AEMC

REVIEW

Australian Energy Market Commission

FINAL REPORT

REVIEW OF THE GAS SUPPLY GUARANTEE

4 NOVEMBER 2021

INQUIRIES

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Reference: EMO0041

CITATION

AEMC, Review of the Gas Supply Guarantee, Final report, 4 November 2021

ABOUT THE AEMC

The AEMC reports to the Energy Ministers' Meeting (formerly the Council of Australian Governments Energy Council). We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the Energy Ministers' Meeting.

SUMMARY

1 The purpose of this review is to advise Energy Ministers on whether there continues to be value in retaining the Gas Supply Guarantee or a similar mechanism and, if there is, in what form it should be incorporated in the national energy framework.[1]

2 This review has been carried out in the context of a transitioning energy sector.

3 As noted by the Australian Energy Market Operator (AEMO) in its *2021 Gas Statement of Opportunities*, the long-term operation of gas-powered generators in the national electricity market (NEM) is uncertain and highly dependent on the evolution of the NEM's generation mix changes. In particular, coal-fired generation retirements and the increasing number of variable renewable energy developments. There have also been changes in the timing, location, and scale of new transmission infrastructure or augmentations in the NEM.[2]

4 This suggests that, for the foreseeable future, there are uncertainties in the electricity sector that will impact the operation of gas-powered generators and, consequently, on their need for natural gas. Therefore, the supply of gas is expected to continue to play a critical role in the electricity sector for some time, particularly during periods of low variable renewable energy generation or prolonged coal-fired generation outages.

Extending the term of the Gas Supply Guarantee

5 The Commission's recommendation is:

- for the Australian Government to extend the term of the Gas Supply Guarantee another three years to March 2026
- that an assessment on the long term need of the Gas Supply Guarantee be carried out prior to the conclusion of this extended period
- that the definition of gas supply shortfall be amended to clarify that a shortfall is considered in the context of part of a NEM region rather than the NEM as a whole.

6 This final recommendation has been made on balance following consideration of a number of alternative views from stakeholders as well as the short to medium-term outlook for the east coast energy market.

7 In particular, the Commission recognises the current uncertainties in the east coast energy sector, particularly the transition in the NEM to greater use of variable renewable generation. As a result, the Commission considers that it is prudent, under the current changing circumstances, that AEMO and market participants be able to access a tool such as the Gas Supply Guarantee that could assist them in managing potential gas supply shortfalls faced by gas-powered generators.

8 Reflecting the low-cost nature of the current Gas Supply Guarantee, the flexibility of the mechanism in dealing with issues as they arise and the role AEMO can play in bringing the

1 Energy Ministers, *Review of the Gas Supply Guarantee*, terms of reference, 9 September 2020, p. 1.
2 AEMO, *2021 Gas Statement of Opportunities*, March 2021, p. 30.

industry together to share information when it is needed most, the Commission does not recommend any fundamental change to the mechanism such as including it in the national energy rules at this time. It is satisfied that the continuation of the current arrangements for another three years will be consistent with the long term interests of electricity and gas consumers. This recommendation is consistent with that set out in the draft report.

9 The Commission anticipates that the outcome of a review of the Gas Supply Guarantee in three years will indicate whether the transformation of the energy sector still requires a mechanism of this nature or if the risks to supplying gas-powered generators have changed such that the Gas Supply Guarantee is no longer needed.

How the Gas Supply Guarantee operates

10 AEMO developed the Gas Supply Guarantee Guidelines to facilitate the delivery of east coast gas producers and pipeline operators' commitments made to the Australian Government in March 2017 to make gas available to meet peak demand periods in the NEM. These guidelines came into effect on 1 December 2017.[3]

11 The Gas Supply Guarantee Guidelines document is a non-binding instrument and sets out the process for AEMO to facilitate determining what action can be taken to address a potential forthcoming gas supply shortage that would impact the operation of gas-powered generators in the NEM. The Gas Supply Guarantee Guidelines are currently scheduled to expire on 31 March 2023.

12 To carry out its commitment to the Gas Supply Guarantee, AEMO monitors the relevant east coast gas markets and the Bulletin Board to determine whether a potential shortfall in the next three to four days exists that could lead to gas-powered generators having inadequate gas supplies during an upcoming electricity peak demand period. If this is the case, AEMO facilitates conferences with the relevant market participants to enable those participants to resolve the potential issue.

Context for the recommendation

13 In making its recommendation, the Commission has had regard to the outlook for gas-powered generators in the NEM and the east coast gas market. It has also considered the various tools that support managing reliability in the NEM as well as the tools that enable gas market participants to actively manage their gas usage. Stakeholder views on the NEM and east coast gas market as well as on the Gas Supply Guarantee itself have also been considered in making the recommendation.

Market outlook

14 In summary, the overall outlook for the supply of gas to the east coast gas market and its availability for gas-powered generators in the NEM in the near term appears sufficient. However, this outlook relies on the actions of gas market participants. The east coast based liquified natural gas (LNG) exporters have publicly committed to providing gas into the

3 AEMO, *Gas Supply Guarantee Guidelines*, March 2020, p. 2.

domestic east coast market.

15 In addition, as discussed in Chapter 3 of the draft report, the Australian Government's National Gas Infrastructure Plan has identified gas storage facility, pipeline and import terminal projects that, if target commissioning deadlines are met, will support continued adequate supply for gas-powered generation to meet the needs of the NEM.

16 Additionally, the *2021 Gas Statement of Opportunities* has indicated that there are many uncertainties in the electricity sector that may impact gas demand by gas-powered generators and therefore gas supply adequacy for these generators. Specifically, weather variability, extreme weather events, and generation or transmission outages are forecast to drive continued volatility in gas-powered generator demand for gas.

17 Other events in the NEM may also temporarily increase gas demand from gas-powered generators. These events include delays or deferral in developing new generation and transmission capacity; prolonged unforced outages or mothballing of coal-fired generation or maintenance of coal generation units coincident with weather variability.

18 As a result, there is an underlying risk that the need for gas-powered generation in the NEM will become more volatile and unpredictable as the use of variable renewable generation increases. This volatility may become a growing feature of the NEM's transition. As such, it could place an additional strain on energy market participants and AEMO's ability to operate the NEM. The ESB 2025 work program is expected to help address some of these uncertainties.

19 The Commission also acknowledges that while many market participants do not see significant gas supply shortages arising, there is some risk that the east coast gas market will not always be able to provide enough gas in time to adequately supply gas-powered generators during electricity peak demand periods.

Managing potential gas supply shortages

20 One of the reasons the majority of stakeholders have suggested that gas-powered generators have no problems obtaining adequate gas supply to support peak demand periods in the NEM is that there are market-based solutions in place.

21 Stakeholders have observed there have been several changes in both the NEM and east coast gas market since 2017, when the Gas Supply Guarantee was introduced, that aid in enabling short-term gas supplies to reach gas-powered generators.

22 Chapter 4 of this final report sets out a number of operational tools already in the NEM that aid in managing the reliability of the market. These range from information provision requirements such as the reliability and emergency reserve trader mechanism to more active requirements such as the retailer reliability obligation. In addition, the Energy Security Board's post-2025 process may also result in other options being developed in the future.

23 There are also a number of tools available in the east coast gas market to support managing potential gas supply shortages that may arise. In addition to information reporting obligations, gas market participants can utilise the facilitated markets to obtain short term

gas supplies. The introduction of the day ahead auction and the capacity trading platform for pipeline capacity has increased the options available to market participants such as gas-powered generators.

24 As a result, the Commission considers that the electricity and gas facilitated markets include tools that enable market participants and AEMO to alleviate a situation where a gas supply shortfall could otherwise lead to load shedding during an electricity peak demand period.

25 Finally, there are emergency management options available to AEMO and the jurisdictions. The use of these options may decrease the chance of electricity market load shedding being required if gas-powered generators are unavailable when needed. However, they might not completely remove the chance of load shedding occurring.

Improvements to consider

26 The final recommendation is that the Gas Supply Guarantee be retained for another three years and its contribution to the energy sector be reassessed in the future. In coming to this recommendation, the Commission also considered potential improvements for the NEM and east coast gas market that have been identified by AEMO.

27 As discussed in chapter 5 of this report, two of these potential improvements were assessed more closely and specific stakeholder feedback was sought.

Defining a gas supply shortfall

28 A gas supply shortfall is currently defined in the Gas Supply Guarantee Guidelines as "a shortfall in gas supply available to meet the fuel requirements for gas generators to operate at the capacity required during a peak NEM demand period".[4]

29 AEMO has suggested that the gas supply shortfall could instead be linked to a broader definition of electricity demand in the NEM. Specifically, whether there is sufficient gas to enable gas-powered generators to operate at the capacity required during forecast low reserve condition, forecast or actual lack of reserve condition occurring in the NEM, or to meet electricity demand in a part of a NEM region.

30 The majority of stakeholders did not support amending the definition. Others provided alternative suggestions to those provided by AEMO.

31 The Commission considered the issues raised by stakeholders in submissions and later correspondence. It has concluded that the definition should be amended to at least reflect the fact that a gas supply shortfall should be considered in the context of issues arising in part of a NEM region, rather than the NEM as a whole. The Commission recommends that the gas supply shortfall definition read as:

> a shortfall in gas supply available to meet the fuel requirements for gas generators to operate at the capacity required during a peak demand period in part of a NEM region.

4 AEMO, *Gas Supply Guarantee Guidelines,* March 2020, p. 4.

32 The Commission considers that the definition above retains the original intent of the Gas Supply Guarantee with the benefit of providing greater clarity to its applications.

Coordinating planned maintenance across east coast gas infrastructure

33 During the review, AEMO advised that it established the South East Australia Gas Maintenance Coordination Workshop (SEAGMCW) in August 2017 to provide a forum for maintenance planning. AEMO considers this as critical to minimising threats to gas supply from overlapping or adjacent maintenance activities of gas infrastructure across the east coast gas market.

34 AEMO stated that this forum is primarily run to meet AEMO's obligation to coordinate all planned maintenance by Victorian declared wholesales gas market facility operators under the National Gas Rules and that participation in the workshop has been expanded on a voluntary basis to include facility operators in other locations.

35 The draft report noted that the forum complements the aims and outcomes of the Gas Supply Guarantee by preemptively reducing the risks of a gas supply shortfall emerging that AEMO may otherwise need the Gas Supply Guarantee to help address. The voluntary participation of some facility owners in the forum suggests that market participants value AEMO's facilitation of coordinated planned maintenance of gas infrastructure.

36 In response to the draft report, AEMO stated that it had recently updated its website to include information on the purpose of the workshop, the obligatory and voluntary nature of participation. The information also notes the potential for the SEAGMCW to reduce the likelihood of needing to call on a measure such as the Gas Supply Guarantee.

37 Stakeholders generally indicated that SEAGMCW provides value. Some noted that it has positive flow-on effects by reducing the chance of a gas supply shortfall and so reducing the need to use the Gas Supply Guarantee. Despite this, no stakeholder supported an explicit link between the workshop and the Gas Supply Guarantee. Instead, stakeholders considered that acknowledgement or inclusion of SEAGMCW in the guidelines is either unnecessary or inappropriate.

38 The Commission welcomes the additional information provided by AEMO and the acknowledgement of the forum's operation on its website. It also notes that AEMO has implemented a number of measures in place to help address competition law concerns with respect to the forum. The Commission does not consider that any final recommendations in regard to the forum are required.

CONTENTS

TABLES

FIGURES

1 INTRODUCTION

On 9 September 2020, the Energy Ministers provided the Australian Energy Market Commission (AEMC or Commission) with terms of reference to conduct a review of the Gas Supply Guarantee (Guarantee).

The terms of reference provided by Energy Ministers require the AEMC to consider the following:[5]

- the scope of the Gas Supply Guarantee guidelines (the guidelines) as developed and amended by the Australian Energy Market Operator (AEMO)[6]
- the manner in which the guidelines have been utilised by AEMO, including in relation to industry engagement
- any overlap between the guidelines and other existing reliability or security mechanisms in the national energy framework
- the potential for the guidelines, or another similar mechanism as identified by the AEMC, to support reliability in the national electricity market (NEM), or to otherwise provide value to consumers
- the form any such mechanism should take (for example, through changes to the national electricity and gas laws, or associated rules)
- the impact of any such mechanism on AEMO, the market and market participants (including the costs and benefits of any recommended approach) — such consideration should also take into account any current and enduring issues arising from the COVID-19 pandemic.

1.1 This review process

The AEMC commenced the review with a plan to use a two-stage approach:

- Stage one involved identifying if there is a problem and how material the problem is. The Commission completed this step through the review's draft report.
- Stage two involved identifying potential solutions and recommending an implementation plan to help resolve the problem established through stage one of the review. The Commission has completed stage 2 through this final review report.

In undertaking the review, the AEMC was required to consult with AEMO, the Australian Energy Regulator (AER), the Australian Competition and Consumer Commission (ACCC), industry as well as state and territory governments.

The AEMC was requested to report back to Energy Ministers by quarter 1, 2022.[7]

On 11 March 2021, the Commission published a consultation paper identifying specific issues for stakeholder consideration and feedback. Submissions closed on 15 April 2021. The

5 Energy Ministers, *Review of the Gas Supply Guarantee*, terms of reference, pp. 2-3.

6 In March 2017, AEMO, at the request of the COAG Energy Council, developed the guidelines to facilitate the delivery of these commitments, with the guidelines being effective since 1 December 2017.

7 Energy Ministers, *Review of the Gas Supply Guarantee*, terms of reference, pp. 2-3.

Commission received 11 submissions. In addition, AEMC staff held 25 meetings with stakeholders.

The draft report for this review was published on 29 July 2021. The AEMC received nine submissions in response to its draft report. In addition, AEMC staff held six meetings with stakeholders.

2 BACKGROUND

In March 2017, east coast gas producers and pipeline operators committed to the Australian Government that they would make gas available to meet peak demand periods in the NEM (such as during heat waves):[8]

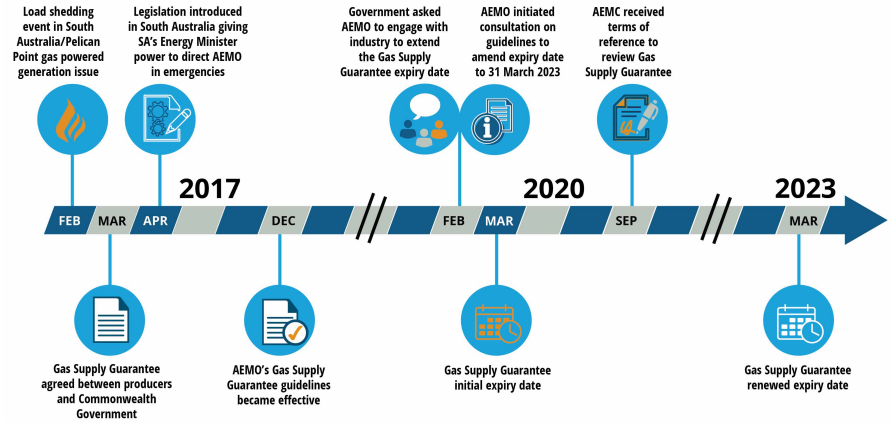
AEMO, at the request of COAG Energy Council (now Energy Ministers) and in collaboration with industry, developed the guidelines to facilitate the delivery of these commitments, with the guidelines being effective since 1 December 2017.[9]

The guidelines document is a non-binding instrument and set out the process for calling meetings with market participants in relation to potential gas supply shortfalls, the purposes of those conferences and how the conferences will be conducted.

The guidelines were due to expire in March 2020. However, in February 2020 the Minister for Energy and Emissions Reduction requested AEMO to engage with industry on extending the Gas Supply Guarantee expiry date.[10] AEMO initiated a consultation process and subsequently amended the expiry date of the guidelines to 31 March 2023.[11]

A timeline of events is illustrated in Figure 2.1 below.

Figure 2.1: Gas Supply Guarantee timeline



Source: AEMC.

It is worth noting that the mechanism has not been triggered since its inception in December 2017.[12] While AEMO has not found a gas supply shortfall or communicated with the industry

8 The Hon. Malcolm Turnbull MP, Prime Minister, *Measures agreed for cheaper, more reliable gas,* 15 March 2017. See https://www.malcolmturnbull.com.au/media/measures-agreed-for-cheaper-more-reliable-gas. See also AEMO, *Gas Supply Guarantee Guidelines*, March 2020, pp. 2-3; AEMC, *Gas Supply Guarantee Review*, draft report, pp. ii, 3-4.

9 AEMO, *Gas Supply Guarantee Guidelines*, March 2020, p. 2.

10 AEMO, *Notice of guideline consultation*, 19 February 2020, p. 1.

11 AEMO, *Gas Supply Guarantee Guidelines Consultation*, final determination, March 2020, p. 2.

12 This was noted in the submissions to the consultation on AEMO's *Gas Supply Guarantee Guidelines* by the Australian Petroleum Production and Exploration Association (APPEA), Australia Pacific LNG and Shell Australia. See AEMO's website: https://aemo.com.au/en/consultations/current-and-closed-consultations/gas-supply-guarantee-guidelines-consultation.

to resolve a potential shortfall, it has used some steps within the process under the Gas Supply Guarantee to preemptively reduce the risk of a supply shortfall emerging.[13]

13 AEMO, *Summer 2020-21 Readiness Plan*, November 2020, p. 16.

3 ASSESSING THE PROBLEM

This chapter aims to identify and consider the issue that the Gas Supply Guarantee is seeking to address. It provides:

- an overview of the changes that have occurred in both the national electricity market and the east coast gas market since 2017
- a summary of stakeholders' views on whether there is currently an issue in the electricity and gas markets that the Guarantee addresses
- a detailed analysis of the present and future role of gas-powered generators in the NEM
- the Commission's conclusions.

3.1 Introduction

The operation of the Australian east coast gas and electricity markets are complex. As a result, it is difficult to quantify the impact of specific factors and reforms on market outcomes, including that of the Gas Supply Guarantee. This is particularly the case when a reform has not yet been utilised in the relatively short time that it has been in operation.

The first step in this review was to consider the issues, or perceived problems, that led to the introduction of the Guarantee. This context will aid in an assessment of the current market scenarios that may benefit from the Guarantee, or a similar mechanism.

To answer this key question, the Commission examined the context and circumstances in which the Australian Government introduced the Gas Supply Guarantee. It also considered the current market environment, noting that several changes have occurred since 2017.

For the east coast gas market, these changes include:[14]

- improved liquidity; increased investment in gas supply infrastructure and both greater flows and contractual trading of gas into the east coast market's southern regions from other regions
- regulatory reforms in the east coast gas market to enable secondary trading of pipeline capacity to occur more readily and to improve the transparency of the market for all market participants.
- the Australian Government's National Gas Infrastructure Plan, which identifies the infrastructure needed to support a supply-demand balance in the east coast gas market.

The NEM has also experienced many changes since 2017, including:

- the increased penetration of renewable-based generation while some large coal-fired generators have recently retired, changing the generation mix in the NEM
- the introduction of large scale energy storage systems that can respond quickly to market conditions

14 See AEMC, *Review of the Gas Supply Guarantee,* draft report, 29 July 2021, chapters 2, 3 and appendices A, B and C. See also AEMC, *Review of the Gas Supply Guarantee*, consultation paper, 11 March 2021.

- changing demand patterns with declining consumption overall with relatively little change in peak demand
- the introduction of reforms such as five-minute settlement and the wholesale demand response mechanism in the NEM,[15] a requirement for generators to provide notice of planned closures, changes to wind farm settings and the introduction of the retailer reliability obligation.

In addition, the Australian Domestic Gas Supply Mechanism (ADGSM) was also introduced in 2017, resulting in east coast LNG exporters undertaking to make more supply available to the east coast gas market in general.[16]

Stakeholder views on whether there is currently an issue in the electricity and gas markets that the Guarantee helps to address are set out below. This is followed by the Commission's assessment of these views as well as consideration of the market environment.

3.2 Stakeholder views

3.2.1 Responses to the consultation paper

The majority of stakeholders did not consider that there was a problem associated with gas-powered generators having an adequate gas supply to support peak demand periods in the NEM.[17]

Many of the stakeholders that held this view suggested that no problem existed that warranted a regulatory mechanism because the gas could be made available to gas-powered generators when needed.[18]

Stakeholders also indicated that improvements to planning and forecasting supply and demand trends should support market participants in acting to meet any potential supply shortfalls.[19]

Stakeholders also considered how AEMO's operation of the NEM is able to manage supply risks to gas-powered generators. GLNG and PIAC did not consider that there was a problem associated with making sure that gas-powered generators had adequate gas supply to support peak demand periods in the NEM. They considered that the electricity market can manage the risks associated with gas-powered generators not having adequate gas supplies during these periods through alternative fuels and sources of capacity, such as batteries and pumped storage.[20]

Additionally, both PIAC and Shell mentioned established mechanisms that also function to manage reliability risks in the NEM and therefore reduce the reliability risk of a gas supply

15 Implementation is scheduled for 1 and 24 October 2021 respectively.

16 The ADGSM was designed as a measure of last resort in the event of a forecast domestic gas shortage and provides the Australian Government with the ability to restrict LNG exports to secure domestic supply. In January 2021, the Australian Government announced a new heads of agreement with the east coast LNG exporters, replacing the initial agreement.

17 For additional detail see AEMC, *Review of the Gas Supply Guarantee*, draft report, 29 July 2021, pp. 7-9.

18 Submissions to consultation paper: APA, p. 2; APGA, p. 3; APLNG, p. 2; APPEA, p. 4; GLNG, p. 5; Origin, p. 1; Shell, p. 2. Alinta, Beach Energy and Central Petroleum expressed similar views in discussions with the AEMC.

19 Submissions to consultation paper: APA, p. 2; GLNG, pp. 5-7; APLNG, p. 2.

20 Submissions to consultation paper: GLNG, pp. 8-9, PIAC, p. 2.

shortfall. These mechanisms include the retailer reliability obligation and the Reliability and Emergency Reserve Trader (RERT).[21]

On the other hand, AEMO and AGL considered that while there is currently no problem associated with gas-powered generators having adequate gas supply to support peak demand periods in the NEM, a problem could emerge in the near future.[22]

3.2.2 Responses to the draft report

In submissions to the draft report, the majority of stakeholders reiterated their views that there is no problem that warrants a regulatory mechanism to ensure gas-powered generators have an adequate gas supply to support peak demand periods. These stakeholders considered that a problem does not exist because gas can be made available to gas-powered generators when needed.[23]

Some of these stakeholders pointed to recent events in Victoria and Queensland[24] as examples of the gas market providing adequate gas supplies for gas-powered generators without the need for regulatory mechanisms.[25]

Others suggested that a problem does not exist due to the market, policy and regulatory changes that have occurred in the last few years increasing the flexibility of the gas market and its interactions with the NEM.[26] Origin and Shell similarly argued that there are a number of market options and initiatives available for gas generators to obtain gas supply.[27]

Conversely, AEMO reaffirmed its view that there is a potential problem that gas-powered generators may not have an adequate gas supply to support peak demand periods in the NEM in the future, even if no problem currently exists.[28]

AEMO indicated that since its April submission to the consultation paper there have been significant gas events and movements in the gas supply outlook. Some of these events have triggered AEMO to consider the application of RERT and gas market measures. For example, AEMO was concerned about the availability of gas supplies in May and June 2021 due to rapid decreases in Iona underground gas storage inventory and an unplanned outage impacting Longford gas plant production.[29]

In addition, AEMO stated that while an assessment conference or industry conference is still yet to be triggered under the Guarantee, situations in the NEM have instigated its electricity and gas operations teams to collaborate and investigate gas supply issues impacting gas-

21 Submissions to consultation paper: PIAC, p. 2; Shell, p. 1. Alinta expressed a similar view in discussions with the AEMC.
22 Submissions to consultation paper: AEMO, p. 1; AGL, p. 1.
23 Submissions to draft report: APA, p. 4; APLNG, p. 1; APPEA, p. 1; GLNG, p. 1; Origin, p. 1; Shell, p. 2.
24 Details on these events (Yallourn flooding in Victoria and Callide C explosion in Queensland) can be found in Appendix D of the draft report.
25 Submissions to draft report: APA, pp. 5-7; GLNG, p. 1; Shell, p. 1.
26 Submissions to draft report: APA, pp. 4-5; APPEA, p. 2.
27 Submissions to draft report: Origin, p. 1; Shell, p. 1.
28 AEMO, submission to draft report, p. 1.
29 ibid.

powered generators. AEMO considers that this indicates an ongoing future need for the Guarantee.[30]

APGA suggested that gas supply shortfall issues could arise in the future, and supported a flexible and low-cost mechanism to help address them.[31]

Despite not considering a gas supply availability problem to currently exist, Shell recognised a need for the AEMC to provide confidence regarding gas supply availability to governments during a time of significant and fundamental change to the NEM.[32]

3.3 Commission analysis

To determine whether there is a problem that the Gas Supply Guarantee needs to address, it is important to note that the Guarantee's implicit aim when it was introduced was to help avoid electricity load shedding during electricity peak demand periods. Therefore, the problem to consider is whether gas-powered generators are able to obtain gas when they need it to enable the electricity market to avoid load shedding during electricity peak demand periods.

Given gas-powered generators represent both a source of demand in the gas market and a source of supply in the electricity market, there are three underlying questions that the review has sought to explore:

1. Will gas-powered generators be needed to help avoid load shedding in the NEM? Or will the electricity market have adequate alternative solutions to meet electricity peak demand periods?
2. If gas-powered generators will be needed to help meet electricity peak demand in the future, is the gas market able to provide adequate gas supplies to gas-powered generators through its operations and processes, including during peak gas demand periods?
3. If the answer to the second question is no, then can preexisting gas market emergency mechanisms like the STTM contingency gas framework or gas market interventions facilitate in providing gas-powered generators with sufficient gas during periods of gas supply scarcity?

These questions are examined in more detail in the following chapters of this report.[33]

3.3.1 Gas-powered generators' role in the electricity market

The role and demand of gas-powered generation in the NEM

Understanding the present and future role of gas-powered generators in the NEM, as well as its dynamics, is important to determine whether a present or future gas supply adequacy risk exists during NEM peak demand periods.

30 ibid.
31 APGA, submission to draft report, p. 2.
32 Shell, submission to draft report, p. 2.
33 For additional detail see AEMC, *Review of the Gas Supply Guarantee*, draft report, 29 July 2021, pp. 10-19.

The Commission has assessed AEMO's recently published expectations involving the present and future role of gas-powered generators and the impacts they have on peak gas and electricity demand.

In AEMO's view, gas-powered generators will retain a critical role in meeting electricity demand during high temperatures in summer and low variable renewable energy periods in winter.[34] It has also noted that storage capacity in the NEM is increasing. However, storage would be unable to replace gas-powered generators entirely because it is unable to cover all conditions, such as extended high electricity demand periods, extended periods of low wind speed (wind droughts) or to cover generator and/or transmission outages.[35]

As a result, the Commission has concluded that the need for gas-powered generation in the NEM continues although it has become more unpredictable as the use of variable renewable generation has increased. This has the potential to place an additional strain on energy market participants and AEMO's ability to operate the NEM at times.

Adding to this is the difficulty in forecasting gas-powered generation. Forecasting gas demand for gas-powered generators is challenging because it is driven by events, such as extreme weather or generation outages, that are difficult to predict. This can lead to significant variations in forecasts and significant differences between forecast and actual demand.

Analysing the variability in gas demand for gas-powered generation

A number of uncertainties in the electricity sector may impact gas consumption by gas-powered generators and therefore gas supply adequacy. Weather variability, extreme weather events, and generation or transmission outages are forecast to drive continued volatility in gas-powered generator demand for gas.[36]

In addition, other events in the NEM may temporarily increase future gas demand from gas-powered generators. These events include delays or deferral in developing new generation and transmission capacity; earlier than expected closure of coal-fired generation or maintenance of coal generation units coincident with weather variability.[37]

As a result, AEMO has assessed two key risks — the impact of electricity market events, that are distinguishable and unexpected, and natural weather variability that is expected, but predictable only at short notice.[38]

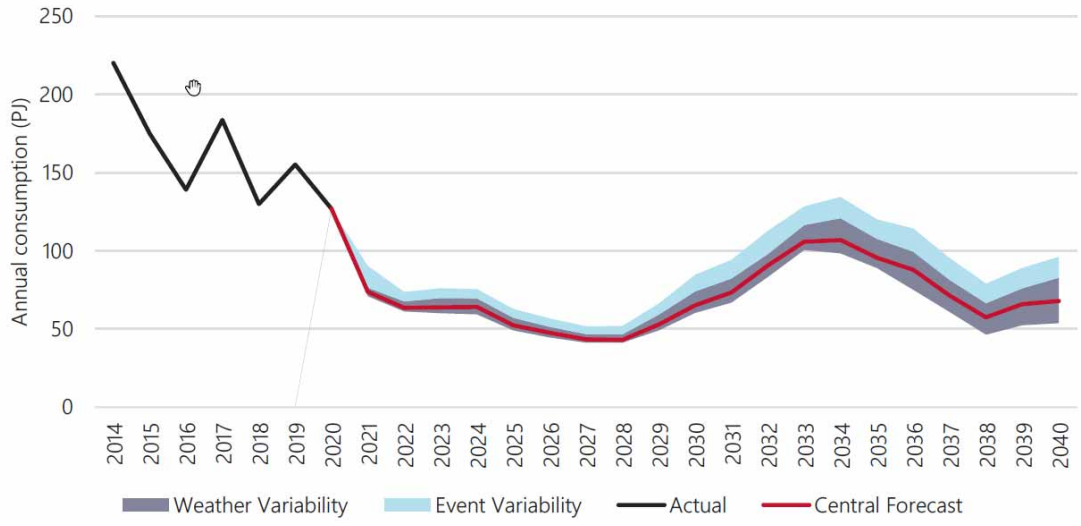
- **Event-driven variability** such as outages of major coal generators, or transmission outages that affect key electricity flow paths
- **Weather variability**, including extreme weather events, can impact the output from wind, solar and hydro generators, and commensurately impact thermal dispatch from coal and gas-powered generators.[39]

34 AEMO, *2021 Gas Statement of Opportunities*, March 2021, p. 20.
35 ibid, p. 36.
36 AEMO, *2021 Gas Statement of Opportunities*, March 2021, p. 32.
37 ibid.
38 ibid.
39 ibid, p. 33.

In summary, weather variability and power system events, such as electricity infrastructure outages, will continue to be key drivers of uncertainty in the long-term forecast of gas demand for gas-powered generation.

Higher reliance on variable renewable energy will increasingly expose the NEM to weather variability, which drives a larger forecast range in gas-powered generators' demand for gas over time.[40] This is illustrated by Figure 3.1 below.

Figure 3.1: Forecast variance in gas-powered generation consumption due to NEM events and weather variability, 2014-2040 (PJ)



Source: AEMO, *2021 Gas Statement of Opportunities*, March 2021, p. 33.

3.3.2 Is there enough gas to meet NEM peak demand periods?

The Commission examined AEMO's gas supply adequacy forecasts to assess the risks of gas supply being inadequate to cover future gas and electricity peak demand periods. Information from AEMO and the National Gas Infrastructure Plan (NGIP) indicate that, with the development of certain key projects, the supply of gas is likely to meet the needs of the NEM at peak electricity demand periods. This was explored further in section 3.3.2 of the draft report.[41]

3.3.3 Increased flexibility in gas supply and transportation contracts

Some stakeholders have also suggested that the increasing volatility of gas-powered generation is being accommodated by increased gas market flexibility.

40 ibid, p. 33.

41 AEMC, *Review of the Gas Supply Guarantee*, draft report, 29 July 2021, pp. 15-18.

For example, some gas-powered generators are dual fuel and can also operate on diesel, although this is a significantly expensive and short-term measure and is likely to be a last resort.[42]

These stakeholder views are consistent with the Commission's opinion that there are a number of alternatives to managing a need for flexible supply and transportation of gas across the east coast gas market.

As noted above in section 3.1, several relevant changes have occurred in the gas market since 2017 that have improved the adaptability of the gas market to the changing needs of market participants. There is no indication that flexibility will decline. In fact, reforms in gas market transparency and pipeline regulation are likely to further support flexibility in the east coast gas market over the longer term.

3.3.4 Gas market emergency measures

AEMO and jurisdictions have access to several types of regulatory or intervention-based emergency management tools to respond to a supply issue in the east coast gas market.

This includes responding to events that result in the gas market being unable to provide adequate gas supplies to gas-powered generators through regular operations.

These tools enable emergency reallocation of gas to gas-powered generators although they may entail costs for other gas market participants who face their gas supplies being reallocated. These measures are explored further in chapter 4.

3.4 Conclusion

As noted above, the majority of stakeholders suggested that gas-powered generators have no problems obtaining adequate gas supply to support peak demand periods in the NEM through market-based solutions. There have been several changes in both the NEM and east coast gas market since 2017, when the Gas Supply Guarantee was introduced, that aid in enabling short-term gas supplies to reach gas-powered generators.

Having regard to these views, the Commission has concluded that a gas supply adequacy risk does not seem to be significant for electricity peak demand periods at present due to market mechanisms already in place that support flexible and short-term gas supply arrangements.

However, AEMO and the Australian Government both consider that gas-powered generators may, under certain conditions, face challenges obtaining gas when needed to supply the NEM into the future. These concerns arise from uncertainty regarding the timing in the development of new gas projects in the near term that will support the availability of gas where and when it is needed and counteract declining supply from existing sources.

The Commission acknowledges these concerns. At present, the gas projects identified by AEMO and the interim NGIP as necessary for the market are not sufficiently progressed to provide a degree of certainty about their commissioning dates. As a result, there is some risk

42 AEMO, submission to consultation paper, p. 4.

that the east coast gas market will not always be able to provide enough gas in time to adequately supply gas-powered generators during future electricity peak demand periods.

In addition, there is an underlying risk that the need for gas-powered generation in the NEM has become more unpredictable as the use of variable renewable generation increases. This volatility may become a growing feature of the transition that the electricity sector is moving through. As such, it has the potential to place an additional strain on energy market participants and, at times, AEMO's ability to operate the NEM.

This volatility is unlikely to be predictable or uniform from one year to the next. For example, gas market volatility seen in 2016 and 2017, driven by a combination of supply and demand-side factors, has not been repeated to the same extent since.

Until such a combination of factors is repeated and similar levels of volatility are seen in the gas market, it could be considered premature to assess the usefulness of the Gas Supply Guarantee in all market circumstances, and in all scenarios, as they might occur through the continued transition of the NEM.

Noting market participant views and those of AEMO and the Australian Government, the Commission maintains its draft recommendation that, on balance:

- the Gas Supply Guarantee in its current form be extended for another three years to March 2026
- a review to assess the long term need for the mechanism to be carried out prior to the conclusion of the extended period.

The Commission considers this recommendation remains valid in recognition of the current uncertainties in the east coast energy sector, particularly the transition in the NEM to greater use of variable renewable generation. It is prudent under the current changing circumstances that AEMO and market participants be able to access a tool such as the Gas Supply Guarantee that could assist them in managing potential gas supply shortfalls faced by gas-powered generators.

Reflecting the low-cost nature of the current Gas Supply Guarantee, the flexibility of the guidelines in dealing with issues as they arise and the role the guidelines play in bringing the industry together to share information when it is needed most, the Commission does not recommend any fundamental change to the mechanism such as including it in the national energy rules. It is satisfied that the continuation of the current, low cost, light-handed arrangements for another three years is likely to be consistent with the long term interests of electricity and gas consumers. This recommendation is unchanged from the draft report.

The Commission anticipates that a review of the Gas Supply Guarantee in three years will indicate whether the transformation of the energy sector still requires a mechanism of this nature or if the risks to supplying gas-powered generators have changed such that the Guarantee is no longer needed.

4 IMPACT OF THE PROBLEM

This chapter seeks to identify the impact of the Gas Supply Guarantee on operating the energy markets and on market participants. It provides:

- a summary of stakeholders' views on what could be the impact of not having the Guarantee in place, how material the impact could be and who in the NEM and the east coast gas market may be impacted
- a detailed analysis of the electricity and gas facilitated markets tools available to market participants, AEMO and jurisdictions to respond to alleviate a situation where a gas supply shortfall could otherwise lead to load shedding during an electricity peak demand period
- the Commission's draft conclusions.

4.1 Stakeholder views

4.1.1 Responses to the consultation paper

Most stakeholders responded to the consultation paper's question on the potential impact on the NEM and the east coast gas market of not continuing with the Guarantee.[43]

In general, stakeholders did not identify any significant impact on the operation of the electricity and gas markets if the Guarantee did not continue beyond its expiry date in 2023.

Some stakeholders noted the potential costs of relying on alternative emergency reliability measures to avoid load shedding compared to the costs of using the Guarantee. While noting these mechanisms, AEMO and PIAC both considered the Guarantee to be less costly than these measures, such as RERT or interventions in the gas market.[44]

AEMO and Lochard Energy also considered the impacts of load shedding on consumers and stated that the Guarantee is more cost-effective by comparison.[45]

APGA and GLNG considered that while gas supply shortfalls could occur that would leave gas-powered generators unable to adequately support the NEM, the Guarantee would not help to avoid these shortfalls or their impacts.[46]

Other stakeholders suggested that the impact of any possible shortfall would be minimal at best. They considered that the gas and/or electricity markets are currently equipped to resolve these situations through other arrangements and regulatory mechanisms.[47]

43 For additional detail see AEMC, *Review of the Gas Supply Guarantee*, draft report, 29 July 2021, pp. 21-22.
44 Submissions to consultation paper: AEMO, pp. 1; 7-8; PIAC, p. 1.
45 Submissions to consultation paper: AEMO, pp. 1; 7-8; Lochard Energy, p. 4.
46 Submissions to consultation paper: APGA, p. 3; GLNG, p. 9.
47 Submissions to consultation paper: APA, p. 1; APLNG, p. 4; APPEA, p. 4; GLNG, pp. 10-11; Shell, p. 2.

4.1.2 Responses to the draft report

The majority of stakeholders continued to suggest that the gas and/or electricity markets are currently equipped to resolve potential gas supply shortfall situations through other arrangements and regulatory mechanisms.[48]

No additional reasons or information were provided by stakeholders on this issue.

4.2 Commission analysis

The Gas Supply Guarantee was designed to assist gas market participants in supplying gas to one or more gas-powered generators in a short time frame to enable those generators to assist in meeting the unexpectedly high demand for electricity in the NEM.

The result of using the Guarantee could be a decline in supply for some gas users to enable the demand from a gas-powered generator to be met. However, without adequate gas being made available to a gas-powered generator, it is possible that electricity demand would not be met without intervention by AEMO to reduce demand in the NEM or increase supply in the east coast gas market.

The Commission assessed the electricity and gas facilitated markets tools that enable market participants, AEMO and jurisdictions to respond to alleviate a situation where a gas supply shortfall could otherwise lead to load shedding during an electricity peak demand period. These are discussed below.[49]

4.2.1 Electricity market tools

AEMO and market participants currently have various tools to manage electricity peak demand periods. There are also mechanisms under consideration as part of the NEM 2025 reforms.

Table 4.1 below covers the existing options for addressing peak demand reliability concerns in the NEM. These include information provision, emergency management and facilitated market tools.

Table 4.1: Electricity market tools

TOOL / MARKET	CATEGORY	NER	TIMEFRAME
National Electricity Market Emergency Management Forum (NEMEMF)	Emergency management	N/A	meet twice a year / called if there is an emergency
Directions	Emergency management	4.8.9	generally within a day
Load shedding (Instructions)	Emergency management	4.8.9	within day

48 Submissions to draft report: APA, p. 4; APLNG, p. 1; APPEA, p. 1; GLNG, p. 1; Origin, p. 1; Shell, p. 1.

49 For additional detail see AEMC, *Review of the Gas Supply Guarantee*, draft report, 29 July 2021, pp. 22-31.

TOOL / MARKET	CATEGORY	NER	TIMEFRAME
Lack of Reserve (LOR) operational assessment horizon	Information	4.8.4A	within day
Pre-dispatch (PD PASA)	Information	3.8.20	within day to day-ahead / voluntary up to a week ahead
Lack of Reserve (LOR) forecast assessment horizon	Information	4.8.4A	within day to 7 days ahead
Gas Supply Guarantee (GSG)	Emergency management	N/A	only effective 3 to 4 days ahead
Short-notice RERT	Emergency management	3.20.3	3 hours to 7 days ahead
Short Term PASA (ST PASA)	Information	3.7.3	2 to 7 days ahead
Extended pre-dispatch report	Information	N/A	7 days ahead
Medium-notice RERT	Emergency management	3.20.3	7 days to 10 weeks ahead
Summer readiness report	Information	N/A — Finkel recommendation	1 month before summer starts
Long-notice RERT	Emergency management	3.20.3	10 weeks to 1 year ahead
Energy Adequacy Assessment Projection	Information	3.7C	2 years ahead, but repeated at least annually
Interim Reliability Reserve	Emergency management	Part ZZZZD — 11.128.4	1 to 3 years ahead
Medium Term PASA (MT PASA)	Information	3.7.2	2 to 3 years ahead
Retailer Reliability Obligation (RRO)	Facilitated market	4A.C.1	3 years and 3 months ahead
Generator notice of closure	Information	2.10.1	3.5 years ahead
Electricity Statement of Opportunities (ESOO)	Information	3.13.3A	Annual, with an outlook of 20 years in practice, 10 years as the obligation

Source: AEMC.

Note: Many of the information tools are discussed in Appendix A of AEMC, *Review of the Gas Supply Guarantee,* draft report, 29 July 2021 and the lack of reserves framework is discussed more extensively in Appendix B of the draft report. More details on the RRO, RERT and the Summer readiness report are available in AEMC, *Review of the Gas Supply Guarantee,* consultation paper, 11 March 2021.

The timeframe for the Gas Supply Guarantee was provided to the AEMC by AEMO staff.

4.2.2 East coast gas market tools

AEMO and market participants also have a wide range of information, emergency management tools and facilitated markets to respond to a gas supply shortfall on the east coast, as illustrated in Table 4.2 below.

Table 4.2: Gas market tools

TOOL / MARKET	CATEGORY	NGR	TIMEFRAME
National Gas Emergency Response Advisory Committee (NGERAC)	Emergency management	N/A	meet twice a year / called if there is an emergency
Gas emergency protocol — Victoria	Emergency management	definition in rule 333	within day
STTM contingency gas	Emergency management	Part 20 – 444	within day
Victoria Declared Wholesale Gas Market (DWGM)	Facilitated market	Part 19	within day to day-ahead
Short-Term Trading Market (STTM)	Facilitated market	Part 20	within day to day-ahead
Gas Supply Hub (GSH)	Facilitated market	Part 22	within day to up to a month ahead
Day-ahead auction (DAA)	Facilitated market	Part 25	day-ahead
Bulletin Board (BB)	Information	Part 18	from day-ahead up to 36 months outlook
Capacity trading platform (CTP)	Facilitated market	Part 24	bespoke
Victorian gas operations winter outlook	Information	N/A	1 month before winter starts
Gas Statement of Opportunities (GSOO)	Information	Part 19 — rule 323	Annual with a 5-year outlook
Victorian Gas Planning Report (VGPR)	Information	Part 15D	Annual, with an outlook of 20 years in practice, 10 years as the obligation

Source: AEMC.

Note: Additional details on the emergency management and information tools are provided in section 4.2 of AEMC, *Review of the Gas Supply Guarantee,* draft report, 29 July 2021, while STTM contingency gas processes are discussed further in Appendix C of the draft report.

In addition to these existing tools, the upcoming reforms on gas transparency measures are also expected to materially increase the range of information available including greater information on production and reserves of natural gas, information to support secondary

trading of storage, details on the capacity and demand of large gas users, and changing the GSOO from a voluntary to mandatory information reporting process.[50]

4.3 Conclusion

The NEM's various existing tools, information and the operation of the facilitated markets mean there are numerous mechanisms to enable and encourage gas-powered generators, other electricity market participants and AEMO to maintain reliability in the NEM and work towards avoiding load shedding of consumers during electricity peak demand periods.

Other electricity market mechanisms being considered under the Energy Security Board (ESB) post-2025 process may increase these options further, such as through changes to the Retailer Reliability Obligation mechanism.[51]

The east coast gas market also increasingly provides comprehensive information, market tools and emergency management options that enable gas-powered generators to make informed decisions to obtain gas supply when needed to meet electricity demand.

As a result, the Commission has concluded that its draft report considerations remain relevant. That is, the electricity and gas facilitated markets include tools that enable market participants, AEMO and jurisdictions to respond to alleviate a situation where a gas supply shortfall could otherwise lead to load shedding during an electricity peak demand period. Some of these tools have been introduced since the commencement of the Guarantee in early 2017, placing participants in a better place to manage short term supply-demand issues than they were previously.

This suggests that if the Guarantee was to expire in 2023 as currently scheduled, then parties would be in a position to respond to potential gas supply shortages that may limit the operation of the gas-powered generators.

However, as set out in Chapter 3 and the draft report, the Commission is of the view that in the current transitional stage of the energy market, a risk remains that market participants would not always be able to respond on their own to avoid load shedding when a gas supply shortfall emerges.

This risk may be low but remains despite the information that AEMO and market participants make available to inform electricity dispatch and gas supply decisions made by both the electricity and gas markets, as well through the facilitated markets.

In addition, while the emergency management options available to AEMO and the jurisdictions decrease the chance of electricity market load shedding being required if gas-powered generators are unavailable when needed, these tools might not completely remove the chance of load shedding occurring.

Therefore, if the Guarantee was to expire in 2023 as currently scheduled, the Commission considers that there is a small risk under current market conditions that market tools may not

50 AEMC, *Review of the Gas Supply Guarantee*, consultation paper, 11 March 2021, pp. 42-43.
Energy Ministers, *Measures to improve transparency in the gas market*, consultation paper, November 2020, pp. 7-9.

51 ESB, *Post-2025 market design options — a final advice to Energy Ministers,* Part A, July 2021, pp. 26-27.

be sufficient for market participants and AEMO to manage a potential gas supply shortfall that could impact the operation of the gas-powered generators.

Accordingly, there is likely to be some value in a mechanism such as the Guarantee to enable AEMO to proactively facilitate a market-based solution and prevent the need for potentially more expensive emergency measures in the face of a potential gas supply shortfall. In particular, the existing Guarantee is a relatively low-cost, light-handed mechanism that provides this support to AEMO. In addition, the Guarantee could easily, and with little cost, be continued in its current form during the transition of the east coast energy market.

In forming this conclusion, the Commission notes stakeholder responses to the draft report provided some support for this approach.

5 ASSESSING POTENTIAL SOLUTIONS

Under the terms of reference for this review, the Commission was asked to consider whether there are issues in the NEM and/or east coast gas market that need to be addressed and whether the Gas Supply Guarantee is the appropriate mechanism to address these issues.

The terms of reference also requested the Commission consider incorporating any required mechanism in the national energy framework. This could consist of utilising existing mechanisms and functions, amending existing provisions, or creating new provisions altogether.

This chapter aims to identify and consider a range of potential improvements to the Gas Supply Guarantee mechanism. It provides:

- an overview of how the Gas Supply Guarantee mechanism works
- a summary of stakeholders' views on whether the Guarantee mechanism is fit for purpose, including if there are rules in place or under development that provide a better solution, and whether other approaches or mechanisms (that are not rules-based) provide a better solution
- a summary of the potential improvements to the mechanism and alternative measures suggested by AEMO
- the Commission's analysis and conclusions.

5.1 How the Gas Supply Guarantee operates

The Commission recognises that there is no certainty that the Guarantee would be effective if it were ever called on to address a gas supply shortfall and avoid a NEM reliability issue, as noted by Origin and GLNG.[52]

It has considered ways to address this potential issue by assessing how the Guarantee operates, the mechanism's value and scope and its operating costs, which are covered in detail in chapter 5 of the draft report. Box 1 below provides a general overview of how the Gas Supply Guarantee operates.

BOX 1: OVERVIEW OF HOW THE GAS SUPPLY GUARANTEE OPERATES

Monitoring

AEMO monitors the relevant gas markets and the Bulletin Board to determine whether a potential shortfall in the next three to four days exists that could lead to not enough gas being available for gas-powered generation during an upcoming electricity peak demand period.

52 Submissions to consultation paper: Origin, p. 1; GLNG, pp. 8-9. Macquarie Bank expressed a similar view in discussions with the AEMC.

The AEMC notes the monitoring is carried out at regular intervals by AEMO's Gas operations team and that this team liaises with AEMO's NEM operations team if it appears there is a potential issue arising.[a] In addition, the Commission understands that the Guarantee could potentially also be useful in shorter time frames.

Coordinating a market-based gas supply solution

If AEMO considers that there is a risk of a relevant gas supply shortfall, it can convene two types of conferences involving market participants that have voluntarily registered with AEMO for this process to help facilitate a solution.

The first of these is an assessment conference which is used to facilitate AEMO's assessment of whether a gas supply shortfall exists or is likely to occur. Participating parties in assessment conferences can include pipeline service providers, storage facility providers and gas producers across the east coast gas market, while industry conferences can also include gas-powered generators, other relevant large users and jurisdictional representatives.

If the shortfall remains unresolved, AEMO can then schedule additional industry conferences and notify jurisdictional representatives. This second conference is used to confirm whether a possible shortfall exists, determine whether there has been an industry response to the potential shortfall and allow AEMO to call for industry response. Regardless of the location(s) of the gas-powered generator(s) that may be impacted by a shortfall in gas supply, all of these registered parties can be included in the relevant conference.

Planning and maintenance coordination

The risk that a gas supply shortfall may emerge and potentially impact on the ability of gas-powered generators to increase output to address NEM reliability concerns can be greater if multiple gas infrastructure is unable to perform at full capacity at the critical time. To reduce this risk, AEMO facilitates a forum for relevant gas market participants to share information on planned maintenance activities across the east coast gas market.[b]

The AEMC understands from AEMO that coordinated maintenance outcomes from these discussions are subsequently reflected in the information provided by participants to the Bulletin Board.[c] The SEAGMCW is not acknowledged in the Gas Supply Guarantee Guidelines. However, AEMO's *Summer 2020-21 readiness plan* notes the operation of the forum in the context of the Gas Supply Guarantee.[d]

AEMO has subsequently clarified that the forum is an extension of its obligations for the DWGM "to coordinate all maintenance planned by DWGM facility operators" under rule 326 of the National Gas Rules (NGR).[e] It noted that some non-DWGM facility operators see value in coordinating maintenance activities with the DWGM facility operators although they are not under any obligation to do so.

Source: [a] AEMO, *Gas Supply Guarantee Guidelines*, April 2020.

[b] AEMO, supplementary submission to consultation paper, p. 3.

[c] A number of east coast gas market participants have obligations under the NGR to inform AEMO of planned outages of facilities for publication on the Bulletin Board.

[d] AEMO, *Summer 2020-21 readiness plan*, November 2020, p. 16.

[e] AEMO, supplementary submission to consultation paper, p. 3.

The Commission acknowledges the potential benefits of the Guarantee identified by AEMO in the draft report. While there are positive features of the Guarantee, not all market participants share AEMO's view of the benefits. However, the benefits should be considered in light of the mechanism's scope, and the limited requirements placed on market participants in its operation.[53]

The Commission has also considered the scope of the Gas Supply Guarantee in the context of the May 2021 explosion at the Callide C power station. This unexpected event had an immediate and significant impact on the NEM. Nevertheless, the nature of the issue meant that the Guarantee was not used by AEMO in this instance in supporting the market response to the event. Nevertheless, AEMO may find the Guarantee useful if, prior to Callide's unit 4 resuming service, a gas supply shortfall emerges.[54]

5.2 Stakeholder views

In the consultation paper and the draft report, stakeholders were asked to comment on whether the Gas Supply Guarantee mechanism is fit for purpose; if there are rules in place or under development that could provide a better solution; and whether other approaches or mechanisms (that are not rules-based) may provide a better solution.

5.2.1 Responses to the consultation paper

The majority of stakeholders did not support renewing the Guarantee mechanism or replacing it with a different mechanism designed to achieve the same outcome.[55]

Most of these stakeholders suggested that the mechanism does not need to be renewed because it is not necessary. However, Shell and GLNG also argued that the Guarantee imposes negative outcomes while it is in place, particularly in encouraging gas-powered generators to be less proactive in managing their gas positions than they would otherwise be.[56]

APGA noted that the ESB electricity market design process is expected to deliver electricity market reform resulting in superior solutions to the issues addressed through the Guarantee. In its view, no amendments should be made to the current mechanism until the ESB process is implemented.[57]

Origin and GLNG did not think there would be any certainty that the Guarantee would be effective if AEMO sought to use it to address a gas supply shortfall that emerged.[58] GLNG suggested that should NEM reliability issues occur, these would most likely occur in the southern states where various gas development moratoriums have restricted new supply.[59]

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53 AEMC, *Review of the Gas Supply Guarantee*, draft report, 29 July 2021, pp. 36-37.

54 The analysis can be found in AEMC, *Review of the Gas Supply Guarantee*, draft report, 29 July 2021, Box 4, pp. 39-40.

55 Submissions to consultation paper: APA, p. 2; APLNG, p. 4; APPEA, p. 4; GLNG, p. 13; Origin, p. 1; Shell, p. 2.

56 Submissions to consultation paper: GLNG, p. 4; Shell, p. 2. Central Petroleum expressed a similar view in discussions with the AEMC.

57 APGA, submission to consultation paper, pp. 4-5.

58 Submissions to consultation paper: Origin, p. 1; GLNG, pp. 8-9.

59 GLNG, submission to consultation paper, p. 9.

AEMO proposed considering possible improvements to the Guarantee. These included improving the certainty of data used to inform the mechanism, automating the mechanism and making the Guarantee mandatory and enshrining both the mechanism and AEMO's role in the rules.[60] These suggestions are discussed in greater detail below in this chapter.

5.2.2 Responses to the draft report

The majority of submissions to the draft report that suggested that the Guarantee is not needed to resolve any gas supply issues also recommended that no changes be made to the Guarantee's gas supply shortfall definition if the mechanism were to be extended beyond its current 2023 expiry date.[61]

For example, APA argued that no changes are needed to the current definition in the Guarantee's guidelines because the current definition already provides AEMO with discretion to consider localised issues, which it regarded as the primary purpose for the Guarantee's introduction in 2017.[62]

Other submissions indicated that the changes to the Guarantee's gas supply shortfall definition would lead to adverse consequences:

- APGA considered that modification of the shortfall definition would reduce the low cost and flexible nature of the Guarantee.[63]
- APLNG stated that the suggested changes set out in the draft report would significantly increase the number of circumstances and frequency with which the Guarantee would be used. This would generate risk to capital investment and future supply by broadening the use of non-market mechanisms to circumstances where market responses are available.[64]

Some stakeholders provided alternatives to the gas supply shortfall definition discussed in the draft report. These responses are explored further in section 5.3.1 below.

In regard to the maintenance and coordination workshop, stakeholders generally indicated that SEAGMCW provides value. Some stakeholders indicated that it has positive flow-on effects by reducing the chance of a gas supply shortfall and so reducing the need to use the Guarantee.

Despite this, no stakeholder supported creating an explicit link between the workshop and the Guarantee. Instead, stakeholders considered that acknowledgement or inclusion of SEAGMCW in the guidelines is either unnecessary or inappropriate. [65]

APGA stated that to do so would undermine the low cost and flexible nature of the current mechanism.[66]

60 AEMO, submission to consultation paper, p. 9.
61 Submissions to draft report: APA, p. 7; APGA, p. 2; APLNG, p. 1; APPEA, p. 1; GLNG, p. 1.
62 APA, submission to draft report, p. 8.
63 APGA, submission to draft report, p. 2.
64 APLNG, submission to draft report, p. 1.
65 Submissions to draft report: APA, p. 9; APGA, p. 2; GLNG, p. 2; Shell, p. 3.
66 APGA, submission to draft report, p. 2.

There was also little stakeholder support for any other changes to current arrangements involving the workshop:

- Origin supported a coordinated approach to maintenance provided that the obligations do not outweigh the benefits.[67]
- APA suggested that any formalisation or expansion of the SEAGMCW membership or coordination role would result in increased costs in contract-carriage markets and a reduction in efficiency in maintenance/outage planning in accordance with existing commercial commitments.[68]

APGA opposed the utilisation of the SEAGMCW. It suggested that the SEAGMCW risks increasing costs by forcing maintenance into restricted windows, reducing the ability for operators to negotiate maintenance activity costs.[69]

Shell was the only stakeholder to comment on the other recommendations raised in the draft report, including on the ST PASA rule change request, improving Bulletin Board data, the possible application of the Guarantee to system strength requirements and the concept of mandatory extended pre-dispatch.[70] Shell supported the AEMC's draft report views on these issues.

5.3 Commission analysis

AEMO noted in its first submission to this review that, in the longer term, measures to address gas-powered generation shortfalls may become more important and therefore reliance on the Guarantee, particularly in its current form, will become riskier as a sole measure. It noted that both strengthening of the Guarantee and the development of alternative measures to address the risks as these become clearer will need to be carefully considered.[71]

Given the initial focus of this review was on problem identification and materiality, AEMO did not propose any specific amendments or alternative options in its first submission.

However, the Commission specifically requested AEMO provide a supplementary submission identifying some potential areas for improvements or alternative measures. AEMO responded with a supplementary submission that identified three supporting measures and three potential changes to the guidelines.[72]

As discussed in section 5.4 of the draft report, the Commission considered potential changes to the current arrangements summarised below.[73]

67 Origin, submission to draft report, p. 2.
68 APA, submission to draft report, p. 9.
69 APGA, submission to draft report, p. 2.
70 Shell, submission to draft report, p. 2.
71 AEMO, submission to consultation paper, p. 9.
72 AEMO, supplementary submission to consultation paper, 17 June 2021.
73 For more details see AEMC, *Review of the Gas Supply Guarantee*, draft report, 29 July 2021, pp. 40-48.

Table 5.1: **AEMO's suggested potential areas for improvement**

SUGGESTION	DESCRIPTION	AEMC FINAL RESPONSE
SUPPORTING MEASURES		
1. Mandatory extended pre-dispatch	AEMO suggests that gaps in ST PASA could be resolved by a new mandatory extended pre-dispatch mechanism (by providing bids and prices 7 days ahead). This would provide AEMO and gas-powered generators with enhanced information where a potential NEM need is identified.	Given the very high-level nature of this suggestion the AEMC will not look into this issue further as part of this review.
2. ST PASA rule change request	AEMO lodged a rule change request that seeks to provide AEMO and market participants with the flexibility to respond to future ST PASA modelling changes faster and with less burden by shifting prescription from the NER to procedures.	The AEMC will assess AEMO's proposed changes through a rule change process.
3. Gas transparency measure reform	AEMO noted that improvements to data quality will be realised through the Gas transparency measures reform, which is expected to commence mid-2022.	The AEMC considers that these improvements should assist AEMO and market participants with detecting and resolving potential gas supply shortfalls.
POTENTIAL CHANGES TO GAS SUPPLY GUARANTEE GUIDELINES		
4. Application to broader NEM system security requirements	AEMO has stated that the Guarantee should be and already can be used to address broader NEM power system security requirements such as system strength and voltage requirements, in addition to reliability needs as originally intended.	Since the ESB and AEMC already have a comprehensive system security work program, the Commission will not assess system security issues in this review.
5. References to NEM peak demand	AEMO considers that the Guarantee should be linked to a broader definition of peak demand that incorporates regional peak demand periods through definitional changes in the guidelines.	The Commission seeks feedback on AEMO's suggested new definition.
6. References to east coast gas coordination role	The SEAGMCW provides a forum to coordinate planned maintenance. This forum operates to meet AEMO's obligations for the DWGM although some market participants outside of the	The Commission seeks feedback on the value of the SEAGMCW and how it can be appropriately recognised.

SUGGESTION	DESCRIPTION	AEMC FINAL RESPONSE
	DWGM participate voluntarily. AEMO does not propose incorporating the SEAGMCW into the guidelines.	

Source: AEMO, supplementary submission to consultation paper, 17 June 2021.

Two of these potential improvements were assessed more closely and in light of stakeholder feedback. The analysis is set out in the remainder of this chapter.

5.3.1 References to NEM peak demand

Current arrangements

A gas supply shortfall is currently defined in the guidelines as "a shortfall in gas supply available to meet the fuel requirements for gas generators to operate at the capacity required during a peak NEM demand period".[74]

AEMO's initial views

As noted in AEMO's supplementary submission, the AEMC had suggested to AEMO that a peak NEM demand period was an unlikely driver for a gas supply shortfall event and that a definition based on some other peak demand, such as a regional peak, might be more appropriate.[75]

AEMO agreed that a definition based on peak NEM demand period should not be used to define a gas supply shortfall in the guidelines. To address this issue, AEMO recommended broadening the gas supply shortfall definition to be based on broader NEM objectives.[76]

One option suggested by AEMO to achieve this would be to amend the gas supply shortfall definition to "a shortfall in gas supply available to meet the fuel requirements for gas-powered generators to operate at the capacity required to operate the NEM".[77] Alternatively, AEMO suggested the definition could reference the trigger events set out at 3(b) of the guidelines, which cover various conditions under which AEMO may consider that a gas supply shortfall may occur.[78]

In subsequent discussions between the AEMC and AEMO, it was agreed that an alternative gas supply shortfall definition should be explored that would remain focused on reliability issues but not rely on NEM peak demand alone. AEMO subsequently provided the following suggested definition:[79]

> A shortfall in gas supply available to meet the fuel requirements for Gas Generators to

74 AEMO, *Gas Supply Guarantee Guidelines,* March 2020, p. 4.
75 AEMO, supplementary submission to consultation paper, p. 3.
76 AEMO, supplementary submission to consultation paper, p. 3.
77 AEMO, supplementary submission to consultation paper, p. 3.
78 AEMO, supplementary submission to consultation paper, p. 3.
79 AEMO email to AEMC, 5 July 2021.

> operate at the capacity required during forecast low reserve condition (LRC), forecast or actual lack of reserve condition (LOR) occurring in the NEM, or to meet electricity demand in a part of a NEM region.

Responses to the draft report

In response to the draft report, AEMO suggested another definition amendment: to remove the reference to 'peak NEM demand period' and clarify that the shortfall is in the context of NEM reliability requirements. In its view, this new definition would ensure simplicity and clarity, but retain the same practical application of the guidelines.[80]

> A shortfall in gas supply available to meet the fuel requirements for gas generators to operate at the capacity required to meet supply reliability in the NEM.

According to AEMO, the use of 'peak NEM demand period' does not sufficiently cover the circumstances when or how the NEM experiences reliability issues. That is, reliability issues are:

- not based on NEM-wide demand, instead, they arise for a region based on a lack of reserve condition, or due to network capability constraints
- not driven by demand alone, instead, the issues arising out of both NEM supply and demand (not necessarily peak demand) conditions.

AEMO noted that the definition proposed above differs from that proposed in its previous submission. That is, that the initially proposed definition included reference to the NEM conditions in which a gas supply shortfall would arise.

AEMO reconsidered the proposed definition as the conditions under which a gas supply shortfall could arise are not solely based on NEM conditions, that is, gas supply and demand conditions are also relevant, noting that it is not feasible to cover all conditions within the definition of gas supply shortfall; and the fact that the guidelines already set out the conditions under which a gas supply shortfall could occur.[81]

In addition, AEMO noted that if the definition of gas supply shortfall is amended, such amendment would be supported by other minor guidelines amendments. In its view, these would clarify the conditions in which a gas supply shortfall could arise; the sources that might inform AEMO's identification of a gas supply shortfall; and how this relates to the overall Guarantee process.

Origin also suggested a new definition — "a shortfall in supply needed for gas generators to operate at the capacity needed during LRCs and any LOR conditions, but not to meet electricity demand in a NEM region."[82] Origin stated that while LRCs and LORs are viable measures of low reliability, expansion to include meeting electricity demand is unnecessary and adds uncertainty.

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80 AEMO, submission to draft report, p. 2.
81 AEMO, submission to draft report, p. 3.
82 Origin, submission to draft report, p. 1.

Shell also suggested a new definition which defined a gas supply shortfall as a shortfall in supply needed for gas generators to operate at the capacity needed during LRCs or any LOR 2 or 3 [83] conditions to meet electricity demand in a NEM region, occurring in any region where a gas-powered generation has indicated a reduction in availability due to fuel constraints.[84]

Shell argued its alternative definition would be more appropriate because it considers that AEMO triggering the Guarantee during LOR 1 conditions may interfere with normal market conditions for generators to respond. In addition, it considers that triggering the Guarantee for a LOR 2 or LOR 3 where gas-powered generators have not indicated a loss of availability due to fuel constraints would be broader than the purpose of the Guarantee.[85] Shell also suggested an independent 'after the event' review to occur if the Guarantee is triggered based on a definition that includes LRC or LOR.

The table below provides a summary of the proposed changes from each stakeholder.

Table 5.2: Summary of proposed changes to the definition of gas supply shortfall

STAKEHOLDER	DEFINITION
Current definition	A shortfall in gas supply available to meet the fuel requirements for gas generators to operate at the capacity required during a peak NEM demand period.
AEMO — draft report definition	A shortfall in gas supply available to meet the fuel requirements for gas generators to operate at the capacity required during **forecast low reserve condition (LRC), forecast or actual lack of reserve condition (LOR) occurring in the NEM, or to meet electricity demand in part of a NEM region.**
Shell — suggested definition	A shortfall in gas supply available to meet the fuel requirements for gas generators to operate at the capacity required during **a period** of forecast low reserve condition (LRC) or forecast or actual lack of reserve condition (LOR) — **Level 2 or 3**, occurring **in any NEM Region(s) where a gas- fuelled generator has indicated a reduction in availability due to fuel constraints.**
Origin — suggested definition	A shortfall in gas supply available to meet the fuel requirements for gas generators to operate at the capacity required during forecast low reserve condition (LRC), forecast or actual lack of reserve condition (LOR) occurring in the NEM~~, or to meet electricity demand in part of a NEM region~~.

83 LORs are categorised over three tiers: LOR1 exists when reserve levels are lower than the two largest supply resources in a state; LOR2 exists when reserve levels are lower than the single largest supply resource in a state; LOR3 exists when the available electricity supply is equal to or less than the operational demand.

84 Shell, submission to draft report, p. 2.

85 Shell, submission to draft report, p. 2.

STAKEHOLDER	DEFINITION
AEMO — new suggested definition	A shortfall in gas supply available to meet the fuel requirements for gas generators to operate at the capacity required **to meet supply reliability** in the NEM.

Source: AEMC.

In subsequent discussions with the AEMC on the various definitions set out above, most of these stakeholders did not support a change in the current definition or preferred the versions they had put forward.[86]

Commission's response

The Commission has considered the issues raised by stakeholders in submissions and later correspondence. On balance, it has concluded that the definition should be amended to at least reflect the fact that a gas supply shortfall should be considered in the context of issues arising in part of a NEM region, rather than the NEM as a whole. As a result, the Commission recommends that the gas supply shortfall definition be read as:

> a shortfall in gas supply available to meet the fuel requirements for gas generators to operate at the capacity required during a peak demand period in part of a NEM region.

This definition has the benefit of retaining the original intent of the Guarantee while also providing greater clarity to its application for market participants. In light of the variety of views held by market participants regarding the purpose and operation of the Guarantee, the Commission considers this change would be beneficial and would come at a very low implementation cost.

In addition, the Commission also recommends, as suggested by AEMO,[87] that the Guarantee guidelines be amended to clarify that triggering an assessment conference or industry conference process would not automatically occur for most LOR conditions, and would be subject to an AEMO determination that additional gas supply would help to address this issue. Again, this clarification is warranted to resolve any misunderstandings regarding the operation of the Guarantee that may persist.

5.3.2 References to east coast gas coordination role

Current arrangements

During the review, AEMO advised that it established the SEAGMCW in August 2017 to provide a forum for maintenance planning. AEMO considers this critical to minimising threats to gas supply from overlapping or adjacent maintenance activities of gas infrastructure across the east coast gas market.

86 Email correspondence from GLNG, AEMO, APGA, APLNG and Shell.

87 AEMO, submission to draft report, p. 3.

The SEAGMCW is chaired by AEMO and attendees include producers, storage providers and transmission pipeline operators that have voluntarily elected to participate in the forum.[88] Meetings are held three times a year or if requested due to a material change to maintenance activities or a projected gas supply shortfall. Participants update their relevant Bulletin Board details following the meeting as required by rule 181 of the NGR.[89] However, there was no reference to such a forum in the guidelines nor was there any reference to it on the AEMO website.

AEMO's initial views

AEMO facilitates the SEAGMCW for producers, storage providers and transmission pipeline operators that supply gas to southeast Australia.

AEMO has stated that the SEAGMCW is primarily run to meet AEMO's obligation to coordinate all maintenance planned by DWGM facility operators under rule 326 of the NGR and that participation in the workshop has been expanded on a voluntary basis to non-DWGM facility operators that see the value in coordinating maintenance activities with DWGM facility operators.[90]

AEMO indicated that, even though there are opportunities to enhance publicly available information on the Guarantee and its interactions with other measures such as the SEAGMCW, it does not see the Guarantee's guidelines as the optimal place to provide 'contextual information'. Instead, AEMO suggested that enhancements could be made to its website so that participants could better understand the linkages between various formal and informal obligations and AEMO roles.[91]

Responses to the draft report

In response to the draft report, AEMO stated in its submission that it has recently updated its website to include information on the purpose of the workshop, the obligatory and voluntary nature of participation, and the potential for the SEAGMCW to reduce the likelihood of needing to call on a measure such as the Guarantee.[92]

AEMO also provided more context about participation in the forum. It noted that the inclusion of non-DWGM facility operators on a voluntary basis was implemented from August 2017 — following the creation of the Guarantee in March 2017 — and with the encouragement of gas shippers.[93]

According to AEMO, the broader workshop was developed in response to gas supply issues and near misses caused by maintenance conflicts and an increased focus on the importance

88 Except for DWGM facility operators. AEMO supplementary submission to the consultation paper, p. 3.

89 AEMO email to AEMC, 29 June 2021.

90 AEMO, supplementary submission to consultation paper, p. 3.

91 ibid.

92 See AEMO's website: https://www.aemo.com.au/energy-systems/gas/declared-wholesale-gas-market-dwgm/transmission-system-operations

93 AEMO, submission to draft report, p. 5.

of gas-powered generation following the closure of coal-fired power stations in South Australia and the Hazelwood Power Station in Victoria.[94]

In addition, AEMO noted that it has measures in place to mitigate the risk of SEAGMCW activities leading to competition concerns and that all attendees agree to comply with the SEAGMCW competition law protocol at all times. For example, AEMO is the only recipient of maintenance schedules and other information provided by SEAGMCW participants that is not already publicly available on the Bulletin Board. Disclosure of any information to participants is only on an exception basis, and only to the extent required to resolve conflicts identified through AEMO analysis of maintenance schedules.[95]

Further, once any changes to maintenance schedules are finalised through the SEAGMCW, facility operators publish this information on the Bulletin Board. At this point, the updated maintenance information becomes publicly available.[96]

As noted above in section 5.2.2, no stakeholders supported an explicit linkage between the workshop and the Guarantee. Instead, stakeholders considered that acknowledgement or inclusion of SEAGMCW in the guidelines is either unnecessary or inappropriate.[97]

Commission's response

To reduce the risk of gas supply shortfalls emerging that could affect electricity peak demand periods, AEMO takes steps through the SEAGMCW to coordinate different gas market participants' planning and maintenance activities. This activity is not described in the guidelines although it is relevant to how AEMO manages gas supply shortfalls that may impact the operation of gas-powered generators.

In its draft report, the Commission noted that the SEAGMCW meetings appeared to complement the aims and outcomes of the Guarantee by preemptively reducing the risks of a gas supply shortfall emerging that AEMO may otherwise need the Guarantee to help address. The voluntary participation of some facility owners in the forum suggests that some market participants value AEMO's facilitation of coordinated planned maintenance of gas infrastructure.

The Commission welcomes the additional information provided by AEMO and the acknowledgement of the forum's operation on its website that will provide transparency and clarity to market participants. It also notes the advice that AEMO has a number of measures in place to help address competition law concerns with respect to the forum. The Commission does not consider that any final recommendations regarding the forum are required.

5.4 Conclusion

The Commission has considered views expressed about the Gas Supply Guarantee's value to market participants and AEMO, noting the scope of its operations.

94 ibid.
95 ibid.
96 ibid.
97 Submissions to draft report: APA, p. 9; APGA, p. 2; GLNG, p. 2; Shell, p. 3.

As discussed in chapter 3, the Commission has concluded that its draft recommendation is still valid. Specifically, the Commission recommends the Australian Government retains the Guarantee for another three years. This reflects the balance between the potential for the Guarantee as one of the tools available to AEMO to manage the NEM, the limited scope of the Guarantee and its relatively low cost, light-handed form.

The Commission has made this recommendation in recognition of the current uncertainties in the east coast energy sector, as recognised by a number of stakeholders during this review. In particular, the transition in the NEM to greater use of variable renewable generation.

In addition to its recommendation to extend the life of the Guarantee, the Commission also recommends that AEMO amend the definition of 'gas supply shortfall' in its Guidelines to address the uncertainty among market participants on the potential application of the Guarantee. This is a small adjustment to the Guidelines but should provide clarity while not changing the Guarantee itself.

It has considered the low-cost nature of the current Gas Supply Guarantee, the flexibility of the guidelines in dealing with issues as they arise and the role the guidelines play in bringing the industry together to share information when it is needed most. These are positive features of the Guarantee which stakeholders have not sought to change.

As a result, the Commission does not recommend any fundamental change to the mechanism such as including it in the national energy rules. It considers that the current form of the Gas Supply Guarantee is suitable in the context of extending its term for three years.

The Commission anticipates that a review of the Gas Supply Guarantee in three years will indicate whether the transformation of the energy sector still requires a mechanism of this nature or if the risks to supplying gas-powered generators have changed such that the Guarantee is no longer needed.

ABBREVIATIONS

ACCC	Australian Competition and Consumer Commission
ADGSM	Australian Domestic Gas Security Mechanism
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Commission	See AEMC
CTP	Capacity trading platform
DAA	Day-ahead auction
DWGM	Declared wholesale gas market
ESB	Energy Security Board
ESOO	Electricity statement of opportunities
GSH	Gas supply hub
GSOO	Gas statement of opportunities
LNG	Liquified natural gas
LOR	Lack of reserves
MW	Megawatt
NEL	National Electricity Law
NEM	National electricity market
NEMEMF	National Electricity Market Emergency Management Forum
NEO	National electricity objective
NER	National Electricity Rules
NGERAC	National Gas Emergency Response Advisory Committee
NGIP	National gas infrastructure plan
NGR	National Gas Rules
RERT	Reliability and emergency reserve trader
RRO	Retailer reliability obligation
STTM	Short term trading market