Seed Advisory

Declared Wholesale Gas Market Review

Report for Victorian Gas Market Participants

2 December 2016

Contents

1. Executive Summary

1.1. Introduction

Seed Advisory Pty Ltd (Seed) has been engaged by a range of Victorian gas market participants: AGL, EnergyAustralia, Engie, ERM, Gas Trading Australia, M2 Energy and Origin Energy collectively called Project Participants to provide independent strategic advice in relation to the Australian Energy Market Commissions (AEMC) review of the Declared Wholesale Gas Market (DWGM).

The Project Participants were seeking a strategic and concise analysis to inform policy and key decision makers of their concerns with the current DWGM design, the AEMC's proposal and if possible, to suggest a high level alternative pathway for DWGM reform.

This report and our analysis was prepared over a brief period in collaboration with Project Participants but represents our independent perspectives. Project Participants agree with the overarching intent of the report but this report is not intended to reflect completely the views or position of any one or more Project Participant.

1.1.1. Overview of scope

In brief, the scope of this project involved providing high level advice to:

- Identify strength and weaknesses of the current DWGM and AEMC proposal (Section 4) using an assessment framework based on the six characteristics of well-functioning gas markets (Section 3)
- Develop a practical comparison, through simple examples, of how six (6) scenarios or situations work in the current DWGM and how they may operate if the AEMC's recommendations were implemented (Section 4.3).
- Describes an alternative pathway forward to progress market reform (Section 6).

Section 2.2 outlines the scope of work in further detail including the specific exclusions.

1.1.2. Overview of approach

Our approach involved working collaboratively with Project Participants where we:

- Reviewed key documents prepared by the AEMC in relation to DWGM reform
- Conducted two workshops with Project Participants, one to discuss strengths and weaknesses and the other to discuss pathways for reform
- Held one on one discussions with Project Participant and other stakeholders to gather views, clarify matters and follow up on information.

1.2. Key conclusions

1.2.1. Strengths and weaknesses of DWGM

We identified 14 strengths and weaknesses of market features of the DWGM, Table 1.1 outlines those features we identified as either major strengths or major weaknesses.

It highlights that the management of risk is a common characteristic of all major weaknesses, this is unsurprising but is balanced by the recognition that the broad market features (which are considered a major strength) provide some ability to manage risk.

Section 4.1 provides further detail on our analysis of the strengths and weaknesses of the DWGM.

Table 1.1: Summary of major strengths and weaknesses – current DWGM

Strength or weakness	Feature	Link to characteristic of well-functioning gas markets
Major strengths	Open access (currently delivered through market carriage).	6 (minimise transaction costs) 5 (barriers to entry)
	Key market design features: Gross pool, Intra-day bidding and pricing, combined balancing, capacity and commodity.	1 (credible price) 4 (manage risks)
	Established market with high transparency of information.	3 (information availability) 5 (barriers to entry)
Major weaknesses	Lack of 'clean' spot prices (including implementation of causer pays principles).	1 (credible prices) 4 (manage risks)
	Lack of firm entry/exit capacity or access rights (e.g. through AMDQ on SWP) and limited / distorted ability to purchase access rights.	4 (manage risks) 2 (investments)
	Lack of forward trading market.	4 (manage risk) 6 (minimise transaction costs)
	Uncertainty during constraints / curtailment events.	4 (manage risks) 1 (credible price)

1.2.2. Strengths and weaknesses of the AEMC proposal

We again identified 14 strengths and weaknesses of market features of the AEMC proposal, Table 1.2 outlines those features we identified as either major strengths or major weaknesses.

It highlights that the management of risk is again a common characteristic of all major weaknesses, but is again balanced by the recognition that the development of a platform for forward trading and providing firmer entry and exit rights provides an ability to manage some risks.

Section 4.2 provides further detail on our analysis of the strengths and weaknesses of the AEMC proposal.

Table 1.2: Summary of major strengths and weaknesses – AEMC proposal

Strength or weakness	Feature	Link to characteristic of well-functioning gas markets
Major strengths	Development of a platform for forward trading (exchange based).	4 (manage risks) 1 (credible price)
	Entry-Exit firm rights.	4 (manage risk) 2 (investment)
Major weaknesses	Continuous balancing.	4 (manage risks) 6 (minimise transaction costs)
	Voluntary nature of exchange based trading.	4 (manage risks) 1 (credible prices)
	Constraint cost allocation.	4 (manage risks) 1 (credible price)
	Auction for allocation of entry-exit rights.	4 (manage risk) 6 (minimise transaction costs)
	Separation of commodity and balancing.	4 (manage risks) 6 (minimise transaction costs)

The strengths and weaknesses identified for the DWGM and the AEMC proposal are clearly different. However, an analysis of the heat maps prepared to summarise these strengths and weaknesses against the characteristics of well-functioning markets (refer Table 4.3 and Table 4.6) identifies that the DWGM has a similar pattern to the heat map for the AEMC proposal.

The broad split between strengths and weaknesses is similar. So is the clustering of strengths and weaknesses with the characteristics of 'credibility of prices' and 'risk management'.

It appears that the AEMC proposal has the potential for (equally) major issues relating to risk management as the current DWGM. This raises a question of the achievable net benefit or expected outcomes from adopting the new market design.

1.2.3. Overview of practical scenarios

We identified six (6) practical scenarios to assist in a comparison of the approach used in the DWGM compared to the AEMC proposal. The six (6) scenarios analysed were:

- Starting a gas day unbalanced (with less or more gas than required).
- Injecting or withdrawing gas at locations where there is congestion or constraints.
- Purchasing gas for use in gas powered generation.
- Purchasing gas for sale to mass market customers.
- Purchasing gas from Victoria (through the DWGM) to ship interstate.

- Entering the DWGM as a new market participant (retailer).

The key findings from our analysis (refer Section 5 for further details) shows that:

- the current market operates reasonably well for these scenarios but is also not without areas of concern or issues in particular related to the ability for participants to manage risk.
- the AEMC proposal has beneficial features over the DWGM in some areas but there are a number of areas of concern with its practical operation and participant's ability to manage risk.
- the question can again be raised of the achievable net benefit or expected outcomes from adopting the new market design given the concerns raised over the management of risk.

1.2.4. Possible pathways for DWGM reform

We have identified three broad pathways for reform and some considerations for choosing each pathway. We are not suggesting these are the only pathways. We are also not suggesting the specific actions or reforms that are to take place, nor commenting on the governance structure within which these reforms should take place.

In addition, we are suggesting that:

- Market reform is required, the status quo i.e. the current market is not the preferred or recommended position.
- The long term goal or vision for gas market development is consistent with the COAG Energy Councils vision.
- Recognising that market dynamics and requirements change market reform is also likely to be continuous irrespective of the pathway chosen.

Pathway One: AEMC Approach

It is generally accepted that this pathway involves extensive change and at least 3 or more years before implementation.

We have raised questions on the achievable level of benefits, the level of complexity and the costs to implement. Our view is that this is a high risk pathway with uncertain outcomes and benefits.

Pathway Two: Further investigation / analysis

This pathway would involve further analysis or investigation such as risk analysis, detailed cost benefit analysis etc. of model(s) including the AEMC model to eventually settle on a preferred model for Victoria.

Whilst potentially appealing (at least from a theoretical perspective) we would not recommend this pathway given it just delays reform, and recognising that reform is required for the DWGM it does not address issues in a timely manner and only delays any potential benefits.

Pathway Three: Hybrid approach – integrating the DWGM with elements of the AEMC proposal

This is our preferred and recommended pathway. The fundamental difference between this pathway and the first pathway is that this one recognises the starting position is the current DWGM and reform involves changing (not necessarily minor) from here.

At a conceptual level this pathway involves:

- identifying areas of the DWGM that should be retained (such as those discussed in Section 6.1);
- addressing issues or concerns with the DWGM as a matter of priority (such as those discussed in Section 6.2); and
- integrating these with key elements of the AEMC proposal (such as those discussed in Section 6.3).

We believe this pathway has a number of benefits including:

- It recognises the strengths and inherent value in key elements of the current DWGM and where possible retains these features.
- It provides a 'best of both worlds' approach through integrating with the strengths of the AEMC's proposal.
- It allows for targeted and prioritised reform – which would reduce risk and cost.
- Implementation is able to be commenced more readily – some issues are able to potentially be addressed within 12 – 18 months from commencement which will mean benefits can be realised sooner.
- It is flexible to respond to changing circumstances as they arise.
- It recognises the reality that market reform is more a process of continuous improvement than a destination.

1.2.5. Overall conclusions

Our analysis has highlighted that:

- The current gas market (DWGM) has a number of desirable features, it works, but it also has a number of issues.
- There is general recognition that reform of the DWGM is needed – the status quo has issues and time is of the essence.
- There is general agreement of shared vision for gas markets as a longer term aspiration.
- The AEMC proposal also has some desirable features but also, what appears to be, some potentially significant issues.
- There needs to be an appreciation in any reform process that the market context and landscape is changing and that the reform process needs to be adaptable to change.
- Therefore, there is a requirement for 'continuous reform' which involves a 'journey not a destination'.
- The recommended pathway that recognises these factors is the hybrid approach which integrates the best features from the DWGM and the AEMC proposal whilst addressing the key issues with the DWGM and works towards the COAG Energy Councils vision for gas market development.

2. Introduction

2.1. Background

On 4 March 2015, the Victorian Government, with the agreement of the Council of Australian Governments (COAG) Energy Council, asked the AEMC to conduct a review of the DWGM.

The AEMC issued a draft report in late 2015 with comments received by February 2016. The AEMC subsequently convened a technical working group including representatives from market participants that met three times between June and August 2016 to refine elements of the draft report.

A Draft final report was published in October 2016, with submissions due in early December 2016. A final report is expected to be prepared by March 2017.

We understand there is general agreement amongst Project Participants with the AEMC's reform objectives and desired characteristics of a well-functioning gas market. There is also a general view amongst Project Participants, to a greater or lesser degree, that the current DWGM design has some issues that need to be addressed.

However there are concerns amongst Project Participants with the AEMC's specific recommendations many of which have been raised at the technical working group and other forums. We understand Project Participants have raised questions on the expected benefits and are concerned with the significant time, cost and complexity to implement the recommendations.

Project Participants are of the view that there is merit in the industry pursuing an alternative pathway to DWGM reform that will likely deliver greater benefits with reduced cost / complexity.

To this end, Project Participants sought an independent strategic and concise analysis to inform policy and key decision makers of their concerns with the current DWGM design, the AEMC's recommendations and to suggest an alternative approach to gas market reform.

2.2. Scope of work

The scope involved preparing a strategic and concise analysis that:

- Uses a framework for summarising and undertaking the assessment – the framework is described in Section 3 and includes the key features of a well-functioning gas markets as used by the AEMC in their final draft report.
- Summarises areas (utilising the framework) where market participants believe the current DWGM works well (and hence should be retained if practical) and areas where some improvement may be warranted (Section 4).
- Summarises areas (utilising the framework) where market participants believe the AEMC's recommendations are likely to deliver benefits and those where the benefit may be questionable or where there is potentially material cost or complexity to implement (Section 4).

- A practical comparison, through simple examples, of how 6 simple scenarios or situations work in the current DWGM and how they may operate if the AEMC's recommendations were implemented (Section 5).
- Describes a possible pathway forward to progress market reform (Section 6).

The scope excludes:

- Detailed design or assessment of the current DWGM or AEMC's proposals including any cost benefit analysis.
- Financial or market modelling of potential outcomes from market reform.
- Development of a detailed way forward or project plan. This is a strategic report to inform policy makers. Subsequent stages of work would further expand on the way forward and undertake detailed assessments.

2.3. Approach

The approach involved working collaboratively with Project Participants with the following steps:

- Preparation of an assessment framework to summarise our findings and analysis.
- An analysis of the current DWGM and AEMC proposal and a workshop with Project Participants to:
  - Summarise areas where we believe the current DWGM works well and areas where improvement may be warranted.
  - Summarise areas where the AEMC's proposal may deliver benefits and areas where there may be questionable benefits or material cost / complexity.
- Identification of six (6) simple but practical scenarios or worked examples to compare how the scenario would operate in the current DWGM versus the AEMC recommendation.
- A workshop with Project Participants to assist in the identification of options to progress DWGM reform.

We also held one on one discussions with Project Participant and other stakeholders to gather views, clarify matters and follow up on information.

3. Assessment framework

Consistent with our scope of work we developed simple frameworks to capture the strengths and weaknesses as well as the simple scenarios. These are outlined below.

3.1. Analysis of strengths and weaknesses

Our analysis involved developing a qualitative framework to categorise and assess the strengths and weaknesses of the current DWGM and the AEMC proposal. Section 4 contains the results of this analysis.

Our framework includes:

- A short description of the market feature or characteristic – noting that we are assessing market features or characteristics not outcomes. The outcomes are an outworking of specific characteristics or features and are allowed for separately in the framework.
- A simple two tier scale assessment of strengths and weaknesses. We characterised a strength or weakness as either major or moderate. A major strength or weakness was identified as those we believe could provide a high level of benefit or risk. Moderate strengths or weaknesses were those that we believe only provided limited benefit or risk.
- A brief comment or description of the outcome or impact of the market feature or characteristic. This discusses any issues or benefits of the relevant characteristic and provides some of the qualitative basis for determining the assessment as major or moderate. We note that at the moment there are elements of the AEMC proposal that have not been fully developed or publicly described. In these instances we have noted that we are unsure of the impact.
- A link to at most two of the relevant characteristic of a well-functioning gas market (refer Section 3.1.1).
  - Appendix B.4 of the AEMC's Draft Final Report on the Review of the Declared Wholesale Gas Market identifies six (6) characteristics of well-functioning gas markets. We support these characteristics and believe a market that exhibits such characteristics would be well-functioning.
  - We note that the terms of reference provided to the AEMC identified that the AEMC consider four issues[1]. We believe that a market that exhibits the characteristics of a well-functioning gas market should equally address these four issues. We therefore did not need to specifically undertake our analysis with reference to these four issues.
  - One of the six characteristic of well-functioning markets is low or minimal barriers to entry. It is important to understand that very few of the market features analysed directly link to this characteristic but many of them indirectly do, for example markets that exhibit high risk also pose high barriers to entry. However, for simplicity we have not included these indirect linkages.

[1] AEMC, *Review of the Declared Wholesale Gas Market*, Draft Final Report, 14 October 2016, pg. 107

3.1.1. Characteristics of a well-functioning gas market

The characteristics of a well-functioning gas market are:

1. **Credible price:** Demand and supply conditions reflected in prices: markets participants should have access to a credible reference price reflective of underlying supply and demand conditions that usefully aids commercial decision making.
2. **Facilitate Investment:** Timely and efficient investment in infrastructure: efficient additions to, and expansions of, infrastructure enable supply to meet demand while minimising the cost of excess capacity.
3. **Information available:** Readily available market information: efficient outcomes are likely to be achieved when participants (current and potential) have access to clear, timely and accurate information about prices and factors driving prices, such as supply and demand conditions.
4. **Manage risks:** Price and volume risks can be managed and are appropriately allocated: participants being able to manage operational risks to delivery of physical gas while maintaining safe operating parameters, as well as being able to insure themselves adequately against financial risks.
5. **Minimised barriers to entry:** barriers to entry (and exit) can be a function of market structure, government regulation, industry-specific sunk costs or geography, and certain barriers have the potential to detract from the ability of markets to deliver efficient outcomes.
6. **Minimised transaction costs:** efficient transaction costs support timely and efficient investments in infrastructure and encourage competition.

3.2. Scenario analysis

Our analysis also involved identifying six (6) simple but practical scenarios. We similarly developed a qualitative framework to summarise these scenarios and how they operate in the current DWGM and how we believe they may operate in the AEMC proposal. Section 5 contains the detail and analysis of these scenarios.

Our framework for summarising these scenarios includes:

- A short description of the scenario – noting that we have selected six scenarios for illustration purposes only.
- A simple description of how the scenario would operate in the DWGM and how we believe it may operate in the AEMC proposal. We again note that at the moment there are elements of the AEMC proposal that have not been fully developed or publicly described. In these instances, we have noted that we are unsure of how the scenario may operate.
- A brief comment on the scenario and in particular any differences between its outcome or operation under the current market and the AEMC proposal.
- A link to the relevant characteristic of a well-functioning gas market (refer Section 3.1.1).

4. Analysis of Strengths and Weaknesses

This section details our high level view of the strengths and weaknesses of the current DWGM and the AEMC proposal. We appreciate there are a number of weaknesses (and strengths) not associated explicitly with market design that we have not discussed for example the lack of competition in upstream gas markets. Consistent with the AEMC's report our focus has been on market design features only.

We acknowledge there are clearly relationships between some of the strengths and weaknesses for example a strength in the current DWGM can be a weakness in the AEMC proposal and vice versa.

4.1. Current DWGM – Strengths and Weaknesses

Our analysis has identified 14 strengths and weaknesses summarised in Table 4.1 below and further detail on each feature is provided in Table 4.4. We then pictorially represent our analysis in the form of a heat map in Table 4.3 on page 18.

Table 4.1: Summary of strengths and weaknesses of current DWGM

Strength or weakness	Number	Summary of relevant market features
Major strength	3	• Open access • Broad market design features – e.g. gross pool • Established market with high transparency of information
Moderate strength	4	• Simplicity of entry / exit capability • Combined market / system operator • Causer pays principles (not implementation) • Variable access charges
Major weakness	4	• Lack of 'clean' spot prices • Lack of firm entry / exit capacity • Lack of forward trading market • Uncertainty during constraint / curtailment events
Moderate weakness	3	• Delay in provision of certain market information • Lack of locational spot prices • Complex registration process

Table 4.2: Strengths and weaknesses of current DWGM

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
A	Open access (currently delivered through market carriage)	Strength (major)	• There is no need to contract for (interruptible) capacity which reduces transaction costs and can also possibly increase asset utilisation.	6 (minimise transaction costs) 5 (barriers to entry)
B	Key market design features: Gross pool, Intra-day bidding and pricing, combined balancing, capacity and commodity	Strength (major)	These features provide participants with a number of benefits: • flexibility and increased system security - intra-day bidding and pricing enables participants to respond to changed circumstances. • increased liquidity and transparency - gross pool improves liquidity due to mandatory participation and all gas must be bid into market. • maintains incentives for accurate forecasting – intra-day bidding provides incentives for accurate forecasting. • increased alignment with electricity market through the intra-day bidding and scheduling.	1 (credible price) 4 (manage risks)
C	Established market with high transparency of information	Strength (major)	• The current market is well established, understood and whilst not perfect it performs reasonably well. • The current market information provided by AEMO is extensive and broad in its coverage	3 (information availability) 5 (barriers to entry)

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
			including gas flows, bid stacks and prices. • These characteristics provide increased confidence for new and existing participants.	
D	Entry/exit capability	Strength (moderate)	• Whilst there are no firm entry and exit rights there is an allocation of entry and exit capability for participants based on factors such as their bids and AMDQ. • These entry and exit capabilities are automatically provided for incumbent electricity generators. • This provides benefits such as certainty and an increased ability to ship gas interstate (e.g. NSW) which may result in better portfolio and asset utilisation.	4 (manage risks) 6 (minimise transaction costs)
E	Combined market / system operator	Strength (moderate)	• This approach avoids duplication of processes. • A central coordinator is potentially more efficient and effective at maintaining system security. • There is likely increased impartiality from an independent system and market operator. • A 'not for profit' or government owned market operator is also likely to have a lower overall cost to industry than a private sector operator.	6 (minimise transaction costs) 1 (credible price)
F	Causer pays principles (note this is not the implementation of the	Strength (moderate)	• The principal of allocating costs to the parties through causer pays is a characteristic which provides appropriate incentives and signals. • This does not however mean that the current	1 (credible price) 4 (manage risks)

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
	principles)		implementation of the causer pays principles is appropriate.	
G	Variable access charges	Strength (moderate)	• The variability of access charges through the current transmission tariff regime provides increased price transparency and improves the ability to accurately calculate pass through charges.	4 (manage risks) 1 (credible prices)
H	Lack of 'clean' spot prices (including implementation of causer pays principles)	Weakness (major)	This includes factors such as deviation payments, ancillary services and uplift cost allocation including the need for a separate market and operational schedule. These factors: • can distort prices, create risks and socialise costs • are highly complex • have impacted the development of derivative markets (but they are not the only factors) • incentivise disorderly bidding through parties bidding gas at either $0 or $800 / GJ to achieve certain outcomes.	1 (credible prices) 4 (manage risks)
I	Lack of firm entry/exit capacity or access rights (e.g. through AMDQ on SWP) and	Weakness (major)	• The lack of firm entry / exit rights increases risks for participants through reduced certainty of	4 (manage risks) 2 (investments)

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
	limited / distorted ability to purchase access rights.		deliverability of gas. • They also reduce investment signals and the potential value (to participants) of any investment to increase capacity[2]. • To manage this uncertainty it requires participants to offer (bid) gas at $0 ($800) to ensure rights although this may not represent a realistic or acceptable price.	
J	Lack of forward trading market	Weakness (major)	• There is limited forward trading of short term supply contracts between participants. • This increases costs and creates difficulties in managing risks for participants. • These are driven by factors such as complex sub-allocation rules and administrative requirements to amend gas supply constraints with AEMO. Changing these will increase the ease with which bi-lateral short term contracts are traded. • The lack of liquidity in derivatives are also driven by the complexities associated with uplift and the inability for derivatives to easily hedge this risk.	4 (manage risk) 6 (minimise transaction costs)
K	Uncertainty during constraints / curtailment events	Weakness (major)	• The rules governing AEMO's discretion and approach are vague – e.g. how AEMO manages linepack on days of constraint.	4 (manage risks) 1 (credible price)

[2] This does not imply that to date there has been inadequate investment in infrastructure in the DWGM. We understand there is adequate capacity and infrastructure in the DWGM to meet current requirements.

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
			• This increases market exposure for participants as it is difficult to forecast and manage. • Market prices at times may be adversely impacted.	
L	Delay in provision of market information and understanding potential price exposures (uplift)	Weakness (moderate)	• Participants only obtain information on their actual position and cost for a gas day sometimes 3 days later. • This can impact a participant's ability to understand their exposures and adjust their position if required.	4 (manage risks) 1 (credible price)
M	Lack of locational spot prices	Weakness (moderate)	• This can reduce the strength of price signals and risk management options it can also adversely impact investment signals.	1 (credible price) 4 (manage risks)
N	Complex registration process	Weakness (moderate)	• The complexity associated with registering with AEMO as a new participant can increase costs for new entrants. • There is also no ability or participant category for someone to trade voluntarily which may hinder further liquidity and innovation.	5 (barriers to entry)

Table 4.3: Summary heat map of strengths and weaknesses of current DWGM

Characteristic	Market Feature (Current DWGM)													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1. Credible reference price														
2. Timely & efficient investment														
3. Readily available market information														
4. Ability to manage risk														
5. Minimise barriers to entry														
6. Minimise transaction costs														

Legend

	Strong weakness / major issue
	Moderate weakness / issue
	Moderate strength / benefit
	Major strength / benefit

4.2. AEMC Proposal – Strengths and Weaknesses

Our analysis has identified 14 strengths and weaknesses summarised in Table 4.4 below and further detail on each feature is provided in Table 4.5. We then pictorially represent our analysis in the form of a heat map in Table 4.6 on page 26.

Table 4.4: Summary of strengths and weaknesses of AEMC proposal

Strength or weakness	Number	Summary of market features
Major strength	2	• Development of a platform for forward trading • Firmness of entry and exit rights
Moderate strength	3	• Nationally cohesive market arrangements • Separation of commodity and balancing • System balancing signal
Major weakness	5	• Continuous balancing • Voluntary nature of exchange based trading • Constraint cost allocation • Auction for allocation of entry / exit rights • Separation of commodity and balancing
Moderate weakness	4	• Firm entry and exit rights • Lack of locational prices. • Use of specific proprietary software (Trayport) • No bid stack and other detailed market information will be published

Table 4.5: Strengths and weaknesses of AEMC proposal

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
A	Development of a platform for forward trading (exchange based)	Strength (major)	• The development of a platform or capability to facilitate forward trading will assist in managing risks including electricity and gas price risk management. • It will also provide further transparency over forward prices. • However, the voluntary nature proposed by the AEMC has potentially adverse implications.	4 (manage risks) 1 (credible price)
B	Entry-Exit firm rights	Strength (major)	• The ability to have firm entry or exit capacity provides confidence for participants and improves risk management options. • Firm rights also increase opportunities for market led investment. • However, the proposed entry exit model has other adverse implications.	4 (manage risk) 2 (investment)
C	Nationally cohesive market arrangements	Strength (moderate)	• Increased harmonisation across the east coast gas markets reduces administration costs and can help with easier trade or shipping of gas between states. • Increased harmonisation does not however require complete standardisation or uniformity in design. This also acknowledges that the proposed Southern	6 (minimise transaction costs)

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
			and Northern hubs are not identical in design.	
D	Separation of commodity and balancing	Strength (moderate)	• A separate price for commodity and balancing can increase price transparency through understanding price differences for varying components of the current bundled DWGM gas price.	1 (credible price) 3 (information availability)
E	System balancing signal	Strength (moderate)	• The AEMC proposal provides a signal for system balancing similar to the current approach used by AEMO to monitor system security.	1 (credible price) 4 (manage risk)
F	Continuous balancing.	Weakness (major)	• The physical characteristics of the Victorian transmission system are not necessarily conducive to continuous, market-led balancing: — There is limited spare-capacity and quick-response storage. — The supply sources are distant from the main demand centre. — There is a winter peak retail demand well in excess of average demand. • Continuous balancing will also only work if allocations are near real time, which is not evident in current contract conditions and market processes. • If gas market participants fail to manage balancing appropriately there may be an increased risk of	4 (manage risks) 6 (minimise transaction costs)

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
			system operator intervention with potentially limited options available and minimal time to respond. • The voluntary nature of the proposed balancing market may reduce liquidity and therefore increase costs for some portfolios and smaller participants. • It is unclear if the proposed market design provides select participants with gaming opportunities given existing contractual positions and the voluntary nature of the market. • There are increased costs to participants to develop the capabilities (e.g. market monitoring, changed processes, new systems, metering costs to upgrade meters to enable continuous monitoring etc.).	
G	Voluntary nature of exchange based trading	Weakness (Major)	• The voluntary nature of the proposed exchange may adversely impact market liquidity. • Many participants are likely to rely on their gas supply agreements to balance. This may also introduce barriers to new entrants unable to obtain adequately flexible gas supply agreements. • At times of low liquidity there is likely to be reduced credibility of the calculated reference price which may present gaming opportunities. This also	4 (manage risks) 1 (credible prices)

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
			reflects that not all gas will be traded through the exchange so there will be limited visibility of the underlying price at which gas is transacted. • Other factors such as locational issues or specific constraints may also not be reflected in the price.	
H	Constraint cost allocation	Weakness (Major)	• It is unclear to Project Participants how constraints will be managed and the approach to cost allocation on days of constraint. • There is a risk that there may be issues of similar concern in the new market design as exists in the current market design.	4 (manage risks) 1 (credible price)
I	Auction for allocation of entry-exit rights	Weakness (major)	• It is unclear how the auction process for entry and exit rights will work. There are concerns that the approach to capacity allocation may either distort utilisation, increase inefficiency or increase risks. • In any event it is likely to be impractical and difficult to align the timing of purchase of entry-exit rights with other items of the gas delivery chain such as new customer acquisition and commodity or gas supply agreement negotiations. • Many participants internal risk management processes would require co-incident timing on any outcome of supply agreement negotiations and the	4 (manage risk) 6 (minimise transaction costs)

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
			purchase of entry-exit rights to avoid mismatch risks. • An auction process in the context of the size of the Victorian gas market and participant numbers may be unnecessarily complex and introduce higher than necessary establishment and operational costs. • Whilst there are some protections introduced to mitigate hoarding there is a view that the limited liquidity in the Victorian market may provide gaming opportunities if some parties purchase excessive rights.	
J	Separation of commodity and balancing	Weakness (Major)	• The limited liquidity in the current DWGM given its relatively small size and participant numbers would be further reduced upon separation of the commodity and balancing components. • Reduced liquidity then impacts the ability to manage risk and the credibility of any reference prices. • There is also a potential for increased inefficiency of asset utilisation.	4 (manage risks) 6 (minimise transaction costs)
K	Firm entry and exit rights	Weakness (moderate)	• Firm entry and exit rights will most likely increase the likelihood of market led investments. • There is however concern that some specific supply path related investments may be neglected (as the	1 (credible prices) 2 (investment)

Ref.	Market element / feature	Strength or weakness	Comment	Relevant characteristic(s) of well-functioning market
			only focus is on entry and exit price signals). • It is also unclear if firm entry and exit rights will positively or negatively impact asset utilisation. There is a possibility that some assets may have less efficient utilisation than currently exists in the open access regime.	
L	Lack of locational prices.	Weakness (moderate)	• Some Project Participants suggest that one state-wide reference price does not provide adequate transparency / price signals. • There is however acknowledgement that the separation of capacity and commodity price is a form of differentiated prices.	1 (credible price) 4 (ability to manage risks)
M	Use of specific software (Trayport)	Weakness (moderate)	• The use of proprietary software (instead of market operator based systems) may increase fixed costs and establishment costs for smaller participants or new entrants.	5 (barriers to entry)
N	No bid stack and other detailed market information will be published	Weakness (moderate)	• It is likely that a key information source providing valuable information to participants will be unavailable in the new market design.	3 (information availability)

Table 4.6: Summary heat map of strengths and weaknesses of AEMC proposal

Characteristic	Market Feature (AEMC Proposal)													
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1. Credible reference price														
2. Timely & efficient investment														
3. Readily available market information														
4. Ability to manage risk														
5. Minimise barriers to entry														
6. Minimise transaction costs														

Legend

	Strong weakness / major issue
	Moderate weakness / issue
	Moderate strength / benefit
	Major strength / benefit

4.3. Strengths and Weaknesses Analysis – Key Observations

In summary, the strength and weaknesses analysis identified the following:

- The current DWGM works reasonably well but is not without its own issues.
- The majority of issues relate to the characteristics of 'credibility of prices' and 'risk management' which is consistent with one of the four issues the AEMC was requested to address in the terms of reference for their review.
- The AEMC proposal has some strengths but also a number of potential weaknesses.
- Whilst the strengths and weaknesses identified for the DWGM and the AEMC proposal are different, the heat map for the DWGM has a similar pattern to the heat map for the AEMC proposal.
  - In particular the broad split between strengths and weaknesses is similar as is the clustering of strengths and weaknesses with the characteristics of 'credibility of prices' and 'risk management'.
- Based on the analysis of available materials, it appears that the AEMC proposal has similar issues, as does the current DWGM design, in relation to risk management. This raises a question of the achievable net benefit or expected outcomes from adopting the new market design – particularly when due consideration is given to the implementation costs associated with delivering the AEMC's proposal.

5. Scenario Analysis

This section, is intended to illustrate through six (6) simple but practical scenarios, the approach taken under the current DWGM compared to what we believe the approach may be under the AEMC proposal. We appreciate that the AEMC proposal is not fully developed in certain areas. In some instances we have raised questions on how we think it may operate or flagged that we are uncertain as to how it may operate.

Table 5.1 provides a description of the scenarios and a reference to the table numbers in this report that provide the detail and analysis.

Table 5.1: Summary of scenarios

Scenario number	Table Ref	Scenario description
1	Table 5.2	Starting a gas day unbalanced (with less or more gas than required)
2	Table 5.3	Injecting or withdrawing gas at locations where there is congestion or constraints
3	Table 5.4	Purchasing gas for use in gas powered generation
4	Table 5.5	Purchasing gas for sale to mass market customers
5	Table 5.6	Purchasing gas from Victoria (through the DWGM) to ship interstate
6	Table 5.7	Entering the DWGM as a new market participant (retailer)

The analysis, albeit high level shows that:

- the current market operates reasonably well for these scenarios but is also not without areas of concern or issues in particular related to the characteristic of managing risk.
- the AEMC proposal has beneficial features over the DWGM in some areas but there are a number of areas of concern with its practical operation and participant's ability to manage risk.
- the question can again be raised of the achievable net benefit or expected outcomes from adopting the new market design given the concerns raised over the management of risk.

Table 5.2: Scenario One – Starting a gas day unbalanced (with less or more gas than required)

DWGM Approach	AEMC Proposal Approach
In a mandatory (gross pool) market if a participant is short gas they will purchase the next available 'tier' of gas which will set a marginal price for the market. Similarly, if a participant is long they will displace someone else's gas 'out'. There are also defined points in time to sell/buy in a defined mandatory market (full schedule competition).	A participant who is short or long at the beginning of a gas day either needs to continue through to the next day out of balance with uncertain consequences or alternatively seek to re-balance via the voluntary balancing market. The proposed voluntary balancing market requires a participant to make a bid or offer so that the party out of balance can buy/sell the required gas. It is unclear what may happen if there is limited liquidity and on a day there are no bids or offers before the whole system goes out of balance.
Comment	**Relevant characteristic(s) of well-functioning market**
• The current market and bid stack allows a participant to have confidence that they will be able to be in balance at the end of the day but at an unknown price. There is no requirement for a participant to have the specific portfolio flexibility through gas supply agreements to manage these situations. • The voluntary market in the AEMC model provides less information with reduced bid / offer data and can expose a market participant to potentially significant residual balancing costs if the system as a whole shifts out of balance. There is also a potential risk of gaming. • The incentive for a participant to offer gas once the out of balance position of the market or another participant is known could incentivise gaming with varying clearing prices. You may have one supplier that is long with all others competing for the remaining gas intra-day. Any balancing gas will clear at different prices and not at defined interval schedules. • Any issues will be most acute for smaller market participants with limited portfolio flexibility or participants whose entry/exit rights do not align with their commodity position. The lack of liquidity and risks may also discourage new market entry.	4 (manage risk)

Table 5.3: Scenario Two – Injecting or withdrawing gas at locations where there is congestion or constraints

DWGM Approach	AEMC Proposal Approach	
In the current market participants compete to have their gas scheduled via pricing in the bid stack (and at certain injection points possibly via AMDQ) There are known five scheduling opportunities within a day for participants to compete to have gas scheduled.	In the AEMC proposal there is no defined schedule timeframe and Project Participants are uncertain if there is an ability to re-compete for a schedule at a point during a particular day.	
Comment		**Relevant characteristic(s) of well-functioning market**
• There is general acknowledgement that the current market does not necessarily deliver satisfactory outcomes on days of constraint or curtailment. The approach to pro-rating quantities of gas incentivises disorderly bidding and uncertain outcomes e.g. bidding gas at $0 or $800 to ensure scheduling is not necessarily a sign of a well-functioning market. • The AEMC proposal presents uncertainty amongst Project Participants of how the exit / entry rights work dynamically based on actual flows in a system. There are a number of points that are bi-directional and a constraint can be a net flow, so where there is an increase in injections the withdrawals can also be increased and vice versa. Where there is finite exit and entry rights, what happens if there is more capacity on a day based on actual flows? Further, what happens if the capacity sold is then curtailed based on actual flows – who is curtailed?		4 (manage risk) 1 (credible price)

Table 5.4: Scenario Three – Purchasing gas for use in gas powered generation

DWGM Approach	AEMC Proposal Approach
• To purchase gas for use in gas powered generation requires an estimate of forecast usage and for participants to submit an uncontrolled withdrawal bid. • Participants pay the ex-ante price for their forecast usage and deviation payments for any differences in usage. • Transmission charges are variable which allow for an easy recovery through the electricity price and does not dis-incentivise unit commitment.	• To purchase gas for use in gas powered generation requires an estimate of forecast usage. Participants can purchase gas anytime in advance or on the day through the exchange assuming adequate liquidity. • It is unclear to Project Participants how exit rights will operate or be defined for gas powered generation. Exit rights with large fixed costs may see generators retire early due to a risk of not recouping any required investment. • Participants may need to purchase interruptible exit rights which presents different risks.
Comment	**Relevant characteristic(s) of well-functioning market**
• In the DWGM participants can manage elements of price risk and intraday scheduling through establishing their physical portfolio and offering supply at appropriate times / prices from sources such as LNG at Dandenong. • With appropriate liquidity the AEMC proposal can provide price certainty and improve risk management and improved alignment with the electricity market. The current use of physical portfolio sources may be costlier than alternative approaches. Although purchasing gas on the day in the new market requires liquidity at a reasonable price which is also uncertain. • In the DWGM curtailment of gas fired generation has been rare and investment signals have historically not been needed for mass market customers and generation usage. The introduction of a requirement to purchase either long term firm exit rights or expect a regular use of interruptible exit rights may impose an unnecessary burden.	4 (manage risk) 6 (minimise transaction costs)

- In the AEMC proposal without firm exit rights a generation owner may be reluctant to sell electricity caps or swaps due to the uncertainty introduced. In the DWGM Project Participants with generators place reliance on the historically rare occurrence of curtailment but they are unsure this will exist in the new market design.
- The new market design could result in reduced electricity market liquidity or an increase in electricity price to reflect the greater risks taken or to recover the costs of firm entry / exit rights.
- The firming of exit rights for gas fired generation may be unnecessary given there are currently no known physical constraints. Introducing a requirement to firm exit rights for all gas fired generation may result in an implication that additional exit capacity is required. If so this will result in inefficiencies being built into the system This additional cost will potentially increase electricity prices.

Table 5.5: Scenario Four – Purchasing gas for sale to mass market customers

DWGM Approach	AEMC Proposal Approach
• Participants forecast their usage, maximum demand and load profile requirements for their mass market customer base. • Gas supply agreements are negotiated and executed – most likely at Longford. • Contract details are registered with AEMO and systems updated accordingly. • Entry / exit rights via AMDQ are allocated automatically based on participant specific mass market share / usage.	• The first three tasks are likely to be the same. • There is uncertainty on the auction approach to purchase shaped seasonal entry and exit rights to meet customer load and supply agreement requirements.
Comment	**Relevant characteristic(s) of well-functioning market**
• The introduction of an auction mechanism for the allocation of entry rights can create risks in aligning the commodity and capacity components which will potentially increase transaction costs and risks for participants. • This may be exacerbated by the staggered release of capacity or withholding of some capacity for short term use as the timing will most likely not align with the negotiation or purchase of the underlying commodity.	4 (manage risk) 6 (minimise transaction costs)

Table 5.6: Scenario Five – Purchasing gas from Victoria (through the DWGM) to ship interstate

DWGM Approach	AEMC Proposal Approach
• Participants are required to forecast usage and submit withdrawal bids at the relevant withdrawal point (e.g. Culcairn) this includes an intraday bid if a participant wants to buy on an intraday basis including after close of business at the 6pm and 10pm schedules. • Participants pay the ex-ante price for their forecast usage and deviation payments for any differences in usage. • Participants are not required to watch the market throughout the day to manage their position. They can monitor the periodic schedules and relevant AEMO market notices/changes in conditions. • Transmission charges are variable which allow for an easy recovery through the interstate gas pricing without the need for fixed cost recovery on variable usage patterns.	• It is unclear to Project Participants how this will work in detail. • Gas market participants looking to ship gas interstate are likely to need a dedicated resource to monitor the market throughout the day and to transact (at undefined times) and adjust orders for gas (again at undefined times). • Participants may need to have pre-purchased firm exit capacity (with associated fixed costs) without necessarily having a guarantee on access to the matched or aligned volume of commodity.
Comment	**Relevant characteristic(s) of well-functioning market**
• The current market is well understood by participants and provides flexibility through the intraday scheduling process[3]. There is transparency with settlement based on actual allocated gas volumes. Market participants are able to apply for accreditation with AEMO in line with their contractual rights outside the market to ensure that they do not get scheduled above their accredited delivery capabilities. • Through the AMDQ CC auctions, market participants also need to prove that they have contractual rights outside of the market in line with their AMDQ CC capacity purchases to prohibit AMDQ hoarding. • In the AEMC proposal there are likely increased resourcing or market monitoring requirements given the	4 (manage risk)

[3] Noting however that there are times when constraints occur and this is discussed in Scenario Two.

continuous nature of the market and lack of defined schedule times.

- There may also be difficulties in aligning exit capacity rights with commodity volumes. The consequences (financial and physical) for a participant who has a mismatch between commodity and capacity (exit rights) is unclear.
- The settlement calculations and amounts incurred by participants in situations where a participants allocated withdrawal quantity is different from the volume purchased on an exchange – participants could be exposed to overrun costs or potentially imbalance costs.
- It is also unclear if purchasing capacity at an exit point is verified with participant's contractual rights outside the market.
- Unlike the DWGM in the AEMC's proposal there may be less flexibility and ability to manage risks with overnight changes in circumstances. This assumes the exchange closes at 5 pm.

Table 5.7: Scenario Six – Entering the DWGM as a new market participant (retailer)

DWGM Approach	AEMC Proposal Approach
New entrants are likely to require an internal business case to be developed and approved including a market entry strategy comprising the following elements: • Negotiating and executing a small gas supply agreement (likely to be flat and/or with limited flexibility given small size of load) and / or using the spot market to manage the very initial period. • The new entrant will also have the option of using the spot market to manage imbalances – noting that this is not without risk. • The new entrant will receive or pay a transparently and competitively determined price for any gas sold or purchased from the spot market through the bid stack. • The new entrant will be able to have some confidence of the possible performance of the market given it has been in operation for many years with significant levels of historic information to support any analysis.	New entrants are likely to require a similarly structured internal business case to be developed and approved including a market entry strategy comprising the following elements: • Entering into a gas supply agreement with similar characteristics to one that would be executed in the context of a DWGM. • The new entrant will be required to use the voluntary balancing market to manage their imbalances. With potentially limited liquidity, uncertain price outcomes and no history to base any analysis on the perceived risks of new entry are likely to be materially higher which will likely impact the economics of any business case. • If the new entrant is unable to secure a gas supply agreement it will be forced to rely completely on quantities offered on the voluntary exchange to manage its exposures noting that the 1TJ per day minimum parcel size may be too large for new entrants to manage within a potentially small portfolio. • There are arguments against reducing the 1 TJ per day minimum parcel size. A smaller size may result in some larger market participants making any offers on the exchange "all or none" (as they may not want to sell only a few GJ of gas). Or they may simply not make any offers on the exchange at all, which will further reduce liquidity and flexibility. • The new entrant will also need to co-ordinate the gas supply agreement with the purchased of entry/exit rights, potentially across multiple locations.

Comment	Relevant characteristic(s) of well-functioning market
• The AEMC's proposal is underpinned by an assumption that adequate market liquidity will emerge on the voluntary commodity exchange. There is some concern amongst Project Participants that this assumption may not eventuate and that the resultant risks are greater than the current risks within the DWGM. • We question what would make a large gas producer increase their willingness to offer additional volumes into any new market than what is currently on offer? There is a risk that the requirement to secure entry rights may discourage gas producer participation due to increased complexity and cost in aligning commodity sales with entry rights. • Similarly, the requirement for market participants to coordinate acquisition of commodity and entry/exit capacity rights presents an additional hurdle relative to the current market, which ultimately increase the risk associated with entering the market. • Whilst different, and not suggesting it is not performing well, there is limited liquidity in the Wallumbilla Gas Supply Hub as most trading occurs off market (whether off market on the exchange, or bilaterally outside the exchange), and volumes offered on the exchange are not long dated. • Under the AEMC's proposal, gas market participants are likely to be incentivised to retain for own use a large portion of any gas supply agreement flexibility instead of offering this to the market. • Compared to the current market, this may reduce the transparency of information for new entrants and existing participants and make it more difficult for small or niche players to access gas.	5 (Barrier to entry)

6. Pathways for reform

This section outlines a simple comparison of possible alternative and high level pathways for reform to address the identified issues (most importantly those relating to risk management) and progress towards the COAG Energy Council's vision for gas markets.

It is important to note that we are not suggesting there is an easy solution or a perfect market design – we appreciate that inherent in any market design there will always be strengths and weaknesses.

Rather we are suggesting that there are trade-offs between the time, risk and cost associated with any reform process and the potential benefits.

In developing our pathways, we worked from the basis that the current market operates reasonably well but as evidenced in our analysis is not without its issues. We also recognise that there are a number of beneficial features of the AEMC proposal but that this too is not without issues or risks.

Our analysis starts from this basis and looks to summarise:

- Features of the current market design that should remain (where practical or possible)
- Opportunities for reform of the current market
- Features of the AEMC proposal to be integrated into the current market design and reform process (where practical or possible)
- Elements of the AEMC proposal that should not be pursued
- Key issues with the overall AEMC approach or proposal for the way forward
- Alternative pathways for reform

6.1. Features of the current market design that should remain

Our analysis of strengths coupled with discussions with Project Participants and other stakeholders identified a number of key features of the current market that perform well and more importantly provide value to participants and ultimately consumers.

The features identified are:

- Open access, in particular on the Longford pipeline eliminates the requirement for participants (most importantly new entrants) to contract for capacity to deliver gas to consumers. It also allows participants an ability to better manage uncertainties in their gas forecasts and not have potential distortions in the market through having capacity withheld.
- The combination of balancing and commodity provide simplicity and helps maximise liquidity in a small market
- The requirement for mandatory bidding of all gas combined with a gross pool concept. This means all gas flows through the DWGM and all bids and offers are transparent to all participants and others. The key benefits are:
  - The availability of further information (through all bids and offers) as well as improved liquidity and transparency.
  - Reduced difficulty or barriers for new entrants or smaller players to access gas. Contract conditions such as minimum volumes and take or pay requirements can

sometimes present barriers to new entrants from executing gas supply agreements.
  - The transparency of the merit order of gas through the bid stack can provide participants some certainty of a price hedge up to their bid prices. There is also an ability for participants to adjust bids during the day to respond to changing conditions.

- The defined schedules throughout a gas day provide predictability and certainty of operational / process requirements. Participants and other stakeholders will know what is required and how things will work. This is in contrast to a potentially ad hoc schedule approach.
- The management of system security by AEMO combined with a central dispatch function provides for optimization benefits across all pipelines, which can increase system security and market benefits.
- The variabilised structure of transmission charges provides for transparency and ease of pass through to electricity prices and customers without the need for allocation of fixed costs.
- The use of market systems instead of proprietary systems with licences can reduce barriers and costs for new entrants.

6.2. Opportunities for reform to the DWGM

Our analysis of weaknesses coupled with discussions with Project Participants and other stakeholders identified a number of key features of the current market that require reform. Some of the areas below were generally agreed by all Project Participants whilst others reflect the views of select Project Participants.

The opportunities for reform generally agreed by all Project Participants include:

- Forward trading: there is a clear need to improve the ease and flexibility in short term trading, in particular physical gas commodity trades[4]. A significant proportion of gas is likely to still be purchased under medium to longer term contracts, however participants and others would benefit from an ability to manage risk through buying or selling short term gas[5] (e.g. weekly, winter period, monthly). This could be in the form of an overlay via an exchange or similar to the physical market, potentially with some similarities in concept to the supply hub at Wallimbulla.
  The difficulties experienced by participants in this regard are not all directly related to the design of the DWGM, rather they relate to operational and other process barriers. A number of Project Participants suggested that these barriers currently mean that there may be more time spent negotiating and executing short term forward contracts than the duration of the underlying contract. In other words, the effort involved outweighs the benefit.
  The following actions could simplify the process for forward trading to improve liquidity:

[4] Over time, and if the market sees further benefit, this may evolve to the development of derivatives. However, there is no need for this to be a mandatory requirement or an initial step.
[5] It is important to appreciate that short term gas commodity contracts can include physical gas swaps, for example where gas at Longford can be swapped for gas at Culcairn at an agreed price.

  - The development of standard contract terms for forward trading. Currently there are no uniformly agreed standard contract terms for trading short term commodity contracts. Similar to electricity, if the industry can agree standard terms this will streamline the process.
  - Following from this, the market could establish trade points at major injection/withdrawal points in Victoria (and on major transmission pipelines), similar to the in-pipe and virtual trade points established on major Queensland pipelines and at Wallumbilla. This may help promote forward trading by enabling transfers of title to gas between participants, without having to dismantle the DWGM. It may also enable swaps at different locations to occur.
  - The development of standard allocation or sub-allocation algorithms and processes. At the moment there is no standard methodology or process for sub-allocations.
  - The simplification to register the contracts with AEMO as part of the market systems.

- Address uplift / constraint management. There is unlikely to be a single, perfect solution in this regard and some solutions may introduce other issues. However, we believe there are opportunities to at least partially address this issue and areas to consider include:

  - Removal of the unconstrained schedule from AEMO's processes[6]. Uplift is caused by deviations between the constrained and unconstrained schedules. If the latter is removed then this may reduce the incidence or severity of uplift, however it will socialise the costs associated with constraints into the market price and therefore across all market participants. This however may still be preferable to the current approach for uplift.
  - Improved or simpler implementation of the causer pays principle[7]. Some Project Participants raised concerns that the allocation of uplift can at times be distorted and not necessarily paid by the party responsible for the constraint.
    An example raised was the allocation of uplift on 1 October 2016. On this day there was an ad hoc schedule developed by AEMO to replace the 6am schedule as Longford was unable to meet production targets, the reschedule involved injection of out of merit order gas, including LNG at Dandenong to address the constraints. Some argue that the cause of this issue was the inability to inject gas at Longford and those parties should pay the cost. However, we understand that the parties who paid the majority of the uplift were those who had insufficient AMDQ (which acts as an uplift hedge) including those parties not operating at Longford and who had therefore not caused the shortfall. The reason being that the ad hoc schedule replaced the 6 am schedule, resulting in the shortfall at Longford not being treated as a deviation and consequently relieving those who had failed to inject at Longford from having to make deviation payments at the higher 10 am price ($33.75), and relieving them from surprise uplift payments. In

[6] We note that EnergyAustralia has submitted a rule proposal to AEMO that has some overlap with this item. It is in relation to the application of constraints in the Declared Transmission System. http://aemo.com.au/Stakeholder-Consultation/Consultations/Rule-Proposal-for-the-DWGM---VIC---Application-of-constraints-in-the-Declared-Transmission-System

[7] This can also include socialising costs where the use of a causer pays principle is too problematic.

addition some of those who had reduced Longford production (causing the constraint) also injected out of merit order gas and received ancillary payments which would have offset any cost of uplift they may have occurred leaving the residual to be paid by other parties.

- The approach to accepting market bids on days or times of constraint. For example, when Longford is constrained most parties will still bid their MDQ and then rely on the market to pro-rate their quantities accordingly. This incentivises disorderly and misleading bidding as parties know they cannot meet their bids given the constraint. AEMO may be able to implement an over-riding constraint and provide information to participants accordingly to make sure their bids reflect the actual deliverability during times of constraint.
- Some have raised questions on the ability to improve the firmness of AMDQ and ease of access to new or unused AMDQ.
- Other parties raised questions on the Market Clearing Engine's modelling of constraints and is it realistic. There may be merit in reviewing the current engine / algorithm to ensure it allows for constraints, minimum flows and optimization across the system appropriately. This will also reduce the incidence and severity of uplift. We note however that the MCE is very difficult to change and that this is a separate but important issue to consider addressing.
- AEMO should be required to make and publish linepack adjustment before a schedule is developed to provide participants with this information in advance of submitting bids.

- Provide timelier market data: Some market data is only provided 3 or more days after the event. Shortening, where possible, data provision will improve participants' ability to understand their position and manage risks.

Other opportunities for reform of the DWGM suggested by some participants but not necessarily agreed to by all participants included:

- The introduction of locational pricing which may align economic drivers and investment signals at relevant points on the system. It may also address some uplift related issues given the impact of constraints will likely be reflected in the spot price.
- Re-centralising to AEMO the mass market demand forecast process which is currently required to be submitted by participants. Some argue the current approach is inefficient and potentially less accurate.
- The firming of already scheduled injections and withdrawals in future reschedules for a day irrespective of AMDQ positions and price changes. This may provide confidence for some participants to offer gas that may be at risk of being constrained down due to inadequate AMDQ. This may also improve liquidity.

6.3. Features of the AEMC proposal to be integrated into the current market design

Our analysis of strengths coupled with discussions with Project Participants and other stakeholders identified some key features of the AEMC proposal that (where practical and possible) should be integrated into the reform process and the current market design.

The features identified also closely match those areas for reform of the DWGM identified in Section 6.2. They include:

- The development of a forward (physical) exchange or market.
- Increased firmness of transport / capacity rights and the concept of entry and exit rights. Project Participants acknowledge that AMDQ is not working effectively and some alternative form of entry and exit rights in particular on days of constraint is required
- The provision of more timely market data – clearly (near) real time data is desirable however we understand this may be difficult.
- Improved alignment or harmonisation across the east coast gas markets. Although identical market designs are not necessarily required.

6.4. Elements of the AEMC proposal that should not be pursued

Our analysis of weaknesses coupled with discussions with Project Participants and other stakeholders identified some areas of the AEMC proposal that potentially introduce unnecessary risks and complexity.

The features identified include:

- Separation of balancing, capacity and commodity: As discussed we believe this is complex, reduces liquidity in an already illiquid market and introduces costs and difficulty in operational processes and system development.
- The model for entry and exit rights: this is seen as complex, the transparency and predictability is useful but there is also inherent inflexibility and a need to align commodity contracting with entry or exit rights which will increase risk management concerns over time.
- Continuous balancing and AEMO's involvement in balancing: this is again complex and introduces a need for continuous monitoring of the market by participants in particular when they system is out of balance. It may also reduce overall market response times with AEMO's involvement in balancing the market in an environment with low liquidity.
- Use of proprietary software instead of market based software. This may be expensive or an unnecessary cost for smaller participants or new entrants. However, it is important that any market based software would be capable of changing in short timeframes if required.
- Voluntary nature of balancing market: the lack of a gross pool will reduce liquidity and the depth of available information in particular the bid stack.

6.5. Key issues with the overall AEMC approach for the way forward

There is support and recognition that reform of the DWGM is required. However, there are concerns with the approach proposed by the AEMC which involves extensive and unproven change[8] in a potentially unachievable timeframe.

The key concerns with the approach include:

[8] Whilst these models have been proven to work in other gas markets there is concern that they are unproven in the Australian context.

- The AEMC proposal is complex with further work required to analyse and assess. It is likely to be more operationally complex than the current market, for example:
  - There are separate markets for balancing, commodity and entry and exit rights.
  - It is unclear how many staff may be required to operate in this market for a new entrant?
  - It is unclear what the fixed costs could be and how they may be allocated or passed on to consumers?
  - The approach to contracting gas supply may be problematic - if participants can't align their gas supply agreement with exit / entry rights and customer contracts this will introduce risk.
- There is a missed opportunity of addressing other issues with the current market, for example
  - There will be no changes to the upstream market. We fully appreciate that this was not the scope of the AEMC's review, but in the absence of changes to upstream markets there is likely to be limited change or benefit downstream.
  - Some have raised concerns that the AEMC model does not necessarily address issue of constraints which do occur in practice.
- There are questionable or unproven assumptions about the operation of the AEMC proposal, these include:
  - An unknown impact on current gas supply agreements. How will they operate in the new market? Will they need renegotiation?
  - What is the impact and interaction with the electricity market and the electricity positions of gas fired generators? If these changes cause changed incentives or behaviour for electricity generators what is the impact on the electricity market?
  - The security of supply impacts are unknown given the separation of responsibility from AEMO. Market participants may not be able to manage the circumstances when the pressure is low.
  - There is a high risk that there will be no or very limited liquidity on the voluntary exchange.
    - participants may keep gas for their own use to hedge. This is in contrast to bidding it into a gross pool like the DWGM.
    - most trades may still occur off market.
    - the publishing of bids and offers and other information on an exchange may reveal too much information for some parties wishing to not reveal their position to the market. This may disincentivise their offering volume which will impact liquidity.
    - large players may ultimately set the benchmark price which can be subject to gaming given low liquidity. This can have unintended consequences in settlement of other contracts such as derivatives that may reference a benchmark price.
  - The value placed on and reliability of 'as available' gas or capacity. This capacity or gas may be offered at a late stage but given it is 'as available' some participants have raised concerns that there is no certainty that it will be

available. This may make it more problematic for internal approval of contracts that are as available for uses that may require firmer commitments.

- There are resultant uncertainties in the overall value of benefits and costs. The AEMC's consultants acknowledged the uncertainty in valuing the benefits and costs from this reform. Our view is that there is a high degree of uncertainty in:
  - The actual outcomes – will risk management actually improve? Will there be liquidity? As a result what are the real value of benefits assumed?
  - The cost to develop and ongoing costs? The range estimated by the AEMC's consultants was very wide reflecting this uncertainty. The real costs are still unknown given the detailed design is not complete.
  - The impact of any transition and the timing of transition. How this will affect existing and future positions in electricity and gas? Will it cause a 'contracting vacuum' during any transition period and possible wealth transfers? Is there increased regulatory uncertainty during and before any transition period?

6.6. Alternative pathways for reform

Given the issues discussed in this Section we have identified three broad pathways for reform and some considerations for choosing each pathway. We are not suggesting these are the only pathways. We are also not suggesting the specific actions or reforms that are to take place, nor commenting on the governance structure within which these reforms should take place.

As an overarching position we are suggesting that:

- Market reform is required, the status quo i.e. the current market is not the preferred or recommended position.
- The two largest cost items in a typical delivered cost of gas for any consumer is the commodity cost and the network (transmission and distribution) cost. The intended market reforms are designed to better manage risk but are unlikely to materially reduce either of these cost items.
  Rather risk premiums and portfolio structuring costs for gas portfolios will be reduced but not the underlying commodity cost or network charges. Therefore, the potential benefits of any market reform need to be viewed within this context, in particular given there are no changes likely to be made to upstream markets.
- The long term goal or vision for gas market development is consistent with the COAG Energy Councils vision. The ideal market should satisfy the characteristics of well-functioning gas markets. What is being questioned is the approach to reach that vision and what the form of the market may look like that satisfies this vision and requirements.
- Market reform is also likely to be continuous irrespective of the pathway chosen. This reflects the reality that circumstances, market dynamics and requirements are changing and that markets must always evolve and adapt to these circumstances.
- The current process, timeframes and reality for making any changes to the DWGM is potentially too long and complex[9]. This most likely inhibits the ability for the market

[9] This includes rule changes, system changes, AEMO procedure changes etc.

to effectively adapt to changing circumstances. Irrespective of this a simpler process for changes to the market should also be developed as a matter of priority.

Pathway One: AEMC Approach

As previously discussed it is generally accepted that this pathway involves extensive change and at least 3 or more years before implementation.

We have already raised questions on the achievable level of benefits, the level of complexity and the costs to implement. Our view is that this is a high risk pathway with uncertain outcomes and benefits.

Given changing circumstances and market dynamics there is also no guarantee that the market environment in 2020 or beyond will necessarily be compatible with the assumptions underpinning the analysis of the market in 2016. If this is the case and this market is implemented in 2020 but the prevailing environment is not conducive, what then?

Pathway Two: Further investigation / analysis

This pathway would involve further analysis or investigation such as risk analysis, detailed cost benefit analysis etc. of model(s) including the AEMC model to eventually settle on a preferred model for Victoria.

Whilst potentially appealing (at least from a theoretical perspective) we would not recommend this pathway given it just delays reform, and recognising that reform is required for the DWGM it does not address issues in a timely manner and only delays any potential benefits. It also does not recognise that there has been a significant level of work already completed by the AEMC and others on market reform and design options and that at some stage further investigation or analysis of new models is likely to suffer from diminishing returns.

Pathway Three: Hybrid approach – integrating the DWGM with elements of the AEMC proposal

This is our preferred and recommended pathway. The fundamental difference between this pathway and the first pathway is that this one recognises the starting position is the current DWGM and reform involves changing (not necessarily minor) from here. Our interpretation of the first pathway is that it essentially is about designing a new market almost independent of the current DWGM and implementing transition measures to manage any initial period risks with the new market.

At a conceptual level this pathway involves:

- identifying areas of the DWGM that should be retained (such as those discussed in Section 6.1);
- addressing issues or concerns with the DWGM as a matter of priority (such as those discussed in Section 6.2); and
- integrating these with key elements of the AEMC proposal (such as those discussed in Section 6.3).

We believe this pathway has a number of benefits including:

- It recognises the strengths and inherent value in key elements of the current DWGM and where possible retains these features.
- It provides a 'best of both worlds' approach through integrating with the strengths of the AEMC's proposal.
- It allows for targeted and prioritised reform – which would reduce risk and cost
- Implementation is able to be commenced more readily – some issues are able to potentially be addressed within 12 – 18 months from commencement which will mean benefits can be realised sooner.
- It is flexible to respond to changing circumstances as they arise.
- It recognises the reality that market reform is more a process of continuous improvement than a destination.

7. Key conclusions

Our analysis highlights that:

- The current gas market (DWGM) has a number of desirable features, it works, but it also has a number of issues.
- There is general recognition that reform of the DWGM is needed – the status quo has issues and time is of the essence.
- There is general agreement of shared vision for gas markets as a longer term aspiration.
- The AEMC proposal also has some desirable features, but also what appears to be, some potentially significant issues.
- There needs to be an appreciation in any reform process that the market context and landscape is changing and that the reform process needs to be adaptable to change.
- Therefore, there is a requirement for 'continuous reform' which involves a 'journey not a destination'.
- The recommended pathway that recognises these is the hybrid approach which integrates the best features from the DWGM and the AEMC proposal whilst addressing the key issues with the DWGM and works towards the COAG Energy Councils vision for gas market development.


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