

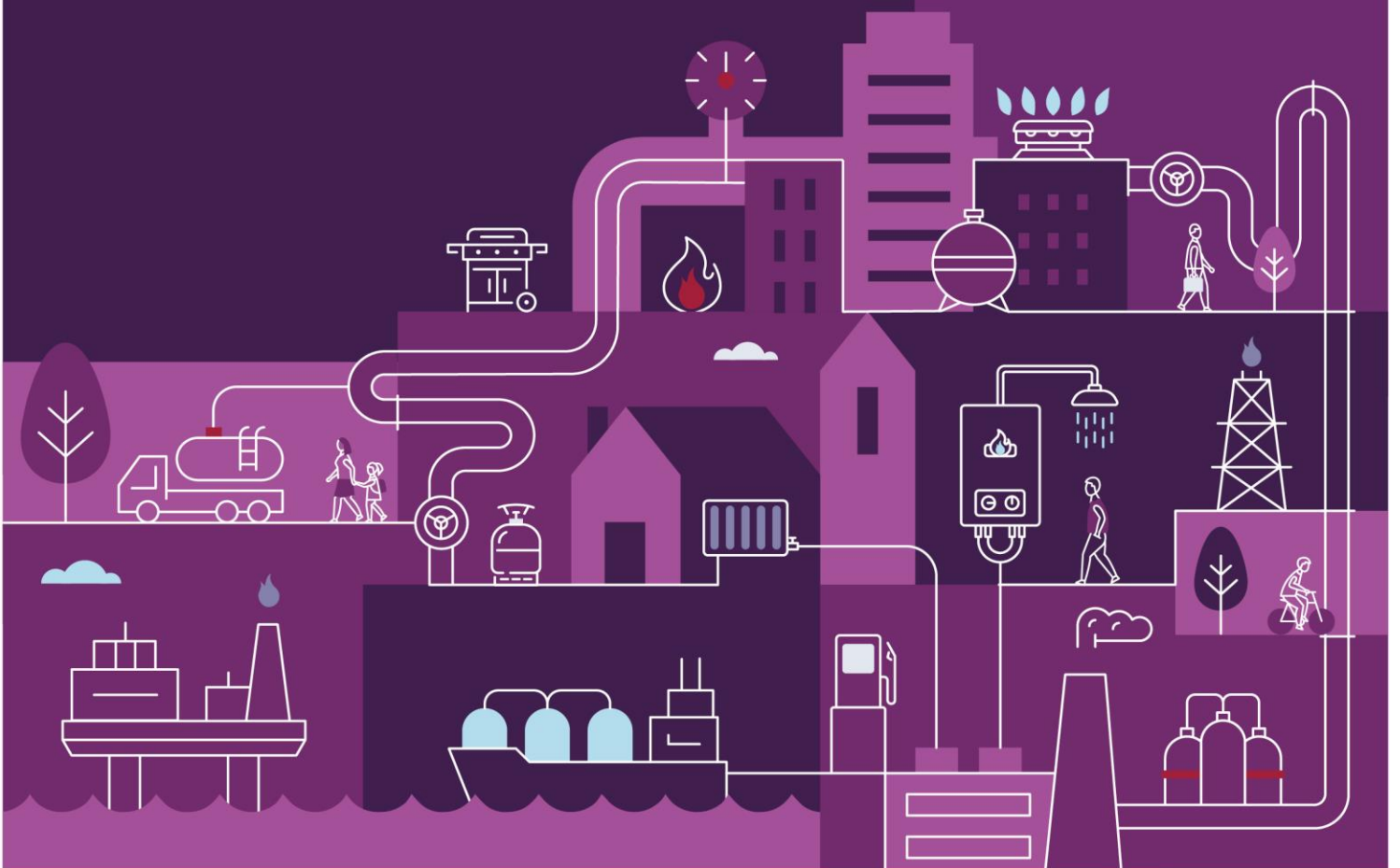


Review of the Western Australia Gas Statement of Opportunities

October 2023

A five-yearly review of AEMO's WA
gas market analysis

A report for Western Australia's gas market





Important notice

Purpose

The purpose of this publication is to present the results and recommended actions from the second five-yearly review of the Western Australian Gas Statement of Opportunities, which AEMO is required to conduct in accordance with rule 105 of the Gas Services Information Rules. This publication is based on information available to AEMO as of 6 June 2023, unless otherwise indicated.

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Executive summary

The Western Australian (WA) Gas Statement of Opportunities (GSOO) report provides Gas Market Participants (GMPs) and other gas industry stakeholders with information and forecasts relating to medium and long-term gas supply and demand and gas transmission and storage capacity in the WA domestic market. AEMO is obliged under the Gas Services Information (GSI) Rules to conduct a review of the WA GSOO at least once every five years¹. The last review was undertaken in 2018.

In March 2023, AEMO surveyed WA gas stakeholders, receiving 21 responses from a broad spectrum of stakeholders, including gas buyers, gas sellers, advocacy groups and government.

The three most submitted suggestions for improvements to future WA GSOOs were:

- **Renewable energy and industrial decarbonisation.** Stakeholders asked AEMO to include more information on the rates at which industry will decarbonise and large-scale renewable energy supplies will grow, with consequent changes in gas use. Stakeholders requested that WA GSOO forecasts should include the impact of these trends on both overall gas demand and gas demand patterns.
- **Future gas supply.** WA has multiple gas supply projects either proposed or under development. Stakeholders asked AEMO to consider providing more clarity on future gas supply projects, especially Perth Basin supply and liquified natural gas (LNG)-linked Domestic Market Obligation (DMO) supplies.
- **Gas supply reliability.** Recent outages have highlighted a lack of flexibility in WA gas supply, with most gas plants producing at or close to capacity. Stakeholders asked AEMO to include a reliability outlook in its gas supply forecast.

Other topics raised by stakeholders that could be considered for inclusion in future WA GSOOs:

- **More details on assumptions.** Consider providing further clarity on the methodology in modelling gas demand and potential gas supply and the associated assumptions for the WA gas market.
- **Regional information.** Consider expanding the number of regions and model supply and demand in each region. The borders of the regions should reflect the WA Gas Bulletin Board (GGB) zones.
- **Intra-day demand and gas network adequacy.** Consider including information on gas demand at peak times, coupled with pipeline data, to analyse sufficiency of the gas network and gas storage.
- **Comparisons with previous GSOOs.** Compare the current forecasts with previous GSOO forecasts to show how they have changed over time.

More details on the recommendations made in this report can be found in Section 4.

¹ GSI Rule 105(1); see <https://www.wa.gov.au/system/files/2022-11/Gas%20Services%20Information%20Rules%201%20December%202022.pdf>.

Summary of recommendations

The WA GSOO must reflect the impacts associated with the rapid energy transition underway in WA. The impacts of decarbonisation and the growth of renewable energy projects must be forecast and the impacts on gas demand modelled. Declining gas supply and continued growth in the mining and minerals processing sectors must also be accurately forecast. The key recommendations are listed below.

Methodology - AEMO commits to document the detailed input assumptions for the three WA GSOO scenarios as fully as possible. This will increase the information available to stakeholders and improve interpretation of the scenarios used in the forecasting.

AEMO will investigate the feasibility of more closely aligning WA GSOO and WEM ESOO criteria for including pre-Final Investment Decision (FID) renewable energy projects and industrial decarbonisation programs, which AEMO studied closely in the 2023 WEM ESOO.

The WA GSOO will also more clearly explain the use of the High scenario in the forecasts. This is the scenario that AEMO uses to explore the less certain renewable energy supply projects and future decarbonisation projects, and the more speculative gas supply projects.

Policy - AEMO will aim to more fully explain the government climate change policy targets embedded in its scenario modelling. As required it will also investigate the relevant assumptions causing any discrepancies between AEMO's forecast and desired government policy outcomes.

Gas supply - AEMO will review the criteria it uses to model future gas supply, including how it treats gas deliveries under DMOs, to ensure they remain appropriate. It will also investigate the feasibility of including a gas supply reliability assessment in the WA GSOO. If it proceeds, this is likely to entail consultation with GMPs on what a suitable metric would be to assess supply reliability.

AEMO will investigate the feasibility of modelling pipeline throughput on either a daily or hourly basis. This is likely to require consultation with pipeline operators regarding pipeline capacities throughout the WA network and any expected flow restrictions over the outlook period.

AEMO will investigate more closely aligning the three WA GSOO regions with the ten WA GBB zones. It will also assess the feasibility of adjusting the supply and demand models to align with the WA GBB zones and whether this would compromise the confidentiality of GMPs' Formal Information Request (FIR) responses.

Stakeholder engagement - Ongoing stakeholder feedback was a key theme running through the responses AEMO received. To facilitate this, AEMO will continue to make best endeavours to meet with proponents of gas supply projects, major decarbonisation projects and renewable energy projects.

Limited benefit or out of scope - AEMO considers that due to the range of prices available to gas consumers, publishing a single annual price forecast as part of the WA GSOO is unlikely to provide value to stakeholders.

The WA GSOO will continue to consider the impacts associated with the energy transition, including the impacts of decarbonisation of the SWIS generation fleet.

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1 Background and context

The Western Australian (WA) Gas Statement of Opportunities (GSOO) report provides Gas Market Participants (GMPs)² and other gas industry stakeholders with information and assessments relating to medium and long-term natural gas supply and demand and natural gas transmission and storage capacity in the WA domestic market.

The Australian Energy Market Operator (AEMO) must publish the WA GSOO annually by 31 December of each calendar year. Rules 2(2)(b) and 104 of the Gas Services Information (GSI) Rules specify requirements for the WA GSOO. The WA GSOO addresses existing and expected market developments in the WA gas market.

Rule 105 of the GSI Rules requires AEMO to conduct a review of the WA GSOO information (Review) at least once every five years, which must be carried out in consultation with GMPs and gas industry groups.

The Review may consider any of the following:

1. The regions (if any) to be specifically considered in a WA GSOO.
2. Assumptions used to develop a WA GSOO.
3. Scenarios to be considered by a WA GSOO.
4. The general methodologies to be used in developing a WA GSOO.
5. The types of information to be collected for a WA GSOO.
6. Any other inputs that AEMO considers relevant.

This 2023 Review is the second³ five-yearly review of the WA GSOO since the GSI Rules commenced in 2013. The Review considers the matters specified in rule 105 of the GSI Rules, in consultation with GMPs and other gas industry stakeholders.

² As defined in the Gas Services Information Rules (GSI Rules), available at: <https://www.wa.gov.au/government/document-collections/gas-services-information-rules>. All references to the GSI Rules in this report refer to the version dated 1 December 2022.

³ The first five-yearly review was completed in 2018 and is available here: https://aemo.com.au/-/media/Files/Gas/National_Planning_and_Forecasting/WA_GSOO/2018/Five-Yearly-Review-of-the-WA-GSOO.pdf.

2 Process

The Review must be undertaken in consultation with GMPs and gas industry groups, as per rule 105(2) of the GSI Rules.

AEMO provided an overview of the Review to GMPs at the February 2023 Western Australia Gas Consultative Forum (WA GCF). The overview outlined the areas the survey would seek feedback on. It also shared the timeline for the review and sought comments from GMPs on the areas to be addressed.

A web-based survey was issued to GMPs via email. A survey link was also published on AEMO's website⁴.

The submission template included eight open-ended questions, which allowed stakeholders to provide qualitative feedback. A further 24 questions asked stakeholders to:

- Reply yes or no to a statement.
- Choose an option from a list of categories offered.
- Rate (on a five-point scale), the accuracy or usefulness of various aspects of the GSOO.

The survey closed on 17 March 2023. AEMO has collated and analysed the information it has received. An overview of the responses is presented in Section 3.

Following analysis of the responses and noting the common themes, AEMO developed its recommendations for changes to future WA GSOOs. These are presented in Section 4.

2.1 Consultation process

The consultation process for the Review is described in Table 1.

Table 1 Consultation process for the review

Consultation method	Approach
WA Gas Consultative Forum (WA GCF), 16 February 2023	AEMO introduced the review to GMPs and requested feedback on the proposed topics for consultation.
Survey link emailed to GMPs, 17 February 2023	The survey allowed for focused rating, categorical, and open-ended responses to address each area outlined in rules 105(3)(a)-(f) of the GSI Rules.
Survey link published on AEMO website, 21 February 2023	The survey link was published in the WA GSOO section of the AEMO website.
Gas Advisory Board, 23 March 2023	AEMO outlined the questions in the survey and requested feedback on their suitability.
WA GCF, 26 May 2023	AEMO: <ul style="list-style-type: none"> • Presented the preliminary results from the Review submissions and AEMO's proposed action items. • Asked GMPs for any additional comments. • Confirmed that a final report would be published on its website in June 2023.
Publication of final report, 2 October 2023	Publish final Five-Year Review report (this report).

⁴ Published at <https://aemo.com.au/en/energy-systems/gas/gas-forecasting-and-planning/wa-gas-statement-of-opportunities-wa-gsoo/5-yearly-review-of-wa-gas-statement-of-opportunities> and deactivated on 17 March 2023.

3 Submissions and findings

AEMO received 21 submissions from stakeholders. Most responses to questions about the overall quality and content of the WA GSOO indicated that respondents were satisfied with the current format of the WA GSOO. Stakeholders provided suggestions on areas of improvement and additional analysis that could enhance the report.

3.1 Submissions to the review

The 21 submissions are an increase on 18 responses to the previous Review in 2018. Of the 21 submissions, 16 were from registered GMPs. AEMO received 18 online submissions, while three written submissions were sent directly to AEMO.

The submissions represented the various sectors of the WA gas market, as Table 2 shows. Gas buyers represented the mining, power generation and industrial subsectors, and gas suppliers represented both LNG-linked and domestic-only gas projects.

Table 2 Review responses

Stakeholder type	Submissions received
Gas buyers	11
Gas suppliers	7
Other (Government and advocacy groups)	3
Total submissions	21

The 24 multiple choice questions and eight open-ended questions generated a total of 517 individual question responses⁵.

3.2 Overall observations on the WA GSOO

Most of the responses to the questions about the overall quality and content of the WA GSOO report were positive (178 question responses). There were 30 negative question responses and 54 neutral responses.

Gas suppliers were the most satisfied group, with 76% of their question responses being positive. Gas buyers responded to 67% of questions positively, while government and advocacy groups answered 46% of the questions positively.

Figures 1 and 2 show responses to questions which rated the WA GSOO in general terms. Assessments were graded on a five-point scale^{6,7}.

⁵ Not all respondents answered every question.

⁶ The sample size is too small for robust statistical analysis.

⁷ Scoring scale: most favourable – 5, favourable – 4, neutral – 3, unfavourable – 2, least favourable – 1.

Figure 1 How satisfied are you with the 2022 WA GSOO?

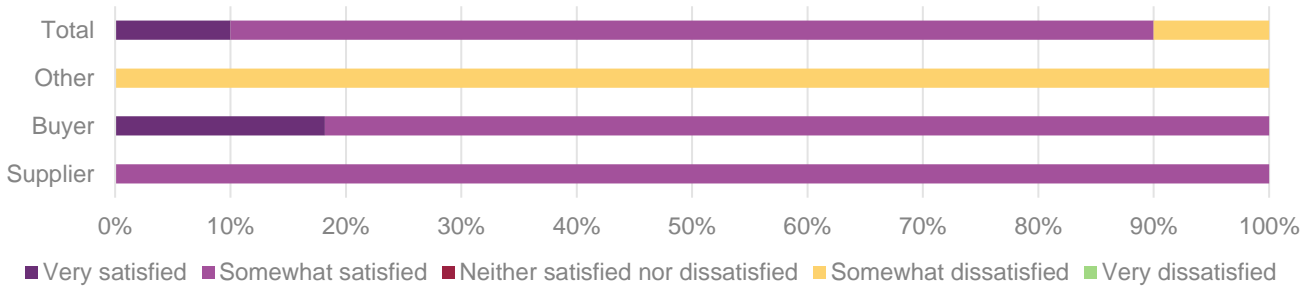
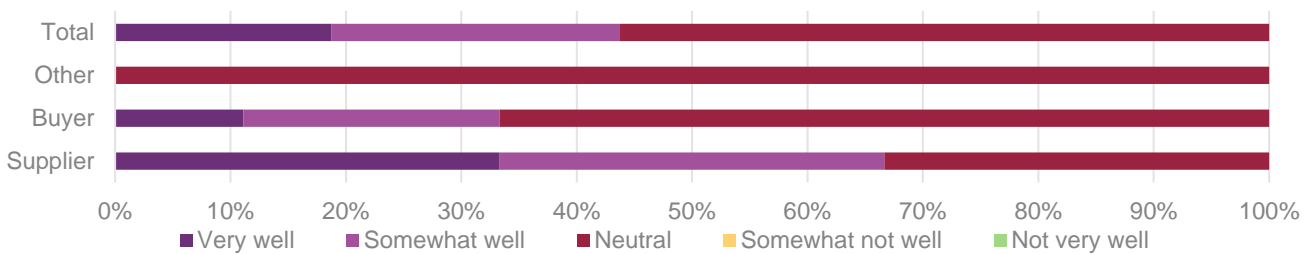


Figure 2 Over the last five years, how well did the WA GSOO address the content requirements as detailed in the GSI Rules?



Examples of overall positive responses included:

"The GSOO is an important summary document to understand different market dynamics and directions."

"The base scenario supply and demand forecast is extremely useful to form a view of the WA domestic gas market."

The overall responses that suggested improvements included:

"Recommend future GSOOs provide further information on the outlook for gas transmission pipelines and gas storage facilities."

3.3 WA GSOO content

The majority of the responses to questions seeking stakeholders' opinions on GSOO content were positive (153 question responses, or 68% of all relevant question responses⁸). There were 28 negative responses to these questions (12% of relevant question responses).

Gas suppliers (75% positive responses) were markedly more satisfied with the content than gas buyers (66% positive responses). Government and advocacy groups were less satisfied, with 52% of their responses to this subset of the questions being positive.

One of the main aims of the WA GSOO is to develop a 10-year supply demand balance forecast for Western Australia's gas market. Stakeholders' opinion of the inputs into this forecast is shown in Figures 3 to 14.

⁸ The responses to information-seeking questions such as "Sections to include/exclude from the GSOO" are not included in these figures.

Gas demand

Figure 3 shows that the assumptions underpinning the gas demand forecasts were deemed more realistic than those underpinning the gas supply forecasts by both buyers and sellers. Government and advocacy groups did not see gas demand forecast assumptions as realistic.

Figure 3 In the 2022 WA GSOO, how realistic were the assumptions made for the domestic gas demand forecasts (base scenario)?

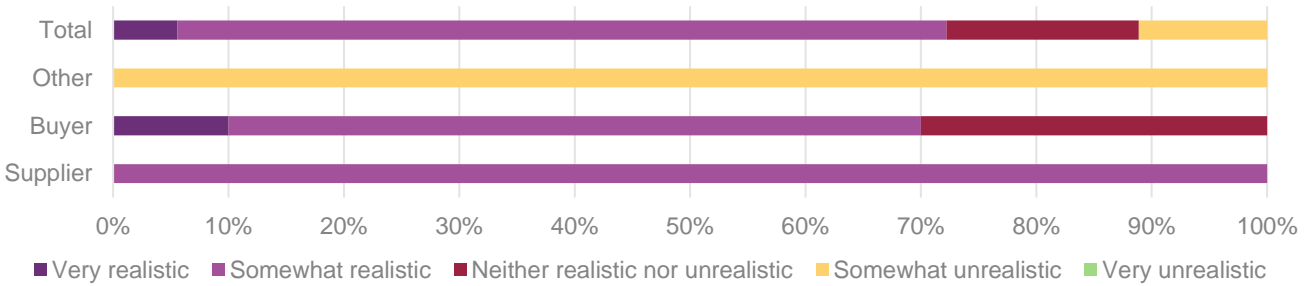
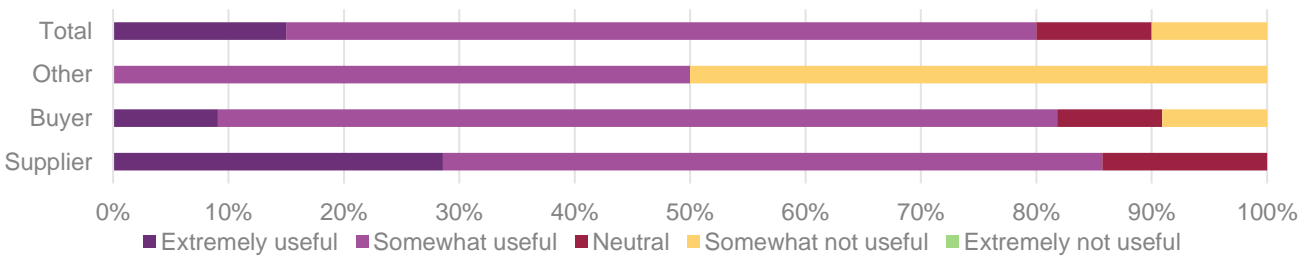


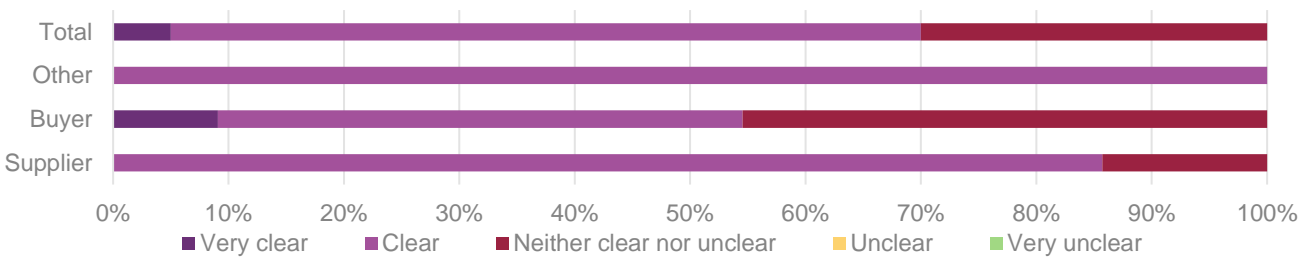
Figure 4 shows that this result is reflected in the perceived usefulness of the gas demand forecast. Again, buyers and sellers were overwhelmingly satisfied, with other stakeholders split.

Figure 4 In the 2022 WA GSOO, how useful are the domestic gas demand forecasts (base scenario)?



This usefulness was perhaps underpinned by a clear understanding of the methodology behind the gas demand forecasts. The question on clarity of methodology shows positive or neutral results for all respondents as shown in Figure 5.

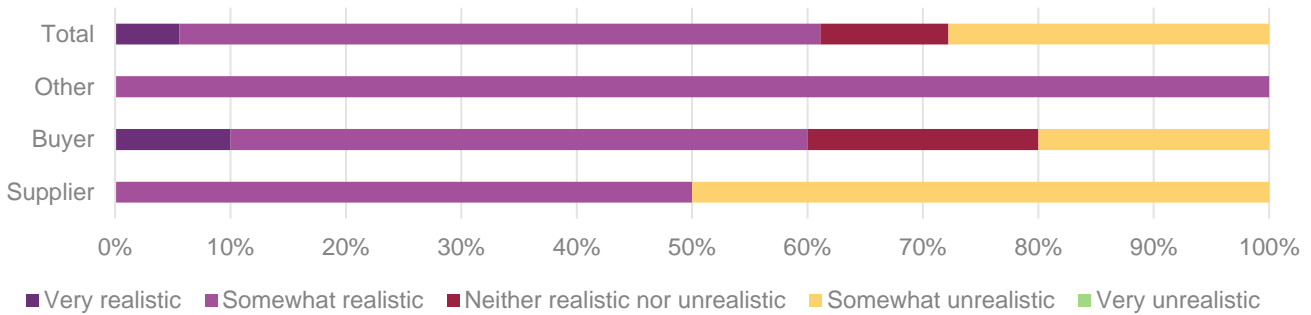
Figure 5 In the 2022 WA GSOO, how clear was the description of the domestic gas demand forecast methodology?



Gas supply

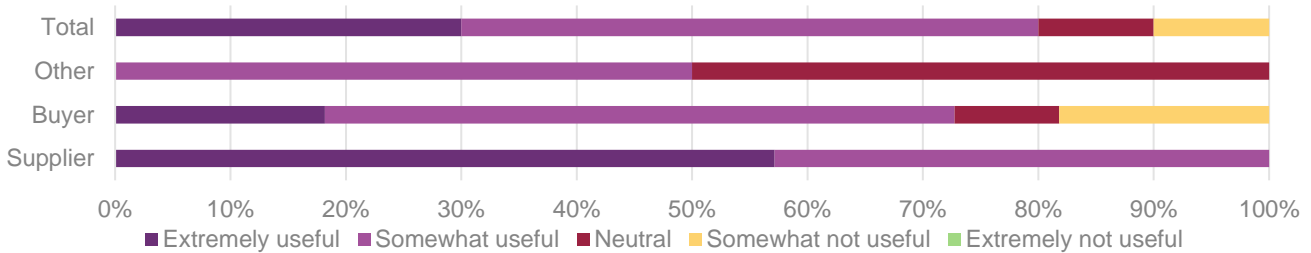
Figure 6 shows that the gas supply assumptions received a more mixed response. While buyers, government and advocacy groups were mostly positive, gas suppliers were split, with half the respondents saying that the assumptions were unrealistic.

Figure 6 In the 2022 WA GSOO, how realistic were the assumptions made for the potential gas supply forecasts (base scenario)?



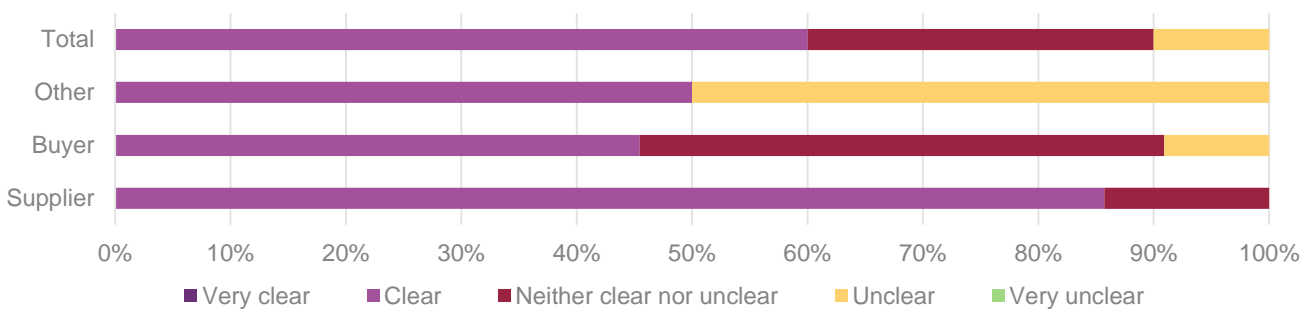
However, Figure 7 shows that most buyers and all suppliers deemed the supply forecasts to be useful.

Figure 7 In the 2022 WA GSOO, how useful are the potential domestic gas supply forecasts (base scenario)?



Stakeholders said they found the description of the potential gas supply forecast methodology clearer than they found the gas demand methodology (shown in Figure 5). Figure 8 indicates that nearly all gas suppliers said they found the description clear.

Figure 8 In the 2022 WA GSOO, how clear was the description of the potential domestic gas supply forecast methodology?

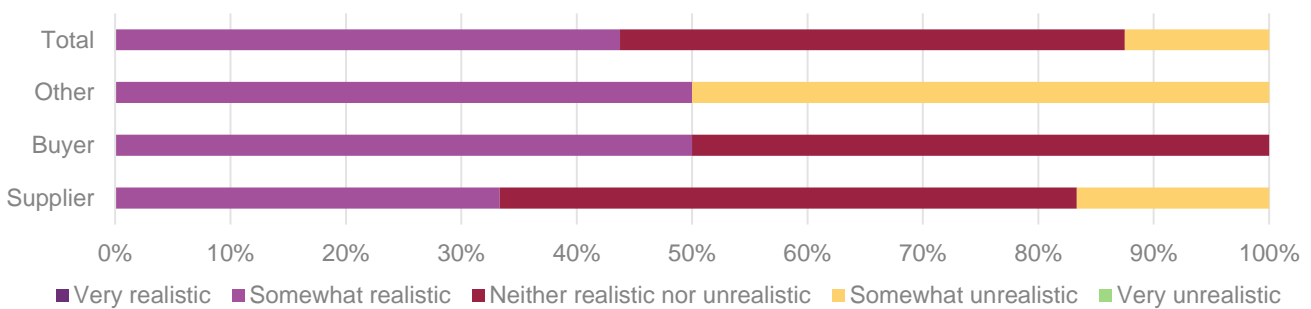


Underlying assumptions

The demand forecasts presented in the WA GSOO are built on a number of underlying input forecasts. The most important of these are the economic forecast, the commodity forecasts and the South West Interconnected System (SWIS)⁹ gas-fired power generation (GPG) forecast. The economic and commodity forecasts were generally well received, while there was less confidence in the SWIS GPG forecast.

Figure 9 shows that 87% of responses were positive or neutral about the realism of the economic forecast assumptions.

Figure 9 In the 2022 WA GSOO, how realistic were the assumptions made for the economic forecasts (base scenario)?



On the realism of the commodity forecasts, Figure 10 shows that 94% of the responses were positive or neutral.

Figure 10 In the 2022 WA GSOO, how realistic were the assumptions made for the commodity forecasts (base scenario)?

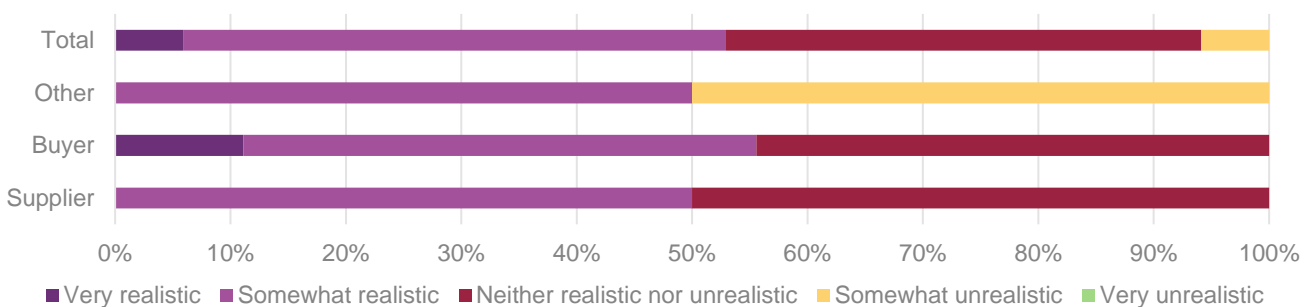
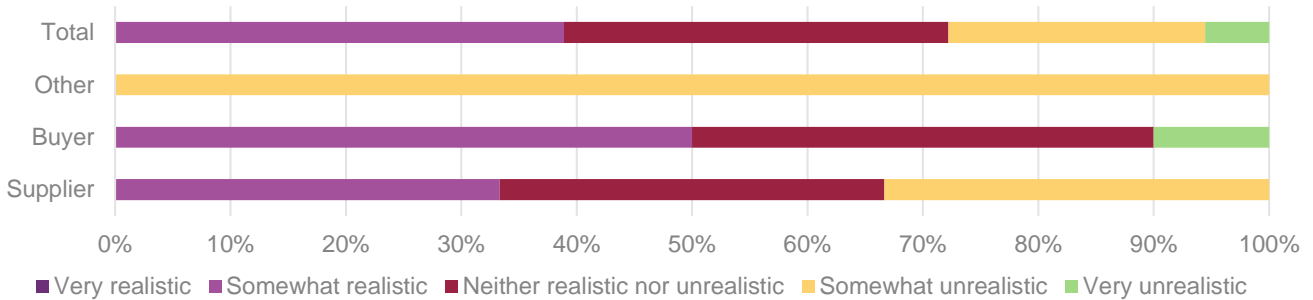


Figure 11 shows that there were 61% of respondents neutral or negative about the realism of the assumptions made for the SWIS GPG forecasts. Electricity generation also resulted in the most comments in the open-ended questions, the majority of which highlighted the modelling of renewable generation (discussed further in Section 3.4.1).

⁹ The electricity grid in the southwest of WA and extending generally between Kalbarri, Albany and Kalgoorlie.

Figure 11 In the 2022 WA GSOO, how realistic were the assumptions made for the gas demand for SWIS power generation forecasts (base scenario)?

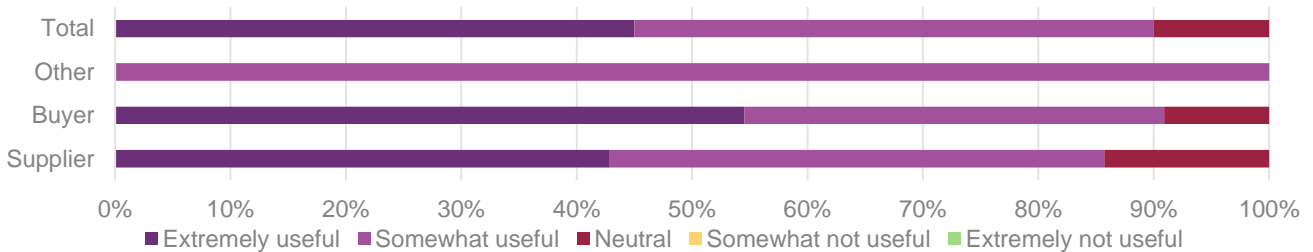


Presentation of WA GSOO data

Presenting the data that make up the forecasts concisely is important to the overall usefulness of the document. To achieve this, AEMO publishes numerous graphs in the WA GSOO, as well as a separate Data Register. The Data Register contains all the data that make up the graphs within the document and its appendices.

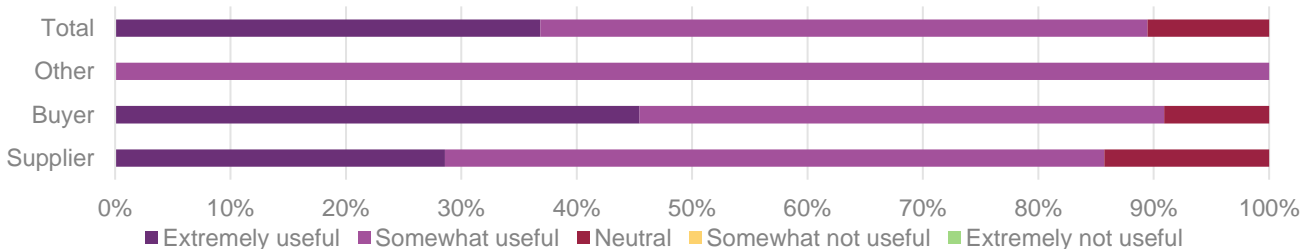
Figure 12 shows that stakeholders were overwhelmingly positive about the usefulness of the visualisations in the WA GSOO, with 90% of all responses saying it is either “extremely” or “somewhat” useful.

Figure 12 How useful are the visualisations in the WA GSOO?



The Data Register also appears highly valued by stakeholders. Figure 13 shows that 90% of all responses were positive.

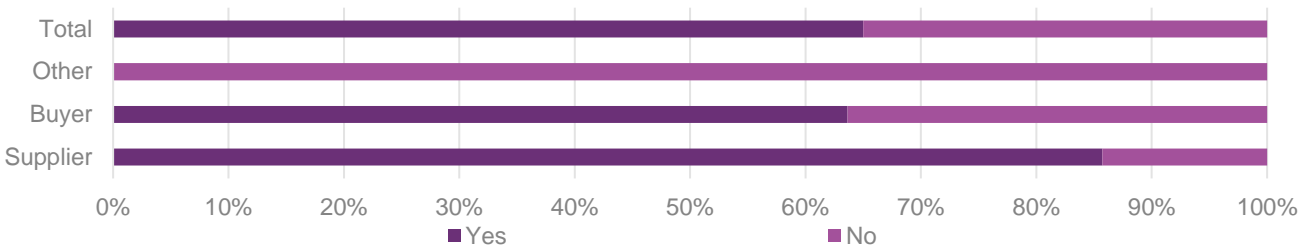
Figure 13 How useful is the data register that is published with the WA GSOO?



Regional breakdown

Stakeholders requested more information about the regional breakdown of the WA GSOO forecasts. Figure 14 shows that although the majority of responses from both buyers and suppliers were positive, 35% were not. This topic also featured in the top 10 issues raised in the open-ended questions, with stakeholders highlighting the lack of alignment between the WA GSOO and the WA Gas Bulletin Board (WA GBB). This lack of alignment is discussed in more detail in Section 3.4.7.

Figure 14 Is the regional breakdown (Metro/South West, North and East), provided in the WA GSOO sufficient?



3.4 Key themes

To further understand stakeholders’ priorities, and to delve deeper in the issues raised in the multiple choice questions, AEMO included open-ended questions seeking stakeholders’ opinions on both existing WA GSOO content and topics that could be considered in the future.

These responses indicated that while most stakeholders were reasonably satisfied, the comments described multiple opportunities for improvement in the information and analysis contained in the WA GSOO. AEMO extracted 146 individual topic comments from the open-ended questions, split across 50 categories.

The energy transition was a common theme that emerged from many comments. The responses covered many topics, but focussed strongly on decarbonisation objectives, with renewable energy and the transition away from fossil fuel energy sources. Additional industry consultation was suggested by several respondents as a way of improving AEMO’s understanding of the gas market issues in Western Australia.

The most-mentioned topics that are currently included in the WA GSOO but that stakeholders would like to see more analysis of were:

- The WA gas reservation policy (often referred to as the Domestic Market Obligation, or DMO).
- Future gas supply sources.
- Key drivers of gas demand.
- Reliability of current gas supply sources.
- Pipeline utilisation.

Other topics that were raised by respondents included:

- More information on the underlying assumptions.
- More regional information and possibly an increased number of regions. This could include both the definition of each region and the supply and/or demand within each region.

- Additional details of intra-day gas demand, with information on gas requirements at peak times.
- More comparisons of previous forecasts with the current WA GSOO forecasts.

Table 3 Most common topics mentioned in responses

Topic	Types of information to be collected for a WA GSOO (no. of responses)	Total comments received (no. of responses)	Existing topic in WA GSOO?
Renewable energy, decarbonisation and climate change policy	11	30	Limited
Future gas supply	7	7	Yes
Gas supply reliability	4	11	Limited
Domestic market obligations	4	10	Limited
Gas prices	3	7	No
Pipeline capacities and utilisation rates	1	5	Limited
Alignment with the WA GBB	-	10	No
Coal supply	-	6	No

Note: these topics had either three or more mentions in the question “Top three subjects to request information on in future GSOOs”, or five or more total comments.

3.4.1 Renewable energy, decarbonisation, and climate change policy

Feedback

The issue raised most often by stakeholders was renewable energy and its impact on both gas demand and supply. This issue is closely related to requests for AEMO to more closely align at least some of its scenarios with government climate policy (also a topic in the top 10) and to reflect in the WA GSOO the efforts of industry to decarbonise.

Most stakeholders who mentioned renewables were either requesting more information on the likely impact of renewables on future gas supply or requesting that additional renewable projects be included in AEMO’s modelling.

The main concern about renewables, particularly for gas developers, is how the uptake of renewable energy will affect future gas demand. A key driver is the rate at which renewables will be developed and what degree of competition gas marketers can expect:

“The transition from fossil fuels to renewables. How will this transition take place and what are the impacts on the market?”

Stakeholders requested more information on two aspects of the impact of renewables on gas demand – the impact on overall gas quantity required, and the change in usage pattern as gas is increasingly used for firming – best summarised by the comment:

“The impact on gas demand in relation to increasing penetration of renewables in the market (as more flexible gas arrangements are required to support increased investment in large-scale renewable projects)”.

Stakeholders also commented on the limited number of future renewables projects in the GPG modelling, especially as coal retirements were included in the modelling. Comments such as:

“Modelling was undertaken without consideration of projects progressing to FID¹⁰ ... with coal retirements reflected, but not renewables or battery projects”

indicate that not all stakeholders were comfortable with AEMO’s criteria for selecting which renewable energy projects to include in its modelling.

There was some concern that AEMO modelled the transition from coal to gas in the power generation sector as occurring too quickly:

“Proponents are likely to prepare for the closure of coal-fired power plants now by starting to substitute coal for gas. The base case demand forecast should therefore reflect a more gradual increase as opposed to such a sharp increase at the end of this decade”.

As well as GPG, stakeholders asked to see more information on industrial decarbonisation programmes and their impact on gas demand. While the WA GSOO accounts for those decarbonisation projects highlighted in the Formal Information Request (FIR) responses (particularly in the mining sector), five stakeholders requested that AEMO looks more comprehensively at:

“Carbon neutral programs which may accelerate gas reduction”

and the closely related converse outcome:

“Understanding the drivers of large users which may need additional natural gas demand to electrify their operations”.

This apparent contradiction of increasing gas usage due to electrification can occur when a user is shifting from coal or diesel to renewable energy fired by gas.

A perceived lack of alignment with Federal Government policy was highlighted by several stakeholders. Four suggested it would be valuable for AEMO to resolve this by adding an additional scenario that explicitly includes climate policy goals. Typical comments included:

“At least one scenario should be developed that is consistent with Australia meeting the Paris Agreement goals of limiting global warming to 1.5 degrees”.

A linkage to the WEM ESOO was also suggested as a way of aligning AEMO’s forecasts:

“A decarbonisation scenario ... this should be linked to the decarbonisation scenario in the Electricity Statement of Opportunities”.

AEMO discussion

AEMO started to see evidence of actual and planned decarbonisation in the FIR responses in mid-2022. These indicated that several companies were planning to change their gas usage patterns – either from a switch from gas to renewable electricity, or a switch from coal to gas. AEMO supplements the FIR data with meetings with energy consumers that are looking to decarbonise, and evidence from both these sources was used to build the gas demand profile.

¹⁰ Final investment decision.

The requests for more information indicated that stakeholders understand that decarbonisation does not lead to a simple outcome of “less gas usage” or “more gas usage”. Each decarbonisation project is different and will lead to a different change in gas requirements.

As businesses seek to decarbonise their energy consumption AEMO expects significant fuel-switching will occur across industry. The impacts of this have been explored in the 2023 WEM ESOO for the first time, identifying business electrification, growth in cooling load (air-conditioning), electric vehicles, and the expansion of industrial loads as the key electricity demand growth drivers. In the context of the GSOO, increased electricity consumption may result in increased gas consumption from GPG. AEMO expects to explore this impact in future GSOOs by considering a range of generation fleet mixes across the GSOO scenarios.

The scenarios that underpin the WA GSOO have been developed by AEMO and include differing degrees of decarbonisation within their outlooks. Within the framework of these scenarios, AEMO has modelled each decarbonisation project individually, and the net outcome (in terms of gas usage) will depend on the decarbonisation solutions and generation mix.

3.4.2 Future gas supply

Feedback

Forecasting future gas supply is one of the key obligations of the WA GSOO. Perhaps unsurprisingly, clarity on future gas supply sources came top of the information stakeholders wanted to see collected for the WA GSOO, and was raised by seven stakeholders.

Illustrating the majority of comments was the request to include more information on:

“Future supply sources (Perth Basin)”

and a more general request for a:

“Realistic view of developing projects”.

There was also concern about the process of bringing gas projects online, with a request to increase information/analysis of:

“Factors impacting new or expanded potential supply (such as approvals timeframes, construction cost/schedule conditions)”.

AEMO discussion

The methodology for the WA GSOO includes criteria that specify which projects can be included, for both supply and demand projects. This means that the WA GSOO typically includes very few pre-FID projects.

To get a realistic view of development projects, AEMO consults extensively with industry and government (typically the Department of Jobs Tourism, Science, and Industry (JTSI)), both via the WA GCF and one-to-one meetings. The information gathered, plus publicly released information, enables AEMO to build up its view of future gas supply.

While the criteria AEMO applies mean that future supply can be underestimated, this is preferable to over-estimating gas supply due to the commercial, geological and regulatory hurdles facing new projects.

To show the range of possible supply outcomes, the High scenario will continue to include less certain supply projects. To more transparently communicate the likelihood associated with Projects, AEMO intends to include a merit criterion which informs classifications of projects in future GSOOs. This approach has been integrated into the 2023 WEM ESOO for the first time to classify generation and demand projects.

3.4.3 Gas supply reliability

Feedback

Current gas supply and reliability of gas supply were raised in 11 responses. The recent simultaneous outages of John Brookes (December 2022 to February 2023) and Wheatstone (January 2023) featured in a number of responses, with a lack of flexibility in the gas market also highlighted. There were also requests for more information on gas supply project closures.

The general request:

“For supply ensure that WA GSOO looks at not only supply facility capacity but also reliability”

was a common theme, perhaps highlighted by the outages during summer 2022-23:

“Lack of flexibility in the WA gas market when market issues occur (e.g. John Brookes, Wheatstone)”.

There were a number of queries regarding AEMO’s decision to model future production at 85% of DMO for Chevron’s Wheatstone and Gorgon projects:

“the assumptions for Wheatstone and Gorgon (particularly Wheatstone) were very conservative”

and

“If AEMO ... decides to continue to model domestic gas obligations to reflect actual operating patterns, we recommend modelling at least 90% nameplate capacity”¹¹.

AEMO discussion

AEMO has not previously assessed day-to-day reliability of gas supply; modelling has always been on an annual basis. However, AEMO recognises that the reliability of supplies in the gas market is a key issue as most of the gas supply projects are running at, or close to, capacity. Simultaneous gas plant outages can cause supply issues, as seen in January 2023 when the Emergency Management Facility (EMF) was activated.

AEMO would need to consult the Gas Advisory Board (GAB) and/or the WA GCF on what an effective measure of reliability would look like, and how reliability could be effectively incorporated into future supply modelling, which has previously concentrated on annual volumes.

¹¹ Based on historical production, AEMO modelled future production from Gorgon and Wheatstone at 85% of DMO.

3.4.4 Domestic Market Obligations

Feedback

There were nine comments requesting more information on DMOs. The three main aspects of DMO raised were gas delivery and reporting, reliability of supply and crisis response, and AEMO's modelling of DMO gas supply.

The most frequent request was that the WA GSOO publish a "running total" of gas deliveries versus obligations for each LNG project. Comments such as:

"We believe that there should be transparent reporting of the Domgas Reservation commitment for the given suppliers and reporting of actual compliance against that commitment for each prior annual period"

and the common request to:

"Monitor domgas obligation compliance of all the different players".

Other stakeholders asked for a scenario whereby DMO production is incorporated into gas supply forecasting at a higher rate, requesting a scenario whereby 100% of DMO is delivered by each project:

"A scenario in which suppliers deliver up to their actual monthly equivalent domgas obligation".

Similar to this, other stakeholders questioned AEMO's decision to model DMO production at 85% of requirement:

"Recommend the domestic gas obligations for Gorgon and Wheatstone be modelled at the contractual rates of 300 TJ/d and 200 TJ/d respectively, which shows the domestic market obligations being given effect".

One stakeholder, who was not comfortable with the production level AEMO chose, acknowledged that the AEMO modelling was attempting to be realistic:

"If AEMO however decides to continue to model domestic gas obligations to reflect actual operating patterns, we recommend modelling at least 90% nameplate capacity or more".

Another stakeholder requested AEMO more explicitly unpick the differences in each gas reservation agreement and attempt to model how these impact future gas supply:

"The GSOO should acknowledge the complexity and differences of each gas reservation policy and how this may affect supply over the 5-year domestic gas supply period".

AEMO discussion

Forecasting gas supply is a requirement in the WA GSOO, and this includes DMO gas supply. However, administration of DMOs is not within the scope of the WA GSOO. Agreement of gas reservations with WA's LNG exporters, and enforcement of domestic market obligations is managed by Department of Jobs, Tourism, Science and Innovation (JTSI). AEMO uses the DMO information publicly available from JTSI and does not have any additional information beyond public agreements and WA GBB submissions.

The forecast 85% production rate for Wheatstone and Gorgon (2022 WEM GSOO) was determined after analysis of actual deliveries from the two domestic gas plants from their inception up until mid-2022. AEMO will

consult with industry on appropriate methodologies to assign production rates to projects as part of future GSOOs.

3.4.5 Gas prices

Feedback

Three stakeholders requested a price forecast be published in the WA GSOO, while there were several requests that AEMO publishes the gas prices it uses when forecasting WA gas supply.

In addition, there were several requests to reinstate the price points at which market participants would change their behaviour.

AEMO discussion

A gas price forecast in the WA GSOO is not required under the GSI Rules. AEMO uses assumed gas prices when forecasting gas supply projects and gas demand from GPG, but these are not a forecast of future prices.

Gas prices in WA are not public – most gas is traded under medium- to long-term bilateral contracts with confidential pricing. There is a very small spot market with transparent pricing, but only around 2% of the total market is traded here.

A gas price forecast was included in the WA GSOO pre-2018 but was removed following the Five-Yearly WA GSOO review at that time, because stakeholders believed it was more valuable for the WA GSOO to consider the drivers of the domestic gas price over time. Since then, AEMO has sought information on gas prices that would cause buyers and sellers to change their behaviour (open/close supply projects and industrial plants) but has not always published these figures due to the small sample size, potentially compromising confidentiality. While AEMO has used an estimated gas price to forecast GPG, it has not published this price.

3.4.6 Pipeline capacity and utilisation rates

Feedback

Under rule 104(2)(a) of the GSI Rules, the WA GSOO must include information on gas transmission pipelines. This has historically been restricted to a network diagram and capacities of the major lines.

Several stakeholders considered that AEMO's analysis of pipeline flows and capacities could be expanded. This is driven by the changing gas supply picture changes, with more production expected to come online in the southern part of the network (Perth Basin) and the possibility that gas demand may become more variable, driven by the ability of gas to provide flexible and peak electricity supply.

Along with the expanding coverage of capacity and utilisation, one stakeholder requested more analysis on the impact of the growing southern production, especially as there is now an LNG liquefaction contract that is backed by production from the Perth Basin:

“With more gas production forecast to be coming online in the “south” over the next decade, is there a point in time where gas may need to start physically flowing north in order to meet northern demand?”

Pipeline capacity during periods of peak demand was also a concern for a number of stakeholders:

"The other aspect that AEMO does not take into consideration is pipeline capacity of DBNGP¹². Further analysis needs to be done on the supply / demand modelling account for hourly peak capacity constraints as power generation gas consumption increases. This is largely due to gas peakers in the SWIS ramping up at a similar time during the morning and afternoon peak. Is there sufficient gas flow down the pipe? Is there sufficient capacity for the increase in the demand for gas?"

AEMO discussion

The WA GSOO is required to provide information on pipeline capacity. Modelling pipeline constraints based on hourly or daily flow would be a significant uplift to AEMO's scope for the preparation of the GSOO and needs to be considered against the additional costs to undertake such a study and whether AEMO has access to the requisite information under the GSI Rules.

Where practicable, AEMO will consider aligning the WEM ESOO and WA GSOO in its approach to the maximum GPG demand, with the potential to leverage the half-hour granularity of the WEM ESOO's reliability assessment.

Daily pipeline flow modelling would require AEMO to gather additional information relating to pipeline capacities and operational coordination processes. This may require additional questions in the FIR, which would require stakeholder engagement and consultation via existing forums like the WA GCF. AEMO will also liaise with the Australian Gas Infrastructure Group (AGIG) on actual capacities in each section of the Dampier to Bunbury Natural Gas Pipeline (DBNGP) pipeline.

3.4.7 Alignment with the WA GBB

Feedback

The WA GSOO and the WA GBB do not currently use the same regions. The WA GSOO currently uses the zone names North, East and Metro/South West, while the WA GBB uses Dampier, Goldfields, Kalgoorlie, Karratha, Metro, Mid-West, Parmelia, South-West and Telfer.

It was clear from the responses that the WA GSOO zones are not well understood. Multiple stakeholders suggested aligning the WA GSOO zones with the WA GBB zones. There were numerous comments similar to:

"Consider expanding to report on all zones that currently feature in the GBB"

and

"A view broken down into pipelines or zones as per GBB would be more accurate".

Suggested actions for AEMO included:

"It would be valuable to include a chart with forecast supply by region (and possibly source)".

AEMO discussion

Aligning the WA GSOO and the WA GBB would make comparing the two easier. It would also allow readers to easily use WA GBB data that is published after the WA GSOO, enabling stakeholders to more easily inform their own forecasts.

¹² Dampier to Bunbury Natural Gas Pipeline.

Maintaining confidentiality would be a key element to any change in reporting – there may only be one or two big suppliers/buyers in a given region – so AEMO would need to investigate this issue.

Supply by region is possible, although it would just be north (Carnarvon) and south (Perth). Supply by project is a regular question but is difficult to achieve without breaching the confidentiality of FIR responses.

3.4.8 Coal supply

Feedback

Coal supply and its impact on the gas market was highlighted by five stakeholders, although it should be noted that there were no requests to include it as part of the information to be collected for future WA GSOOs.

While coal is part of the GPG forecasting process, the quantity of electricity and its dispatch profile were not published. The request:

“it would be useful to ... [have] more details regarding coal power generation”

was a typical general response.

A more detail request included coal import and production:

“We believe market participants would derive significant benefits from having more information in relation to the supply, import and production of coal along with an expected dispatch profile, showing how many MWh it may produce and therefore its approximate impact on the usage of gas for GPG in the SWIS”.

AEMO discussion

Coal is not explicitly within the scope of the WA GSOO and forecasting coal supply is not a requirement under the GSI Rules. However, because GPG is a key part of gas demand in WA, an understanding of coal is needed to build a realistic GPG forecast. Coal generation is dispatched as part of the GPG modelling and coal use is published as part of the WA GSOO accompanying documents.

4 Recommendations

AEMO has identified and grouped the key feedback themes from stakeholders' submissions, and summarised these, along with AEMO's recommendations, in the following section. These recommendations will be presented to the WA GCF and GAB for comments, and then used for the development of future WA GSOOs.

4.1 AEMO commitment

AEMO will commit to document detailed assumptions input to the three GSOO scenarios. It will also make best endeavours to meet with proponents for new gas supply and demand projects, including those where changes in usage are expected – such as industrial decarbonisation.

4.2 AEMO commitment to explore

Renewable projects

The impact of renewable energy projects on gas demand must be modelled in the WA GSOO (rule 104(2)(b)). Stakeholders believe that the WA GSOO contains too few renewable projects, so their impact on gas demand is underestimated. AEMO will investigate the feasibility of more closely aligning WA GSOO and WEM ESOO criteria for including pre-FID renewable energy projects. Detailing the relevant criteria should increase the transparency of AEMO's forecasts. AEMO will also more clearly explain the use of the Low and High scenarios to explore the less certain renewable energy supply projects.

Decarbonisation

Stakeholders indicated that the WA GSOO contains too little information on industrial decarbonisation programmes. The impact of changes in energy sources needs to be understood to accurately model industrial gas demand (rule 104(2)(b)) and AEMO currently includes decarbonisation in its gas demand forecast. However, AEMO will investigate the feasibility of more closely aligning the WA GSOO and WEM ESOO criteria for including the outcomes of industrial decarbonisation programs, which AEMO considered closely in the 2023 WEM ESOO. This will include making best endeavours to meet with proponents of major decarbonisation projects, and more clearly explaining the use of the High scenario to explore future decarbonisation projects.

Reliability of gas supply

Stakeholders noted that the reliability of gas supply is not fully assessed in the WA GSOO. Reliability is not explicitly mentioned in the GSI Rules, although "information on gas production facilities" could be interpreted as including facility availability (rule 104(1)(b)(i)). AEMO will investigate the feasibility of including a gas supply reliability assessment in the WA GSOO. If it proceeds, this is likely to entail consultation with GMPs on what a suitable metric would be to assess reliability of current and future gas supply projects.

Future gas supply sources

Stakeholders requested more clarity on future gas supply sources and the factors impacting new supply. Forecast future gas supply must be included in the WA GSOO (rule 104(1)(b)(i)). AEMO will review the criteria

it uses to model future gas supply to ensure they remain appropriate. It will also make best endeavours to meet with proponents of every potential supply project and explain the use of the High scenario to explore the more speculative supply projects.

Pipeline capacity

Stakeholders indicated they would like the WA GSOO to include an analysis of pipeline capacity and utilisation. The WA GSOO must include information on gas pipelines and whether they are expected to be subject to future constraints (rule 104(2)n(a)). AEMO will investigate the feasibility of modelling pipeline throughput on either a daily or hourly basis. This is likely to require consultation with pipeline operators regarding pipeline capacities throughout the WA network and any expected flow restrictions over the outlook period.

Government policy targets

Stakeholders were concerned that the WA GSOO does not appear to align with government policy targets. The impact of policy targets on gas supply and demand must be understood (rule 104(1) and rule 104 (2)). AEMO already accounts for government targets and uses them in its Base scenario. However, AEMO will aim to more fully explain the climate change policy targets embedded in its scenario modelling. In addition, AEMO will investigate the assumptions causing any discrepancy between AEMO's forecast and desired policy outcomes.

Geographical alignment with WA GBB

The GSI Rules for the Five-Year Review require AEMO to review the regions that the WA GSOO considers (rule 105(3)(a)). Stakeholders noted that the three regions used in the WA GSOO are not aligned with the ten zones used on the WA GBB. AEMO will investigate the feasibility of more closely aligning the WA GSOO regions with the WA GBB zones. It will also assess the feasibility of aligning the supply and demand models with the WA GBB regions and whether this would compromise the confidentiality of GMPs' FIR responses.

4.3 Limited benefit or beyond the scope of the WA GSOO

Gas prices

Stakeholders requested that the WA GSOO should include a gas price forecast. Gas prices in WA are not public and forecasting gas prices is not a GSI Rules obligation. Additionally, a gas price forecast could diminish the credibility of the WA GSOO for the GMPs that do not agree with the forecast. However, AEMO could reinstate the graph of price points that drive behaviour if confidentiality can be retained.

Coal supply

Forecasting coal supply is not required under the GSI Rules and so it is beyond the scope of the WA GSOO. However, the impact of coal power generation needs to be understood to accurately model GPG (rule 104(2)(b)). Power generation forecasting is already undertaken by AEMO and this includes coal generation. AEMO should ensure its assumptions about coal generation are reasonable and clearly explained.

Domestic market obligations (DMOs)

Stakeholders requested more information on DMOs. DMOs are included in AEMO's supply modelling but are not explicitly included in the GSI Rules and DMO compliance is beyond the scope of the WA GSOO.

5 Glossary

Term	Definition
AEMO	Australian Energy Market Operator
AGIG	Australian Gas Infrastructure Group
DBNGP	Dampier to Bunbury Natural Gas Pipeline
DMO	Domestic market obligation. Term used by gas stakeholders to refer to the WA Domestic Gas Policy, which requires that landed LNG projects commit to making domestic gas available to the WA market by reserving the equivalent of 15% of their LNG production.
EMF	Emergency Management Facility. A mechanism whereby GMPs must supply additional information to AEMO via the WA GBB during times of gas supply stress.
ESOO	Electricity Statement of Opportunities for the Wholesale Electricity Market
FID	Final investment decision
FIR	Formal information request
GAB	Gas Advisory Board. A WA committee of gas representatives convened by the Rule Change Panel.
GMP	Gas Market Participant
GPG	Gas-fired power generation
GSI Rules	Gas Services Information Rules
GSOO	Gas Statement of Opportunities
JTSI	Department of Jobs, Tourism, Science and Innovation
LNG	Liquefied natural gas
SWIS	South West Interconnected System
WA	Western Australia
WA GCF	Western Australia Gas Consultative Forum