence or other interest representing the right to extract oil or gas subject to such terms as may be imposed by the conveyance of that interest;

(b) royalty interests, production payments payable in oil or gas, and other non-operating interests in properties operated by others; and

(c) an agreement with a foreign government or authority under which a reporting issuer participates in the operation of properties or otherwise serves as "producer" of the underlying reserves (in contrast to being an independent purchaser, broker, dealer or importer).

A property does not include supply agreements, or contracts that represent a right to purchase, rather than extract, oil or gas.

"**prospective resources data**" means:

(a) an estimate of the volume of prospective resources, and

(b) the risked net present value of future net revenue of prospective resources.

"**qualified reserves auditor**" means an individual who:

(a) in respect of particular reserves data, resources or related information, possesses professional qualifications and experience appropriate for the estimation, evaluation, review and audit of the reserves data, resources and related information; and

(b) is a member in good standing of a professional organization.

"**qualified reserves evaluator**" means an individual who:

(a) in respect of particular reserves data, resources or related information, possesses professional qualifications and experience appropriate for the estimation, evaluation and review of the reserves data, resources and related information; and

(b) is a member in good standing of a professional organization.

"**qualified reserves evaluator or auditor**" means a qualified reserves auditor or a qualified reserves evaluator.

"**reserves**" means proved, probable or possible reserves.

"**reserves data**" means an estimate of proved reserves and probable reserves and related future net revenue, estimated using forecast prices and costs.


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