



AUSTRALIAN COMPETITION
& CONSUMER COMMISSION

Framework for the consistent reporting of natural gas reserves and resources

Consultation paper

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Australian Competition and Consumer Commission
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Glossary

Term	Meaning
1P reserves	Means proved reserves
2P reserves	Means the sum of proved and probable reserves
3P reserves	Means the sum of proved, probable and possible reserves
1C resources	Means a low estimate of contingent resources
2C resources	Means best estimate of contingent resources
acquisition	Means the gaining of an interest in a gas field
approved for development	Has the meaning given in the PRMS – that is, all necessary approvals have been obtained, capital funds have been committed, and implementation of the development project is ready to begin or is under way
basin	Means a large geological area holding a thick accumulation of sedimentary rock
coal seam gas field	Means a gas field primarily comprised of gas contained in coalbeds
contingent resources	Has the meaning given in the PRMS – that is, those quantities estimated to be potentially recoverable from known accumulations but which are not currently considered to be commercially recoverable due to one or more contingencies
conventional gas field	Means a gas field primarily comprised of gas contained in relatively porous and permeable sedimentary rocks such as sandstone and limestone. Compared to unconventional gas fields, relatively little intervention is required to promote gas flow and relatively few wells are required to produce gas over the life of the field.
deterministic method	Has the meaning given in the PRMS – that is, a method based on discrete estimate(s) corresponding to a given level of certainty, made based on available geoscience, engineering, and economic data
developed reserves	Has the meaning given in the PRMS – that is, the quantities expected to be recovered from existing wells and facilities
discoveries	Means the discovery of new gas fields, or new reservoirs in existing gas fields, with gas reserves
divestment	Means disposal of an interest in a gas field
dry gas field	Means a field that primarily comprises of dry gas (that is natural gas. without condensates or liquid hydrocarbons)
extensions	Means changes in reserves in a gas field resulting from the enlargement of the proved area
gas condensate field	Means a gas field primarily comprised of gas condensates or liquid hydrocarbons
gas field	Means an area consisting of one or more reservoirs over which the right to explore for, extract, recover or process petroleum has been granted
net revenue interest	Has the meaning given in the PRMS – that is, a revenue share of petroleum sales, after deduction of royalties or share of production owing to others under applicable lease and fiscal terms
oil field (with associated gas)	Means an oil field that also contains natural gas within the same reservoir
on production	Has the meaning given in the PRMS – that is, the project is currently producing, or capable of producing, and selling

Term	Meaning
PRMS	Means the Petroleum Resources Management System developed by the Society of Petroleum Engineers (SPE)
possible reserves	Has the meaning given in the PRMS – that is reserves that analysis of geological and engineering data suggest are less likely to be recoverable than Probable Reserves. The quantity actually recovered has a low probability of exceeding the 3P Reserves estimate. If probabilistic methods are used, there should be at least a 10% probability that the quantities actually recovered will equal or exceed the 3P Reserves estimate. For the avoidance of doubt, Possible Reserves should be the upside quantities to the 2P scenario.
probabilistic method	Has the meaning given in the PRMS – that is, a method in which the known geoscience, engineering, and economic data are used to generate a continuous range of estimates and their associated probabilities
producers	Holders of gas reserves and resources, including entities currently producing gas and those that are not currently producing but have an interest in gas reserves and/or resources
prospective resources	Has the meaning given in the PRMS – that is, those quantities estimated to be potentially recoverable from undiscovered accumulations by the application of future development projects
proved reserves	Has the meaning given in the PRMS – that is, reserves that analysis of geological and engineering data suggest are reasonably certain to be commercially recoverable. If deterministic methods are used, the term “reasonably certain” is intended to express a high degree of confidence that the quantities will be recovered. If probabilistic methods are used, there should be at least a 90% probability that the quantities actually recovered will equal or exceed the 1P Reserves estimate.
probable reserves	Has the meaning given in the PRMS – that is, reserves that analysis of geological and engineering data suggest are less likely to be recoverable than Proved Reserves but more likely to be recoverable than Possible Reserves. It is equally likely that the quantities actually recovered will be greater than or less than the 2P Reserves estimate. If probabilistic methods are used, there should be at least a 50% probability that the quantities actually recovered will equal or exceed the 2P Reserves estimate.
reserves	Has the meaning given in the PRMS – that is, those quantities of gas that are expected to be commercially recoverable
sales quantities	Has the meaning given in the PRMS – that is, those quantities available for sale after excluding the gas consumed, flared or lost in operations
unconventional gas field	Means a gas field primarily comprised of gas contained in sedimentary rocks with relatively low porosity and permeability. Compared to conventional gas fields, relatively more intervention is required to promote gas flow and a relatively high number of wells may be required over the life of the field. The International Energy Agency categorises the three major types of unconventional gas as: shale gas: natural gas contained within shale rock coal seam gas (CSG): natural gas contained in coalbeds tight gas: natural gas found in low permeability rock formations.
undeveloped reserves	Has the meaning given in the PRMS – that is, the quantities expected to be recovered through future significant investments. This includes reserves to be produced: from new wells on undrilled acreage in known accumulations; from deepening existing wells to a different but known reservoir; from infill wells that will increase recovery; or where a relatively large expenditure is required to complete an existing well or install production or transportation facilities for primary or improved recovery projects.

1. Introduction

1.1. Background

The ACCC's 2015 East Coast Gas Inquiry (2015 Inquiry) found that the gas market was not signalling expected supply problems effectively, and noted a lack of transparency around reporting of gas reserves and resources. In particular, the 2015 Inquiry found that public information on reserves and resources was fragmented and reported inconsistently, making it of limited use to gas market participants and policy-makers. The ACCC therefore recommended that all producers¹ be required to publish reserve and resource information on the Natural Gas Services Bulletin Board (Bulletin Board) using a consistent reporting framework and common gas price assumptions.²

The need for greater transparency and consistent reporting of reserves and resources estimates and the assumptions underpinning those estimates has been reinforced through the ACCC's 2017-2020 Gas Inquiry (current Inquiry).³ To this end, the ACCC and the Gas Market Reform Group (GMRG), in accordance with the Prime Minister's March 2017 direction that the two work together to advise on options to improve transparency in the gas market,⁴ recently recommended that producers be required to report information on their reserves and resources and the volume of contracted 2P reserves. This information is to be reported to the Australian Energy Market Operator (AEMO) for publication on the Bulletin Board, using the reporting framework currently being developed by the ACCC.⁵ These recommendations were set out in a report that was provided by the ACCC and the GMRG to the Council of Australian Governments (COAG) Energy Council in December 2018 entitled, *Measures to improve the transparency of the gas market*.

In keeping with this recommendation, the ACCC has developed the proposed reporting framework, which sets out:

1. the reserves and resources information that producers would be required to report
2. the bases on which producers would be required to report the reserves and resources information
3. the manner in which producers would be required to estimate reserves (including the gas price assumptions to be used in the estimation and associated disclosure requirements).

The ACCC's development of this proposed framework has been guided by the following objectives:

- provide market participants and policymakers with a better understanding of the supply outlook and, in so doing, enable more informed and efficient consumption, exploration, production, infrastructure investment and upstream policy decisions to be made

¹ The term 'producers' is used throughout this consultation paper to refer to holders of gas reserves and resources. It therefore includes entities that are currently producing gas and explorers that have an interest in gas reserves and/or resources.

² ACCC, *Inquiry into the east coast gas market*, April 2016, p. 13.

³ ACCC, *Gas Inquiry 2017-2020 Interim report*, December 2018, ch. 2.

⁴ In March 2017, the Prime Minister announced a number of measures to help deliver "cheaper, more reliable gas" in the east coast, one of which was a direction to the ACCC and the GMRG to work together to: "...advise on options to quickly improve transparency in the gas market, to facilitate competition between producers and information for purchasers. The scope will include the full supply chain – producers, transporters, retailers." (Hon. M Turnbull MP, *Measures agreed for Cheaper, More Reliable Gas*, 15 March 2017.)

⁵ ACCC and GMRG, *Joint recommendations: Measures to improve the transparency of the gas market*, December 2018.

- signal changes to the supply outlook and potential supply shortfalls in a more timely and effective manner and, in so doing, enable the market to respond more efficiently to changing market conditions and reduce market volatility
- reduce the information asymmetry that currently exists between gas suppliers and users and, in so doing, enable users to negotiate more effectively with suppliers when entering into gas supply agreements (GSAs).

The ACCC has also sought to minimise the regulatory burden and compliance costs, whilst also ensuring that the reporting framework is fit for purpose, targeted and proportionate to the issues it is intended to address. In this regard, while the proposed reporting framework is being developed for the Bulletin Board, the ACCC's view is that there would be value in other government agencies that collect reserves and resources information and the Australian Securities Exchange (ASX) to adopt the same framework. Apart from reducing compliance costs and the regulatory burden faced by producers, the adoption of a single reporting framework in Australia would ensure that reserves and resources are reported in a consistent manner to the market and policymakers.

1.2. Consultation process

The purpose of this consultation paper is to outline the ACCC's proposed reporting framework and to seek stakeholder views on this proposal and a number of specific questions set out in the paper. Submissions should be provided by **COB 12 March 2019**.

To assist stakeholders, a template has been prepared (see **attachment 1**) that stakeholders can use to provide their feedback on the questions posed in this Consultation Paper and any other matters relating to the proposed reporting framework. The ACCC strongly encourages stakeholders to use this template. Stakeholders should not feel obliged to answer each question, but rather address those issues of particular interest or concern.

Submissions should be made in electronic, text-searchable format and emailed to: gas.inquiry@acc.gov.au.

General inquiries should also be directed to gas.inquiry@acc.gov.au or nicole.ross@acc.gov.au.

All submissions will be published on the ACCC's website unless stakeholders have clearly indicated a submission is commercial-in-confidence. Stakeholders wishing to submit commercial-in-confidence material should provide both a public version and commercial-in-confidence version of their submission. The public version should clearly identify the commercial-in-confidence material by replacing the confidential material with '[c-i-c]'.

The ACCC's general policy on the collection, use and disclosure of information is set out in the *ACCC-AER information policy: the collection, use and disclosure of information*. A copy of the guide is available on the ACCC website.

1.3. Next steps

The development of the reporting framework is, as noted above, part of a broader recommendation by the ACCC and GMRG that producers be required to report their reserves and resources and the volume of contracted 2P reserves to AEMO, for publication on the Bulletin Board.

The ACCC understands that the COAG Energy Council's Senior Committee of Officials (SCO) intends to consult on these proposed reporting obligations in March 2019 and to provide its final recommendations to the COAG Energy Council in mid-2019. As part of this process, SCO will also be consulting on the changes to the National Gas Law (NGL), the National Gas Rules (NGR) and other subordinate instruments that would be required to give

effect to these recommendations and the reporting framework.⁶ The ACCC intends therefore to complete its work on the reporting framework by April 2019 so that it can be considered as part of this process.

If the Energy Council agrees to implement the reporting obligations and reporting framework, then, in a similar manner to other Bulletin Board reporting obligations, the Australian Energy Regulator (AER) will become responsible for monitoring producers' compliance with the obligations and the reporting framework.⁷

1.4. Structure of the consultation paper

Given the breadth of issues to be covered by the reporting framework, this consultation paper is structured as follows:

- Section 2 sets out the ACCC's proposal on the information to be reported by producers and the bases on which the information would have to be reported and contains a number of specific questions that the ACCC is seeking feedback on
- Section 3 sets out the ACCC's proposal on the requirements that would apply to reserves estimation (including the gas price assumptions to be used in the estimation and the associated disclosure requirements) and contains a number of specific questions that the ACCC is seeking feedback on.

A separate attachment has also been prepared, which contains the feedback template that the ACCC encourages stakeholders to use when responding to this consultation paper (attachment 1).

⁶ It is unclear at this stage whether the reporting framework will be given effect through:
(a) the inclusion of rules in the NGR;
(b) a subordinate instrument made under the NGL or NGR (e.g. a binding guideline); or
(c) a combination of (a) and (b).

Irrespective of the form it takes, compliance with the reporting framework is intended to be **mandatory**.

⁷ Under the NGL, the enforcement tools that the AER could employ if a producer failed to comply with the disclosure requirements and reporting framework will depend on whether the obligations are classified as a civil penalty provision. If they are not classified in this way, then the AER can only: seek an administrative resolution, which may include a voluntary commitment by the producer to rectify non-compliance; or institute civil proceedings in the Federal Court and seek an injunction or an order that the producer cease or remedy the conduct. If, however, they are classified as civil penalty provisions, then the AER would also be able to issue an infringement notice to the producer, or institute civil proceedings in the Federal Court seeking an order that the penalty be paid.

2. Information to be reported and bases on which it is reported

The reserves and resources reporting framework will, as noted in section 1, set out the information to be reported and the bases on which this information is to be calculated. When developing these two aspects of the proposed reporting framework, the ACCC has had regard to the objectives set out in section 1 and has also had regard to:

- the Society of Petroleum Engineers' (SPE) Petroleum Resources Management System (PRMS),⁸ which is a widely-used principles-based reporting standard that provides for a consistent approach to the calculation of petroleum quantities
- the reporting frameworks employed by a number of other Australian and international agencies, including:
 - the National Offshore Petroleum Titles Administrator (NOPTA)⁹
 - the Queensland Department of Natural Resources, Mines and Energy (DNRME)¹⁰
 - the Australian Securities Exchange (ASX)¹¹
 - the United Kingdom's Oil and Gas Authority (OGA)¹²
 - the Canadian Securities Administrators (CSA)¹³
 - the United States Securities and Exchange Commission (SEC).¹⁴

The remainder of this section provides an overview of the ACCC's proposals for these two aspects of the reporting framework and how they compare with the reporting frameworks used by other agencies. It also provides further detail on the information that producers would be required to report and the bases on which this information is to be reported. This section also sets out a number of questions the ACCC is seeking further feedback on, including in relation to the likely compliance costs.

2.1. Rationale for inclusion in the proposed reporting framework

In the 2015 Inquiry, the ACCC found that there was limited publicly available information on reserves and resources and where that information was available, it was reported in a fragmented and inconsistent manner. The ACCC, for example, found that:

- those producers that were required to report information, were required to report different information and at different times and levels of geographical aggregation
- there were a number of producers that were not required to publicly report on their reserves and resources (for example, unlisted companies and those listed overseas).

⁸ SPE, *Petroleum Resources Management System (PRMS)*, revised June 2018.

⁹ See *Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011* (Cth), Part 3; and NOPTA, *Annual title assessment report (ATAR) templates*, <http://www.nopta.gov.au/forms/reporting-templates.html> (herein referred to collectively as NOPTA ATAR requirements).

¹⁰ *Petroleum and Gas (General Provisions) Regulation 2017* (Qld), s. 43 and DNRME, *Petroleum and gas reporting guideline*, October 2018. See also <https://data.qld.gov.au/dataset/petroleum-gas-production-and-reserve-statistics> (herein referred to collectively as DNRME requirements).

¹¹ ASX, *Listing Rules – Chapter 5: Additional reporting on mining and oil and gas production and exploration activities* (herein referred to as Chapter 5 Listing Rules), 1 July 2014 and ASX, *Guidance Note 32*, 1 December 2013.

¹² OGA, *UK Oil and Gas Reserves and Resources as at end 2017*, November 2018.

¹³ CSA, *National Instrument F1-101, Standards of Disclosure for Oil and Gas Activities*, 1 July 2015 and CSA, *Companion Policy 51-101, Standards of Disclosure for Oil and Gas Activities*, 1 July 2015 (herein referred to as CSA requirements).

¹⁴ SEC, *Modernization of Oil and Gas Reporting Final Rule*, Federal Register Vol. 74, No. 9, 14 January 2009, SEC, *Code of Federal Regulations: Title 17 Chapter II, Regulation S-K, part 210.4-10 and Regulation S-X, subpart 229.1200*, accessed 20 December 2018 (herein referred to as SEC requirements).

The ACCC also found differences in the bases on which reserves and resources information were calculated by producers.

The need for greater transparency and consistency in reserves and resources reporting has been reinforced in the current Inquiry through the work the ACCC has carried out on east coast reserves and resources. It is for this reason that the ACCC is proposing that the reporting framework specify both:

- the reserves and resources information to be reported by all producers
- the bases on which this information is reported by producers.

2.2. Summary of the ACCC's proposal

Table 2.1 provides a summary of the ACCC's proposals on the information to be reported by producers and the bases on which this information is to be reported. These two aspects of the proposed reporting framework should be read in conjunction with the Glossary and box 2.1. Further insight into the way in which the ACCC envisages the reserves and resources information would be reported under this framework can be found in tables 2.2 to 2.4.

Table 2.1: Proposals on information to be reported and bases on which it is reported

Information to be reported			
Reserves	1P (proved reserves)	2P (proved plus probable reserves)	3P (proved plus probable plus possible)
	Broken down into developed and undeveloped reserves		
Resources	1C (low estimate)	2C (best estimate)	
Gas field information	<p>Each of the fields in which the reserves and resources are located must be categorised according to:</p> <ul style="list-style-type: none"> The field's stage of development: the categories include on production, approved for development, or at another development stage The type of gas contained in the field: the categories include a conventional gas field, a coal seam gas field, or another type of unconventional gas field The nature of the gas field: the categories include a dry gas field (mostly methane), a gas condensate field (mainly condensates or liquid hydrocarbons), or an oil field (where gas is found associated with oil). 		
Movements in 2P Reserves	Movements in 2P reserves in the last 12 months, broken down into: production, discoveries, acquisitions, divestments, extensions, ¹⁵ reserve reassessments and other revisions.		
Contracted 2P reserves	The total quantity of 2P reserves that have been contracted under existing GSAs reported at a basin level.		
Bases upon which information is to be reported			
Quantities to be reported and estimation methods	Reserves and resources estimates to be based on the producer's net revenue interest in the sales quantities of gas (measured in PJ) from all gas containing fields. Producers must also disclose whether they have used a deterministic, probabilistic or geostatistical method to estimate their reserves and resources.		
Reporting standard	The classification of reserves and resources and the definition of key terms used in the reporting framework, such as "1P", "2P", "3P", "1C", "2C", "developed reserves", "undeveloped reserves", "deterministic", "probabilistic", "sales quantities", "net revenue interest", "on production" and "approved for development" are to be based on the PRMS.		
Reporting level	<ul style="list-style-type: none"> Reserves and resources and movement in 2P reserves: field level. Contracted 2P reserves: basin level.¹⁶ 		
Reporting frequency	Producers to report information on an annual basis, but if any material changes in reserves and resources or contracted reserves are subsequently made, the updated information should be reported to AEMO for publication as soon as practicable.		
Evaluation requirements	Reserves and resources estimates should be prepared by, or under the supervision of, a qualified independent evaluator.		

¹⁵ Changes to the prior year's 2P reserves in a field resulting from the enlargement of its proved area.

¹⁶ A different reporting level is proposed for contracted 2P reserves to mitigate the risk that this information reduces competitive rivalry between producers when negotiating with users. To further reduce this risk, the ACCC has recommended that before publishing this information on the Bulletin Board, AEMO be required to ensure that there are at least three producers operating in that basin and if that is not the case, to further aggregate the data.

Table 2.2: Example of how the reserves, resources and gas field information would be reported

Basin/Field Name		Gas Field Information			Reserves									Contingent Resources (PJ)*	
					1P Reserves (PJ)*			2P Reserves (PJ)*			3P Reserves (PJ)*				
Basin Name	Field Name	Stage of Development	Type of gas field	Nature of gas field	Developed	Un-developed	Total	Developed	Un-developed	Total	Developed	Un-developed	Total	1C	2C
XX	AA1	On production	Conventional	Oil	5	10	15	5	10	15	5	10	15	50	100
YY	AA2	Approved for Development	CSG	Dry gas	5	10	15	5	10	15	5	10	15	50	100
YY	AA3	Other	Unconventional	Gas condensate	5	10	15	5	10	15	5	10	15	50	100

* Quantities to be based on the producer's net revenue interest in the sales quantities of gas available in the field.

Table 2.3: Example of how the movement in 2P reserves information would be reported

Basin Name	Field Name	Total 2P Reserves (as at 30 June 2017)	Breakdown of movement in 2P reserves								Total 2P Reserves (as at 30 June 2018)
			Production (PJ)*	Discoveries (PJ)*	Acquisitions (PJ)*	Divestments (PJ)*	Extensions (PJ)*	Reserve Reassessments (PJ)*	Other Revisions (PJ)*	Total movement in 2P reserves (PJ)*	
XX	AA1	15	-5	5	5	-5	5	-5	-5	-5	10
YY	AA2	20	-10	10	10	-10	10	-10	-10	-10	10
YY	AA3	5	-5	5	5	-5	5	-5	-5	-5	0

* Quantities to be based on the producer's net revenue interest in the sales quantities of gas available in the field.

Table 2.4: Example of how the contracted 2P reserves information would be reported

Basin Name	Contracted 2P reserves (PJ)*
XX	10
YY	10

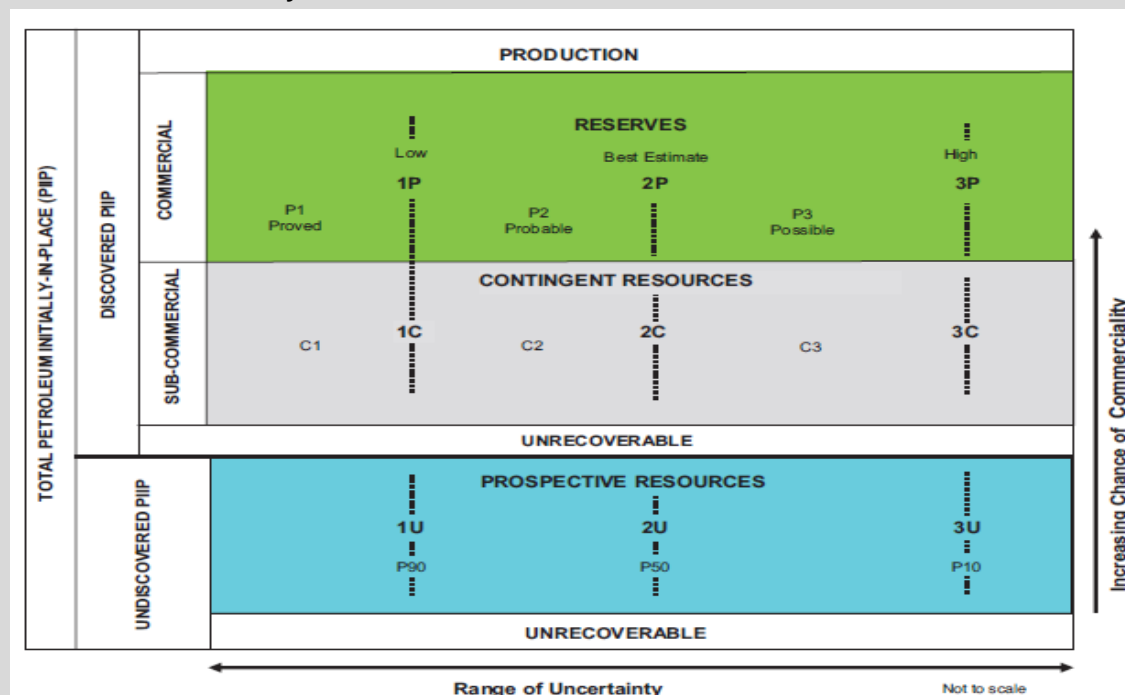
* Quantities to be based on the producer's net revenue interest in the total quantity of gas that it is obliged to supply under a GSA.

As table 2.1 reveals, the proposed framework is based on the PRMS (see box 2.1). It also draws on elements of the reporting frameworks employed by NOPTA, the ASX and other international agencies (see table 2.5).

Box 2.1: PRMS concepts used in the proposed reporting framework

The PRMS classification system is summarised in the figure below.¹⁷ As this figure shows, when a gas reservoir is discovered, it may be classified as either a reserve or resource (contingent or prospective), depending on its commerciality. Within each category of reserves and resources there are different confidence levels associated with the ability to extract the relevant quantities (for example, reserves may be classified as proved, probable or possible). Reserves may be further classified as developed or undeveloped reserves.

PRMS classification system



The key terms used in this classification system are defined by PRMS as follows:¹⁸

- **reserves** are defined as those quantities of gas that the producer has determined to be commercially recoverable and has a firm intention to proceed with development
- **contingent resources** are defined those quantities estimated to be potentially recoverable but not yet commercial to develop, due to one or more contingencies (i.e. there is currently no viable market, or the commercial recovery depends on the development of technology or infrastructure)
- **prospective resources** are those quantities estimated to be potentially recoverable from undiscovered accumulations by the application of future development projects.

The reserve and resource categories included in the ACCC's proposed framework are defined by PRMS as follows:¹⁹

- **1P (Proved reserves):** low estimate of reserves (if probabilistic methods are used, there should be at least a 90% probability the quantities actually recovered will equal or exceed the low estimate)
- **2P (Proved plus probable reserves):** best estimate of reserves (if probabilistic methods are used, there should be at least a 50% probability the quantities actually recovered will equal or

¹⁷ SPE, *Petroleum Resources Management System (PRMS)*, revised June 2018, p. 2.

¹⁸ *ibid*, p. 3.

¹⁹ *ibid*, pp 13, 35, 36.

exceed the best estimate)

- **3P (Proved plus probable plus possible reserves):** high estimate of reserves (if probabilistic methods there should be at least a 10% probability that the quantities actually recovered will equal or exceed the high estimate)
- **1C:** low estimate of contingent resources (if probabilistic methods are used, there should be at least a 90% probability the quantities actually recovered will equal or exceed the low estimate)
- **2C:** best estimate of contingent resources (if probabilistic methods are used, there should be at least a 50% probability the quantities actually recovered will equal or exceed the best estimate)
- **3C:** high estimate of contingent resources (if probabilistic methods are used, there should be at least a 50% probability the quantities actually recovered will equal or exceed the best estimate)

Developed reserves and undeveloped reserves are defined by PRMS as follows:²⁰

- **developed reserves** are the quantities expected to be recovered from existing wells and facilities
- **undeveloped reserves** are the quantities expected to be recovered through future significant investments.

Sales quantities and net revenue interest are defined by PRMS as follows:

- **sales quantities** are those quantities available for sale after excluding the gas consumed, flared or lost in operations and non-hydrocarbons that must be removed before sale (including water)²¹
- **net revenue interest** is a producer's revenue share of sales after deduction of royalties or share of production owing to others under applicable lease and fiscal terms.²²

Deterministic, probabilistic and geostatistical estimation methods are defined by PRMS as follows:²³

- a **deterministic** assessment method is one that is based on discrete estimate(s) corresponding to a given level of certainty, made based on available geoscience, engineering, and economic data
- a **probabilistic** assessment method is one in which the known geoscience, engineering, and economic data are used to generate a continuous range of estimates and their associated probabilities
- **geostatistical** assessment methods include a variety of mathematical techniques and processes dealing with the collection, methods, analysis, interpretation, and presentation of large quantities of geoscience and engineering data to (mathematically) describe the variability and uncertainties within any reservoir unit or pool.

The project maturity-based reserve sub-classifications 'on production' and 'approved for development' are defined by PRMS as follows:²⁴

- **on production** means the project is currently producing or capable of producing and selling gas.
- **approved for development** means all necessary approvals have been obtained, capital funds committed, and implementation of the development project is ready to begin or is under way.

Comparison with other reporting frameworks

Table 2.5 provides a summary of the reporting frameworks employed by a number of Australian and international agencies and shows how these frameworks compare with the ACCC's proposals on the information to be reported and the bases on which information is to be reported.

²⁰ *ibid*, p. 34.

²¹ *ibid*, p. 20.

²² *ibid*, pp 45, 23-24.

²³ *ibid*, pp. 40, 43, 46.

²⁴ *ibid*, p. 31.

Table 2.5: Comparison of reporting requirements

	Information Reported							Bases on which Information Reported						
	Reserves			Resources				Movement (mvt) in reserves	Contracted 2P reserves	Classification System	Quantities	Reporting Level	Frequency	Evaluation requirements
	1P	2P	3P	1C	2C	3C	Prospective							
ACCC														
ACCC proposal	Broken down by developed and undeveloped for each category			Total only		n.a.		Mvt in 2P reserves broken down into categories	Reported at basin level.	PRMS	Net revenue interest in sales quantities	Field for all information except contracted 2P	Annual with updates if there are material changes	Prepared by, or under supervision, of qualified evaluator
Australian agencies														
ASX²⁵	Broken down by developed and undeveloped reserves for each category Also broken into unconventional quantities		Optional	Optional			Mvt in 1P, 2P and 2C (if reported) and explanation of material change	n.a.	PRMS	Net revenue interest in sales or raw quantities (if raw non-sales gas must also be reported)	Geographic area ²⁶	Annual (part of annual financial report)	Prepared by, or under supervision, of qualified evaluator	
NOPTA²⁷ (not public)		Total only		Total only			n.a.	n.a.	PRMS	n.a.	Pools within each field	Annual (anniversary of title)	n.a.	
DNRME²⁸	Where available	Total only	Where available	Where available			n.a.	n.a.	PRMS	Total volume in each reservoir	Reservoirs within each field	Six monthly but published with 6mth lag	No specific requirements but info must be auditable.	
International agencies														
UK OGA²⁹	Broken down by fields in production and under development			Broken down by producing fields, proposed new developments and marginal discoveries		Prospect, lead or play	Mvt in 2P reserves and 2C resources broken down into categories	n.a.	PRMS with modifications to sub-categories	n.a.	Field but aggregated to basin for publication	Annual	n.a.	
US SEC³⁰	Broken down by developed and undeveloped	Optional (Broken down by developed and undeveloped)		n.a.			Mvt in 1P undeveloped and reasons for mvt	Disclosure of contracted volumes ³¹	Similar to PRMS	Net revenue interest in sales quantities	Country or continent	Annual (part of annual financial report)	No specific requirements	
Canada CSA³²	Broken down by developed (producing vs non-producing) & undeveloped	Total only	Optional	Optional			Mvt in 1P and 2P broken down into categories	Disclosure of contracted volumes if they protect producer from full effect of market prices	COEGH (consistent with PRMS)	Gross and net quantities	Country	Annual (part of annual financial report)	Estimates must be accompanied by report from independent qualified evaluator or auditor	

²⁵ See ASX, Chapter 5 Listing Rules, 1 July 2014.

²⁶ The ASX provides producers some discretion to determine the geographic areas used for reporting, but has noted it should be determined having regard to the materiality of the reserves.

²⁷ See NOPTA ATAR requirements (see footnote 9).

²⁸ See DNRME requirements (see footnote 10). The information identified as 'Where available' is not required by the Regulations, but is referred to in the guideline as being "good industry practice".

²⁹ See OGA requirements (see footnote 12).

³⁰ See SEC requirements (see footnote 13).

³¹ If a producer is committed to provide a fixed and determinable quantity of gas under existing contracts, it must, amongst other things, disclose the quantities of gas subject to the commitment.

³² See CSA requirements (see footnote 14). The COEGH is the Canadian Oil and Gas Evaluation Handbook.

As this table shows, while there are some similarities between the reporting frameworks employed by other agencies and the ACCC's proposal, there are also some notable differences. For example:

- the ACCC's proposal goes further than the ASX, SEC, CSA and DNRME reporting frameworks by mandating that 3P reserves, 1C and 2C resources be reported in addition to 1P and 2P reserves
- the ACCC's proposal is more confined than the NOPTA and OGA reporting frameworks, requiring only 1C and 2C resources be reported and excluding 3C and prospective resources.

While not shown in the table, there are a number of other areas in which the reporting frameworks employed by other agencies require additional information that has not been included in the ACCC's proposal. For example:

- NOPTA requires information on exploration and development activities carried out in the previous year and planned for the following year,³³ while the SEC requires disclosure of investments and progress made to convert proved undeveloped reserves into proved developed reserves³⁴
- the ASX,³⁵ SEC³⁶ and CSA³⁷ require detail on why undeveloped reserves have not been developed after a specified period of time
- NOPTA requires production forecasts to be disclosed for the life of the field.³⁸

The differences outlined above primarily stem from the differences between the objective of the ACCC's proposed framework and the objectives of the other frameworks. As noted in section 1, the ACCC's objectives in developing the proposed reporting framework are to:

- provide market participants and policymakers a better understanding of the supply outlook and, in so doing, enable more informed and efficient consumption, exploration, production, infrastructure investment and policy decisions to be made
- signal changes to the supply outlook and potential supply problems in a more timely and effective manner and, in so doing, enable the market to respond more efficiently to changing conditions
- reduce the information asymmetry that currently exists between gas suppliers and users and, in so doing, enable users to negotiate more effectively with suppliers.

In contrast, the objectives of:

- NOPTA are to advise on and administer the offshore petroleum titles regime to support the effective regulation of oil and gas resources consistent with good oil field practice and optimum recovery³⁹
- the OGA are to maximise the economic recovery of the UK's oil and gas resources⁴⁰
- the ASX, CSA and SEC are to enable capital market participants to make informed investment decisions and to value listed gas producers.⁴¹

³³ See NOPTA ATAR requirements (see footnote 9).

³⁴ SEC, *Code of Federal Regulations: Title 17 Chapter II, Regulation S-X*, s. 229.1203.

³⁵ ASX, *Chapter 5 Listing Rules*, 1 July 2014, r. 5.39.4.

³⁶ SEC, *Code of Federal Regulations: Title 17 Chapter II, Regulation S-X*, s. 229.1203.

³⁷ See CSA, *Form 51-101F1 – Statement of Reserves Data and Other Oil and Gas Information*, item 5.1.

³⁸ See NOPTA ATAR requirements (see footnote 9).

³⁹ NOPTA, *Corporate Plan 2017-2020*, July 2017.

⁴⁰ See <https://www.ogauthority.co.uk/about-us/what-we-do/>.

The differences in objectives mean that some aspects of these other reporting frameworks are more or less relevant to the ACCC's proposed reporting framework than others.

The remainder of this section provides further detail on the information to be reported and the bases on which the information is to be reported under the proposed reporting framework, and the specific matters the ACCC is seeking stakeholder feedback on.

2.3. Information to be reported

2.3.1. Categories of reserves

The ACCC proposes that producers be required to prepare 1P, 2P and 3P reserve estimates and to report this information to AEMO for publication on the Bulletin Board, along with a breakdown of each reserve category into 'developed' and 'undeveloped' reserves.

While 2P reserves are generally considered the most realistic assessment of recoverable quantities, uncertainty in reserve estimates is, as noted in the PRMS, best communicated by reporting a range of categories.⁴² Requiring producers to report 1P reserves would, for example, provide market participants with greater insight into the downside risk associated with the 2P reserve estimates, while 3P reserves would provide a better insight into the potential upside associated with 2P reserves.

Requiring producers to break these estimates down into 'developed' and 'undeveloped' reserves would also provide market participants with greater insight into the different risk profiles associated with the reserves and the extent to which further investment may be required to develop the reserves.

In the ACCC's view, the insights that would be provided by this information are consistent with the objectives of the reporting framework. The ACCC seeks stakeholders' views on this aspect of the reporting framework and the questions set out in box 2.2 below.

Box 2.2: Questions on categories of reserves

1. Do you agree that producers should be required to report on their 1P, 2P and 3P reserves estimates?
 - (a) If so, please explain how you would use this information and the benefit it would provide.
 - (b) If not, please explain why.
2. Do you agree that producers should be required to break down their 1P, 2P and 3P reserves into developed and undeveloped reserves?
 - (a) If so, please explain how you would use this information and the benefit it would provide.
 - (b) If not, please explain why.
3. Should it be mandatory for producers to develop 3P reserves estimates, or should the reporting of this information be optional as it is under the ASX Listing Rules and in other jurisdictions?

2.3.2. Categories of resources

The ACCC proposes that producers be required to develop 1C and 2C contingent resources and to report this information to AEMO for publication on the Bulletin Board.

The ACCC understands that some care must be taken in relation to contingent resource estimates because, in contrast to reserves, they are not yet considered commercial to

⁴¹ See for example, *SEC Modernization of Oil and Gas Reporting Final Rule*, Federal Register Vol. 74, NO. 9, 14 January 2009.

⁴² SPE, *PRMS*, revised June 2018, para 2.2.2.1.

develop. However, consistent with the objectives of the reporting framework, the publication of 1C and 2C contingent resources would, in the ACCC's view, provide market participants and policymakers valuable insights into the potential upside to reserve estimates and the longer-term supply outlook.

While the ACCC can see the value of requiring 1C and 2C resources to be reported, it is not convinced about the need for 3C or prospective resources to be reported because these resource categories are more speculative in nature. The ACCC is not therefore proposing to include these resource categories in the reporting framework.

The ACCC welcomes further feedback on this aspect of the reporting framework and on the questions set out in the box below.

Box 2.3: Questions on categories of resources

4. Do you agree that 1C and 2C contingent resources should be reported?
 - (a) If so, please explain how you would use this information and the benefit it would provide.
 - (b) If not, please explain why.
5. Do you think it should be mandatory for producers to develop 1C and 2C contingent resource estimates, or should the reporting of this information be optional as it is under the ASX Listing Rules and in other jurisdictions?
6. Do you think any other resource categories (e.g. 3C contingent resources or prospective resources) should be reported? If so, please explain how you would use this information and the benefit it would provide.

2.3.3. Gas field information

The ACCC proposes that producers be required to report the following information to AEMO for publication on the Bulletin Board for each of the fields in which their reserves and resources are located:

- **The field's stage of development** and, in particular, whether the field is 'on production', has been 'approved for development' or at another stage of development.
- **The type of gas contained in the field** and, in particular, whether the field is a conventional gas field, a coal seam gas field, or another type of unconventional gas field.
- **The nature of the field** and, in particular, whether the field is a dry gas field (mostly methane), a gas condensate field (mainly condensates or liquid hydrocarbons), or an oil field (where gas is found associated with oil).

Requiring producers to report on their fields' stage of development, would provide market participants and policymakers more insight into the likely timing of the development of reserves in those fields. Information on the type of gas contained in the field and the nature of the field would provide more insight into the potential performance of the field, the extraction and processing methods that may be required and the development and production costs and risks.

In the ACCC's view, the insights that would be provided by this information are consistent with the objectives of the reporting framework. The ACCC seeks stakeholders' views on this aspect of the proposed reporting framework and the questions set out in the box below.

Box 2.4: Questions on gas field information

7. Do you agree that information on the field's stage of development, the type of gas and the nature of the gas field should be reported?
 - (a) If so, please explain how you would use this information and the benefit it would provide.
 - (b) If not, please explain why.
8. Do you agree with the categories that have been proposed for the field's stage of development, the type of gas and/or the nature of the gas field? If not, please explain why and what alternatives you would suggest.
9. Is there any other gas field information that you think should be reported? If so, please explain why you think this is consistent with the objectives of the reporting framework.

2.3.4. Movement in 2P reserves

The ACCC proposes that producers be required to report the annual movements in their 2P reserves to AEMO for publication on the Bulletin Board and to provide a breakdown of the movement in reserves arising as a result of:

- the production of gas
- the discovery of new reservoirs in existing fields with 2P reserves
- the extension of a field's proved area
- acquisitions of interests in a field
- divestments of interests in a field
- reserves reassessments (i.e. write-downs or upward revision of 2P reserves)
- other revisions.

The publication of this information would enable market participants and policymakers to reconcile current 2P reserve estimates with estimates from the prior year. It would also provide greater insights into the drivers of the change in 2P reserves and the supply outlook. It would, for example, provide an indication of:

- the extent to which production from a field is being replaced by discoveries or extensions (i.e. reserves replacement) and if further investment may be required
- whether a field is in decline or if there is still some upside potential (e.g. through discoveries or extensions)
- the performance of a field and development risks, particularly if there has been a write-down of reserves.⁴³

The publication of this information would therefore be consistent with the objectives of the reporting framework.

The ACCC is interested in stakeholders' views on this aspect of the reporting framework and the questions set out in box 2.5 below.

⁴³ The insights that can be provided by this type of information were highlighted in section 2.7 of the Gas Inquiry December 2018 Interim Report. In short, the analysis in this section, which was based on equivalent information to that described above, showed that 2P reserves had fallen by approximately 5,000 PJ (~12%) in the 12 months to 30 June 2018, with the majority of the decline arising as a result of significant write downs in the Bowen and Surat basins. It also showed that while 2P reserves had declined in most basins over the period, they had actually grown in the Otway basin as a result of extensions.

See ACCC, *Gas Inquiry 2017-2020 Interim Report*, December 2018, pp. 51-52.

Box 2.5: Questions on movement in 2P reserves

10. Do you agree that annual movements in 2P reserves should be reported?
 - (a) If so, please explain how you would use this information and the benefit it would provide.
 - (b) If not, please explain why.
11. Do you agree with the categories that have been proposed for the breakdown of movements in 2P reserves? If not, please explain why.
12. Do you think there would be value in also requiring producers to report on annual movements in 2C resources?
 - (a) If so, please explain how you would use this information and the benefit it would provide.
 - (b) If not, please explain why.

2.3.5. Contracted 2P reserves

The ACCC and GMRG have recommended that producers be required to provide AEMO with information on the volume of 2P reserves that have been contracted under existing GSAs for publication on the Bulletin Board.⁴⁴ When read in conjunction with 2P reserves estimates, the publication of this information is intended to provide market participants and policymakers with a better understanding of remaining uncontracted reserve levels and the extent to which further investment may be required to meet future demand.

The ACCC understands that this recommendation will be consulted upon by SCO as part of the broader consultation on the ACCC-GMRG's proposed transparency measures. If it is implemented, the ACCC proposes that the reporting framework require:

- (a) producers to report the total contract quantities they are contracted to supply under GSAs at a basin level
- (b) AEMO to determine whether there are at least three producers operating in the basin before publishing the information on the Bulletin Board and, if not, to further aggregate the data (e.g. by region) to ensure this threshold is met.⁴⁵

The latter of these proposals is designed to mitigate the risk identified in the ACCC-GMRG joint transparency recommendations. That is, when the supply-demand balance is tight, as it currently is in the east coast, there is a risk that the publication of individual producers' positions could accord those producers that have uncontracted reserves a greater degree of bargaining power in negotiations with gas users.⁴⁶

The ACCC is interested in hearing stakeholders' views on this aspect of the proposed reporting framework and the questions set out in the box below.

⁴⁴ ACCC and GMRG, *Joint recommendations: Measures to improve the transparency of the gas market*, December 2018, p. 16.

⁴⁵ If the information is aggregated across at least three producers, it will be impossible for one party to work out the actual quantity of the contracted reserves of another party without access to the private market information of the other party.

⁴⁶ ACCC and GMRG, *Joint recommendations: Measures to improve the transparency of the gas market*, December 2018, p. 16.

Box 2.6: Questions on contracted 2P reserves

13. Do you agree that if the ACCC and GMRG's recommendation on contracted 2P reserves is implemented that:
- (a) producers should be required to report the total quantity of 2P reserves that they are contracted to supply as total contract quantities under GSAs at a basin level? If not, please explain why.
 - (b) AEMO should be required to further aggregate the information if there are less than three producers operating in the basin? If not, please explain why.

2.3.6. Other information

As noted in section 2.2, producers are required to report a range of other information under the reporting frameworks employed by other agencies. The ASX,⁴⁷ SEC⁴⁸ and CSA,⁴⁹ for example, require producers to provide an explanation of why reserves that have remained undeveloped for a specified period of time have not been developed and their statement of the producer's intention with regard to the development of those reserves. The ASX and CSA also require producers to disclose, amongst other things, when the development of undeveloped reserves is anticipated and the plans for developing those reserves.⁵⁰ The SEC, on the other hand, requires producers to discuss the investments and progress made in converting undeveloped reserves to developed reserves.⁵¹

The ACCC welcomes stakeholders' views on whether this type of information, or any other information should form part of the reporting framework.

Box 2.7: Questions on other information

14. Is there any other information that you think should form part of the reporting framework? If so, please set out:
- (a) what the information is
 - (b) how you would use the information and the benefit it would provide
 - (c) why you think the inclusion of this information would be consistent with the objectives of the reporting framework.

2.4. Bases upon which information is to be reported

2.4.1. Reporting standard

The ACCC proposes that the PRMS be used as the reporting standard in the proposed reporting framework. Specifically, the ACCC proposes that producers be required to:

- use the PRMS classification system and report their reserves and resources in the most specific category that reflects the degree of uncertainty in the estimated quantities (i.e. 1P, 2P or 3P reserves and 1C or 2C resources)
- use the PRMS definitions set out in box 2.1 when reporting:
 - the breakdown of 1P, 2P and 3P reserves into developed and undeveloped reserves

⁴⁷ ASX, *Chapter 5 Listing Rules*, 1 July 2014, r. 5.39.4.

⁴⁸ SEC, *Code of Federal Regulations: Title 17 Chapter II, Regulation S-X*, s. 229.1203.

⁴⁹ See CSA, *Form 51-101F1 – Statement of Reserves Data and Other Oil and Gas Information*, item 5.1.

⁵⁰ See ASX, *Chapter 5 Listing Rules*, 1 July 2014, r. 5.31.6 and CSA, *Form 51-101F1 – Statement of Reserves Data and Other Oil and Gas Information*, item 5.1.

⁵¹ SEC, *Code of Federal Regulations: Title 17 Chapter II, Regulation S-X*, s. 229.1203.

- the quantities of reserves and resources
- the analytical method used to estimate reserves and resources
- information on a field's stage of development.

The PRMS classification system is, as noted in table 2.5, used by NOPTA⁵² and the ASX⁵³ to classify reserves and resources. The definitions outlined in box 2.1 are also used by the ASX.⁵⁴

While the ACCC understands that the classification systems used by agencies in other jurisdictions, such as the OGA, CSA and SEC, differ to some extent from the PRMS,⁵⁵ the ACCC does not at this stage consider it necessary to make any modifications to the PRMS. The ACCC is, however, seeking stakeholders' views on this issue and the questions set out below.

Box 2.8: Questions on reporting standard

15. Do you agree that the PRMS classification system should be used in the proposed reporting framework? If not, please explain why.
16. Do you agree that the PRMS definitions set out in box 2.1 should be used in the proposed reporting framework? If not, please explain why.
17. Are there any other reporting standards or definitions that you think should be reflected in the reporting framework?

2.4.2. Quantities to be reported and estimation methods

Consistent with the approach recommended in the PRMS,⁵⁶ the ACCC proposes that the reserves and resources information outlined in section 2.2 be reported on:

- a sales quantity basis, which represents the gas available for sale after excluding the gas consumed, flared or lost in operations and non-hydrocarbons that must be removed before sale^{57 58}
- a net revenue interest basis, which represents the producer's revenue share of gas sales after deducting royalties or the share of production owing to others under applicable lease and fiscal terms.⁵⁹

To ensure consistency in the way quantities are reported, the ACCC proposes that this information be reported in petajoules (PJ).

In a similar manner to the PRMS, the ACCC is of the view that producers should have some discretion as to whether they use deterministic or probabilistic methods to estimate their reserves and resources (see box 2.1 for more detail on these methods). The ACCC does,

⁵² NOPTA, *Annual tittle assessment report templates*, <http://www.nopta.gov.au/forms/reporting-templates.html>

⁵³ ASX, *Listing Rules – Additional reporting on mining and oil and gas production and exploration activities*, 1 July 2014, r. 5.25.2.

⁵⁴ *ibid*, rules 5.25.5, 5.25.6, 5.31.5, 5.39.2 and 5.44.

⁵⁵ The OGA, for example, utilises the PRMS definitions for reserves and resources but uses a different approach for the sub-classification of reserves. The CSA, on the other hand, uses the Canadian Oil and Gas Evaluation Handbook (COGEH) rather than PRMS and while the classification system in the COGEH is similar to the PRMS, there are some differences.

⁵⁶ This approach is also employed by the ASX. See ASX, Chapter 5 Listing Rules, 1 July 2014, r. 5.25.5.

⁵⁷ SPE, *PRMS*, June 2018, p. 3.

⁵⁸ The ACCC understands this differs from the approach adopted by the DNRME, which is that reserves be reported in each underground reservoir and therefore includes gas consumed, flared or lost in operations (see *Queensland Petroleum and Gas (General Provisions) Regulation 2017*, r. 43). It is, however, consistent with the approach recommended by PRMS and the approach required by the ASX (see ASX, Chapter 5 Listing Rules, 1 July 2014, r. 5.39).

⁵⁹ SPE, *PRMS*, June 2018, p. 45.

however, propose that producers be required to disclose which method they have used when reporting these quantities.⁶⁰

The ACCC is interested in hearing stakeholders' views on these proposals and the questions set out in the box below.

Box 2.9: Questions on quantities and analytical methods

18. Do you agree that reserves and resources should be reported on the basis of sales quantities? If not, please explain why.
19. Do you agree that reserves and resources should be reported on a net revenue basis? If not, please explain why.
20. Do you agree that producers should be required to disclose the analytical method they have used to estimate their reserves and resources? If not, please explain why.

2.4.3. Reporting level

The ACCC proposes that:

- the reserves and resources information set out in sections 2.2.1-2.2.4 be reported at a field level
- the contracted 2P reserves information set out in section 2.2.5 be reported at a basin level.

The latter of these proposals is discussed in section 2.2.5. The remainder of this section therefore focuses on the proposal for reserves and resources to be reported at a field level.

The ACCC understands that this issue was considered by the Australian Energy Market Commission (AEMC) as part of its East Coast Wholesale Gas Markets and Pipeline Frameworks Review (East Coast Review) and that the AEMC recommended that reserves be reported at a field level.⁶¹ In doing so, the AEMC noted that this approach would be less onerous than that applied by the DNRME in Queensland where reserves are reported on a reservoir basis.^{62,63} The ACCC agrees with the AEMC and notes that this approach would also be less onerous than that employed by NOPTA, which requires reserves and resources to be reported for each pool within a field.⁶⁴ Another benefit of reporting information at a field level is that it would provide an indication of how close the reserves and resources are to existing infrastructure and an insight into some of the development risks that may be associated with those reserves and resources.

Another option that the ACCC has considered is to require reserves and resources to be reported at a basin level. However, it is not clear that this option would be any less onerous for producers to comply with, given they would still need to estimate their reserves at a field level before aggregating it up to a basin level. Reporting at a basin level would also limit the insights that could be obtained on the performance and supply outlook for individual fields. It is for these reasons that the ACCC is proposing reporting at a field level. The ACCC is nevertheless interested in hearing stakeholders' views on the alternative reporting levels that could be used for reserves and resources information.

⁶⁰ This is consistent with the approach employed by the ASX. See ASX, Chapter 5 Listing Rules, 1 July 2014, r. 5.25.6.

⁶¹ AEMC, *East Coast Wholesale Gas Market and Pipeline Frameworks Review - Stage 2 Final Report Information Provision*, 23 May 2016, pp. 64-65.

⁶² *ibid.*

⁶³ See DNRME requirements (see footnote 10).

⁶⁴ See NOPTA ATAR requirements (see footnote 9).

Box 2.10: Questions on reserves and resources reporting level

21. Do you agree that the reserves and resources information set out in sections 2.2.1-2.2.4 should be reported at a field level?
- (a) If so, please explain how you would use this information and the benefit it would provide.
 - (b) If not, please explain why and set out what reporting level you think should be adopted.

2.4.4. Frequency and timing of reporting

The ACCC proposes that the information set out in section 2.2 be reported by producers to AEMO on an annual basis. The ACCC also proposes that if any material changes are subsequently made to the reserves and resources information set out in sections 2.1-2.2 or the contracted 2P reserves information in section 2.5, the updated information (including an explanation for any revisions) should be reported to AEMO for publication on the Bulletin Board as soon as practicable.

This proposal is broadly consistent with the AEMC's recommendation in the *East Coast Gas Review*,⁶⁵ which was that producers should be required to report on an annual basis but if revised estimates are subsequently reported to the ASX, or to another government agency, the updated information should be reported to AEMO.⁶⁶ Elaborating on this further, the AEMC noted that:⁶⁷

"This requirement has been included in the proposed rules to capture any changes in reserves that occur during the year as a result of impairments or new discoveries, but will only be triggered if the information is also reported to the ASX or a state, territory or Commonwealth government agency."

In terms of the timing of reporting, the options that the ACCC is considering, include:

- (a) requiring all producers to report their reserves and resources as at a fixed date (e.g. as at 30 June), which is the approach employed by the Queensland DNRME⁶⁸
- (b) requiring producers to report their reserves and resources information as at the end of the producer's financial year, which is the approach employed by the ASX,⁶⁹ or
- (c) allowing producers to determine when they report their reserves and resources information within the year.

A key advantage of option (a) is that it would provide a more accurate picture of reserves and resources at a fixed point in time in the year than the other alternatives.⁷⁰ The implementation of this option could, however, impose additional costs on those producers that are required to report at a different time of year under other reporting regimes.⁷¹ It was for this reason that the AEMC recommended in its *East Coast Gas Review*, that producers have some discretion

⁶⁵ AEMC, *East Coast Wholesale Gas Market and Pipeline Frameworks Review - Stage 2 Final Report Information Provision*, 23 May 2016, p. 64.

⁶⁶ The ACCC understands that there are a number of rules in Part 18 of the NGR that require material changes to be reported to AEMO for publication of the Bulletin Board. See for example, rules 168, 178 and 182- 185.

⁶⁷ AEMC, *East Coast Wholesale Gas Market and Pipeline Frameworks Review - Stage 2 Final Report Information Provision*, 23 May 2016, pp. 63-64.

⁶⁸ *Petroleum and Gas (General Provisions) Regulation 2017* (Qld), s. 43.

⁶⁹ ASX, Chapter 5 Listing Rules, 1 July 2014, r. 5.39.1.

⁷⁰ This approach would, for example, avoid the risk of double counting or under reporting if there are any acquisitions or divestments in a year and there is a mismatch in the timing of reporting between the acquirer and the seller. The double counting of reserves or resources could arise in this scenario if the acquirer is first to report, while under-reporting could occur if the seller reports first. The ASX has sought to mitigate this risk by including a requirement for quarterly interim reporting of tenements acquired and disposed of. See ASX, Chapter 5 Listing Rules, 1 July 2014, r. 5.4.3.

⁷¹ For example, if the producer is an ASX listed entity and has a different financial end of year date.

as to when they report,⁷² subject to the caveat that any revisions subsequently reported to the ASX, or to another government agency are also reported.

The ACCC welcomes feedback stakeholders have on these options.

The ACCC also welcomes feedback on the materiality threshold that should be adopted for any updates of reserves and resources. The ACCC understands that the term 'material change' is currently used in other parts of the Bulletin Board reporting regime to refer to a change exceeding 10%.⁷³ While this appears to be an appropriate threshold to use in this context, the ACCC is interested in stakeholders' views on this issue.

Box 2.11: Questions on the frequency and timing of reporting

22. Do you agree that the frequency of reporting should be annual? If not, please explain why.

23. Do you agree that producers should also be required to report on any material changes in reserves and resources estimates that occur within the year?

(a) If so:

- i. do you think there should be any limitation on the requirement to report changes (for example, should the requirement be limited to changes in reserves and resources that are advised to the ASX and/or government agencies, or should it be limited to material changes in reserves and resources)?
- ii. do you think the threshold for material changes should be set at +/-10% or do you think another threshold would be more appropriate?

(b) If not, please explain why.

24. Do you think that all producers should be required to report their reserves and resources as at a fixed date? If not, please explain why and the option you believe should be employed.

2.4.5. Evaluation requirements

The ACCC proposes that the reserve and resource estimates reported by producers be subject to a requirement that the estimates be prepared by, or under the supervision of, an independent qualified petroleum reserves and resources evaluator.⁷⁴

This proposal, which draws on ASX⁷⁵ and CSA⁷⁶ requirements, is designed to ensure the consistent and impartial application of estimation processes. Consistency and impartiality in the estimation process would provide market participants and policymakers with a more accurate picture of the supply outlook than may otherwise be possible.

Implementing this proposal should also provide market participants and policymakers greater confidence in the reserves and resources information that is reported. As noted in section 1.1, producers benefit from the information asymmetry that currently surrounds reserves and resources and may therefore have, or be perceived to have, an incentive to make decisions in the estimation process which maintain a degree of information asymmetry. A requirement that estimates be prepared by an independent qualified evaluator, or under the supervision of such an evaluator, should therefore increase trust in the information.

⁷² AEMC, *East Coast Wholesale Gas Market and Pipeline Frameworks Review - Stage 2 Final Report Information Provision*, 23 May 2016, pp. 63-64.

⁷³ See for example rule 141 of the NGR.

⁷⁴ Defined as: A member of good standing of a professional organisation of engineers, geologists or other geoscientists whose professional practice includes petroleum reserves and contingent resources evaluations and/or audits. The professional organisation must have disciplinary powers, including the power to suspend or expel a member.

⁷⁵ In relation to qualifications: see ASX, Chapter 5 Listing Rules, 1 July 2014, r. 5.41-5.44.

⁷⁶ In relation to independence: see CSA, *National Instrument 51-101 Standards of Disclosure for Oil and Gas Activities*, 1 July 2015, s. 1.1, and CSA, *Companion Policy 51-101: Standards of Disclosure for Oil and Gas Activities*, 31 December 2015, s. 1.1(3).

Box 2.12: Questions on evaluation requirements

25. Do you agree that reserve and resource estimates should be required to be prepared by, or under the supervision of, an independent qualified evaluator? If not, please explain why.
26. Do you think that any other evaluation requirements (e.g. a requirement to obtain an independent audit) should be implemented?

2.5. Compliance costs

The ACCC has sought to minimise the compliance costs and regulatory burden associated with these two aspects of the proposed reporting framework by, for example:

- proposing the use of the same reporting standard and reporting bases employed by other agencies in Australia
- proposing annual reporting, with updates only being required if there is a material change in reserves and resources.

Notwithstanding the steps that have been taken, there will be some costs associated with complying with the reporting requirements outlined above. The ACCC is therefore interested in hearing from producers on:

- the **incremental** costs they expect to incur complying with the reporting requirements set out in sections 2.3 and 2.4
- if there are any refinements that could be made to the reporting requirements in sections 2.3-2.4, to further reduce compliance costs or the regulatory burden, whilst also ensuring the requirements are fit for purpose and achieves the objectives set out in section 1.

The term incremental costs is used in this context, because the ACCC is aware that producers are already subject to reserves and resources reporting requirements at a state, territory or Commonwealth level and that ASX listed entities are also subject to reporting requirements. The ACCC is therefore only interested in the incremental costs that producers are likely to incur in complying with the proposed framework.

Box 2.13: Questions on compliance costs

27. What incremental costs do producers expect to incur in complying with the reporting requirements proposed in sections 2.3 and 2.4?
28. Do you think there are any refinements that could be made to the proposed reporting requirements in sections 2.3 and 2.4 to further reduce compliance costs or the regulatory burden, whilst also ensuring the requirements are fit for purpose and achieves the objectives set out in section 1?

3. Reserves estimation requirements

In addition to the matters set out in section 2, the reporting framework will set out:

- the manner in which reserves are to be estimated
- how the gas price assumptions used in the estimation of reserves are to be determined
- the disclosure requirements associated with these gas price assumptions.

In a similar manner to other aspects of the proposed reporting framework, the development of this aspect of the reporting framework has been guided by the objectives set out in section 1. The ACCC has also had regard to the PRMS and the approaches that have been employed in other reporting frameworks.

Before setting out the ACCC's proposed approach to this aspect of the reporting framework, it is worth taking the time to set out:

- the rationale for extending the reporting framework to the manner in which reserves are to be estimated and the gas price assumptions used in the estimation of reserves
- the guidance provided in the PRMS and other reporting frameworks about how reserves are to be estimated, the gas price assumptions to be used in the estimation and the disclosure requirements.

These issues are discussed, in turn, below, along with the ACCC's proposed approach to this aspect of the reporting framework and the specific questions the ACCC is seeking further feedback on.

3.1. Rationale for inclusion in the proposed reporting framework

As noted in box 2.1, reserves are defined by the PRMS as those quantities of gas that are "commercially recoverable" and the producer has demonstrated a "firm intention to proceed with the development".⁷⁷ The assessment of whether quantities are commercially recoverable requires a range of assumptions to be made about forecast conditions. Assumptions must, for example, be made about the costs that are expected to be incurred in bringing the gas to market, the prices that are expected to be received from the sale of the gas and the taxes and/or royalties that are expected to be paid.

Of particular importance in this context are the assumptions that must be made about the prices that will be received from the sale of the gas. The importance of this assumption was highlighted in the 2015 Inquiry, when Santos wrote down its reserves in the Cooper Basin by approximately 20%. At the time, Santos noted that the reduction was "primarily due to the adoption of lower oil and gas price assumptions and the consequent removal or reclassification of sub economic projects".⁷⁸ While the potential for a write-down had been anticipated by some market commentators,⁷⁹ the scale of the write-down came as a surprise to the market, because participants did not have a good understanding of the sensitivity of the reserves estimates to the underlying price assumptions.

Importantly, the issue highlighted by this example is not unique to Santos. Rather, it is an issue that affects all the reserve estimates reported by producers in Australia, because there is currently no requirement for producers to disclose the price assumptions underpinning their reserves estimates, or the sensitivity of their reserve estimates to these assumptions.

⁷⁷ SPE, PRMS, revised June 2018, p. 6.

⁷⁸ Santos, *Reserves Statement for the year ending 31 December 2015*, 19 February 2016, p. 2.

⁷⁹ See for example, EnergyQuest who observed that the oil price assumption used in Santos' asset impairment analysis was US\$20-\$30/bbl higher than the market average and noted that if the same forecasts were used for reserves and they were lowered, there was "likely to be de-booking of reserves".
EnergyQuest, *Energy Quarterly*, November 2015, p. 13.

The need for greater transparency in this area has been reinforced in the current Inquiry through the work conducted on east coast reserves and resources. As part of this work, which was carried out in the latter half of 2018, the ACCC sought information from producers on the gas price assumptions underpinning their contracted and uncontracted reserves estimates. These assumptions, which were reported in the December 2018 interim report, are reproduced in chart 3.1, with separate markers used to identify the assumptions used for contracted reserves and uncontracted reserves.

Chart 3.1: Gas price assumptions underpinning producers' reserve estimates



Source: ACCC, *Gas inquiry 2017-2020 interim report*, December 2018, p. 49.

As this chart shows, the gas price assumptions employed by producers varied markedly, with the prices assumed for:^{80 81}

- contracted reserves ranging from \$2.65/GJ to \$10.58/GJ
- uncontracted reserves ranging from \$3.45/GJ to \$14.50/GJ.⁸²

In the case of contracted reserves, producers noted that their assumptions were based on the prices specified in the relevant GSAs. While for uncontracted reserves, producers typically noted⁸³ that their assumptions were based on an estimate or a forecast of a market price for gas at a particular location and point in time, which were calculated using either:⁸⁴

- an oil-linked pricing mechanism, the application of which required forecasts of Brent Crude oil or Japanese Crude Cocktail (JCC) prices and exchange rates, or
- a domestic 'market price' estimate, the sources of which producers noted included estimates published by AEMO, brokers and in other industry reports.

⁸⁰ While some of the variation in chart 3.1 can be attributed to the location of the producers' gas fields (e.g. Queensland versus Victoria), the information provided by producers indicate that even at a basin level there is a significant degree of variation in the gas price assumptions underpinning the reserve estimates.

⁸¹ ACCC, *Gas inquiry 2017-2020 interim report*, December 2018, pp. 49-50.

⁸² The bottom end of the range (\$3.45/GJ) reflects a price a producer would use, with other contracted and uncontracted gas prices, to calculate a weighted average price to book reserves. The upper end of the range (\$14.50/GJ), on the other hand, reflects a producer's 'high case' gas price assumption, which is based on its expectation of LNG netback prices.

⁸³ ACCC, *Gas inquiry 2017-2020 interim report*, December 2018, p. 50.

⁸⁴ A number of producers noted that these price assumptions do not necessarily reflect their expectations about the price they expect to receive for the reserves in the short- to medium-term and may change each time reserves are calculated.

The significant variation in gas price assumptions underpinning producers' reserves estimates and, in particular, the uncontracted reserves highlights the need for the reporting framework to:

- provide greater clarity on the manner in which reserves are to be estimated and how the gas price assumptions used in the estimation of reserves are to be determined
- provide for greater transparency of the gas price assumptions underpinning reserves estimates and the sensitivity of these estimates to the price assumptions.

Consistent with the objectives set out in section 1, greater clarity and transparency in this area would enable market participants and policymakers to better assess the risks surrounding the commercial viability of reserves. This would, in turn, enable more informed and efficient consumption, exploration, production, infrastructure investment and upstream policy decisions to be made.

It is with this in mind that the ACCC proposes to extend the reporting framework to the gas price assumptions used in the estimation of reserves.

3.2. Guidance provided by the PRMS and other reporting frameworks

3.2.1. PRMS

In contrast to the prescription provided in other areas of the PRMS, limited guidance is provided in the PRMS on the price assumptions an evaluator should use when estimating reserves. The only specific guidance that is provided is that the price assumptions should be considered “reasonable to exist throughout the life of the project” and should, where relevant, take into account the price specified in GSAs or hedges.⁸⁵

Some more general guidance is provided in the PRMS evaluation guidelines, which state the following in relation to the commerciality assessment:⁸⁶

“Economic viability is tested by applying a forecast case that evaluates cash-flow estimates based on an entity’s forecasted economic scenario conditions (including costs and product price schedules, inflation indexes, and market factors)...

Forecasts based solely on current economic conditions are estimated using an average of those conditions (including historical prices and costs) during a specified period. The default period for averaging prices and costs is one year. However, if a step change has occurred within the previous 12-month period, the use of a shorter period reflecting the step change must be justified...

...

Alternative economic scenarios may also be considered in the decision process and, in some cases, may supplement reporting requirements. Evaluators may examine a constant case in which current economic conditions are held constant without inflation or deflation throughout the project life.”

Evaluations may also be modified to accommodate criteria regarding external disclosures imposed by regulatory agencies....External reporting requirements may also specify alternative guidance on the definition of current conditions or defined criteria with which to evaluate Reserves.”

3.2.2. Approaches employed by Australian and international agencies

The approaches that other Australian and international agencies have taken in relation to reserves estimation and the gas price assumptions underpinning those estimates are summarised in table 3.1, along with the disclosure requirements.

⁸⁵ SPE, PRMS, revised June 2018, pp 17-18.

⁸⁶ *ibid*

Table 3.1: Treatment of gas price assumptions in other reporting frameworks

	Basis on which reserves are to be estimated	Requirements for gas price assumptions	Disclosure requirements for gas price assumptions
Australian Agencies			
ASX	No specific requirements other than a statement in ASX Guidance Note 32 that “to the extent an estimate of petroleum reserves involves a representation about future matters, it must be based on reasonable grounds – meaning that the economic assumptions used to calculate the estimates must also be objectively reasonable”.		The first time a producer reports its reserve estimates, it must disclose: ⁸⁷ “All material economic assumptions used to calculate the estimates...If those economic assumptions are commercially sensitive to the oil and gas entity, an explanation of the methodology used to determine the assumptions rather than the actual figure can be reported.”
NOPTA		No specific requirements	No disclosure requirements
DNRME		No specific requirements	No disclosure requirements
International Agencies			
UK OGA		No specific requirements	No disclosure requirements
US SEC⁸⁸	Proved reserves must be estimated on the basis of current economic conditions (i.e. historic prices and costs)	Producers must use: the prices specified in GSAs for contracted reserves (excluding escalations based on forecast conditions) the historic 12-month average gas price for uncontracted reserves (calculated as the unweighted average of the first-day-of-the-month price for each month in the 12-month period ending on reporting date).	No disclosure requirements.
	Producers also have the <i>option</i> to report their reserves under alternative price and cost scenarios based on, for example, futures prices or management’s forecasts.		If producers publish their reserves under alternative price scenarios, they must disclose the gas price assumptions they have used.
Canada CSA⁸⁹	Reserves (and resources, if reported) must be estimated using ‘forecast prices and costs.’	Producers must use ‘forecast prices’, which are defined as prices that are: (a) the prices specified in GSAs for contracted reserves (including in an extension period if the GSA is likely to be extended) (b) generally accepted as being a reasonable outlook of the future ⁹⁰ for uncontracted reserves .	Producers are required to disclose: <ul style="list-style-type: none"> • the gas price assumptions (including the <i>benchmark reference prices</i>)⁹¹ for the countries or regions in which they operate: <ul style="list-style-type: none"> ○ for each of at least the following five financial years ○ generally, for subsequent periods • the producer’s weighted average gas price for the most recent year • the inflation, exchange rate and other forecast factors used in pricing.
	Producers also have the <i>option</i> to report their reserve under the constant case (i.e. current economic conditions are held constant without inflation over the project life)	Under the constant case option, the price must be based on: (a) the historic 12-month average gas price for uncontracted reserves (calculated in the same way as the US) (b) the prices specified in GSAs for contracted reserves .	

⁸⁷ ASX, Chapter 5 Listing Rules, 1 July 2014, r. 5.31 and ASX, Guidance Note No. 32, p. 9.

⁸⁸ These obligations can be found in SEC, *Code of Federal Regulations: Title 17 Chapter II, Regulation S-K*, accessed 20 December 2018, s. 210.4-10(a)(22) and 22(v) and SEC, *Code of Federal Regulations: Title 17 Chapter II, Regulation S-X*, accessed 20 December 2018, s. 229.1202(b).

⁸⁹ These obligations can be found in *National Instrument 51-101 Standards of Disclosure for Oil and Gas Activities*, 1 July 2015, s. 1, and *National Instrument Form 51-101F1: Statement of Reserves Data and Other Oil and Gas Information*, 1 July 2015, items 2.1, 2.2, 3.1, 3.2, 7.1 and 7.3.

⁹⁰ The CSA has stated that forecast prices are likely to fail this requirement if they fall outside the range of forecasts by major independent qualified reserves evaluators or auditors, or other reputable sources. See CSA, *Companion Policy 51-101: Standards of Disclosure for Oil and Gas Activities*, 31 December 2015.

⁹¹ Form 51-101F1 provides for the *benchmark reference prices* to be obtained from sources, such as public product exchanges or prices posted by purchasers, and also provides for these prices to be overridden by contract prices if a producer has a contractual or other obligation to supply the gas at that price.

Approaches employed in Australia

As table 3.1 shows, the reporting frameworks currently in use in Australia do not specify how reserves are to be estimated or the gas price assumptions to be used in the estimation. It is worth noting though that in 2011-12 the ASX considered imposing more stringent requirements in this area to try and promote greater consistency in the reporting of reserves and resources. Some of the options that the ASX considered in this context, included requiring listed producers to:

- estimate their reserves and resources on the basis of:
 - future economic conditions, with the gas price assumptions to be based on the producer's reasonable forecast of future prices or the prices specified in GSAs
 - current economic conditions, with the gas price assumptions to be based on a similar historic price approach to that employed in the US.
- disclose their gas price assumptions, the gas price range within which there would be no material change in reserve estimates, or the method used to derive the gas price assumptions.

Most of the stakeholders involved in the ASX's consultation process were of the view that reserves and resources should be estimated on the basis of future economic conditions rather than current economic conditions.⁹² They also noted that requiring the use of historic gas prices would result in companies having to maintain more than one set of reserves estimates because the historic prices would "not align with the pricing assumptions used internally by companies for planning purposes, investment decisions and other transactions".⁹³

Most stakeholders were also opposed to the requirement to disclose the price assumptions underpinning their reserve estimates because they claimed that, in the case of:⁹⁴

- contracted reserves, the prices specified in GSAs were subject to confidentiality clauses
- uncontracted reserves, the gas price forecasts were "commercially sensitive" because they were also used for planning, investment and contract negotiation purposes.

These stakeholders were also opposed to reporting a price range, because they claimed this was also commercially sensitive information.⁹⁵ While these two options were opposed, stakeholders generally supported the proposal to include a brief explanation of the method used to determine the gas price assumptions when the reserves are first reported.⁹⁶

It was on the basis of this feedback that the ASX decided not to impose any specific requirements on how reserves are to be estimated or the gas price assumptions to be used in the estimation. The ASX decided instead to leave this to producers and to also provide producers with some discretion as to whether they disclose the gas price assumptions underpinning their estimates, or the method used to determine the assumptions.

Approaches employed internationally

In contrast to the position taken by the ASX, the instruments administered by the SEC and CSA specify the manner in which listed producers are to estimate their reserves and the gas

⁹² ASX, *Reserves and Resources Disclosure Rules for Mining and Oil & Gas Companies: Report on Consultation Feedback*, April 2012, p. 20

⁹³ *ibid.*

⁹⁴ *ibid.*, pp. 23-24.

⁹⁵ *ibid.*

⁹⁶ *ibid.*

price assumptions to be used in the estimation. While there are some similarities in the approaches employed by the SEC and the CSA, there are also some fundamental differences. These differences primarily stem from the alternative positions the SEC and CSA have taken on the way in which reserves should be estimated (i.e. current economic conditions versus forecast economic conditions), which directly affects the way in which the gas price assumptions are determined.

The SEC, for example, requires listed producers to estimate their proved reserves on the basis of current economic conditions. Consistent with this requirement, the SEC requires the gas price assumptions applied to:

- contracted reserves to be based on the prices specified in the relevant GSAs (excluding any escalations based on forecast conditions)
- uncontracted reserves to be based on the historic 12-month average gas price.

The SEC also accords producers the option to report their reserves estimates under alternative price and cost scenarios (for example, based on futures prices or management's forecasts). If producers exercise this option, they must disclose the price assumptions underpinning the alternative reserve estimates.

Some insight into the SEC's rationale for adopting this approach, can be found in the following extracts taken from the final rule on the modernisation of oil and gas reporting:

"We believe that the purpose of disclosing reserves estimates is to provide investors with information that is both meaningful and comparable. The reserves estimates in our disclosure rules, however, are not designed to be, nor are they intended to represent, an estimation of the fair market value of the reserves. Rather, the reserves disclosures are intended to provide investors with an indication of the relative quantity of reserves that is likely to be extracted in the future using a methodology that minimizes the use of non-reserves-specific variables. By eliminating assumptions underlying the pricing variable, as any historical pricing method would do, investors are able to compare reserves estimates where the differences are driven primarily by reserves-specific information, such as the location of the reserves and the grade of the underlying resource."⁹⁷

"...since the new rules and amendments require the use of a single price to estimate reserves and since that price may not be as informative of value as a futures price, the new rules and amendments also gives companies the option of providing a sensitivity analysis and reporting reserves based on additional price estimates.

If companies elect to provide a sensitivity analysis, we expect this to benefit investors by allowing them to formulate better projections of company prospects that are more consistent with management's planning price and prices higher and lower that may reasonably be achieved. In particular, it allows companies the flexibility to communicate how their reserves would change under alternative economic conditions, including those that they may believe better reflect their future prospects."⁹⁸

In contrast to the SEC, the CSA require reserves and resources to be estimated on the basis of forecast economic conditions. Consistent with this requirement, the CSA require the gas price assumptions applied to:

- contracted reserves to be based on the prices specified in the relevant GSAs (including during an extension period if the GSA is likely to be extended)
- uncontracted reserves to be based on a forecast price that is "generally accepted as being a reasonable outlook of the future".

⁹⁷ SEC, *Modernization of Oil and Gas Reporting Final Rule*, Federal Register Vol. 74, No. 9, 14 January 2009, p. 2162.

⁹⁸ *ibid*, p. 2185.

In addition to forecast economic conditions, Canadian producers have the option to report their reserves under the constant case scenario. The gas price assumptions in this case must be based on the prices specified in the relevant GSAs for contracted reserves or the historic 12-month average gas price for uncontracted reserves.

The other key difference between the approach employed in the US and Canada, is that the CSA requires greater disclosure of the gas price assumptions than the SEC.

Canadian listed producers, for example, are required to disclose their forecast gas price assumptions, their weighted average gas price for the most recent year and other assumptions they have used to determine the forecast prices.⁹⁹ US listed producers, on the other hand, are not required to disclose gas price assumptions underpinning their current economic conditions based estimates. They are only required to disclose these assumptions if they decide to report their reserve estimates under alternative gas price assumptions.

3.3. Summary of the ACCC’s proposal

As the preceding discussion highlights, if the reporting framework is to be extended to the requirements for reserve estimation the first decision that must be made is whether reserves should be estimated on the basis of current or forecast economic conditions. Once this decision is made, a decision can be made on how the gas price assumptions used in the estimation of both contracted and uncontracted reserves are to be determined. The final decision that must be made relates to the disclosure requirements that will apply to the gas price assumptions.

Table 3.2 sets out the ACCC’s proposed approach to these three decision points.

Table 3.2: Proposal on the reserves estimation requirements

Element		Proposal
Manner in which reserves are to be estimated		Reserves should be estimated on the basis of forecast economic conditions.
Gas price assumptions to be used	Uncontracted reserves	Producers should be responsible for determining the forecast gas prices used in the estimation of uncontracted reserves.
	Contracted reserves	Producers should be required to use the prices specified in the relevant GSAs for contracted reserves and should account for the operation of: <ul style="list-style-type: none"> • the price escalation mechanisms specified in the relevant GSAs over the forecast period • contract extension provisions specified in the relevant GSAs over the forecast period, if the GSAs are likely to be extended and the prices (or pricing mechanisms) to apply in the extension period have already been determined.
Disclosure requirements		When reporting their reserve estimates to AEMO for publication on the Bulletin Board, producers should be required to disclose the following: <ol style="list-style-type: none"> (a) The gas price range within which there would be no material change in the 2P reserves estimates. The price range should be based on the assumptions used to estimate uncontracted reserves and should be reported at a basin level for each of the following five years and generally for subsequent periods. (b) The sensitivity of the 2P reserves estimates to a +/-10% change in the gas price range reported under (a). (c) A description of the method used to determine the gas price range and any other assumptions made about the economic conditions that have influenced the selection of the range (for example, inflation rate, exchange rate, oil price and economic growth assumptions). (d) An explanation of any changes that have been made to the gas price range from the previous year and why they were made.

⁹⁹ In addition to this information, Canadian listed producers must disclose the future net revenue attributable to the reserves and the key components of the future net revenue, including forecast revenue, operating costs, development costs, abandonment and reclamation costs, taxes and royalties. Producers must also identify and discuss in their annual reports, the significant economic factors or uncertainties that affect particular components of the reserves estimates.

Further detail on the ACCC's proposed approach and the specific matters it is seeking feedback on is provided below.

3.4. Manner in which reserves are to be estimated

The ACCC proposes that producers be required to estimate their reserves on the basis of forecast economic conditions. The ACCC expects that parties would base their estimates on the broader macroeconomic conditions reported by reputable agencies such as the Reserve Bank of Australia, the Australian Bureau of Statistic, Commonwealth and State Treasuries, as well as economic conditions reported by reputable economic commentators both in Australia and in international markets. To the extent that reserves estimates differ materially from such sources, parties would need to be able to make a strong case justifying their departure from more accepted economic assessments. .

The ACCC is proposing the use of forecast economic conditions because it better reflects the forward-looking nature of the commerciality assessment that producers are required to carry out, both when estimating reserves and when deciding whether or not to proceed with the development of the reserves. It can therefore be expected to provide a better insight into the future development of reserves and the supply outlook than the alternatives.

The ACCC understands that the proposal to use forecast economic conditions is consistent with the approach that producers in the east coast are currently employing. The use of this approach should therefore minimise compliance costs (i.e. because producers will only have to develop one set of reserves estimates for reporting, planning and investment purposes). It should also ameliorate the risk of conflicting reserves estimates being reported by producers, which could confuse market participants and policymakers.

While the ACCC's proposed approach is consistent with the approach employed by producers and the CSA, it does differ from the current economic conditions approach employed by the SEC. It is important to note though that the SEC's objectives differ from those set out in section 1. The objective of this aspect of the SEC's reporting framework is, as noted in section 3.2, to provide investors with an indication of the "relative quantity" of reserves held by producers so they can make comparisons across companies. It is **not** to provide an indication of the future prospects of the reserves, which is one of the key objectives of the ACCC's proposed reporting framework. To enable producers to convey this information to the market, an optional reserves reporting mechanism has been included in the SEC's reporting framework. This optional reporting mechanism is consistent with the ACCC's proposal, because it allows producers to report their reserves estimates under alternative forecast price and cost assumptions.

While the ACCC is proposing the use of forecast economic conditions, it is interested in hearing stakeholders' views on this proposal and the questions set out in the box below.

Box 3.1: Questions on the manner in which reserves are to be estimated

29. Do you agree that producers should be required to estimate their reserves on the basis of forecast economic conditions? If not, please explain why.

3.5. Gas price assumptions used in the estimation of reserves

Having concluded that reserves should be estimated on the basis of forecast economic conditions, the ACCC has given further thought to the gas price assumptions that should be used in the estimation process. In a similar manner to the PRMS, SEC and CSA, the ACCC proposes to draw a distinction between the gas price assumptions to be used for contracted and uncontracted reserves. The ACCC's proposals are outlined below.

3.5.1. Uncontracted reserves

Consistent with the recommendation that reserve estimates be based on forecast economic conditions, the ACCC proposes that the gas price assumptions underpinning uncontracted reserves be based on a forecast of the price that producers expect to receive for the gas.

The ACCC has identified three options for the way in which these assumptions could be determined:

1. A common reference gas price could be established that all producers would be required to use (Option 1).
2. Producers could be accorded responsibility for determining their own gas price assumptions and required to disclose those assumptions (Option 2).
3. Producers could be accorded responsibility for determining their own gas price assumptions and not required to disclose those assumptions (Option 3).

The first of these options is based on the approach employed by the SEC, while Option 2 is based on the CSA's approach and Option 3 is based on the ASX's approach.

While the ACCC's preferred option would be Option 1, it has become clear through the work that has subsequently been carried out that there are some practical limitations associated with this option. The most significant of which is that there is currently no widely accepted external reference price that could be used for this purpose.

That is, while there are a number of facilitated gas markets in operation in the east coast, they only provide for short-term trades of gas (e.g. on the day products through to quarterly products) and do not therefore provide a good basis for determining the forecast price of gas. Similarly, while there are quarterly and monthly ASX gas futures products available at Wallumbilla and Victoria, the term of these products is relatively short and trade in these products has been limited to date.¹⁰⁰ Futures prices could not therefore be relied upon to act as the reference price for reserves estimation at this point in time.

The only other externally derived reference price that could potentially be considered in this context is the forward LNG netback price at Wallumbilla. However, as noted in box 3.2, the LNG netback price is just one of a number of factors that can influence gas prices in the east coast. When coupled with the other issues identified in box 3.2, the ACCC's preliminary view is that the LNG netback price should not be used as the common longer-term reference price for the purposes of estimating reserves. The ACCC is interested though in stakeholders' views on this option.

¹⁰⁰ At the time of drafting, the ACCC understands that there have been no trades in the Wallumbilla ASX futures products.

Box 3.2: Relevance of LNG netback prices¹⁰¹

In October 2018 the ACCC started to publish both an historical monthly LNG netback price series at Wallumbilla dating back to 2016 and a forward monthly netback price series at Wallumbilla extending to the end of the following calendar year.

The LNG netback price is calculated by taking the price that could be received for LNG and subtracting the costs incurred in converting the gas to LNG and shipping it to the destination port. When adjusted for these factors and any differences in non-price terms and conditions, the LNG netback price represents the price that a gas supplier would expect to receive from a domestic gas buyer to be indifferent between selling the gas to the domestic buyer and exporting it.

While LNG netback prices currently play an important role in the east coast market, they are not the sole factor influencing domestic prices. The gas prices received by producers will also depend on the location of the gas fields, the marginal cost of supply, the buyer's maximum willingness to pay and the demand-supply balance, the importance of which will differ over time (see the discussion on the bargaining framework in the ACCC's 2015 Inquiry report for more detail on the influence of these factors).¹⁰²

Setting this more fundamental issue aside, if a decision was made to use the LNG netback price as the common reference point, the following issues would need to be overcome:

The term of the forward LNG netback price series, which currently only extends out to a maximum of two years. Given the life of a field usually extends beyond two years, further information would be required if this LNG netback price series was to be used for the reserves estimation process.

The LNG netback price series is calculated at Wallumbilla. Adjustments to this price would therefore need to be made to account for transportation cost differentials between Wallumbilla and the producers' gas fields.¹⁰³

In the absence of any externally derived reference price, the only other option that would be available if a decision was made to mandate the use of a common gas price assumption would be to accord an independent agency responsibility for determining the reference price on an annual basis. There are, however, likely to be significant costs associated with implementing this option, particularly given the complexities outlined in box 3.2.

It is also not immediately obvious that the reference price determined by such an agency would be any more robust than the gas price assumptions developed by producers. In this regard, it is worth noting that producers should have a strong incentive to develop forecasts that are as accurate as possible, because they are the ones investing in developing resources on the back of their future expectations. Producers are also likely to have more technical and practical market experience than an agency.

In addition to these issues, mandating the use of a common reference price could result in producers having to maintain two sets of reserves estimates. One of which would be reported on the Bulletin Board and the other used by producers for planning and investment decisions and potentially reported to the ASX by ASX listed entities. The lack of alignment between these estimates could result in differences between the market's view and the producer's view of the future prospects of reserves and mislead the market about the supply outlook.

Given the issues outlined above, the ACCC has considered the other two options listed above, both of which would involve according producers responsibility for determining their own gas price assumptions. The main concern the ACCC has with Option 3 is that producers would not be required to disclose the gas price assumptions underpinning their reserves estimates. This option would not therefore provide market participants or policymakers any insight into the sensitivity of the reserves estimates to the gas price assumptions. It would not

¹⁰¹ Further detail on the LNG netback price series can be found in ACCC, *Gas Inquiry 2017-2020 Guide to the LNG netback price series*, October 2018.

¹⁰² ACCC, *Inquiry into the east coast gas market*, April 2016, pp. 50-53.

¹⁰³ This issue is likely to arise under any common reference price.

therefore address the concerns that were identified in the 2015 Inquiry (see section 3.1). The ACCC is not therefore advocating the adoption of Option 3.

In contrast to Option 3, Option 2 would require producers to disclose a range of information about the gas price assumptions they have used. The adoption of this option should therefore ameliorate the concerns that were identified in the 2015 Inquiry (see section 3.1). It should also impose more discipline on producers when determining their gas price assumptions, because the market will be able to readily determine if the assumptions employed by particular producers are reasonable or not.

Having regard to the matters outlined above, the ACCC's preliminary view is that:

- Option 2 should be adopted initially
- further consideration should be given to implementing Option 1 if Option 2 does not appear to be addressing the underlying concern; namely, that a reserves and resourcing reporting framework provide more transparency, consistency and reliable estimates of gas reserves and resources across the full market.

While the ACCC has formed this preliminary view, it is interested in stakeholders' views on the three options.

The ACCC is also interested in whether stakeholders think that the disclosure requirements under Option 2 would impose sufficient discipline on producers to employ reasonable gas price assumptions, or if additional measures are required. These additional measures could, for example, require any gas price assumptions to satisfy a 'reasonableness', 'best estimate' or 'robustness' test that would be overseen by the AER, which is similar to the approach employed by the CSA. If such a test was to be implemented then consideration would need to be given to the form that this test would take¹⁰⁴ and how it would be applied and enforced by the AER. The ACCC welcomes stakeholders' views on this issue.

Box 3.3: Questions on gas price assumptions to be used for uncontracted reserves

30. Do you think that:

- (a) Producers should be responsible for determining the forecast gas prices they will assume when estimating uncontracted reserves and required to disclose these assumptions (i.e. Option 2)?
 - i. If so, please explain why.
 - ii. If not, please explain why.
- (b) Producers should be required to use a mandated common gas price assumption when estimating uncontracted reserves (i.e. Option 1)?
 - i. If so, please explain why and set out:
 - a. the benefits you think this would provide over the producer-determined assumptions?
 - b. how you think the forecast common gas price assumption should be determined?
 - ii. If not, please explain why.
- (c) Producers should be responsible for determining the forecast gas prices they will assume when estimating uncontracted reserves and not required to disclose their assumptions (i.e.

¹⁰⁴ The ACCC notes that there a number of these types of tests in the NGR, including in:

- Rule 74, which requires any forecast or estimate used by a service provider subject to full regulation in the context of price and revenue regulation to be arrived at on a reasonable basis and to represent the best forecast or estimate possible in the circumstances.
- Rule 213, which requires any demand forecasts submitted by participants in the Declared Wholesale Gas Market to represent the 'best estimate' of the quantities of gas they expect to withdraw.
- Rule 410, which requires any ex ante offers or bids provided by participants in the Short Term Trading Market to represent the best estimate of the quantities of gas it expects to supply or withdraw on the day.

Option 3)?

- i. If so, please explain why and set out how do you think this option would address the concerns outlined in section 3.1?
- ii. If not, please explain why.

31. If Option 2 is implemented, do you think that the disclosure requirements in section 3.6 will impose sufficient discipline on producers, or do you think the gas price assumptions used by producers should be required to satisfy a test that would be overseen by the AER? If you think the gas price assumptions should be subject to a test, please set out:

- (a) what form you think the test should take and if the test should apply to the gas price assumptions or the method used to determine the gas price assumptions
- (b) how you think the test should be enforced by the AER (for example, should the AER have the power to require producers to re-estimate their reserves using an alternative price assumption).

3.5.2. Contracted reserves

In contrast to uncontracted reserves, producers have a contractual obligation to supply contracted reserves at the prices specified in the relevant GSAs. The ACCC therefore proposes that the gas price assumptions underpinning contracted reserves be based on the prices specified in the relevant GSAs. Given the proposal that reserves be estimated on the basis of forecast economic conditions, the ACCC also proposes to allow producers to account for the operation of:

- the price escalation mechanisms specified in the relevant GSA over the forecast period
- contract extension provisions specified in the relevant GSAs over the forecast period, if the GSAs are likely to be extended and the prices (or pricing mechanisms) to apply in the extension period have already been determined.

This proposal is consistent with the approach set out in the PRMS and the approach employed by the CSA (see section 3.2). It is also consistent with the approach that producers have indicated they use (see section 3.1). The adoption of this approach should therefore minimise compliance costs.

While this proposal appears relatively uncontroversial, the ACCC is still interested in hearing stakeholders' views on the proposal and the specific matters set out in the box below.

Box 3.4: Questions on gas price assumptions to be used for contracted reserves

32. Do you agree that the gas price assumptions underpinning contracted reserves should be based on the prices specified in the relevant GSAs? If not, please explain why.

33. Do you agree with the ACCC's proposal to allow producers to account for the operation of:

- (a) price escalation mechanisms when determining the prices to apply under the relevant GSAs over the forecast period? If not, please explain why.
- (b) contract extension provisions if the GSAs are likely to be extended and the prices (or pricing mechanisms) to apply in this period have already been determined? If not, please explain why.

3.6. Disclosure requirements for gas price assumptions

The ACCC proposes that producers be required to disclose the following information when reporting their reserves estimates to AEMO for publication on the Bulletin Board:

- (a) The gas price range within which there would be **no** material change in the 2P reserves estimates. This range should be reported on the following bases:

- the range should be based on the gas price assumptions used to estimate uncontracted reserves
- the range should be reported at a basin level
- the range should be reported for each of the following five years and generally for subsequent periods
- the prices within the range should be expressed in \$/GJ and in nominal terms.

As noted in section 2.4.4, the ACCC understands that the term 'material change' is currently defined in other parts of the Bulletin Board reporting regime as a change exceeding 10%.¹⁰⁵ If applied in this context, this would mean that 'no material change' threshold used to define the gas price range would be met even if the reserves estimates differed by up to 10%. The ACCC is yet to form a view on whether 10% is the most appropriate materiality threshold to use in this context, or whether a lower threshold (for example, 5% or 2%) may be more appropriate, given that a higher threshold is likely to result in a wider price range, which could limit the usefulness of this information. The ACCC welcomes feedback on this issue.

- (b) The sensitivity of the 2P reserves estimates to a +/-10% change in the gas price range reported under (a).¹⁰⁶
- (c) A description of the method used to determine the gas price range that underpins the reserves estimates (e.g. based on an LNG netback method or an external forecast produced by a government agency) and any other assumptions that have been made when determining the price range (for example, inflation rate, exchange rate, oil price and economic growth assumptions).
- (d) An explanation of any changes that have been made to the gas price range from the previous year and why the changes were made.

The disclosure of this information is intended to provide market participants and policymakers a better understanding of the gas price assumptions underpinning the reserves estimates, the reasonableness of those assumptions and the sensitivity of the reserve estimates to those assumptions. The disclosure of this information should therefore provide more insight into the potential for reserves to be revised up or down in response to changes in forecast gas prices and, in so doing, address the concerns identified in section 3.1. The disclosure of this information should also impose more discipline on producers when developing their reserves estimates, because the reasonableness of the assumptions and the sensitivity of their reserve estimates to the assumptions, will be readily discernible to the market.

It is worth noting in this context that the ACCC has considered requiring producers to report on the actual gas price assumptions used to estimate reserves rather than the price range within which there would be no material change in reserves. However, the ACCC's preliminary view is that if the materiality threshold is set at an appropriate level, the disclosure of the price range within which there would be no material change in reserves should:

- address the concerns identified in section 3.1
- provide market participants and policymakers a better understanding of the sensitivity of the reserve estimates than a single price point
- reduce the risk of coordinated conduct amongst producers.

It is important to note though that these benefits could be undermined if the materiality threshold is not set at an appropriate level. If, for example, the materiality threshold was set too high, the price range reported by producers may be too broad to provide any useful

¹⁰⁵ See for example rule 141 of the NGR.

¹⁰⁶ For example, if the price range was \$10-\$11/GJ, then the producers would need to report what their reserve estimates would be if: the price fell to \$9.10/GJ; and if the price rose to \$12.10/GJ.

insights into the sensitivity of the reserve estimates to price assumptions. If, on the other hand, it is set too low it may increase the risk of coordinated conduct amongst producers. The materiality threshold is therefore an important element of the proposed disclosure requirements that may need to be monitored over time to ensure that it continues to be set at an appropriate level.

The ACCC also considered requiring the gas price assumptions underpinning contracted reserves estimates to be reported, but concluded this was also unnecessary because any changes to the price assumptions should not affect these reserves (i.e. because producers have a contractual obligation to supply at the price specified in the GSA). The ACCC has therefore sought to minimise the compliance costs and regulatory burden by only requiring the price range to be reported for uncontracted reserves.

The ACCC is interested in hearing stakeholders' views on the proposed disclosure requirements and the questions set out in the box below.

Box 3.5: Questions on the disclosure requirements for gas price assumptions

34. Do you agree that producers should be required to disclose the following information when reporting their reserves estimates?

- (a) The gas price range within which there would be no material change in the 2P reserves estimates, which is to be reported at a basin level for each of the following five years and generally for subsequent periods (with the range to be based on the price assumptions used to estimate uncontracted reserves).
- (b) The sensitivity of the 2P reserves estimates to a +/-10% change in the gas price range reported under (a).
- (c) A description of the method used to determine the gas price assumptions and any other assumptions that have been made when determining the price range.
- (d) An explanation of any changes that have been made to the gas price assumptions from the previous year and why the changes were made.

If not, please explain why.

35. Do you agree with the proposal to require producers to report the gas price range:

- (a) for each year over a five year period and generally thereafter? If not, please explain why.
- (b) for uncontracted reserves only? If not, please explain why.
- (c) at a basin level? If not, please explain why.

36. If producers are required to report the gas price range within which there would be no material change in 2P reserves, what materiality threshold do you think should be adopted for this purpose and why?

37. Do you agree that the threshold for measuring the sensitivity of the reserves estimates should be 10%? If not, please explain why and what alternative threshold you think should be applied.

38. Is there any other information that you think should be disclosed about the gas price assumptions? If so, please explain what the information is and why it is required to meet the objectives set out in section 1.

3.7. Compliance costs

The ACCC has sought to minimise the compliance costs and regulatory burden associated with this aspect of the proposed reporting framework by, for example, proposing the adoption of a similar approach to reserves estimation and determination of gas price assumptions to what producers are currently employing.

There will nevertheless be some incremental costs associated with complying with the requirements outlined above. The ACCC is therefore interested in hearing from producers on:

- the **incremental** costs they expect to incur complying with the reporting requirements set out in sections 3.4–3.6
- if there are any refinements that could be made to the reporting requirements in sections 3.4–3.6 to further reduce compliance costs or the regulatory burden, whilst also ensuring the requirements are fit for purpose and achieve the objectives set out in section 1.

Box 3.6: Questions on compliance costs

39. What incremental costs do producers expect to incur in complying with the proposed reporting requirements set out in sections 3.4-3.6?
40. Do you think there are any refinements that could be made to the proposed reporting requirements in sections 3.4-3.6 to further reduce compliance costs or the regulatory burden, whilst also ensuring they are fit for purpose and achieves the objectives set out in section 1?