Submission on behalf of the Consortium

Response to APA submission

AER APA Victorian Transmission System Access Arrangement 2023–27

Marsden Jacob Associates independent consultants to the Consortium

And

Lochard Energy as secretariat to the Consortium

Consortium Members

AGL, Alinta Energy, Cooper Energy, EnergyAustralia, GloBird Energy, Lochard Energy, M2 Energy, Venice Energy.

17 February 2022

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Dr Kris Funston,
Executive General Manager, Network Regulation Division,
AER
Level 17 Casselden, 2 Lonsdale Street, Melbourne VIC 3000

Submitted by email to: kris.funston@aer.gov.au and AERInquiry@aer.gov.au

Documents Attached: MJA Review of Southern Gas Markets 15Feb2022

Dear Kris,

Submission re APA VTS Access Arrangement 2023-2027 – Capacity of the South-West Pipeline

I write on behalf of a consortium of East coast gas market participants in combination with Lochard Energy (LE) to provide support for APA's proposal to increase the capacity of the South-West Pipeline (SWP), described in its VTS Access Arrangement 2023-2027, currently subject to a determination by the AER. APA's proposal is centred on the VTS capacity requirements in order to balance the projected decline of gas production from the Gippsland gas fields that have hitherto provided most of Victoria's gas supply, as reported by AEMO in the 2021 GSOO and VGPR.

The 2021 GSOO concluded that the proposed LNG import terminal at Port Kembla in NSW (PKGT) would offset the Gippsland deliverability until 2026, while the majority of Victorian gas market participants have indicated that they would be supplying their customers from several other sources, including from expanded gas storage at Lochard Energy's Iona underground storage plant[1], conditional on the SWP capacity expansion to carry the additional load[2]. The SWP expansion is conditional on AER approval of the VTS Access Arrangement. The attached report, prepared for the consortium by Marsden Jacob Associates (MJA), provides details of a survey of gas storage/SWP customer capacity requirements that supports APA's proposal.

The MJA report also describes MJA's analysis of the changes in gas market dynamics flowing from declining Gippsland production. Key findings of their analysis are:

- Gippsland gas production will become less flexible as it declines, therefore less able to respond to sudden increases in demand or failure of other supplies;
- Gas demand for power generation will become more volatile as gas plants provide support to increasing levels of non-dispatchable renewable energy, coal generation is less relied upon, with accelerated closures due a carbon constrained future; and
- There is uncertainty regarding the supply roles that may be played by import terminals, e.g. base load, peaking and where they fit in gas scheduling.

All of these factors are signalling, as well in the consortium's view, that additional incremental investment in sources of flexibility, such as Iona/SWP, is warranted.

[1] LE has already taken FID on capacity expansion to 570 TJ/d

[2] They would contract directly with APA for this capacity if they could but under the Victorian contract carriage model this is not possible.

The Consortium expects that the forthcoming 2022 GSOO will reassess the security provided by PKGT and the need for Iona/SWP expansion. However, the consortium also notes that SWP capacity expansion must be provided more quickly than envisaged by APA, to meet potential supply shortfalls in 2023, as identified by AEMO in the 2021 GSOO. Approvals and planning must be fast-tracked to ensure the Stonehaven compressor is able to be installed by winter 2023 instead of 2024 and Pirron compression preferably also a year earlier in 2024.

Finally, we note that declining gas demand is a concern for APA, who have requested that its proposed SWP investments be protected from being declared redundant under Rule 85 of the NGR. In the DWGM, assets such as Iona and Dandenong LNG storage play critical roles in minimising extreme price events and providing system security even when their capacity is not fully utilised, thereby continuing to provide value to customers.

In summary, the key factors set out above indicate that Iona/SWP development will provide a more prudent and certain investment solution to reducing Gippsland deliverability than reliance upon the PKGT, and we encourage the AER to consider these factors when reviewing APA's SWP proposal

If you wish to discuss any aspect of this submission further, please contact Giles Toler at [redacted]

Yours Sincerely,

[redacted]

Anthony Fowler

CEO, Lochard Energy

On behalf of the Consortium members

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MARSDEN JACOB ASSOCIATES

economics
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markets
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15 February 2022

Lochard Energy as secretariat of the Consortium
Level 10, 2 Southbank Boulevard
Southbank, Vic 3006

Dear Madam / Sir

Future Southern Gas Market - Requirements and Risks

At the request of the consortium group of gas market participants[1] (the "Consortium") this report presents the findings of a study by Marsden Jacob Associates (Marsden Jacob) on the future requirements of the southern gas market[2] including an expansion of the South West Pipeline (SWP). This report is being provided to the Consortium[1] to assist in a submission on the Victorian Transmission System Access Arrangement (AA) for the 2023 – 2027 period being prepared by APA Group.

This report follows a first (Phase 1) report by Marsden Jacob[3] that presented a review of the southern gas market, and a survey (described below) of the Consortium members' future supply needs.

This report presents our key findings from the Phase 1 and subsequent work. The work was structured to identify (through analysis and explorative modelling) the impacts, challenges and risks associated with the decline of southern gas production, and what conclusions could be drawn from this review in relation to future gas market needs.

1 Summary of Findings

The findings from the Marsden Jacob study are as follows.

- The forecast decline of Gippsland supply, and proposed replacement of this supply via an LNG Import Terminal at Port Kembla introduces significant uncertainty and unpredictability into the sources of reliable supply and transport of gas in the southern gas market. In these circumstances investment is warranted in supply capacity that provides the flexibility and margin needed for market resilience during the period existing sources of supply in the southern gas market decline.
- This concern[4] was also expressed in a survey of a consortium of small and large gas market participants where:
  - the broad consensus was a concern regarding the forecast decline in Longford production, the resulting increase in supply uncertainties and risks, and that this would place an increasing reliance on the SWP; and

[1] The consortium group of gas market participants was AGL, Alinta Energy, Cooper Energy, EnergyAustralia, GloBird Energy, Lochard Energy, M2 Energy, Venice Energy. The involvement of this group was co-ordinated by Lochard Energy which acted as secretariat for the group.
[2] The southern gas market comprises New South Wales, Victoria, South Australia and Tasmania.
[3] Future Requirements of the SWP, Phase 1 Study Report, A report by Marsden Jacob Associates, dated 29 October 2021.
[4] Impact of Gippsland decline.

- the intended capacity requirement on the SWP (to 2030) from the group surveyed) showed a total requirement for 570 TJ/day commencing in 2023. The results of this survey relating to the SWP are presented in Table 1 below.

Table 1 Summary: SWP Gas Supply Capacity Requirements (TJ/day) (1)

SWP	2023	2024	2025	2026	2027	2028	2029	2030
Current Capacity[5]	468	468	468	468	468	468	468	468
Required Capacity[6]	**572**	**568**	**569**	**570**	**571**	**569**	**564**	**515**
Shortfall	-104	-100	-101	-102	-103	-101	-96	-47

*Note 1: The c*urrent SWP capacity assumes additional capacity after Western Outer Ring Main (WORM) is completed which is expected by mid-2023. In 2022, SWP capacity is 445 TJ/d (based on AEMO VGPR 2021).

Source: Responders replies and Marsden Jacob analysis and presentation.

- While Figure 1 in the 2021 GSOO[7] provides some important insights into the future needs of the southern gas market, the static nature of the analysis (which includes the assumption that all assets are available at full capacity and excludes constraints that will occur) may tend to overstate supply capability. The GSOO analysis does show a reducing margin (between supply capacity and maximum daily demand) which signals a decline in resilience (from past levels) as southern production declines, and that PKGT does not fully address this.
- The replacement of the lost conventional gas production with an LNG import terminal at Pt Kembla (as proposed) and possibly other developments, will mean the roles of existing storage and supply facilities may change, and that there will be greater variability and unpredictability in the use of transportation infrastructure.
- The future order in which gas supply sources are used is expected to change, as well as their commercial drivers, which will result in changes to typical gas supply patterns and facility (pipeline, storage and production) utilisation. This will increase the risk of unexpected outcomes and reduced resilience.

2 Participant Survey

Marsden Jacob surveyed gas market participants on their respective future gas supply needs[8]. The survey presented the considered views of a collection of small and large gas market participants on issues related to both the competitive functioning of the market and physical supply adequacy.

2.1 Intended Capacity Requirements

The survey commenced with their intended capacity requirements in the southern gas market (excluding Tasmania). These results are presented in Table 2 below which presents for the categories shown in the table, the aggregate of the surveyed participants maximum daily quantities (MDQ / TJ/day) from 2023 onwards.

The table reports on the total intentions of the parties that responded to the survey in relation the demands to be supplied and the MDQ capacity on pipelines that will be required:

- "Demand (ex GPG)" is the total MDQ of demand excluding GPG that is intended to be supplied;

[5] Post WORM.
[6] Sum of responders' requirements.
[7] Fig, 2 in this document. See below.
[8] This survey was undertaken in Phase 1 of the Marsden Jacob study. The surveyed market participants were the members of the Consortium.

- "Demand – GPG" is the total MDQ of GPG demand that is intended to be supplied;
- "SA – SEAGas" is the total capacity required on SEAGas (to supply demand in SA);
- "Vic / NSW – SWP" is the total capacity required on SWP (to supply demand in either Vic or NSW); and
- "Vic / NSW – Other" and "SA – Other" are other capacities required to supply demand in the named states.

It is noted that the numbers in the table do not include the required capacities from all market participants (meaning that the capacities cannot be totalled to give the total market needs). Marsden Jacob's interpretation of the table is that the capacities shown represent minimum demand.

Table 2 Consolidated Responses of Gas Supply Capacity Requirements (TJ/day)

	2023	2024	2025	2026	2027	2028	2029	2030
Demand (ex GPG)								
Adelaide	33	34	34	34	35	35	36	36
Melbourne	587	582	587	590	593	597	600	604
Sydney	201	204	206	207	209	211	212	214
Demand - GPG								
Adelaide	125	15	15	15	15	15	15	15
Melbourne	175	175	175	175	175	175	175	175
Sydney	60	80	80	80	80	80	80	80
Intended - Capacity Requirements								
SA - SEAGas	10	10	-	-	-	-	-	-
SA - Other	19	19	5	5	5	5	5	5
Total SA	29	29	5	5	5	5	5	5
VIC / NSW - SWP	572	568	569	570	571	569	564	515
Vic / NSW - Other	272	268	274	277	282	284	287	290
Total Vic / NSW	**844**	**836**	**843**	**847**	**853**	**853**	**851**	**805**

Source: Responders replies and Marsden Jacob analysis and presentation.

The results of the survey of gas market participants showed that these participants had the view that they required capacity on the SWP at around 570 TJ/day and were intending to contract at this level in aggregate (apart from 2030 where this is less). Given that not all gas market participants participated in the survey, the survey results may tend to understate the total capacity sought by the market.

2.2 Responses on Future Gas Market Outlook and Requirements

The surveyed gas market participants were then asked four questions relating to future gas market security and the SWP. Answers were to be Yes or No with the opportunity for comments. The four questions asked, and the percentage of "Yes", "Qualified Yes", "No", and no answer responses, are presented in Table 3 below.

Table 3 Percentage of Question Replies to Yes or No Response

Question	Yes	Qualified Yes (1)	No	No Answer
Do you believe the SWP should be expanded to flow to Melbourne	100%			
Do you believe the SWP should be expanded to flow to Iona	50%	50%		
Do you see any developments recent or forecast that will significantly impact the demand / supply balance in Victoria	50%	25%	25%	
Do you consider that there is a significant security of supply risk over the forecast period	50%	25%		25%

Note (1) "Qualified Yes" refers to agreement subject comments that are reflected in the reply to the questions asked.

Source: Responders replies and Marsden Jacob analysis and presentation

The comments that accompanied the Yes/No/Other responses supported the responses shown in Table 2. The key messages from the comments provided were as follows:

- There was general concern regarding the forecast decline in Longford production and the uncertainties and risks associated with new supply developments (such as Sole and Golden Beach).
- A general theme was that gas supply adequacy is being seen as an increasing issue.
- That the role of Iona is expected to increase in the future and that that refilling capacity may become an issue.
- General agreement on the increasing reliance that will be placed on the SWP as Gippsland declines.

Appendix 1 presents the consolidated responses provided[9].

3 Southern Gas Market Outlook and Challenges

3.1 Supply

Marsden Jacob found that the decline in southern gas production (mainly through the reduction in Gippsland gas production) is likely to fundamentally change the southern gas market in terms of the supply of gas quantity (TJ or PJ), the supply of gas capacity (TJ/day), the location of supply and flow of gas, and the reduction in price stability provided by domestic "base load" production. The decline in southern gas production is projected by AEMO[10] to be 133 PJ/year (a 33% reduction in Southern gas supply) from 2021 to 2025, with the possibility of a steeper rate of decline post 2025.

3.2 Gas Demand from Gas Powered Generation

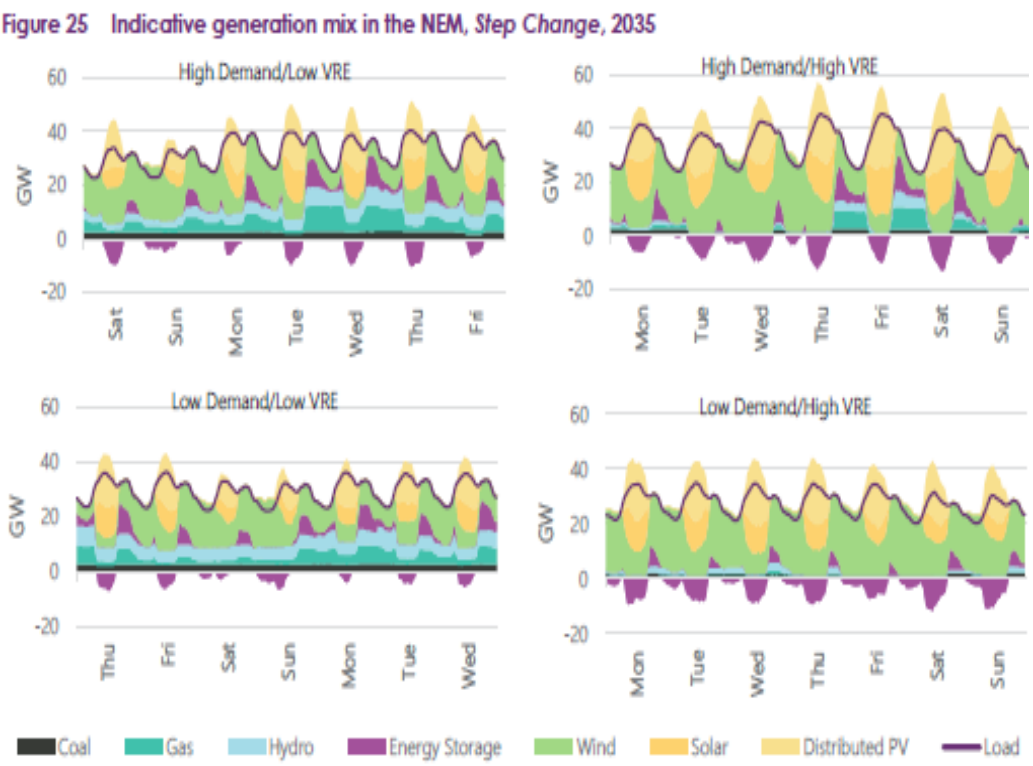
A key issue to the level of future gas demand is the level Gas Powered Generation GPG will operate at in the future. The pace of change in the NEM and resulting outlook is such that the AEMO Draft 2022 ISP is indicating considerably higher levels of maximum daily GPG gas demand than was contained in the AEMO 2021 Gas Statement of Opportunities (GSOO) report. Figure 25 in the AEMO Draft 2022 ISP shows that in 2035 gas

[9] This is taken from the Marsden Jacob Phase 1 report.

[10] Table 31 of the 2021 Victorian Gas Planning Report. This shows total annual available supply plus anticipated in Victoria reducing from 360 PJ in 2021 to 227 PJ in 2025.

generation on days of low wind and solar generation in the NEM would be about 1,440 TJ/day (see Box 1 below), compared to the AEMO 2021 GSOO which has the outlook for maximum daily GPG generation in the southern gas market at 460 TJ/day in 2025 and 632 TJ/day in 2030.[11]

Box 1 Extract from the AEMO Draft 2022 ISP – Figure 25



Estimated gas use in the NEM for a day of high demand and low VRE is 1,440 TJ.
(10,000 MW, 16 hours, 9 GJ/MWh).

Source: AEMO Draft 2022 ISP and Marsden Jacob analysis

In this regard we note that the transformation of the National Electricity Market (NEM) away from coal generation has the potential to significantly increase the level and volatility of GPG use, particularly for gas generators located in NSW, Victoria and SA. The outlook for coal generation closures contained in the AEMO Draft 2022 ISP has coal generators closing earlier than assumed in the AEMO 2021 GSOO[12].

Additional factors (to that of coal generator closures) that will also act to increase the maximum level of daily level of GPG in the NEM include the following:

- The new gas generators being developed in NSW (Kurri Kurri, Tallawarra B, Port Kembla[13]);
- The aging of the remaining coal generators that may mean an increased probability of generator outages (which may occur at times of high electricity market system stress when GPG generation is high); and
- The expected increase in correlation between high gas demand days and high electricity demand.

[11] AEMO 2021 GSOO Table 5 titled "Actual and forecast GPG daily demand range at the time of maximum gas demand, winter, Central, 1-in-20 year peak conditions (TJ/d)"
[12] AEMO Draft 2022 ISP and AGL announcement in February 2022 that Loy Yang A and Bayswater will close up to 3 years earlier.
[13] The Port Kembla power station is proposed to be a gas and green hydrogen power station at Port Kembla.

3.3 Disruption

In essence, the base load supply of gas (Gippsland production) is declining, but unlike electricity, the AEMO gas demand projections show the need for base load gas supply will remain. Added to this is the potential for significantly higher gas demand from GPG that will require substantially increased flexible gas supply.

The replacement of the lost conventional gas production with an LNG import terminal at Pt Kembla will mean the roles of supply facilities may be uncertain and subject to change, that there will be greater variability in the use of transportation facilities, and that there will be unexpected constraints on the use of transportation facilities[14].

3.4 Timing

We also note that there are new risks associated with the PKGT that relate to whether or not it is developed, if developed its timing of entry, and if and when operating the issues of gas delivery risks and costs from the PKGT. Capacity planning should recognise these new risks.

3.5 Market Developments

A number of projects have been proposed and the current committed responses to the decline in southern gas production[15] are as follows:

- The increase in capacity (circa 100 TJ/day) of two pipelines from Queensland to accommodate the anticipated increase in gas flows to the southern gas market from Queensland; and
- The Port Kembla LNG Import Terminal (known as the Port Kembla Gas Terminal or PKGT) scheduled to enter in early 2023 and which will provide up to 500 TJ/gas per day with an annual supply limit of 115 PJ[16].

3.6 Supply Adequacy

Based on the Central demand outlook in the 2021 GSOO, the decline in southern gas production (indicated in the 2021 GSOO) and the committed development listed above, the level of surplus[17] capacity in the southern gas market is shown in Figure 1 below.

The key observations from this outlook are as follows:

- There are further developments required in the long term to address the deficit in capacity;
- There is a small capacity margin until PKGT enters after which surplus capacity is near 400 TJ/day. However, this is below historical levels (required to address unforeseen supply outages);
- The level of GPG is taken from the 2021 GSOO and is likely to understate maximum GPG levels. This would mean a reduction in gas capacity margin and lower gas supply resilience; and
- Higher planned levels of surplus capacity than currently required would be prudent in the future to account for the increased uncertainties of southern gas production decline, uncertainties of gas reliability from gas import terminals, and future level of gas demand volatility.

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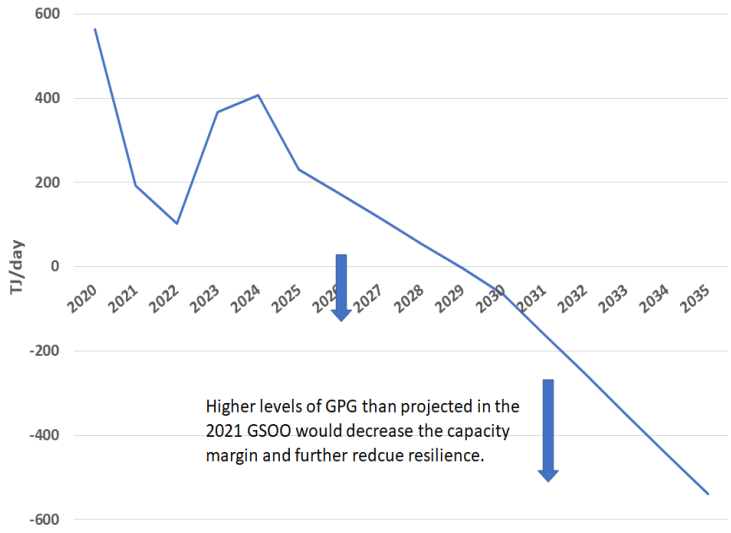
[14] A key point is that the level of uncertainty means specific outcomes are difficult to project, but the outlook will present supply challenges very different than the past.

[15] As of January 2022 (when this report was written).

[16] National Gas Infrastructure Plan, Nov '21 p15

[17] Surplus gas capacity is define as the total capacity of supply sources less the 1 in 20 daily maximum demand of the southern gas market.

Figure 1 Southern Gas Market Capacity Demand and Supply Balance TJ/day



The capacity outlook shown in the figure opposite is based on:

- AEMO 2021 GSOO Central demand outlook and maximum GPG;
- southern gas market capacity of 738 TJ/day in 2030 and 369 TJ/day in 2035 (indicated in the 2021 GSOO[18]);
- the committed projections of the 100 TJ/day pipeline expansions from Queensland and the PKGT.

Marsden Jacob believes that it is likely that peak GPG rates will be above the level assumed in the 2021 GSOO, and hence margins may be reduced later in the forecast period.

Source: Marsden Jacob analysis

In providing comment on the capacity balance outlook in the southern gas market (Figure 1 above), we note that there are uncertainties in relation to the availability of capacity when required on supply assets (pipelines, production, storage)[19], uncertainties in relation to future gas demand (particularly the demand from GPG), and that the issue of gas supply is not confined to peak demand days.

Following on from the above, even Figure 2 below (Figure 1 in the 2021 GSOO) which does show a yearly distribution of southern gas market daily demands, is not totally adequate for drawing conclusions of future gas capacity needs. The reasons for this include:

- It represents a static analysis of the supply side;
- It excludes the introduced risks associated with LNG imports;
- It excludes the importance of storage operation, volume and refill on available capacity; and
- Does not account for the dependence of capacity on gas flow paths, the consequent impact on pipeline constraints, and the impact of new operating modes (reverse flow on EGP, for example).

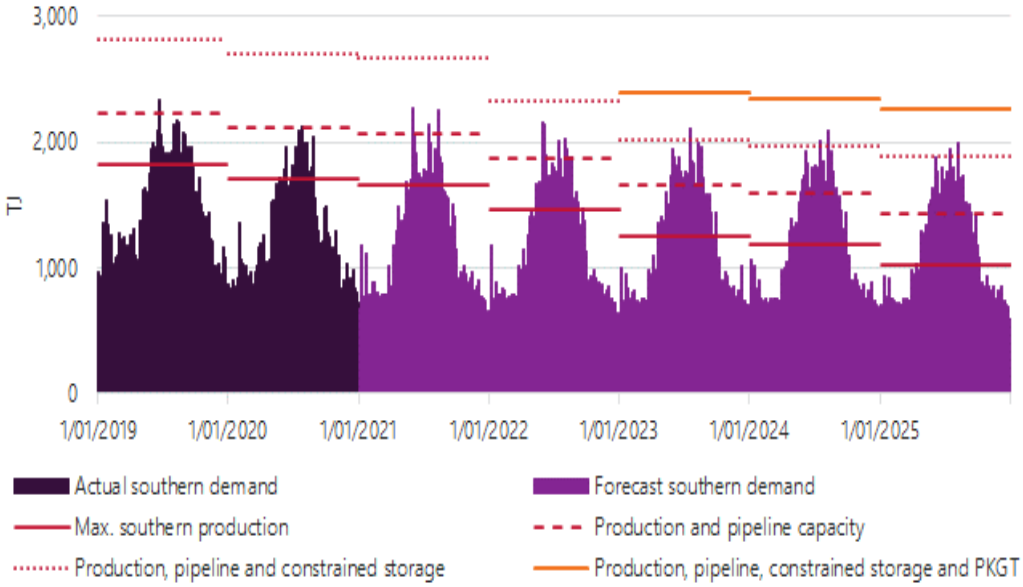
All these factors go beyond the conventional peak day analysis, and beyond the more comprehensive daily analysis (shown in the figure below). They are reflective of changes in the gas market resulting from the Longford decline, and the replacement of this capacity with a new, different source of supply.

Figure 1 in the 2021 GSOO (Figure 2 in this report, below) does provide the insight that the reducing margin (between supply capacity and maximum daily demand) projected from that historically signals a decline in resilience (from past levels) as southern production declines, and that PKGT may not fully address this.

[18] Figure 30 and Figure 31 from the AEMO 2021 GSOO.

[19] As the southern gas market changes there may be increasing challenges around co-ordinating of planned maintenance and managing outages at production plants to provide the supply required.

Figure 2 Figure 1 from the 2021 AEMO GSOO



Source: AEMO spreadsheet that contains figures from the 2021 GSOO "2021 Gas Statement of Opportunities report figures and data.xlsx"

4 Marsden Jacob Assessment of future Southern Gas Market

As part of this study Marsden Jacob undertook explorative modelling[20] (over an outlook period of 2022 to 2035) of the southern gas market to obtain insights into its needs and its operation under various demand and supply development outlooks.

The insights obtained included the following:

- Substantial developments will be required, which include LNG import terminal(s), new domestic gas and supporting pipeline capacity.
- The uncertainties in demand outlook (including GPG level and volatility) and the rate of southern gas market decline introduce higher risks than have historically existed.
- The volatility of daily gas demand will increase, primarily due to more extreme and increased GPG gas use. A lower level of non GPG gas demand would mean a gas demand profile that is more uncertain and volatile.
- There are likely to be strong locational differences associated with the impact of the Gippsland gas decline and the introduction of a PKGT.
- There was decreased predictability in the southern gas market in relation to the operation of facilities (gas supplied from import terminal(s) and storage, and resulting economics).
- There is the potential for the gas market to be more sensitive to supply disruptions (i.e. lower level of resilience).
- Storage and supply capacity will be critical to the capability of the southern gas market to respond to events such as sustained GPG generation, northern gas supply constraints or sudden disruptions to southern gas production (these matters relate to resilience which AEMO identify as required in the gas market).

[20] The modelling was undertaken to gain insights into the operation of the future southern gas market and the roles that would be played by the existing, committed, and other required facilities to 2035. The modelling was not designed to undertake a cost benefit analysis of any development path or particular asset.

- There is likely to be increased complexity for participants in managing risk.

The key theme was the size of the impact that arises due to the decline in southern gas production and the challenges in replacing this supply in a manner that provides for the southern gas market to operate competitively and reliably.

5 Market Development Conclusions including the SWP Expansion

While the review and explorative modelling undertaken by Marsden Jacob provided insights to the future operation and requirements of the southern gas market, it also identified issues / questions (to be resolved) on the roles the current committed assets would undertake, and the additional investments required to satisfy supply resilience and economics.

The size and committed status of the PKGT means its role and impact will be a key issue to the future operation of the gas market and of existing and future facilities providing supply capacity to the market. Issue to be resolved in this regard include:

- The implications of the location of the PKGT (which is north of the VNI and EGP pipelines) to daily and annual flow paths and how will this affect access across the southern gas market to supply and consequently supply adequacy.
- The amount of gas that would be supplied by the PKGT, its role and whether it is used before or after domestic gas supply (noting that this may change during a year), and how this will affect its daily operation and contracting arrangements (volume and swing).
- How the entry of a new domestic gas supply (for example Gunnedah, Beetaloo, North Bowen, Galilee) would interact with the incumbent LNG facility.

Marsden Jacob is of the view that given the uncertainty and unpredictability in the nature of the gas market (based on our review including explorative modelling results), that there is high value in diversity of supply capacity, especially in capacity associated with flexible supply sources.

The reduction of any constraint the SWP places on Iona access to the Melbourne market would be consistent with this approach.

Appendix 1 Consolidated Survey Responses to Questions

This appendix presents a summary of the responses of the gas market participants that participated in the survey described in Section 2 of this report to the four questions asked. The questions are presented below followed by the summary of responses.

Question 1	Do you believe the SWP should be expanded for flow to Melbourne?
Question 2	Do you believe the SWP should be expanded for flow to Iona?
Question 3	Do you see any developments recent or forecast that will significantly impact the demand / supply balance in Victoria?
Question 4	Do you consider that there is a significant security of supply risk over the forecast period?

Note of presentation of Summary of Responses

The replies to the questions provided many comments. While these were directed at the specific question being asked, the replies often addressed broader issues that applied across the questions.

A review of the replies showed that they could be conveniently grouped under the following headings while maintaining the meaning of the reply:

- Demand;
- GPG Demand;
- Declining gas fields;
- New gas supply;
- Port Kembla Gas Terminal;
- Iona Underground Gas Storage;
- SWP;
- Gas Supply Adequacy.

The comments provided are summarised and presented below.

The comments present the full range of answers received (noting that some rewording has been undertaken).

Demand

There was one comment that electrification may see a reduction in the longer term but in the interim peak demand requirements are likely to remain largely unchanged until about 2030.

GPG Demand

There were a number of comments on GPG gas demand which supported an expectation of increasing GPG use.

These comments had the following message:

- The outlook is for sustained gas power generation due to higher penetration of intermittent renewables, ageing coal power station, and capacity limits in obtaining gas supply from Queensland in winter.
- In the NEM there is an increasing reliance on GPG for capacity for both system security and for energy supply. This is

due to ageing coal plant that is creating supply issues and the need for renewable firming.

Declining Gas Fields

There were a number of comments and concerns expressed on the declining gas fields. The strong theme of the comments was as follows:

- There is generally a lack of certainty in relation to the speed of decline of the existing legacy fields; and
- There is an increasing risk of N-1 events occurring due aging fields and infrastructure.

Longford

There was great concern expressed about the decline in Longford and what this is meaning for gas supply adequacy. Noted comments expressed the following:

- Longford is in decline and there is no committed replacement.
- Longford decline can be considered in terms of both capacity and plant integrity.
- Short-term, unforced outages of Longford have been increasing as this winter has demonstrated.
- Supply failures at Longford can result in extreme prices.
- There is increasing uncertainty in relation to Longford production and its ability to provide winter shaped supply and reliable supply.

New supply

There were concerns expressed about the uncertainties and risks associated with new supply developments. These included the following messages:

- Plant issues at Sole.
- Golden Beach entry uncertainty.
- Golden beach is untested and unproven.
- There is uncertainty around potential new and existing field production. This includes BassGas decline, Sole processing concerns, reliance on additional drilling in the Otway.
- There is red tape on new projects that hinders development.
- There is increasing risk of well replacement rates in Queensland not achieving expectations, which would result in a limited ability for Queensland CSG fields to support southern gas market demand.
- There are timing/investment risks with the required expansions of SWQP/MSP/Culcairn by APA.
- A potential import terminal on the western side of the VTS is likely to create a further bottleneck in transportation and influence system constraints.
- Adding an import terminal at Geelong would add to the complexities associated with the changing utilisation of the Qld/SWQP and Culcairn across the year.

Port Kembla Gas Terminal (PKGT)

The PKGT was seen as critical to supply. While most were highly confident the PKGT would enter, there was uncertainty expressed about its entry, its ability to obtain cargos, and its ability to replace Longford.

Comments reflected the following:

- The AEMO GSOO and EnergyQuest have factored in the AIE Import Terminal as a certainty.
- Port Kembla is far from certain.
- While AEMO doesn't predict a large capacity deficit within the next 2 to 3 years, this is solely reliant on Port Kembla being commissioned (with associated transport upgrades), and cargoes being committed to the project (at a time of increasingly tight international markets), as well as no other plant or production problems.
- If Port Kembla does proceed, we do not believe it will be sufficient to replace the decline at Longford, though the expansion in Queensland supply plus Golden Beach could delay the requirement of an expansion into the market from the SWP.

Iona

There was general commentary that the role of Iona is expected to increase in the future, and that this meant that refilling capacity may become an issue.

Comments made reflected the following:

- Filling UGS at maximum capacity rates is a lesser issue than having the ability to send gas to the DWGM at maximum capacity.
- Consistent year on year high utilisation of Iona may require additional refilling capacity.
- This winter had Iona increasingly used as a mid-merit "supply" or "deep storage" source as opposed to purely peak shaving.
- The slow refill rate of Iona UGS limits recovery of the storage volume if it has been emptied rapidly.
- If there is insufficient market demand and excess supply in the proximity of UGS, then an expansion is necessary.
- The Iona expansion volume should reflect the anticipated increase in capacity. With the Lochard expansion the expectation is that the facility will be capable of taking 250 TJ/day into the facility. Currently this is capped at 155 TJ/day on SWP and will be 200 TJ/day with WORM expansion. This still a leaves 50 TJ/day gap.

SWP

There was general agreement on the increasing reliance that will be placed on the SWP as Longford declines.

Comments reflected the following:

- The SWP should be expanded.
- At the moment there exists constrained capacity at SWP (supporting Iona/ Otway/Casino/Henry) with a relatively low cost of expansion.
- Significant capacity increase in the SWP is needed to cope with Iona expansion, additional Victorian West Coast

Supply, and a new import terminal supply.

- An expansion of the SWP would reduce systemic risk.
- An increase in SWP capacity could help provide certainty of access to the market for further field expansion in the Otway region.
- Market participants will have difficulty committing to buying additional capacity at Iona or additional supply from Otway if there is no surety of scheduling and dispatch to DWGM.
- Potential new supply at Otway may compromise/congest UGS capacity.
- Should there be demand for UGS filling exceed available capacity then SWP should be expanded to flow to Iona.
- Keen for the South West pipeline in Victoria to have the necessary expansion to transport gas to demand centres as needed whilst catering for Iona's gas storage and reinjection needs.

Gas Supply Adequacy

Supply adequacy was seen as an increasing issue.

Comments reflected the following:

- AEMO modelling is indicating an increasing need for peak day capacity and/or shortfalls by the end of the access arrangement period.
- Increased reliance on Iona / northern gas for capacity at peak in absence of alternative large sources.
- Ageing gas fields and plant infrastructure with accompanying lack of capital investment is affecting both gas supply and demand.
- Forecasts are likely based on "expected" outcomes or base-case scenarios. However, low probability, high consequence risks need also to be considered.
- If demand (southern markets in particular) cannot be met using the sum of UGS and SWQP and Gas Plant MDQ's, then there is a real threat to system security and supply, particularly on unproven assumptions and uncommitted resources/facilities.
- There is risk.
- While AEMO are not forecasting any capacity constraints in the most recent GSOO on a 1 in 20 day, this assumes that all other plants are operating as expected. This winter has shown that the NEM and East Coast Gas markets are increasingly becoming less resilient to extreme market events and or multiple credible contingencies.
- The outcomes of the 2021 winter have shown how balanced the East Coast gas market is, particularly when credible contingency events occur simultaneously in both the gas and electricity markets.
- From a system security and gas power generation requirement, additional capacity is required in the market, particularly as Gippsland declines.
- Keen for the South West pipeline in Victoria to have the necessary expansion to transport gas to demand centres as needed whilst catering for Iona's gas storage and reinjection needs.