

Day-Ahead Auction of Contracted but Un-Nominated Capacity & Reporting Framework

Consultation Paper

October 2017





Submissions

Stakeholders are encouraged to make submissions in response to this Consultation Paper by **5pm (AEST) 6 November 2017**.

Electronic submissions are preferred and can be sent via e-mail addressed to the Gas Market Reform Group (GMRG) at enquiries@gmrq.coagenergycouncil.gov.au

Stakeholders who wish to provide hard copies by post may do so by addressing their submissions to:

Gas Market Reform Group
c/o Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

The GMRG has a strong preference for public submissions to generate full and frank debate. All stakeholder submissions will be published on the GMRG's website at <http://gmrg.coagenergycouncil.gov.au/> unless stakeholders have clearly indicated that a submission should remain confidential, either in whole or in part.

In addition to providing a written submission, stakeholders will have an opportunity to attend a public forum, which will be held in Melbourne on **31 October 2017**. Stakeholders are encouraged to express their interest in attending this forum by emailing enquiries@gmrq.coagenergycouncil.gov.au.

Please note that this paper is intended to examine the options associated with the development of the day-ahead auction and reporting framework for secondary capacity trades. It is intended for consultation and does not reflect the final views of the GMRG.

For further information about this Consultation Paper or making a submission, please contact the GMRG via email at enquiries@gmrq.coagenergycouncil.gov.au

The views and opinions expressed in this publication are those of the GMRG.

While reasonable efforts have been made to ensure that the contents of this publication are factually correct, the GMRG and its advisors, NERA Economic Consulting and Johnson Winter & Slattery, do not accept responsibility for the accuracy or completeness of the contents, and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this publication.



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Abbreviations

Term	Definition
AA	Access Arrangement
ACCC	Australian Competition and Consumer Commission
ADP	Amadeus to Darwin Pipeline
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AEST	Australian Eastern Standard Time
BB	Natural Gas Services Bulletin Board
CGP	Carpentaria Gas Pipeline
COAG	Council of Australian Governments
CTA	Capacity Trading Agreement
DTS	Declared Transmission System
DWGM	Declared Wholesale Gas Market
<i>East Coast Review</i>	AEMC's <i>Eastern Australian Wholesale Gas Market and Pipelines Framework Review</i> (May 2016)
EGP	Eastern Gas Pipeline
Energy Council	COAG Energy Council
ERA	Economic Regulation Authority (WA)
ETS	Trayport Exchange Trading System
FTP	File Transfer Protocol
GMRG	Gas Market Reform Group
GSH	Gas Supply Hub
GTA	Gas Transportation Agreement
HPTP	High Pressure Trade Point)
JWS	Johnson, Winter & Slattery
LPTP	Low Pressure Trade Point)
MAPS	Moomba to Adelaide Pipeline System
MCF	Moomba Compression Facility
MDQ	Maximum Daily Quantity
MHQ	Maximum Hourly Quantity
MOS	Market Operator Service
MSP	Moomba to Sydney Pipeline
MSV	Market Schedule Variation
NER	National Electricity Rules
NGL	National Gas Law
NGO	National Gas Objective
NGP	Northern Gas Pipeline



Term	Definition
NGR	National Gas Rules
RBP	Roma to Brisbane Pipeline
SCO	Senior Committee of Officials
SIP	STTM Interface Protocol
SRA	Settlement Residue Auction
STTM	Short Term Trading Market
SWQP	South West Queensland Pipeline
TGP	Tasmanian Gas Pipeline
Transportation services	This term is used to jointly refer to pipeline and compression services
Vision	COAG Energy Council's <i>Australian Gas Market Vision</i> (December 2014)



1. Introduction

The Gas Market Reform Group (GMRG) was established by the COAG Energy Council (Energy Council) in the latter half of 2016 to lead the design, development and implementation of a range of reforms set out in the Gas Market Reform Package, including a package of capacity trading reforms.¹

The capacity trading reform package was recommended by the Australian Energy Market Commission (AEMC) as part of its *Eastern Australian Wholesale Gas Market and Pipelines Framework Review (East Coast Review)* (see Appendix A for further detail) and endorsed by the Energy Council at its August 2016 meeting. The reforms, which relate to transmission pipeline and compression services (jointly referred to as ‘transportation services’) include the development of:

- a capacity trading platform(s) that shippers can use to trade secondary capacity ahead of the nomination cut-off time and provides for exchange-based trading of commonly traded products and a listing service for other more bespoke products;
- a day-ahead auction of contracted but un-nominated capacity, which would be conducted shortly after nomination cut-off and subject to a reserve price of zero (with compressor fuel provided in-kind by shippers);
- standards for key contract terms in primary, secondary and operational transportation agreements to make capacity products more fungible and, in so doing, facilitate a greater level of secondary capacity trading; and
- a reporting framework for secondary capacity trades that provides for the publication of the price and other related information on secondary trades.

Together these reforms are expected to foster the development of a more liquid secondary capacity market by:²

- using market based processes to allocate capacity on a non-discriminatory basis to those that value it most;
- improving the incentive shippers have to trade capacity and posing a constraint on the ability of service providers to sell secondary capacity at prices in excess of what would be expected in a workably competitive market;
- reducing the search and transaction costs associated with secondary capacity trades; and
- reducing information asymmetries and aiding the price discovery process.

Greater liquidity in this market is expected to facilitate increased trade in gas and support the development of a more robust reference price for gas. This, in turn, is expected to enable market participants to make more informed decisions about their use of gas and investments in exploration, production, pipelines and storage facilities.³ The package of reforms is therefore expected to promote the National Gas Objective (NGO) and the Energy Council’s Vision for the Australian Gas Market (*Vision*) (see Box 1.1).

¹ COAG Energy Council, Bulletin Two: Gas Market Reform Package, August 2016.

² AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, pp. 69 and 73.

³ *ibid*, p. viii.



Box 1.1: National Gas Objective and Vision for the Australian Gas Market

National Gas Objective

The NGO is set out in section 23 of the NGL and states the following:

The objective of this law is to promote efficient investment in, and efficient operation and use of, natural gas services for the long term interests of consumers of natural gas with respect to price, quality, safety, reliability and security of supply of natural gas.

Energy Council's Vision for the Australian Gas Market⁴

The Energy Council's *Vision* is for:

...the establishment of a liquid wholesale gas market that provides market signals for investment and supply, where responses to those signals are facilitated by a supportive investment and regulatory environment, where trade is focused at a point that best serves the needs of participants, where an efficient reference price is established, and producers, consumers and trading markets are connected to infrastructure that enables participants the opportunity to readily trade between locations and arbitrage trading opportunities.

At the time it released the *Vision*, the Council also noted that it would pursue the following outcomes in the next phase of gas market reform and development:

Stream 1: Encouraging competitive gas supply:

- (a) Improvements to the regulatory and investment environment so that gas supply is able to respond flexibly to changes in market conditions.
- (b) A "social licence" for onshore natural gas development achieved through inclusion, consultation, improving the availability and accessibility of factual information relating to resources projects, and rigorous science to ensure that communities' concerns are addressed.

Stream 2: Enhancing transparency and price discovery:

- (a) Provision of accurate and transparent market making information on pipeline and large storage facilities operations and capacity, upstream resources, and the actions of producers, export facilities, large consumers and traders.
- (b) Increased flexibility and opportunity for trade in pipeline capacity.
- (c) A competitive retail market that will provide customers with greater choice and large users with enhanced options for self-supply and shipment.

Stream 3: Improving risk management:

- (a) Liquid and competitive wholesale spot and forward markets for gas that provide tools for participants to price and hedge risk.
- (b) Access to regional demand markets through more harmonised pipeline capacity contracting arrangements which are flexible, comparable, transparent on price, and non-discriminatory in terms of shippers' rights, in order to accommodate evolving market structures.
- (c) Harmonised market interfaces that enable participants to readily trade between locations and find opportunities for arbitrage and trade.
- (d) Identified development pathways to improve interconnectivity between supply and demand centres, and existing facilitated gas markets, which enable the enhanced trading of gas.

Stream 4: Removing unnecessary regulatory barriers:

- (a) Regulation of gas supply and infrastructure is appropriate and enables participants to pursue investment opportunities, in response to market signals, in an efficient and timely manner.

The outcomes that are most relevant to the capacity trading related reforms are Streams 2(b), 3(b), 3(c) and 3(d).



1.1 Progression of the capacity trading reform package

To progress the capacity trading reforms outlined above, the GMRG has established:

- a number of project teams to carry out the detailed design and development work, with the teams consisting of a mix of members drawn from industry, consumer groups, market bodies and other industries (see Appendix B for a list of members); and
- an Advisory Panel to provide strategic perspective and advice to the GMRG on key issues, which is made up of senior representatives from all segments of the gas supply chain as well as Energy Consumers Australia (see Appendix B for a list of members).

Importantly, neither the project teams nor the Advisory Panel have any decision-making power. Their role is to inform the GMRG's consideration of the design options, which will be consulted upon more broadly with other stakeholders before Dr Michael Vertigan AC, as Chair of the GMRG, makes his final recommendations to the Senior Committee of Officials (SCO)⁵ and the Energy Council. The GMRG has nevertheless benefited from, and greatly appreciates, the effort and resources that project team members and the Advisory Panel have put into considering the design options and providing their advice to the GMRG. The GMRG also greatly appreciates the support that AEMO, the AEMC and the AER have provided through this process and the assistance that AEMO has provided on key elements of the reform package.

Work on the design of the capacity trading reforms commenced in early 2017 and was initially required to be completed during 2018, to enable the recommendations to be considered by the Energy Council at the end of 2018 with the reforms to be implemented by 2021. However, in response to a request from the Hon. Josh Frydenberg MP, Minister for the Environment and Energy, the GMRG examined the opportunities to accelerate this work and agreed to make its recommendations on the capacity trading reforms by the end of 2017.

This accelerated timetable is expected to enable the capacity trading platform and day-ahead auction to become operational in 2018-19, subject to the passage of amendments to the National Gas Law (NGL), National Gas Rules (NGR) and subordinate instruments.

The GMRG's recommendations on the organisation(s) that should operate and administer the capacity trading platform(s) and day-ahead auction were presented to the Energy Council in July. In short, the GMRG recommended the development of a single capacity trading platform that will form part of the Gas Supply Hub (GSH) trading exchange and a centralised auction platform, both of which would be operated by the Australian Energy Market Operator (AEMO). These recommendations were endorsed by the Energy Council at its 14 July 2017 meeting.⁶ The design of the capacity trading platform and day-ahead auction has therefore proceeded on this basis.

In keeping with the accelerated timetable outlined above, the GMRG published the *Standardisation Related Reforms and the Capacity Trading Platform Consultation Paper* on 7 September 2017 and provided stakeholders four weeks to provide feedback on the

⁴ COAG Energy Council, Australian Gas Market Vision, December 2014.

⁵ SCO comprises senior officials from State, Territory and Commonwealth governments.

⁶ COAG Energy Council, 12th Energy Council Meeting Communique, 14 July 2017.



issues raised in the paper. A public forum was also held on 14 September 2017, which was attended by a range of market participants across the gas supply chain and representatives from the AEMC, AEMO and Australian Energy Regulator (AER). The consultation period ended on 4 October 2017 and the GMRG is now working on its final recommendations on these two elements of the reform package, which will be provided to SCO and the Energy Council in November 2017.

In relation to the day-ahead auction and the reporting framework for secondary capacity trades, the GMRG intends to make its final recommendations to SCO and the Energy Council in December 2017. To this end, the GMRG has prepared the following consultation paper, which focuses on these two elements of the reform package. Further detail on the consultation process is provided below.

The Energy Council's decision to implement the capacity trading reforms was made in response to a review of the east coast gas market. Although neither the review nor the Energy Council resolution explicitly extended the reforms to the Northern Territory (which is expected to become connected to the east coast market in late 2018) or Western Australia, the GMRG is of the view that there would be merit in implementing the reforms in these jurisdictions and has involved industry participants from these jurisdictions in the project teams. However, a formal decision on this issue will need to be made by the responsible governments and likely the Energy Council.

1.2 Consultation process and next steps

This consultation paper comprises two parts:

- **Part A: Day-ahead auction** – This part of the consultation paper focuses on the product(s) to be sold through the auction, auction design, the coverage of the auction and the operational, financial, contractual and governance arrangements that will be required to underpin the auction. The development of this part of the consultation paper has been informed by the work carried out by AEMO, the Day-Ahead Auction project team and advice from the GMRG's independent auction advisor, NERA Economic Consulting (NERA), and its legal advisor, Johnson Winter & Slattery (JWS).
- **Part B: Reporting framework** – This part of the consultation paper focuses on the types of trades that could be subject to the reporting framework, the information that trading parties could be required to report and the governance arrangements required to underpin the reporting framework. The development of this part of the paper has been informed by work carried out by the Standardisation project team and JWS.

The GMRG is seeking written feedback on this consultation paper by **5pm (AEST) on 6 November 2017**. To assist stakeholders in responding to this consultation paper, Parts A and B include a number of questions that the GMRG would like to obtain further feedback on and provides an indication of the GMRG's preliminary views on various issues. The inclusion of the GMRG's preliminary views is designed to facilitate consultation and should not be interpreted as concluded positions of the GMRG.

A template has been prepared for stakeholders to use to provide their feedback on the questions posed in this paper and any other issues that they would like to provide feedback on (see Attachment 1). The GMRG strongly encourages stakeholders to use this template, so that it can have due regard to the views expressed by stakeholders on each issue. Stakeholders should not feel obliged to answer each question, but rather address those issues of particular interest or concern.



In addition to providing a written submission, stakeholders will have an opportunity to attend a public forum, which will be held in Melbourne on **31 October 2017**. Stakeholders are encouraged to express their interest in attending this forum by emailing enquiries@gmrq.coagenergycouncil.gov.au.

The feedback received through this consultation process will inform the GMRG's final recommendations on the design of the day-ahead auction and reporting framework, which are expected to be provided to the Energy Council in December 2017 for its consideration and approval.

If these recommendations are accepted by the Energy Council, then work will commence on drafting the changes that will be required to the NGL, the NGR and other subordinate instruments to give effect to these reforms. The GMRG is currently working on a detailed implementation plan, which will set out the expected dates for consultation on the governance arrangements and the time that AEMO and service providers will have to implement and test the relevant systems. The GMRG intends to work closely with AEMO and service providers on the development of this implementation plan, which is expected to be provided to the Energy Council in November 2017.

1.3 Structure of this paper

The remainder of this consultation paper is structured as follows:

- Chapter 2 provides further detail on the capacity trading reform package, how trade is expected to occur under the reform package and the assessment framework the GMRG intends to use when developing its final recommendations;
- Part A focuses on the day-ahead auction, which is discussed in detail in:
 - Chapter 3, which focuses on the product(s) that will be sold through the auction;
 - Chapter 4, which focuses on auction design;
 - Chapter 5, which focuses on the coverage of the auction;
 - Chapter 6, which focuses on the design and use of the auction platform;
 - Chapter 7, which focuses on the legal and governance framework for the auction.
- Part B focuses on the reporting framework, which is discussed in detail in:
 - Chapter 8, which focuses on the reporting requirements and timeframes; and
 - Chapter 9, which focuses on the governance arrangements that will apply to the reporting framework.
- Appendix A provides a summary of the AEMC's recommendations and the consistency of the GMRG's preliminary views with these recommendations;
- Appendix B sets out the members of the project teams and Advisory Panel;
- Appendix C provides an overview of the services offered by pipelines;
- Appendix D contains a summary of analysis carried out by EnergyEdge for the GMRG on auction quantities and the risk of curtailment; and
- Appendix E contains a map of the transmission pipelines in Australia.

A separate attachment has also been prepared, which contains a template that the GMRG encourages stakeholders to use to provide their feedback (Attachment 1).



2. Capacity Trading Reform Package

The capacity trading reform package was recommended by the AEMC in the *East Coast Review* and endorsed by the Energy Council at its 14 August 2016 meeting. The objective of this reform package is, as noted in Chapter 1, to improve the efficiency with which transportation capacity is allocated and utilised on contract carriage transmission pipelines and to foster the development of a more liquid market for secondary capacity.⁷ The remainder of this chapter provides further detail on:

- the key elements of the capacity trading reform package;
- how capacity can be procured under the new capacity trading framework;
- the scope and objectives of the standardisation reforms; and
- the assessment framework the GMRG intends to use when considering any design options and developing its final recommendations on the standardisation reforms.

2.1 Key elements of the reform package

The capacity trading reform package (see Figure 2.1) that the Energy Council has agreed to implement provides for the introduction of:

- **A capacity trading platform** that shippers can use to trade secondary transportation capacity prior to the nomination cut-off time on gas day D-1 (i.e. the day before the gas is due to be transported), which will consist of both:
 - an anonymous exchange mechanism that shippers can use to buy or sell commonly traded transportation products, such as firm forward haul services, stand-alone compression services and pipeline storage (park) services (see Appendix C for more detail on these services); and
 - a listing service that shippers can use to buy or sell more bespoke products.

The trading platform, which will be operated and administered by AEMO and form part of the GSH trading exchange, is intended to reduce the search and transaction costs that shippers may otherwise face when trying to trade secondary capacity.

- **A day-ahead auction of contracted but un-nominated transportation capacity** that will be conducted on designated pipelines shortly after nomination cut-off on gas day D-1 and subject to a reserve price of zero (with compressor fuel provided in-kind by shippers). The objective of the day-ahead auction is, as the AEMC noted, to:⁸
 - encourage capacity holders to sell any spare capacity they may have on the trading platform prior to the nomination cut-off time by providing for service providers to retain the auction proceeds; and
 - pose a constraint on the ability of service providers to sell day-ahead capacity at prices in excess of what would prevail in a workably competitive market by adopting a zero reserve price and allowing the market to determine the value.

The day-ahead auction will be operated and administered by AEMO.

The reform package also provides for the implementation of:

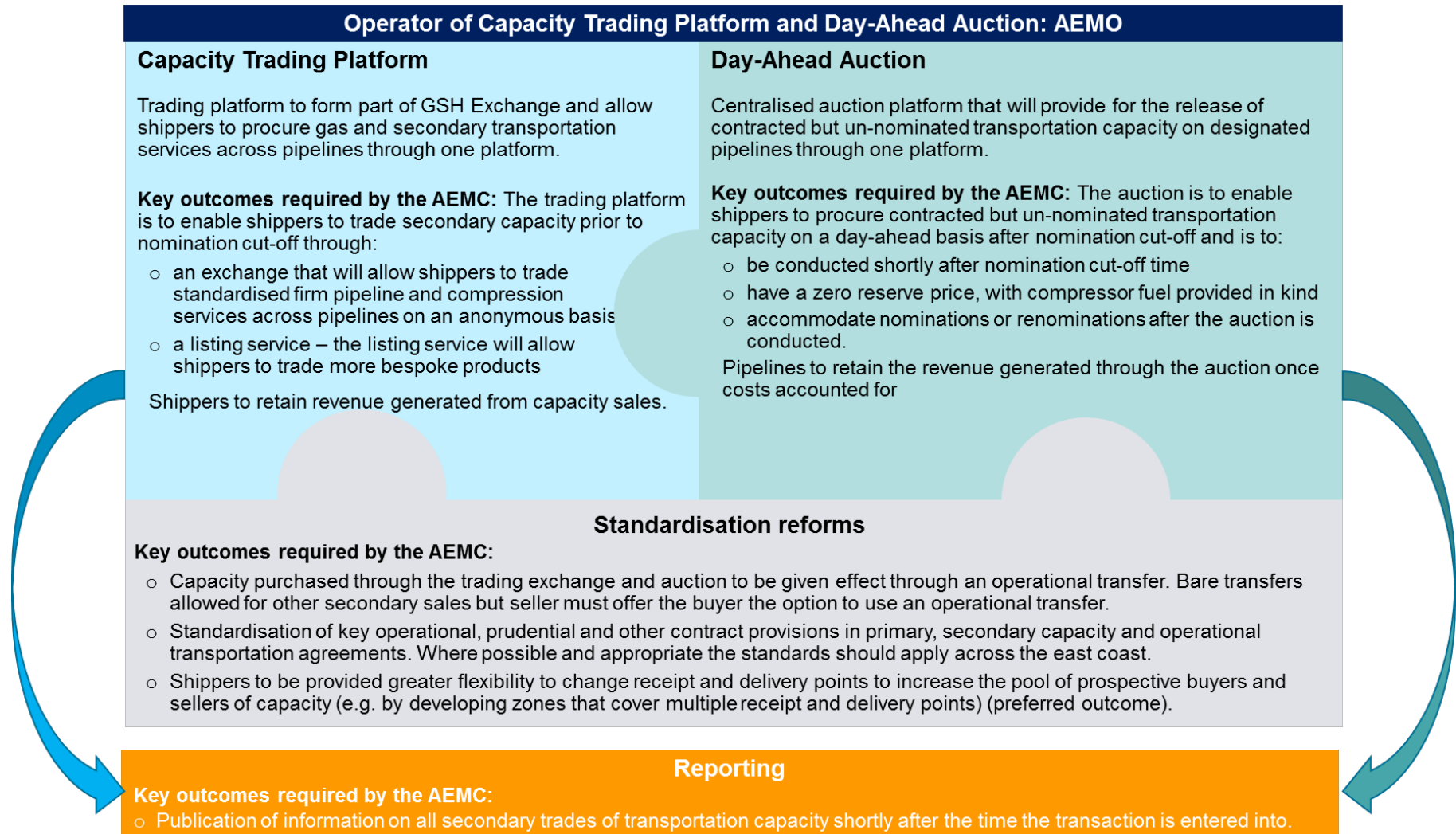
- a range of standardisation related reforms, which are intended to facilitate a greater level of secondary capacity trading; and
- a reporting framework for secondary capacity trades, which is intended to reduce information asymmetries and aid the price discovery process.

⁷ AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, pp. 67, 73 and 83.

⁸ *ibid*, p. 83.



Figure 2.1: Capacity trading reform package





The capacity trading reforms will, in effect, result in the implementation of a new access regime for secondary capacity, which will impose new obligations on service providers (i.e. pipeline operators and the operators of compressors) as well as primary and secondary shippers. To give effect to these new obligations and the reform package more generally, amendments will need to be made to the NGL, NGR, the regulations made under the NGL and the GSH Exchange Agreement and a number of new subordinate instruments will need to be developed. The functions and powers of AEMO, the Australian Energy Regulator (AER) and the AEMC will also need to be expanded. Subject to the passage of amendments to the NGL, the NGR and subordinate instruments, the capacity trading reforms are expected to be implemented in 2018-19.

2.2 How secondary capacity can be procured under the new framework

Once the reform package is implemented, shippers that want to buy or sell secondary capacity will be able to have recourse to either:⁹

- **the exchange component of the GSH** – the exchange will be used to facilitate the trade of standardised transportation products (e.g. day-ahead, daily, weekly, monthly and quarterly firm forward haul, compression and park products) through either screen trading or the pre-matched trade service;¹⁰ or
- **the listing service component of the GSH** – the listing service will be used to facilitate the trade of more bespoke transportation products through bilateral (off-market) trades.

Shippers may also be able to procure day-ahead standardised capacity products through the auction on those pipelines and other facilities that will be subject to the auction if there is any contracted but un-nominated capacity available.

The way in which secondary capacity will be released through these mechanisms is depicted in Figure 2.2.

Before utilising the capacity trading platform exchange or the day-ahead auction, shippers will need to enter into agreements with AEMO. Secondary shippers will also need to enter into a number of other contractual arrangements to utilise the capacity procured through the GSH or the auction. Figure 2.3 provides an overview of the contractual architecture that will underpin the reforms, while Table 2.1 provides more detail on the arrangements shippers will need to have in place.

⁹ Shippers will also be able to have recourse to other means to identify potential counterparties and enter into bilateral trades.

¹⁰ The pre-matched service allows participants to register off-market trades in listed products to the exchange for settlement.



Figure 2.2: How secondary capacity will be released through the capacity trading platform and auction

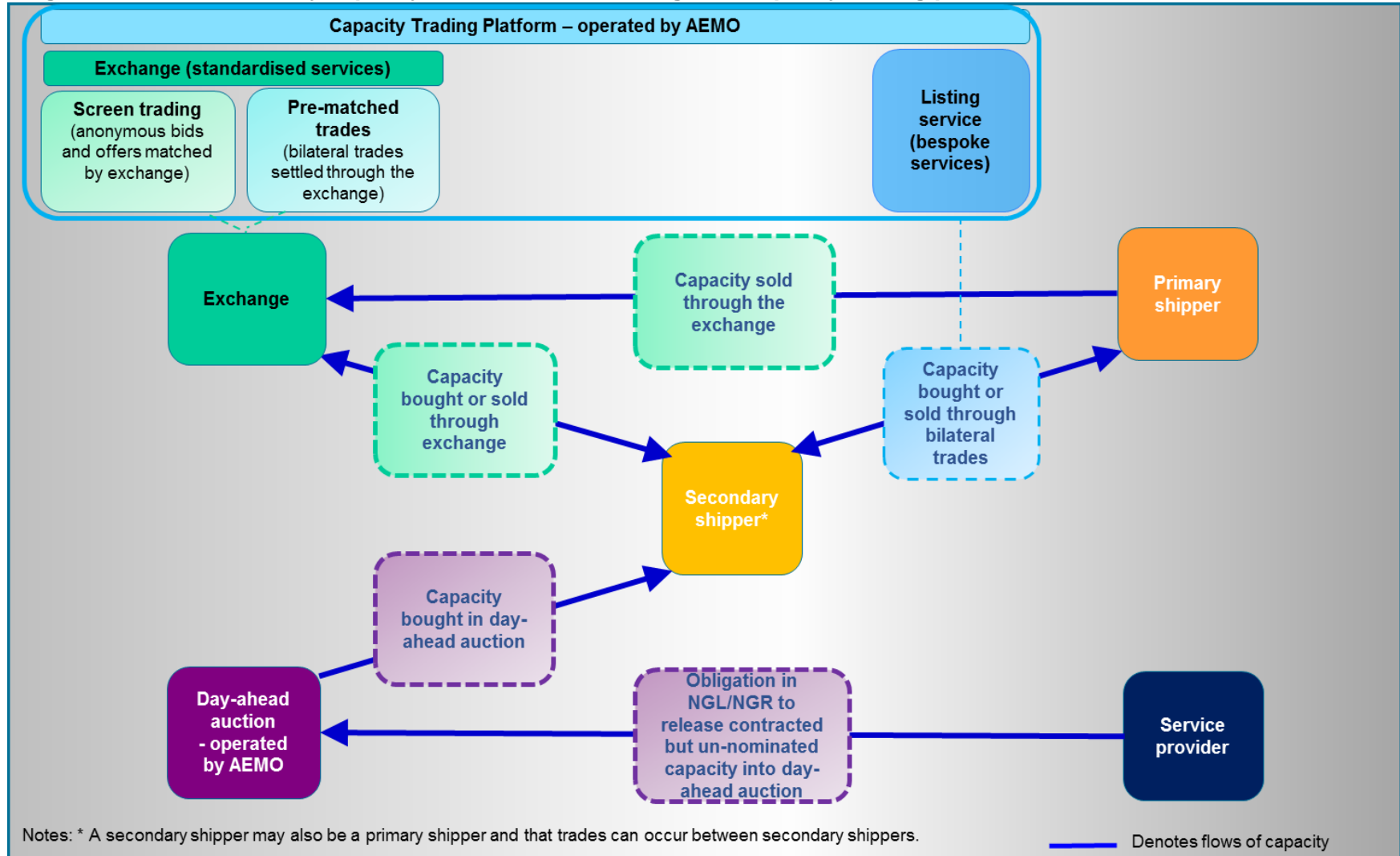


Figure 2.3: Contractual architecture that will underpin the capacity trading platform and auction

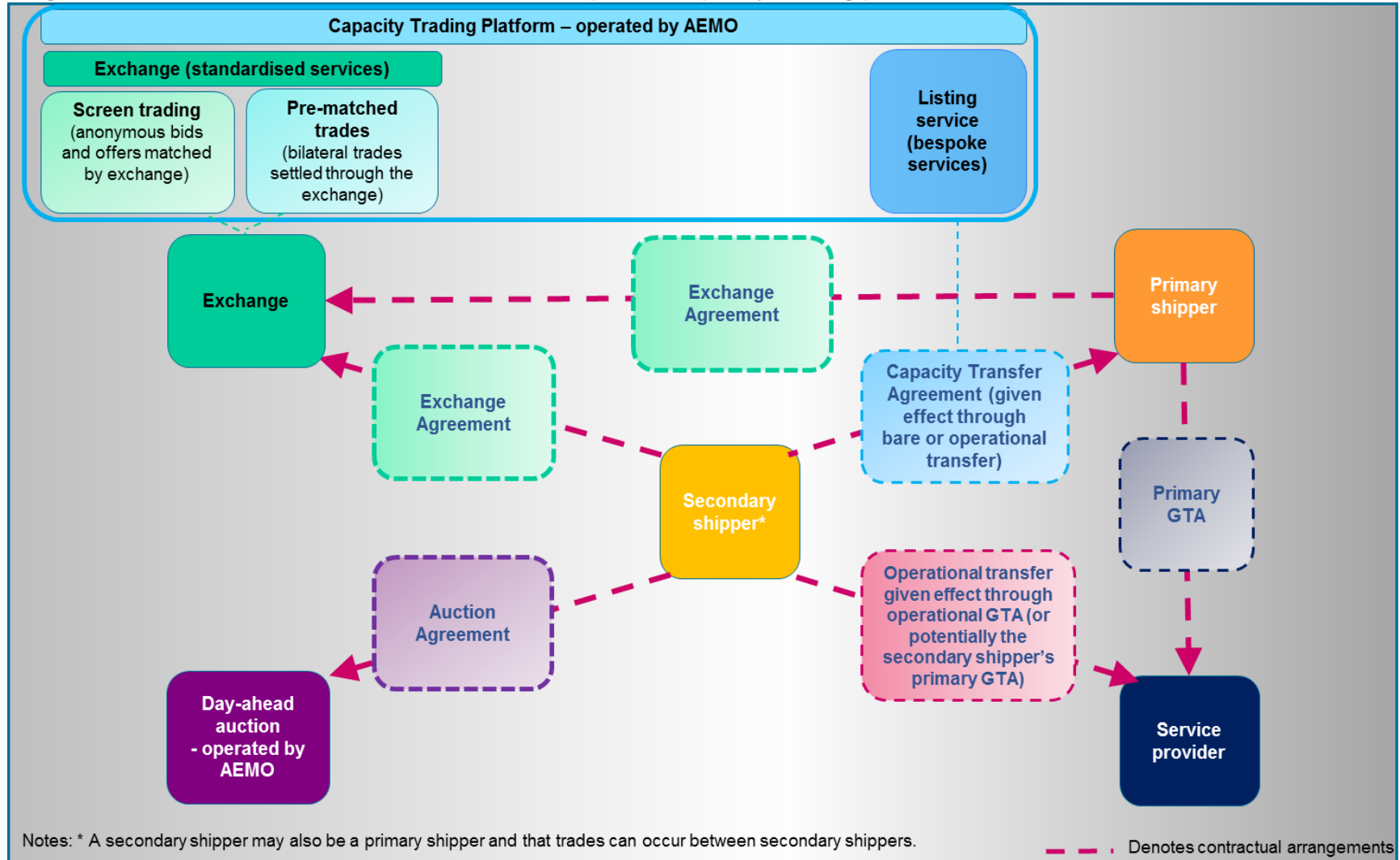


Table 2.1: Arrangements shippers will require to access capacity trading measures

Participation in the day-ahead auction	
Membership and contractual obligations	<p>While the participation arrangements for the day-ahead auction have not yet been finalised, they are expected to operate in a similar manner to the GSH (see Chapter 7).</p> <p>Specifically, it is envisaged that shippers that want to purchase capacity through the day-ahead auction will execute an Auction Agreement with AEMO. The Auction Agreement will set out the terms of participation in the auction and the terms governing purchases of capacity through the auction, including the prudential and settlement obligations.</p>
Participation in the GSH capacity trading platform	
Membership and contractual obligations	<p>Primary and secondary shippers that want to use the GSH will need to become members of the GSH exchange and be registered as trading participants.</p> <p>Shippers can become a trading participant by executing a Membership Agreement with AEMO and then registering as a trading participant. Through the Membership Agreement, shippers will become a party to the Exchange Agreement.</p> <p>The Exchange Agreement is a multilateral agreement that sets out the terms of participation in the GSH and the terms governing transaction entered into through the exchange. The body of this agreement contains the trading, delivery, prudential and settlement obligations, while the product specifications are set out in schedules.</p>
Use of secondary capacity procured through the trading platform or auction	
Operational transfers¹¹	<p>If a shipper procures capacity through the exchange or day-ahead auction, the trade will be given physical effect through an operational transfer. Secondary shippers will also have the option to utilise an operational transfer if they enter into a bilateral trade through the listing service or other means. A secondary shipper will therefore need to have entered into an operational Gas Transportation Agreement (GTA) with the relevant service provider, or otherwise agreed with the service provider to include an operational transfer mechanism into its primary GTA.</p> <p>Operational GTAs, which are sometimes referred to as 'zero MDQ' contracts, operate like a master agreement between the service provider and secondary shipper, with the operational capacity (measured on a Maximum Daily Quantity (MDQ) basis) set at zero until the shipper purchases capacity. The operational GTA sets out the terms on which the secondary shipper can utilise the service provider's assets if it procures secondary capacity via an operational transfer, including the operational, prudential and other terms governing the relationship between the service provider and secondary shipper. If capacity is purchased then the MDQ in the shipper's operational GTA will be increased for the duration of the trade and it will be entitled to make nominations directly to the service provider and liable to pay the service provider for any specified charges (i.e. imbalance or overrun charges) set out in the operational GTA. The primary shipper, on the other hand, will remain liable to pay the service provider for the capacity sold to the secondary shipper.</p> <p>It is worth noting in this context that while the term 'transfer' in operational transfer implies that capacity is being transferred from one shipper to another, this will not occur in relation to the day-ahead auction. In the day-ahead auction, any contracted but un-nominated capacity sold through the auction will be allocated to the auction winners, but there will not be a corresponding reduction in the capacity holdings of primary shippers that have contracted but un-nominated capacity.</p>
Allocation agreements	<p>If a secondary shipper procures capacity through the exchange or day-ahead auction and wants to use a multi-user receipt or delivery point, it will need to become a party to the allocation agreement at that point(s). This agreement sets out the rules the allocation agent is required to use to allocate gas metered as having been supplied between shippers.</p>

¹¹ Under an operational transfer, the service related elements, price, prudential and other legal provisions relating to the sale of capacity are set out in the secondary Capacity Trading Agreement (CTA), Exchange or Auction agreements entered into by the shippers, while the operational terms are set out in the operational GTA entered into by the service provider and secondary shipper. The key difference between the operational transfer and bare transfer is that under an operational transfer, the secondary shipper is responsible for making nominations directly to the service provider and complying with the operational and legal obligations in the operational GTA it has entered into with the service provider in relation to the capacity that has been purchased.

Other services and arrangements	<p>In some cases, a secondary shipper that procures capacity through the exchange or day-ahead auction may also require:</p> <ul style="list-style-type: none"> ▪ access to other transportation related services that are not available on the exchange or through the auction (for example, in some locations a shipper will require redirection services and compression services) and will need to enter into arrangements with the relevant service provider for the provision of that service; and ▪ access to a receipt or delivery point that is controlled by a third party and will need to enter into arrangements with that party to ensure they can utilise those points.
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2.3 Assessment framework for the reform package

There are a number of different ways in which the capacity trading reforms could be designed and implemented. When assessing these options and developing its final recommendations for the SCO and the Energy Council, the GMRG intends to use the rule making test that the AEMC is required to consider when exercising its rule making functions.¹² This test states that:¹³

- the AEMC may only make a rule if it is satisfied it will, or is likely to, contribute to the achievement of the NGO; and
- the AEMC may give such weight to any aspect of the NGO as it considers appropriate, having regard to any relevant Council statement of policy principles.

In keeping with this test, the GMRG will have regard to the NGO, which as noted in Box 1.1 is to promote efficiency for the long-term interests of natural gas consumers (see Box 2.1 for more detail on economic efficiency).

Box 2.1: Economic efficiency concepts

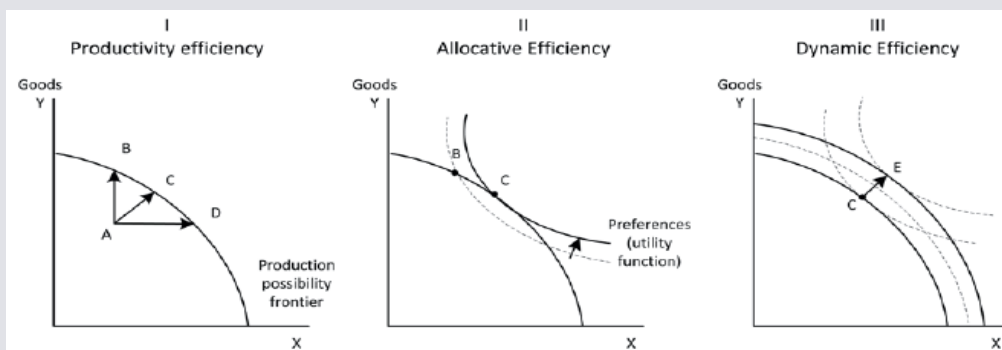
Economists generally recognise the following types of efficiency:

- **Allocative efficiency** – this term is used to refer to the situation in which society's resources are allocated between end uses in an optimal way to those that value them most. This efficiency concept requires prices that are cost reflective and is consistent with the 'efficient use of' element of the NGO.
- **Productive (or technical) efficiency** – this term is used to refer to goods and services being produced at the lowest possible cost, using the least-cost combination of inputs. This concept is consistent with the 'efficient operation of' element of the NGO.
- **Dynamic efficiency** – this term is used to refer to a market outcome in which society's resources are deployed efficiently between present and future uses, so that the welfare of society is maximised over time (i.e. allocative and productive efficiency are achieved jointly over time). This term is also used to refer to the ability of firms and markets to adapt over time in response to changes in consumer preferences and/or technology by implementing measures that result in a reduction in costs, improvements in product quality and/or the development new products. This is consistent with the *long run* 'efficient investment in', 'efficient operation of' and 'efficient use of' elements.

These three dimensions of economic efficiency are illustrated in the following diagram developed by the Productivity Commission.

¹² Section 291 of the NGL.

¹³ See section 291 of the NGL.



Source: Productivity Commission, Staff Research Note – On Efficiency and Effectiveness: some definitions, May 2013, p.3.

As the AEMC has previously observed, quantifying the costs, benefits and efficiency improvements associated with these types of reforms can be difficult.¹⁴ The GMRG's assessment of whether the proposed design of the reforms will, or is likely to, contribute to the NGO, will therefore be carried out qualitatively having regard to whether the reforms are consistent with:

- the AEMC's required and preferred outcomes for the capacity trading reforms (Appendix A) and will facilitate more trade in secondary capacity by making capacity products more fungible, reducing search and transaction costs, removing unnecessary impediments to trade across pipelines and increasing the pool of buyers and sellers;
- the broader objectives of the capacity trading reform package, which were described by the AEMC as being to improve the efficiency with which transportation capacity is allocated and utilised and foster the development of a more liquid market for secondary capacity;¹⁵ and
- the Energy Council's Vision of the direction gas market development should take to meet the NGO and the outcomes the Energy Council agreed to pursue in the next phase of gas market reform (see Box 1.1).¹⁶

The GMRG's assessment will also be guided by the following principles that the AEMC usually employs when applying the NGO:¹⁷

- Competition and market signals will generally lead to better outcomes than centralised planning and regulation, as competing energy businesses have an incentive to meet consumers' needs efficiently.
- Where it is required, regulation should be targeted, fit-for-purpose, provide incentives that imitate the outcomes of a workably competitive market, and involve regulatory costs proportionate to the materiality of the issue.
- Risk allocation and the accountability for investment decisions should rest with those parties best placed to manage them.
- Market and regulatory frameworks should be flexible and provide firms with a clear and consistent set of rules that allow them to independently develop strategies and

¹⁴ AEMC, Stage 2 Final Report: Information Provision, May 2016, p. 4.

¹⁵ AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, pp. 67-69.

¹⁶ COAG Energy Council, Australian Gas Market Vision, December 2014.

¹⁷ AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, pp. 128-129.



adjust to changes in the market. These frameworks should also be resilient to changing supply and demand conditions, and patterns of flow, over the longer term.

Given the nature of the reforms, the GMRG will also consider the extent to which the proposed reforms:

- allow capacity in the short-term to be allocated to those that value it most;
- provide secondary shippers with access to secondary capacity on reasonable terms (i.e. at prices and on other terms and conditions that, so far as practical, reflect the outcomes of a workably competitive market);
- appropriately reflect the legitimate business interests of service providers and other parties that have rights to use the transportation services, including primary and secondary capacity holders;
- are operationally feasible and recognise the operational and technical requirements necessary for the safe and reliable operation of the assets used in the provision of transportation services;
- facilitate the efficient operation and use of the capacity trading platform and day-ahead auction;
- reduce barriers to entry in upstream and downstream markets; and
- more generally promote efficient investment in, and efficient operation and use of, natural gas services.

When evaluating the design of the capacity trading platform and day-ahead auction, the GMRG will also have regard to the attributes that the Capacity Trading Platform and Day-Ahead Auction project teams thought the capacity trading and auction platforms would need to emulate if they were to become 'platforms of choice' for market participants. These attributes are set out the table below.

Table 2.2: 'Platform of Choice' evaluation criteria

Evaluation criteria	
Operation of the platform:	Operated by an independent (i.e. a party that has no commercial interests in the outcome of the trades) and experienced operator
	Operated in a predictable and reliable manner
	Operation of platform underpinned by a robust governance framework
	Transparency in costs and operation of platform
Trading Platform features:	Provides for low transaction costs and quick and effective execution of trades
	Readily integrated with service providers' nominations and scheduling processes
Co-ordination benefits:	Shippers can readily co-ordinate trades across pipelines
	Shippers can readily co-ordinate trades through the capacity trading platform and the day-ahead auction
	Shippers can readily co-ordinate trades with other gas services on the GSH
Scale and scope benefits and adaptability:	Capable of capturing scale and scope benefits
	Future proof, scalable and adaptable



Part A: Day-Ahead Auction of Contracted but Un-Nominated Capacity

In the *East Coast Review*, the AEMC recommended the introduction of a day-ahead auction of contracted but un-nominated transportation capacity that would be carried out shortly after nomination cut-off time on gas day D-1 and subject to a zero reserve price (with compressor fuel provided in-kind by shippers). In doing so, the AEMC noted that the day-ahead auction would improve the incentives shippers have to trade capacity and allow the market, rather than service providers, to determine the price of contracted but un-nominated capacity and allocate this capacity in a non-discriminatory manner to those that value it most.

Elaborating further on this recommendation, the AEMC noted that:¹⁸

- shippers may not have a strong incentive to sell spare capacity because the cost and effort of doing so, and the risk of being short capacity if the sale occurs a long time before the nomination cut-off time, may exceed the revenue generated;
- the service provider, as the only seller of day-ahead capacity after nomination cut-off time, has the ability and incentive to price contracted but un-nominated capacity above the levels that would be expected in a workably competitive market;¹⁹ and
- the market for contracted but un-nominated capacity is complex and subject to co-ordination failure, because multiple buyers need to transact with multiple sellers to reach the welfare-maximising allocation and the only way this can currently occur is through bilateral negotiations, which can be lengthy, complex and expensive.

The AEMC went on to add that high prices for contracted but un-nominated capacity, in conjunction with the limited incentive shippers have to trade capacity and the co-ordination failure described above, may result in inefficient outcomes and price prospective shippers out of the market.²⁰

The way in which the AEMC expected the day-ahead auction to address these shortcomings is reflected in the following extract:²¹

“Firstly, in instances where shippers simply forego the opportunity to sell capacity because it is not core-business, a prospective shipper’s alternative is to purchase contracted but un-nominated capacity from the pipeline owner. However, high prices for this capacity may be pricing prospective shippers out of the market. The auction would provide prospective shippers the opportunity to purchase competitively priced capacity. In the limited cases identified by the ACCC where an incumbent shipper is deliberately withholding capacity, the auction would also improve the shipper’s incentive to sell the capacity prior to the nomination cut off, given that the auction will limit the incumbent shippers’ ability to block access to a competitor.

¹⁸ AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, pp. 72-73

¹⁹ The AEMC also pointed to the finding from the ACCC’s Gas Inquiry that the pricing of as available and interruptible services on some pipelines may be adversely affecting the efficient utilisation of capacity.

AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, p. 72.

²⁰ *ibid.*, p. 73.

²¹ *ibid.*



The auction provides a pricing and allocation mechanism that is less costly for participants, and, depending on its design, the auction may provide a platform to simultaneously coordinate trades - allocating capacity in an efficient manner to the combination of shippers that value it highest as indicated through their bids.”

The AEMC considered the effect that the day-ahead auction could have on investment in pipelines and while it recognised the potential for the auction to give rise to a free-rider effect, it did not consider this to be a material issue given the nature of the product being auctioned:²²

“The Commission acknowledges that on some occasions, shippers would be able to access very-short term capacity at a potentially low price (ie, at or just above the reserve price) on the occasions that they require it, without the long term commitment of a take-or-pay contract used to underwrite investment. This could, theoretically, create a free-rider effect, whereby shippers do not underwrite capacity because they are able to buy cheaper capacity underwritten by another shipper.

However, the Commission does not consider that this is likely to be a material issue in practice for day ahead auctions of contracted but un-nominated capacity. Very few, if any, shippers would be able to rely solely on day-ahead capacity to manage their gas needs, or the gas needs of their customers, over any medium to long term period. The majority of gas users are either relatively inflexible in their usage (for example, residential gas customers) or require a relatively consistent supply of gas to justify sunk investment in immovable assets (for example, a factory).

Relying on capacity purchased through the auction would entail both price and volume risk. While prices could be low at some times (at or just above the reserve price), at other times, when the demand for capacity is high, the auction would be expected to clear at a high price. When demand is high enough, all contracted capacity will be nominated – leaving no capacity available for sale at the auction.

Most shippers will therefore require long term contracts (used to underwrite capacity), with the ability to fine-tune capacity requirements on an ongoing basis. The recommended auction serves to improve the ability of all shippers to fine-tune their capacity requirements without affecting the requirement for long term contracts that underwrite new investment.”

The conclusion the AEMC reached on this issue is consistent with the findings of an independent report prepared by NERA for the GMRG. This report was commissioned by the GMRG in response to a request from the Advisory Panel that further work be carried out to understand the interactions between the auction and the primary and secondary capacity markets. This report is expected to be published on the GMRG's website and to be circulated to stakeholders by Monday 23 October 2017.

Table A.1 provides further detail on the AEMC's recommendations, which were categorised as:

- **required outcomes** – these recommendations were described by the AEMC as outcomes that must be progressed by the GMRG and are necessary to the implementation of the reforms;

²² AEMC, Stage 2 Draft Report: East Coast Review, 4 December 2015, pp. 57-58.



- **preferred outcomes** – these recommendations were described by the AEMC as outcomes that should be pursued by the GMRG unless it is clear there are greater benefits in alternative approaches; or
- **suggested outcomes** – these recommendations were described by the AEMC as outcomes that have in-principle benefits but need to be considered further by the GMRG.

Table A.1: AEMC's Recommendations: Day-ahead auction

Required Outcomes
<ul style="list-style-type: none"> ▪ Auction design: <ul style="list-style-type: none"> – A daily, day-ahead capacity auction for contracted but un-nominated pipeline capacity and hub (compression) services. – Auction happens shortly after nomination cut-off time. – Reserve price of zero dollars, with compressor fuel provided by shippers in-kind. – At least all contracted but un-nominated capacity placed for sale through auction. ▪ Product design: Accommodate nominations or renominations by incumbent shippers after the auction is conducted.
Preferred outcomes
<ul style="list-style-type: none"> ▪ Geographic scope: Single auction across the east coast market, in order to optimise allocation across as many products as possible. ▪ Auction design: <ul style="list-style-type: none"> – Combinatorial auction where multiple buyers and sellers can simultaneously coordinate trades, managing the complementarities between different pipeline segments. – Single round auction to reduce complexity and opportunities for anti-competitive behaviour between participants. – Bidders pay the value of their winning bids ("first-price" rule) to reduce complexity. – Winning combination of bids to be determined using a profit maximisation algorithm (constrained by requirement that at least all contracted but un-nominated capacity is put on sale in auction). ▪ Product design: Capacity purchased in auction curtailed before firm capacity. ▪ Exemptions: Exemption from the auction for pipelines serving a single user.
Suggested outcomes
<ul style="list-style-type: none"> ▪ Exemptions: Exempting on a case-by-case basis pipelines that are not fully contracted from needing to conduct the auction. ▪ Operator of the auction: The auction to be run by the same institution(s) which run the capacity trading platform. ▪ Other: As available rights in current gas transportation agreements (GTAs) to be phased out to avoid them competing with rights allocated in the auction.

Source: AEMC, Stage 2 Final Report: *East Coast Review*, 23 May 2016, p. 16.

In the *East Coast Review*, the AEMC identified a number of organisations that could operate and administer the day-ahead auction, but did not reach a concluded position on this issue. It instead recommended the GMRG consider the options in further detail. The GMRG's recommendations on this issue were presented to the Energy Council in July 2017. In short, the GMRG recommended that AEMO be accorded responsibility for the



operation of both the capacity trading platform and the day-ahead auction.²³ This recommendation was endorsed by the Energy Council at its 14 July 2017 meeting.²⁴

Following the Energy Council's decision, the GMRG has worked closely with AEMO, the Day-Ahead Auction project team, NERA and JWS on the development of the end-to-end design of the day-ahead auction. This has required consideration to be given to:

- the product(s) that could be sold through the auction;
- the auction design;
- the pipelines and compression facilities that should be subject to the auction and the exemptions that should be available;
- the design of the auction platform and the arrangements shippers will need to have in place to use the platform; and
- the legal and governance framework that will underpin the auction.

These issues are discussed in turn in the remainder of this part of the consultation paper, which also sets out the GMRG's preliminary view on these issues. As noted in Chapter 1, the inclusion of the GMRG's preliminary view in this consultation paper is intended to facilitate consultation and elicit feedback from stakeholders. It should not therefore be interpreted as a concluded position of the GMRG.

²³ GMRG, Final Recommendations: Operation and administration of the Capacity Trading Platform(s) and Day-Ahead Auction, July 2017.

²⁴ COAG Energy Council, 12th Energy Council Meeting Communique, 14 July 2017.



3. Products to be Auctioned

As noted in the preceding section, the AEMC has recommended the introduction of a day-ahead auction of contracted but un-nominated transportation capacity. The AEMC also recommended that:

- nominations or renominations by incumbent shippers that occur after the auction be accommodated (required outcome);
- the auction product be curtailed prior to firm capacity (preferred outcome); and
- as available and interruptible rights in current gas transportation agreements (GTAs) be phased out to avoid them competing with rights allocated in the auction (suggested outcome).

These product design related recommendations have been considered by the Day-Ahead Auction project team and the GMRG. In doing so, consideration has been given to:

- the types of transportation products that should be subject to the day-ahead auction;
- the priority of the auction products, which depends, in part, on the way in which nominations and renominations by incumbent shippers are accommodated;
- whether the auction products should be sold on a zonal or point-to-point basis; and
- other features of the auction products.

These issues are discussed in further detail in the remainder of this chapter, which also contains the GMRG's preliminary views on various issues.

3.1 Transportation products to be subject to the auction

In the *East Coast Review*, the AEMC recommended that the day-ahead auction apply to pipeline and hub services, but the specific products it expected to be released through the auction were not specified. This issue was discussed with the Day-Ahead Auction project team, which agreed that the products to be auctioned should include:

- forward haul transportation products, which on bi-directional pipelines would include separate forward haul products in each direction;²⁵ and
- compression services.

Some project team members also suggested the auction should provide for the release of backhaul capacity on pipelines that only operate in a single direction (see Box 3.1 for more detail on backhaul services),²⁶ but this view was not endorsed by all project team members.

Those project team members that advocated the inclusion of backhaul capacity in the auction claimed that it would benefit:

- shippers because it would provide them with more flexibility to 'transport' gas and allow the market to determine the price of this service; and

²⁵ For example, on the South West Queensland Pipeline there would be an eastern haul and a western haul product.

²⁶ In the east coast, the pipelines that operate in a single direction include, amongst others, the Queensland Gas Pipeline, the Carpentaria Gas Pipeline (CGP), SEAGas Pipeline, the Eastern Gas Pipeline and the Tasmanian Gas Pipeline.



- service providers because it would result in less gas having to be physically transported on the pipeline and therefore reduce the pipeline's operating costs.

Those that were opposed to its inclusion, on the other hand, claimed it went beyond the scope of the AEMC's recommendation for an auction of contracted but un-nominated capacity (i.e. because backhaul capacity is not contracted on a firm basis and so cannot be released 'as contracted but un-nominated capacity').

Box 3.1: Backhaul services

A backhaul service involves the 'notional transportation' of gas in the opposite direction to the predominant flow of gas. The term 'notional transportation' is used in this context because the service does not actually result in the physical transportation of gas in the opposite direction. Rather the service involves a swap, with gas 'exchanged' at the point at which it is intended to enter the pipeline for an equivalent amount of gas at the backhaul delivery point. The practical effect of this service is that the net forward haul flow is offset by the volumes of gas nominated for backhaul.²⁷ If there is an insufficient volume of gas being transported on a forward haul basis then the backhaul service will be interrupted, which is why this service is usually only sold on an interruptible basis.

From a service provider's perspective, the incremental cost of providing backhaul services is relatively low and administrative in nature.²⁸ There are also a number of benefits associated with backhaul services. For example, the reduction in physical flows on the pipeline can:

- reduce the pipeline's compressor fuel and maintenance requirements;
- help to alleviate physical constraints on a pipeline; and
- provide service providers with more capacity to sell on a forward haul basis.

The GMRG has considered the arguments raised by project team members and its preliminary view is that there would be value in including interruptible backhaul capacity in the auction. The reasons for this are three-fold.

First, the inclusion of backhaul capacity in the auction could result in a range of efficiency gains across the gas supply chain, because it will improve the efficiency with which capacity on single directional pipelines is allocated and used. This will, in turn:

- facilitate the 'transportation' of gas to where it is valued most highly; and
- promote the efficient operation of, and investment in, these pipelines, which will benefit users of these pipelines and consumers of natural gas service.

The inclusion of backhaul capacity in the auction could also:

- provide shippers with more flexibility to procure and deliver gas to their end location (for example, a shipper located outside an STTM could use backhaul capacity to procure gas from the STTM and 'deliver' it to its end location); and

²⁷ For example, if shippers with forward haul contracts on the CGP wanted to transport 100 TJ of gas from Ballera to Mt Isa on a gas day and another shipper with a backhaul service wanted to "transport" 10 TJ of gas from Mt Isa to Ballera, the service provider would net the flows of gas and transport 90 TJ of gas to Mt Isa and allow the shipper with the backhaul service to take delivery of the remaining 10 TJ at Ballera.

²⁸ The administrative costs include the costs associated with netting the forward haul and backhaul flows and making the relevant adjustments to the pipeline schedules.



- result in more gas being supplied into the domestic market if it reduces the cost of transportation and makes gas that would otherwise have been considered uncommercial to develop or to supply into the domestic market becoming commercially viable to do so.²⁹

The importance of these benefits cannot, in the GMRG's view, be understated given the conditions currently prevailing in the east coast market.

Second, there appear to be a number of parallels between the factors the AEMC cited in support of its decision to recommend the day-ahead auction and the following features of the market for backhaul services:

- Shippers may not have a strong incentive to on-sell backhaul services (or enter into swaps) because:
 - (a) the cost and effort of doing so may exceed the revenue generated; and
 - (b) in contrast to firm forward haul products, which usually require shippers to pay for capacity irrespective of whether they use it or not, shippers usually only pay for backhaul services when they use it and so may not have as strong an incentive to on-sell this service.

It is also worth noting in this context that for the reasons set out in (b), the initial set of exchange traded products that have been proposed for the capacity trading platform exclude backhaul services. While this will not prevent shippers from entering into these trades on a bilateral basis, it is possible that the search and transaction costs associated with doing so may act as a further impediment to trade.

- The incremental costs associated with providing backhaul services are relatively low,³⁰ but because service providers can face limited competition for this service they may be able to set prices above what would prevail in a workably competitive market, as the ACCC observed in its *Inquiry into the east coast gas market*.³¹

The high prices for these services, in conjunction with the limited incentive shippers have to trade the service, may, as the AEMC noted in relation to as available services, result in inefficient outcomes and price prospective shippers out of the market.

Third, when viewed through the lens of the assessment framework set out in section 2.3, the inclusion of backhaul services in the auction appears to be consistent with:

- the NGO, because it will promote efficient investment in, efficient operation and use of, natural gas services and the long-term interests of consumers of natural gas;
- the broader objectives of the capacity trading reforms, which are to improve the efficiency with which transportation capacity is allocated and utilised and foster the development of a more liquid market for secondary capacity; and

²⁹ This could occur if the auction results in lower backhaul tariffs, which in turn, results in gas that would otherwise have been considered uncommercial to develop becoming commercially viable to extract.

³⁰ The only cost that service providers incur when providing backhaul services are the administrative costs associated with netting the forward haul and backhaul flows and making the relevant adjustments to the pipeline schedules.

³¹ ACCC, *Inquiry into the east coast gas market*, April 2016, p. 110.



- the Energy Council's Vision of the direction gas market development should take and a number of the outcomes it expected to pursue in the next phase of gas market reform (i.e. outcomes 2(b), 3(b) and 3(d) – see Box 1.1).

The GMRG's view on this issue is, as noted above, a preliminary view only at this stage. The GMRG therefore welcomes further feedback from stakeholders on this issue and the questions in Box 3.2.

Box 3.2: Questions on transportation products to be auctioned

1. Do you agree with the proposal to include the following products in the auction:
 - forward haul transportation services (with separate products offered in both directions on bi-directional pipelines)? If not, please explain why.
 - compression services? If not, please explain why.
2. Do you agree with the proposal to include an interruptible backhaul service in the auction for single direction pipelines? If not, please explain why.

Section 4.2.4 provides further detail on how backhaul could be included in the auction.

3.2 Priority of the auction product

As noted in the introduction to this chapter, the AEMC recommended that nominations or renominations by incumbent shippers that occur after the auction is conducted be accommodated (required outcome) and that the auction product be curtailed prior to firm capacity (preferred outcome).³²

In making these recommendations, the AEMC noted that while shippers typically lose their firm capacity rights at nomination cut-off time, some shipper's rights continue to exist (either explicitly or implicitly) after this point:³³

"Firstly, some GTAs have a nomination cut-off which is later than the typical time. Shippers under these arrangements may retain an explicit, contractually firm right to nominate after the time of the day-ahead auction, which may lead to conflict if both services cannot be accommodated simultaneously."

In addition, some shippers have historically retained the ability to nominate after the cut-off. These shippers value the ability to nominate because their actual gas transportation requirements vary compared to their forecast requirements made at the nomination cut-off time. This is not a contractually firm right, and would not be accommodated if the pipeline owner were to subsequently sell the capacity on a firm basis to another shipper such that the capacity of the pipeline was unable to accommodate the (re)nomination. Nonetheless, the Commission understands that shippers' (re)nominations have nearly always been accommodated in practice in these circumstances."

The AEMC identified the following options to accommodate these types of nomination and renomination arrangements, but noted that there were shortcomings with each:^{34,35}

³² ibid, pp. 77 and 81.

³³ ibid, p. 77.

³⁴ ibid. 77-78.

³⁵ AEMC, Pipeline Access Discussion Paper, 3 March 2016, pp. 65-71.



1. **Selling capacity on a firm basis by withholding some auction capacity to accommodate renomination rights:** The AEMC noted that while this option would reduce the risk of nominations and renominations not being accommodated, the risk could not be reduced to zero unless all the capacity was withheld. The AEMC also noted that this option would be more complex to implement and would limit the amount of capacity released in the auction.
2. **Selling capacity on an interruptible basis:** The AEMC noted that while this option could accommodate nominations and renominations that occur after the auction is conducted, it would result in a lower quality product being auctioned and could adversely affect trading liquidity (a key auction rationale).
3. **Selling some capacity on a firm basis and some on an interruptible basis (hybrid product option):** The AEMC noted that while this option would increase the quality of the product sold through the auction, a “potentially complex and controversial process” would be required to determine the proportion of capacity to be released on a firm or interruptible basis. The AEMC also noted that it would not guarantee that all renominations could be accommodated.
4. **Conducting the auction more frequently than on a daily basis:** The AEMC noted that the cost and time associated with running the auction multiple times throughout the day may mean this is not a feasible option.

The AEMC therefore recommended that further work be carried out to determine how nominations and renominations could be accommodated.³⁶

In addition to these recommendations, the AEMC suggested that as available and interruptible rights in current GTAs be phased out, because they will compete with the rights allocated in the auction. In doing so, the AEMC noted that if these rights are given priority over the rights purchased in the auction, it could result in capacity not being allocated to its highest value use (i.e. because there may be auction participants that value the capacity more). The AEMC went on to add that if these rights are retained, then the GMRG should consider how they should be accommodated in the auction design.³⁷

Project team’s views on renomination rights and the quality of the auction product

The AEMC’s recommendation that the auction product accommodate nominations and renominations by incumbent shippers, was the subject of intense debate over a number of months by the Day-Ahead Auction project team and members of the other project teams.

On one side of this debate were a number of incumbent shippers and service providers, who claimed that renomination rights are highly valued by shippers because they provide additional flexibility to manage variations between forecast demand and supply conditions and actual conditions during the gas day. This group of project team members noted that firm and reasonable endeavours renomination rights are currently utilised by a range of shippers (including commercial and industrial customers, retailers and gas-fired generators), and that if these rights were to be restricted in any way by the auction, it could have a deleterious effect on these shippers and the markets in which they operate. The market that was identified as being most at risk from any form of restriction on

³⁶ AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, 78.

³⁷ *ibid*, pp. 82-83.



renomination rights was the National Electricity Market (NEM), because renomination rights are currently relied upon by gas-fired generators to manage variations between the pre-dispatch schedule issued on gas day D-1 and actual dispatch on the gas day. This group therefore argued that all forms of renomination rights (firm and reasonable endeavours) should be accommodated by the auction.

This group of project team members also argued that the auction product should be a relatively low quality product because in their view a higher quality auction product may:

- devalue firm and other capacity rights in primary GTAs, encourage primary capacity holders to de-contract and reduce their incentive to underwrite pipeline investments;
- impede the development of a secondary capacity market, because while the adoption of a higher quality product may provide firm capacity holders with a stronger incentive to release capacity prior to auction, prospective shippers may prefer to procure the capacity through the auction because it will have a zero reserve price; and
- give rise to higher implementation costs because, amongst other things, it would require changes to be made to the prioritisation schedules in primary GTAs.

On the other side of the debate were prospective users of the auctioned capacity. While this group accepted the AEMC's recommendation that renomination rights should be accommodated and recognised the important role renominations play in the NEM, they questioned whether the auction should accommodate:

- all renomination rights, including firm renomination rights that service providers are contractually required to provide and reasonable endeavours renomination rights, that service providers have some discretion to provide; or
- firm renomination rights that a service provider is contractually required to provide.

In this group's view, the auction should only be required to accommodate firm renomination rights, because shippers with reasonable endeavours renomination rights do not have a firm right to access this service.

This group of project team members also argued that the auction product should be a relatively high quality product, because in their view a lower quality auction product could:

- expose auction winners to a greater degree of curtailment risk, which they noted could have financial implications³⁸ and give rise to aggregation risk if the auction winner has procured capacity across a number of pipelines or assets (see section 4.6 for more detail on aggregation risk);
- impede the development of the secondary capacity market, because while a lower quality auction product may provide prospective shippers with a strong incentive to procure capacity prior to the auction, it may not provide firm capacity holders with a strong incentive to release capacity because demand for this product is likely to be relatively low; and
- give rise to a greater level of gaming risks, which could expose auction participants to greater risk unless actively monitored by the AER.

³⁸ If capacity is curtailed then it could, depending on when the curtailment occurs and if the auction winner has purchased capacity across multiple pipelines, result in the auction winner having to pay service providers imbalance and other charges. They may also incur additional costs trying to source gas from another location or for failing to deliver gas to the end location.



Options to accommodate nominations and renominations by incumbents

The Day-Ahead Auction project team spent some time considering the options the AEMC identified to accommodate nomination and renomination rights and a number of other options that were identified in the project team meetings. In short, the project team agreed that conducting more frequent auctions during the gas day was unlikely to be a feasible option at this stage given the cost and complexity that would be faced by all parties. They also agreed to rule out the option of selling a purely firm product by withholding some capacity on the basis that this would not comply with the AEMC's recommendations. The project team were not, however, able to agree on any of the remaining options and therefore suggested they all be consulted upon.

Further detail on the remaining options, which are referred to as the 'second priority as available auction product', 'second priority interruptible auction product' and 'hybrid auction product' options, is provided in Table 3.1, which also outlines:

- the scheduling, curtailment and renomination priorities for any contracted but un-nominated capacity (see Box 3.3 for more detail);
- the curtailment risks associated with each option, which could arise as a result of:
 - late nominations or renominations by incumbent shippers (note that if all the contracted but un-nominated capacity is not sold through the auction then even if renominations occur curtailment may not be required); or
 - other curtailment events;
- the gaming risks associated with each option;
- the effect that each option is expected to have on the incentive parties have to trade secondary capacity prior to the auction; and
- the consistency of each option with the AEMC's recommendations.

The first column of this table sets out another option that the GMRG and NERA have subsequently identified, which is referred to as a 'second priority firm service'.

The way in which auction quantities would be calculated under each of these options is set out in section 4.1.



Table 3.1: Auction product options

		Option 1: Second Priority Firm Auction Product	Option 2: Second Priority As Available Auction Product	Option 3: Second Priority Interruptible Auction Product	Option 4: Hybrid Auction Product (Firm and Second Priority Interruptible)
Quality of the product		Relatively high quality product because the auction product ranks after the firm product but higher than all other products.	Relatively low quality product because the auction product ranks after firm and as available products but higher than interruptible product.	Lowest quality product because the auction product ranks last	The firm auction product is a high quality product because it ranks equally to other firm rights, while the second priority interruptible auction product is a low quality product because it ranks last.
Priorities for contracted but un-nominated capacity <ul style="list-style-type: none"> Scheduling and renominations priority (green arrow) Curtailment priority (red arrow) 		1. Firm product. ↑ 2. Auction product. ↓ 3. As available product. 4. Authorised overrun. 5. Interruptible product.	1. Firm product. ↑ 2. As available product. 3. Auction product. ↓ 4. Authorised overrun. 5. Interruptible product.	1. Firm product. ↑ 2. As available product. 3. Authorised overruns. 4. Interruptible product. 5. Auction product. ↓	1. Firm product (scheduled 1 st) and firm auction product (scheduled 2 nd). ↑ 2. As available product. 3. Authorised overrun. 4. Interruptible product. 5. Second priority interruptible auction product. ↓
Curtailment risk <i>(can have financial consequences and give rise to aggregation risks if part of a combinatorial bid).</i>	Level of risk	Moderate level of risk given the auction product is subordinate to renomination rights and nominations conducted after the auction by firm capacity holders.	Relatively high level of risk given the auction product is subordinate to renomination rights and nominations conducted after the auction by firm and as available capacity holders.	Highest level of risk because the auction product is subordinate to the renomination rights and nominations conducted after the auction by firm, as available and interruptible capacity holders.	Firm auction product lowest level of risk because it is not subordinate to renominations or nominations after the auction is conducted. Second priority interruptible product highest risk because it is subordinate to renomination rights and nominations conducted after the auction by firm, as available and interruptible capacity holders.
	Risk from upward renomination	Auction winner curtailed if insufficient contracted but un-nominated capacity available to meet renominations by shippers with firm rights, but not curtailed by renominations from other shippers.	Auction winner curtailed if insufficient contracted but un-nominated capacity available to meet renominations by shippers with firm and as available rights, but not curtailed by renominations from other shippers.	Auction winner curtailed if insufficient contracted but un-nominated capacity available to meet renominations by shippers with firm, as available and interruptible rights.	Auction winner with firm auction product not affected by renominations, but an auction winner with a second priority interruptible auction product would be curtailed if there is insufficient contracted but un-nominated capacity available to meet renominations by shippers with firm, as available and interruptible rights.
	<i>Note that if all the contracted but un-nominated capacity is not sold through the auction then even if renominations occur curtailment may not be required</i>				
	Other curtailment risks	Auction winner curtailed before shippers with firm rights but after shippers with as available and interruptible rights.	Auction winner curtailed before shippers with firm and as available rights but after shippers with interruptible rights.	Auction winner curtailed first.	Auction winner with second priority interruptible auction product will be curtailed first, but the auction winner with a firm auction product will be curtailed equal last (i.e. with the firm product).
Gaming risks		Risk that shippers that have higher priority renomination rights than auction winners under-nominate on gas day D-1 and then renominate upward on gas day D as part of a deliberate strategy to disrupt auction winners, which could discourage auction participants from using this auction because they lose trust in the 'firmness' of the auction product (note this would not affect the firm auction product under the hybrid option but would affect the second priority interruptible auction product)			
		Risk that shippers that have higher priority in the scheduling order engage in a withholding game by over-nominating on gas day D-1 and then renominate downward on gas day D to prevent auction participants from obtaining capacity through the day-ahead auction.			



		Option 1: Second Priority Firm Auction Product	Option 2: Second Priority As Available Auction Product	Option 3: Second Priority Interruptible Auction Product	Option 4: Hybrid Auction Product (Firm and Second Priority Interruptible)
		n.a.	Risk that shippers with as available or interruptible rights nominate to use these rights and then renominate down if they procure capacity in the auction at a lower price, which could occur if as available and interruptible tariffs are only charged on the basis of actual throughput. If this does occur it will reduce the capacity released in the auction.		
Effect of product design on incentives for parties to trade prior to the auction	Shippers with firm rights - incentive to sell	Shippers with firm rights that may otherwise try to withhold capacity should have a relatively strong incentive to sell spare capacity prior to the auction, because the quality of the auction product is such that it could be viewed by prospective shippers as a close substitute for purchasing capacity from the shipper with firm rights.	Shippers with firm rights that may otherwise try to withhold capacity may have a lower incentive to sell spare capacity than under the second priority firm product, because the quality of the auction product is lower and may not be viewed by prospective shippers as a close substitute for purchasing capacity from the shipper with firm rights.	Shippers with firm rights that may otherwise try to withhold capacity will have limited incentive to sell any spare capacity they have, because the quality of product released in the auction is so low and would not be viewed by prospective shippers as a close substitute for purchasing capacity from the shipper with firm rights.	Shippers with firm rights should have a relatively strong incentive to sell their capacity prior to the auction because a portion of the auctioned capacity will be sold on a firm basis.
	Shippers seeking capacity – incentive to buy	The effect of the product design on the incentive prospective shippers have to enter into a secondary capacity trade prior to the auction will depend on whether: <ul style="list-style-type: none"> there is a substantial amount of contracted but un-nominated capacity and the risk of curtailment is considered low – in this case the auction is likely to be preferred because the auction reserve price is zero; or there is limited contracted but un-nominated capacity or the risk of curtailment is high – in this case a secondary trade is likely to be preferred because shippers will be able to procure higher quality firm rights (note that given the risk of curtailment is higher under the interruptible product, if this product was selected it may result in greater demand for secondary trades than under the secondary priority firm auction product). 			
Consistency with the AEMC's recommendations		Complies with the AEMC's recommendations that: <ul style="list-style-type: none"> renominations by incumbent shippers be accommodated (required outcome); capacity purchased through the auction be curtailed before firm capacity (preferred outcome); and as available and interruptible rights do not compete with rights allocated in the auction so that capacity can be allocated to those that value it most highly (suggested outcome) 	Goes beyond the AEMC's recommendations that: <ul style="list-style-type: none"> renominations by incumbent shippers be accommodated (required outcome); or capacity purchased through the auction be curtailed before firm capacity (preferred outcome). Also fails to comply with the AEMC's suggestion that as available and interruptible rights do not compete with rights allocated in the auction	May not comply with the AEMC's recommendations that: <ul style="list-style-type: none"> renominations by incumbent shippers be accommodated because some rights will need to be restricted, even if it is just reasonable endeavours rights; capacity purchased through the auction be curtailed before firm capacity; or as available and interruptible rights do not compete with rights allocated in the auction so that capacity can be allocated to those that value it most highly 	



Box 3.3: Priorities for contracted but un-nominated capacity

The prioritisation of scheduling, curtailment and renomination rights set out in Table 3.1 relates to the contracted but un-nominated capacity, but not to spare primary capacity. This distinction is important because the AEMC's recommendations only related to the transportation asset's contracted but un-nominated capacity and not to any spare primary capacity that may be available.

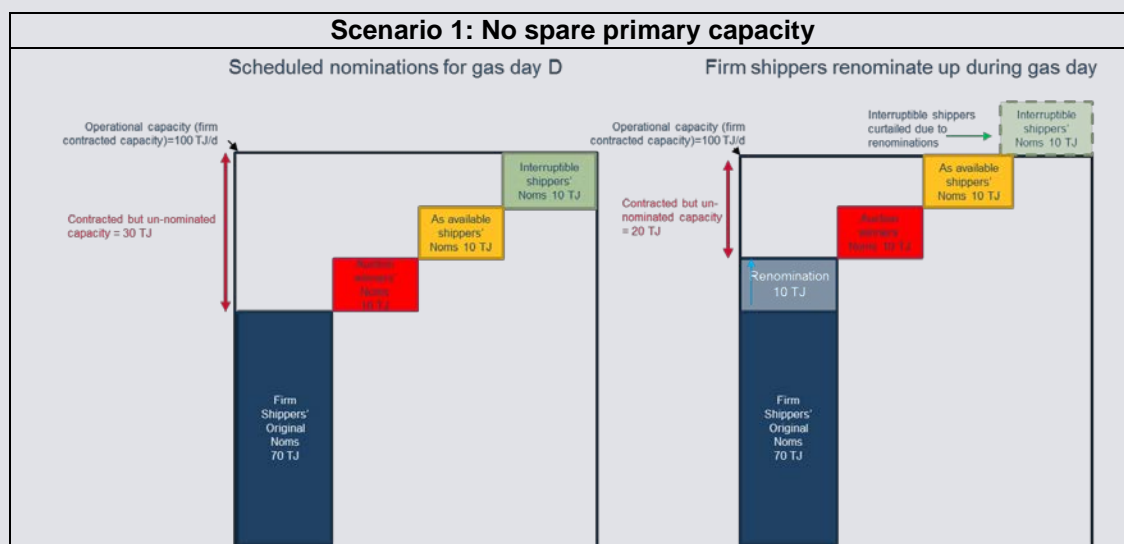
If there is spare primary capacity, a service provider would be able to use this capacity to provide as available or interruptible services and schedule these services prior to the auction. If this occurred, then the as available and interruptible services would *not* be curtailed by nominations or renominations by incumbent shippers, because this form of curtailment should only affect users of the contracted but un-nominated capacity. If, however, there is no spare primary capacity then the as available and interruptible services would be subject to the curtailment order set out in Table 3.1.

The difference between these two scenarios can be seen in the simplified example below, which assumes the auction product is a second priority firm product.

In the first scenario in this example, it is assumed that:

- firm shippers have contracted 100 TJ/day but only nominate to use 70 TJ/day by the nomination cut-off time on gas day D-1, leaving 30 TJ/day to go into the auction;
- auction participants only want 10 TJ/day, which leaves 20 TJ/day to be allocated to as available and interruptible shippers, who each nominate to use 10 TJ/day; and
- firm shippers renominate upwards on gas day D by 10 TJ/day.

In this case there is no spare primary capacity, so the renomination by firm shippers would result in the interruptible shippers' being curtailed (i.e. because it has the lowest priority in the curtailment order for contracted but un-nominated capacity).

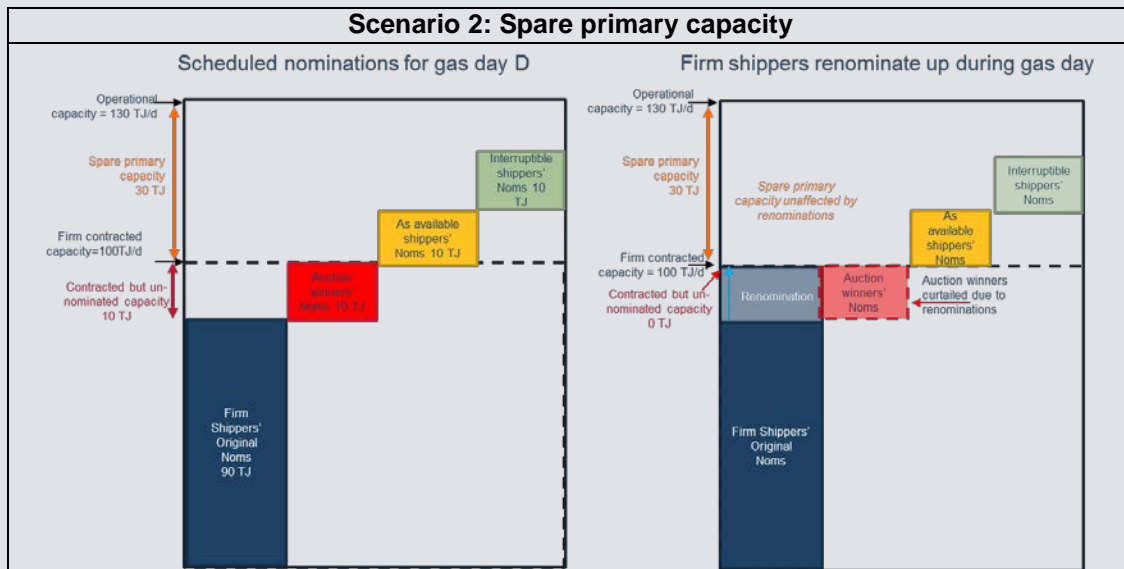


In the second scenario, it is assumed that:

- firm shippers have contracted 100 TJ/day but nominate to use 90 TJ/day by the nomination cut-off time on gas day D-1, leaving 10 TJ/day to go into the auction;
- auction participants secure 10 TJ/day;
- there is 30 TJ/day of spare capacity, which the service provider allocates to as available and interruptible shippers prior to the auction, each of whom nominate 10 TJ/day; and

- firm shippers renominate upwards on gas day D by 10 TJ/day.

In this case the renomination by firm shippers would result in the auction winners' capacity being curtailed, because they are the only users of the contracted but un-nominated capacity, which is reduced as a result of the firm shippers' renomination.



As noted below, members of the Day-Ahead Auction project team suggested that if there is spare primary capacity and upward renominations result in the auction winners' capacity being curtailed, then auction winners should have the option to avoid being curtailed by procuring an as available or interruptible service from the service provider on the gas day to access the spare primary capacity.

The key points to note about the four options in Table 3.1 can be summarised as follows:

1. **Option 1: Second priority firm auction product:** As its name suggests, this auction product ranks *below* firm transportation rights, but above all the other transportation rights (e.g. as available and interruptible rights) from a scheduling, curtailment and renomination rights perspective in relation to the contracted but un-nominated capacity. It is therefore consistent with the AEMC's recommendations that nomination and renomination rights be accommodated and the auction product be curtailed ahead of firm services. It would also appear to provide shippers with firm capacity rights a relatively strong incentive to sell any spare capacity they have prior to the auction. The other benefit of this option is that by scheduling the auction product prior to as available and interruptible rights, it will address the concerns the AEMC expressed about these rights competing with the auction and potentially resulting in capacity not being allocated to its highest value use. From a risk perspective, this auction product is expected to be subject to:
 - a moderate degree of curtailment risk because it will be subordinate to the firm shippers' renomination rights and curtailed ahead of firm services if another curtailment event occurs, but the level of risk is lower under this option than the second priority as available and interruptible services; and
 - lower gaming risks than the other options.



2. **Option 2: Second priority as available auction product:** This auction product ranks *below* firm and as available transportation rights, but above interruptible rights from a scheduling, curtailment and renomination rights perspective in relation to the contracted but un-nominated capacity. The prioritisation of as available services ahead of the auction product in relation to renomination rights and curtailment in this case appears to go beyond what the AEMC intended. It could also reduce the incentive shippers with firm capacity have to sell spare capacity prior to the auction. From a risk perspective, this auction product is expected to be subject to:

- a relatively high degree of curtailment risk because it will be subordinate to firm and as available shippers' renomination rights and will also be curtailed before these products if another curtailment event occurs, but the level of risk is lower than what it would be under the second priority interruptible service; and
- higher gaming risks than under the second priority firm service option.

The other point to note about this option is that because as available rights are scheduled before the auction the amount of capacity released in the auction would be lower under this option than the second priority firm auction product (see section 4.1 for more detail). This is because as available rights do not usually have a contracted capacity attached to them.

3. **Option 3: Second priority interruptible auction product:** This auction product ranks *below* all other transportation rights from a scheduling, curtailment and renomination rights perspective in relation to the contracted but un-nominated capacity. The prioritisation of as available and interruptible services ahead of the auction product in relation to renomination rights and curtailment in this case appears to go beyond what the AEMC intended. It could also substantially limit the incentive shippers with firm capacity have to sell spare capacity prior to the auction. From a risk perspective, this auction product is expected to be subject to:

- a high degree of curtailment risk because it will be subordinate to firm, as available and interruptible shippers' renomination rights and will also be curtailed before these products if another curtailment event occurs; and
- higher gaming risks than under the second priority firm service option.

The amount of capacity released in the auction would also be lower under this option than the second priority firm and as available auction products (see section 4.1 for more detail), because interruptible rights do not usually have a contracted capacity attached to them.

4. **Option 4: Hybrid auction product:** Under this option, two auction products would be available:

- a firm auction product, which would rank equally to other firm transportation rights (note that this ranks higher than the second priority firm auction product); and
- a second priority interruptible auction product, which would rank below all other transportation rights in relation to the contracted but un-nominated capacity.

To create a firm auction product under this option, some renomination rights would need to be restricted. This option may not therefore be consistent with the AEMC's recommendations that nomination and all renomination rights (firm and reasonable



endeavours rights) be accommodated and the auction product be curtailed ahead of firm services. From a risk perspective:

- the firm auction product would be subject to a low degree of curtailment risk while the second priority interruptible product would be subject to a high degree of curtailment risk; and
- the gaming risks appear to be highest under this option.

From a prospective shipper's perspective, the willingness to purchase any of these products through the day-ahead auction, which is critical to the success of the auction and the capacity trading reforms more generally, will depend on the perceived risk of the product and whether these risks can be managed. Setting aside the gaming risks, which will, as far as possible, be dealt with through market conduct rules (see Chapter 7), the key risk that auction participants will face is curtailment risk. As noted above, the risk of curtailment is highest under the second priority interruptible auction product and lowest under the hybrid option firm auction product. Whether this difference is material, however, will depend on the likelihood that auctioned capacity will be curtailed and whether the risks of curtailment can be minimised. These issues are discussed below.

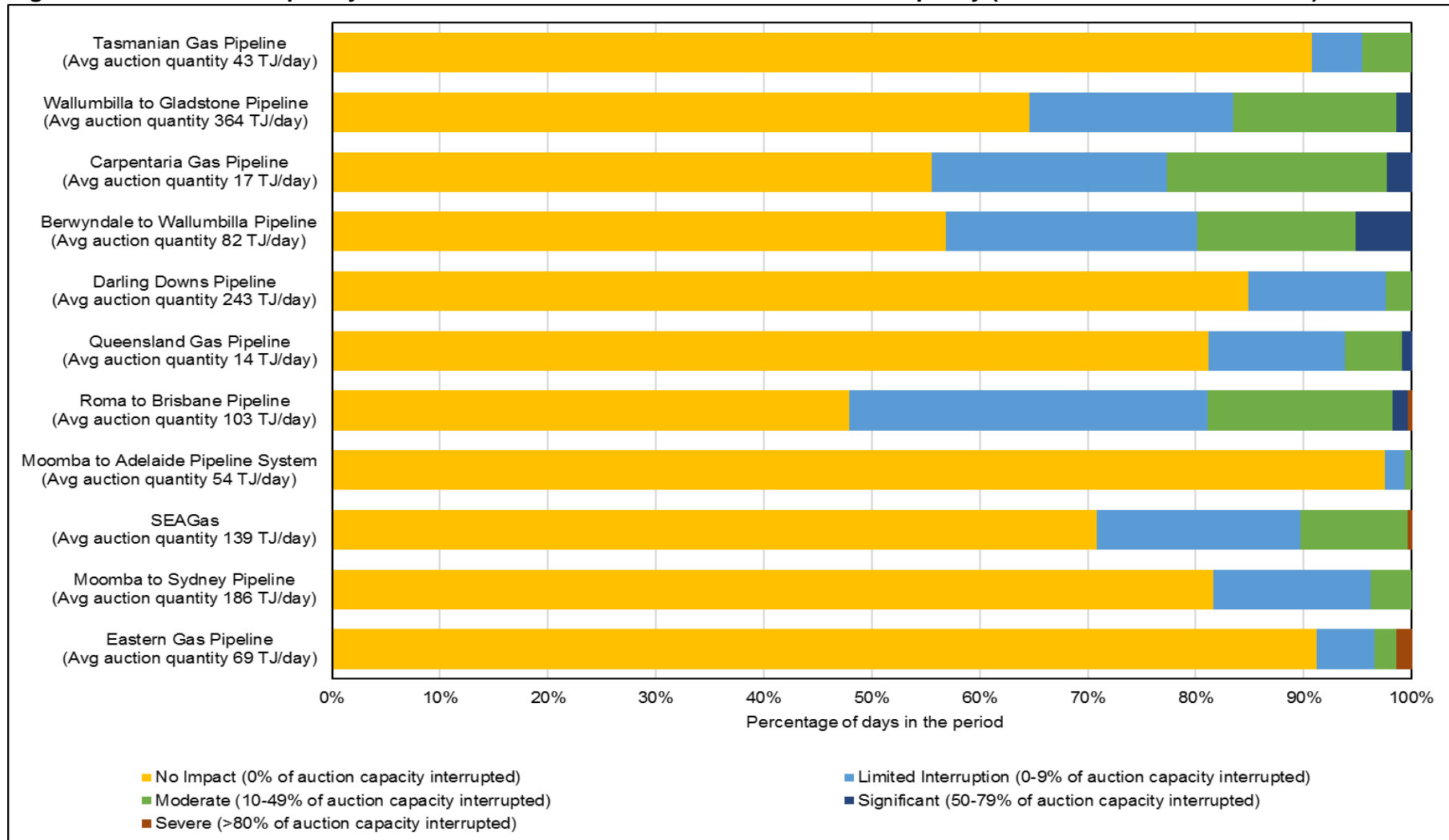
Risk of curtailment

To get some insight into the risk of curtailment, the GMRG engaged EnergyEdge to use historic Natural Gas Services Bulletin Board (BB) data to examine the likelihood that the contracted but un-nominated capacity released through a day-ahead auction would be curtailed if the auction had been in place since 2016.³⁹ The results of this examination are summarised in Figure 3.1 (see Appendix D for more detail).

Before examining this figure, it is worth noting that the information on nominations and actual deliveries used to measure the risk of curtailment is only reported to the BB on an aggregated basis. It is not therefore possible to measure the risk of curtailment under each of the product options outlined above. Another limitation with the data is that information on contracted capacity used in the calculation of auction quantities and the risk of curtailment has only been available on the BB since November 2016, so the period of analysis is relatively short (i.e. eight months). Some care must therefore be taken when interpreting the results of this analysis and drawing firm inferences about future risks.

³⁹ The risk of curtailment has been measured by comparing the firm nominations for gas day D-1 with actual deliveries on gas day D.

Figure 3.1: Level and frequency of curtailment of contracted but un-nominated capacity (November 2016 – June 2017)



Source: EnergyEdge, Auctionable Quantity Risk, 14 August 2017.

Note that limitations on the way in which data is reported for the SWQP on the BB meant that it was not possible to carry out a similar analysis for this pipeline.



As Figure 3.1 shows, the risk of curtailment was relatively low on most pipelines over the period of analysis, with the majority of pipelines experiencing no curtailment on 80% or more days in the period. There are, however, some notable exceptions to this, including the Roma to Brisbane, Berwyndale to Wallumbilla, Carpentaria, Wallumbilla to Gladstone and SEAGas pipelines, with each of these pipelines experiencing greater levels and more frequent periods of curtailment.

It is worth noting that these results are likely to underestimate the curtailment risk that would exist once the auction is implemented, because if the auction works as intended, firm capacity holders that do not need their capacity will trade it before the auction whereas firm capacity holders that may still need access to their capacity won't. The capacity mix in the auction may therefore be heavily skewed towards the kind that is more likely to be interrupted. The data used in this analysis cannot distinguish between these two kinds of capacity. The results are therefore likely to underestimate the curtailment risk once the auction and the capacity trading platform are in place.

Notwithstanding these limitations, it is clear from these findings that curtailment is a genuine risk and that prospective shippers are likely to ascribe a higher value to firmer products and be more willing to participate in the auction, which will be critical to the success of the capacity trading reforms.

Tools to manage the risk of curtailment

During their discussion on the relative merits of the options set out in Table 3.1, the Day-Ahead Auction project team considered whether any measures could be put in place to mitigate the risk of the auction product being curtailed. The measures that were discussed in this context include:

- Informational measures that can help to inform auction participants of the likelihood that auction capacity will be curtailed before they bid for capacity, which include having recourse to publicly available information, such as:
 - the BB, which includes information on forecast nominations, contracted capacity levels, historic information on actual flows and material changes to capacity and intra-day flows;
 - the STTM and DWGM schedules;
 - the short term and medium term Projected Assessment of System Adequacy (PASA), which includes information on electricity forecasts; and
 - the auction platform, which will include information on the capacity available for auction.
- Other measures to reduce the impact of being curtailed, which include:
 - not requiring auction winners to pay for capacity that is curtailed (see section 4.6); and
 - allowing auction winners to access primary capacity from the service provider if there is any spare primary capacity available on the pipeline.

In practice the latter of these options would require the auction winner to have an existing as available or interruptible service with the service provider (which may be



provided for in the shipper's operational GTA) that it can readily access if curtailment occurs and for the auction winner to pay the service provider for this service.

Note that the latter of these proposals differs from the AEMC's suggestion that as available and interruptible services should be phased out so they don't compete with rights allocated in the auction. While acknowledging the concerns held by the AEMC about the potential for as available and interruptible services to compete with the auction product, the project team thought there would still be value in maintaining these services as a risk management tool. Specifically, the project team thought that if the contracted but un-nominated capacity is curtailed as a result of renomination rights and there is still spare physical capacity on the pipeline, then rather than being curtailed, auction winners should have the option to access the primary capacity through an as available or interruptible service.

GMRG's preliminary view

Having regard to the AEMC's recommendations and the assessment framework set out in section 2.3, the GMRG has considered the relative merits of the four options in Table 3.1.

As noted in Table 3.1, the hybrid option (Option 4) does not appear to comply with the AEMC's recommendation that all renominations (including firm and implied rights) be accommodated and that the auction product be curtailed before the firm product. Of the remaining three options, the second priority firm auction product (Option 1) is more consistent with the AEMC's recommendations regarding nominations and renomination rights, the curtailment order and as available and interruptible rights, than the other two options. It is also subject to a lower level of curtailment and gaming risk and will provide shippers with firm capacity rights the strongest incentive to release any spare capacity they may have prior to the auction. It can therefore be considered more consistent with:

- the NGO, because it will allow capacity in the short-term to be allocated to those that value it most and, in so doing, promote the efficient use of natural gas services and the long-term interests of consumers of natural gas;
- the broader objectives of the capacity trading reforms, which are to improve the efficiency with which transportation capacity is allocated and used and foster the development of a more liquid market for secondary capacity; and
- the Energy Council's Vision of the direction gas market development should take and a number of the outcomes it expected to pursue in the next phase of gas market reform (i.e. outcomes 2(b) and 3(b)– see Box 1.1).

As to the arguments some project team members raised in support of their claim that a lower quality auction product should be adopted, the GMRG is not convinced that the adoption of a second priority firm auction product will devalue firm rights in primary GTAs, or reduce the incentive for efficient investment in pipelines, because:

- the proposed auction product will be subordinate to firm transportation rights; and
- shippers that rely on purchasing capacity through the auction would, as the AEMC noted, be subject to price and volume risk (i.e. if demand for capacity is high, the



auction would clear at a high price and there is also a risk no capacity would be available in the auction).⁴⁰

The GMRG therefore expects firm rights in primary GTAs to continue to be valued and used by shippers, although as the AEMC noted, the introduction of the auction may enable shippers to fine-tune their capacity requirements, which may result in lower levels of capacity being contracted in the future. While some project team members have claimed this will have a deleterious effect on pipeline investment, it is important to recognise that investment is not synonymous with dynamic efficiency and that if de-contracting results in a reduction in unnecessary investment, this would be efficient.

The GMRG is also not convinced that the adoption of a second priority firm auction product will discourage prospective shippers from entering into secondary capacity trades, because this product is still a lower quality product than the firm rights that can be procured through a secondary trade. It will also only be available on a day-ahead basis. As highlighted by the analysis undertaken by EnergyEdge, if the product quality is too low and the curtailment risk is perceived to be too high, then there is unlikely to be much demand for the auction product. If this occurs, then the incentive that the AEMC thought the auction would provide firm capacity holders to release spare capacity and the expected benefits of the capacity trading reforms may fail to materialise.

As the preceding points highlight, the GMRG is of the view that the auction product should be a second priority firm product. This is, however, a preliminary view only at this stage and the GMRG is interested in hearing other stakeholders' views on this option. The GMRG is also interested in hearing whether there are any other risk management tools that stakeholders believe could be used to manage the curtailment risks that will be associated with this product. As noted previously, the project team has given some thought to this issue. NERA has also identified some options to manage curtailment risk in the auction design, which is discussed in further detail in section 4.5. While there are a number of tools that auction participants can have recourse to, none of them will completely eradicate the risk of curtailment. The GMRG is therefore interested in hearing whether stakeholders have any other suggestions.

Box 3.4: Questions on the priority of the auction product

3. Do you agree with the proposal to adopt a second priority firm auction product? If not:
 - please explain why you think this option should not be selected; and
 - please set out the option you think should be adopted and why you think it is more consistent with the AEMC's recommendations and the assessment framework set out in section 2.3 than the second priority firm auction product.
4. Are there any other tools that you think should be available to auction participants to manage curtailment risk?

⁴⁰ AEMC, Stage 2 Draft Report: East Coast Review, 4 December 2015, pp. 57-58.



3.3 Other features of the auction product

In addition to considering the firmness of the auction product, the Day-Ahead Auction project team considered whether the auction product should have any maximum hourly quantity (MHQ) flexibility, renomination rights or an imbalance allowance.

In short, project team members agreed that:

- the MHQ factor for the auction product should be the same as that specified in the service provider's operational GTA for the relevant facility; and
- the auction product should have a reasonable endeavours renomination right.

There was, however, some debate about whether the auction product should have an imbalance⁴¹ allowance, or if the allowance would remain with the firm capacity holders whose capacity has been released in the auction.

The GMRG agrees with the position the project team reached on MHQ and renomination rights. In relation to imbalance allowances, the GMRG's preliminary view is that the auction product should have an equivalent allowance to that which would apply to secondary capacity trades (as specified in the service provider's operational GTA), so that auction winners have some ability to manage the inevitable variation between receipts and deliveries. One potential problem with this proposal is that if it results in the imbalance allowance of market operator service (MOS) providers in the STTM being reduced and if this is the only mechanism by which MOS providers provide balancing services, then it may affect their ability to provide this service. The GMRG is therefore interested in hearing from stakeholders about whether this proposal is feasible and if there are any other issues associated with providing auction winners an imbalance allowance.

⁴¹ An imbalance arises when the shipper's receipts differ from its deliveries. The imbalance may be positive or negative.



Box 3.5: Questions on other elements of the auction product

5. Do you think the auction product should have:
 - the same MHQ factor as that specified in the service provider's operational GTA? If not, please explain why.
 - a 'reasonable endeavours' renomination right? If not, please explain why.
6. Do you think the auction product should have an imbalance allowance equivalent to that specified in the service provider's operational GTA?
 - What, if any, effect do you think this would have on a MOS provider's ability to provide balancing services in the STTM? If you think it will be problematic, are there any measures that you think could be employed to address this issue, while also providing auction winners with some level of an imbalance allowance?
 - Are there any other issues that the GMRG should be aware of in relation to this proposal?

3.4 Zonal versus point-to-point auction products

The AEMC's recommendations did not specify whether the auction should be conducted on a zonal or point-to-point basis. This issue was, however, considered to some extent when AEMO and APGA presented their initial proposals to operate the auction.

At the time these proposals were developed, AEMO proposed to conduct the auction between key points (or zones), while APGA proposed to conduct the auction between individual receipt and delivery points. Following the decision to accord AEMO responsibility for operating the auction, the Day-Ahead Auction project team proceeded on the basis that the zonal approach developed for the capacity trading platform would also apply in the auction. Under this approach, auction participants would be able to acquire capacity on a zone-to-zone basis and have secondary firm rights at all the receipt and delivery points within the zones.⁴² Secondary firm rights are required in this case because:

- the contracted but un-nominated capacity released through the auction may be released from different receipt or delivery points in the zone to those the auction winner intends to use; and
- the capacity of individual receipt and delivery points within a zone will usually be lower than the zonal capacity.

Further detail on the zonal model and secondary firm rights concept can be found in Chapter 4 of the *Standardisation Related Reforms and the Capacity Trading Platform Consultation Paper*.⁴³

⁴² Secondary firm rights allow shippers to use any receipt or delivery points within a zone subject to the following priority schedule:

- primary shippers with firm rights at a receipt or delivery point have the highest priority;
- shippers with secondary firm rights have the second highest priority and are treated equally if there is insufficient capacity at a point (i.e. they all receive a pro-rata allocation of capacity); and
- shippers with as available or interruptible rights at a receipt or delivery point have a lower priority than shippers with secondary firm rights.

⁴³ <http://gmrgr.coagenergycouncil.gov.au/publications/standardisation-related-reforms-and-capacity-trading-platform-consultation-paper>



Through subsequent discussions with NERA, it has become clear that a point-to-point approach with some zoning of substitutable points (for example, in the STTM) would be simpler to implement and more straightforward for auction participants, service providers (who need to calculate the auction quantity) and AEMO.

Under the point-to-point approach, the contracted but un-nominated capacity at individual receipt and delivery points and the pipeline segments connecting receipt and delivery points would be released into the auction. Auction participants would then submit bids for individual receipt and delivery points and the capacity of the pipeline between these points would be allocated through the auction algorithm. For example, if an auction participant wanted to transport 10 TJ of gas on the Roma to Brisbane Pipeline between Wallumbilla run 2 and Dalby, it would submit bids for 10 TJ of capacity at the Wallumbilla run 2 receipt point and 10 TJ of capacity at the Dalby delivery point. If there is sufficient contracted but un-nominated capacity on the Roma to Brisbane Pipeline between these two points and the auction participant was successful in the auction, then it would be allocated 10 TJ of capacity at the Wallumbilla run 2 receipt point, 10 TJ at the Dalby delivery point and 10 TJ on the pipeline segment between these two points.

Under the point-to-point approach, if an auction participant wins capacity at its selected points then, in a similar manner to the zonal approach, it will have secondary firm rights at these points. Secondary firm rights are required in this case to deal with the risk that the firm contract holders renominate their receipt or delivery point capacity upwards on the day.

While the GMRG can see merit in using more of a point-to-point approach in the auction, it is interested in hearing whether stakeholders have any concerns about the proposal to use different approaches for the capacity trading platform and auction. In this regard, it is worth noting that the zonal model has been proposed for the trading platform to maximise the pool of potential buyers and sellers of secondary capacity. This pooling benefit is not, however, required in the day-ahead auction because all of the contracted but un-nominated capacity will be aggregated and released through the auction. So, from this perspective there is no need for the same approach to be employed. However, if the zonal approach results in trading platform users being exposed to a greater level of delivery risk than auction participants, this would need to be considered further given the potential for the different approaches to distort shippers' decisions to use these two mechanisms.

The GMRG is also interested in understanding the potential for the point-to-point approach to result in commercial in-confidence information being published if information on the contracted but un-nominated capacity at each point is published prior to the auction. The GMRG understands that a similar issue was considered by the AEMC in its recent BB rule change. In this case the AEMC considered whether disaggregated nomination information should be published on the BB but concluded that the publication of this type of information could adversely affect competition in the NEM by revealing a gas-fired generator's intended electricity generation. The final rule therefore requires AEMO to aggregate this information in a manner, which so far as practicable, does not



directly or indirectly disclose a nomination made by a ‘market generating unit’ as defined in the National Electricity Rules (NER).⁴⁴

Given the parallels between this rule change and what is being contemplated under the point-to-point approach, it is relevant to consider how the confidentiality of information on the contracted but un-nominated capacity at the delivery points servicing ‘market generating units’ could be maintained. While the zonal approach could be used to address this issue, there are other methods that could be used. For example, access to this information on the auction platform could be limited to participants that can demonstrate to AEMO they have permission to use those points. The GMRG is interested in hearing stakeholders’ views on these options and any other options that may be considered appropriate.

Box 3.6: Questions on contract path specification

7. Do you think a zonal or point-to-point contract path approach should be employed in the auction?
8. If you think a point-to-point approach should be employed, do you have any concerns with:
 - the proposal to use different approaches for the trading platform and auction? If so, please explain why.
 - the potential for the publication of information on contracted but un-nominated capacity at delivery points servicing market generating units to adversely affect competition in the NEM? If so, please explain why and how you think this could be addressed.
9. Are there any other complexities associated with the point-to-point approach or technical requirements the GMRG should factor into its consideration of this issue?

3.5 Summary of the GMRG’s preliminary view on product design

Table 3.2 summarises the GMRG’s preliminary view on the design of the day-ahead auction product. Table A.2 in Appendix A shows how these preliminary views compare with the AEMC’s recommendations.

⁴⁴ AEMC, Rule Determination: National Gas Amendment (Improvements to Natural Gas Bulletin Board) Rule 2017, 26 September 2017, p. 40.



Table 3.2: Summary of the GMRG's preliminary view on product to be auctioned

Design Element	Preliminary View
Products to be auctioned	<ul style="list-style-type: none"> ▪ Forward haul transportation services (with separate products offered in both directions on bi-directional pipelines). ▪ Compression services. ▪ Interruptible backhaul services on single direction pipelines.
Priority of the auction product	<ul style="list-style-type: none"> ▪ The auction product should be a second priority firm product, which in relation to the contracted but un-nominated capacity will rank <i>below</i> firm transportation rights, but above all the other transportation rights (e.g. as available and interruptible rights) from a scheduling, curtailment and renomination rights perspective. ▪ Nominations and renominations by shippers with firm transportation rights will be accommodated, but will not be accommodated in relation to other rights. ▪ As available and interruptible products will not be phased out, but in relation to contracted but un-nominated capacity they will be scheduled after the auction product so they don't compete with the rights allocated in the auction.
Other features of the auction product	<ul style="list-style-type: none"> ▪ MHQ factor to be based on the factor set out in the service provider's operational GTA. ▪ Reasonable endeavours renomination rights. ▪ Imbalance allowance to be based on the allowance specified in the service provider's operational GTA.
Zonal or point-to-point contract paths	<ul style="list-style-type: none"> ▪ Point-to-point contract paths (with zoning of substitutable points) and secondary firm rights at selected receipt and delivery points. ▪ Measures should be implemented to ensure that information on the contracted but un-nominated capacity at delivery points does not directly or indirectly disclose a nomination made by a market generating unit as defined in the NER.



4. Auction Design

In the *East Coast Review* the AEMC made a number of recommendations about the design of the day-ahead auction of contracted but un-nominated capacity. These recommendations are summarised in Table 4.1.

Table 4.1: AEMC recommendations on auction design

AEMC Recommendation		Classification
Auction quantity	At least all technically feasible contracted but un-nominated capacity to be released through the auction.	Required outcome
Auction format	Combinatorial auction where multiple buyers and sellers can simultaneously coordinate trades, managing the complementarities between different pipeline segments.	Preferred outcome
	Single round auction to reduce complexity and opportunities for anti-competitive behaviour between participants.	
Reserve price	Reserve price of zero dollars with compressor fuel provided by shippers in-kind.	Required outcome
Pricing rule	Bidders pay the value of their winning bids ("first-price" rule) to reduce complexity.	Preferred outcome
Determination of winning bids	Winning combination of bids determined using a profit maximisation algorithm (constrained by requirement that at least all contracted but un-nominated capacity is put on sale in auction).	Preferred outcome
Allocation of auction residue	Preferred method to allocate to service providers after the costs of running the auction have been recovered.	Preferred outcome
Auction timing	Auction to be conducted on a daily basis, shortly after nomination cut-off time.	Required outcome

Source: AEMC, Stage 2 Final Report: *East Coast Review*, 23 May 2016, p. 16.

The AEMC's recommendations have been considered by the Day-Ahead Auction project team and by NERA, the GMRG's auction design expert and are discussed in further detail in the remainder of this chapter.

4.1 Auction quantity

A required outcome of the day-ahead auction is that all contracted but un-nominated capacity (within technical constraints) should be released through the auction. In making this recommendation, the AEMC noted that it will:⁴⁵

“support the rationale for the day-ahead auction of increasing market liquidity by providing access to all available capacity and preventing pipeline owners from restricting supply and hence increasing the price outcomes of the auction.”

⁴⁵ AEMC, Stage 2 Final Report: *East Coast Review*, 23 May 2016, pp. 76-77.



The AEMC went on to add that determining the quantity of contracted but un-nominated capacity “should be a relatively trivial calculation” and set out in either the NGR, or determined by service providers through a process approved by the AER.⁴⁶

If, as proposed in section 3.4, the auction product is available on a receipt and delivery point basis then the service provider’s daily calculation of the contracted but un-nominated capacity should be relatively straightforward. For example, if Shipper A has reserved capacity of 20 TJ/day at receipt point A and delivery point B but only nominates to use 10 TJ on gas day D, then 10 TJ/day of capacity at receipt point A, delivery point B and the pipeline segment connecting these two points would be released into the auction.

One potential complexity with this calculation that needs to be considered is whether the nominations a service provider receives for as available or interruptible capacity prior to nomination cut-off time should be included in the calculation. As section 3.2 highlights this will, in turn, depend on whether the auction product is:

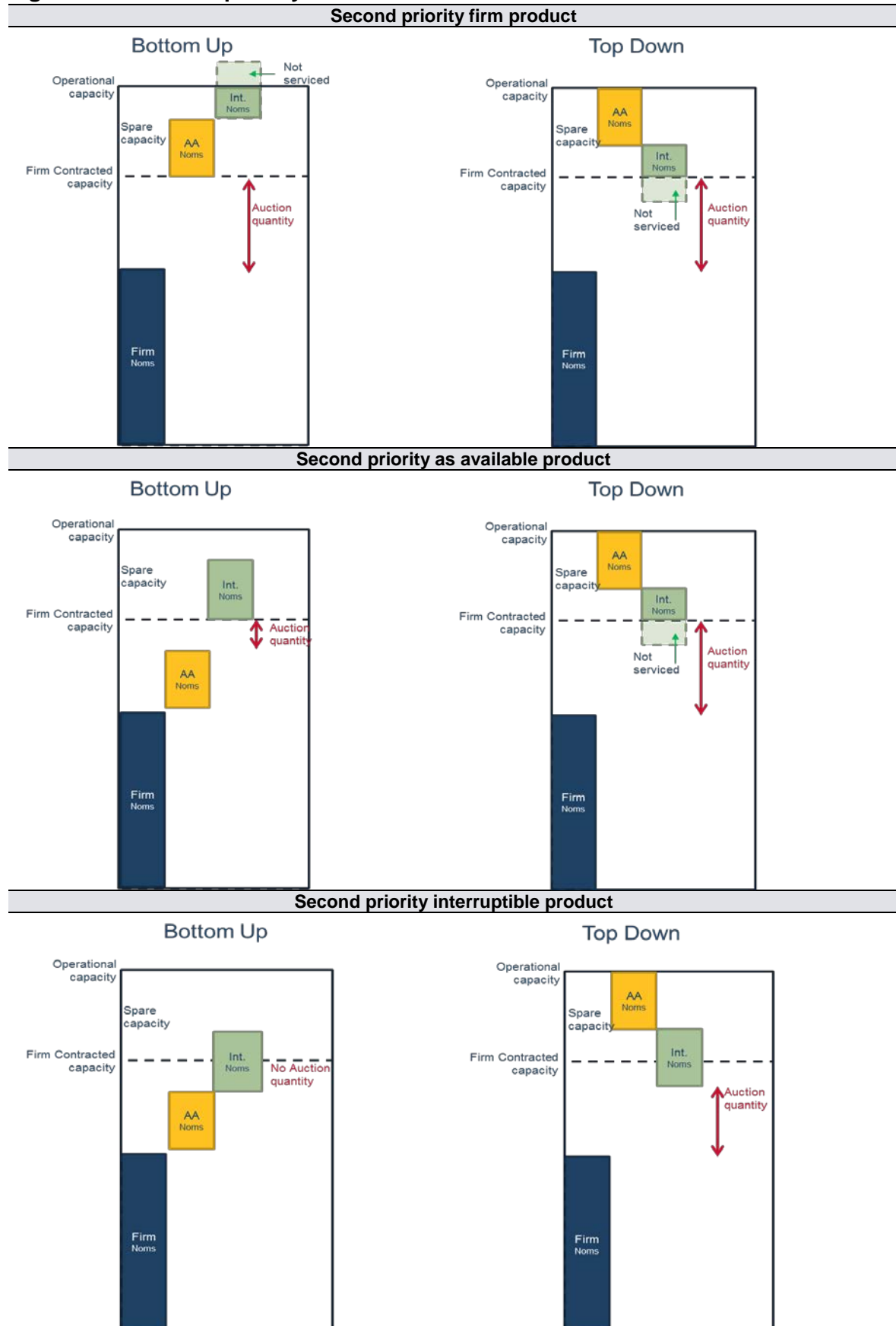
- **a second priority firm product (Option 1):** In this case the calculation would *exclude* as available and interruptible nominations because the auction product would be scheduled ahead of these services when allocating the contracted but un-nominated capacity;
- **a second priority as available product (Option 2):** In this case the calculation would *include* as available nominations but *exclude* interruptible nominations because the auction product would be scheduled after as available services but before interruptible services when allocating the contracted but un-nominated capacity; or
- **a second priority interruptible product (Option 3):** In this case the calculation would *include* as available and interruptible nominations because the auction product would be scheduled after these products when allocating the contracted but un-nominated capacity.

The effect that product design will have on the calculation of the auction quantity can be seen in Figure 4.1, which also highlights the effect that a bottom up or top down approach to scheduling as available and interruptible nominations received prior to nomination cut-off time will have on the auction quantity. As this figure highlights:

- the auction quantity is greatest under the second priority firm product design and lowest under the second priority interruptible product design; and
- if there is spare primary capacity available then the top down approach to scheduling will maximise the auction quantity available under the second priority as available and interruptible product design options.

⁴⁶ *ibid*, p. 77.

Figure 4.1: Auction quantity calculations





These options were discussed with the Day-Ahead Auction project team, but in a similar manner to product design, the team was unable to reach consensus on whether as available or interruptible nominations received prior to nomination cut-off should be included in the calculation of contracted but un-nominated capacity. A number of project team members did, however, think there was value in employing a top-down approach to scheduling as available and interruptible nominations if there is spare primary capacity available.

As noted in section 3.2, the GMRG's preliminary view is that the auction product should be a second priority firm product. The GMRG is therefore of the view that as available and interruptible nominations received prior to nomination cut-off should not be included in the calculation of contracted but un-nominated capacity.

If this preliminary view is maintained in the GMRG's final recommendation then no further consideration will need to be given to whether a top down or bottom up approach to scheduling as available or interruptible products should be employed, because they will be scheduled after the auction product. If, however, a decision is made to adopt a second priority as available or interruptible auction product, then further consideration will need to be given to this issue. In this regard, it is worth noting that like the majority of project team members, the GMRG thinks there would be merit in trying to maximise the volume of capacity released in the auction by employing a top down approach to scheduling if spare primary capacity is available. The GMRG is, however, interested in understanding whether there are any technical reasons why this approach could not be employed.

The GMRG is also interested in stakeholders' views on whether:

- there are any other factors that service providers would need to take into account when calculating the auction quantity for each product;
- there are any specific calculation issues that the GRMG would need to consider if the point-to-point approach is used (see section 3.4); or
- the method used to calculate the auction quantity should be specified in the NGR.

Box 4.1: Questions on the calculation of auction quantity

10. Do you agree that the calculation of the contracted but un-nominated capacity will simply involve deducting the actual nominations from the reserved capacity for each product (e.g. at receipt points, delivery points, pipeline segments and compression), or are there other complexities that service providers will need to deal with that have not yet been identified?
11. Given your view on product design, do you think as available or interruptible nominations received prior to nomination cut-off should be included in the calculation of contracted but un-nominated capacity?
12. If the auction product is defined as a second priority as available or interruptible product, do you think service providers should be required to employ a top down approach to scheduling these services, or are there technical reasons why this approach can't be employed?
13. Are there any other factors that service providers would need to take into account when calculating the auction quantity for each product?
14. Are there any specific calculation issues that the GRMG would need to consider if the point-to-point approach is used?



15. Do you think the method service providers are to use when calculating the auction quantity should be specified in the NGR, or do you think service providers should be able to develop their own method and have it approved by the AER?

4.2 Auction format

The AEMC's preferred outcomes for the day-ahead auction format are that:⁴⁷

- a combinatorial auction format be employed so that auction participants can co-ordinate trades and manage complementarities between pipelines; and
- a single round of bidding be allowed to reduce the complexity associated with the auction and minimise the opportunities for anti-competitive behaviour.

A combinatorial auction is required in this context, because the day-ahead auction will include capacity at receipt points, delivery points, pipeline segments and compression services (jointly referred to as 'products' in the following discussion). To transport gas from one point to another, auction participants will need to win the same quantity of all products that connect the receipt and delivery points. If bidders compete for individual products in an auction, they run the risk of winning capacity at only a subset of them, which would be of no value to them. The combinatorial auction format, which allows bidders to submit bids for packages or combinations of products, reduces this aggregation risk because it allows participants to make their bid for one product conditional upon obtaining other products.

There are two types of combinatorial auction formats that could be used in this context:

- **Partial combinatorial auction:** A partial combinatorial auction is a linear-programming based auction mechanism that allows participants to bid the same quantity across a number of products at the same time. Under this auction format a participant's bid may be partially filled, but if this occurs then it will win the same quantity for all products included in the bid. While this auction format can accommodate simple demand, it cannot accommodate substitutable or complementary demand without modification. This auction format is currently used in the inter-regional Settlement Residue Auction (SRA), which AEMO is proposing to use as the basis for the day-ahead auction.
- **Fully combinatorial auction:** A fully combinatorial auction is an integer linear programming based auction mechanism that allows participants to bid for mutually-exclusive packages and only win bids in their entirety. It therefore shields auction participants from aggregation risk and can also accommodate simple, substitutable and complementary demand.

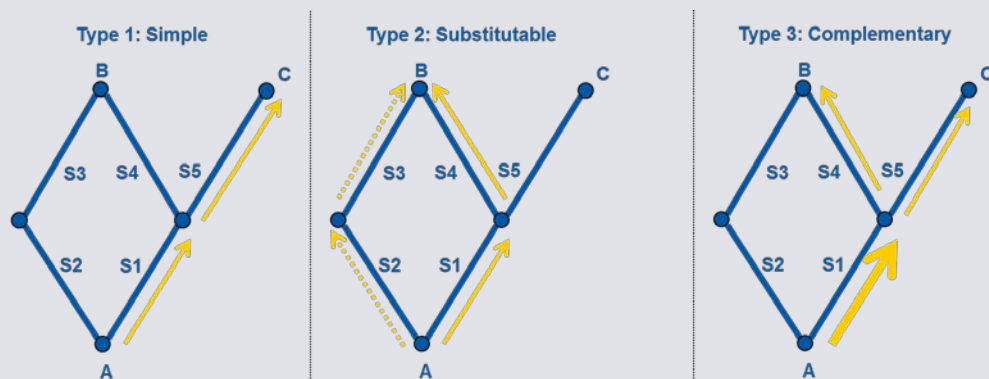
The choice between these two auction formats will depend on the nature of demand that auction participants are expected to have and the level of aggregation risk that auction participants are expected to be exposed to. Box 4.2 provides further detail on the different types of demand that auction participants may want to express in the auction, while Table 4.2 provides further detail on the differences between the partial and fully combinatorial auction formats.

⁴⁷ AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, pp. 78-79.

Box 4.2: Potential demand profiles

Figure 4.2 illustrates the potential demand profiles that auction participants may have.

Figure 4.2: Potential demand profiles



Type 1: Simple demand

In this case a bidder wants to transport the same amount of gas from A to C, which requires the same capacity to be purchased at receipt point A, segment S1, segment S5 and delivery point C. This type of demand appears to be the most dominant form of demand in the east coast that would need to be accommodated in the day-ahead auction, which could be done under either a partial or fully combinatorial auction.

Type 2: Substitutable demand

In this case a bidder wants to transport gas from A to B, but there are two different routes (S1-S4 and S2-S3). The two routes may be:

- perfect substitutes in which case the bidder does not have a preference whether gas is transported via S1-S4 or S2-S3; or
- imperfect substitutes in which case the bidder may be willing to pay more for one route.

In the east coast, there are currently only a small number of substitutable paths that are technically feasible (e.g. gas from the Gippsland, Otway and Bass basins can be transported to Moomba via three different routes or to Sydney and Canberra via two different routes). However, most of these substitutable paths involve transporting gas across the Victorian Declared Transmission System, which will not be subject to the auction. These substitutable paths are therefore likely to be imperfect substitutes.

If this type of demand was commonplace, the day-ahead auction would need to allow participants to bid for mutually exclusive paths at different bid amounts. This could be done under a fully combinatorial auction or a partial combinatorial auction that includes XOR bidding. Discussions with the Day-Ahead Auction project team, however, suggest that this type of demand is not currently commonplace.

Type 3: Complementary demand

In this case the bidder wants to transport gas from A to B *and* C, but has no (or very little) value in transporting gas from A to only one of B or C.

While in principle this type of demand could exist, in discussions with the Day-Ahead Auction project team it has become clear that this type of demand is unlikely to arise in practice and if it does, then it would be more appropriately dealt with by contracting directly with service providers than through the day-ahead auction. It has therefore been assumed that this type of demand is unlikely to be an important component in the day-ahead auction.

Table 4.2: Partial vs fully combinatorial auction formats

	Partial combinatorial auction	Fully combinatorial auction
Description	<ul style="list-style-type: none"> ▪ Bid consists of a quantity, a price per unit and a nomination of the segments included in bid (e.g. S1 only or S1&S5) ▪ Bid amount caps the sum of prices paid for transporting one unit at each segment included in the bid ▪ Bidders can submit multiple bids - more than one of their bids may win ▪ Winning bids determined simultaneously using a linear program - maximum value $\sum(\text{bid amount} * \text{amount allocated to bid})$ ▪ If a bidder wins part of its bid, the quantity won across all products in the bid is the same ▪ May use a pay as bid or a uniform pay-as-cleared pricing rule. ▪ The partial combinatorial auction can be coupled with: <ul style="list-style-type: none"> – minimum requirements to minimise aggregation risk (i.e. if a participant wins less than the minimum requirement, its bid is discarded); and – XOR bidding to accommodate substitutable demand (this form of bidding enables participants to bid for mutually exclusive paths at different bid amounts). 	<ul style="list-style-type: none"> ▪ Bid consists of a quantity for each segment (Q_S1, Q_S2, Q_S3 etc) and a total bid amount for the entire bid ▪ Bidders can submit multiple <i>mutually-exclusive</i> bids – at most one may win ▪ Winning bids are identified using an integer linear program (ILP) - maximum value. ▪ May use a pay as bid (first price), second price or pseudo clock pricing rule.
Advantages	<ul style="list-style-type: none"> ▪ Simple for bidders to understand. ▪ Identification of price for individual products relatively straightforward. ▪ Accommodates simple demand (Type 1). ▪ Implementation relatively simple 	<ul style="list-style-type: none"> ▪ Removes all aggregation risks. ▪ Mutually exclusive bids can accommodate: <ul style="list-style-type: none"> – simple demand (Type 1); – substitutable demand (Type 2); and – complementary demand (Type 3).
Disadvantages	<ul style="list-style-type: none"> ▪ Does not fully remove aggregation risk because participants may win less than the quantity specified in their bids, but this can potentially be accommodated through a minimum requirement. ▪ Does not accommodate: <ul style="list-style-type: none"> – substitutable demand (Type 2), unless coupled with XOR bidding; or – complementary demand (Type 3) 	<ul style="list-style-type: none"> ▪ Bidding language complex and requires bidders to submit a very large number of bids to express their demand (see Box 4.3) ▪ First-price rule requires sophisticated bid strategy and increases complexity for bidders ▪ Second-price rule is complex to implement ▪ Pseudo-clock pricing may lead to grossly inefficient allocation ▪ First- and second-price rules determine a price for each winning package which complicates the allocation of the auction residue ▪ Significantly more complex to implement than partial format.



As the discussion in Box 4.2 highlights, the most dominant form of demand that the day-ahead auction will need to accommodate is simple demand (Type 1). While this type of demand could be accommodated under either a partial or fully combinatorial auction, a fully combinatorial auction would add significant complexity for bidders (see Box 4.3) and the auctioneer (AEMO). It would also be more complex to implement. NERA has therefore recommended the adoption of a partial combinatorial auction format, which the Day-Ahead Auction project team unanimously supported.

All project team members agreed that the auction should be as simple as possible and that the partial combinatorial format protects bidders adequately from all conceivable aggregation risks. The Day-Ahead Auction project team did not see any advantage in adopting a fully combinatorial format and unanimously rejected it owing to its significant additional complexity.

Box 4.3: Complexity of bidding in fully combinatorial auctions

The efficiency of the final allocation under the fully combinatorial auction depends critically on bidders submitting a rich set of bids. In particular, it requires that bidders submit bids for all combinations for which they have positive value. Yet, the bidding language employed by combinatorial auctions can be cumbersome for bidders. In practice, it is unlikely that bidders would submit bids for all possible combinations as there would likely be a very large number.

Demand in the auction is also expected to be additive in most parts. That is, auction participants will bid for different routes in the network and for each of these routes, participants would be expected to bid a demand curve with decreasing bid amounts for incremental units. The number of bids required to fully express this demand profile increases exponentially in the number of routes a bidder is interested in as well as the number of increments.⁴⁸ For example, if an auction participant wants to bid for three different routes and on each of these routes wants to express demand for three different increments, it would need 64 bids. For four routes with four increments each, the participant would need 625 bids and for five routes with five increments, 7,776 bids. It is clearly impractical to require bidders to submit that many bids. In contrast, in the partial combinatorial auction, a bidder would only need 25 bids to bid for five routes with five increments.

Further detail on the partial combinatorial auction format is provided below, along with an overview of two optional features that could be used to allow participants to express Type 1 and Type 2 demand without exposing them to the risk of winning unusably low quantities (minimum requirement) or substitutable paths (XOR sets). A third optional feature is also discussed below, which would enable backhaul capacity to be released through the auction on those pipelines that do not currently operate in a bi-directional manner, if a decision is made that this type of capacity should be released through the auction (see section 3.1).

4.2.1 Partial combinatorial auction

Under the partial combinatorial auction format, a bid consists of a bid quantity (GJ), a bid price (\$/GJ) and a nomination of products (receipt and delivery points, pipeline segments and compression services). A bid effectively links demand for different products with

⁴⁸ The total number of bids required is calculated as follows: $(1 + \text{number of increments})^{\text{number of routes}}$.



bidders being guaranteed to win the same quantity of each product included in a bid. The bid amount can be interpreted as a bidder's maximum willingness to pay for winning one unit of each product included in the bid. A bidder can submit more than one bid and may win more than one of them. This allows bidders to bid for incremental units at lower bid amounts, effectively mapping out a full demand curve.

If a bid wins in full, the bidder will be allocated the specified quantity of all products included in the bid and the sum of the prices for all products included in the bid will be less than or equal to the bid price. If, on the other hand, a bid is only partially filled, then the bidder will win the same quantity across all products included in the bid and the sum of the prices for all products included in the bid will be equal to the bid price.

Winning bids are determined using a linear program, which maximises the total value of bid amounts subject to not exceeding the available supply of each product. Winning bids are determined simultaneously for all products and the lowest accepted bids are usually filled partially.

If a pay-as-cleared pricing rule is adopted (see section 4.3), then the lowest accepted bids set the per-unit prices for all products. This has the following implications:

- If some of the available supply of a product is unsold, the price of the auction product is zero.
- The lowest accepted bids impose pricing constraints on all other products. If a lowest accepted bid only includes one product, the price of that product is set to the bid price. If a lowest accepted bid includes more than one product, it imposes a constraint that the sum of the prices of the products included in that bid sum to the bid price.

Prices are then determined jointly such that they satisfy all of the constraints imposed by the lowest accepted bids. If there is more than one set of prices that jointly satisfies all of these constraints, the set of prices that maximise total auction revenues is selected. If this does not resolve all indeterminacy, a method of random selection determines the final prices, subject to the previous constraints.

Box 4.4 provides an example of how the partial combinatorial auction format works. For simplicity, the example only includes one bid that extends over more than one product.



Box 4.4: Partial combinatorial auction example

In this simple example, there are three products (S1, S2 and S3) that shippers A, B, C and D are bidding for. Each product has capacity C and each bid consists of a price per unit and the products included in the bid. The bids are set out in the table below.

Bids for capacity

Shipper	Price (per unit)	Q	S1 (C ₁ = 300)	S2 (C ₂ =200)	S3 (C ₃ = 150)
A	\$40	100	X	X	X
B	\$50	100	X		
C	\$30	160		X	
D	\$20	100			X

The way in which capacity would be allocated to shippers A, B, C and D under the partial combinatorial auction format is set out in the table below.

Allocation of capacity

Shipper	Q	S1 (C ₁ = 300)	S2 (C ₂ =200)	S3 (C ₃ = 150)	Comments
A	50	X	X	X	This is the lowest accepted bid for S3. It is only partially filled (50 of a total of 100).
B	100	X			
C	150		X		This is the lowest accepted bid. It is only partially filled (150 of a total of 160).
D	100			X	

In this example, shipper A has a higher bid per unit than shipper D, but is the lowest accepted bid for S3 and so is only partially filled. This is because shipper A competes with shipper C for capacity at S2 at the same time. Increasing the capacity allocated to shipper A by one unit, would require a reduction in the capacity allocated to shippers C and D by one unit each. While shipper A is only willing to pay \$40 for one unit of S2 and one unit of S3, shippers C and D are willing to spend \$30 + \$20 = \$50 for one unit of S2 and S3. It is therefore more efficient to constrain shipper A rather than shipper D at S3.

The final prices that would be payable in this example are set out in the table below.

Final prices

Product	Price (per unit)	Comments
S1	\$0	Total demand bid for this product is less than total capacity (150 < 300)
S2	\$30	Bid C is the lowest accepted bid and thus sets the price for this product.
S3	\$10	Bid A imposes a price link across all products: $P_{S1} + P_{S2} + P_{S3} = \40 . Because shipper A already spends \$30 per unit of S2, it can only afford an additional \$10 per unit of S3.



4.2.2 Optional feature 1: Minimum requirements

The partial combinatorial auction allows bidders to express simple demand (Type 1) and protects them from winning unusable subsets of the products included in their bids. However, there is still a risk that auction participants may win unusably low quantities. To address this risk, the partial combinatorial auction could be coupled with a minimum requirement, as has been done in the European day-ahead pipeline capacity auctions. Alternatively, participants could bear this risk, as they currently do in the STTM and DWGM.

If a minimum requirement is adopted, then it could take the form of either:

- a global minimum requirement that applies to all participants (e.g. 100 GJ); or
- a bid-specific minimum requirement that would be set by individual participants.

Irrespective of the form it takes, if a minimum requirement is adopted then the allocation process in the partial combinatorial auction will need to be modified to deal with bids that violate the minimum requirement. NERA has identified two potential options to deal with this:

- Option 1: Bidders with partially filled bids that do not meet the minimum requirement(s) will not be allocated these bids as winning bids. The winning solution (including prices) would remain unchanged and the quantity allocated to these bids would remain unsold.
- Option 2: Any partially-filled bids that violate the minimum requirement(s) are discarded and the next best solution is identified through re-optimisation. In practice, this means that the next lower bid in the bid stack would be used to fill the remainder, which would result in a change in price.

The advantage of Option 1 is that it does not require re-optimisation and ensures there are no unhappy losers. It generally leads to higher per-unit prices, but a lower total quantity actually sold. This seems acceptable if a global minimum requirement is adopted as the efficiency gain from re-optimisation is likely going to be small. However, if bidders can set bid-specific minimum requirements, this option might lead to significant amounts of unsold capacity. Bid-specific minimum requirements could also be used to drive up the price of unwanted products. For example, bidders may submit relatively high bids with a very large minimum requirement for certain products to drive up the prices paid by their rivals. Such bids are likely to set the price for these products, but unless they meet their minimum requirements, bidders would not have to pay for them.

Option 2, on the other hand, generally leads to lower per-unit prices, but a higher total quantity sold. It is more complex to implement owing to the combinatorial nature of bids and may require an exhaustive search of the bid space to identify the value-maximising solution which respects all minimum requirements. This may lead to a partial unravelling of the combinatorial solution with potentially much lower prices overall. As a consequence, this may lead to unhappy losers (i.e. bidders who clearly offered to pay more than the clearing price, but whose bids were discarded as they did not meet their minimum requirement).



If a global minimum requirement is applied to all bids, the potential gains from re-optimisation are likely to be small, so Option 1 seems preferable. If participants can set bid-specific minimum requirements, Option 2 seems preferable because the efficiency gains from re-optimisation could be large and it eliminates the potential for gaming.

Mixed views were expressed by the Day-Ahead Auction project team about the need for a minimum requirement. Some team members, for example, were of the view that a minimum requirement was not necessary and that the auction design should avoid any unnecessary complexity. Others, on the other hand, thought that a bid-specific minimum requirement should be incorporated into the auction design because it would provide auction participants with some protection against paying for unusable levels of capacity. Project team members that were supportive of a minimum requirement, generally favoured bid-specific minimum requirements because these requirements will likely differ across bidders. The project team did not, however, offer a view on the allocation process (option 1 or 2 above) that should be employed if a minimum requirement is implemented.

In the discussions that were held on this issue, it was noted that adding the minimum requirement feature to the auction format would increase the complexity of the auction solver and increase the implementation costs because the SRA solver, which AEMO is proposing to leverage for the day-ahead auction, does not currently have this feature.

4.2.3 Optional feature 2: XOR sets

In the simple partial combinatorial auction, bids are not mutually exclusive so participants can win one or more of their bids. It does not therefore allow participants to express demand for substitutable routes (Type 2 demand). This shortcoming can be overcome by allowing bidders to submit mutually exclusive bids through the inclusion of XOR sets of bids.

XOR sets allow participants to specify different bid amounts for substitutable routes and ensures that they win at most one of the bids. The way in which XOR sets could be used by participants to deal with substitutable routes is shown in Box 4.5. If a decision was made to include XOR sets, then given there are only a small number of substitutable routes in the east coast, the number of XOR sets that a bidder could be allowed to submit could be limited to a specified number (e.g. five) to reduce bid submission and implementation complexity.



Box 4.5: Example of how XOR sets work

In this example, the auction participant specifies five bids (B1, B2, B3, B4 and B5) and two XOR sets:

- XOR Set 1 includes B1 and B2
- XOR Set 2 includes B3 and B4
- B5 is the only bid that is not included in any XOR set.

All bids include an amount, a quantity as well as a nomination of products. The bidder is guaranteed to win at most one of the bids included in an XOR set. For example, the bidder could win either B1 or B2, but never both.

As a result of these bids, the bidder could win any of the following 17 combinations of bids or nothing:

Possible bid combinations the bidder could win		
B1 only	B2 & B5	B2 & B4
B2 only	B3 & B5	B1 & B3 & B5
B3 only	B4 & B5	B1 & B4 & B5
B4 only	B1 & B3	B2 & B3 & B5
B5 only	B1 & B4	B2 & B4 & B5
B1 & B5	B2 & B3	Nothing

As noted in Box 4.2, the Day-Ahead Auction project team were of the view that while there are few imperfect substitutable transportation routes in the east coast, the demand for these routes is currently low. When asked whether there was value in adding XOR sets to the auction format to accommodate these routes, the project team noted that the benefit of doing so was unlikely to outweigh the cost and complexity of adding this feature given the limited demand for substitutable transportation routes. One project team member did, however, note that over time substitutable routes could become more important and that the auction design should be able to accommodate such changes. It was also noted in this context that the SRA does not currently include XOR sets and that the inclusion of this feature would increase the implementation cost.

Finally, in addition to accommodating substitutable routes, XOR sets could be used to accommodate the hybrid product design (i.e. a firm and an interruptible auction product – see section 3.2) if a decision is made to implement this product design. In this case, XOR sets would allow participants to submit mutually exclusive bids for the firm product and the interruptible product, which are likely to have different values. The project team did not express a view on this option.

4.2.4 Optional feature 3: Backhaul

On pipelines that do not operate in a bi-directional manner, backhaul transportation does not involve the physical transportation of gas. It is merely an offsetting of positions (i.e. a notional swap). For example, if shipper A wants to transport gas downstream and shipper B wants to do the opposite, the service provider can offset their positions.



As noted in section 3.1, including backhaul transportation in the auction design may lead to significant efficiency gains because it allows shippers to ‘move’ gas without utilising physical infrastructure. It also has the potential to reduce congestion because backhaul can reduce the total amount of gas that needs to be transported on a pipeline.

If backhaul products were to be available in the auction, then the bids for backhaul capacity would specify the same information as any other bids (i.e. bid amount, total quantity and backhaul products). Backhaul products could be included in one of two ways in the day-ahead auction:

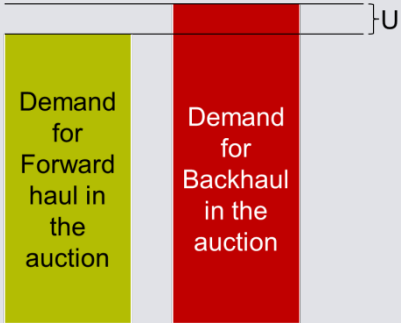
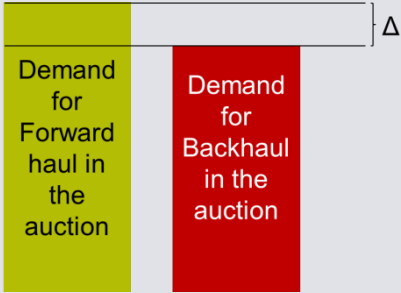
- **Static backhaul product:** A static backhaul product would offer backhaul against the firm forward haul contracted and nominated capacity on a given day.
- **Dynamic backhaul product:** A dynamic backhaul product would offer backhaul against the firm forward haul contracted and nominated capacity and the forward haul bids cleared in the day-ahead auction. This option would therefore provide the potential for more forward haul and more backhaul capacity. The auction mechanism under this option would clear bids dynamically and offset forward and backhaul bids dynamically based on competition and the bids submitted in the auction.

Of the two options, the dynamic backhaul option would be more complex to implement and could introduce a number of issues that would need to be resolved in the auction design (see Box 4.6). In particular, it could introduce market power concerns because forward haul bids implicitly “supply” backhaul capacity and vice versa. To prevent bidders from exploiting such market power, the auction would need to clear pipelines with dynamic backhaul separately from others. This is likely to reduce efficiency as it reintroduces aggregation risks for bidders who want to flow gas across pipelines with and without dynamic backhaul. NERA has therefore recommended that if backhaul is to be included in the day-ahead auction then the static backhaul product should be used.

As outlined in section 3.1, the project team had mixed views on whether a backhaul product should be included in the day-ahead auction, with some team members contending that backhaul capacity is not contracted on a firm basis and does not therefore strictly fall within the scope of the AEMC’s recommendation. Other team members, on the other hand, thought that there would be value in including a backhaul product, but did not specify whether it should be a static or dynamic backhaul product.

Box 4.6: Dynamic backhaul

With dynamic backhaul, backhaul bids are not counted towards the total capacity on the included backhaul segments, but against it. In effect, a backhaul bid provides additional capacity for flowing capacity forward on such a pipeline. At the same time, forward bids provide backhaul capacity. Pricing in the partial combinatorial auction is generally based on whether demand for a product is constrained by the available capacity. If it is, the price is determined by the lowest accepted bid. If it is not, the price is zero. This can be readily applied to pipelines with backhaul. The table below summarises the different cases that can occur when backhaul is allowed.

Case	Explanation	Resulting prices
	<p>Demand for Backhaul in the auction exceeds demand for forward haul in the auction</p> <p>The difference (U) needs to be served with the available static backhaul capacity</p>	<ul style="list-style-type: none"> Price of forward haul = \$0 Price of backhaul = \$0 if U is less than available static backhaul capacity Price of backhaul > \$0 and set by lowest accepted bid if U is greater than available static backhaul capacity
	<p>Demand for forward haul in the auction exceeds the demand for backhaul in the auction</p> <p>The difference (Δ) needs to be served with available pipeline capacity</p>	<ul style="list-style-type: none"> Price of backhaul = \$0 Price of forward haul = \$0 if Δ is less than available capacity on the pipe Price of forward haul > \$0 and set by lowest accepted bid if Δ is greater than available capacity on the pipe

Pipelines on which dynamic backhaul is offered could not be included in linked bids that include other pipeline segments as this would interfere with the allocation on those other pipeline segments. A bid for forward haul capacity at a pipeline segment with backhaul transportation enables the allocation of additional backhaul capacity. This creates value which the partial combinatorial auction may use to subsidise the forward haul bid at another segment if necessary. It may trump another bid at another segment even though its bid amount is lower, simply because every unit allocated to it provides one more unit of backhaul capacity. The algorithm implicitly assumes that the price achieved for backhaul can be used to subsidise the enabling bid at other pipeline segments. This subsidy would take away revenues from pipelines with dynamic backhaul and transfer it to others.

Bidders could exploit this feature by bidding less for pipeline segments with dynamic backhaul. For example, if an auction participant includes backhaul at a pipeline that is known to be heavily constrained by its forward haul capacity, it can be fairly confident it will receive a "subsidy" if necessary at other segments to enable this bid. By bidding less, more of the subsidy will be used to pay for his bid at the other segments. Effectively, such a participant has market power which it can exploit to get other products more cheaply.

To prevent market power from spilling into other segments, bidders should not be allowed to submit bids that include segments on a pipeline with dynamic backhaul alongside others.



4.2.5 GMRG's preliminary view and questions

Having regard to the advice provided by NERA, the feedback obtained from the Day-Ahead Auction project team and the assessment framework set out in section 2.3 the GMRG's preliminary view is that a partial combinatorial auction format should be adopted. As to whether any of the optional features should be included, the GMRG's preliminary views can be summarised as follows:

- **Minimum requirements:** The GMRG's preliminary view is that this feature should not be included in the initial auction specification, because it is not clear that the value auction participants will derive from its inclusion (which is likely to be relatively small given the quantities likely to be available in the auction) will outweigh the costs and complexities associated with its implementation. The GMRG understands that the exclusion of this feature at market start would not prevent it from being added to the partial combinatorial auction at a later date if there was sufficient demand for its inclusion. Further consideration could therefore be given to its inclusion one to two years after the auction is implemented.
- **XOR sets:** The GMRG's preliminary view is that XOR sets should not be included in the initial auction specification given the limited demand for substitutable transportation routes, the GMRG's preliminary view on product design and the costs and complexities associated with its implementation. Importantly, the exclusion of this optional feature at market start would not prevent it from being included at a later stage if the nature of demand changes. It is worth noting in this context that if stakeholder feedback suggests that a hybrid product design should be implemented, then the GMRG will revisit this issue because there is likely to be value in including XOR sets if a hybrid product is adopted.
- **Backhaul:** Consistent with the view expressed in section 3.1, the GMRG is of the view that there could be significant efficiency gains associated with the inclusion of backhaul capacity in the day-ahead auction. The GMRG's preliminary view is therefore that the auction format should include the static backhaul feature.

As noted elsewhere in the consultation paper, these are preliminary views only at this stage and the GMRG welcomes further feedback from stakeholders on these issues.

Box 4.7: Questions on auction format

16. Do you agree with the proposal to utilise a partial combinatorial auction? If not, please explain why?
17. Do you think there is value in including the minimum requirement optional feature from market start, or do you think this could be added over time if required?
 - If you think it should be included from market start, please outline the benefits you think bidders will derive from its inclusion and if you think these benefits will outweigh the costs and complexities of including this in the auction solver?
 - If a minimum requirement is adopted (either from market start or later), which combination of minimum requirement (global or bid-specific) and allocation mechanism (option 1 or 2) do you prefer and why? The GMRG is particularly interested in stakeholders' views on the impact on bidders and efficiency as well as potential gaming opportunities with any of these combinations.



18. Do you think there is sufficient demand for substitutable routes to warrant the inclusion of the XOR set optional feature? If so, please explain why.
19. Do you agree with the proposal to include the static backhaul optional feature? If not, please explain why.

4.3 Reserve price

One of the required outcomes for the day-ahead auction is that the auction should have a zero reserve price and compressor fuel should be provided in-kind by the auction winners.⁴⁹ The AEMC's position on this issue was based on advice from NERA that the short run marginal cost of gas transmission for contracted but un-nominated capacity closely approximates the cost of the incremental gas used to run compressors.⁵⁰

Elaborating further on this recommendation, the AEMC noted that a zero reserve price would:⁵¹

"...support the rationale for the day-ahead auction of providing access to capacity at a price consistent with that in a competitive market by addressing monopoly pricing behaviour on the part of pipeline owners for as-available capacity. It will allow the shippers that value the capacity most highly access to that capacity providing they are willing to pay at least the cost of its provision."

This recommendation was widely supported by stakeholders that participated in the *East Coast Review*, including a number of service providers.⁵²

While the GMRG agrees with this recommendation, it understands that on some pipelines compressor fuel is provided by the service provider rather than the shipper. The GMRG has therefore given some thought to how a service provider could recover these costs in these cases and identified the following options:

- Option 1: Adjust the reserve price to reflect the cost of compressor fuel; or
- Option 2: Leave the reserve price at zero and allow the service provider to recover the costs through their operational GTA that the auction winner will have in place with the service provider.

Of the two options, Option 2 would be simpler to implement from an auction design perspective. The GMRG is therefore proposing to allow service providers that provide compressor fuel gas to recover the costs of doing so through the operational GTA. The GMRG is, however, interested in hearing further from stakeholders on this issue.

⁴⁹ AEMC, Stage 2 Final Report: *East Coast Review*, 23 May 2016, p. 75.

⁵⁰ NERA, Determining a reserve price for a short term gas transmission auction, February 2016.

⁵¹ AEMC, Stage 2 Final Report: *East Coast Review*, 23 May 2016, p. 75

⁵² See for example, Epic, Submission to Pipeline Access Discussion Paper, 29 March 2016, p. 6, APA, Submission to Pipeline Access Discussion Paper, 1 April 2016, p. 16 and APGA, Submission to Pipeline Access Discussion Paper, 29 March 2016, p. 21.



Box 4.8: Questions on reserve price

20. If compressor fuel is provided by a service provider, do you think the reserve price should be adjusted to reflect these costs, or do you think the costs should be recovered through the operational GTA?

4.4 Pricing rule

One of the AEMC's preferred outcomes for the day-ahead auction is that winning bidders be required to pay the value of their bid (the 'first price rule'). In recommending this pricing rule, the AEMC noted that while it may result in bid shading (i.e. auction participants submitting bids that are lower than their willingness to pay) and inefficiencies, it would be less complex to implement than other pricing rules.^{53,54}

Advice provided by NERA, however, indicates that a first-price rule is strategically more complex for bidders than a pay-as-cleared rule, because under a first-price rule if auction participants bid their willingness to pay and win they will not make any profit. Auction participants will therefore need to reduce their bids below the value they place on the capacity based on their expectation of the likely strength of competition in the auction. While determining the optimal bid level sounds simple in theory (i.e. pick the bid level that maximises expected profits), in practice, it is very difficult because it requires balancing higher probability of winning (which is influenced by other participants' bids) against having to pay a higher price if the bid wins. If auction participants get this wrong, it could lead to inefficient outcomes.

In contrast to the first price rule, a pay-as-cleared pricing rule establishes a uniform price-per-unit for each product that all auction winners pay, which is determined by the lowest accepted bids in the auction. The pay-as-cleared pricing rule, which is used in the SRA, is strategically much simpler than the first price rule, because auction participants that have a higher willingness to pay than their rivals can simply submit bids at value. The pay-as-cleared rule then ensures that they do not pay more than what is required to win. Auction participants that expect to value the product at around the expected clearing price may have an incentive to shade the amounts of their bids down by a small amount as this reduces the amount they would need to pay if their bid turns out to be the marginal (and thus price-setting bid). However, their ability to shade their bids down is constrained by competition from the highest losing bids and general uncertainty over the level of competition.

The main advantage of the first price rule that is often cited is that it promotes participation by new entrants if there are known asymmetries between bidders. This is because under a first price rule, incumbents might shade their bids too much and so new entrants have a chance to outbid them and gain access to capacity. This "surprise" tactic is, however, likely to be short lived because over time incumbent shippers would factor in this new competition into their bids. In this context, if demand does change unexpectedly, or a new entrant enters the market, the first price rule is likely to result in an inefficient outcome

⁵³ Under the second price rule, winning bidders pay the minimum amount they would have needed to bid in order to win the auction.

⁵⁴ AEMC, Stage 2 Final Report: *East Coast Review*, 23 May 2016, p. 130.



because bids from incumbents will reflect the expected price not the actual value. This is in direct contrast to a pay-as-cleared rule, where most bids will be reflective of auction participants' actual valuations. Under a pay-as cleared auction, if demand changes unexpectedly, the auction mechanism uses bids that are reflective of actual value to identify an optimal allocation. While prices would go up to reflect the new demand, the outcome would likely remain efficient.

The expected revenues from the auction will be the same regardless of whether a first-price or a pay-as-cleared rule is used provided that bidders are risk neutral and have fixed valuations, and that both rules lead to an efficient allocation in the long run.⁵⁵ This means that even though the first price and pay-as-cleared auctions are mechanically quite different, they are likely going to lead to the same expected long-term revenues.⁵⁶

The Day-Ahead Auction project team was broadly supportive of NERA's recommendation to adopt a pay-as cleared pricing rule, with one team member noting that there are known gaming issues with a first price rule, which allow more dominant participants to exercise market power to achieve a desired pricing outcome.

Having considered the advice provided by NERA and the feedback provided by the project team, the GMRG's preliminary view is that a pay-as-cleared pricing rule should be used in the day-ahead auction because it will be strategically simpler from a bidding perspective and will deliver a more efficient allocation of capacity in situations where demand changes unexpectedly. The GMRG understands that this pricing rule differs from the AEMC's preferred outcome. However, for the reasons set out above, the GMRG believes the pay-as-cleared pricing rule is more consistent with what the AEMC was trying to achieve (i.e. less complex to implement) than the first price rule. It is also more consistent with the NGO.

On a separate but related issue, it is worth noting that the pay-as cleared pricing rule may not result in the identification of a unique set of prices if:

1. *the lowest accepted bid is fully cleared:* In this case the price could be anywhere between the highest losing bid and the lowest accepted bid. To deal with this potential, NERA has recommended that the price be set by the amount of the lowest accepted bid (see Box 4.9). In doing so, NERA noted that this solution will implement the pay-as-cleared principle adopted for all products with a partially cleared lowest-accepted bid. In contrast, it is unclear how prices would be set if the value of the highest-losing bid was adopted given the combinatorial nature of the bid stack. This solution would also be unworkable if either a minimum requirement or XOR sets are included in the auction design as both of these features can lead to losing bids with a higher bid amount than that of the lowest accepted bid.⁵⁷

⁵⁵ This is the "revenue-equivalence theorem, first demonstrated by Vickrey (1961) in "Counterspeculation, Auctions and Competitive sealed tenders"

⁵⁶ Participants in a first price auction will factor in their expectation of the likely competition as well as bids from other bidders when determining bid amounts. If there is little competition for particular products or even spare capacity, participants are going to bid close to or even \$0 in a first price auction. Over time, participants would be expected to develop a good understanding of likely competition in the auction and therefore revenues in a first price and pay-as-cleared auction would be expected to be similar in the longer term.

⁵⁷ The reason why these bids are not cleared is not because they either violate their minimum requirement and/or another bid in their XOR set is already filled.



2. *there are two or more sets of prices that satisfy the pricing constraints imposed by lowest accepted bids*: This could occur if two or more products are always bid for in pairs. In this case, NERA has suggested the use of a random tie-break mechanism to resolve any price indeterminacy because it is easier to implement and would lead to the same long-term expected revenues as a sharing solution (see Box 4.9).

In practice both of these situations are unlikely to occur on a regular basis. How these indeterminacies are resolved therefore appears to be a minor issue. The GMRG agrees with NERA's proposed simple solutions, but is interested in hearing other stakeholders' views on this issue.

Box 4.9: Price indeterminacy

Lowest accepted bid fully cleared

In the example in the table below, shipper A and B would win capacity. Shipper B is the lowest accepted bid and is fully cleared. The price could be set anywhere between \$30 (the highest losing bid) and \$40 (lowest cleared bid). NERA has proposed to address this indeterminacy by selecting the lowest accepted bid, which in this example is \$40.

Bids for capacity

Shipper	Price (per unit)	Q	S1 (C ₁ = 300)
A	\$50	150	X
B	\$40	150	X
C	\$30	100	X

Two or more prices that satisfy pricing constraints imposed by lowest accepted bids

In the example in the table below, shipper A and B win in full. Shipper C is the lowest accepted bid and receives 50 units. The lowest accepted bid C requires the prices of S1 and S2 sum to \$30. The partial combinatorial linear program usually picks a corner solution (i.e. it may set the price of S1 to \$30 and the price of S2 to \$0 or vice versa). The way the linear program picks a solution is not random and depends on the structure of the problem (such as order of products and/or bids).⁵⁸

Bids for capacity

Shipper	Price (per unit)	Q	S1 (C ₁ = 200)	S2 (C ₂ = 200)
A	\$50	75	X	X
B	\$40	75	X	X
C	\$30	100	X	X

There are two ways to resolve indeterminacy fairly in this case:

- Option 1 requires picking one of the corner solutions at random (e.g. S1=\$30 or S2=\$30).
- Option 2 requires a sharing solution in which any indeterminacy is resolved by splitting it evenly between the products involved (e.g. S1=\$15 and S2=\$15).

Option 2 would be more complex to implement as it would effectively require running a quadratic program to implement such a sharing solution more generally. As the auction is run repeatedly, Option 1 may be an acceptable compromise because even if a service provider "loses" on any particular day, it would still have a chance to win another tie-break the following day. On average over the year, revenues would be expected to be distributed fairly.

⁵⁸ Note the available quantities do not have to be the same across the relevant products for this issue to arise. In the example above, there are 200 units available of products S1 and S2, respectively. However, the problem would also arise if, say 300 units were available for S2 instead and a fourth shipper, B4, submitted a bid of \$60 for 100 units of that product.



Box 4.10: Questions on the pricing rule

21. Do you agree with the proposal to adopt a pay-as cleared pricing rule? If not, please explain why.
22. If you propose an alternative pricing rule, please provide details on how this rule could be implemented and whether or not the inclusion of minimum requirements and/or XOR sets would be problematic under this alternative rule.
23. Do you agree with the proposal to set the price at the lowest accepted bid if the lowest accepted bid is fully cleared? If not, please explain why. If you propose an alternative pricing rule, please provide details on how this rule could be implemented and whether or not the inclusion of minimum requirements and/or XOR sets would be problematic under this alternative rule.
24. Do you agree with the proposal to use a random tie-break mechanism in those cases where there are more than one set of prices that satisfy the pricing constraints imposed by the lowest accepted bids? If not, please explain why.

4.5 Determination of winning bidders

The AEMC's preferred outcome for determining the winning combination of bidders in the day-ahead auction is to use a profit maximisation algorithm. In recommending this approach, the AEMC noted that from an efficiency perspective, the optimal allocation should maximise economic surplus, which is equivalent to profit if it is assumed that bids reflect the auction participant's value and that all capacity is released in the auction (i.e. there is no economic withholding to maximise profits).⁵⁹ Profit in this context represents the difference between the revenue received from bidders less the reserve price, which the AEMC has recommended should be set at zero. The profit maximisation algorithm proposed by the AEMC therefore reduces to a revenue maximisation algorithm.

The SRA algorithm that AEMO is proposing to use as the basis for the day-ahead auction currently employs a revenue maximisation algorithm. Its proposed approach to determining auction winners is therefore consistent with the AEMC's preferred outcome.

While on this topic, it is worth noting that, while rare, it is possible that there may be two or more sets of bids that maximise revenue. To minimise the risk of this occurring, the Day-Ahead Auction project team suggested that bids be expressed to four decimal places as they are in the SRA. Even with this measure in place, there is still a risk that a tie could occur. NERA has therefore given some thought to the form that a tie-breaking mechanism could take and recommended the use of the random tie break rule, which the project team was broadly supportive of.

The GMRG agrees with the tie-breaking measures the project team and NERA have recommended, but is interested in hearing other stakeholders' views on this issue and the questions set out in the box below.

⁵⁹ AEMC, Stage 2 Final Report: *East Coast Review*, 23 May 2016, p.80.



Box 4.11: Questions on the method for determining winning bidders

25. Do you agree with the proposal to determine winning bidders through the use of a profit maximising algorithm, which in this case reduces to a revenue maximising algorithm? If not, please explain why.
26. Do you agree with the proposal to use a random tie-break rule to determine winning bidders? If not, please explain why.

4.6 Treatment of curtailment on the gas day

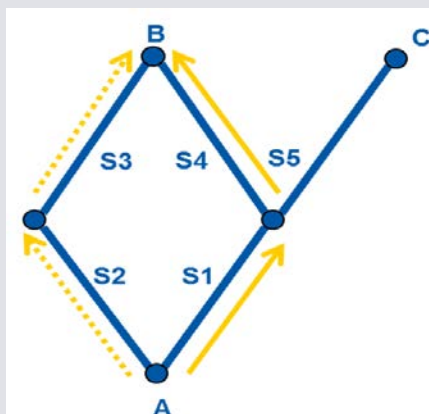
Consistent with its recommendation that renominations by firm capacity holders be accommodated by the auction product, the AEMC's preferred outcome for the day-ahead auction is that capacity purchased in the auction is curtailed before firm capacity.⁶⁰

To implement this recommendation, a mechanism will need to be included in the auction design that can be used to determine the sequence in which auction winners are curtailed and by how much if the auctioned capacity needs to be curtailed. This is of particular importance in a combinatorial auction, where auction participants that win capacity across multiple products (i.e. receipt point, pipeline segment, delivery point and/or compressor) run the risk of being curtailed on one product but not on another (see Box 4.12). To avoid reintroducing aggregation risks through curtailment, a mechanism will be required to determine who gets curtailed and the extent to which bidders get curtailed across their entire route. A mechanism may also need to be included to compensate auction winners if they are curtailed.

⁶⁰ AEMC, Stage 2 Final Report: *East Coast Review*, 23 May 2016, p.81.

Box 4.12: Curtailment example

In the following example, an auction participant wants to ship gas from A to B. To do this, the auction participant can submit a combined bid for receipt point A, segment S1, segment S5 and receipt point B. Alternatively, it could bid for the route A-S2-S3-B.



If, in this example, the primary capacity holders were to renominate, then the auctioned capacity would be curtailed at some segments and the auction allocation may no longer be allocatively efficient, given shippers' overall capacity requirements and preferences. For example, if a shipper won 10 units of capacity for the route A-S1-S4-B, and its capacity is curtailed by 5 units at S1, the allocation may no longer be value-maximising as the shipper now holds stranded capacity at A, S4 and B (in particular, it holds 10 units at A, S4 and B out of which it will likely only be able to use 5 units).

Moreover, the bidder may have preferred the route S2-S3, where there is a systematic tendency for renomination on S1-S4. This may mean that a party may systematically be awarded apparently cheap but unreliable capacity. The bids in the auction will likely include an expectation of curtailment, so bids for segments for which there is a systematic tendency for renomination are likely going to receive lower bids.

As noted in section 3.2, the Day-Ahead Project team has suggested that if the auctioned capacity is curtailed as a result of a renomination but there is spare primary capacity available then auction winners should be able to try and avoid the curtailment by procuring the primary capacity from the service provider.

If the curtailment cannot be avoided and the auction winner has purchased multiple products, then:

1. the auction winner could just be curtailed on the product that has insufficient capacity;
2. the auction winner could be curtailed by the same amount across all products in its winning bid; or
3. the auction winner could choose between options 1 and 2.

Of the options listed above, the project team thought that auction winners would value being able to choose between options 1 and 2, particularly if they could use storage or overrun services to minimise the effects of the curtailment of one product.



If curtailment is required, then the curtailment rules will need to establish the order in which bids are curtailed. NERA has identified the following options that could be used in this context:

- pro-rata curtailment;
- service provider wide revenue-based curtailment;
- service provider wide valuation-based curtailment; and
- system wide valuation-based curtailment.

Further detail on these options is provided in Table 4.3, which also contains NERA's evaluation of the feasibility of implementing these options and the efficiency impacts.

Table 4.3: Curtailment order

Options	Explanation	NERA Evaluation
Basic pro-rating	Under this option all auction winners would be curtailed to the same extent (i.e. by the same number of units or same proportion), regardless of their bids and shipping routes. This option is obviously the simplest, but is likely going to result in the costliest curtailment (with compensation) or reintroduces severe aggregation risks (without compensation).	Simple to implement. Inefficient and could lead to excessive curtailment. Reintroduces significant aggregation risks.
Service provider wide revenue based	Under this option, service providers would be provided with information about the winning bids on all their pipelines (and where relevant, compressors) as well as the prices achieved on individual segments. They would then be required to use the curtailment that has the least impact on their revenues.	Feasible to implement. Less efficient than valuation based approaches and unclear if more or less efficient than pro-rating.
Service provider wide valuation based	Under this option AEMO would determine the most efficient curtailment option using the winning bids. This option minimises the cost of curtailment at bid amounts. Service providers would need to communicate renominations in specific intervals ⁶¹ to AEMO who then re-determines the value maximising curtailment order at all pipelines (and where relevant, compressors) holistically. AEMO would then communicate the curtailment decision to service providers. This option identifies the least-cost and least-disruptive curtailment, but is the most complex to implement and unlikely to be practical.	Unlikely to be feasible to implement. Most efficient option.
Pipeline wide valuation based	Under this option service providers would be provided with information about the winning bids on all of their pipelines (and where relevant, compressors). They would then be required to establish the value maximising curtailment across their network based on the winning bids. This option is likely going to be less efficient than system-wide valuation-based curtailment as service providers will not take into account the impact of their curtailment decisions on other assets. However, given the complexity of the system-wide option, this option is generally the most efficient feasible option of the remaining options.	Feasible to implement. Less efficient than system-wide approach but more efficient than pro-rating and revenue-based approach.

As this table highlights, the system wide valuation approach is unlikely to be feasible to implement and has been ruled out. Of the remaining options, the pipeline wide valuation-

⁶¹ AEMO could, for example, determine curtailment in 3-hour intervals.



based approach is more efficient than the pro-rating and revenue based options, while from an implementation perspective the pro-rating option would be the simplest to implement.

In addition to considering the curtailment options, NERA considered whether auction winners should be compensated if they are curtailed. Based on its assessment of the effect that alternative compensation mechanisms could have on efficiency, the primary and secondary markets and the consequences of combining the curtailment and compensation options, NERA identified the following joint options for curtailment and compensation (i.e. money back):

1. pro-rata curtailment with compensation;
2. pipeline wide revenue-based curtailment with compensation; and
3. pipeline wide valuation-based curtailment with or without compensation.

The table below provides a summary of the advice NERA provided on these joint options.

Table 4.4: Curtailment and compensation options

Options	NERA Evaluation
Pro-rating with compensation	<p>Pro-rata curtailment is straightforward to implement. It is best implemented with “money back” compensation to minimise risk for shippers.</p> <p>The drawbacks of this option are that basic pro-rating is a highly inefficient curtailment option, which does not reflect valuations and often leads to excessive curtailment. Without compensation, the aggregation risks for shippers would be severe and hence we do not propose a pro-rating approach without compensation. Introducing compensation, however, may lead to a comparatively large loss in revenues for service providers owing to the inefficiency of this approach.</p>
Pipeline wide revenue based with compensation	<p>Under this option, service providers would be free to identify the least-cost curtailment. The regime is incentive compatible as it would be in their interest to minimise the impact of curtailment on their (net) revenues. At the same time, money back compensation shields shippers from aggregation risks.</p> <p>The major drawback of this option is that it does not identify the curtailment solution that minimises the value lost from the perspective of winning bidders.</p>
Pipeline wide valuation based with or without compensation	<p>Valuation-based approaches achieve the highest allocative efficiency. Given that system-wide valuation-based curtailment is infeasible, this is the most efficient curtailment option from shippers’ perspective. As it minimises aggregation risk for shippers, it appears to be the only option that could conceivably be implemented without compensation.</p> <p>However, unlike in the case of revenue-based approaches, service providers are not compensated for building and running such a system. Not providing compensation may be a reasonable compromise in this sense as it allows service providers to keep all revenues from the auction in return. However, regulatory oversight may be necessary to ensure that curtailment is implemented as intended.</p>

These options were discussed with the Day-Ahead Auction project team. In short, the project team was of the view that if curtailment of the auctioned capacity occurs then:

- Auction winners should be able to try and avoid curtailment of the affected product by procuring primary capacity from the service provider if there is spare capacity available (e.g. by accessing an as available service on the gas day) and, if they are unable to do so, should have the option to choose whether they are:



- (a) only curtailed on that product; or
 - (b) curtailed by the same amount across all products included in the winning bid.
- The curtailment rules should be pragmatic and relatively simple in the initial stages of the auction's operation given there is some uncertainty surrounding the frequency with which curtailment will actually occur and the costs and complexities associated with some of the options. The project team therefore advocated the use of the pro-rating with compensation approach, which they noted was consistent with the approach service providers typically employ in relation to as available and interruptible products.

While the GMRG can see the efficiency benefits associated with the pipeline-wide valuation option, it understands the concerns raised by the project team about the complexities associated with this option and their desire to avoid any unnecessary complexities in the initial stages of the auction's operation, particularly when the risk of curtailment is unclear. Having regard to these concerns and the assessment framework set out in section 2.4 the GMRG's preliminary view is that the pro-rating with compensation option should be adopted for the first one to two years of the auction's operation and if after this period, the curtailment risk is found to be material then the pipeline-wide valuation option could be reconsidered. The GMRG would, however, welcome further feedback on this preliminary view.

Box 4.13: Questions on curtailment on the gas day

- 27. Do you agree that auction winners should be able to try and procure primary capacity from the service provider if the curtailment arises as a result of a renomination and there is spare primary capacity available? If not, please explain why.
- 28. Do you think that auction winners should be able to choose whether they are only curtailed on the product for which there is insufficient capacity or across all products? If not, please explain why.
- 29. Do you think that the pro-rating with compensation curtailment option should be employed as the project team has suggested, or do you think the pipeline wide valuation with or without compensation option should be employed? In addressing this question, please outline how significant you think the risks of curtailment are.

4.7 Allocation of auction residue

In the *East Coast Review*, the AEMC noted that its preference was for any revenue generated through the auction to be given to service providers after the costs of running the auction have been recovered.⁶² Elaborating on this further, the AEMC noted that allowing service providers to keep the auction residue would encourage capacity holders to participate in the secondary capacity market ahead of the auction. The AEMC also noted that this approach was consistent with the status quo, because service providers currently have the ability to sell contracted but un-nominated capacity on an as-available or interruptible basis and to keep the proceeds.⁶³

⁶² *ibid* p.80.

⁶³ *ibid*, pp.80-81.



Allowing service providers to keep the auction residue is a critical design feature of the day-ahead auction because it will provide shippers with an incentive to release any spare capacity they may have on a firm basis prior to the auction (i.e. because they will retain the proceeds from the secondary capacity sale). The GMRG therefore agrees with this aspect of the AEMC's recommendation. The GMRG does, however, have some concerns about the proposal to recover the costs of developing and conducting the auction from the auction proceeds, which are discussed in further detail in section 6.2.4.

Setting this issue aside, if the auction residue is to be passed through to service providers then a decision must be made on how the residue will be allocated between service providers under the partial combinatorial auction format. While there are a number of ways in which this could be done, NERA has advised that allocating the auction residue on the basis of revenues achieved by individual products will ensure that scarce resources are remunerated, which will, in turn, provide the right signal for contracting spare primary capacity (see Box 4.14 for a simplified example). Other compensation schemes that split revenues according to different criteria, such as the total capacity allocated, do not have this property. NERA has therefore recommended allocating the auction residue on the basis of revenues achieved by individual products.

The Day-Ahead Auction project team generally agreed with this recommendation.

Box 4.14: Allocation of auction residue

In this example, shippers A-E have made the bids set out in the table below and the capacity is then allocated.

Shipper	Bid		Auction allocation					Comments
	Price (per unit)	Qty	Qty	S1 (C ₁ = 300)	S2 (C ₂ = 200)	S3 (C ₃ = 150)	S4 (C ₄ = 100)	
A	\$40	100	40	X	X	X		A has the lowest accepted bid for S2. It is only partially filled (40 of a total of 100).
B	\$50	100	100	X				
C	\$30	160	160		X			
D	\$20	100	100			X		
E	\$15	20	10			X	X	E has the lowest accepted bid for S3. It is only partially filled (10 of a total of 20).

In this example:

- the prices of S1 and S4 are zero because there is unsold capacity; and
- the price of S3 is set by shipper E (\$15).

The price of S2 is determined as follows. Shipper A has the lowest accepted bid across S1, S2 and S3. It thus requires that the price of these three segments sum to \$40. As the price of S1 is \$0 and the price of S3 is \$15, the price of S2 is set to \$25.

The total revenue under this auction is therefore \$7,250 with \$5,000 earned at S2 (\$25x200) and \$2,250 (\$15x150) earned at S3. For simplicity, the cost of running the auction is \$0. The owner of S2 would therefore receive \$5,000 and the owner of S3 would receive \$2,250.



Like the project team, the GMRG agrees with NERA's recommendation that the auction residue should be allocated on the basis of revenues generated by individual products. The GMRG is, however, interested in hearing other stakeholders' views on this issue.

Box 4.15: Questions on the allocation of the auction residue

30. Do you agree with the proposal to allocate the auction residue to service providers based on the revenue achieved by individual products? If not, please explain why and set out what alternative approach you think should be employed.

4.8 Information available to auction participants

Before the day-ahead auction is conducted, information on the products and auction quantities would be published on the auction platform, which will inform the price that auction participants are willing to bid in the auction. Once the auction is conducted, auction participants would be provided with information on:

- their own winning bids, including the quantities won and the products included in their winning bids; and
- the price of all the products sold through the auction, which is also intended to be published on the BB website.

One issue that is yet to be resolved is whether the bid-stack should also be published. In markets with a large number of participants, the release of this type of information is generally perceived as beneficial. However, it is unclear at this point whether there will be sufficient participation in the day-ahead auction to overcome the risks that may arise if information on the bid-stack is published. The risk in this case is that if only a few parties participate in the auction, then given the repeated nature of the auction, the provision of more information might make it easier for auction participants to tacitly coordinate a low-price outcome.

Given the potential for the bid-stack to be misused in this way, NERA has suggested that information on individual bids not be made public in the initial stages of the auction's operation, which is the approach that has been employed in Europe. NERA also noted that if participation in the auction increases over time and a greater level of competition emerges, then this decision could be revisited.

Mixed views were expressed on this issue by the Day-Ahead Auction project team, with some team members advocating the publication of the bid stack as is currently done in mandatory markets in the east coast, while other team members either agreed with NERA's suggestion or were indifferent.

The GMRG's preliminary view on this issue is that the bid-stack should not be published in the initial stages of the auction's operation and that the issue should be reconsidered by the AEMC when it conducts its second biennial review into the liquidity in the wholesale gas and pipeline capacity trading markets in 2020. While the GMRG understands that this approach differs from what has occurred in the STTM and DWGM, it is important to recognise that these are mandatory markets and have a greater level of participation than



what is anticipated in the initial stages of the day-ahead auction. The gaming risks that NERA has identified are therefore less likely to afflict these other markets.

While the GMRG has formed a preliminary view on this issue, it is interested in hearing other stakeholders' views on this issue and on the questions set out in the box below.

Box 4.16: Questions on the information to be provided to auction participants

31. Do you agree with the proposal to:

- provide auction participants with information on the products to be auctioned and the auction quantities prior to the auction?
- provide auction winners with information on their own winning bids and the clearing price for all the products sold through the auction?
- publish information on auction quantities and the clearing prices on the BB website?

32. Do you agree with the proposal not to publish the bid-stack in the initial stages of the auction's operation? If not, please explain why you think the gaming issues identified by NERA are unlikely to affect the robustness of the auction.

4.9 Auction timing

One of the AEMC's required outcomes for the day-ahead auction is that the auction be conducted shortly after nomination cut-off time.⁶⁴

Nomination cut-off times in the east coast currently range from 2 pm to 4 pm (see Table 4.5). Before the auction can be conducted, the following activities will need to be carried out:

- service providers will need to run an initial schedule for gas day D based on the nominations received by nomination cut-off time and then calculate the auction quantity;
- service providers will need to transfer the information on the quantity of capacity that can be released in the auction to AEMO, who will then need to publish the information on the auction platform; and
- auction participants will need to submit their bids, which will be informed by the auction quantity information published on the auction platform.

Once the auction is conducted, then auction winners will be notified by AEMO. AEMO will also provide service providers with details on who has won capacity and the quantity of capacity procured by each auction winner. This information will then be used by service providers to allocate capacity to the auction winners who will then be able to submit their nominations for the next gas day.

Some indicative timings for each of these activities are set out in Table 4.5, which the GMRG is seeking stakeholder feedback on. The timings assumed in this table are based on the current gas day start times and nomination cut-off times. If a decision is made to harmonise nomination cut-off times and extend the application of gas day start time

⁶⁴ AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, pp. 76-77.



harmonisation beyond the facilitated markets, then it is possible the auction could be conducted an hour earlier. This would provide auction winners more time to put in place supply and delivery arrangements for the following day.

Table 4.5: Indicative timings for the day-ahead auction based on current gas day and nomination cut-off times (all times AEST)

State/ Territory	Gas Day Start Time	Pipeline Nomination Cut Off Time for Gas Day D+1*	Service Provider Provides Auction Quantity to AEMO	Indicative Timing for Day-Ahead Auction			Service Provider Allocates Auction MDQ	Auction Winners Submit Noms
				AEMO Publishes Auction Capacity	Auction Bids Due	Auction Completed Results Announced		
NSW/ACT	6:30 am	2 -2:30 pm	5.30 pm	5:45 pm	6:15 pm	6:45 pm	7.15 pm	7.45 pm
SA	6:30 am	3:30 pm						
Qld	8:00 am	3-4:00 pm						
Tas	6:30 am	1:30 pm						
NT	8.30 am	2-2:30 pm	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Vic (DTS)	6:00 am	n.a.						

Notes: * Nomination cut-off times assumed to be offsets to gas day start times.

One issue that is yet to be resolved, is what will occur if:

- Service providers are unable to provide AEMO with the auction quantity within the required timeframe (e.g. because the service provider has experienced some form of system failure) – the options in this case could include:
 - conducting the auction at a later time;
 - excluding the pipeline or compression asset from the auction; or
 - cancelling the auction.
- AEMO experiences a system failure and is unable to conduct the auction within the required timeframe – the options in this case could include:
 - conducting the auction at a later time; or
 - cancelling the auction.

The GMRG is interested in getting feedback on these options and the proposed timing of the auction.

Box 4.17: Questions on the auction timing

33. Do you agree with the proposed timing offsets for the auction related D-1 activities? If not, how long do you think should be allowed for each activity?
34. What do you think should occur if:
 - a service provider is unable to provide AEMO with the auction quantity within the required timeframe?
 - AEMO experiences a system failure and is unable to conduct the auction within the required timeframe?



4.10 Summary of the GMRG's preliminary view on auction design

The table below summarises the GMRG's preliminary view on the design of the day-ahead auction. Table A.2 in Appendix A shows how these preliminary views compare with the AEMC's recommendations.

Table 4.6: Summary of the GMRG's preliminary view on the auction design

Design Element	Preliminary View						
Auction quantity	If the auction product is defined as a second priority firm product, then as available and interruptible nominations received prior to nomination cut-off should not be included in the calculation of contracted but un-nominated capacity.						
Auction format	<p>Partial combinatorial format.</p> <p>Under this auction format, a bid will comprise: the bid quantity (GJ); the products (receipt and deliver points, pipeline segments and compression services) included in the bid; and the bid price per GJ. A bidder will be able to submit more than one bid and may win more than one of them.</p> <table border="1"> <tr> <td>Optional feature 1: Minimum requirement</td><td>Not included in the initial stages of the auction's development but could be added at a later stage if the benefits from doing so are found to outweigh the costs.</td></tr> <tr> <td>Optional feature 2: XOR Sets</td><td>Not included in the initial stages of the auction's development but could be added at a later stage if the nature of demand changes such that there is greater demand for substitutable routes.</td></tr> <tr> <td>Optional feature 3: Backhaul</td><td>Static backhaul capacity included in the auction given the efficiency benefits associated with backhaul.</td></tr> </table>	Optional feature 1: Minimum requirement	Not included in the initial stages of the auction's development but could be added at a later stage if the benefits from doing so are found to outweigh the costs.	Optional feature 2: XOR Sets	Not included in the initial stages of the auction's development but could be added at a later stage if the nature of demand changes such that there is greater demand for substitutable routes.	Optional feature 3: Backhaul	Static backhaul capacity included in the auction given the efficiency benefits associated with backhaul.
Optional feature 1: Minimum requirement	Not included in the initial stages of the auction's development but could be added at a later stage if the benefits from doing so are found to outweigh the costs.						
Optional feature 2: XOR Sets	Not included in the initial stages of the auction's development but could be added at a later stage if the nature of demand changes such that there is greater demand for substitutable routes.						
Optional feature 3: Backhaul	Static backhaul capacity included in the auction given the efficiency benefits associated with backhaul.						
Reserve price	<p>Reserve price of zero dollars with compressor fuel either provided by:</p> <ul style="list-style-type: none"> shippers in-kind; or the service provider with the costs then recovered through the operational GTA. 						
Pricing rule	Pay-as cleared pricing rule, which is determined by lowest accepted bids in the auction.						
Determination of auction winners	Profit-maximising combination of bids wins.						
Curtailment	<ul style="list-style-type: none"> Auction winners have the option to try and avoid curtailment of the affected product by procuring primary capacity from the service provider if there is spare capacity available and, if they are unable to do so, have the option to choose whether they are only curtailed on that product; or curtailed by the same amount across all products included in the winning bid. Pro-rata with compensation approach for curtailment-compensation rules. 						
Allocation of auction residue	Auction residue allocated to service providers based on the revenues achieved by the products (receipt and deliver points, pipeline segments and compression services) owned by each service provider.						
Information provided to bidders	<p>Before the auction, auction participants would be told what products are available in the auction and the auction quantity. After the auction, auction participants would be provided with information on:</p> <ul style="list-style-type: none"> their own winning bids, including the quantities of each product procured; and the price of all products in the auction. <p>In the initial stages, the bid-stack would not be made public. The performance of the auction will be reviewed periodically. If participation is high and there is strong competition in the auction, consideration could be given to publishing this information.</p>						
Auction timing	Based on current gas day start times and nomination cut-off times, the auction is indicatively expected to be completed by 6.45 pm.						



5. Coverage of the Auction

In the *East Coast Review* the AEMC noted that the overarching objective of the day-ahead auction is to improve the efficiency with which short-term transportation capacity is allocated and used by making contracted but un-nominated capacity available on a daily basis to shippers that might value it. The auction is expected to achieve this objective by:

- Countering the incentive firm capacity holders may otherwise have to withhold capacity by making contracted but un-nominated capacity available through the auction. The release of this capacity is expected to provide firm capacity holders an incentive to sell any spare capacity they have prior to the auction, which should, in turn, increase liquidity in the currently undeveloped secondary market and enable capacity to be allocated to those that value it most.
- Limiting the ability of service providers to price short-term capacity products above the levels that would be expected in a workably competitive market.

On the topic of auction coverage, the AEMC recommended the adoption of a single combinatorial auction across the east coast to optimise the allocation of as many products as possible across the market (preferred outcome).⁶⁵ The AEMC also recommended that:⁶⁶

- transportation assets (i.e. pipelines and compression assets) servicing a single facility should be exempt from the auction (preferred outcome); and
- transportation assets that are not fully contracted be exempted on a case-by-case basis from the auction (suggested outcome).

In relation to the first of these recommendations, the AEMC noted that if a transportation asset (pipeline or compressor) is only servicing a single user or facility, then an auction of contracted but un-nominated capacity may achieve little because there would be no prospect of the capacity being resold to another shipper.⁶⁷ This recommendation was considered uncontroversial by the AEMC and therefore classified as a preferred outcome.⁶⁸

The second recommendation, on the other hand, was more controversial. In this case, the AEMC noted that a key rationale of the auction is to address contractual congestion and to counter the market power held by service providers in the market for day-ahead capacity. The AEMC went on to add that neither of these rationales appeared to apply in cases where transportation assets are less than fully contracted.⁶⁹ The AEMC did, however, note that there were a number of reasons why pipelines should not be exempted on the basis of how much capacity is contracted:⁷⁰

“Contractual congestion occurs where physical pipeline capacity is available, but cannot be utilised by shippers that value it because it is contractually held by another party. By

⁶⁵ AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, pp. 81-82.

⁶⁶ *ibid.*, p. 82-83.

⁶⁷ *ibid.*, p. 82.

⁶⁸ *ibid.*

⁶⁹ *ibid.*, p. 83.

⁷⁰ *ibid.*



definition, pipelines that have a low proportion of capacity contracted are not contractually congested.

Similarly, the incentive and ability to exercise market power is weaker in cases where significant pipeline capacity is not contracted.

On the other hand, there are a number of reasons to suggest that pipelines should not be exempted on the basis of how much capacity is contracted. For example, a key benefit of the auction is that it can simultaneously allocate products across the system, taking complementarities into account. Exempting some pipelines will inhibit the ability of the auction algorithm to reach the welfare-maximising allocation.

Furthermore, exempting pipelines that are not fully contracted may create an incentive to 'game' the system by deliberately remaining less than fully contracted, in order to avoid being required to participate in the auction."

The AEMC therefore stopped short of recommending that the auction only apply to contractually congested assets and instead classified this as a 'suggested' outcome. The AEMC also recommended that the GMRG undertake further work to determine an appropriate methodology for determining exemptions.⁷¹

These recommendations were considered jointly by the Day-Ahead Auction and Capacity Trading Platform project teams, which identified a number of potential options for the coverage of the auction and appropriate exemptions. The GMRG has also obtained independent advice from NERA on the coverage options. Further detail on the options that were identified by the project teams and NERA is provided in the remainder of this chapter, which also sets out what pipelines would be subject to the auction if it was limited to contractually congested pipelines and the GMRG's preliminary view on coverage and exemptions.

5.1 Coverage and exemption options identified by project teams

In the early stages of the development of the auction and capacity trading platform, the Day-Ahead Auction and Capacity Trading project teams considered what transportation assets should be subject to the auction and the exemptions that should be available. Through this discussion, the teams identified the following potential options for coverage of the auction:

1. the auction only applies to contractually congested transportation assets (Option 1);
2. the auction applies to all major transportation assets, irrespective of the level of contractual congestion (Option 2); or
3. the auction applies to contractually congested transportation in the initial stages but a review is undertaken 12 months after commencement of the auction to determine whether other pipelines should be included (Option 3).

Team members were, however, divided on which of these options should be implemented. Those team members that advocated Option 1 noted that it was consistent with the AEMC's suggested outcome and also highlighted the statement by the AEMC

⁷¹ *ibid.*



that neither of the key rationales for the auction (i.e. to address contractual congestion and counter the market power held by service providers) appear to apply to assets that are less than fully contracted. These team members also claimed that if the auction was extended to assets that are not contractually congested, then capacity released in the auction may compete with uncontracted primary capacity and service providers may be unable to recover their capital costs, which they noted could adversely affect future investment.

Those team members that advocated Option 2, on the other hand, thought that limiting the scope of the auction to contractually congested pipelines would be inconsistent with the AEMC's recommendation that a single combinatorial auction be carried out across the east coast to optimise the allocation of capacity (preferred outcome). They also cited a number of problems with relying on contractual congestion as the trigger for the auction and claimed that a wider application of the day-ahead auction would be more consistent with the broader objectives of the capacity trading reforms (see section 2.3). Some of these team members also challenged the claim by other team members that extending the auction to assets that are not contractually congested would adversely affect the demand for primary capacity or investment.

The team members that supported Option 3 thought it was something they could "live with".

During this discussion, project team members noted a number of potential problems with using contractual congestion as the trigger for inclusion in the auction, including:

- The lack of a clear definition of how contractual congestion is to be measured. For example, it is not clear whether:
 - contractual congestion would be defined as occurring when the asset is 100% contracted or at a lower level, such as 90% or 95%; and
 - contractual congestion should be measured on an historic or prospective basis and the period over which it should be measured (e.g. a 12 month outlook period or a shorter or longer period).

While project team members agreed that contractual congestion should be defined as lower than 100%, they were unable to reach agreement on the specific level that should be used, or the period over which it should be measured.

- The potential for contracting changes to result in frequent and rapid changes in the level of contractual congestion, which would result in a constantly changing set of transportation assets that are subject to the auction. To deal with these types of changes, the project team suggested that the assessment of whether an asset is contractually congested be carried out on a periodic basis (e.g. every six months) and that any changes in between not affect the decision as to whether the asset is subject to the auction.
- The potential for bi-directional pipelines to be contractually congested in one direction but not the other direction, which could result in one direction being included in the auction but not the other.

In addition to considering the coverage options, the project teams identified two potential categories of exemptions from the day-ahead auction:



- Exemptions for pipelines that are subject to a 15 year no coverage determination, or pipelines that are not providing third party access. The rationale cited for this exemption is that the auction could, in effect, require the provision of third party access when a pipeline is not currently providing such access.
- Exemptions for transportation assets servicing a single facility (e.g. gas fired generators or industrial customers), which is a preferred outcome of the AEMC's recommendations. The rationale cited for this exemption is that the cost of conducting an auction on such a transportation asset is likely to outweigh the benefits because there are unlikely to be prospective users seeking capacity in the auction.

While project team members agreed that the first exemption category should be implemented, they were unable to reach an agreement on the second exemption category. In this case, there were some project team members that supported the inclusion of this exemption category, while others thought that prospective users may still want to try to access these pipelines. To accommodate these diverging views, some team members noted that the exemption arrangements could allow prospective users to register their interest in accessing these types of pipelines through the day-ahead auction, which could then act as a trigger for a review of the exemption.

5.2 Coverage options identified by NERA

Given the diversity of views expressed by project team members about the coverage of the auction, the GMRG obtained independent advice from NERA on the coverage options for pipelines. NERA identified the following options:

- all transmission pipelines;
- contractually and physically congested pipelines;
- contractually congested pipelines with no physical congestion; and
- contractually and physically uncongested pipelines.

In relation to the first of these options, NERA noted that this option would be advantageous from an administrative perspective, because it does not require monitoring of contractual or physical congestion levels and prevents service providers from trying to game its congestion status. NERA did, however, note that given this option does not take into account the expected efficiency effects under different congestion scenarios, it is possible that the cost of administering the auction may exceed the expected efficiency gains on some pipelines.

Further insight into the effect that NERA thought the auction could have on allocative and dynamic efficiency under the different congestion scenarios can be found in Table 5.1 (see Box 2.1 for more detail on these economic efficiency concepts). Before looking at this table, it is worth noting that the allocative and dynamic efficiency gains from introducing the auction will depend on:

1. the previously-unsatisfied demand for unused capacity that is satisfied following the auction; and
2. the impact of the auction on pipeline revenues and future investment.



Table 5.1: Summary of NERA's findings on expected efficiency effects under different congestion scenarios

		Contractual congestion	No contractual congestion
Physical congestion	Allocative efficiency	No efficiency gains In this case the auction is not expected to result in significant allocative efficiency gains because on most days the amount of capacity released in the auction will be close to zero.	n.a. <i>This scenario would imply that, despite the fact that the pipeline is not fully contracted, it is physically congested, which is an unrealistic scenario.</i>
	Dynamic efficiency	No efficiency gains In this case the auction is not expected to have a material effect on contracting or investment because the pipeline is highly utilised and capacity is scarce.	
No physical congestion	Allocative efficiency	Increase in efficiency In this case the capacity released through the auction is likely to result in additional gas being transported because: <ul style="list-style-type: none"> existing buyers without long-term capacity may buy more capacity than they would buy at the as available/interruptible prices set by service providers; and/or new shippers may enter the market because they can access capacity at a lower price than before. 	Increase in efficiency In this case, shippers would have the option of purchasing firm or relatively reliable as available/interruptible products from service providers and may not need to rely on the auction. However, these shippers may prefer the auction given it has a reserve price of zero. This may result in additional gas being transported because: <ul style="list-style-type: none"> existing shippers without long-term contracts may buy more capacity than they would buy firm or as available/interruptible services at the prices set by service providers; and/or new shippers may enter the market because they can access capacity at a lower price than before.
	Dynamic efficiency	Impact on dynamic efficiency uncertain The effect of the auction on contracting depends on whether: <ul style="list-style-type: none"> demand in the auction is <i>below</i> the auctioned capacity – in this case firm capacity holders may de-contract in the longer term because they would expect to access short-term capacity around the reserve price (\$0); or demand in the auction is <i>above</i> the auctioned capacity – in this case firm capacity holders will be less likely to de-contract because they would face the risk of not procuring capacity in the auction (or if they can purchase capacity being interrupted as a result of renominations by firm capacity holders) and paying a higher price for capacity (i.e. the clearing price will be set by the lowest successful bid and will be above \$0). Even if there is some de-contracting the impact on dynamic efficiency will depend on whether the lower revenues received by service providers result in less pipeline development and, if so, whether less pipeline development is efficient or not.	Impact on dynamic efficiency uncertain, but more de-contracting likely than for contractually congested pipelines In this case, firm capacity holders are more likely to de-contract than they are under the contractual-physical congestion scenario, because they know that cheaper capacity is likely to be available through the auction and that on days on which auction demand is very high, they could still buy spare primary capacity from service providers. The risk of ending up without capacity is therefore lower in this case than the contractual-physical congestion scenario. The impact of de-contracting on dynamic efficiency will depend on whether the lower revenues received by service providers result in less pipeline development and, if so, whether less pipeline development is efficient or not. By definition, contractually uncongested pipelines have a lower share of long-term contracts to start with. Further reductions due to de-contracting are more likely to be dynamically inefficient than under the contractual-physical congestion scenario.



As Table 5.1 shows, the application of the auction to:

- physically uncongested pipelines is expected to result in an increase in allocative efficiency, but it is unclear whether those gains are larger for contractually congested pipelines (bottom left corner of the table) or contractually uncongested pipelines (bottom right corner of the table).⁷²
- contractually and physically uncongested pipelines (bottom right corner of table) may carry a greater risk of de-contracting; and
- contractually and physically congested pipelines (top left corner of table) is expected to have no effect on allocative or dynamic efficiency.

In relation to the dynamic efficiency effects, NERA noted that the introduction of the auction could result in de-contracting on both contractually congested and uncongested pipelines, but the extent to which this occurs will depend on:

- shippers' collective preference for firm capacity and the lower priority products sold in the auction;
- the probability of obtaining capacity in those auctions; and
- the clearing prices of those auctions.

NERA also noted that de-contracting from current levels may be efficient if it prevents or reduces overinvestment in capacity, or inefficient if it stimulates under-investment in pipelines. NERA went on to add that if de-contracting is of particular concern for contractually uncongested pipelines, there may be benefits from exempting these pipelines from the auction requirement, but otherwise, given the inconclusive nature of the findings, dynamic efficiency does not provide a basis for excluding these pipelines.

In addition to considering the expected efficiency effects, NERA also considered the effect that the exemption of some pipelines from the auction may have on:

- **The efficiency of the auction:** NERA noted that exempting pipelines from the auction may increase, rather than reduce, overall costs because if shippers want to transport gas across multiple pipelines, the exclusion of some pipelines in this route may undermine the realisation of potential efficiency gains. The impact on the efficiency of the auction will be commensurately larger, the greater the extent to which shippers rely on bundled pipeline segments in the auction.
- **Monitoring and other costs:** NERA noted that the cost of monitoring the congestion status of pipelines and costs associated with pipelines moving into and out of the auction over time as contractual congestion levels change may be high relative to the cost savings from exempting certain pipelines from the auction.

⁷² It is superficially plausible that the allocative efficiency gains from the auction will be larger on pipelines that are currently contractually congested. Shippers may have unsatisfied demand for these pipelines that they cannot satisfy at any price. Shippers at least have the option of purchasing capacity at some price on uncongested pipelines. However, if demand for capacity on contractually uncongested pipelines is sufficiently elastic and the price charged by the pipeline company for capacity is sufficiently high, the volume of additional demand served as a result of the auction may be higher on contractually uncongested pipelines. Accordingly, the welfare gains may be larger than in the case of contractually congested pipelines.



5.3 Pipelines that would be subject to the auction if it is limited to contractually congested pipelines

Table 5.2 sets out the capacity and current levels of contractual congestion on all the major pipelines in the east coast that are currently subject to BB reporting obligations. A map showing the location of these pipelines can be found in Appendix E.

Table 5.2: Contracted congestion (measured between Sep 2017 – Aug 2018)

Pipeline	Flow Direction	Capacity (TJ/d)	% Contracted (Avg Sep 17 – Aug 18)	Level of contracting		
				100%	More than 95%	More than 90%
Queensland LNG Pipelines						
APLNG Pipeline	To Curtis Island	1560	100%	x	x	x
Wallumbilla to Gladstone Pipeline	To Curtis Island	1588	100%	x	x	x
GLNG Pipeline	To Curtis Island	1430	100%	x	x	x
Comet Ridge to Wallumbilla Pipeline	To Roma	950	100%	x	x	x
	To Wallumbilla	175	100%	x	x	x
Queensland Other Pipelines						
South West Queensland Pipeline	To Moomba	404	99%		x	x
	To Wallumbilla	340	60%			
Roma to Brisbane Pipeline	To Brisbane	233	96%		x	x
	To Wallumbilla	125	59%			
Darling Downs Pipeline	To Wallumbilla	270	100%	x	x	x
	To Darling Downs	530	100%	x	x	x
Spring Gully Pipeline	To Wallumbilla	142	100%	x	x	x
	To Spring Gully	40	100%	x	x	x
Berwyndale to Wallumbilla Pipeline	To Wallumbilla	164	92%			x
	To Roma	276	0%			
Queensland Gas Pipeline	To Gladstone	138	91%			x
	To Wallumbilla	40	0%			
Carpentaria Gas Pipeline	To Mt Isa	119	79%			
NSW/ACT						
Eastern Gas Pipeline	To Sydney	358	95%			x
Moomba to Sydney Pipeline	To Sydney	439	75%			
	To Moomba	120	91%			x
South Australia						
Moomba to Adelaide Pipeline	To Adelaide	237	100%	x	x	x
	To Moomba	85	100%	x	x	x
SEA Gas	To Adelaide	314	100%	x	x	x
Tasmania						
Tasmanian Gas Pipeline	To Hobart	129	67%			
	To Longford	120	92%			x

Source: Natural Gas Services Bulletin Board, <http://gasbb.com.au/>, accessed 29 September 2017.



As this table shows, if contractual congestion is defined as having contracted 90% or more of the nameplate capacity contracted on average over a 12 month period, then while it would capture a reasonable number of pipelines, it would exclude a number of key pipelines, including:

- the Carpentaria Gas Pipeline (Ballera to Mt Isa);
- the Roma to Brisbane Pipeline (Kogan North to Wallumbilla);
- the South West Queensland Pipeline (Moomba to Wallumbilla);
- the Berwyndale to Wallumbilla Pipeline (Wallumbilla to Roma);
- the Moomba to Sydney Pipeline (Moomba to Sydney); and
- the Tasmanian Gas Pipeline (Longford to Hobart).

If a more restrictive definition of contractual congestion (i.e. 100% contracted) was adopted, then the list of pipelines that would be subject to the auction would only include the following pipelines:

- the dedicated LNG pipelines (i.e. the APLNG, Wallumbilla to Gladstone, GLNG and Comet Ridge to Wallumbilla pipelines), many of which are likely to seek an exemption because they don't provide third party access or service a single facility;
- the Darling Downs Pipeline (in both directions);
- the Spring Gully Pipeline (in both directions);
- the Moomba to Adelaide Pipeline (in both directions); and
- the SEAGas Pipeline.

As this list highlights, there would be limited value in adopting the combinatorial auction if the auction was limited to contractually congested pipelines and a relatively restrictive definition of contractual congestion was adopted. Even if the lower 90% threshold was adopted, there would be some key gaps in the partial combinatorial auction, which could, as NERA pointed out, undermine the efficiency of the auction because it would be more fragmented.

The other point to note about this analysis is that it is based on current levels of contractual congestion. As contracts roll off and new contracts are entered into, the pipelines that would be included or excluded from the auction could change dramatically. A good example of this arose earlier in the year, when this analysis was originally carried out. At the time this analysis was conducted, it showed that the South West Queensland Pipeline was contractually congested from Moomba to Wallumbilla but not in the other direction. However, when this analysis was repeated a week later, it showed that the pipeline was contractually congested from Wallumbilla to Moomba but not in the other direction. This highlights one of the shortcomings of using contractual congestion as a trigger for determining whether or not an asset is subject the auction, because not only would this type of change be disruptive for shippers it could also impose significant costs on service providers if it results in assets moving into and out of the auction.



5.4 GMRG's preliminary view and questions

The analysis carried out by NERA and the diversity of views expressed by project team members on whether the auction should be limited to contractually congested assets, or should apply to all major transmission pipelines and hub services, highlights the complex and contentious nature of this issue. The analysis of pipelines that would be subject to the auction if contractual congestion is used as the trigger, also highlights some of the practical limitations and fragmentation that could arise under this approach. More fundamentally, this analysis highlights the potential for a contractual congestion trigger to fail to achieve the broader objectives of the capacity trading reforms and to capture the efficiencies that would be associated with a single combinatorial auction across the east coast.

As noted in section 2.3, the objectives of these reforms are to improve the efficiency with which transportation capacity is allocated and utilised and to foster the development of a more liquid market for secondary capacity. It is difficult to see how this objective would be achieved if the auction was limited to contractually congested pipelines, given the fragmented nature of the auction coverage that would emerge under this approach.

This can be contrasted to an auction that applies to:

- all the transmission pipelines (excluding the Declared Transmission System) linking major demand centres and supply sources in the east coast; and
- contractually congested pipelines in regional areas.⁷³

In this case, the auction could be expected to deliver significant allocative efficiencies across the market by enabling short-term capacity to be allocated to those that value it most. In the GMRG's view this will promote the NGO and contribute to the achievement of the Energy Council's Vision of a liquid wholesale gas market and a number of the outcomes it expected to pursue in the next phase of gas market reform (i.e. outcomes 2(b), 3(b) and 3(d) – see Box 1.1). The GMRG is therefore proposing to employ this broader approach to determining the assets to be included in the auction (noting that the day-ahead auction will still only require the release of contracted but un-nominated capacity).

The GMRG understands a broader application of the auction to assets that are not contractually congested may result in some de-contracting on individual assets as shippers fine-tune their capacity requirements. It is important to recognise that there are limits as to how much de-contracting can occur (i.e. if all shippers de-contract there will be no capacity available in the auction). It is also important to recognise that de-contracting is not synonymous with inefficiency. Rather, de-contracting may be efficient if it prevents or reduces overinvestment in capacity.

That is not to say there is no risk that extending the auction to assets that are not contractually congested will result in dynamic inefficiencies. However, this risk must be weighed up against the efficiencies that would arise from the broader application of the

⁷³ As the AEMC noted in its *East Coast Review*, the ACCC has identified evidence in the case of some regional pipelines that shippers are deliberately withholding capacity in order to improve their competitive position in up- or downstream markets. It would be important therefore for the auction to apply in these areas as well.



auction, which in the GMRG's view are likely to be significant. On balance and having regard to NERA's finding that the impact of the auction on dynamic efficiency is inconclusive, the GMRG is of the view that the allocative efficiency gains will outweigh the possible dynamic inefficiencies and therefore promote the NGO, the Energy Council's Vision and the broader objective of the capacity trading reforms.

In relation to exemptions, the GMRG's preliminary view is that exemptions should be available to:

- **Transportation assets that are not providing third party access:** This is consistent with the approach that has been taken in Part 23 of the NGR and is, in the GMRG's view, appropriate because the auction should not be used as the vehicle through which third parties gain access to transportation assets that are not currently providing third party access. The appropriate vehicle for gaining this type of access is, in the GMRG's view, the coverage test in the NGL in the case of pipelines⁷⁴ or Part IIIA of the *Competition and Consumer Act (2010)* for compressors.

The GMRG has considered the suggestion by some stakeholders that this exemption should extend to pipelines that are subject to a 15 year no coverage decision. However, the GMRG is of the view that there could still be benefit in applying the auction to these pipelines if they are providing third party access and do not fall into another exemption category. While the GMRG is not proposing to adopt a specific exemption for pipelines, it would expect the majority of pipelines subject to a 15-year no-coverage determination to be able to seek an exemption on the basis that the pipeline does not provide third party access or that it services a single facility.

- **Transportation assets that service a single facility:** Like the AEMC, the GMRG is of the view that there would be little value in subjecting these assets to the auction because there is little prospect of the un-nominated capacity being resold to another shipper. The GMRG does, however, believe there may be merit in allowing prospective users of these pipelines or the owner of the end-user facility to apply to have the exemption revoked. This could, for example, be appropriate if the owner of the facility is serviced by a retailer and it wants to diversify its sources of supply.

An indicative list of the assets that could be subject to the auction under the GMRG's proposed approach is set out in Table 5.3. This list indicative only at this stage and the GMRG welcomes further feedback on its contents.

⁷⁴ While coverage is often thought about as the test for regulation, it is also the process by which third parties can try and obtain access to facilities that would not otherwise provide that access.



Table 5.3: Indicative list of assets that could be subject to the auction

Transmission Pipelines and Compressors
Queensland
South West Queensland Pipeline (both directions)
Roma to Brisbane Pipeline (both directions)
Darling Downs Pipeline (both directions)
Spring Gully Pipeline (both directions)
Berwyndale to Wallumbilla Pipeline (both directions)
Queensland Gas Pipeline (both directions)
Carpentaria Gas Pipeline
Contractually congested regional pipelines
NSW/ACT
Eastern Gas Pipeline
Moomba to Sydney Pipeline (both directions)
Contractually congested regional pipelines
South Australia
Moomba to Adelaide Pipeline System (both directions)
SEAGas Pipeline
Contractually congested regional pipelines
Tasmania
Tasmanian Gas Pipeline
Compression assets
Compressors servicing the Wallumbilla GSH (operated by APA)
Compressors servicing the Moomba GSH (operated by APA)

Box 5.1: Questions on coverage of the auction

35. Do you agree with the proposal to apply the auction to all the transmission pipelines (excluding the Declared Transmission System) linking major demand centres and supply sources in the east coast and contractually congested pipelines in regional areas? If not, please explain why.
36. Are there any other pipelines or compressors that you think should be added to the list of pipelines and compressors that could be subject to the auction in Table 5.2?
37. Do you think that the efficiencies associated with a broader application of the auction will outweigh some of the dynamic efficiency losses that could occur on individual pipelines? If not, are there any other measures that you think could be employed to ameliorate the effect of any such losses?
38. Do you agree that exemptions should be available to:
 - transportation assets that are not providing third party access? If not, please explain why.
 - transportation assets that service a single facility? If not, please explain why?
39. Do you think an exemption should be available to pipelines that fall below a minimum size threshold if they are not contractually congested? Please explain your response.
40. Are there any other exemptions that you think should be provided for? If so, please explain what they are and why they are required.



6. Design and Use of the Auction Platform

The day-ahead auction will be operated and administered by AEMO. To minimise the costs and time associated with implementing the auction platform, AEMO has proposed to use a number of its existing IT systems, an adapted version of the inter-regional SRA algorithm and the existing data exchange system for communications between itself and service providers. AEMO has also proposed to draw on the settlement and credit support frameworks that have been set up for the GSH to minimise the costs and complexities associated with using the day-ahead auction (subject to checking the impact on the GSH legal framework).

The remainder of this chapter provides further detail on the auction platform and systems that AEMO is proposing to use, the arrangements shippers will need to have in place to use the auction platform and how the auction will interact with the STTM and DWGM.

6.1 Auction platform and systems

In a similar manner to the GSH and a number of other AEMO operated market systems, shippers that want to utilise the auction platform will need to access the platform via a new tab on the Electricity Market Management System (EMMS) web portal. The auction platform, as proposed by AEMO, will utilise:

- an adapted version of the web-interface that is currently used for bid submission in the inter-regional SRA; and
- the existing EMMS file server and data interchange to provide auction participants with auction related information and reports.

The auction platform will also use an adapted version of the auction algorithm that is currently used in the SRA, which provides for combinatorial bidding and uses a linear program to establish the bid stack and allocate the auction residue. As noted in section 4.1, if a decision is made to include the minimum requirements or the XOR set optional features in the auction format, then a number of changes will need to be made to the SRA algorithm. This will need to be subject to testing before it is implemented.

In relation to the data interchange, there will, as noted in sections 4.1 and 4.8, need to be a number of transfers of information between AEMO and service providers. For example, before the auction can be conducted, service providers will need to inform AEMO of the quantity of contracted but un-nominated capacity that can be released in the auction. AEMO will then need to inform service providers of the outcomes of the auction and the shippers that have purchased capacity. If auction capacity is curtailed on the gas day, then service providers will also need to inform AEMO of the extent to which each auction winner was affected by the curtailment. There may then need to be further communication between AEMO and other service providers if the affected auction winners had a combinatorial bid in place, or this could be left to the auction winner to communicate to the relevant service providers.

To minimise the costs associated with these data exchanges, AEMO is proposing to utilise either:



- the BB data exchange;⁷⁵ or
- the STTM Web Exchange (SWEX) and SWEX Interface Engine (SWEXIE).⁷⁶

The GMRG understands that AEMO is carrying out further work to understand the strengths, limitations and costs of these options, which will be informed by feedback on the *Standardisation Related Reforms and Capacity Trading Platform Consultation Paper*.

The GMRG agrees with AEMO's proposal to try and minimise the cost and time associated with implementing the day-ahead auction by utilising existing systems and a modified version of the SRA algorithm. The GMRG is interested though in whether stakeholders share this view, or if they think any aspects of the proposed platform or systems should be modified. The GMRG is also interested in understanding whether service providers will need to put in place any new systems to calculate auction quantities and to deal with information transfers between itself and AEMO and, if so, how long this is likely to take. This information will inform the implementation plan that the GMRG is currently working on.

Box 6.1: Questions on auction platform and systems

41. Do you agree with AEMO's proposal to use existing systems and a modified version of the SRA algorithm? If not, please explain why.
42. Will service providers need to put any new systems in to calculate auction quantities or to deal with information transfers between itself and AEMO? If so, how long do service providers think this is likely to take?

6.2 Use of the Auction Platform

To utilise the day-ahead auction platform, auction participants will need to enter into a number of contractual arrangements, including an Auction Agreement with AEMO, which will set out the terms of participation in the auction, including the settlement and credit support arrangements. Auction participants may also be required to pay a participation fee if the costs of conducting the auction are to be recovered directly from those that use the auction (see section 6.2.4).

Further detail on the Auction Agreement, the settlement and credit support requirements, participation fees and other contractual arrangements that auction participants will need to enter into is provided below.

⁷⁵ The BB CSV interface provides a file gateway allowing service providers to submit market data to AEMO using File Transfer Protocol (FTP). BB participants have three options to submit their CSV files: CSV file upload using FTP; CSV file upload using the website upload page or direct entry via the webform. This exchange is used by all service providers on the east coast that are required to report information to the BB, which should minimise implementation risks and costs.

⁷⁶ The SWEX and SWEXIE are used to transfer data between STTM registered participants, service providers and AEMO. Four different interfaces are available under the SIP to submit information to and from AEMO: direct data entry using a browser; data loading using CSV file to browser; CSV file upload using FTP; and CSV file upload using HTTPS. In contrast to the BB CSV interface, not all service providers are utilising the SIP data link because some are not connected to a STTM.



6.2.1 Auction Agreement

Market participants that want to purchase capacity through the day-ahead auction would need to execute an Auction Agreement with AEMO. The Auction Agreement is expected to, amongst other things, set out:

- the arrangements for access to the auction platform and conditions for participation in auctions (this includes information on the requirement shippers will have to provide payment security and when credit support can be called);
- the shipper's agreement to be bound by and comply with the arrangements governing participation in auctions, the conduct of auctions and the results of auctions;
- the circumstances in which AEMO can suspend a shipper from participation in auctions and terminate the shipper's Auction Agreement, which are expected to be similar to those that apply in the GSH;
- the payment and settlement arrangements and other contractual matters, such as warranties and representations and limitations and exclusions of liability; and
- an acknowledgement that AEMO's role is limited to conduct of the auction, the notification of auction results and settlement and that the shipper is responsible for ensuring it has the rights it needs to use the capacity purchased at auction.

A shipper would enter into one Auction Agreement covering its participation in auctions from time to time. A shipper could terminate its Auction Agreement by notice to AEMO, with termination taking effect once it has met all liabilities under the Auction Agreement. Further detail on the Auction Agreement can be found in Chapter 7.

6.2.2 Settlement arrangements

Capacity purchased through the day-ahead auction is expected to be settled centrally by AEMO. Settlement amounts would be calculated and reported to auction participants and service providers on a daily basis and settled on a monthly basis.

Under the proposed settlement framework, an auction participant's settlement amount in relation to a day-ahead auction would be calculated as follows:

- the face value of the capacity purchased by the participant in the auction; *less*
- the value of any compensation that may be payable by AEMO to the auction participant if any of its auction capacity is curtailed (see section 4.6).

The settlement amount in any month will include the amounts for all auctions in the month plus any participation fees payable by the auction participant (see section 6.2.4).

Settlement for service providers will be separate from auction settlement and will be undertaken in accordance with provisions in the NGR. Settlement amounts would be calculated and reported daily and settled monthly. A service provider's daily settlement amount would be calculated as:

- the face value of the auction capacity purchased by auction participants in relation to the service provided by that service provider; *less*



- the value of any compensation that may be payable by AEMO to auction participants if that auction capacity is curtailed on the day.

While settlement amounts will be calculated on a daily basis, the billing cycle will be monthly as it currently is in the GSH. Final settlement statements will therefore be prepared and issued by AEMO to auction participants and service providers on a monthly basis. Further detail on the proposed settlement process is provided in Table 6.1.

Table 6.1: Settlement timeline

Process	When	Who
Daily Settlement		
Provide AEMO with information on whether any auction winner's capacity has been curtailed	From end of the gas day	Service Providers
Prepare estimate of settlement amounts	Each business day	AEMO
Report settlement amount and quantities to auction participants and service providers via market report	Each business day	AEMO
Monthly Settlement		
Provide AEMO with information on the extent to which any auction winner's capacity has been curtailed	By 9am on the 14 th business day after the end of that billing period	Service Providers
Issue final settlement statement	By the 15th business day after the end of the billing period	AEMO
Auction participants make payment to AEMO	By 12 noon on the 17th business day after the end of the billing period	Auction Participants
AEMO makes payments to service providers	By 2pm on the same day	AEMO

The GMRG understands that AEMO is considering whether to combine the settlement process and settlement amounts for auction purchases and the GSH and to issue one settlement statement to participants.⁷⁷ The GMRG thinks there is merit in this proposal, subject to checking the impact on the legal framework for the GSH. The GMRG is interested though in whether stakeholders share this view.

Box 6.2: Questions on settlement arrangements

43. Do you agree with AEMO's proposal to combine the settlement amounts for the GSH and day-ahead auctions? If not, please explain why.

6.2.3 Credit risk management

This section considers the arrangements for managing the risk that a shipper fails to pay an amount owed to AEMO in settlement. These amounts are principally payment for capacity bought at auction (net of any compensation for curtailment) and participant fees.

⁷⁷ A breakdown of the auction related settlement amounts would be listed as a separate line item on the statement.



Credit risk in relation to amounts owed under operational GTAs will be dealt with through the operational GTA and is considered in Chapter 3 of the *Standardisation Related Reforms and the Capacity Trading Platform Consultation Paper*.

The GMRG's preliminary views are that:

- credit risk should be managed through the provision of payment security by shippers participating in auctions;
- permitted forms of payment security should include cash deposits by way of prepayment or bank guarantees only;
- a minimum level of payment security must be maintained at all times to cover participant fees;
- each shipper will determine how much additional payment security it will provide from time to time;
- AEMO will determine each auction participant's trading limit as the difference between its current payment security (above the minimum) and its current outstandings (amounts invoiced but unpaid and amounts it will be required to pay for past auctions but not yet invoiced); and
- in any auction, the shipper will only be permitted to bid up to its current trading limit.

These arrangements are intended to minimise credit risk to the extent feasible and consistent with the approach taken in other markets operated by AEMO, including the GSH. However, there remains a residual credit risk; that is, the risk that payment security for some reason fails and there is a shortfall between the amount that AEMO receives from a shipper and the amount the shipper owes. AEMO has no financial capacity to accept this residual credit risk. The GMRG's preliminary view is therefore that this risk will be allocated to service providers, by limiting the maximum amount that AEMO is required to pay to service providers to the amount AEMO receives from shippers in settlement, less auction participation fees.

AEMO has proposed that credit support arrangements for day-ahead auctions and the GSH could be managed as a single process. This would enable a single prepayment or third party payment guarantee to be provided for both markets and amounts owed to the participant in one market could be set off against amounts owed by the participant in the other, to reduce the amount of credit support required.

The GMRG recognises a single settlement and credit support process across both markets will be more convenient for shippers and will reduce costs for some shippers. The GMRG therefore thinks there is merit in this proposal, subject to checking the impact on the legal framework for the GSH. The GMRG is currently investigating further with AEMO whether this can be implemented while retaining the current credit risk management arrangements in the GSH (which allow for payment netting and allocation of residual credit risk to shippers).

Box 6.3: Questions on credit risk management

44. Do you agree with AEMO's proposal to combine the credit risk management arrangements for the GSH and auction products? If not, please explain why.



6.2.4 Fees to use the auction platform

One of the AEMC's preferred outcomes for the day-ahead auction is that the costs of running the auction be recovered from the auction proceeds, with any residual revenue then provided to service providers.⁷⁸ This cost recovery model differs from the model used in other markets operated by AEMO, such as:

- the GSH where trading participants are required to pay a fixed fee and variable transaction fees; and
- the SRA where auction participants are required to pay a variable charge for units purchased in the auction.

In both of these cases, it is the market participants utilising the market mechanisms that pay AEMO's implementation and operating costs, rather than infrastructure providers.

While the GMRG appreciates the simplicity of the AEMC's suggested approach, it does have some concerns about the potential for the difference in treatment of costs AEMO incurs in developing and operating the capacity trading platform and the day-ahead auction to distort shippers' decisions to use these mechanisms.⁷⁹ The other concern the GMRG has with the suggested approach is that it is unclear what would occur if the auction proceeds were insufficient to cover AEMO's costs. Specifically, it is unclear whether service providers or market participants would be required to fund the difference.

Given these concerns, the GMRG has given some thought to other cost recovery models that could be applied to the day-ahead auction. The three options the GMRG has identified would involve recovering the costs AEMO incurs implementing and operating the day-ahead auction from:

1. **auction participants only** – the rationale for this user pays option is that auction participants are the main beneficiaries of the day-ahead auction;
2. **auction participants and GSH participants** – the rationale for this option is that trade on the day-ahead auction and capacity trading platform is closely related and there may be times where conditions in the auction are such that it drives market participants to use the trading platform and vice versa; or
3. **BB shippers (i.e. primary capacity holders on transmission pipelines)** – the rationale for option is that if primary capacity holders released their capacity then the auction would not need to be conducted (causer pays).

The risk with the first of these options is that if there is limited demand for auction products (i.e. because the auction works as intended and encourages firm capacity holders to sell any spare capacity they have ahead of the auction), then it may result in:

⁷⁸ This intention is reflected in the following statement from the *East Coast Review*:
“The preferred method of allocating auction revenue is to give it to pipeline owners, after the costs of running the auction have been recovered.”
AEMC, Stage 2 Final Report: Eastern Australian Wholesale Gas Market and Pipelines Framework Review, 23 May 2016, p. 80.

⁷⁹ For instance, if shippers are required to pay an annual fee of \$14,500 and a variable transaction fee of \$0.01-\$0.03/GJ to use the capacity trading platform, but nothing to use the day-ahead auction then it may discourage shippers from using the capacity trading platform.



- relatively high participation fees, which could further discourage market participants from using the auction; and/or
- AEMO failing to recover the costs it incurs in operating the auction, the cost of which would be borne by all market participants, given AEMO is a not-for-profit company limited by guarantee under the *Corporations Act 2001* (Commonwealth).

This risk is not expected to be as significant under the second and third options given the number of participants in the GSH and primary capacity holders. Of these two options, the second option (i.e. recovery from auction and GSH participants) would be easier to implement. It would also minimise the risk of differences in GSH and auction participation fees distorting shippers' decisions to use either the auction or trading platform, because it would enable a more holistic approach to be taken to setting both of these fees. The other benefit of this option is that if there is a sufficient number of auction participants, then the fees recovered from these participants could also make a contribution to the GSH systems that will be used in the auction. The GMRG's preliminary view is therefore that this cost recovery model option should be utilised.

As to the level of fees and the fee structure that will be used to recover AEMO's costs, in the GMRG's view this should be a matter for AEMO to determine in consultation with registered auction and GSH participants. This is consistent with the approach used in the GSH, with rule 534(1) in the NGR allowing AEMO to charge exchange members fees that are sufficient to cover its budgeted costs of establishing, operating and administering the GSH, while rule 534(2) requires AEMO to consult with exchange members on the structure, introduction and determination of fees. This is only a preliminary view at this stage. The GMRG therefore welcomes feedback from stakeholders on this proposal and the questions in Box 6.4.

Box 6.4: Questions on cost recovery

45. Do you agree with the proposal to recover AEMO's costs of implementing and conducting the day-ahead auction from auction and GSH participants? If not, please explain why.
46. Do you agree with the proposal to allow AEMO to determine, in consultation with auction and GSH participants, the fee structure that would apply to the day-ahead auction and secondary capacity trades? If not, please explain why.
47. Do you think the cost recovery provisions should be specified in the NGR?

6.2.1 Other contractual arrangements required by auction winners

In addition to the arrangements outlined above, shippers wishing to procure capacity from the day-ahead auction will need to:

- enter into an operational GTA with the relevant service provider(s);⁸⁰ and
- become a party to the relevant allocation agreement(s) if it wishes to use multi-user receipt or delivery point(s).

⁸⁰ The service provider can also offer an operational GTA-style service under a primary GTA, allowing a primary shipper to roll capacity bought in the secondary market into the primary GTA.



Further detail on these arrangements can be found in Table 2.1.

The GMRG is currently working on the amendments that would be required to the Operational GTA Code that was released for public comment in the *Standardisation Related Reforms and the Capacity Trading Platform Consultation Paper* to accommodate the auction product.⁸¹ When this was initially discussed with the Standardisation project team, it was noted that most of the provisions that had been drafted for secondary capacity trades could be applied equally to the auction product. Some amendments will, however, be required to, amongst others, specify:

- the auction product definition;
- the priority rights associated with the auction product;
- what is to occur in the event of a renomination by firm capacity holders;
- the imbalance allowance associated with the auction product; and
- the other rights and obligations that will be associated with the auction product.

The GMRG is interested in getting stakeholders' feedback on the changes that may need to be made to the Operational GTA Code to accommodate the auction product.

Box 6.5: Questions on amendments to the Operational GTA Code

48. What changes do you think will need to be made to the Operational Code that was released for public comment in the *Standardisation Related Reforms and the Capacity Trading Platform Consultation Paper* to accommodate the auction product?

6.3 Use of the STTM and DWGM by auction participants

Auction participants that procure capacity through the day-ahead auction that want to supply gas to either a STTM or the DWGM will need to have a number of arrangements in place. Further detail on these arrangements is provided below.

6.3.1 Interaction with the STTM

Auction participants that want to transport gas into the Adelaide, Brisbane or Sydney STTM will need to be registered STTM participants and register their operational GTA with AEMO.⁸² Because the day-ahead auction will be conducted a number of hours after the STTM ex-ante schedule is determined, auction participants will not be able to participate in the ex-ante schedule. They will instead need to use market schedule variations (MSVs) if they want to avoid the deviation charges or payments that would otherwise arise because they have deviated from the ex ante schedule. For example, if an auction participant wants to use the auctioned capacity to deliver gas to the STTM then it must be matched by either:

⁸¹ <http://gmrq.coagenergycouncil.gov.au/publications/standardisation-related-reforms-and-capacity-trading-platform-consultation-paper>

⁸² A shipper that wants to supply gas into the STTM will also need to register with AEMO if they are not an existing STTM participant. This can be done by submitting a registration request using the registration form from the AEMO Gas Market Registration Kit. AEMO completes the registration process within 15 business days.



- an increase in withdrawals from or at the STTM hub; or
- a decrease in the supply to the STTM hub by another shipper.

There are two ways in which MSVs can be used:⁸³

- when a shipper makes an intraday nomination to a service provider, the shipper can submit a MSV to inform AEMO of the change and so avoid the deviation charges or payments that would otherwise arise; or
- a shipper or user can submit a MSV variation without a corresponding intraday nomination to transfer a deviation to another shipper or user.

There are two parties to every market schedule variation: the shipper or user who submits the MSV and the confirming shipper or user who accepts it. MSVs must be accepted by the confirming party before AEMO will apply the variation to each party's schedules.

It is worth noting that while this appears to be a complex workaround, it is currently used by market participants to deal with other variations.

6.3.2 Interaction with the DWGM

In contrast to the STTM, the DWGM runs five schedules during the gas day. Auction participants that procure capacity through the day-ahead auction for supply to the edge of the DTS (e.g. to the Culcairn System Injection Point) on gas day D will still therefore be able to participate in the DWGM's scheduling processes on gas day D if they are a registered DWGM market participant.

The only potential complexity that the integration of the day-ahead auction and the DWGM raises is that AEMO, in its capacity as DWGM operator, would need to know what accreditation constraint to apply to the capacity purchased through the auction.^{84,85} Accreditation constraints reflect the contractual or operational constraints, such as the MHQ, that are to be considered by AEMO in the scheduling process. For example, if a participant has purchased 10 TJ of capacity for one day with an MHQ:MDQ factor of 1:24, this would imply an MHQ of 417 GJ per hour (10,000 GJ÷24 hours) and this constraint would be reflected in how AEMO schedules the participant in the DWGM.

Accreditation constraints for capacity purchased through the auction could be dealt with in the following ways:

⁸³ Note that AEMO provides a service to assist market participants with identifying counterparties to MSVs. The service provides market participants who subscribe to the service with information about deviations by other subscribing participants. Deviations are listed for each subscribing market participant, which are ranked by their daily deviation quantity at each facility.

⁸⁴ A system injection/withdrawal point is a transmission system connection point designed to permit gas to flow through a single pipe into the transmission system, which may also be, in the case of a transfer point, a system injection/withdrawal point.

⁸⁵ Accreditation at System Injection Points and System Withdrawal Points takes five business days from receiving the initial application. A current DWGM system limitation is that only one accreditation per Participant ID at each controllable point is allowed. If participants need to treat accreditations for secondary capacity differently from their primary contracts this will require an additional participant ID to be set up (and bid separately).



- **Standing accreditation constraint:** A default accreditation constraint could remain in place for all transactions unless a participant requests a change.⁸⁶
- **Automatic accreditation constraints:** Constraints could automatically be updated when capacity is purchased through the auction.⁸⁷
- **Blank accreditation constraints:** No accreditation constraint is entered for capacity purchased on the platform or auction and participants manage the limitations through their bids.⁸⁸

The GMRG understands that AEMO is carrying out further work to understand the strengths, limitations and costs of the different options, which will be informed by feedback on the *Standardisation Related Reforms and Capacity Trading Platform Consultation Paper*.

⁸⁶ Under this option, participants would provide AEMO with a default MHQ that remains in place unless a change is requested. The default MHQ might represent an average size capacity product a participant expected to purchase. The issue with this approach is that if the participant purchased a larger amount of capacity, its MHQ flows would be constrained below what it was entitled to flow. Conversely, if the participant purchased a smaller capacity product, this would imply a MHQ that would likely be exceeded if the accreditation constraint remained at the standing level, unless managed using intraday schedules. Another option that could be employed would involve the development of an interface that participants can use to update their accreditation constraints after undertaking trades. If the shipper did not nominate a constraint, the standing constraint would be used.

⁸⁷ Under this option, a new system would need to be developed that would enable the DWGM system to receive information on the capacity purchased through the auction. The DWGM system would then convert this into a MHQ constraint in accordance with a pre-determined factor, such as 1/24. This option would require AEMO to implement system changes to the GSH and DWGM, the cost of which has not yet been estimated.

⁸⁸ Under this option, the accreditation constraint would be left blank. While this would not require any additional implementation costs to be incurred, participants may be required to manage their MHQ through the DWGM intraday schedules to avoid penalties on contract carriage pipelines connecting to the DTS. For example, if the auction participant has an MHQ of 1 TJ, it can bid 24 TJ at 6am, but if it is not scheduled it will have to reduce daily quantity in its subsequent bids to 20 TJ at 10 am, 16 TJ at 2pm etc. This would be more complex if the auction participant was partly scheduled in any of the five daily schedules.

7. Legal and Governance Framework for the Auction

To implement the day-ahead auction, a number of changes will need to be made to the NGL, the NGR and the Regulations as well as the functions and powers of the AEMC, AEMO and the AER. A number of subordinate instruments will also need to be developed (e.g. the Auction Agreement).

The remainder of this section provides further detail on the legal and governance framework that will underpin the day-ahead auction and the changes that will need to be made to the NGL, NGR and other regulatory instruments.

7.1 Legal and governance framework

The legal and governance framework for the day-ahead auction will primarily need to cover the exchange of information between service providers and AEMO, participation in and the operation of the day-ahead auction, and market supervision and conduct.

The GMRG's preliminary view is that:

- the arrangements between service providers and AEMO will be established through the NGL, the NGR and procedures made by AEMO under the NGL;
- AEMO's role in establishing and operating the day-ahead auction and the rules about conduct of the auction (implementing the auction design) will be set out in the NGL and the NGR, with AEMO able to provide additional detail in AEMO-made procedures;
- the rules for the conduct of auctions will be made contractually binding between AEMO and shippers under the Auction Agreement; and
- market supervision and conduct would be an AER role under the NGL and Rules.

A successful bidder in the day-ahead auction will use the capacity on the terms of its operational GTA with the service provider.⁸⁹ The operational GTA, and the legal and governance framework that will apply to this contract, is outlined in Chapter 3 of the *Standardisation Related Reforms and the Capacity Trading Platform* consultation paper that was published in September.⁹⁰

There are already well-established governance arrangements for the NGL, NGR and AEMO procedures. The Auction Agreement will, however, be a new subordinate instrument. The GMRG's preliminary view is that the arrangements for making and amending the Auction Agreement should mirror those in place for the GSH Exchange Agreement. In short, this means that:

- AEMO will be authorised to make the Auction Agreement through the NGL.
- The NGR will set out the detailed requirements for the content of the Auction Agreement.

⁸⁹ The service provider can also offer an operational GTA-style service under a primary GTA, allowing a primary shipper to roll capacity bought in the secondary market into the primary GTA.

⁹⁰ <http://gmrg.coagenergycouncil.gov.au/publications/standardisation-related-reforms-and-capacity-trading-platform-consultation-paper>



- AEMO will be able to make amendments to the Auction Agreement over time, following a consultation process similar to the process applicable to the Exchange Agreement and considering any applicable principles in the NGR and the NGO. Those amendments will apply to all Auction Agreements.

7.2 Overview of key changes and new instruments

The following table provides an overview of GMRG's preliminary views about the key changes that will be required to existing instruments and new instruments to give effect to the day-ahead auction.

Table 7.1: Proposed legal and governance framework for auction: Key changes

Topic	Summary of arrangements
NGL	
AEMO's functions and powers	<p>The NGL will specify the new functions and powers of AEMO as the operator of the day-ahead auction platform, covering:</p> <ul style="list-style-type: none"> ▪ establishing, operating and administering day-ahead auctions; ▪ making and administering a day-ahead auction agreement; and ▪ making binding procedures about information to be exchanged with service providers about capacity available to auction and auction results. <p>Other changes will support the operation of these provisions, such as power to make the procedures. Existing provisions (91E, 91H and 91K) cover payments and liability issues. Sections 91G to 91GH will apply to AEMO in relation to the information provided to it.</p>
Service Providers	<p>The NGL will create a framework for identifying which facilities are subject to day-ahead auctions. The GRMG's current proposal is to require the service provider for a transmission pipeline or compressor to register with AEMO in relation to the day-ahead auction unless exempted from registration under the NGR. The registration process will give AEMO the information it needs about the service provider, pipelines and compressors to conduct the day-ahead auction.</p> <p>If necessary, the NGL will be amended to make it clear that the term "service provider" includes compression service providers.</p> <p>The NGL will require service providers to comply with the Procedures made by AEMO and give information to AEMO that relates to, and is necessary for, the operation and administration of the day-ahead auction.⁹¹</p> <p>The NGL may specify that the service provider is not liable to a primary shipper under a primary GTA in relation to the use of capacity the subject of the GTA but sold through the day-ahead auction platform in accordance with the NGR.</p> <p>The NGL will specify the obligation of service providers to offer the standard form operational GTA to any person on request.⁹²</p>
Primary Shippers	<p>The NGL will create a framework for the NGR to specify market conduct rules for shippers with renomination rights.</p>
AER	<p>The AER's existing powers, including monitoring, information collection and enforcement will apply, with any changes necessary to extend the powers to the day-ahead auction.</p>

⁹¹ Similar to section 91FEA for the STTM and subject to provisions similar to sections 91FEB, 91FEC and 91FED dealing with duties of confidence, false and misleading information and immunity.

⁹² The governance arrangements for the Operational GTA are discussed in the GMRG's September consultation paper.



Topic	Summary of arrangements
AEMC	The AEMC's powers to make rules under section 74(3) will be extended to the day-ahead auction.
SA Minister	The SA Minister will be empowered to make initial Rules for day-ahead auction.
Regulations made under the NGL	
Liability	Regulations to specify liability caps, if any, for the purposes of section 91K.
Penalties	Regulations to specify civil penalty or conduct provisions.
NGR – key content	
Registration arrangements	<p>If registration is used, the NGR will set out the arrangements for service provider registration with AEMO.</p> <p>The NGR will also allow the AER to grant exemptions from the obligation to register, where specified criteria are satisfied.</p>
Service provider obligations	<p>The NGR will establish the role of service providers, including:</p> <ul style="list-style-type: none"> the obligation to provide information about contracted but un-nominated capacity in accordance with the Procedures; the obligation to consent to the sale of capacity in the day-ahead auctions; arrangements for giving effect to the auction results including providing pipeline services on the terms of the applicable operational GTA (unless otherwise agreed with the shipper); and payment of the auction proceeds by AEMO to service providers.
Day-ahead auctions	<p>The NGR will:</p> <ul style="list-style-type: none"> set out principles to be applied by AEMO in determining what is to be sold; implement the auction design by specifying how auctions must be conducted and allowing AEMO to include further detail in AEMO made-procedures; specify the content of the Auction Agreement and how it can change, similar to the approach to the Exchange Agreement in Part 22 of the NGR; specify any minimum qualifications to participate in the day-ahead auction as a shipper. such as requirement to be a company incorporated in Australia; and deal with any matters that need to be dealt with in the NGR (and not the Auction Agreement) in order to satisfy other regulatory requirements.
Reporting	The NGR will require AEMO to report specified information about the day-ahead auction and will also require AEMO to publish this on the BB website as well as the auction platform.
Market conduct	<p>The NGR will specify market conduct rules that will be applicable to auction participants and shippers with renomination rights and will also set out the role of AEMO and the AER in monitoring and enforcement.</p> <p>The market conduct rules applicable to auction participants are expected to be modelled on the market conduct rules in Part 22 of the NGR, which apply to the GSH, modified to reflect the different nature of the day-ahead auctions and the gaming risks associated with the auction.</p> <p>The market conduct rules applicable to shippers with renomination rights will be directed at ensuring renomination rights are exercised in good faith and not to game or undermine day-ahead auctions.</p>
Cost recovery	The NGR will allow AEMO to recover the costs of establishing and operating the auction platform from market participants and to determine the appropriate fee structure in consultation with registered auction and GSH participants.

Topic	Summary of arrangements
Procedures	
Applicable to AEMO, service providers and shippers	<p>Procedures setting out the detailed information requirements including the content, timing and form of information to be exchanged between service providers and AEMO. The procedures may also deal with any detail required for the conduct of day-ahead auctions not covered in the NGR.</p> <p>The GMRG proposes that this would be incorporated in Secondary Capacity and Auction Procedures.</p> <p>Note that in <i>Standardisation Related Reforms and the Capacity Trading Platform</i> consultation paper that was published in September, these procedures were referred to as capacity transfer procedures. The GMRG now expects the scope of these procedures to be broader and include, amongst other things, procedures relevant to the conduct of the auction, secondary trade reporting requirements and the capacity transfer procedures between AEMO and service providers.</p>
Auction Agreement	
Auction Agreement	<p>Shippers will sign a short form agreement which will incorporate by reference the main body of the Auction Agreement dealing with:</p> <ul style="list-style-type: none"> ▪ eligibility to enter into an Auction Agreement and remain a party, such as being a body corporate and not currently in external administration or similar; ▪ the role of AEMO in auctions and the responsibility of the shipper to put in place the operational GTAs it will need to use any capacity purchased; ▪ arrangements for access to the auction platform such as identification of authorised users; ▪ conditions for participation in individual auctions such as requirements to provide payment security, acceptable forms of payment security and when credit support can be called; ▪ the conduct of auctions by AEMO in accordance with the principles in the NGR and the shipper's acceptance of auctions results; ▪ publication by AEMO of the auction results; ▪ circumstances in which AEMO can suspend a shipper from participation in auctions and terminate the Auction Agreement, which are expected to be similar to those that apply in the GSH; ▪ the obligation to pay participant fees (if these are to be paid by shippers); ▪ payment and settlement arrangements; ▪ contractual matters such as warranties and representations and limitations and exclusions of liability; and ▪ the arrangements under which AEMO can amend the Auction Agreement terms.
Operational GTA (shippers and service providers)	The day-ahead auction platform agreement will assume that capacity bought in the auctions is used on the terms of an operational GTA. ⁹³

Box 7.1: Questions on governance arrangements

49. Are there any other changes that you think will be required to the legal and governance framework to give effect to the day-ahead auction that have not been identified in Table 7.1?

⁹³ The service provider can also offer an operational GTA-style service under a primary GTA, allowing a primary shipper to roll capacity bought in the secondary market into the primary GTA.



Part B: Reporting Framework for Secondary Trades

In the *East Coast Review*, the AEMC noted that shippers currently have no way to determine whether secondary capacity is being provided on a non-discriminatory basis, or if the prices they are offered are reasonable because the prices and other terms on which secondary capacity trades are struck are currently confidential.⁹⁴ To address this information gap, the AEMC recommended that information on the prices struck in all secondary trades be published, along with information on the key terms and conditions that may have affected the prices in those trades.⁹⁵

In doing so, the AEMC noted that greater transparency in this area would:

- instil a greater level of confidence in the secondary market and foster the development of a more liquid secondary capacity market;
- aid the price discovery process for secondary capacity trades and, in so doing, reduce search costs and expedite the transaction process;
- provide for a more efficient allocation and use of capacity because shippers would be able to more readily assess the market value of capacity and make informed decisions; and
- enable shippers to engage in more effective negotiations and provide them with the confidence that access is being provided on a non-discriminatory basis.

Table B.1 provides a summary of the AEMC's recommendations, which were all classified as **required** outcomes.

Table B.1: AEMC's Recommendations: Reporting framework for secondary trades

Required Outcomes
<ul style="list-style-type: none">▪ Publication of information on all secondary trades of pipeline capacity and hub services.▪ The information to be published is the price of the trade and any other information that might reasonably influence that price, taking into account measures to protect anonymity.▪ Publication should occur at or shortly after the time the transaction is entered into.

Elaborating further on these recommendations, the AEMC noted that there is a clear trade-off between the benefits of wide information provision and the direct and indirect cost of providing the information (which includes any adverse effects that the revelation of counterparties' commercial-in-confidence information may have on market participants). The AEMC therefore recommended that the GMRG have regard to these trade-offs when developing its final recommendations on the reporting framework for secondary capacity.

The remainder of this part of the consultation paper focuses on:

- the reporting requirements that could apply to secondary capacity trades, including the types of trades and information to be reported, who will have the obligation to report information and where it will be published; and
- the governance arrangements required to give effect to the reporting framework.

It also sets out the GMRG's preliminary views on these issues. As noted in Chapter 1, the inclusion of the GMRG's preliminary view in this consultation paper is intended to facilitate

⁹⁴ AEMC, Stage 2 Final Report: East Coast Review, 23 May 2016, p.105.

⁹⁵ *ibid*, p.106.



consultation and elicit feedback from stakeholders. It should not therefore be interpreted as a concluded position of the GMRG.

In keeping with the AEMC's recommendations, the discussion in this part of the consultation paper focuses on the reporting of secondary capacity trades conducted through the exchange and bilateral trades. The reporting framework that is expected to apply to the day-ahead auction is outlined in section 4.8 and Chapter 7.



8. Reporting Requirements for Secondary Trades

To increase the transparency surrounding secondary capacity trades and the market's confidence in the secondary market, the AEMC recommended that information on the prices and other key terms struck in **all** secondary trades of pipeline and compression capacity be published at the time the trade is entered into, or shortly thereafter.

These recommendations have been considered by the Standardisation project team and the GMRG. In doing so, consideration has been given to:

- the types of trades to be reported;
- the information to be reported;
- who should have the obligation to report trades and when this information should be reported; and
- where the information is published.

Further detail on the position the Standardisation project team reached on each of these issues and the GMRG's preliminary views is provided in the remainder of this chapter. As noted previously, the AEMC's *East Coast Review* related specifically to the East Coast market and, while relevant, no decision has yet been made on the extent to which this reporting framework will apply in Western Australia or the Northern Territory.

8.1 Types of trades to be reported

In the *East Coast Review*, the AEMC recommended that information on all secondary trades of capacity be published, irrespective of how the trade is executed (i.e. bilaterally or through the capacity trading platform) and whether it involves a standardised or bespoke product. While some stakeholders questioned the value of reporting bilateral and bespoke trades, the AEMC was of the view that excluding these trades from the reporting framework could distort trading decisions and undermine the development of the capacity trading platform (i.e. because it would encourage parties to enter into trades outside the trading platform). This recommendation was therefore classified as a required outcome.⁹⁶

This recommendation was discussed in some detail by the Standardisation project team, which noted that there are a number of ways that a primary capacity holder's capacity can be used (directly or indirectly) by other market participants that do not necessarily involve a secondary capacity trade, including:

- (a) delivered gas supply agreements (including retail contracts);
- (b) gas purchases from an STTM;
- (c) locational swaps;
- (d) sub-haulage agreements; and
- (e) novations of primary capacity.

⁹⁶ *ibid*, pp. 108-109.



While the project team agreed that reporting these types of trade went beyond the scope of what the AEMC intended, they noted that if market bodies or policy makers wanted to determine the extent to which secondary capacity is being released, focusing purely on secondary capacity trades would underestimate the true level of trade.

Having agreed that the reporting framework should only apply to secondary trades of capacity, the project team noted that from a compliance perspective it would be important to clearly define the types of trades to be subject to the reporting framework. The trades that the project team thought should be reported included all exchange based capacity traded products (screen and pre-matched products) available for sale on the capacity trading platform and the following bilaterally traded products (conducted using either a bare transfer or an operational transfer (see section 2.2):

- forward haul services;
- backhaul services;
- park services or park and loan services; and
- compression services.

The GMRG agrees with the project team that the reporting framework is only intended to apply to secondary capacity trades and does not therefore extend to the types of trades listed in (a)-(e) above.⁹⁷ The GMRG also agrees with the project team that there would be merit in defining the types of trades that are to be reported to avoid any unnecessary confusion about the nature of the reporting obligation. While the GMRG thinks the list the project team developed is a good starting point, it is interested in hearing other stakeholders' views on whether other types of secondary capacity trades should be reported, noting that one of the overarching objectives of the reporting framework is to aid the price discovery process. It is also worth noting in this context that the governance arrangements that will apply to the reporting framework will enable changes to be made to the types of trades to be reported over time, so the list can adapt to change.

⁹⁷ Note that it is possible that through other reviews and inquiries it may be determined that this information should be published, but for present purposes the GMRG is only focusing on the recommendations proposed by the AEMC.



Box 8.1: Questions on the types of trades to be reported

50. Do you agree with the proposal to specify that the reporting framework will apply to the following types of secondary trades:

- all exchange traded products listed on the capacity trading platform; and
- bilateral trades involving forward haul, backhaul, park, park and loan, and/or compression services that are given effect through either a bare transfer or an operational transfer?

Or do you think that there are other types of secondary capacity trades that should be reported?

8.2 Information to be reported

In addition to specifying the types of trades that should be reported, the AEMC recommended that the reporting framework for secondary capacity trades require information on the prices struck in secondary trades to be reported along with the following contract terms:⁹⁸

- (a) when the contract was entered into and the duration of the contract;
- (b) the pipeline or compressor facility that will be used to provide the service;
- (c) the type of service and the firmness and priority of that service;
- (d) the MDQ and MHQ the shipper can nominate;
- (e) the direction of the service and the receipt and delivery points between which gas will be transported, aggregated to a level sufficient to protect the anonymity of parties;
- (f) any additional flexibility the shipper may have, or restrictions it may be subject to; and
- (g) where relevant, any variations from standardised operational, prudential and other contractual terms that could affect the price.

The AEMC also recommended that the GMRG consider whether any further measures are required to protect the anonymity of counterparties and, in doing so, to consider the relative benefits of information provision and anonymity.⁹⁹

In a similar manner to the types of trades to be reported, the Standardisation project team was asked its view on the type of information that should be reported for exchange traded capacity products and bilateral capacity trades. The project team's view on this issue is summarised in Table 8.1.

⁹⁸ *ibid*, pp. 107-108.

⁹⁹ *ibid*, p.108.



Table 8.1: Standardisation project team's view on information to be reported

Information	Exchange traded products	Bilateral trades
Date of trade and duration of contract	✓	✓
Pipeline or compression facility	✓	✓
Service type (i.e. forward haul, backhaul, park and loan, compression), firmness, service priority	✓	✓
Direction of service and zones between which gas is transported	✓ Pipeline zones to be used for reporting	✓ Pipeline zones to be used for reporting
Price (ex GST)	✓	✓ Including details of price structure and price escalation mechanism**
MDQ and MHQ	✓	✓
Type of trade and how it is given effect	Distinguish between screen and pre-matched trades and potentially between trades where the buyer uses an operational or primary GTA ¹⁰⁰	Distinguish between trades where the buyer will utilise an operational GTA or a bare transfer
Any additional flexibility provided to the shipper, or restrictions it is subject to	✗	✗
Variations from standardised operational, prudential and other terms that affect price	✗	✗

* It was noted that information on whether the buyer is utilising an operational or a primary GTA may be difficult to collect unless it is a standing entry for trading participants on the capacity trading platform, which is an option that is being considered in the design of the capacity trading platform.

** Note that the provision of this type of information could be more complex than the other information types and may need to be split into multiple reporting lines.

As this table highlights, the project team thought there would be value in reporting the majority of the information identified by the AEMC. The only exception to this was the final two categories of information that the AEMC identified, which project team members thought would be difficult to report on a consistent and meaningful basis. Some project team members also questioned the value of reporting this type of information, suggested that, at least in the initial stages, greater emphasis should be placed on reporting all the other information and that if it became clear that more needed to be reported this could be revisited.

While the project team had some concerns about reporting this type of information, it was noted that information on the type of trade and how it has been given effect could provide market participants with some indication of whether or not there may be other bespoke contract terms that may have affected the price struck in that trade. For example, if a bilateral trade is identified as involving a bare transfer and the price is higher than equivalent exchange trades, this could be an indicator the buyer has greater flexibility and/or the operational, prudential and other terms are more favourable than those in the standardised operational GTA.

As to whether any additional measures are required to protect anonymity, the project team noted that while reporting trades on a zonal basis rather than a point-to-point basis would provide some protection, it would be difficult to completely protect the anonymity of parties (particularly if there are only two shippers using a pipeline or zone). The project team did, however, acknowledge that the AEMC did not recommend that anonymity should be

¹⁰⁰ Note that in allowing trades to be given effect under the terms of a primary GTA it has been assumed that these terms will not drive the value disproportionately.



protected at all costs. Rather, the AEMC recognised that there is a trade-off between the benefits of information provision and the potential concerns surrounding the revelation of commercial-in-confidence information that must be balanced. It was against this backdrop that the project team concluded no additional confidentiality measures were required.

The position that the project team reached on preserving anonymity is consistent with the GMRG's own view and the view expressed by the majority of stakeholders that provided feedback in the *East Coast Review*.¹⁰¹ The GMRG also agrees with the position the project team reached on the type of information that should be reported for exchange traded products and bilateral trades of capacity and believes that it strikes the right balance between:

- reducing the information asymmetries currently surrounding secondary capacity trades; and
- the direct and indirect costs associated with information provision.

In this regard, it is worth noting that if shippers were required to report more granular information on the flexibility or restrictions in trades and variations between standard and bespoke terms, then this would be the most expensive part of the reporting arrangements. The benefits of reporting this information would therefore need to be clearly established.

The GMRG's position on these issues is preliminary only at this stage. It is therefore interested in hearing other stakeholders' views on this issue and on the questions set out in the box below.

Box 8.2: Questions on the information to be reported

51. Do you agree that the information set out in Table 8.1 should be reported for exchange based capacity trades and bilateral capacity trades? Or do you think that:
 - additional information should be reported? If so, please set out what additional information you think should be reported and why.
 - less information should be reported? If so, please set out what information you don't think should be reported and why.
52. Do you think any additional measures are required to protect the anonymity of counterparties? If so, please explain what they are and how this would be consistent with the overarching objectives of the reporting requirements.

8.3 Reporting obligations

Exchange based capacity trades carried out through the capacity trading platform will be subject to a reporting framework under the Exchange Agreement. Similar to the arrangements that currently apply to commodity products traded through the GSH, reporting will be the responsibility of AEMO. AEMO will collect the information at the time the trade occurs and report shortly thereafter. The type of information that is published may differ from what is currently published for commodity trades.

¹⁰¹ Ibid, pp. 107-108.



The requirement for bilateral trades to be reported, on the other hand, will require new obligations to be imposed on one or more of the trading parties. This issue was not discussed in any detail in the AEMC's *East Coast Review*. It was, however, considered by the Standardisation project team, which identified the following potential candidates for the reporting obligation:

- the seller;
- the buyer; and
- the seller and buyer.

While there was some discussion about the latter of these options, it became clear that requiring both the buyer and seller to report the trade would require more work on the part of industry and AEMO and could give rise to a range of other issues. Of the remaining two options, the project team thought sellers were the more natural candidate for the reporting obligation.

The Standardisation project team also considered how much time the selling party should have to report the bilateral trade once it is executed. In short, project team members were of the view that the seller should be required to report the trade by the earlier of:

- three business days after the trade is executed; and
- the day prior to the trade commencing (D-1).

The GMRG has considered the views expressed by the project team on who should be subject to the reporting obligation in bilateral trades and how long they should have to report trades. While the GMRG agrees with the position the project team reached on the first issue, the proposal to allow sellers up to three business days to report trades appears at odds with the AEMC's recommendation that trades be reported at the time they are executed, or shortly thereafter. While the GMRG understands that it may be difficult to report bilateral trades as soon as they are executed, there is a risk with longer reporting windows that parties will either fail to report the information, or will publish the information too late to be of any benefit to the price discovery process. The GMRG is therefore of the view that a shorter reporting window should be adopted.

Having regard to the reporting time frames that have been adopted in Part 18 (Natural Gas Services BB) of the NGR for information that is of a similar level of importance to the market, the GMRG's preliminary view is trades should be reported by the earlier of:

- one day after the trade is executed; and
- the day prior to the trade commencing (D-1).¹⁰²

The GMRG is, however, interested in hearing from other stakeholders on this proposal. The GMRG is also interested in stakeholders' views on the proposal to impose the reporting obligation on sellers in bilateral trades, which is expected to be given effect through a BB reporting obligation.

¹⁰² The inclusion of the second limb of this reporting window means that if a trade is entered into and will commence the next day, it will need to be reported on the day the trade is executed.



As a practical matter, reporting is likely to require access to AEMO's systems. The GRMG's preliminary view is that in the absence of a requirement for all shippers to register with AEMO, shippers should be able to use a reporting agent such that in some cases, by agreement between the parties, the buyer rather than the seller may report.

Box 8.3: Questions on the reporting obligation for bilateral trades

53. Do you agree that the obligation to report bilateral trades of secondary capacity should fall on the seller? Or do you think the obligation should fall on:
 - the buyer? If so, please explain why.
 - both counterparties? If so, please explain why.
54. Do you agree with the proposal that bilateral trades of secondary capacity should be reported by the earlier of one day after the trade is executed or the day prior to the trade commencing? Or do you think sellers require a longer period of time to report trades?
55. Do you agree that shippers should be given flexibility to engage someone to report on their behalf, or should all shippers be required to gain access in their own name to the reporting systems?

8.4 Where the information should be published

The AEMC's reporting framework recommendations did not specify where the information on secondary trades should be published. Apart from indicating it would be preferable to obtain all the secondary trade information from one location, the Standardisation project team did not proffer a view on this issue.

The GMRG's preliminary view on this issue is that:

- Information on exchange based capacity trades should be published on the GSH (as it currently is for commodity trades) so that trading participants can readily access this information when they are trading.
- AEMO should be required to publish information about exchange based capacity trades and bilateral trades on the BB website, so that a person wishing to access the information does not need to become a GSH participant.¹⁰³ AEMO could also be given the discretion in the Exchange Agreement to publish information about bilateral trades on the GSH, so that users of the trading platform can readily access this information.

In a similar manner to what occurs in other markets, the AER would also be expected to publish key data series for the secondary capacity markets.¹⁰⁴ The form that this would take would be a matter for the AER to determine.

The GMRG welcomes further feedback on this preliminary view.

¹⁰³ This is akin to what AEMO currently does for GSH trades, which are published on the BB website.

¹⁰⁴ See for example, <https://www.aer.gov.au/wholesale-markets/wholesale-statistics>



Box 8.4: Questions on where information should be published

56. Do you agree with the proposal to allow AEMO to publish information on:
- exchange based trades on the GSH and the BB website? If not, please explain why.
 - bilateral trades on the BB website? If not, please explain why.

8.5 Summary of the proposed reporting requirements

Table 8.2 provides a summary of the GMRG's preliminary view on the reporting requirements for exchanged traded capacity products and bilateral capacity trades. Table A.2 in Appendix A shows how these preliminary views compare with the AEMC's recommendations.

Table 8.2: Summary of GMRG's preliminary view on the reporting requirements

	Exchange traded capacity products	Bilateral capacity trades
Types of trades to be reported	All screen and pre-matched trades	All secondary trades of capacity involving forward haul, backhaul, park, park and loan and/or compression services.
Information to be reported	<ul style="list-style-type: none"> ▪ Date of trade and start and end dates for the trade ▪ Pipeline or compression facility ▪ Service type (i.e. forward haul, backhaul, park and loan, compression), firmness, service priority ▪ Direction of service and zones between which gas is transported ▪ Price (ex GST) (including details of the price structure and price escalation mechanism for bilateral trades) ▪ MDQ and MHQ ▪ Type of trade and how it is given effect (e.g. exchange traded products could be classified as screen trades or pre-matched trades and further classified as being given effect through an operational GTA or primary GTA, while bilateral trades could be classified as involving a bare transfer or operational transfer) 	
Responsibility for reporting	AEMO	Seller
When information is published	As soon as practicable after trade	The earlier of: <ul style="list-style-type: none"> ▪ one day after the trade is executed; and ▪ the day prior to the trade commencing (D-1).
Where information is published	GSH and BB website	GSH and BB website



9. Governance Arrangements for the Reporting Framework for Secondary Trades

To give effect to the reporting framework for secondary capacity trades outlined in the preceding chapter, a number of changes will need to be made to the NGL, NGR and Exchange Agreement. Table 9.1 sets out the GMRG's preliminary view on the changes that are likely to be required to give effect to the reporting framework.

Table 9.1: Governance arrangements for reporting framework

Instrument	Summary
NGL	<p>To the extent not already covered by the NGL, the NGL will require shippers to give secondary trade information to AEMO and will permit AEMO to publish it, in each case in accordance with the NGR and applicable procedures.</p> <p>The NGR will provide that a shipper does not incur any civil monetary liability for complying with its reporting obligations.</p> <p>The AER will be responsible for monitoring and enforcing compliance using its existing powers in the NGL.</p>
NGR	<p>The NGR will provide a framework for shippers to gain access to the reporting system, for example through a registration process.</p> <p>The NGR will set out the obligation of shippers to report information about bilateral secondary capacity trades to AEMO, including the categories of information that must be reported and timing. This will be a civil penalty provision.</p> <p>The NGR will require AEMO to report information about secondary trades covering exchange based trading and reported bilateral trades on the BB website and will also be permitted to publish it on the GSH.</p>
Exchange Agreement	<p>The Exchange Agreement will specify the information to be reported by AEMO about secondary trades both on the platform and the BB website, which should be consistent with the categories set out in the NGR.</p>
Procedures	<p>As outlined in section 7.2, the GMRG proposes that AEMO be given the power to publish Secondary Capacity and Auction Procedures, the scope of which will extend to procedures relevant to secondary trade reporting, including details about the form in which information is to be reported to AEMO.</p>

The GMRG is interested in whether stakeholders think that any other changes will need to be made to the NGR, Exchange Agreement or any other instruments to give effect to the new reporting framework and the questions set out in Box 9.1.

Box 9.1: Questions on governance arrangements

57. Are there any other changes that you think will be required to the governance arrangements that have not been identified in Table 9.1?



Appendix A AEMC Recommendations and Consistency of the GMRG's Preliminary View with these Recommendations

Table A.1 contains a summary of the recommendations contained in the AEMC's *East Coast Review*, which have been categorised by the AEMC as follows:

- **required outcomes** – these recommendations were described by the AEMC as outcomes that must be progressed by the GMRG and are necessary to the implementation of the reforms;
- **preferred outcomes** – these recommendations were described by the AEMC as outcomes that should be pursued by the GMRG unless it is clear there are greater benefits in alternative approaches; and
- **suggested outcomes** – these recommendations were described by the AEMC as outcomes that have in-principle benefits but need to be considered further by the GMRG.

Table A.2 sets out the extent to which the GMRG's preliminary views on the day-ahead auction and reporting framework are consistent with the AEMC's recommendations.

Table A.1: AEMC Recommendations

Recommendation	Required outcomes	Preferred outcomes	Suggested outcomes
Standardisation of key primary and secondary capacity contractual terms	<ul style="list-style-type: none">▪ Standardisation of key primary and secondary capacity contractual terms for pipeline and for hub (compression) services.▪ Where possible and appropriate apply across the eastern Australian gas market.▪ Standards to be developed are for key operational, prudential and other contractual provisions in GTAs, CTAs and Operational GTAs, and provisions in contracts used for exchange based trading on the capacity trading platform.▪ Counterparties to existing contracts should not be materially disadvantaged through the standardisation process	<ul style="list-style-type: none">▪ Shippers provided greater flexibility to change their receipt and delivery points	n.a.



Recommendation	Required outcomes	Preferred outcomes	Suggested outcomes
Auction for contracted but un-nominated capacity	<ul style="list-style-type: none"> A daily, day-ahead capacity auction for contracted but un-nominated pipeline capacity and hub (compression) services. Auction happens shortly after nomination cut-off time. Reserve price of zero dollars, with compressor fuel provided by shippers in-kind. At least all contracted but un-nominated capacity placed for sale through auction. Accommodate nominations or renominations by incumbent shippers after the auction is conducted. 	<ul style="list-style-type: none"> Combinatorial auction where multiple buyers and sellers can simultaneously coordinate trades, managing the complementarities between different pipeline segments. Single round auction to reduce complexity and opportunities for anti-competitive behaviour between participants. Bidders pay the value of their winning bids ("first-price" rule) to reduce complexity. Algorithm determines the winning combination of bids by maximising profit (constrained by requirement that at least all contracted but un-nominated capacity is put on sale in auction). Capacity purchased in the auction curtailed before (i.e., earlier than) firm capacity. Single auction across the east coast market, in order to optimise allocation across as many products as possible. Exemption from the auction for pipelines serving a single user. 	<ul style="list-style-type: none"> As available rights in current GTAs to be phased out to avoid them competing with rights allocated in the auction. Exempting on a case-by-case basis pipelines that are not fully contracted from needing to conduct the auction. The auction to be run by the same institution(s) which run the capacity trading platform.
Capacity trading platform(s)	<ul style="list-style-type: none"> Creation of capacity trading platform(s) which include electronic anonymous exchange based trading for commonly traded products in addition to a capacity listing service typical on current capacity trading platforms. Trades carried out through trading platform to be given effect through an operational transfer. Bare transfers will be allowed but the seller will be required to offer the buyer the option to use an operational transfer. 	<ul style="list-style-type: none"> Single capacity trading platform operating across the east coast. As many services as possible capable of being traded on the platform (e.g., transportation services, hub (compression) services and pipeline storage services), recognising the need to avoid unnecessary complexities. Trades conducted outside the capacity trading platform to be advertised ahead of time on the capacity trading platform listing service. 	n.a.
Publication of information on secondary capacity trades	<ul style="list-style-type: none"> Publication of information on all secondary trades of pipeline capacity and hub (compression) services. The information to be published is the price of the trade and any other information that might reasonably influence that price, taking into account measures to protect anonymity. Publication should occur at or shortly after the time the transaction is entered into 	n.a.	n.a.



Table A.2: Consistency of the GMRG's Preliminary View with the AEMC's Recommendations

AEMC Recommendations		Consistency of GMRG Preliminary View
Day-Ahead Auction of Contracted but Un-Nominated Capacity		
Required Outcomes		
Outcomes that must be progressed by the GMRG and are necessary to the implementation of the reforms		
Auction design:	<ul style="list-style-type: none"> A daily, day-ahead capacity auction for contracted but un-nominated pipeline capacity and hub (compression) services. 	✓
	<ul style="list-style-type: none"> Auction happens shortly after nomination cut-off time. 	✓
	<ul style="list-style-type: none"> Reserve price of zero dollars, with compressor fuel provided by shippers in-kind. 	✓ (Note the proposed approach to the reserve price also recognise the potential for alternate arrangements if the service provider provides compressor fuel)
	<ul style="list-style-type: none"> At least all contracted but un-nominated capacity placed for sale through auction. 	✓
Product design:	<ul style="list-style-type: none"> Accommodate nominations or renominations by incumbent shippers after the auction is conducted. 	✓ (Note the proposed product accommodates nominations and renominations by shippers with firm capacity rights)
Preferred outcomes		
Outcomes that should be pursued by the GMRG unless it is clear there are greater benefits in alternative approaches		
Geographic scope:	<ul style="list-style-type: none"> Single auction across the east coast market, in order to optimise allocation across as many products as possible. 	✓
Auction design:	<ul style="list-style-type: none"> Combinatorial auction where multiple buyers and sellers can simultaneously coordinate trades, managing the complementarities between different pipeline segments. 	✓
	<ul style="list-style-type: none"> Single round auction to reduce complexity and opportunities for anti-competitive behaviour between participants. 	✓
	<ul style="list-style-type: none"> Bidders pay the value of their winning bids ("first-price" rule) to reduce complexity. 	✗ Advice provided by NERA indicates that a first price rule is strategically complex for bidders and may result in inefficient outcomes. NERA therefore recommended a pay-as-cleared pricing rule. The pay-as cleared approach offers the same simplicity of participation advantages as a first price approach, but reduces strategic complexity.
	<ul style="list-style-type: none"> Winning combination of bids to be determined using a profit maximisation algorithm (constrained by requirement that at least all contracted but un-nominated capacity is put on sale in auction). 	✓ (Note a zero reserve price results in the profit maximisation algorithm reducing to a revenue maximisation algorithm).



AEMC Recommendations		Consistency of GMRG Preliminary View
Product design:	<ul style="list-style-type: none"> Capacity purchased in auction curtailed before firm capacity. 	✓
Exemptions:	<ul style="list-style-type: none"> Exemption from the auction for pipelines serving a single user. 	✓ (Note that exemptions have also been also proposed for pipelines that are not providing third-party access)
Suggested outcomes		
Outcomes that have in-principle benefits but need to be considered further by the GMRG.		
Exemptions	<ul style="list-style-type: none"> Exempting on a case-by-case basis pipelines that are not fully contracted from needing to conduct the auction. 	✗ The proposed coverage of the auction will extend to all the transmission pipelines (excluding the DTS) linking major demand centres and supply sources in the east coast and contractually congested pipelines in regional areas.
Operator of the auction:	<ul style="list-style-type: none"> The auction to be run by the same institution(s) which run the capacity trading platform. 	✓
Other	<ul style="list-style-type: none"> As available rights in current GTAs to be phased out to avoid them competing with rights allocated in the auction. If these rights are retained, the GMRG should consider how they should be accommodated in the auction design. 	✗ As available rights will be retained to allow auction winners to access any spare primary capacity that may be available on the pipeline if a renomination results in the auctioned capacity being curtailed. As available and interruptible rights will also be scheduled after the auction occurs, to ensure they do not compete with the auction product.
Reporting Framework for Secondary Capacity Trades		
Required Outcomes		
Outcomes that must be progressed by the GMRG and are necessary to the implementation of the reforms		
<ul style="list-style-type: none"> Publication of information on all secondary trades of pipeline capacity and hub services. 		✓
<ul style="list-style-type: none"> The information to be published is the price of the trade and any other information that might reasonably influence that price, taking into account measures to protect anonymity. 		✓
<ul style="list-style-type: none"> Publication should occur at or shortly after the time the transaction is entered into. 		✓



Appendix B Members of the project teams and Advisory Panel

The tables below contain a list of the members of the Standardisation, Capacity Trading Platform and Day-Ahead Auction project teams and the Advisory Panel.

Table B.1: Membership of Project Teams and Advisory Panel

Project Team Members		
Standardisation Project Team	Capacity Trading Platform Project Team	Day-Ahead Auction Project Team
Sally Calder, AGL	Kieran O'Leary, AGL	John Jamieson, APA
Ainslie Lynch, APA	Lino Fusco, CQ Partners	Deidre McEntee, APLNG
Simon Taylor, DBP	Trent Leach, DBP	Leon Devaney, Central Petroleum
Peter Frost, EnergyAustralia	Ishara De Silva, EnergyAustralia	Andrew O'Farrell, Origin
Samantha Staunton, Epic	Andrew Zancanaro, Jemena	Matt Sherwell, Santos
Jan Peric, Jemena	David Lawrence, Pacific Markets Consulting	Jeff Cooke, SEAGas
Michael Handley, Origin	Jennifer Tarr, Stanwell	Erin Bledsoe, Shell
Brad Mills, Shell	Daniel Hamel, AEMO	Kevin Ly, Snowy Hydro
Angelo Mantsio, AEMO		Tom Walker, AEMC
		Nicholas Pope, AEMO
Advisory Panel Members		
Nevenka Codevelle, APA		
Warwick King, APLNG		
Graham Salmond, BHP		
Mark Collette, EnergyAustralia		
Rosemary Sinclair, Energy Consumers Australia		
Paul Adams, Jemena		
Chris Crozier, Orica		
Greg Jarvis, Origin		
Dr Stephen Bell, Qenos		
Angus Jaffray, Santos		
Tom Summers, Shell		



Appendix C Transportation services

The box below provides an overview of the services that transmission pipelines typically provide.

Box C.1: Services provided by transmission pipelines

Transportation services

Transmission pipelines operating on a point-to-point basis usually offer:

- Forward haul services, which provide for the transportation of gas from a receipt point to a delivery point in the direction of the predominant flow of gas.
- Backhaul services, which involve the 'notional transportation' of gas in the opposite direction to the predominant flow of gas. The term 'notional transportation' is used in this context, because a backhaul service does not involve the physical transportation of gas. It instead involves a physical swap of gas at the point at which it is supplied into the pipeline for an equivalent amount of gas at the backhaul delivery point. To be able to provide this service, the volume of gas being backhauled must be less than, or equal to, the volume of gas to be transported on a forward haul basis, which is why it is offered on an as available or interruptible basis.

If a pipeline can physically flow in both directions across its full length (i.e. a bi-directional pipeline), then it will usually offer a single transportation service, which enables gas to be transported in either direction.

Forward haul and bi-directional services can be provided on:

- a firm basis – a firm service allows users to transport gas up to their maximum daily and hourly capacity reservation. The priority accorded to this service in terms of scheduling is higher than any other services and is the last service to be curtailed.
- an as available basis – an as available service allows users to transport gas without reserving and having to pay for capacity on a daily basis, if there is spare capacity available. The priority accorded to this service is lower than that accorded to a firm transportation service in terms of scheduling and is curtailed before firm services.
- an interruptible basis – an interruptible service also allows a buyer to transport gas without reserving and paying for capacity on a daily basis. However, the priority accorded to this service in terms of scheduling is lower than as available services and is usually curtailed ahead of both as available and firm services.

Storage services

Transmission pipelines may also be used to provide the following storage related services:

- Park services, which allow users to inject more gas into a pipeline than they take out on a particular day, up to a specified level and to store that gas in the pipeline. The additional gas supplied into the pipeline may be withdrawn by users at a later point in time, subject to constraints in their transportation contracts.
- Park and loan services, which in addition to allowing users to store gas on the pipeline, also allows users to inject less gas than it takes on any given day (a loan), up to a specified level.

Ancillary services

Transmission pipelines can be used to provide a range of ancillary services, including:

- Renomination services, which enable users to amend their nominations after the nomination cut-off time, which is typically the afternoon before the gas day.
- In-pipe trade services, which enable gas to be traded between users at a notional point on the pipeline and allow users to manage their imbalances.
- Capacity trading services, which enables capacity traded between users to be managed by the service provider rather than by the users (e.g. the user purchasing the capacity can make nominations directly to the pipeline rather than through the user selling the capacity).

Source: AER, Draft Decision Roma to Brisbane Gas Pipeline AA 2017-22, July 2017, Attachment 1, Appendix A.



Appendix D EnergyEdge Analysis of Auction Quantities and Risk of Curtailment

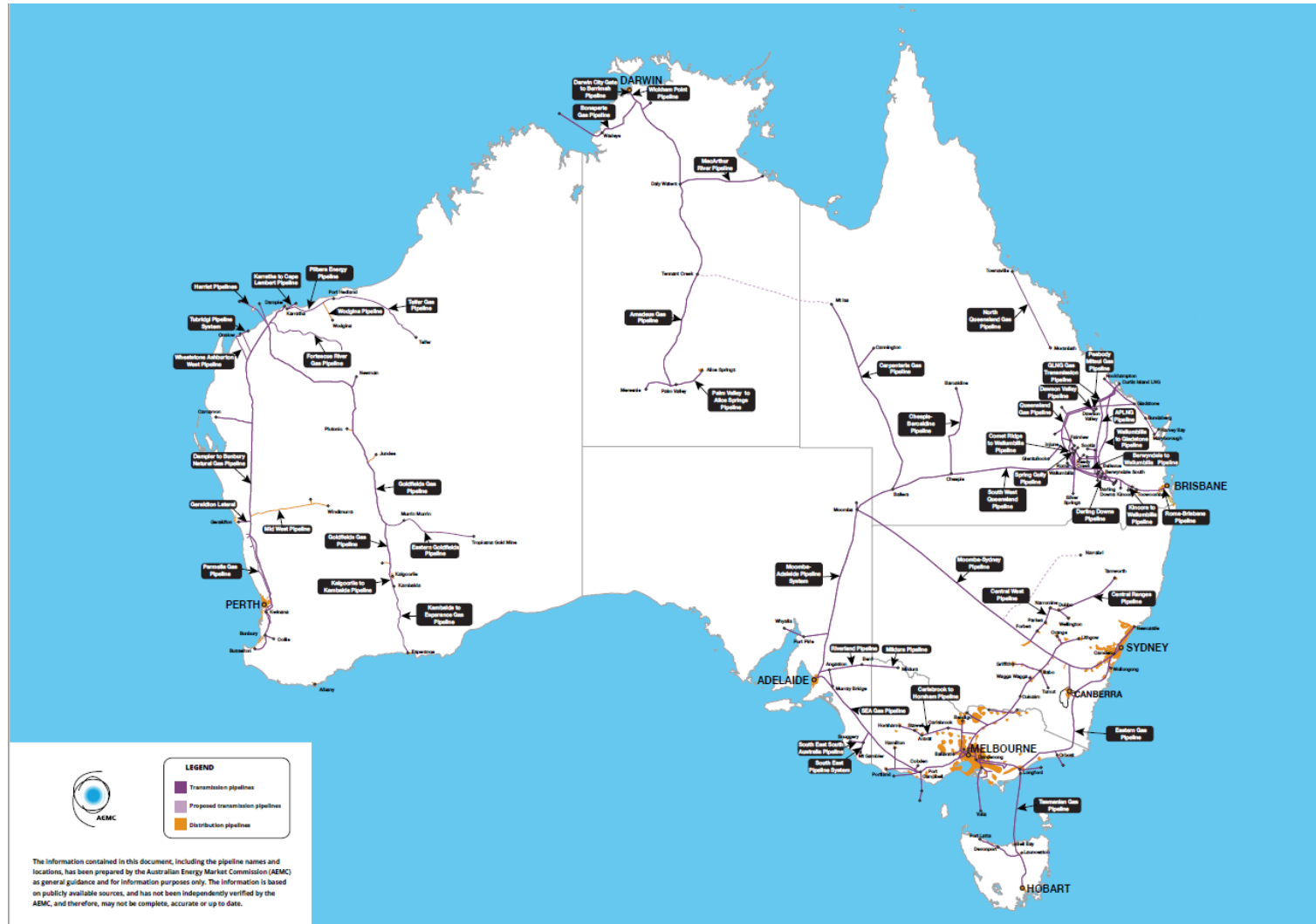
The table below provides a summary of the analysis that EnergyEdge carried out for the GMRG on the quantity of contracted but un-nominated capacity that would have been released through the day-ahead auction if it had been in place over the period November 2016 – June 2017 and the risk that this capacity would have been curtailed over the same period.

Table 9.2: Historical estimates of auction quantities and the risk of curtailment (based on BB data November 2016 - June 2017)

Pipeline	Auction Quantity (TJ/day)			Level and Frequency of Curtailment Over Analysis Period				
	Minimum	Average	Maximum	No Impact (0%)	Limited (0-9%)	Moderate (10-49%)	Significant (50-79%)	Severe (>80%)
Eastern Gas Pipeline	0	69	171	91.2%	5.4%	2.0%	0.0%	1.5%
Moomba to Sydney Pipeline	48	186	292	81.6%	14.6%	3.8%	0.0%	0.0%
SEAGas	1	139	215	70.8%	18.9%	9.9%	0.0%	0.5%
Moomba to Adelaide Pipeline System	0	54	169	97.5%	1.9%	0.6%	0.0%	0.0%
Roma to Brisbane Pipeline	0	103	154	47.9%	33.2%	17.1%	1.4%	0.5%
Queensland Gas Pipeline	0	14	35	81.2%	12.6%	5.3%	1.0%	0.0%
Darling Downs Pipeline	99	243	270	84.9%	12.7%	2.4%	0.0%	0.0%
Berwyndale to Wallumbilla Pipeline	0	82	1641	56.9%	23.2%	14.7%	5.2%	0.0%
Carpentaria Gas Pipeline	0	17	42	55.5%	21.8%	20.4%	2.4%	0.0%
Wallumbilla to Gladstone Pipeline	88	364	792	64.6%	18.9%	15.1%	1.4%	0.0%
Tasmanian Gas Pipeline	0	43	65	90.8%	4.6%	4.6%	0.0%	0.0%
South West Queensland Pipeline	Excluded due to data limitations							

Source: EnergyEdge, Auctionable Quantity Risk, 14 August 2017.

Appendix E Map of Transmission Pipelines



Source: AEMC