AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Pipeline Capacity Trading Industry Guide

February 2019

A guide for participants in the secondary trading and transfer of pipeline capacity

Important notice

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VERSION CONTROL

Version	Release date	Changes
1.0	6/2/2019	First edition

Preface

The pipeline capacity trading reforms described in this guide do not take effect until corresponding changes to National Gas Law and National Gas Regulations are adopted and the supporting market systems and processes are available.

Contents

Tables

Figures

Abbreviations

Abbreviation	Term
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AEST	Australian Eastern Standard Time
AQL	auction quantity limit
BB	Natural Gas Services Bulletin Board
BH	backhaul
CBU	contracted but unnominated
CBUC	CBU capacity
CC	contracted capacity
CRN	contract registration number (STTM)
CTAP	Capacity Transfer and Auction Procedures
CTM	custody transfer meter
CTP	Capacity Trading Platform
DAA	Day-ahead Auction
DC	discretionary capacity
DP	delivery point
DTS	Declared Transmission System
DWGM	Declared Wholesale Gas Market
Energy Council	Council of Australian Governments Energy Council
FH	forward haul
FHQ	forward haul quantity
FO	facility operator
GMRG	Gas Market Reform Group
GSH	Gas Supply Hub
MHQ	maximum hourly quantity
MSV	market schedule variation
NGL	National Gas Law
NGR	National Gas Rules
NR	nameplate rating
OC	operational capacity

Abbreviation	Term
OTS Code	Operational Transportation Service Code
OTSA	Operational Transportation Service Agreement
RP	receipt point
SF	scheduled flow
STTM	Short Term Trading Market
TSPR	Transportation Service Point Register
UC	unused capacity

1. Background

1.1 PCT reform package

On 29 June 2018, the Council of Australian Governments Energy Council (Energy Council) agreed to implement the legal and regulatory framework required to give effect to the pipeline capacity trading (PCT) reform package as recommended by the Australian Energy Market Commission (AEMC) as part of its Eastern Australian Wholesale Gas Market and Pipelines Framework Review (AEMC 2016).

The reforms apply to the operators of certain transmission pipelines and compression facilities operating under the contract carriage model[1]. The objectives of the reforms (GMRG 2018a) are to:

- Facilitate trading of under-utilised pipeline capacity.
- Foster a more liquid secondary capacity market.
- Provide incentives for shippers to trade capacity.
- Encourage efficient pricing and allocation of secondary capacity.
- Reduce transaction costs through standardisation.
- Increase visibility of capacity transaction data.

These objectives are achieved by providing shippers with an incentive to trade spare capacity on a secondary capacity market (the Capacity Trading Platform or CTP). If a shipper fails to sell any spare capacity prior to the nomination cut-off time, then its contracted but unnominated (CBU) capacity is then offered to other participants in an auction conducted a day ahead of the gas day (the Day-ahead Auction or DAA). In contrast to trades conducted by shippers prior to nomination cut-off time, the proceeds from the auction are retained by the facility operator, which incentivises shippers to sell their spare capacity ahead of nomination cut-off time.

The CTP, which forms part of the Gas Supply Hub (GSH), provides exchange-based trading of standardised products, including firm forward haul services, firm park services, and firm compression services on stand-alone compressors, and a listing service for more bespoke products. Whereas the DAA allows shippers to procure forward haul transportation services (with separate products offered in both directions on bidirectional pipelines), backhaul services on single direction pipelines where AEMO has specified backhaul service points, and stand-alone compression services. From a scheduling, curtailment and renomination perspective, the auction services rank below firm transportation services and the renomination rights held by firm capacity holders[2] but above lower tier services, such as as-available and interruptible services.

Other measures in the reform package, designed to improve the fungibility of transportation services and thereby facilitate secondary trading and the auction, include:

- Operational transportation service agreements (OTSA) that standardise contract terms between facility operators and shippers for capacity procured through the CTP and DAA.
- A harmonised market timetable that establishes a common gas day start time of 6 am AEST across the east coast[3], a common nomination cut-off time of 3 pm AEST, and a common auction service nomination cut-off time.
- A reporting framework for secondary capacity trades and a number of other market transparency measures, including information relating to allocation agreements.

[1] Excludes the Declared Transmission System (DTS), which operates under the market carriage model.

[2] For a transitional period of up to two years, certain as-available and overrun services that were procured prior to 19 March 2018 and are used to supply gas to a gas-fired generator will be treated as "transitional firm services" and rank ahead of the auction.

[3] And the Northern Territory, once connected to the east coast.

The Energy Council has stipulated that both the CTP and DAA markets are required to go live at the beginning of March 2019 and timetables are required to be harmonised by the beginning of October 2019.

1.2 Market design and development

The Energy Council established the Gas Market Reform Group (GMRG) to lead the design, development and implementation of the capacity trading reform package. The GMRG undertook an extensive consultation process on the legal and regulatory framework required to implement the capacity trading reform package, including amendments required to National Gas Law (NGL), the Regulations made under the NGL, and the National Gas Rules (NGR), and development of a new regulatory instrument, the Operational Transportation Service Code. Following this consultation, the GMRG provided its final recommendations to the Energy Council (GMRG 2017a, 2017b, 2017c) to:

- adopt the measures required to facilitate capacity trading;
- accord the Australian Energy Market Operator (AEMO) responsibility for operating the CTP and DAA; and
- adopt the proposed design of the CTP and the DAA, the reporting framework for secondary trades, and a standard market timetable.

1.3 Legal, regulatory and procedural framework

The required amendments to the National Gas Law (NGL), Regulations, National Gas Rules (NGR) and related agreements, codes and procedures required to give effect to the reform package are outlined in Figure 1. Responsibilities for administering these instruments are described in Table 1.

Amendments to the NGR are the responsibility of the Australian Energy Market Commission (AEMC) in accordance with the rule change procedures defined in the NGL. Compliance with the rules and relevant instruments will be monitored and enforced by the Australian Energy Regulator (AER). The AER will also be responsible for amending the Operational Transportation Services (OTS) Code.

AEMO is responsible for making and administering the market procedures and other subordinate instruments, as required by the NGR, including Capacity Transfer and Auction Procedures (CTAP), Auction Agreements, the Exchange Agreement, and amendments, as required, to Declared Wholesale Gas Market (DWGM) and Bulletin Board (BB) procedures. The process by which AEMO makes and amends the market procedures is set out in the NGR.

Figure 1 Legal, regulatory and procedural framework of capacity trading reforms

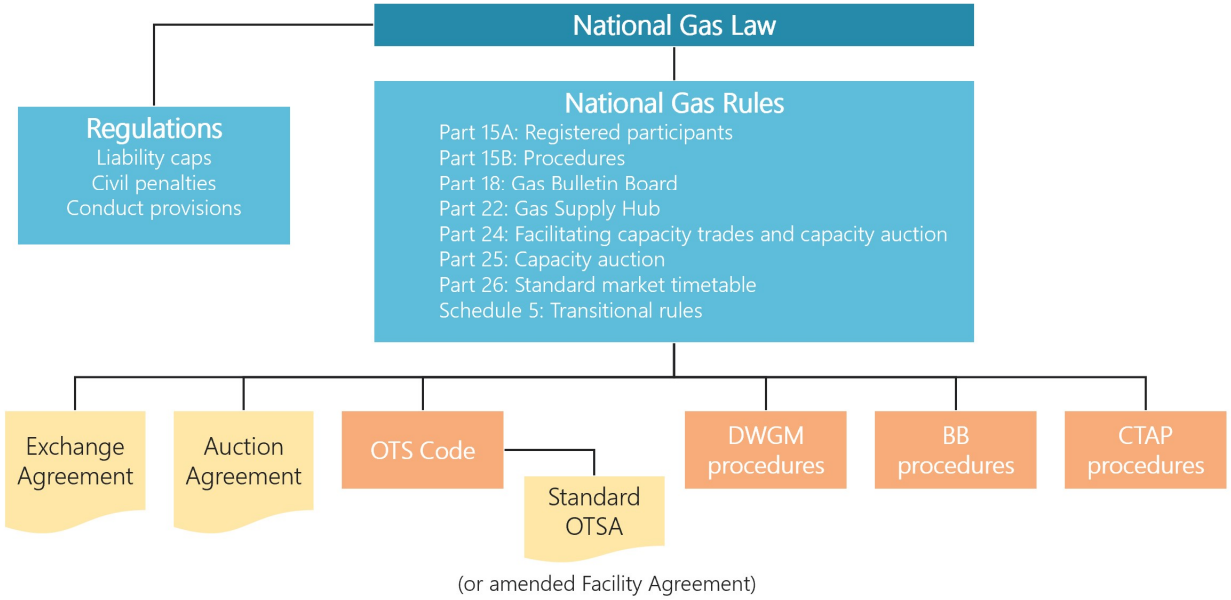


Table 1 Governance responsibilities for pipeline capacity trading

Instrument	Administration	Compliance
National Gas Law (NGL) and Regulations	COAG Energy Council	AER
National Gas Rules (NGR)	AEMC	AER
Operational Transportation Services (OTS) Code	Industry panel chaired by AEMO[a]	AER
GSH Exchange agreements	AEMO	AER
Capacity transfer and auction procedures (CTAP) and auction agreements	AEMO	AER
Procedures (DWGM, STTM, BB and retail)	AEMO	AER

a. Panel assesses proposed changes to the code and provides recommendations to the AER. The AER may confirm, amend or reject the panel's recommendations.

1.4 New or amended instruments

NGL

Changes to the NGL were required to establish the legal framework for the capacity trading reform package; to set out the new functions and powers of AEMO and the AER; to allow AEMO to make the CTAP, and to specify additional obligations of transportation service providers, facility operators and other market participants, and establish the legal framework for the capacity trading reform package.

Regulations

Changes to the Regulations were required to specify the NGL and NGR provisions for civil penalty or conduct provisions and extend the operation of the liability caps to the new arrangements in the NGL.

NGR

Additions to the NGR were required to give effect to the standardisation related reforms and a number of other measures to facilitate secondary capacity trading and the DAA; to set out the rules pertaining to the DAA; to define harmonisation cut-off times; and to set out transitional arrangements.

Changes to the NGR were also required to set out the scope of the CTAP, to give effect to aspects of the secondary capacity reporting framework and a number of other transparency measures, to give effect to some of the proposed features of the CTP, and to set out how AEMO recovers its costs.

Operational Transportation Service Code

The OTS Code is a new instrument that governs the content of standard operational transportation service agreements (OTSA). OTSAs are agreements between facility operators and transportation service users that govern the use of capacity purchased on the CTP or DAA. The code contains descriptions of each standard OTSA, the standard terms and conditions for the provision and use of a standard OTSA, requirements for facility-specific terms, and a form of agreement for execution by the parties.

GSH Exchange Agreement

GSH Exchange Agreement outlines the terms for trading physical gas and services through the GSH. The CTP is implemented through the GSH and, as such, amendments to the Exchange Agreement were required to incorporate the capacity products into the existing trading arrangements. Amendments included registration, capacity product specification, delivery arrangements, prudential requirements, and settlement of capacity trades.

Capacity Trading and Auction Procedures (CTAP)

New procedures for the operation of the CTP and DAA, setting out the processes by which AEMO operates the CTP and DAA and interacts with facility operators, shippers and other market participants.

Auction Agreement

This new agreement between AEMO and auction participants sets out the terms for participation in the DAA and must be executed by auction participants before they can participate in an auction.

Other procedures

Changes were also required to existing AEMO procedures (DWGM, BB) consequent to the changes in the rules and regulations.

1.5 Coverage

The reform package has broad coverage in the eastern states. Referring to Table 2, the reforms apply to non-exempted facilities in the Australian Capital Territory (ACT), New South Wales (NSW), Queensland, South Australia, Tasmania and Victoria outside the Declared Transmission System, including four compression facilities[4] that operate between pipelines. In the Northern Territory (NT), a derogation has been made to delay the implementation of the DAA for facilities located wholly or partly in the NT for five years, but all other elements of the reform package apply[5].

Covered facilities are required to offer an OTSA and facilitate capacity trading and transfers.

[4] Iona compression, Moomba compression, Ballera compression, and Wallumbilla compression

[5] Subject to commissioning the Northern Gas Pipeline (NGP)

Exemptions

Full exemptions[6] are automatically available to distribution pipelines, transportation facilities that form part of the DTS, and compression facilities that are not designated in the Regulations or are not stand-alone facilities. Conditional exemptions[7] are available on application to the AER to facilities that do not provide third-party access, or that service a single shipper, or have a nameplate rating of under 10 TJ per day.

Table 2 Facilities covered by capacity trading reforms at market start

Facility	CTP	DAA	Services
Transportation			
AGP Amadeus Gas Pipeline	From 26 June 2019	Subject to derogation	Forward haul
BWP Berwyndale to Wallumbilla Pipeline	Yes	Yes	Forward haul
CGP Carpentaria Gas Pipeline	Yes	Yes	Forward haul
DDP Darling Downs Pipeline	Yes	Yes	Forward haul
EGP Eastern Gas Pipeline	Yes	Yes	Forward haul, Backhaul (DAA only), Park (CTP only)
MAPS Moomba to Adelaide Pipeline System	Yes	Yes	Forward haul, Park (CTP only)
MSP Moomba to Sydney Pipeline, CWP Central West Pipeline and CRP Central Ranges Pipeline	Yes	Yes	Forward haul, Park (CTP only)
NGP Northern Gas Pipeline	From 26 June 2019	Subject to derogation	Forward haul
PCA Port Campbell to Adelaide Pipeline	Yes	Yes	Forward haul, Backhaul (DAA only)
PCI Port Campbell to Iona Pipeline	Yes	Yes	Forward haul, Backhaul (DAA only)
QGP Queensland Gas Pipeline	Yes	Yes	Forward haul, Backhaul (DAA only)
RBP Roma to Brisbane Pipeline	Yes	Yes	Forward haul, Park (CTP only)
SEPS South East Pipeline System	Yes	Yes	Forward haul
SESA South East South Australia Pipeline	Yes	Yes	Forward haul
SWQP South West Queensland Pipeline	Yes	Yes	Forward haul, Park (CTP only)
TGP Tasmanian Gas Pipeline	Yes	Yes	Forward haul, Backhaul (DAA only), Park (CTP only)
VICHUB VicHub	Yes	Yes	Forward haul, Backhaul (DAA only)
WGP Wallumbilla to Gladstone Pipeline	Yes	Yes	Forward haul

[6] Excluding the secondary capacity transaction reporting framework.

[7] Conditional exemption refers to facilities being exempt only from the obligation to publish a standard OTSA but not the obligation to prepare and offer to enter into a standard OTSA nor other measures in the reform package.

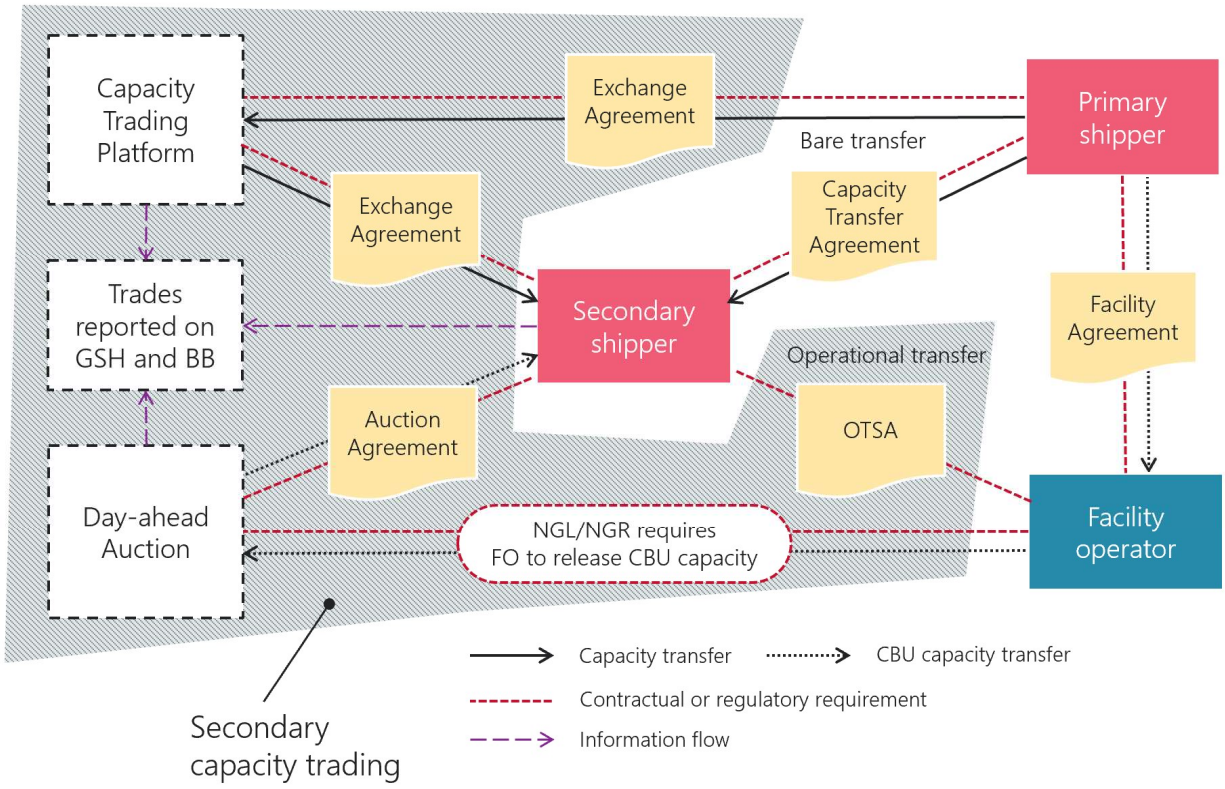
Facility	CTP	DAA	Services
Compression			
ICF Iona Compression	Yes	Yes	Compression
MCF Moomba Compression	Yes	Yes	Compression
BCF Ballera Compression	Yes	Yes	Compression
WCFA Wallumbilla Compression Facility A	Yes	Yes	Compression
WCFB Wallumbilla Compression Facility B	Yes	Yes	Compression

2. Concepts

2.1 Contractual arrangement

The contractual arrangements that shippers need to have in place with AEMO and facility operators to trade and transfer capacity are illustrated in Figure 2. Specifically, to participate in secondary trading of capacity, a shipper must have an OTSA with the relevant facility operator and either a GSH Exchange Agreement (for the CTP) or an Auction Agreement (for the DAA) or both. Refer to Section 1.4 for descriptions of these agreements.

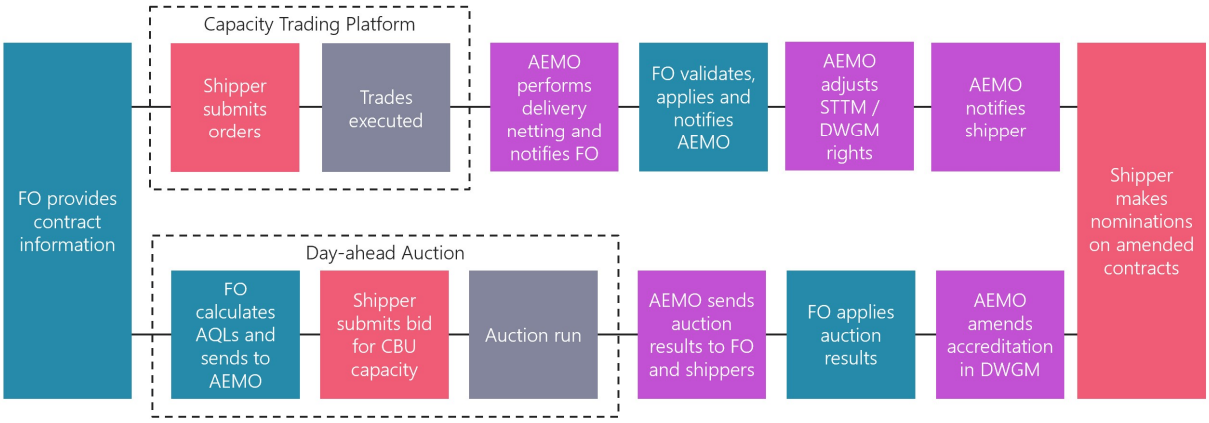
Figure 2 Contractual arrangements for secondary capacity trading and transfer



2.2 Capacity transfer mechanisms

Shippers can procure available capacity on non-exempt transportation facilities on either[8] the CTP or the DAA. Figure 3 gives an overview of these mechanisms, which are further described in Sections 4 (CTP) and 5 (DAA).

Figure 3 Overview of the capacity trading and transfer process



2.3 Service points, zones and pipeline segments

Capacity products are defined by service points (receipt and delivery points), zones (groupings of service points) and pipeline segments (transportation paths between zones), which are recorded in the Transportation Service Point Register (TSPR).

The facility operators are required to provide AEMO with, and keep up to date, a specification of all pipeline, compression, and park service points on each of the transportation facilities covered by the capacity trading reform package[9]. AEMO determines and maintains backhaul service points. Where a notional point is used in place of a physical point, the TSPR specifies the physical points that are represented by the notional point.

The TSPR is published on the AEMO website and is also available on the Gas Bulletin Board and AEMO's capacity trading market interfaces.

2.3.1 Administering the register

Under the legal and regulatory framework (see Section 1.3), AEMO is responsible for maintaining and publishing the Transportation Service Point Register (TSPR).

AEMO's responsibilities include determining the backhaul service points between which backhaul auction services are available in the DAA on single direction pipelines (or parts of pipelines), allocating forward haul and backhaul service points to the forward haul and backhaul zones, which are used for both the CTP and DAA, and determining the forward haul and backhaul pipeline segments used in the DAA.

In allocating service points to zones, AEMO must have regard to:

- Demand and liquidity for the products.
- Possible curtailment of products due to capacity transferred between points.
- Technical and operational characteristics of the facility.

[8] Shippers may use other means to identify potential counterparties and enter into bilateral trades.

[9] And facilities that are commissioned after the reforms take effect or later become subject to the reforms.

To ensure that the receipt and delivery point zones can adapt to changes in the market or the operational or technical characteristics of the transportation facility, facility operators and any other person (including AEMO) may propose a change to the zones.

When new points are added (or removed) on facilities by a facility operator, the facility operator submits an updated service point list to AEMO, which may result in a change to the register. Changes to the service point, zone and segment specification can be initiated by AEMO proposing a change or by any participant proposing a change to zones or segments to AEMO.

AEMO will consult on proposals or changes to service points by publishing a notice on its website. Consultation on changes will include transitional considerations.

3. Participation

3.1 Roles

3.1.1 Market operator

AEMO administers and operates the CTP and the DAA, and maintains and publishes the TSPR (see Section 2.3.1).

3.1.2 Transportation Service Provider

Under the NGL, a Transportation Service Provider (TSP) owns, operates, or controls a transportation facility. The TSP must register the facility and the facility operator unless exempted from doing so. If the facility has only one TSP, they must register the facility and as the facility operator. If more than one person owns, operates or controls a transportation facility, they must jointly appoint a responsible TSP, who must register the facility and as facility operator for the facility.

3.1.3 Facility operator

The facility operator is responsible for all data exchanges with AEMO and is the entity that receives payments from AEMO for auctioned capacity. Their responsibilities include providing and updating AEMO with details of service points and contract details for shippers who are registered to trade capacity or participate in an auction. AEMO updates the market systems with this information, enabling trading participants and auction participants to select which contracts and service points are to be adjusted when entering an order or bid.

Facility operators are also responsible for providing transportation facility users with access to secondary capacity they can purchase through the CTP and DAA via an OTSA, and transferring capacity in their systems to allow trading participants and auction participants to use the capacity they have procured.

3.1.4 Capacity trading participant

Existing GSH trading participants are automatically registered for the CTP and will have access to both the commodity and capacity products. A new category of GSH trading participant is restricted to trading capacity products only.

3.1.5 Auction participant

To participate in the DAA, a trading participant must register as an auction participant by entering into an Auction Agreement with AEMO.

3.1.6 Agent

Both the Exchange Agreement and the Auction Agreement allow an agent to be appointed jointly (such as an unincorporated joint venture) or individually (such as under a corporate group). The agent trades capacity for contracts held by the appointing participants. The facility operator must provide details of contracts held by all the appointing members and their agent. AEMO manages the relationship between appointing members and agents.

There are two types of agent appointments permitted by the Auction Agreement and the Exchange Agreement:

- Jointly appointed by members, e.g. for members of a JV
- Individually appointed by members, e.g. for a corporate group

Under both types of appointment, the appointing members are jointly and severally liable for the acts of the agent. That is, the JV parties or group companies must manage liability between the appointing members themselves.

Jointly appointed

- All appointing members must be parties to the same AA or EA
- The agent cannot act for any one appointing member
- Changes to appointment must be approved by all appointing members

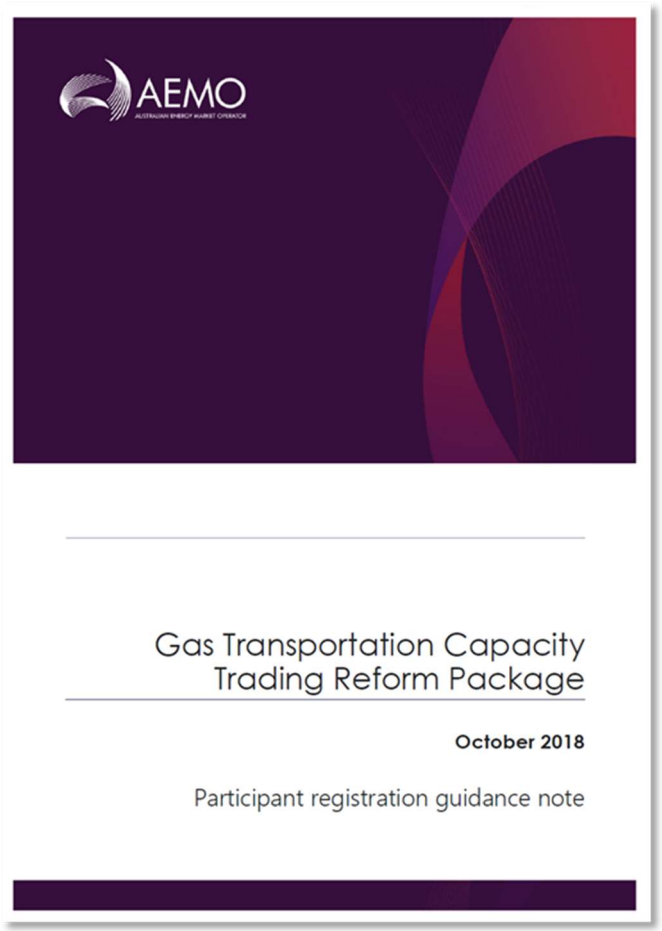
Individually appointed

- Appointing members may have separate AA or EA
- The agent acts individually for each appointing member
- Changes to appointment can be made individually by each member

3.2 Market participant registration

An application for registration must be in the form published by AEMO, contain all the information specified in the form, and be signed by an authorised company signatory. AEMO will notify the applicant when an application has been received and again when accepted.

Registration requirements for the CTP and DAA are outlined below, but participants are encouraged to refer to the capacity trading participant registration guidance note (AEMO 2018d) before registration.



To participate in the CTP, participants must:

- Be a member of the GSH Exchange.
- Provide adequate credit support.

To participate in the DAA, participants must:

- Register as an auction participant.
- Enter into an auction agreement with AEMO.
- Existing guarantees must be replaced with a guarantee that refers to the DAA.
- Gain access to AEMO auction systems.
- Have agreements in place with facility operators (OTSA or existing facility agreement) to use traded or auction capacity for intended service points.

3.2.1 Austraclear

Austraclear is used as the electronic payment facility across AEMO energy markets. The registration process and clearing procedure are described in the AEMO guide to market clearing (AEMO 2014).

Note. Membership of Austraclear can take up to five weeks to process.

3.3 Conduct

Part 22 of the NGR sets out the rules of conduct for GSH Exchange members, which includes requirements to observe high standards of market conduct and to act with due skill, care and diligence in using the trading system and performing transactions, including submission of orders, providing information to AEMO, compliance and performance of transactions.

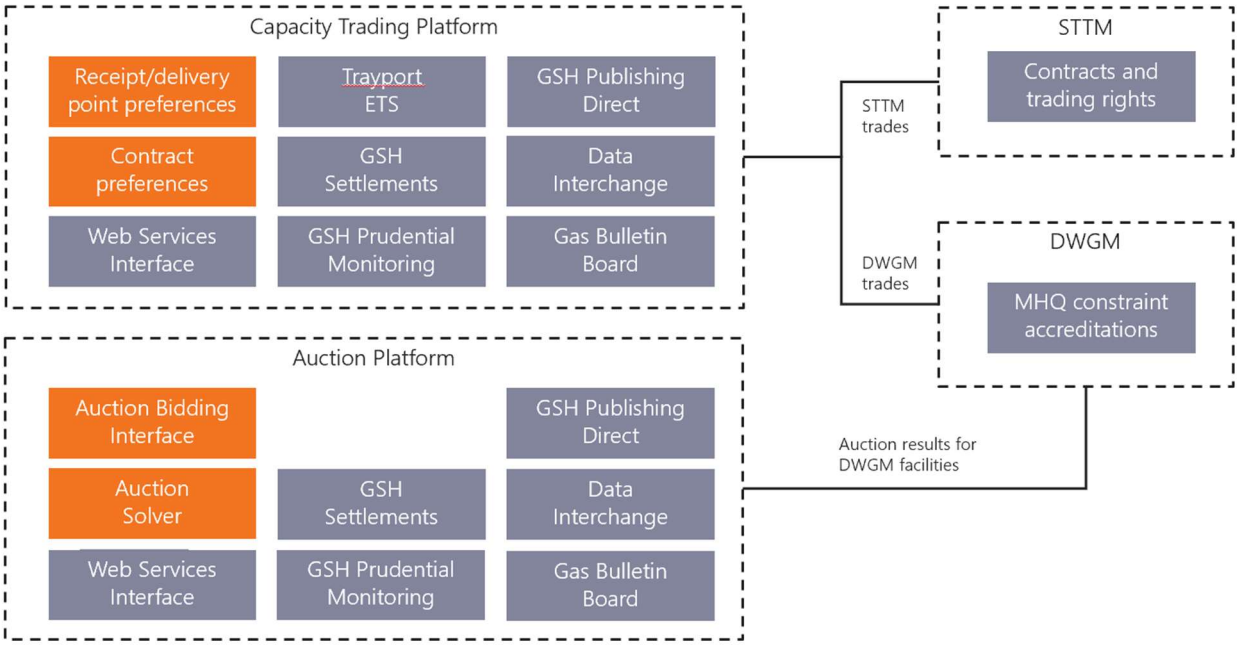
The AER is responsible for monitoring auction behaviour to ensure that shippers do not make false or misleading nominations and renominations. The AER maintains a guideline that sets out how facility operators and shippers should record and maintain nomination and renomination data. Facility operators are required to record relevant shipper data and provide the information to the AER on request, and keep a historical record of this information.

3.4 Accessing market systems

AEMO, facility operators, trading participants (CTP) and auction participants (DAA) exchange information via the CTP interface and the DAA interface, as defined in the GSH Interface protocol and Capacity Transfer and Auction Interface protocol published by AEMO[10]. See Appendix A4 for descriptions of the core systems.

[10] <http://aemo.com.au/Gas/Pipeline-Capacity-Trading/Procedures>

Figure 4 CTP and DAA market systems



For information on using the market systems, refer to the following guides, available on the AEMO website[11]:

- *Gas Supply Hub Industry Guide*
- *Guide to Capacity Trading and Day Ahead Auction Reports* (also see Section 8 "Registers, notices and reports" for summary)
- *Guide to Capacity Trading and Day Ahead Auction Transactions*
- *Guide to Gas Supply Hub Reports*
- *Guide to Gas Supply Hub Point Preferences*
- *Guide to Contract Reference Selections*
- *Guide to Gas Supply Hub Capacity Auction*

[11] <https://www.aemo.com.au/Gas/Pipeline-Capacity-Trading/Guides-and-information> and <https://www.aemo.com.au/Gas/Gas-Supply-Hubs/Market-operations> and <http://aemo.com.au/Gas/Pipeline-Capacity-Trading/Guides-and-information>

4. Capacity trading platform (CTP)

The CTP is operated by AEMO and forms part of the GSH. The CTP provides exchange-based trading of commonly traded transportation products and a listing service for more bespoke products and imbalance trades. The CTP has the following features:

- Trading of standardised products
- Day-ahead and forward daily, weekly and monthly product timescales ("tenors")
- Forward haul, compression and park capacity products
- Anonymous trading
- Trades are integrated with facility operator systems to automate transfers of capacity
- Settlement and prudentials centrally managed by AEMO through the GSH

4.1 Products

The initial set of products to be sold on the exchange include:

- **Firm forward haul services** on transmission pipelines (with services offered in both directions if the pipeline is bi-directional)
- **Firm compression services** on stand-alone compression facilities
- **Firm park (storage) services** on those pipelines that offer this service

These products have a minimum contract size of 500 GJ per day and are available as day-ahead, daily (6-day rolling), weekly (4-week rolling); and monthly products (3-month rolling).

The standardised products are defined in the Exchange Agreement, which references the TSPR. The terms and conditions on which the buyer can use these products are set out in the relevant facility operator's standard OTSA.

4.1.1 Firm forward haul and compression services

To maximise the pool of prospective buyers and sellers, firm forward haul and compression products are sold on the exchange using a zonal model (Figure 5), such that:

- Shippers with firm forward haul or compression capacity can sell their point-to-point capacity on a zone-to-zone basis.
- Secondary shippers can acquire the firm forward haul and/or compression capacity on a zone-to-zone basis and have secondary firm rights[12] at each receipt and delivery point in the relevant zone.

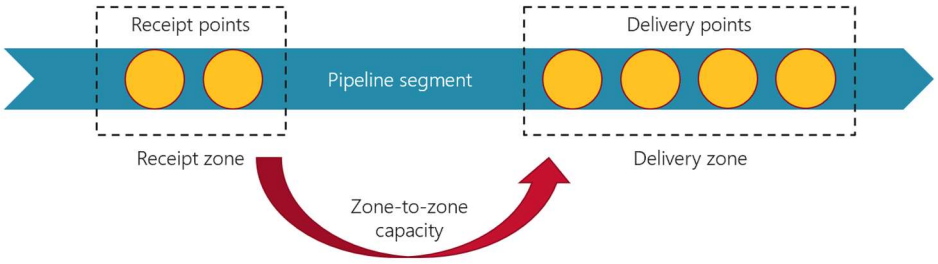
The receipt and delivery points in each zone, which may be physical or notional points, are specified in the Transportation Service Point Register (TSPR).

When a firm forward haul or compression product is traded, the seller notifies AEMO of the pipeline or compression receipt and delivery points it intends to release its capacity from, the buyer notifies AEMO of the

[12] Secondary shippers can use any receipt or delivery point within a zone, but their rights are subordinate to primary firm shippers (who have not sold their capacity) with firm rights at those points.

pipeline or compression receipt and delivery points it intends to use in the relevant zones, and AEMO then notifies the facility operator of the selected service points in the capacity transfer notice.[13]

Figure 5 Zonal model for firm forward haul and compression capacity sold in the CTP



4.1.2 Firm park services

Note. Firm park services are not sold on a day-ahead basis.

In contrast to firm forward haul and compression products, park products are sold at a single physical or notional point on the pipeline (park service point). Like the park products sold by pipeline operators, the exchange traded park product only entitles buyers to store gas on the pipeline. To use this product, a buyer will also need to have access to a transportation service that enables it to:

- supply gas into the pipeline and transport it to the park service point, and
- transport the gas from the park service point to the final delivery point.

This transportation service may be procured through the CTP or DAA, or if the buyer has an existing transportation service on the pipeline, then it may be able to use this service.

4.1.3 Integrated STTM and DWGM products

If the shipper intends to use the forward haul capacity it has procured through the CTP to supply gas into or out of an STTM or the DWGM, then it will also need to ensure the arrangements outlined in Section 6 are in place.

4.2 Trading and transfer process

4.2.1 Step-by-step

The steps involved in the CTP trading and transfer process are illustrated in Figure 6 and further described in Table 3. Detailed timelines are provided in Section 7.

Trades are conducted by either:

- entering bids or offers on standardised products, which are automatically matched through the exchange, or
- entering bilateral (pre-matched) trades in listed, standardised products for settlement through the exchange.

Bids and offers made through the exchange for capacity products are fully anonymous (i.e. the names of counterparties are not revealed before or after the transaction), with AEMO informing the facility operator of the trade and the facility operator then confirming and giving effect to the trade. Bilateral trades brought to the exchange for settlement are also delivered (capacity transferred) via the same process.

[13] If a secondary shipper procures capacity through the CTP or DAA and wants to use a multi-user receipt or delivery point, it may need to become a party to an allocation agreement at that point. This agreement sets out the rules the allocation agent is required to use to allocate gas between shippers at the receipt or delivery point. In addition to being a party to the allocation agreement, the shipper must also be set up in the OTSA to use the relevant points.

Day ahead products are transferred in the middle of the day (see timetable in Table 15), in time for shippers to make nominations before the cut off time. Forward-traded products (that is, not day-ahead) are transferred at the end of the trading day, following closure of the GSH, for trades relating to the next 14 days.

Figure 6 Capacity trading and transfer process

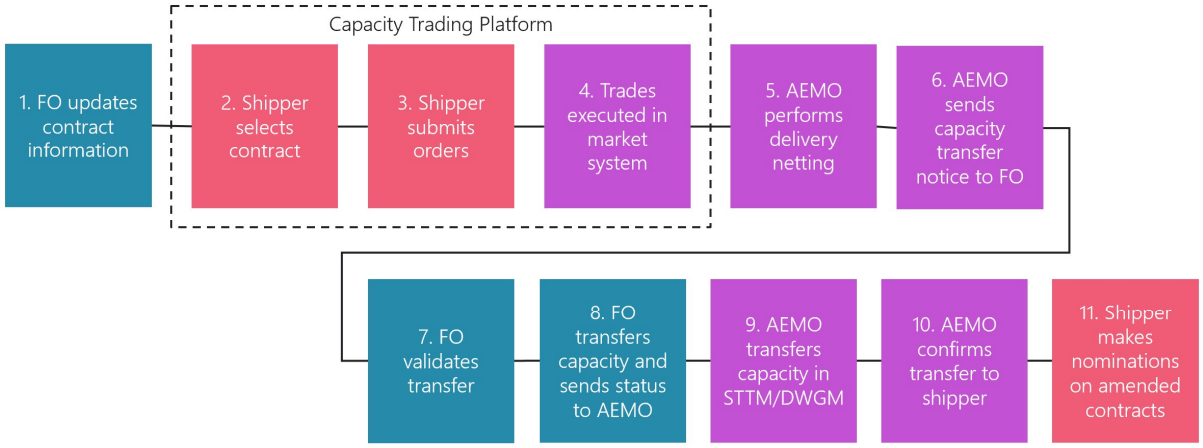


Table 3 Capacity trading and transfer process steps

Step	Description
1	**Facility operator provides / updates contract information** Facility operator informs AEMO about changes to contracts they have with shippers.
2	**Shipper selects contract** Participant logs in to AEMO Markets Portal and selects the contracts and STTM/DWGM references they wish to be adjusted by a successful trade. A contract is selected for each product they wish to bid for from a list of valid contract references for the facility supplied by the facility operator.
3	**Shipper submits orders to the platform (Trayport)** AEMO validates that the participant has pre-selected a contract (includes pre-matched trades) and has sufficient collateral.
4	**Trades are executed on the CTP** Bids are matched with offers to form a trade, and traders receive confirmation (includes pre-matched trades).
5	**AEMO performs delivery netting** AEMO determines the total net capacity of day-ahead and forward-traded products that each shipper has sold or purchased.
6	**AEMO sends capacity transfer notice to the facility operator** The capacity transfer notice informs the facility operator of the transfers of capacity that need to occur, including how much each shipper's capacity is to be increased or decreased, on which contract, and between which points.
7	**Facility operator validates that each transfer is possible** If a transfer cannot be validated[14], the facility operator sends a report to AEMO stating that the transfer is pending. AEMO passes this information to the shipper who contacts the facility operator directly to rectify the issue.
8	**Facility operator transfers capacity and sends final capacity transfer status to AEMO** Facility operator transfers capacity and confirms with AEMO that the capacity has been transferred (or rejected).
9	**AEMO transfers capacity in STTM/DWGM** AEMO transfers capacity for trading rights in the STTM and accreditation at receipt and delivery points at the boundary of the DTS.

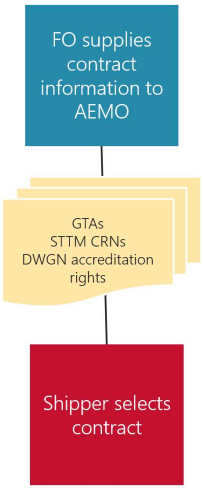
[14] Buyer or seller records might fail validation because seller does not have enough capacity to meet the transfer, or an invalid contract was referenced, or a contractual restriction.

Step	Description
10	**AEMO confirms capacity transfer status to shipper** AEMO confirms with shipper that transfer has completed (trades are delivered at this point).
11	**Shipper makes nominations for use of the capacity directly to the facility operator**

4.2.2 Supplying contract information

Facility operators provide AEMO with a list of contract reference IDs, including STTM contract registration numbers (CRNs), associated with each trading participant. For each facility agreement, facility operators provide:

- Participant IDs who are party to the agreement.
- Registered facilities to which the facility agreement relates.
- Facility operator's reference ID for the transportation services under the agreement and whether it is for an auction service, a traded service, or both.
- Date range (i.e. start date and end date).
- If the facility agreement allows delivery to an STTM hub and the associated STTM CRN.



DWGM accreditation rights are populated from AEMO's systems, and STTM rights provided by facility operators are validated against AEMO's systems.

Contract information must be provided to AEMO in the specified format within two business days of the facility agreement coming into effect and the user becoming an exchange member or auction participant.

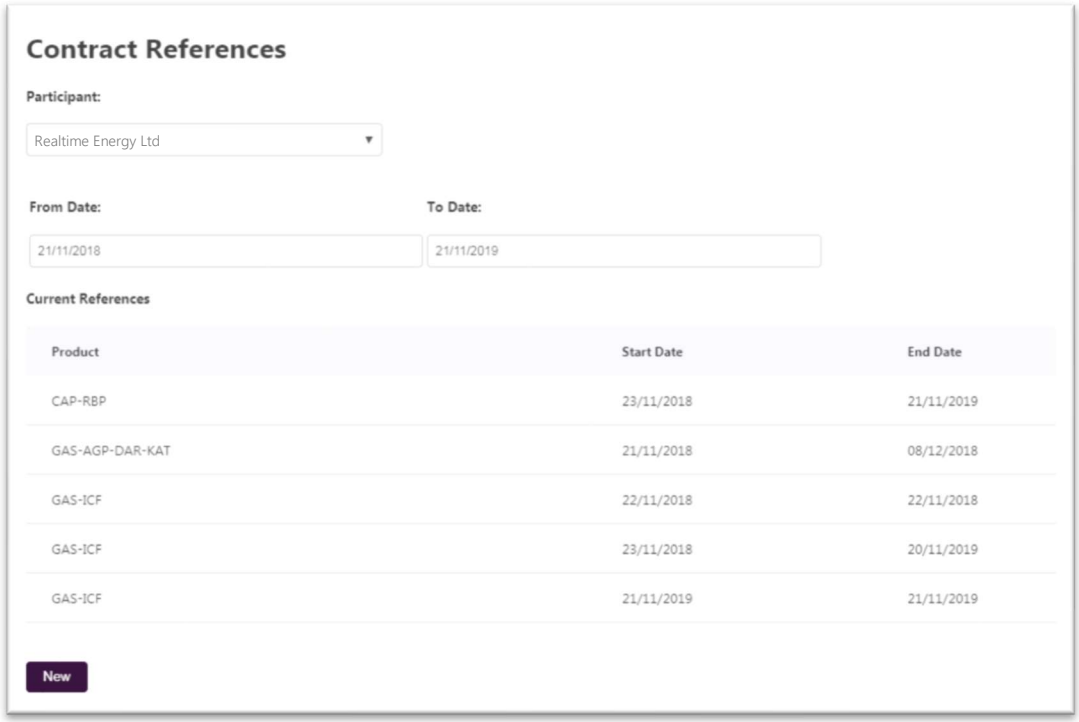
4.2.3 Contract selection

Shippers can have more than one contract on a facility. A contract reference is needed so that the facility operator knows which contract to adjust when a participant trades capacity. Similarly, AEMO needs to know which rights need to be adjusted for STTM and DWGM interface points. In the CTP, shippers make contract reference selections in the Markets Portal prior to placing an order for the product in the ETS.

A contract must be selected for each product. Trading participants can use the same contract reference for buying and selling, or a different contract for each order. An STTM or DWGM reference is only required for products that are integrated. DWGM accreditation may not be required if trading in a mixed zone if the participant has not selected a DWGM interface point. See Section 6 for more information on STTM and DWGM integration.

The contract reference can be updated after trading, up to the time of netting and transfer of the information to facility operators.

Figure 7 Selecting contract references



When a participant places an order for a product, AEMO systems check that a valid contract reference has been pre-selected. If the trade or bid is successful, the contract information is applied to the information provided to facility operators to execute the transfer in their system (in the capacity transfer notice) and to make adjustments in AEMO's market systems.

For further information on selecting contract references, refer to the relevant guide on the AEMO website[15].

4.2.4 Submitting orders for capacity products

Gas Trading Exchange

The CTP forms part of the Gas Trading Exchange, which is built on the Trayport Exchange Trading System (ETS). The ETS is available for trading 7 days a week, 365 days a year. Each 24-hour trading day is divided into four periods: pre-open, opening, trading, and closed, which are described in Table 4. Further information regarding the GSH, including how to use the screens, can be found in the Gas Supply Hub Industry Guide.

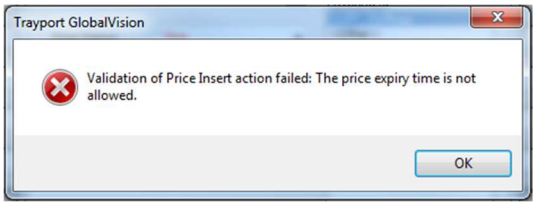
Table 4 ETS trading periods

Period	Time AEST	Description
Pre-open	0830 – 0900	• 30-minute period prior to the opening of trade • At the commencement of this period (0830), the statuses of all current orders are "withheld" until the trader firms these orders up • All orders placed during the pre-open period can be put in as firm or withheld • No matching of orders is performed unless it's a pre-matched trade
Opening	0900	• The opening procedure matches any overlapping bids and offers received in the pre-open period at a single clearing price. • The ETS runs the opening procedure at 0900 just prior to the commencement of trading.

[15] https://www.aemo.com.au/Gas/Pipeline-Capacity-Trading/Guides-and-information

Period	Time AEST	Description
Trading	0900 – 1900	• Continuous trading period • The ETS has a status of "market open" and transactions can be executed • Trading participants can enter, amend and cancel orders during this period • Day-ahead products may close for trading earlier in the day than 1900.
Closed	1900 – 0830	• No trading permitted during this period • Trading participants can cancel orders • ETS allows new orders to be entered or existing orders amended, but these orders will be assigned the status of withheld and thus require firming up in one of the other status periods so that they are accessible for matching

Submitting orders for capacity products

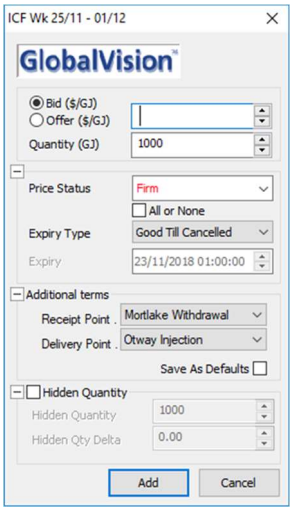


Trading participants submit orders directly onto the exchange. All orders on the exchange are anonymous. Orders for capacity are validated on submission:

- Is the submission correctly formatted?
- Does the participant have sufficient collateral?
- Has the participant pre-selected a contract to apply to the trade?

Once an order is validated, an order confirmation is sent to the participant. Participants can use the order confirmation report to monitor their activity.

Buy and sell orders



A sell order (offer) means that a participant is prepared to sell the offered quantity of capacity between forward haul and compression product zones or at the park service point at a price equal to or greater than the offer price.

Buy order (bid) means that a participant is prepared to buy the bid quantity of capacity between forward haul and compression product zones or at the park service point at a price equal to or less the bid price.

Product price

- Price increments of 0.01 $/GJ
- Maximum price of 999 $/GJ
- Minimum price of 0 $/GJ

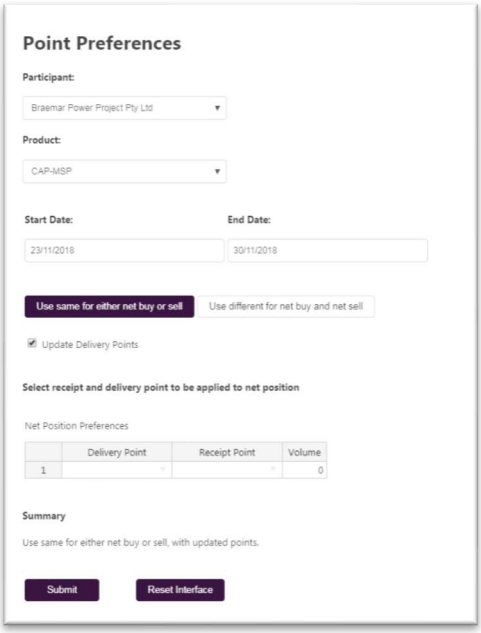
Quantity

For all capacity trading products, the minimum quantity and parcel size is 500 GJ. Minimum quantities and parcel size for the product are detailed in the product specifications which are a schedule to the Exchange Agreement.

Point selection

Forward-haul and compression products must have both a receipt point and a delivery point selected in the Trayport bid window. This can then be updated via the Markets Portal (refer to *Guide to Gas Supply Hub Point Preferences*, Section 3.4). If a participant uses the Point Preferences function in Markets Portal, this will update the receipt and delivery points for the specified quantity for all netted transacted quantity. The points provided in these trades will not be used.

Figure 8 Updating point preferences



4.2.5 Executing trades

Order matching

The matching process combines bids and offers for a given product based on price-time priority. Orders are first matched based on price merit, with new offers matched against the highest price bid, and new bids matched against the lowest price offer. Where two or more orders for a product have the same price and are "in the money", the order with the earlier time is selected.

The transaction price is set at the initiator's order price. It is possible that a bid and offer may overlap in price if:

- Orders are entered around the same time (or the pre-open period), or
- When a participant intends to deal multiple orders at once.

Off-market (pre-matched) trades

Exchange provides a mechanism for participants to bring a bilateral trade to the market for settlement. All gas delivery and settlement obligations are in accordance with the Trading Product for which the trade is registered against. One trading participant submits the pre-matched trade via the deal entry, and the other confirms the submission. Each party enters and confirms their own receipt and delivery point selections for zone-to-zone products. For further information, refer to the Gas Supply Hub guide on the AEMO website[16].

4.2.6 Transferring capacity

Transfer processing timeline

Day-ahead trades are processed in the middle of the day on D-1 for gas day D.

Trades of forward-traded products completed prior to D-14 are processed on D-14 for gas day D (Figure 9), and trades completed on or after D-14 are processed at the end of the trade day for gas day D (Figure 10).

[16] https://www.aemo.com.au/Gas/Pipeline-Capacity-Trading/Guides-and-information

Figure 9 Transfer processing timeline for trades placed pre D-14

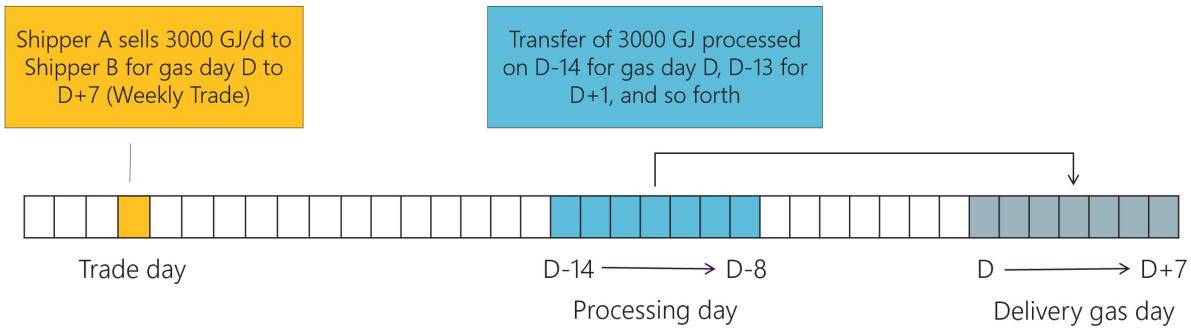
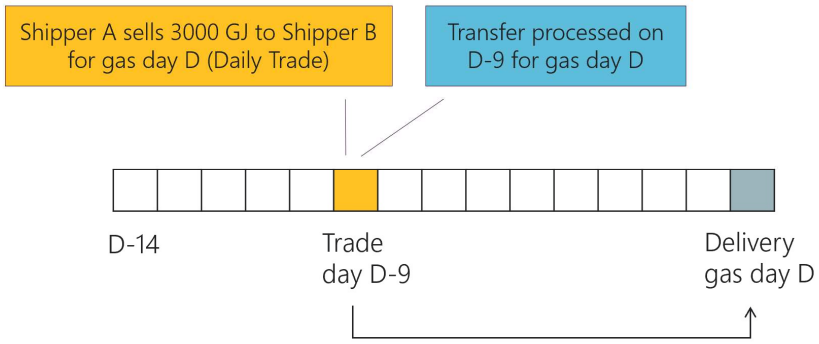


Figure 10 Transfer processing timeline for trades placed post D-14



Delivery netting

AEMO determines the total net capacity of day-ahead and forward-traded products that each shipper has sold or purchased. The netting process looks at each zone-to-zone (or park) product that has been traded for each gas day in the delivery window (next 14 days).

Capacity transfer notice

AEMO applies contract and point information to the net position of each participant and sends a capacity transfer notice to each facility operator. Capacity transfer notices for day-ahead transfers are issued to facility operators between 1100 and 1130 (transitional time) for D-1 (ahead of the nomination cut-off for shippers). Capacity transfer notices for forward-traded products (daily, weekly, monthly) are issued between 1900 to 1930 for D-2 through D-14. The forward transfer notice contains any new transfers for the period of the forward window since the last notice was issued (i.e. one forward transfer notice per day).

Each capacity transfer notice contains capacity transfers relevant only to that facility operator, i.e. the information is private. The specification of the capacity transfer notice data transaction is outlined in the *Capacity Transfer and Auction Data Transaction Guide*.

All types (day-ahead and forward) of capacity transfer notices have the same format.

Table 5 Capacity transfer notice information

Information type	Fields	Notes
Facility	FacilityId FacilityName	As reported in the Transportation Facility Registration data transaction (and report)
Participant	ParticipantId ParticipantName	As reported in the Registered Participants data transaction (and report)
Contract	ServiceReference STTMContractReference	As provided to AEMO in the Contract Information Details data transaction.
Quantity	IncrementalQuantityChange OverallQuantityChange	Netted traded quantity to be transferred. For buyer (increase capacity), the quantity fields have a positive sign. For seller (decrease capacity), the quantity fields have a negative sign. **Note.** For the initial notice issued for each transfer set, the Incremental and Overall Quantity Change are the same. These quantities differ when the facility operator is required to reverse a transfer that has already been processed (see Section 7.2).
Service points, zones and segments	ReceiptPoint ReceiptZone DeliveryPoint DeliveryZone	Forward haul and compression products specify the relevant facility, service points and zones. Park products specify a single park service point recorded in the (receipt point and delivery point fields) and not associated with a zone (fields blank).

Validating capacity transfers

On receiving a capacity transfer notice from AEMO, the facility operator validates and processes the transfer in their own system. For each type of capacity transfer, the facility operator must validate the transfers and report any failed transfers back to AEMO:

- For day-ahead transfers, within 30 minutes of receiving the capacity transfer notice.
- For forward transfers, within 1 hour of receiving the capacity transfer notice.

The reasons a validation might fail include:

- **Shipper capacity shortfall (seller only):** The shipper does not have the quantity of capacity specified in the capacity transfer notice available to transfer for that gas day.
- **Invalid contract reference (buyer or seller):** The contract reference in the capacity transfer notice is invalid—for example, the contract is with a different transportation facility user or the contract does not extend to the transportation service or service points of the operational transfer.
- **Facility agreement transfer restriction (buyer or seller):** The terms of the facility agreement prohibit or restrict the operational transfer—for example, the shipper has insufficient credit support under the facility agreement.

If the facility operator identifies a validation failure, the facility operator notifies AEMO in an interim Capacity Transfer Status file (see below), and AEMO reports the information to the trading participant, which provides the trader with an opportunity to rectify the failure with the facility operator.

If the validation failure is not rectified, then the facility operator will need to reduce pro rata the capacity transfers that cannot be completed due to the validation failure.

Example, pro rata reduction

Trader A has sold 10,000 GJ of capacity to Trader B and Trader C, which is 2,000 GJ more than their rights on the pipeline.

Reduction factor = 1 – 2,000 / 10,000 = 0.8

The reduction factor is applied to the capacity transfer quantity:

Trader B (buyer) = 5,000 x 0.8 = 4,000

Trader C (buyer) = 5,000 x 0.8 = 4,000

Confirming the transfer

Once a facility operator has validated the capacity transfer records, it must confirm the transfer to AEMO in the form of the capacity transfer status file, as described in Table 6. The facility operator must process the transfers and provide confirmation of the transfers back to AEMO:

- For day-ahead transfers, within 1 hour of receiving the capacity transfer notice.
- For forward transfers, within 2 hours of receiving the capacity transfer notice.

Table 6 Capacity transfer status file

Field	Description
TransactionStatus	The status of the transfer (see Table 7)
Reason	The reason for the validation failure if applicable
ConfirmedCapacityQuantity	The quantity that can be transferred to the trading participant
InvalidQuantity	The quantity that has failed validation, if applicable, which is an input to settlements for compensation.

Table 7 Capacity transfer status values

Transaction status	Confirmed capacity quantity
TRANSFERRED	ConfirmedCapacityQuantity matches the quantity that was in the Capacity Transfer Notice for the matching Capacity Transfer ID.
PARTIAL	ConfirmedCapacityQuantity is less than the quantity that was in the capacity Transfer Notice. If the party is at fault (had a validation failure), there may also be an InvalidQuantity and a Reason.
REJECTED	ConfirmedCapacityQuantity is 0 or NULL. The party may be at fault (had a complete validation failure), so there may also need to be an invalid quantity and reason.
PENDING	AEMO will notify the relevant participant that the facility operator has identified a validation failure.

After AEMO receives a Capacity Transfer Status file, it performs the following tasks:

- Makes adjustments to STTM rights or DWGM accreditations.
- Sends a confirmation to shippers in the Shipper Capacity Transfer Notificationreport.

Changes to capacity rights in the STTM or DWGM will only be made following confirmation from the facility operator that capacity has been transferred. If there is a problem transferring the capacity rights in the STTM or DWGM, then AEMO may need to cancel the capacity transfer. This would result in AEMO issuing a reversal of the capacity transfer to the facility operator in a Capacity Transfer Notice.

Guidelines for updating capacity transfer status

- Records with TRANSFERRED, PARTIAL or REJECTED status cannot be updated.
- Records with a PENDING status can be updated up until the cut-off time (or delayed cut-off time if the delayed timetable has been triggered) for that particular transaction.
- If PENDING records have not been updated by the cut-off time (or delayed cut-off time), AEMO will cancel the capacity transfers.
- If AEMO has not received TRANSFERRED or PARTIAL records by the delayed cut-off, then it will cancel the capacity transfers.
- Invalid quantities can be updated after the cut-off for settlement purposes.

Settlement of capacity transactions

AEMO uses the ConfirmedCapacityQuantity and InvalidQuantity values in the settlement of capacity transactions between trading participants (see Section 9.1.3 for more information on settlement of CTP trades).

4.3 Zone curtailment information

Curtailment at a service point can occur when a facility operator is unable to meet the nominations of its firm shippers and secondary shippers who have purchased zonal capacity on the CTP. This may occur due to an operational issue at the point or if the service point is oversubscribed. As CTP shippers have secondary firm rights, they are curtailed before primary firm shippers who have not sold their capacity.

Facility operators notify AEMO about how much capacity was curtailed at each service point on each gas day for secondary capacity purchased on the CTP. Zone curtailment information helps shippers understand the risks associated with zonal capacity traded on the CTP.

Zone curtailment information must be submitted not later than 5 business days after the end of the zone reporting period (week commencing Sunday) via the Capacity Transfer Interface in the specified file format. AEMO publishes the report on the Gas Bulletin Board (BB), aggregated by zone.

5. Day-ahead auction (DAA)

The DAA is run daily for day-ahead contracted but unnominated (CBU) capacity on non-exempt pipelines and compression facilities. The DAA aims to reallocate unused contracted capacity to the shippers that value it most. The DAA is conducted by AEMO shortly after the nomination cut-off time on gas day D-1.

The capacity auction has the following features:

- A single-round, sealed-bid process with a zero reserve price.
- Capacity procured on the auction is used on the terms and conditions set out in the relevant OTSA.
- Capacity is paid for on a pay-as-cleared basis, determined by the lowest accepted bids in the auction.
- The auction maximises the revenue of bids, with the proceeds allocated to facility operators based on the revenues of the products they provide.
- The auction is integrated with facility operator systems to automate the provision of capacity.
- Settlements and prudential arrangements are centrally managed by AEMO and shared with the GSH.

5.1 Products and components

The products offered in the auction can include:

- **Forward haul services** with separate products offered in both directions on bidirectional pipelines.
- **Compression services** on stand-alone compression facilities.
- **Backhaul services** on single direction pipelines (or parts of pipelines).

5.1.1 OTSA

The terms and conditions on which the buyer can use products purchased on the DAA are set out in the facility operator's standard OTSA. Among other things, the OTSA specifies the hourly flexibility the shipper has and provides for a reasonable endeavours renomination right and a zero-imbalance allowance. If the shipper requires additional flexibility, it can procure it from facility operators or shippers, where operationally and technically feasible.

5.1.2 STTM and DWGM interfaces

If the shipper intends to use the forward haul capacity it has procured through the DAA to supply gas into or out of an STTM or the DWGM, then it will also need to ensure the arrangements outlined in Section 6 are in place.

Note. The DAA runs after the publication of the STTM ex ante schedule. As such, STTM products are not integrated with the DAA, and participants who purchase capacity at an STTM point through the DAA need to manage their ex ante STTM position through nominations and MSVs.

5.1.3 Auction product components

Each auction product type has multiple product components. The product components have auction quantity limits (AQLs) applied against them, which constrain the amount of capacity available in the auction product. A participant's bid must be successful for all product components to be allocated capacity in an auction product.

Table 8 Auction product components

Product	Components	Notes
Forward haul	Receipt point Delivery point Receipt zone Delivery zone Forward haul segment	There may be more than one forward haul segment for a forward haul product. However, there is only ever one receipt zone and one delivery zone.
Backhaul	Backhaul receipt point Backhaul delivery point Backhaul segment	There may be more than one backhaul segment for a backhaul product.
Compression	Facility compression service Compression receipt point Compression receipt zone Compression delivery point Compression delivery zone	The facility compression service component is similar to a forward haul pipeline segment. It reflects the CBU capacity of the compression facility.

5.1.4 Forward haul services

A forward haul product gives the participant a right to transport gas between an applicable receipt point and delivery point. The participant bids for a receipt and delivery point pair (auction product). The auction automatically allocates the participant's bid across the various components that make up the auction product.

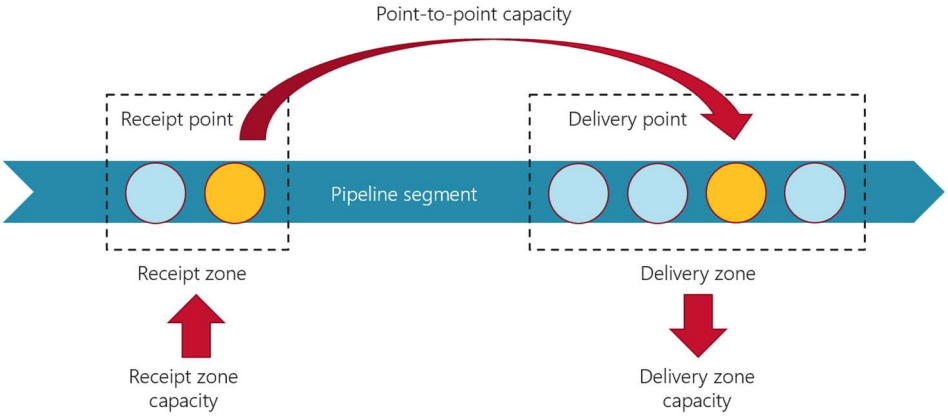
Each forward haul product comprises the following components:

- Receipt point capacity
- Receipt zone capacity
- Forward haul pipeline segments capacity
- Delivery zone capacity
- Delivery point capacity

Forward haul auction services are sold using a hybrid point-to-point and zonal model. The hybrid model allows auction participants to bid on a point-to-point basis for any unused physical capacity at individual receipt or delivery points, but their ability to secure capacity at those points depends on whether there is sufficient CBU capacity available in the receipt point zone and delivery point zone they wish to use and along the pipeline segments (or the compression service facility) they wish to use.

The hybrid model allows CBU capacity from individual points to be moved to other points within the zone if there is unused capacity at those points. When a shipper wins capacity, it knows it has secured capacity at the points it requires and will only be curtailed if firm capacity holders renominate or there is an unplanned, operational issue on the gas day.

Figure 11 Hybrid model for forward haul capacity sold in the DAA



Example

Note. Units of TJ may be shown in some examples in this guide; however, auction bids must be expressed in GJ.

In the example shown in Table 9 and Figure 12, a participant bids on 10 TJ @ $1 per GJ on a forward haul capacity product comprising receipt point (Wal HP Trade Point), located in receipt zone RZ-03, and delivery point (MSP Exit), located in delivery zone DZ-01, which are connected by segments FS-04, FS-05, FS-06 and FS-07. As illustrated in Figure 13, the auction system breaks the bid into each component, constrains each component with its AQL, determines prices for each component, and then aggregates the price of all components, giving the participant a single price for the successful bid.

Table 9 Example forward haul capacity auction bid

Bid ID	Facility	Contract	Receipt Point	Delivery Point	Step 1 Price	Step 1 Quantity	Step 2 Price	Step 2 Quantity
00123	SWQP	OTSA001A	Wal HP Trade Point	MSP Exit	$1.0000	10000	Null	Null

Figure 12 Example forward haul capacity auction product

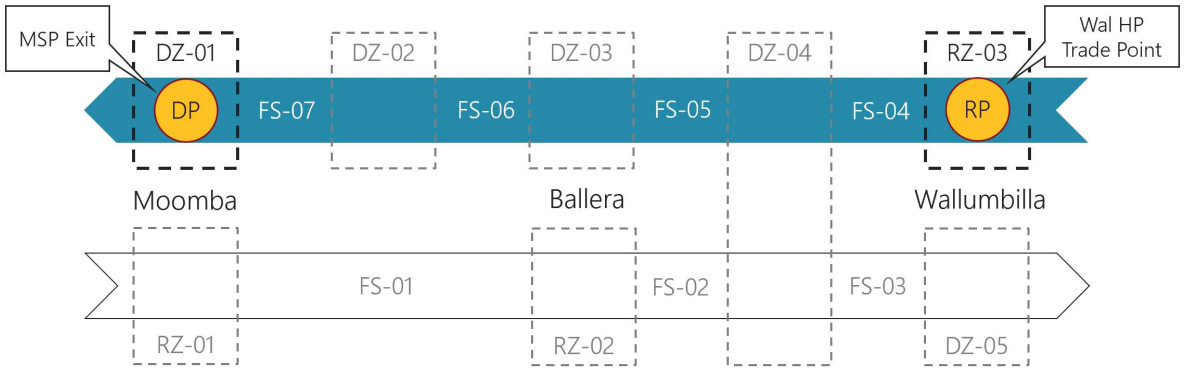
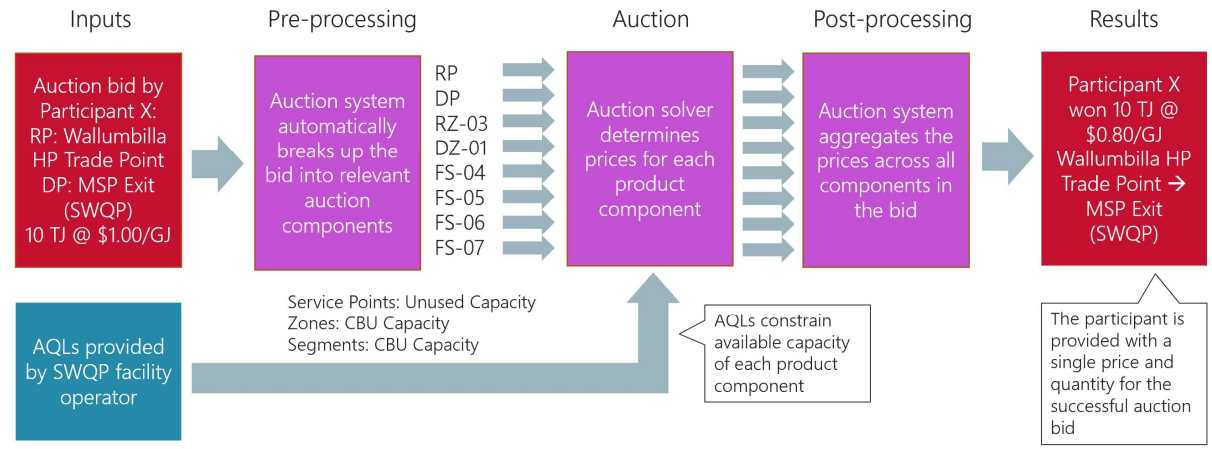


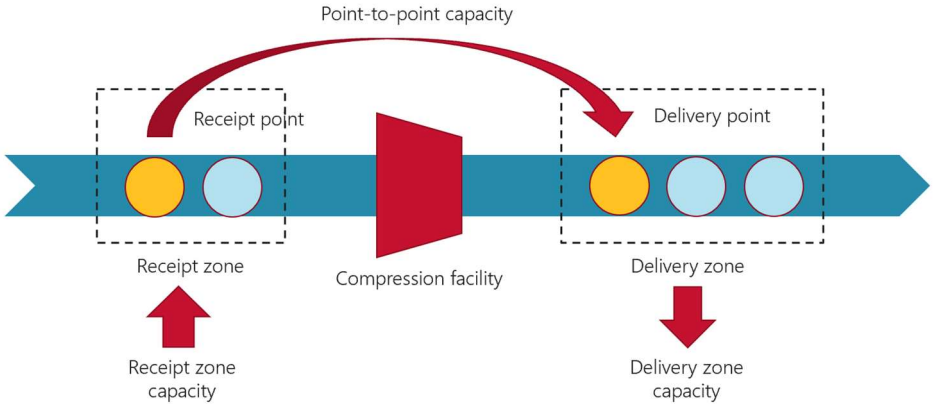
Figure 13 Example forward haul capacity auction process



5.1.5 Compression services

Compression auction services are sold using the same hybrid point-to-point and zonal model as forward haul services.

Figure 14 Hybrid model for compression capacity sold in the DAA



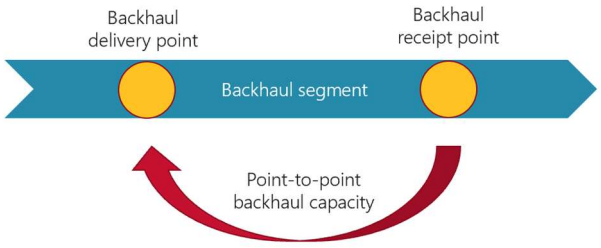
5.1.6 Backhaul services

Backhaul auction services are sold using a point-to-point model between the backhaul receipt points and backhaul delivery points that AEMO determines should be included in the DAA from time to time as specified in the TSPR (Section 2.3). In contrast to forward haul and compression services, the availability of backhaul services is not constrained by CBU capacity. The availability of backhaul services instead depends on whether there are sufficient firm net forward haul flows that have been scheduled prior to the auction for a gas day between the points used for the backhaul service. When bidding in the auction for a backhaul auction service, the shipper bids for the backhaul receipt and backhaul delivery point pair that they wish to use.

There are two types of backhaul services in the auction:

- **Demand offset** where a participant is decreasing demand at one location (the backhaul receipt point) and receiving this gas at another location (the backhaul delivery point).
- **Injection offset** where a participant is injecting gas at one location (the backhaul receipt point) and receiving it at another (the backhaul delivery point), effectively swapping injections between two receipt points on the pipeline.

Figure 15 Point-to-point model for backhaul capacity sold in the DAA



5.2 Auction process

The steps involved in the auction and capacity transfer process are illustrated in Figure 16 and further described in Table 10. For detailed timelines, see Section 7.

Figure 16 Day-ahead auction and capacity transfer process

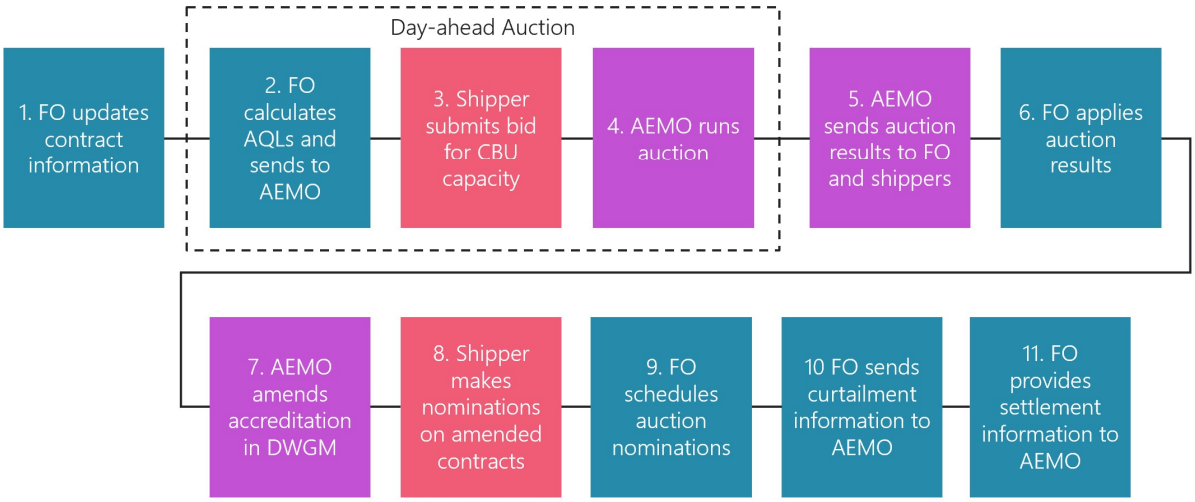


Table 10 Day-ahead auction process steps

Step	Description
1	**Facility operator provides / updates contract information** Facility operator informs AEMO about changes to contracts they have with shippers.
2	**Facility operator calculates AQLs and sends to AEMO** Facility operator determines constraints on quantities of each product available in the auction and sends this information to AEMO.
3	**Shipper submits bid for CBU capacity** Shipper submits a bid (either via the auction interface, CSV submission or API) for an auction service nominating a receipt and delivery point.
4	**AEMO runs auction** The auction solver clears bids against the CBU quantities made available on each facility.
5	**AEMO publishes the auction results** AEMO sends auction results to facility operators and shippers.
6	**Facility operator applies auction results**

Step	Description
7	AEMO amends accreditations in DWGM
8	Shipper makes nominations for use of the capacity directly to the facility operator
9	Facility operator schedules auction nominations
10	Facility operator sends curtailment information to AEMO
11	Facility operator sends settlement information to AEMO On the day after the auction, facility operators submit auction settlement information to AEMO for auction quantities reflecting any curtailment of auction volumes that may have occurred.

5.2.1 Supplying contract information

Facility operators provide AEMO with a list of contract reference IDs associated with each trading participant, as described in Section 4.2.2.

5.2.2 Auction quantity limits

The amount of capacity made available through the capacity auction for each product type is limited by certain constraints specified in the NGR. The auction quantity limits (AQLs) reflect these constraints and restrict the amount of capacity available in any product to auction bidders. Each auction product comprises multiple product components against which auction quantity limits are applied.

Note. The facility operator can provide a lower operational capacity when required, e.g. due to unplanned maintenance, which is reflected in the AQL calculations. Facility operators may also offer additional, discretionary capacity (beyond what's required in the NGR) to the auction.

Facility operators are responsible for calculating and submitting the AQLs to AEMO as per the CTAP each day.

Table 11 AQLs for auction product components

Component	Auction Quantity Limit
Forward haul service point	Unused capacity at that point.
Forward haul delivery zone	Aggregated CBU for the delivery points in the delivery zone
Forward haul receipt zone	Aggregated CBU for the receipt points in the receipt zone
Forward haul pipeline segment	Aggregated CBU for that segment
Backhaul service point	Scheduled flow or unused capacity at the corresponding forward haul service point (depends on configuration)
Backhaul pipeline segment	Scheduled net priority forward haul flow for that segment
Compression service	CBU for the compression facility

Calculating AQLs for forward haul service points

The AQL for forward haul service points is unused capacity. Unused capacity (*UC*) is a measure of the spare physical capacity at the service point at nomination cut-off time. The purpose of the unused capacity auction quantity limit is to ensure that there is sufficient capacity at the service point to facilitate any auction nominations.

$$UC = MIN(NR, OC) - SF$$

where,

NR = Nameplate rating, the maximum quantity of gas that can be received or delivered through the service point on a gas day.

OC = Operational capacity, the quantity of gas that can be injected into or withdrawn from the service point on the gas day.

SF = Scheduled priority flow, as defined in Table 12, where *FHQ* is the scheduled quantity of firm forward haul services at the service point for gas day D and *BHQ* is the scheduled quantity of firm backhaul services at the service point for the gas day.

Table 12 Scheduled flows for each product component

Product component	Scheduled priority flow
Forward haul only	*FHQ*
Forward haul RP also used as a backhaul RP	*FHQ + BHQ*
Forward haul RP also used as a backhaul DP	*FHQ – BHQ*
Forward haul DP also used as a backhaul DP	*FHQ + BHQ*
Forward haul DP also used as a backhaul RP	*FHQ – BHQ*

Refer to Appendix A1.2.1, for example AQL calculation for forward haul service points.

Calculating AQLs for forward haul zones

The AQL for a forward haul receipt or delivery zone is the aggregated contracted but unnominated capacity of each point in that zone. CBU capacity (*CBUC*) is a measure of the spare contracted capacity available within the zone accounting for operational capacity constraints (*OC*) and discretionary capacity (*DC*) offered by the facility operator.

$$CBUC = \sum MIN(CC + DC, OC) - SF$$

where,

CC = Contracted capacity is the contracted capacity at each service point

DC = Discretionary capacity is any additional capacity that the facility operator makes available above what is required.

OC = Operational capacity is the quantity of natural gas that can be injected into or withdrawn from the service point on the gas day.

SF = Priority scheduled flow at the service point.

Refer to Appendix A1.2.2, for example AQL calculation for forward haul zones.

Calculating AQLs for forward haul pipeline segments

The AQL for a forward haul pipeline segment is the contracted but unnominated capacity of the segment. CBU capacity (*CBUC*) is a measure of the spare contracted capacity available on the segment accounting for operational capacity constraints (*OC*) and discretionary capacity (*DC*) offered by the facility operator.

$$CBUC = MIN(CC + DC, OC) - SF$$

where,

CC = Contracted capacity of the forward haul segment.

DC = Discretionary capacity of the forward haul segment.

OC = Operational capacity of the forward haul segment.

SF = Priority scheduled flow of the forward haul segment.

Refer to Appendix A1.2.3, for example AQL calculation for forward haul segments.

Calculating AQLs for backhaul service points

A backhaul receipt point is a service point where a participant is either injecting additional gas (for inject offset backhaul) or reducing demand (for demand offset backhaul) to use a backhaul service. And a backhaul delivery point is a service point where a participant is delivering gas using a backhaul service. The AQL for a backhaul service point is determined by the forward haul point that it is associated with, as described in Table 13.

Table 13 AQLs for backhaul product components

Product component	AQL
Backhaul RP also used as a forward haul DP	Scheduled flow (SF) at the forward haul DP. This is used for demand offset backhaul.
Backhaul RP also used as a forward haul RP	Unused capacity (UC) at the forward haul RP.
Backhaul DP also used as a forward haul RP	Scheduled flow (SF) at the forward haul RP. This is used for injection offset backhaul.
Backhaul DP also used as a forward haul DP	Unused capacity (UC) at the forward haul RP. The delivery point could be to a directly connected user, a distribution system, a park or another pipeline. As such, there needs to be spare physical capacity at the delivery point.

Refer to Appendix A1.3.1, for example AQL calculation for backhaul service points.

Calculating AQLs for backhaul pipeline segments

The auction quantity limit for backhaul reflects the physical flow of gas between the backhaul points in the forward haul direction for the segment. The AQL for a backhaul segment is the scheduled net priority forward haul flow for the backhaul pipeline segment for the gas day.

Refer to Appendix A1.3.2, for example AQL calculation for backhaul segments.

Calculating AQLs for compression services

AQLs for compression services are calculated in the same way as forward haul services.

Park services

AQLs are not required for park services (no park services are offered in the auction).

Managing AQLs and nominations at DWGM interface points

Facility operators specify in the OTSA how AQLs are determined at DWGM interface points and how the auction service on their facility interacts with DWGM scheduling and allocations—for example, require nominations from their shippers or use DWGM provisional schedules to determine nominations for AQLs. DWGM scheduling and allocations are unaffected by the introduction of PCT .

5.2.3 Submitting bids

Bids can be submitted up to 15 days ahead of the gas day and can be for a combination of one or more products or multiple bids may be submitted for single products on a single facility. An auction participant submits a single submission (bid profile) that includes all its bids for each gas day. When a new submission is made for a gas day, the previous submission for the gas day is overridden. As such, a participant must resubmit the entire bid profile when making amendments to any bids included in that profile.

For a bid to be successful, it must acquire a share of the capacity that is available in each product component.

Table 14 Day-ahead auction bid steps

Step	Description
1	Select facility and product type – Forward haul, backhaul, or compression
2	Select contract/rights – Contract with facility operator that allows auction service – DWGM accreditation right
3	Select points – Single point-to-point bid on a facility – Linked bid for multiple point-to-point combinations on the same or different facilities
4	Select quantity and price – Start and end date (could be single day) – Quantity and price (up to 10 steps per bid)

The latest bid for a gas day and auction product (specific receipt point and delivery point combination) is used in the auction.

Bid parameters

- Minimum bid price 0.00 $/GJ

Note. Zero value bids may be subject to tie-breaking (see Section 5.2.4).

- Maximum bid price 50 $/GJ
- Minimum bid quantity 1 GJ
- Maximum bid quantity 500,000 GJ
- Maximum of 10 bid steps per bid

Bids can be submitted via:

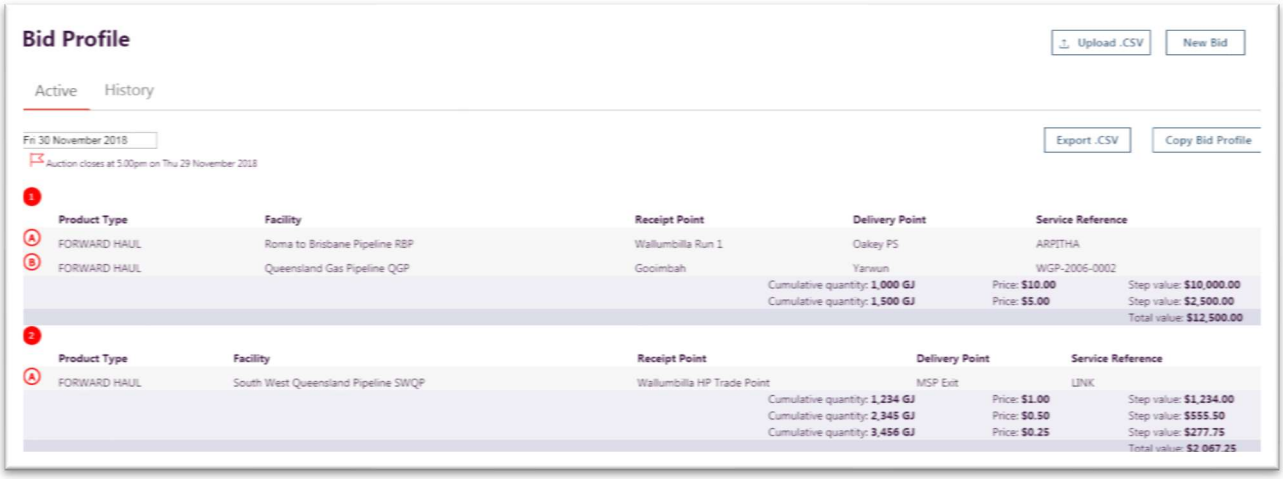
- The web-based bid interface
- CSV upload via the auction interface
- API calls

Bid profile

For each day, a participant submits a single bid profile, which contains all bids (including bid steps) for all products on that day. Because only one bid profile can be submitted for each day, any new bid profile submission completely overwrites any previous submission for that day. In other words, if a participant wants to edit any bid included in the profile, they must resubmit a full profile including the edited bid and any other unedited bids for that day.

Participants can view their active bid profiles through the interface or extract them via an API call.

Figure 17 Bid profile screen



Linked bids

An auction participant can link bids for multiple products to form a single linked bid. The solver gives the same quantity of capacity to each bid, preventing the participant from having capacity stranded in one product when two or more are required to form a transportation path. For example, if a participant wants capacity from Wallumbilla to Sydney, the transportation path requires two auction products:

- SWQP forward haul Wallumbilla to Moomba
- MSP forward haul Moomba to Sydney

For a linked bid, the participant bids the same quantity for each product. If the bid is successful, the same capacity is acquired in each product, which may be all, some or none of the bid quantity. A single price and quantity is provided for a linked bid.

Cancelling or replacing bids

Bids may be cancelled up until the bid cut-off time. To cancel a bid, replace the bid with a blank bid.

Important. The entire bid profile for the gas day is replaced, so any bids in the profile that need to be retained must be resubmitted.

Validating bids

Each auction bid submitted to AEMO is checked such that:

- The bid contains all the required information.
- The bid values are consistent with the auction parameters.
- The bid meets the trading margin rules and that the participant is not subject to a trading halt.
- The bid has a valid contract reference for the auction facility.
- The bid is submitted before the applicable cut-off time.

5.2.4 Running the auction

Solving the auction

AEMO runs the auction once a day (see timetable in Section)to determine clearing prices and allocation of auction products by maximising the total capacity auction revenues for the gas day. AEMO allocates capacity, subject to the AQLs supplied by the facility operators, to the highest priced bids. Winning bids are determined simultaneously so that participants win none or all of the auction products that are linked as part

of their bid. If there is more than one combination of winning bids, then AEMO determines the winning allocation at random. If necessary, the lowest accepted bid for an auction product may be partially filled.

The auction solver determines for each winning bid:

- The quantity allocated to the bid is between zero and the bid quantity.
- The bidder receives an equal quantity for each component.
- Each winning bid (for multiple components) pays a price equal to or less than the bid price.

Example

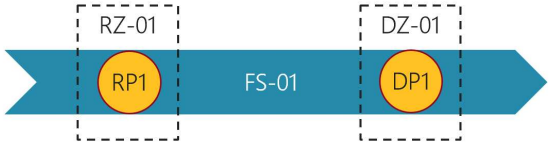
Note. Units of TJ may be shown in some examples in this guide; however, auction bids must be expressed in GJ.

Referring to Figure 18, a trading participant submits a bid for 8 TJ from point RP1 to point DP1 for 1.00 $/GJ. The bid becomes a 8 TJ bid for capacity for each component RP1, RZ-01, FS-01, DZ-01, and DP1. The bid must win capacity for each product component to be successful:

- there must sufficient AQL in each component and,
- the bid must win on price in each component.

The bid will compete on price with other bids in the solver for the same components.

Figure 18 Example of a successful bid



Bid ID	Contract Reference	Receipt Point	Delivery Point	Quantity (GJ)	Price ($/GJ)
#001	Ref#9541	RP-01	DP-01	8000	0.80

Component	Qty Won (GJ)	Clearing Price $/GJ
RP-01	8000	0.10
RZ-01	8000	0.20
FS-01	8000	0.00
DP-01	8000	0.25
DZ-01	8000	0.25
Total price	8000	∑p = 0.80 $/GJ

Principles

The auction solver is a set of linear programs that determine the prices, winners and quantities for each product component in the auction. The key design feature of the auction solver is that it maximises revenue subject to:

- Bidders not paying more than their bid price.
- Auction components not being allocated more than their quantity limit.
- Bidders winning the same quantity (up to their bid quantity) for every component included in the bid (or linked bid).

Determining prices

The capacity auction operates on a pay-as-cleared basis. All winners of a particular product component pay the same clearing price. Any product component for which transportation capacity remains partially unsold in the capacity auction for a gas day has a clearing price of $0 per GJ for that gas day. Note that auction products are facility-specific.

The lowest-priced accepted bid (marginal bid) sets the clearing price for a product component. And the price of an auction product is the sum of prices across its product components (service points, zones, and segments). Bidders pay the clearing price for each product component in the bid. In total, the bidder will pay the aggregate of the clearing prices of the product components in the bid

Tied bids are subject to tie-breaking (see below).

AEMO reports the price and quantity of each auction product purchased to each winning bidder. And each facility operator is notified of the price and quantity of each auction product allocated on their facility (auction products are facility specific). AEMO also publishes the price (and price sensitivity) of all product components following the completion of an auction run. Bid stacks are not published for the DAA.

Figure 19 Scenario 1: Bids do not clear AQL

- Bids (in merit order)
  - Bid1 = 4 TJ @ 2.50 $/GJ
  - Bid2 = 3 TJ @ 1.25 $/GJ
  - Bid3 = 2 TJ @ 1.00 $/GJ
- AQL
  - Unused Capacity = 10 TJ
- Bids 1, 2 and 3 win
- Clearing price = 0.00 $/GJ
  - i.e. total quantity bid is less than AQL

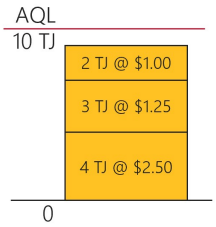
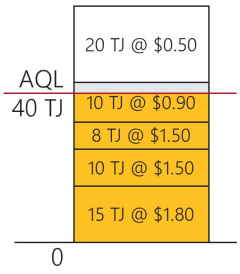


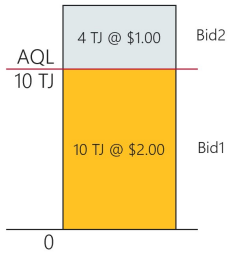
Figure 20 Pricing scenario 2: Bids clear the AQL

- Bids (in merit order)
  - Bid1 = 15 TJ @ 1.80 $/GJ
  - Bid2 = 10 TJ @ 1.50 $/GJ
  - Bid3 = 8 TJ @ 1.50 $/GJ
  - Bid4 = 10 TJ @ 0.90 $/GJ
  - Bid5 = 20 TJ @ 0.50 $/GJ
- AQL
  - CBU Capacity = 40 TJ
- Bids 1, 2, 3, and part 4 (7 TJ) win
- Clearing price = 0.90 $/GJ
  - i.e. Bid4 sets the price



Where a bid against a product component exactly clears the AQL, the clearing price could be either the bid price or any lower price. The solver sets prices at their highest level without violating the bid prices and AQL constraints. Consistent with the design principles, the price in the following example is set at $2.00, which is the lowest cleared bid.

Figure 21 Pricing scenario 3: Lowest cleared bid exactly clears AQL



Tie-breaking

In cases where there are multiple valid bids with an equal bid price, but there is insufficient capacity available to be allocated to all bids, the auction solver chooses a winner randomly (not pro rata). For example:

- Auction product has 10 TJ of capacity available
- Two bids: bid #1 for 10 TJ @ 1.00 $/GJ, bid #2 for 10 TJ @ 1.00 $/GJ
- The auction solver randomly chooses one bid: bid #1 wins 10 TJ, and bid #2 wins 0 TJ.

Bidders can specify prices to four decimal places to reduce the probability of tied bids.

5.2.5 Applying auction results

Following an auction run, AEMO sends each facility operator the auction results (see auction reports in Section 8.2.3). Auction results provide the information necessary to enable facility operators to make adjustments to shipper contracts:

- Contract reference
- Quantity won
- Nominated receipt point and delivery point (including the point's ids)
- Clearing price
- Transaction ID

The facility operator uses the auction results to confirm that the shipper is entitled to use the capacity it has won at the auction. Once facility operators have made the necessary adjustments, auction participants nominate to facility operators to make use of any auction capacity.

5.2.6 Scheduling auction quantities

Following publication of the auction results, shippers have until 1945 (transitional timetable) to submit nominations against auction quantities to the facility operator. The facility operator will then schedule auction nominations and any nominations received under primary agreements using the priority principles that are established in the regulatory framework (see Figure 22).

Figure 22 Service priorities

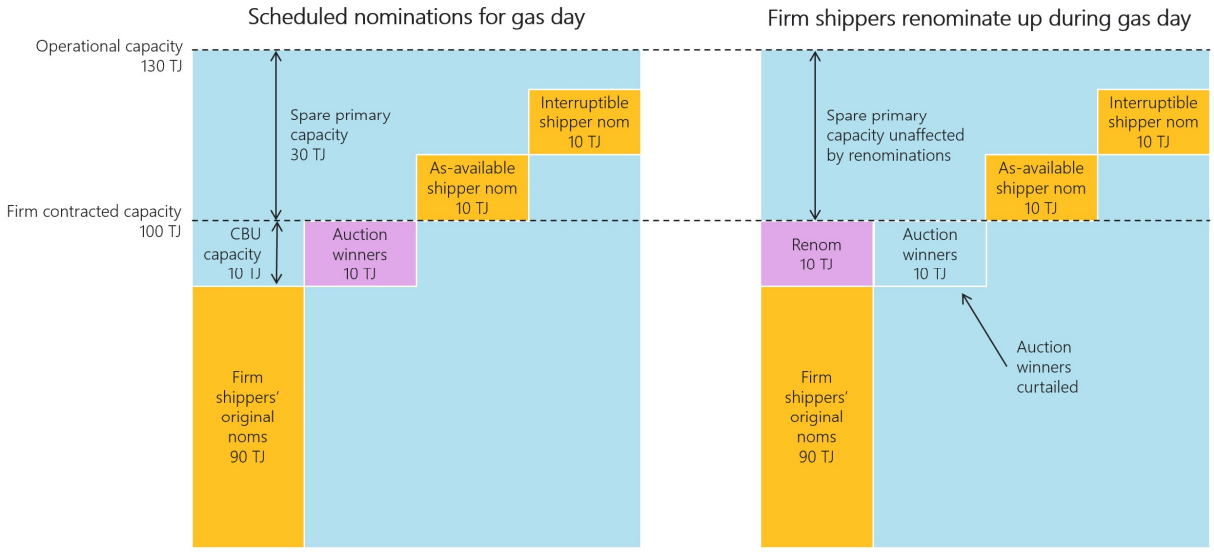
Curtailment

Facility operators may curtail the nominations of auction shippers where:

- A shipper with firm or transitional firm rights renominates and there is insufficient contracted capacity to meet the nominations of firm shippers and transitional rights holders, and auction shippers, or
- There is insufficient operational capacity (for example due to an unplanned outage) to meet the nominations or renominations of both firm shippers and transitional rights holders, and auction shippers.

If there are multiple auction shippers, then the curtailed quantity is shared pro rata. When a facility operator curtails an auction shipper they must notify the shipper as per the requirements in the OTS. Facility operators must also notify AEMO of any curtailment and whether that curtailment is material for publication on the Gas Bulletin Board. This information must be provided shortly after the curtailment event occurs.

Figure 23 Curtailment example



5.2.7 Settlement data

Each day, facility operators are required to provide data that is used for settlement covering the previous day's auction quantities. If an auction participant is curtailed, the auction quantity that it is settled at may be different from the quantity it won in the auction.

Facility operators are required to submit the following information each day for each auction transaction:

- **Revised quantity (RQ):** the actual quantity provided by the facility operator taking account of any curtailment.

- **Scheduled nomination quantity (NQ):** the scheduled nomination against the auction service as provided by the facility operator.

Facility operators must use reasonable endeavours to submit this information by 1300 on gas day D+1.

Refer to Appendix A3 for sample settlement calculations.

5.3 Facility suspension

Under the CTAP, AEMO may suspend participation of an auction facility or part of an auction facility when required.

- A suspension may be granted for the reasons outlined in the CTAP or where AEMO believes it is not practicable or not feasible to conduct the capacity auction on the facility.
- AEMO will publish a notice when a facility is suspended.

A suspended facility does not participate in the auction, and its auction components and quantity limits are not available for bidding. A suspended facility does not count towards the delay triggers for the DAA (see Section 7.2).

Facilities that are suspended are not relieved of their obligations under the NGR.

6. STTM and DWGM integration

6.1 STTM integration

Integrated products are available for each STTM facility. A trade in an integrated product results in an automatic transfer of STTM rights. To trade in an integrated product, trading participants must have their contract rights registered in the STTM.

Note. STTM integration only applies to the CTP, not to the DAA. The DAA runs after the publication of the STTM ex ante schedule. Therefore, participants who purchase capacity at an STTM point through the DAA need to manage any changes to their ex ante STTM position through nominations and renominations to the relevant facility operator and MSVs to manage their market position.

If a shipper procures capacity through the CTP and wants to participate in the STTM in Adelaide, Brisbane or Sydney, then it may be able to participate in the ex ante schedule if the trade is conducted before the close of trade on D-2.

STTM participants can trade their registered contracts (Registered Facility Service or RFS) on the CTP. Where a participant has a new operational transportation service (OTS) on an STTM facility, they can register the service as an RFS in the STTM with an initial capacity of zero. Participants nominate their CRN through the Markets Portal contract reference interface to trade in the integrated STTM product.

When the facility operator transfers capacity purchased on the CTP, AEMO automatically increases the participant's nominated trading right to reflect the capacity transfer and reduces the seller's nominated trading right by the equivalent quantity.

The integrated STTM product can have one or more STTM custody transfer meters (CTMs). A participant who buys or sells an STTM integrated product is acquiring or selling capacity at an STTM delivery point. Any confirmed transfers at STTM points result in the same quantity being transferred from the seller's CRN to the buyer's CRN.

Note. There are no day-ahead integrated STTM products listed on the CTP as transfers of day-ahead products also occurs after the publication of the STTM ex ante schedule.

Example STTM transfer

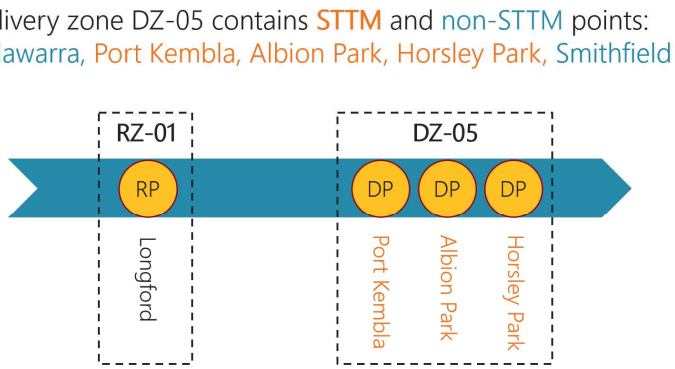
1. Before trade and transfer	• Seller A holds 25 TJ in CRN #1 • Buyer B registers CRN #2 with 0 TJ
2. Trade	• A sells 10 TJ capacity to B
3. Transfer	• AEMO reduces CRN #1 to 15 TJ • AEMO increases CRN #2 to 10 TJ
4. After transfer period	• CRN #1 and #2 revert to original levels

Zones containing STTM service points

Capacity trading zones can contain both STTM and non-STTM points. However, transfers of STTM trading rights can only occur at STTM CTMs, hence STTM integrated products can only include STTM CTMs. As such, where a zone contains both STTM points and non-STTM points, the STTM integrated product will be a subset of the points in the zone i.e. only the STTM points.

In the example shown in Figure 24, delivery zone DZ-05 contains STTM (orange) and non-STTM (blue) points.

Figure 24 Example STTM integrated product



6.2 DWGM integration

The CTP and DAA provide integrated products for delivery and receipt points at the boundary of the DTS. A trade in an integrated product results in an automatic adjustment to the participant's DWGM accreditation. To participate in an integrated product on the CTP or the DAA, trading and auction participants must be accredited at the system injection and withdrawal points they intend to use.

Participants can trade using their existing accreditation rights. Participants who have an OTSA at a DTS interface point can also apply to AEMO for accreditation at the relevant interface point.

When a capacity transfer at a DTS transfer point is confirmed by the facility operator or a participant wins capacity in the DAA, AEMO automatically adjusts the participant's relevant accreditation constraints against its nominated accreditation right to reflect the capacity that has been bought or sold. Note that capacity released by a firm shipper into the DAA will not result in an adjustment to that participant's accreditation as they still retain their firm rights to that capacity.

For a confirmed transfer of capacity at a DWGM interface point, AEMO adjusts the participant's maximum hourly flow bid constraint where the participant has specified a non-null bid constraint (null accreditation is not adjusted). AEMO adjusts the participant's ramp rate where applicable. Adjustments to MHQ are made on a 1/24 basis. Ramp rates are adjusted in accordance with any facility operator specified ramp constraints. Ramp rates are the participant's MHQ divided by the facility ramping period.

For more information on DWGM accreditation and automatic adjustments, refer to the draft accreditation procedures available from the AEMO website (AEMO 2019).

Example DWGM accreditation adjustment

1. Before trade and transfer	• Seller A is accredited for 1,000 GJ/h MHQ • Buyer B is accredited for 250 GJ/h MHQ
2. Trade	• A sells 12,000 GJ capacity to B on CTP at DWGM interface point
3. Transfer	• MHQ adjustment is 12,000/24 = 500 GJ/h • AEMO reduces A's MHQ by 500 GJ/h to 500 GJ/h • AEMO increases B's MHQ by 500 GJ/h to 750 GJ/h
4. After transfer period	• MHQs revert to original levels

Notes

- If B purchased capacity on DAA instead of the CTP, the accreditation adjustment would only be applied to B's MHQ.
- If either party has specified a null MHQ, no adjustment would be made.
- If the facility operator ramping period is 2 hours, then the ramp rate for the buyer and seller is the transferred MHQ divided by ramping period, i.e. A's ramp rate = 500/2 = 250 GJ/hr, and B's ramp rate = 750/2 = 375 GJ/hr.

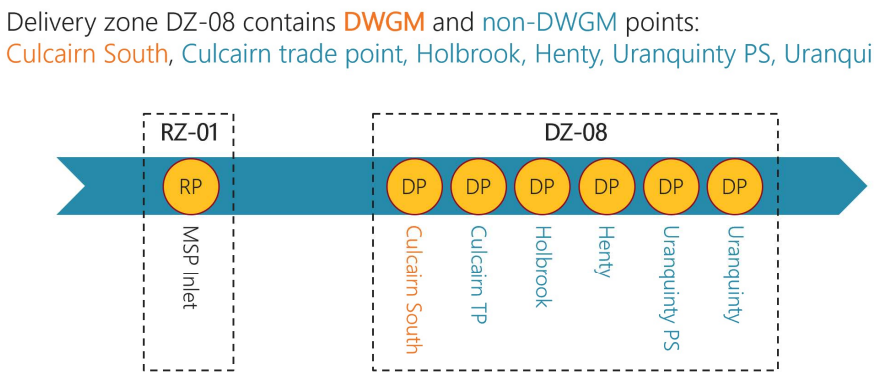
Note. Current DWGM bidding and scheduling processes are not affected by the introduction of pipeline capacity trading.

Zones containing DWGM service points

Unlike the STTM products, DWGM products may contain a mix of DWGM points and non-DWGM points. This is because single-sided adjustments to accreditation constraints are permitted.

In the example shown in **Error! Reference source not found.**, delivery zone DZ-08 contains DWGM (orange) and non-DWGM (blue) points.

Figure 25 Example DWGM integrated product



7. Timeline

7.1 Market timetable

At the commencement of the CTP and DAA, facilities in the eastern states and the NT operate on independent timetables. Gas days in NSW-ACT, Tasmania and South Australia start at 0630 hrs AEST, in Queensland at 0800, and in the Northern Territory at 0830. Similarly, nomination cut-off times also vary across eastern Australia. The transitional market timetable (Table 15 and Figure 26) will take effect from the date of commencement.

The harmonised market timetable (Table 15 and Figure 27) will take effect on 1 October 2019. This will establish a common gas day start time of 0600 hrs AEST across the east coast and the Northern Territory, a common nomination cut-off time of 1500 hrs, and a common auction service nomination cut-off time of 1845 hrs.

Table 15 Transitional and harmonised timetables for capacity trading

Transitional (AEST)	Harmonised (AEST) effective 1 October 2019	Description	Market	Refer to
Various	0600	Gas Day start (depends on facility)		
0900	0900	GSH Exchange open	CTP	s. 4.2.4
1100	1230	Day-ahead capacity product close	CTP	
1100–1300	1230–1430	Capacity transfer of day-ahead trades (see Table 16 and Table 17 for detailed timelines)	CTP	s. 4.2.6
Various	1500	Nomination cut-off time for Gas Day (depends on contract)	DAA	
1730	1630	Facility operators provide AEMO with AQLs	DAA	s. 5.2.1
1745 (not later than)	1645 (not later than)	AEMO publishes AQLs	DAA	s. 5.2.1
1800	1700	Bids close for the next day's auction	DAA	
1830 (not later than)	1730 (not later than)	AEMO determines and publishes auction results	DAA	s. 5.2.5
1930 (not later than)	1830 (not later than)	Facility operators validate and give effect to auction results (see Table 18 for detailed timelines)	DAA	s. 5.2.5
1930	1830	AEMO makes any adjustments to DWGM quantities	DAA	s. 6.2
1945	1845	Nomination cut-off time for auction quantities	DAA	s. 5.2.6
1900	1900	GSH Exchange close	CTP	s. 4.2.4
1930–2200	1930–2200	Capacity transfer of forward-traded products (daily, weekly, monthly) for trades relating to the next 14 days (see Table 16 and Table 17 for detailed timelines)	CTP	s. 4.2

Figure 26 Transitional market timetable for capacity trading

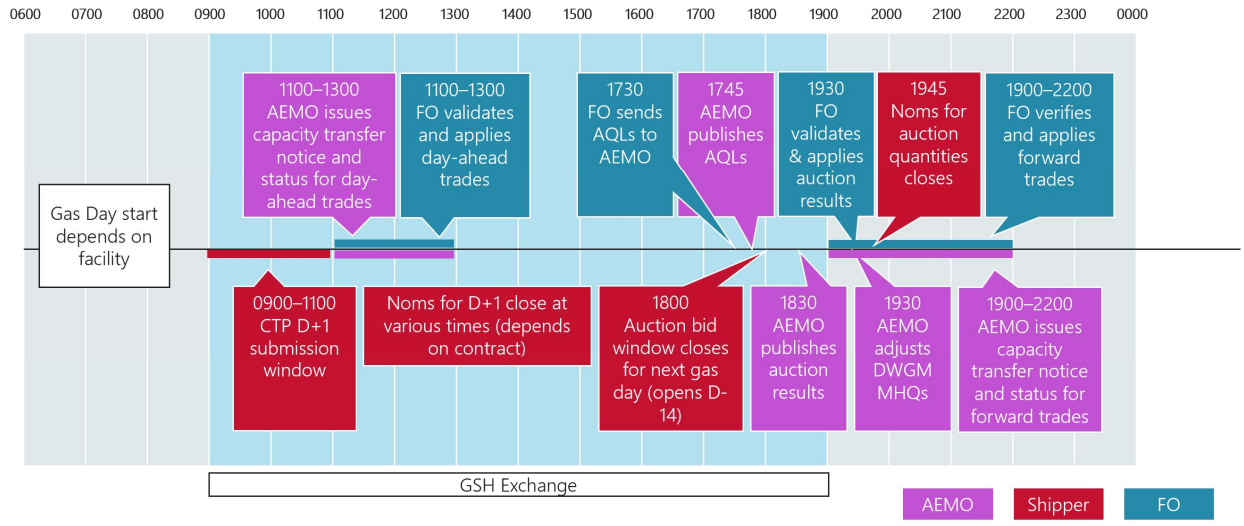
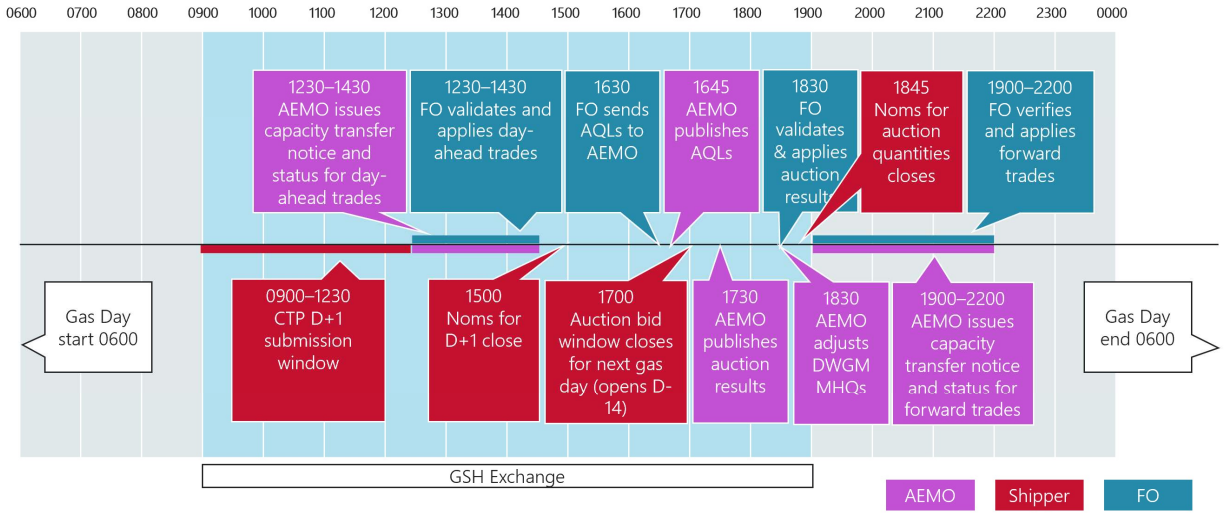


Figure 27 Harmonised market timetable for capacity trading



7.1.1 Facility operator submissions

There are three sets of information that must be transferred between AEMO and facility operators each day to give effect to capacity trades and the auction:

- Day-ahead capacity transfers
- Forward-traded capacity transfers
- Auction-related information

Each of these sets of information involves multiple steps, each of which has a specific time by which it must be completed. Failure to complete the step by the designated cut-off time may trigger a delay to subsequent steps.

Day-ahead and forward-traded information sets

The submission times for day-ahead and forward-traded information sets are shown in Table 16 (transitional timetable) and Table 17 (harmonised timetable).

Table 16 Submission times (transitional timetable) for capacity transfer information

Task (see Figure 6 for step numbering)	Day-ahead Transitional (AEST)	Forward-traded Transitional (AEST)
2. Shipper preselects contract	Before trade	
3. Shipper submits orders	Before 1100	Before 1900
4. Trades executed on Exchange	On transaction	
5. AEMO performs delivery netting	NA	NA
6. AEMO sends capacity transfer notice to FO	1130	1930
7. Facility operator validates transfer	1200	2030
8. Facility operator transfers capacity and sends status to AEMO	1230	2130
9. AEMO transfers capacity in STTM/DWGM	NA	NA
10. AEMO confirms transfer to shipper	1300	2200
11. Shipper makes nominations on amended contracts	Nomination cut-off time	

Table 17 Submission times (harmonised timetable) for capacity transfer information

Task (see Figure 6 for step numbering)	Day-ahead Harmonised (AEST)	Forward-traded Harmonised (AEST)
2. Shipper preselects contract	Before trade	
3. Shipper submits orders	Before 1230	Before 1900
4. Trades executed on Exchange	On transaction	
5. AEMO performs delivery netting	NA	NA
6. AEMO sends capacity transfer notice to FO	1300	1930
7. Facility operator validates transfer	1330	2030
8. Facility operator transfers capacity and sends status to AEMO	1400	2130
9. AEMO transfers capacity in STTM/DWGM	NA	NA
10. AEMO confirms transfer to shipper	1430	2200
11. Shipper makes nominations on amended contracts	Nomination cut-off time	

Auction-related information transfer set

The submission times for auction-related information sets are shown in Table 18 (transitional and harmonised timetables).

Table 18 Submission times for auction-related information

Task (see Figure 16 for step numbering)	Transitional (AEST)	Harmonised (AEST)
2. FO calculates AQLs and sends to AEMO	1730	1630
3. Shipper submits bid for CBU capacity	Before 1800	Before 1700
4. Auction run	By 1830	By 1730
5. AEMO sends auction results to FO and shippers	1830	1730
6. FO transfers auction capacity	1930	1830
7. AEMO amends accreditation in DWGM	1930	1830
8. Shipper makes nominations	1945	1845

7.1.2 Shipper offers and bids

Orders by shippers must be submitted within the prescribed submission windows for each market and product.

7.2 Delayed timetable

If a party (AEMO or a facility operator) is unable to complete any task in any of the three sets of information transfers (Section 7.1.1) by the prescribed time, a delayed timetable is triggered. When triggered, the delayed timetable allows additional time for the party unable to complete their task on time to resolve any issues.

The delayed timetable is limited to the affected transfer sets and applies to dependent activities of all affected participants (AEMO, facility operators, shippers). Only one delay trigger can be triggered per set per day.

The delayed timetable is triggered if:

- AEMO is unable to process and make available information by the required time. For example, AEMO is unable to publish capacity transfer notices for day ahead transfers by 1130 (transitional timetable).
- AEMO does not receive required information from facility operators by the required time. For example, a facility operator fails to send their AQLs to AEMO by 1730 (transitional timetable).

Information transferred in the day-ahead capacity transfer impacts nominations made on firm capacity for the next day, and thus also impacts the calculation of AQLs. As such, a delay in the day-ahead capacity transfer set also triggers a delay for the auction transfer set.

When a delay is triggered

When a delay is triggered, AEMO publishes a notice to inform participants of the delay, advising that:

- the capacity transfer process is automatically delayed by 1 hour compared with standard timetable[17], or
- the auction timetable is automatically delayed by 2 hours compared with the standard timetable.

The notice details which sets of information and market processes are affected and the timetable that will be in operation for the day. All subsequent processing steps in that set of information transfer also operate on the delayed timeline. Any processes that have already been successfully completed (in entirety) do not need to be performed again.

If a delay is triggered in the day-ahead capacity transfer, the capacity auction also operates on the delayed times.

When a delayed activity is missed

If a task cannot be completed by the delayed time, there is a prescribed response for each task and dependent activities.

Capacity transfers

When a delayed timetable is missed, any affected capacity transfers are not completed and a delivery or acceptance failure occurs under the Exchange Agreement. Transfers that were processed by facility operators but then cannot be processed in AEMO integrated systems will need to be reversed. AEMO will publish a notice to affected participants and facility operators for information.

Note. The delayed timetable allows for an additional 24 hours to resolve issues for transfers related to D-3 to D-14.

[17] In the transitional timetable, the forward-traded transfer process is delayed 2 hours compared with the standard timetable to provide additional time for processing because the DAA process overlaps these times.

Capacity auction

When a delayed timetable is missed, and AEMO has not received a complete set of AQLs from auction facilities:

- If one or two auction facilities are affected, AEMO will suspend those facilities from the auction.
- If three or more auction facilities are affected, AEMO will cancel the auction.

If a facility operator or AEMO is unable to transfer the auction capacity, it is treated as a transfer failure for the purposes of calculating the revised auction quantity used in settlement calculations.

8. Registers, notices and reports

This section contains brief descriptions of the public and private reports available for the CTP and DAA. For detailed descriptions of the format and contents of each report, refer to AEMO's *Guide to Capacity Transfer and Day-ahead Auction Reports* (AEMO 2018e).

8.1 Public

All public reports can be accessed via the Bulletin Board (or links on the Bulletin Board).

8.1.1 General

Transportation Facility Register

Public report listing all facilities currently registered under part 24 of the NGR for the CTP and DAA. Published monthly and when updated.

Transportation Service Point Register

Public report listing all service points (receipt and delivery points), zones and pipeline segments currently registered under part 24 of the NGR, for the CTP and DAA. Published monthly and when updated. See Section 2.3 for further information on service points, zones and segments.

Capacity Transfer and Auction Notice

Public report notifying participants when the market delay or cancellation process is triggered. See Section 7.2 for further information on market delays. Published when delayed timetable is triggered.

8.1.2 Capacity Trading Platform

Secondary Capacity Trades

BB report listing all secondary capacity trades, including GSH trades (screen traded and off-market trades) and bilateral trades submitted to the BB. Published daily.

Zone curtailment information

Public report containing details of curtailment of nominations against secondary firm rights (CTP trades) for service points (receipt and delivery points). Published on submission of zone curtailment information by facility operators.

8.1.3 Day-ahead auction

Auction Quantities

Public report listing the auction limit quantities (AQLs) for each product component available for the DAA. See Section 5.2.1 for further information on how AQLs are calculated and applied. Published daily.

Auction Product Price and Volume

Public report listing the cleared quantity, cleared price and price sensitivity for each auction product component following each auction run. Published on completion of auction run for all components in the run.

Auction Service Curtailment Notice

Public report providing a notice to industry whenever an auction service is impacted by a facility curtailment. The report identifies the auction service type, the auction facility affected, the time of the curtailment and

whether curtailment is material or not. published on receipt of curtailment notice from the facility operator. Published on receipt of curtailment notice from facility operator.

Revised Auction Quantities (Daily Auction Service Curtailment Information)

Public report providing a summary of curtailed auction volumes for each auction facility for the previous gas day, listing the following items for each facility and service type:

- initial cleared quantity as determined by the Auction Solver;
- where there has been a curtailment of the initial cleared quantity, the revised auction quantity which must be the aggregate minimum quantity made available to auction participants on the gas day; and
- final aggregated scheduled nominations.

Published daily (D+1) for the previous gas day.

8.2 Private

All private reports can be accessed via the Markets Portal and Publishing Direct, and most are accessible by API (see Section 3.4).

8.2.1 General

Contract Details

Private report listing all facility operator service references and STTM contract references that are available to them for capacity trading. Participants acting as an agent will also receive a list of the service references and STTM contract references for their appointing participants. Published daily and on receipt of updated contract information from facility operators.

Settlement Supporting Data

Private report listing data used for settlement of trades and auction capacity.

8.2.2 Capacity Trading Platform

Contract References

Private report providing participant with an audit trail of their selections in the Contract References markets portal application. Current reference selections are published daily and on changes to contract references.

CTP Receipt and Delivery Point Preferences

Private report providing participant with an audit trail of their entries in the CTP Receipt and Delivery Point Preferences markets portal application. Published daily and on changes to point preferences.

Capacity Transfer Notice

Private report listing capacity quantities per shipper contract that facility operators use to update the capacity quantity on the relevant shipper contracts in their own systems. Published on completion of delivery netting or failure of capacity transfer in STTM or DWGM.

Shipper Capacity Transfer Notification

Private report issued to trading participant providing status and details of capacity transfers, confirmation of the capacity transferred, and any validation failures that may have occurred (and a reason for the failure). The relevant facility operator also receives a copy of the report. Published each time the status of a capacity transfer record is changed in the facility operator system or AEMO system.

8.2.3 Day-ahead Auction

Auction Bid Confirmation

Private report to auction participants confirming that their auction bid has been successfully submitted. The report is published on successful submission of every bid.

Auction Results

Private report confirming the auction products purchased by a participant. The report is also issued to facility operators, containing all auction products purchased on their facility. Auction participants that have an active bid in the auction will receive this report, regardless of whether they win any capacity in the auction. The report contains the price and quantity of the auction products purchased, and details of service points, contract references and DWGM references. The report is published after each completed auction run.

9. Settlement

9.1 Settlement overview

Trades in the CTP and the DAA are settled using the existing GSH processes and procedures (AEMO 2017). Settlement of transactions on the CTP and DAA involve:

- AEMO invoices trading participants that have purchased capacity on the CTP and makes payments to trading participants that have sold capacity.
- AEMO invoices auction participants that have purchased auction products and makes payment to the relevant facility operator.
- AEMO invoices trading participants and auction participants market fees.

AEMO calculates indicative settlement amounts at least once a day and issues final settlement statements 15 days after the end of each billing period. Revised settlement statements are issued 3 months after each billing period.

9.1.1 Market fees

AEMO conducted a full consultation process with industry to determine market fees (AEMO 2018g). Due to the similarities between the GSH and CTP markets, the CTP market fees are broadly aligned with the GSH fees. The DAA market fees are consistent with fee structures in other gas markets.

Capacity Trading Platform

Trading participants pay a fixed participation fee and a variable transaction fee. A GSH trading licence entitles the trading participant to access both commodity and capacity products, and a capacity trading license entitles a capacity trading participant to access to capacity products only. The transaction fee is based on the trading participant's cleared quantities on the CTP.

Day-ahead Auction

A variable transaction fee is charged to auction participants based on cleared quantities in the auction.

9.1.2 DAA settlement

Capacity auction settlement is determined from the outcomes of the auction and the actual capacity and nomination information provided by facility operators:

- **Auction product price (*APP*):** aggregate of component prices.
- **Cleared auction quantity (*Q*):** quantity determined in auction.
- **Revised auction quantity (*RQ*):** actual quantity provided by facility operator taking account of any curtailment or transfer failure.
- **Scheduled nomination quantity (*NQ*):** the scheduled nomination against the auction product provided by the facility operator.

Auction products are settled at the auction product price (*APP*) multiplied by the maximum of the revised quantity (*RQ*) and the nomination quantity for that product (*NQ*), where the revised quantity is the minimum revised quantity of all components.

Note. If a facility operator does not submit a revised quantity, this is set to the original cleared quantity.

Any variances are handled bilaterally between the shipper and the facility operator in accordance with the applicable OTSA.

Refer to Appendix A2 for example settlement calculations.

9.1.3 CTP settlement

CTP settlement is determined from the cleared trades and the actual capacity and nomination information provided by facility operators:

- **Transaction price:** price that the trade was executed at on the CTP
- **Transaction quantity:** quantity determined in trade
- **Confirmed Capacity Quantity:** the quantity transferred by the facility operator
- **Invalid Quantity:** the quantity that failed the facility operator's validation

AEMO settles capacity transactions between trading participants at the transaction price multiplied by the transaction quantity. Any variances, which may include compensation for a transfer validation failure, are settled at 25% of the cost of the deviation. A participant's buy and sell trades may net zero (with no capacity transfer required), but they are still required to settle each transaction.

The capacity variance settlement adjusts settlement to reflect the actual quantity of capacity that has been transferred between shippers:

- If a buyer's confirmed capacity quantity is less than their capacity transfer quantity, then they will receive a payment.
- If a buyer or seller has an invalid quantity associated with a transfer, then they will pay a compensation payment to the trade counterpart.

9.2 Billing process

Initial settlement

AEMO calculates indicative settlement amounts at least once a day for the period from the last invoice to the current gas day. AEMO issues a Settlement Supporting Data report each day (see Section 8), which contains indicative gas day settlement amounts and quantities and prices for each CTP and auction product. The Settlement Supporting Data report is also issued with the publication of the final and revised settlement statements.

Final settlement statement

AEMO calculates settlement amounts for each gas day in the billing period, which are collated on the final settlement statement with the net amount payable by or to the participant. The final settlement statement is issued 15 business days after the end of a billing period. Payments are processed 2 business days later.

Revised settlement statement

AEMO recalculates settlement amounts for each gas day in the billing period, three months after the end of the billing period. The statement presents the settlement adjustment amount payable by or to the participant and any applicable interest. The revised settlement statement is issued on the second business day of the fourth month after the end of a billing period. Payments are processed 2 business days later.

9.3 Clearing process

After issuing invoices and statements to each participant, AEMO enters and authorises their side of each cash transaction in Austraclear. Participants must enter and authorise (if required) their side of the cash transaction based on the information in the invoice or statement. Participants are advised to monitor payment transactions.

For more information, refer to the Guide to AEMO Market Clearing (AEMO 2014):

10. Prudential arrangements

10.1 Prudential exposure

Trading and auction participants must provide collateral to meet their combined settlement exposure across the GSH, the CTP and the DAA.

10.1.1 CTP exposure

AEMO regularly measures the settlement exposure associated with capacity trades on the CTP. The exposure of GSH trading participants to capacity trades in the CTP is calculated by:

Prudential Exposure = Invoiced Amounts + Initial Settlement + Forward Exposure

where,

Invoiced Amounts (for the previous billing period) is the net total of all outstanding final and revised invoices,

Initial Settlement (for the current billing period) is calculated for gas days in the transfer period to ensure a participant's exposure reflects the outcome of any failed transfers, and

Forward Exposure associated with capacity trades on the CTP is calculated as 25% of trade value ahead of the transfer window and 100% of trade value within the transfer window. Prior to a capacity transfer, default (and suspension) of a buyer or seller results in the close out of the transaction and payment of compensation to the non-defaulting party. Hence the buyer and the seller are required to provide collateral to cover 25% of transaction value. Following the transfer of capacity, if the buyer or seller defaults in the market, the transaction and transfer stay on foot. Hence the buyer provides collateral to cover 100% of the transaction value.

10.1.2 DAA exposure

AEMO calculates an auction participant's exposure on submission of each bid and again prior to the auction run. The Auction Agreement defines the prudential process applicable to the auction, similar to the GSH, as:

Prudential Exposure = Initial Settlement + Invoiced Amounts + Bid Exposure

where,

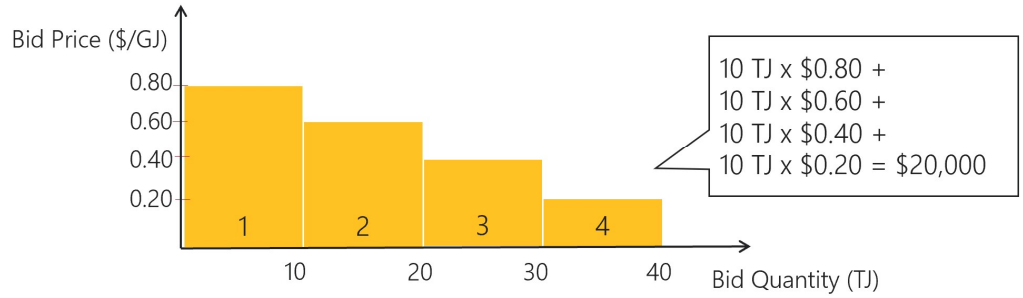
Initial Settlement (for the current billing period) is the net total of indicative gas day settlement amounts (updated daily),

Invoiced Amounts (for the previous billing period) is the net total of all outstanding final and revised invoices, and

Bid Exposure (for the next gas day) is a measure of potential settlement exposure associated with the auction bids submitted to AEMO, measured only on bids for the next gas day, calculated by

$$Bid\ Exposure = \sum (Incremental\ Bid\ Qty \times Bid\ Price)$$

Figure 28 Bid exposure example



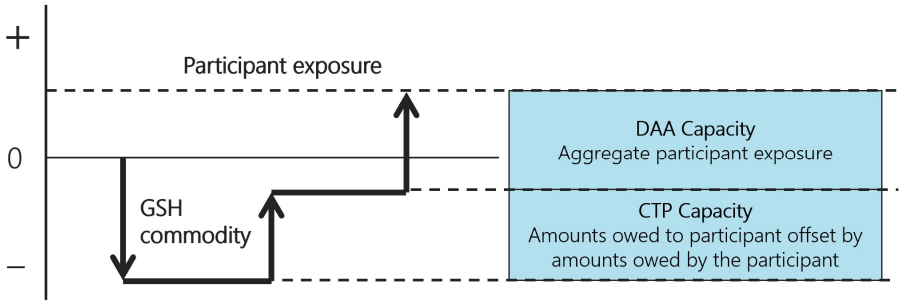
10.2 Prudential monitoring and management

AEMO regularly measures the settlement exposure associated with trading on all markets. Trading and auction participants must provide collateral to meet their ongoing settlement exposure across the GSH, CTP and DAA (see Figure 29). AEMO's methodology on prudential management is outlined here. For further detail, refer to the AEMO guide on settlements and prudential management available from the AEMO website (AEMO 2017).

CTP orders and DAA bids are validated on submission to ensure participants do not breach their trading limits. AEMO also monitors the position of each participant constantly. Participants should regularly review their collateral to avoid transactions being rejected due to insufficient support. Participants can use a single bank guarantee or cash to support their trades across the GSH, CTP and DAA.

AEMO calculates initial settlement at least once a day to provide an indication of likely settlement amounts and to use best available information in the exposure calculations.

Figure 29 Participant exposure monitoring



10.3 Defaults

10.3.1 Primary shipper defaults on GTA

In the event that a primary shipper defaults on a GTA, a process is in place to support orderly termination of the GTA and minimise disruption of the market:

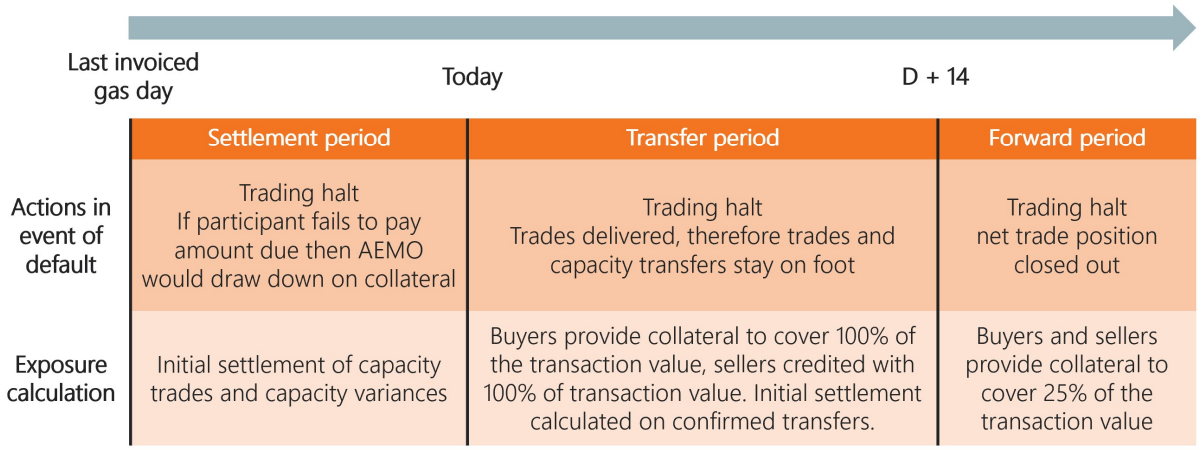
1. The facility operator triggers the process notifying AEMO of a default by a primary shipper.
2. AEMO cancels any CTP transactions that are more than 14 days into the future.
3. For CTP transactions less than 14 days into future, capacity transfers made by the defaulting shipper must stay on foot.
4. AEMO collects capacity charge amounts from buyers, and instead of paying the defaulting shipper, makes a service continuity payment to the relevant facility operator.

10.3.2 Trading participant defaults on market invoice

If a shipper fails to pay a market invoice at the due time, AEMO draws down on collateral posted by auction participant. Prudential exposure is measured regularly during trading day (see Section 10.2 and AEMO will reject market transactions if the participant does not have sufficient collateral. The auction participant must provide collateral to meet their ongoing settlement exposure across the GSH, CTP and DAA.

If the collateral funds are not available on the day payments need to be made to facility operators, AEMO will pro rata payments accordingly to all facility operators and trading participants. Pro rata payment amounts are calculated separately for each market. In other words, if the defaulting participant does not owe any money for auction settlement, then auction payments to facility operator will not be impacted.

Figure 30 Actions in event of default



References

AEMC 2016, *Eastern Australian Wholesale Gas Market and Pipelines Framework Review*, July 2016, available <https://www.aemc.gov.au/markets-reviews-advice/east-coast-wholesale-gas-market-and-pipeline-frame>.

AEMO 2014, *Guide to AEMO market clearing*, April 2014, available <https://www.aemo.com.au/Gas/Gas-Supply-Hubs/Settlements-and-payments/Clearing>.

AEMO 2017, *Gas Supply Hub Settlements and Prudential Methodology*, March 2017, available <https://www.aemo.com.au/Gas/Gas-Supply-Hubs/Settlements-and-payments/Settlement>.

AEMO 2018a, "Pipeline capacity trading", web page, viewed 17 November 2018, available <https://www.aemo.com.au/Gas/Pipeline-Capacity-Trading>.

AEMO 2018b, *Capacity Trading Reform Package: Specification of service points, zones and pipeline segments for capacity trading platform and auction*, consultation paper, July 2018, available <http://www.aemo.com.au/-/media/Files/Gas/Pipeline-Capacity/2018/Zone-Specification---Initial-Consultation-Paper.pdf>.

AEMO 2018c, *Capacity Transfer and Auction Procedures*, consultation draft, 21 August 2018, available <https://www.aemo.com.au/Stakeholder-Consultation/Consultations/Capacity-Trading-Reform-Package>.

AEMO 2018d, "Gas Transportation Capacity Trading Reform Package: Participant registration guidance note", October 2018, unpublished guidance note, available on request from AEMO.

AEMO 2018e, *Guide to Capacity Transfer and Day-ahead Auction Reports*, 22 November 2018, available <https://www.aemo.com.au/Gas/Pipeline-Capacity-Trading/Guides-and-information>.

AEMO 2018f, *Guide to Capacity Transfer and Day-ahead Auction Transactions*, 22 November 2018, available <https://www.aemo.com.au/Gas/Pipeline-Capacity-Trading/Guides-and-information>.

AEMO 2018g, *Gas Pipeline Capacity Trading and Day Ahead Auction 2019: Fee Structure*, October 2018, available <http://aemo.com.au/Stakeholder-Consultation/Consultations/Structure-of-Participant-Fees-for-Capacity-Trading-Platform>

AEMO 2019, *Wholesale Market Accreditation Procedures (Victoria)*, Draft Consultation, August 2013, available <https://www.aemo.com.au/Gas/Declared-Wholesale-Gas-Market-DWGM/Settlements-and-payments/Settlements/Procedures-and-guidelines>.

GMRG 2017a, *Final Recommendations on the Operation and Administration of the Transportation Capacity Trading Platform and Day-Ahead Auction*, July 2017, available <http://gmrg.coagenergycouncil.gov.au/publications>.

GMRG 2017b, *Final Recommendations on the Capacity Trading Reform Package (Standardisation, capacity trading platform and reporting framework for secondary trades)*, November 2017, available <http://gmrg.coagenergycouncil.gov.au/publications>.

GMRG 2017c, *Final Recommendations on the Design of the Day-Ahead Auction of Contracted but Un-Nominated Capacity*, December 2017, available <http://gmrg.coagenergycouncil.gov.au/publications>.

GMRG 2018a, "Capacity trading reform package", web page, viewed 17 November 2018, available <http://gmrg.coagenergycouncil.gov.au/work-streams/capacity-trading-reform>.

GMRG 2018b, *Capacity Trading Reform Package Legal and Regulatory Framework*, consultation paper, March 2018, available <http://gmrg.coagenergycouncil.gov.au/sites/prod.gmrg/files/publications/documents/GMRG%20Legal%20and%20Regulatory%20Framework%20-%20Consultation%20Paper.pdf>.

Glossary

This document uses terms that have meanings defined in the National Gas Rules (NGR). The NGR meanings are adopted unless otherwise specified.

Term	Meaning
auction quantity limit (AQL)	Constraints applied to auction product components when solving an auction.
Natural Gas Services Bulletin Board (BB)	Information service covering all major natural gas production and transportation facilities in Victoria, NSW, Tasmania, Queensland, South Australia and the Northern Territory.
backhaul	A transportation service for delivery of gas in the opposite direction of the gas flow in the pipeline—that is, the delivery point is upstream of the receipt point.
bid profile	A single bid submission that includes all bids for each gas day.
contracted but unnominated (CBU) capacity	Capacity held by a shipper under contract with a facility operator that has not been nominated for use on the next gas day.
contracted capacity	Capacity held by a shipper under contract with a facility operator.
contract registration number (CRN)	Reference to an STTM registered facility service.
contract reference	A reference number to a contract or agreement (or specific services within a contract or agreement) between a shipper and a facility operator to trade capacity on a facility, which may include DWGM reference or STTM contract registration number (CRN).
Capacity Transfer and Auction Procedures (CTAP)	AEMO-managed procedures governing the operation of secondary capacity trading and auctions.
Capacity Trading Platform (CTP)	Platform for exchange-based trading of commonly traded day-ahead and forward-traded capacity products. Operated on the Gas Trading Exchange.
Day-ahead Auction (DAA)	Auction of contracted but unnominated (CBU) capacity products run a day ahead of the gas day.
discretionary capacity	Capacity offered by facility operators to a capacity auction that is additional to what's required in the NGR.
delivery point	The point on a pipeline that gas is withdrawn from for delivery to a customer or injection into a storage facility.
Declared Transmission System (DTS)	The principal gas transmission pipeline system in Victoria identified under the National Gas (Victoria) Act.
Declared Wholesale Gas Market (DWGM)	The market administered by AEMO under Part 19 of the NGR for the injection of gas into, and the withdrawal of gas from, the DTS and the balancing of gas flows in or through the DTS.
forward haul	A transportation service for delivery of gas in the direction of the gas flow in the pipeline—that is, the delivery point is downstream of the receipt point.
facility operator	Operator of a gas production facility, storage facility, or pipeline.

Term	Meaning
Gas Market Reform Group (GMRG)	Industry group established by the COAG Energy Council to lead the design, development and implementation of the capacity trading reform package.
Gas Supply Hub (GSH)	An exchange for the wholesale trading of natural gas to buy and sell gas at interconnecting transmission pipelines.
Gas Trading Exchange (Exchange)	An electronic platform for trading standardised, short-term physical gas products on the three pipelines connecting at Wallumbilla. AEMO centrally settles transactions, manages prudential requirements and provides reports to assist participants in managing their portfolio and gas delivery obligations.
linked bid	Bids on multiple product combinations on the same or different facilities, linked to prevent the participant from having capacity stranded in one product when two or more products are required to form a transportation path.
maximum hourly quantity (MHQ)	Constraint used to set the maximum flow of gas permitted to be scheduled in the DWGM to flow through a point in the DTS each hour.
market schedule variation (MSV)	A quantity of gas that is added to an STTM trading participant's modified market schedule to account for an imbalance.
nameplate rating	The maximum quantity of gas that can be received, delivered or throughput on a gas day.
operational capacity	The quantity of gas able to be received, delivered or throughput on a gas day subject to operational restrictions.
Operational Transportation Service Agreement (OTSA)	Agreement between a shipper and a facility operators setting out the terms and conditions for the provision and use of gas transportation services.
receipt point	Service point where gas is injected.
scheduled flow	The quantity of gas nominated to be received or delivered on a gas day.
Short Term Trading Market (STTM)	A market for the trading of natural gas at the wholesale level at defined hubs between pipelines and distribution systems in eastern and southern Australia
Transportation Service Point Register	The list of service points, zones and pipeline segments used to define capacity products.
unused capacity	The unnominated capacity of a transportation facility.

A1. AQL calculations

The quantity of capacity made available through the capacity auction for each product type is limited by constraints specified in the NGR. The auction quantity limits (AQLs) reflect these constraints and restrict the quantity of capacity available in any product to auction bidders. Each auction product comprises multiple product components against which auction quantity limits are applied.

Note. The facility operator can provide a lower operational capacity when required, e.g. due to unplanned maintenance, which is reflected in the AQL calculations. Facility operators may also offer additional capacity (beyond what's required in the NGR) to the auction.

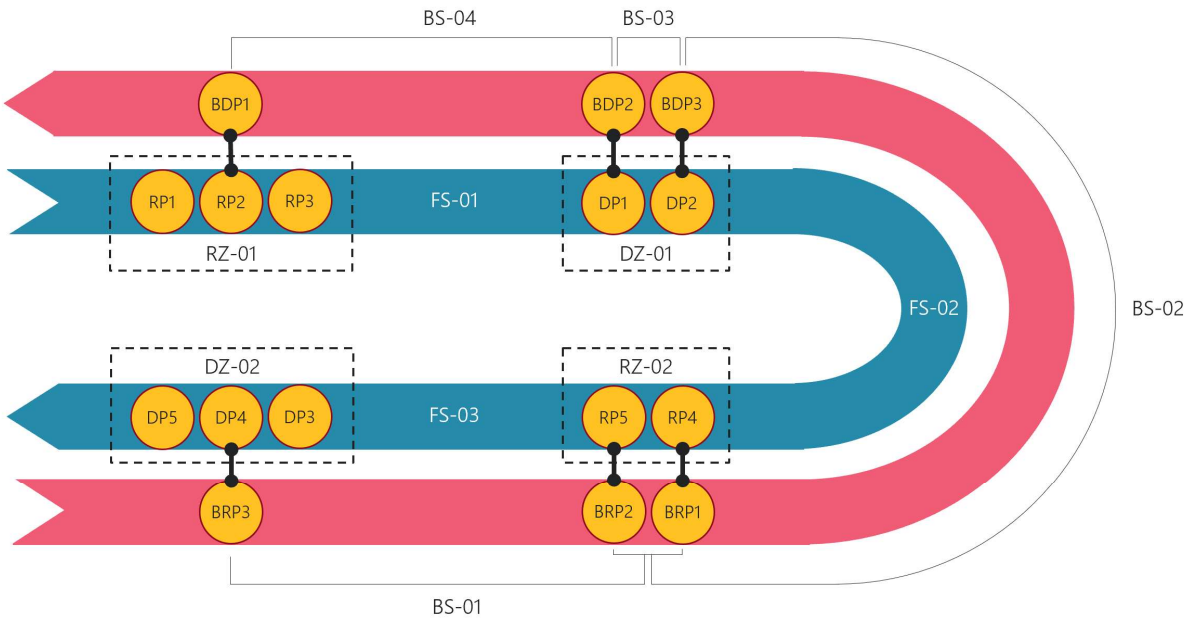
Product components are defined in the Transportation Service Point Register maintained by AEMO. The AQLs restrict the quantity of capacity that is available in a product component to reflect the physical and contractual capacity of the pipeline.

Facility operators are responsible for calculating and submitting the AQLs to AEMO each day.

A1.1 Example

The following example uses a single direction pipeline with forward haul and backhaul auction services. There are two receipt zones, one at the start of the pipeline and one midline, and two delivery zones, one in the middle of the pipeline and one at the end.

Figure 31 Example for AQL calculation



Example AQL calculation

Forward haul components	Description
RP1	Forward haul receipt point only
RP2	Forward haul receipt point and backhaul delivery point BDP1
RP3	Forward haul receipt point only
RP4	Forward haul receipt point and backhaul receipt point BRP1
RP5	Forward haul receipt point and backhaul receipt point BRP2
DP1	Forward haul delivery point and backhaul delivery point BDP2
DP2	Forward haul delivery point and backhaul delivery point BDP3
DP3	Forward haul delivery point only
DP4	Forward haul delivery point and backhaul receipt point BRP3
DP5	Forward haul delivery point only
RZ-01	Receipt zone for receipt points RP1, RP2, and RP3
RZ-02	Receipt zone for receipt points RP4 and RP5
DZ-01	Delivery zone for delivery points DP1 and DP2
DZ-02	Delivery zone for delivery points DP3, DP4 and DP5
FS-01	Pipeline segment between RP1, RP2, RP3 and DP1, DP2
FS-02	Pipeline segment between DP1, DP2 and RP4, RP5
FS-03	Pipeline segment between RP4, RP5 and DP3, DP4, DP5

Backhaul components	Description
BDP1	Backhaul delivery point and forward haul receipt point RP2
BDP2	Backhaul delivery point and forward haul delivery point DP1
BRP3	Backhaul receipt point and forward haul delivery point DP4
BRP1	Backhaul receipt point and forward haul receipt point RP4
BRP2	Backhaul receipt point and forward haul receipt point RP5
BDP3	Backhaul delivery point and forward haul delivery point DP2
BS-01	Backhaul pipeline segment between BRP3 and BDP3.
BS-02	Backhaul pipeline segment between BRP1, BRP2 and BDP3.
BS-03	Backhaul pipeline segment between BDP3 and BDP2.
BS-04	Backhaul pipeline segment between BDP2 and BDP1.

A1.2 Forward haul services

A1.2.1 Service points

The AQL for forward haul service points is unused capacity (UC), calculated by:

$$UC = MIN(NR, OC) - SF$$

where,

NR = Nameplate rating, the maximum quantity of gas that can be received or delivered through the service point on a gas day.

OC = Operational capacity, the quantity of gas that can be injected.

SF = Scheduled priority flow, as defined in Table 19, where *FHQ* is the scheduled quantity of firm forward haul services at the service point for gas day D and *BHQ* is the scheduled quantity of firm backhaul services at the service point for the gas day.

Table 19 Scheduled flows for each product component

Product component	Scheduled priority flow
Forward haul only	FHQ
Forward haul RP also used as a backhaul RP	FHQ + BHQ
Forward haul RP also used as a backhaul DP	FHQ – BHQ
Forward haul DP also used as a backhaul DP	FHQ + BHQ
Forward haul DP also used as a backhaul RP	FHQ – BHQ

Example AQL calculation: Service points

Component	Type	Scheduled flow
RP1	Forward haul receipt point only	*FHQ*
RP2	Forward haul receipt point and backhaul delivery point	*FHQ – BHQ*
RP3	Forward haul receipt point only	*FHQ*
RP4	Forward haul receipt point and backhaul receipt point	*FHQ + BHQ*
RP5	Forward haul receipt point and backhaul receipt point	*FHQ + BHQ*
DP1	Forward haul delivery point and backhaul delivery point	*FHQ + BHQ*
DP2	Forward haul delivery point and backhaul delivery point	*FHQ + BHQ*
DP3	Forward haul delivery point only	*FHQ*
DP4	Forward haul delivery point and backhaul receipt point	*FHQ – BHQ*
DP5	Forward haul delivery point only	*FHQ*

Note that AQL quantities are submitted in GJ. TJ are used in this example only to save space.

Component	*NR* (TJ)	*OC* (TJ)	*FHQ* (TJ)	*BHQ* (TJ)	*SF* (TJ)		Unused Capacity (TJ) *MIN(NR, OC) – SF*	Notes
RP1	40	10	10	–	*FHQ*	10	MIN(40, 10) – 10 = 0	a
RP2	50	50	50	20	*FHQ – BHQ*	50 – 20 = 30	MIN(50, 50) – 30 = 20	
RP3	30	30	20	–	*FHQ*	20	MIN(30, 30) – 20 = 10	
RP4	20	20	10	5	*FHQ + BHQ*	15	MIN(20, 20) – 15 = 5	
RP5	50	50	15	15	*FHQ + BHQ*	30	MIN(50, 50) – 30 = 20	
DP1	50	50	10	15	*FHQ + BHQ*	10 + 15 = 25	MIN(50, 50) – 25 = 25	
DP2	40	40	15	15	*FHQ + BHQ*	15 + 15 = 30	MIN(40, 40) – 30 = 10	
DP3	30	0	0	–	*FHQ*	0	MIN(30, 0) – 0 = 0	b
DP4	30	30	20	10	*FHQ – BHQ*	20 – 10 = 10	MIN(30, 30) – 10 = 20	
DP5	80	80	40	–	*FHQ*	40	MIN(80, 80) – 40 = 40	

Notes

a. Maintenance is being undertaken at RP1. Its operational capacity is reduced to 10 TJ, which is being fully utilised by a firm shipper, resulting in 0 TJ of unused capacity.
b. There is an unplanned outage at DP3, resulting in no available capacity for firm or auction shippers.

A1.2.2 Zones

The AQL for a forward haul receipt or delivery zone is the aggregated contracted but unnominated capacity (CBUC) of each point in that zone, calculated by:

$$CBUC = \sum MIN(CC + DC, OC) - SF$$

where,

CC = Contracted capacity at each service point

DC = Discretionary capacity, any additional capacity that the facility operator makes available above what is required

OC = Operational capacity, the quantity of gas that can be injected or withdrawn

SF = Scheduled priority flow, the priority scheduled quantity at the forward haul service point for firm forward haul services.

Example:AQL calculation: Zones

Note that AQL quantities are submitted in GJ. TJ are used in this example only to save space.

Component	CC (TJ)	DC (TJ	OC (TJ)	SF (TJ)	CBU Capacity (TJ) *MIN(CC+DC, OC) – SF*	Notes
RP1	15	0	10	10	MIN(15+0, 10) – 10 = 0	Operational capacity reduced due to planned maintenance.
RP2	50	0	50	30	MIN(50+0, 50) – 30 = 20	
RP3	30	0	30	20	MIN(30+0, 30) – 20 = 10	
RZ-01					**Σ(CBU) = 30**	
RP4	20	0	20	15	MIN(20+0, 20) – 15 = 5	
RP5	40	10	50	30	MIN(40+10, 50) – 30 = 20	RP5 is not fully contracted, so the facility operator has elected to offer 10 TJ of discretionary capacity.
RZ-02					**Σ(CBU) = 25**	
DP1	40	0	50	25	MIN(40+0, 50) –25 = 15	
DP2	40	0	40	30	MIN(40+0, 40) – 30 = 10	
DZ-01					**Σ(CBU) = 25**	
DP3	30	0	0	0	MIN(30+0, 0) – 0 = 0	The capacity constraint reduced the amount of CBU available at this point and in the zone.
DP4	10	5	30	10	MIN(10+5, 30) – 10 = 5	DP4 is not fully contracted, so the facility operator has elected to offer 5 TJ of discretionary capacity.
DP5	60	20	80	40	MIN(60+20, 80) – 40 = 40	DP5 is not fully contracted, so the facility operator has elected to offer 20 TJ of discretionary capacity.
DZ-02					**Σ(CBU) = 45**	

A1.2.3 Segments

The AQL for a forward haul pipeline segment is the contracted but unnominated capacity (CBUC) of the segment, calculated by:

$$CBUC = MIN(CC + DC, OC) - SF$$

where,

CC = Contracted capacity of the FH segment

DC = Discretionary capacity of the FH segment

OC = Operational capacity of the FH segment

SF = Scheduled priority flow of the FH segment

Example AQL calculation: Segments

Note that AQL quantities are submitted in GJ. TJ are used in this example only to save space.

Component	CC (TJ)	DC (TJ	OC (TJ)	SF (TJ)	CBU Capacity (TJ) *MIN(CC+DC, OC) – SF*	Notes
FS-01	95	10	110	60	MIN(95+10, 110) – 60 = 45	Includes discretionary capacity
FS-02	75	0	75	5	MIN(75+0, 75) – 5 = 70	
FS-03	135	0	100	50	MIN(135+0, 100) – 50 = 50	Capacity constraint applies

A1.3 Backhaul services

A1.3.1 Service points

The AQL for a backhaul service point is determined by the forward haul point that it is associated with, as described in Table 20.

Table 20 AQLs for backhaul product components

Product component	AQL
Backhaul RP also used as a forward haul DP	Scheduled flow (SF) at the forward haul DP. This is used for demand offset backhaul.
Backhaul RP also used as a forward haul RP	Unused capacity (UC) at the forward haul RP. The same limit is used for backhaul and forward haul services.
Backhaul DP also used as a forward haul RP	Scheduled flow (SF) at the forward haul RP. This is used for injection offset backhaul. This reflects that there needs to be sufficient injections at the forward haul receipt point to facilitate the backhaul.
Backhaul DP also used as a forward haul DP	Unused capacity (UC) at the forward haul RP. The delivery point could be to a directly connected user, a distribution system, a park or another pipeline). As such, there needs to be spare physical capacity at the delivery point. The same limit is used for backhaul and forward haul services.

Example:AQL calculation: Service points

Note that AQL quantities are submitted in GJ. TJ are used in this example only to save space.

Backhaul component	Related forward haul service point	AQL	Notes
BRP1	RP4	UC for RP4 = 5	See forward haul service points in Section A1.2.1
BRP2	RP5	UC for RP5 = 20	
BRP3	DP4	SF for DP4 = 10	
BDP1	RP2	SF for RP2 = 30	
BDP2	DP1	UC for DP1 = 25	
BDP3	DP2	UC for DP2 = 10	

A1.3.2 Segments

The auction quantity limit for backhaul reflects the physical flow of gas between the service points in the forward haul direction for the segment. The AQL for a backhaul segment is the scheduled net priority forward haul flow for the backhaul pipeline segment for the gas day.

A1.4 Compression services

AQLs for compression services are calculated in the same way as forward haul services in Section A1.2.

A1.5 Park services

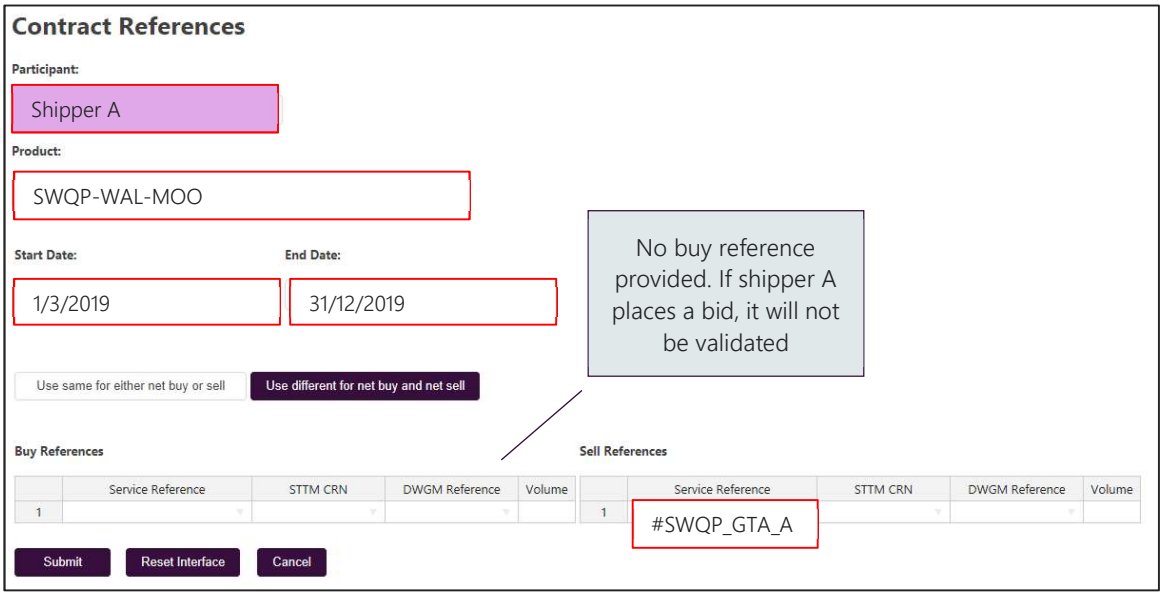
No park services are offered in the auction.

A2. Delivery netting example

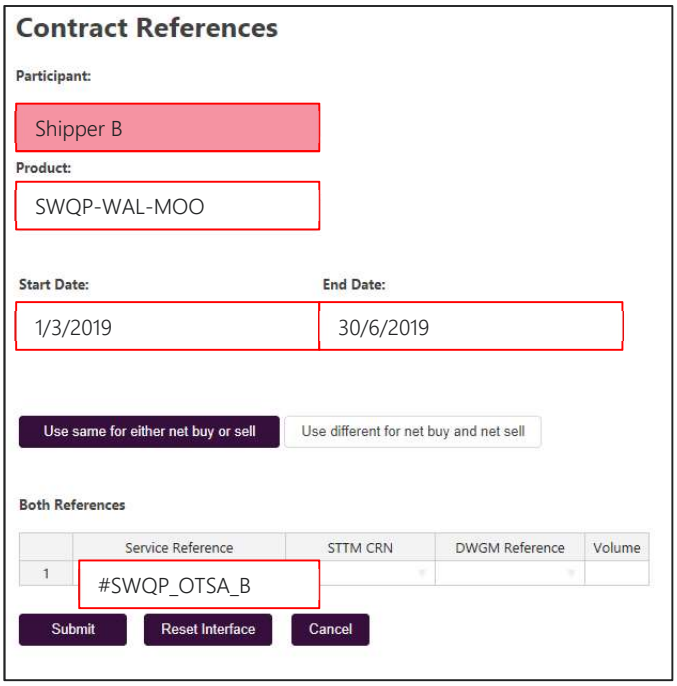
Note that quantities are submitted in GJ. Where shown, TJ are used in this example only to save space.

1. Trading participants select contract references

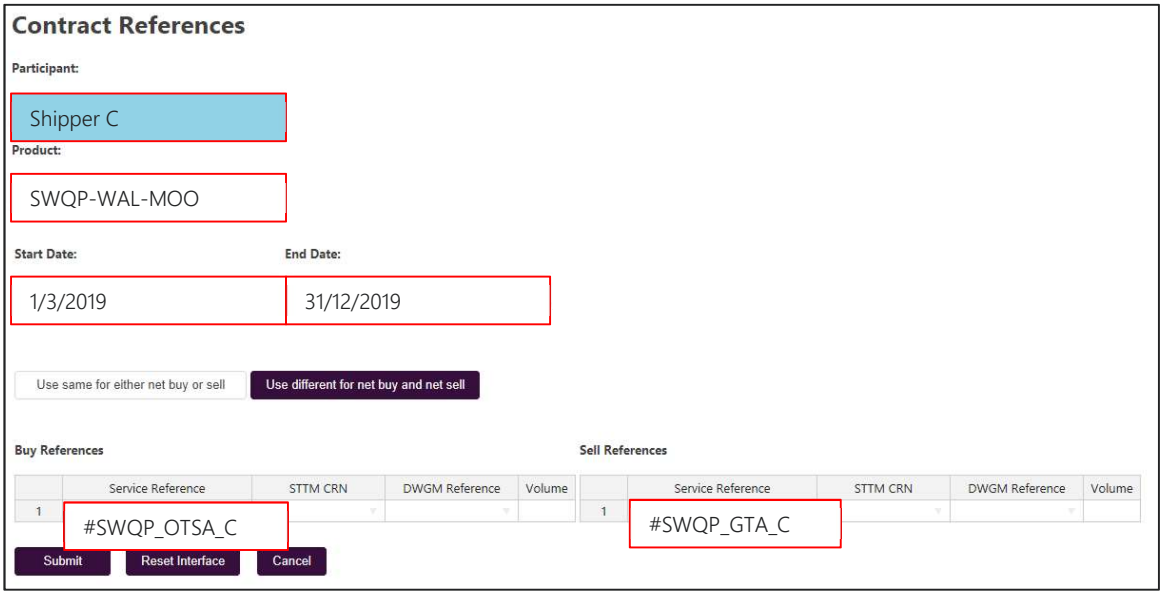
Shipper A:



Shipper B:



Shipper C:



2. Trading participants submit trades

Shipper A sells 10 TJ
Receipt Point: Wallumbilla HP Trade Point
Delivery Point: MSP Exit

→

Shipper B buys 10 TJ
Receipt Point: Wallumbilla HP Trade Point
Delivery Point: MAPS Exit

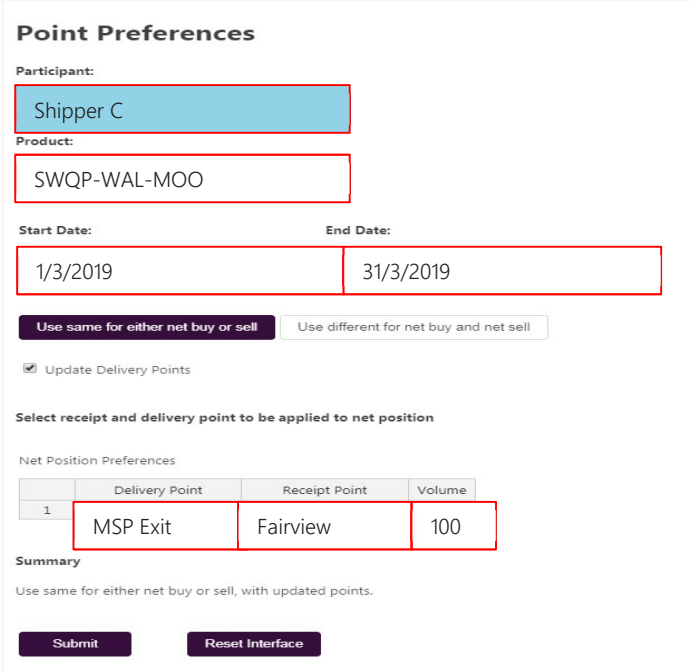
Shipper B sells 5 TJ
Receipt Point: Wallumbilla HP Trade Point
Delivery Point: MSP Exit

→

Shipper C buys 5 TJ
Receipt Point: Fairview
Delivery Point: MAPS Exit

3. Trading participants update point preferences

Shipper C updates their receipt and delivery point preferences. This overwrites any previous selections in Trayport for this date range when points are applied to netting.



4. AEMO performs delivery netting

Participant Name	Incremental Quantity Change	Overall Quantity Change	Receipt Point	Delivery Point	Service Reference
Shipper A	–10,000	–10,000	Wallumbilla HP Trade Point	MSP Exit	#SWQP_GTA_A
Shipper B	+5,000	+5,000	Wallumbilla HP Trade Point	MAPS Exit	#SWQP_OTSA_B
Shipper C	+5,000	+5,000	Fairview	MSP Exit	#SWQP_OTSA_C

A3. Settlement calculations

CTP settlement equations (*simplified)

Settlement Amount = Transaction Price × Transaction Quantity

Capacity Variance Quantity = Confirmed Transfer Quantity – Capacity Transfer Quantity

Invalid Transfer Amount = Invalid Quantity × Capacity Price × 25%*

Capacity Variance Settlement = Capacity Variance Quantity × Capacity Price + Invalid Transfer Amount*

where

Invalid Transfer Amount is compensation payment that is payable by a participant at fault for a failed transfer.

Capacity Price is the volume-weighted average price of trades for a product and gas day.

DAA settlement equations

Auction Settlement Amount = Auction Product Price · Auction Quantity

Auction Quantity = MAX (Revised Auction Quantity, Scheduled Nomination Quantity)

Revised auction quantity = MIN (Revised Auction Quantity(1), …., Revised Auction Quantity(k))

Transfer quantities for a seller are negative.

A3.1 Example 1

CTP product delivered with deviation

Take the trades and capacity transfers as those in the example in A2 and the validation example provided in s. 4.2.6.

Assume both trades were set at $1.00/GJ.

Shipper A has sold 10,000 GJ of capacity to Shipper B and Shipper C, which is 2,000 GJ more than their rights on the pipeline.

Table 21 CTP settlement example

Shipper	Transaction Settlement Amount	Capacity Variance Quantity	Invalid Transfer Amount	Capacity Variance Settlement
A	$\$1 \times -5{,}000 + \$1 \times -5{,}000 = -\$10{,}000$	2,000	$2{,}000 \times \$1 \times 0.25 = \$500$	$2000 \times \$1 + \$500 = \$2500$
B	$\$1 \times 5{,}000 = \$5{,}000$	-1,000	-1,000 x $1 x 0.25 = -$250	$-1000 \times \$1 - 250 = -\$1{,}250$
C	$\$1 \times 5{,}000 = \$5{,}000$	-1,000	-1,000 x $1 x 0.25 = -$250	$-1000 \times \$1 - 250 = -\$1{,}250$

Note: negative settlement amounts represent a payment from AEMO to a participant. A negative capacity value represents a reduction in capacity rights resulting from a sale transaction.

A3.2 Example 2

Curtailment where a participant renominates down on linked bid

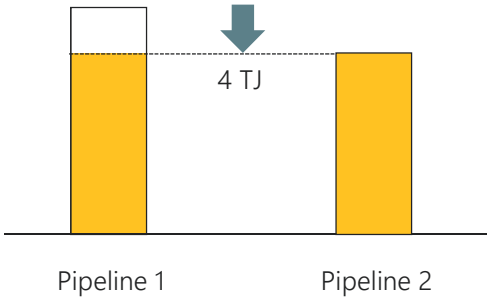
Shipper A has a linked bid from Pipeline 1 to Pipeline 2 for 5 TJ and is scheduled.

Clearing price of 0.10 $/GJ on Pipeline 1 and 0.15 $/GJ on Pipeline 2.

Pipeline 1 receives renominations from its firm shippers requiring it to reduce auction flows by 20%.

Shipper A's scheduled quantity on pipeline 1 is reduced by 20% to 4 TJ.

Shipper A then opts to renominate down 1 TJ on Pipeline 2. Shipper is scheduled for 4 TJ on both pipelines.



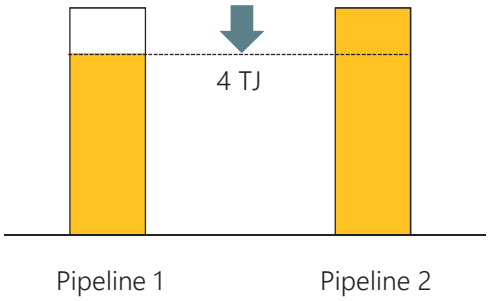
On a linked bid, shipper renominates down on Pipeline 2 after Pipeline 1 operator reduces shipper by 1 TJ.

Pipeline	Initial auction qty	Min revised auction qty on linked pipeline	Final nomination	Clearing Price	Shipper A Settlement
Pipeline 1	5 TJ	4 TJ	4 TJ	$0.10	4000 x $0.10 = $400
Pipeline 2	5 TJ	4 TJ	4 TJ	$0.15	4000 x $0.15 = $600

A3.3 Example 3

Curtailment where a participant does not renominate down on a linked bid

Same as example 2, except Shipper A does not renominate down on Pipeline 2.



On a linked bid, shipper does not renominate on Pipeline 2 after Pipeline 1 operator reduces shipper by 1 TJ.

Sa

Pipeline	Initial auction qty	Min revised auction qty on linked pipeline	Final nomination	Clearing Price	Shipper A Settlement
Pipeline 1	5 TJ	4 TJ	4 TJ	$0.10	4000 x $0.10 = $400
Pipeline 2	5 TJ	5 TJ	5 TJ	$0.15	5000 x $0.15 = $750

A4. Market systems

A4.1 e-Hub

The e-Hub is the key interface used to transfer data between AEMO and facility operators and comprises:

- API Web Portal – contains technical information for each API
- API Gateway – for sending and receiving JSON transactions

Refer to the following documents for further information:

- Guide to Capacity Trading and Day-ahead Auction Transactions
- Guide to AEMO's e-Hub APIs

A4.2 API

Submitting information via API

- Contract Details - list of valid shipper contracts for a facility
- Capacity Transfer Status -status of capacity transfers in facility operator system for each capacity transfer notice issued by AEMO
- Auction Quantities – the auction quantities available for the day ahead auction
- Auction Settlement Quantities – the revised auction quantities and final scheduled quantities provided at the end of each gas day.
- Auction Service Curtailment Notice – notice of a curtailment on an auction facility during a gas day.
- Zone Curtailment Notice – notice of curtailed shipper nominations against secondary firm rights

Downloading information via API

- Capacity Transfer Notice – the capacity quantity adjustment required for a shipper contract.
- Auction Results – the capacity quantity won by shippers at auction.
- Shipper Capacity Transfer Notification – notification to facility operator and shipper.
- Capacity Transfer and Auction Notice – notifies participants when the market delay or cancellation process is triggered.
- Registered Participants – list of all registered participants.
- Transportation Facility Register – list of facilities currently registered under NGR pt 24.
- Transportation Service Point Register – list of all the service points (receipt and delivery points), zones and pipeline segments currently registered under NGR pt 24.

A4.3 GSH Publishing Direct

The GSH Publishing Direct web application is available in AEMO's Markets Portal. This app is used to:

- Access and download CSV reports
- Subscribe to receive an email and/or SMS alert when new versions of reports are published
- Subscribe to receive CSV reports via email when new versions are published

Facility operators are most likely to use Publishing Direct to access the following reports:

- Capacity Transfer and Auction Notice
- Settlement Supporting Data

For further help refer to the Guide to GSH Publishing Direct.

A4.4 Data Interchange

The Data Interchange (DI) is a set of cooperating applications to replicate data between AEMO's Wholesale Market Systems and a participant's RDBMS conforming to the Electricity and Gas Data Models. It has two core functions:

- AEMO-side reporting applications that generate structured .CSV files into the participant file server.
- Participant-side software to replicate data from the participant file server to participants' local DBMS.

All reports related to capacity trading and day ahead auction activity will be available via the DI.

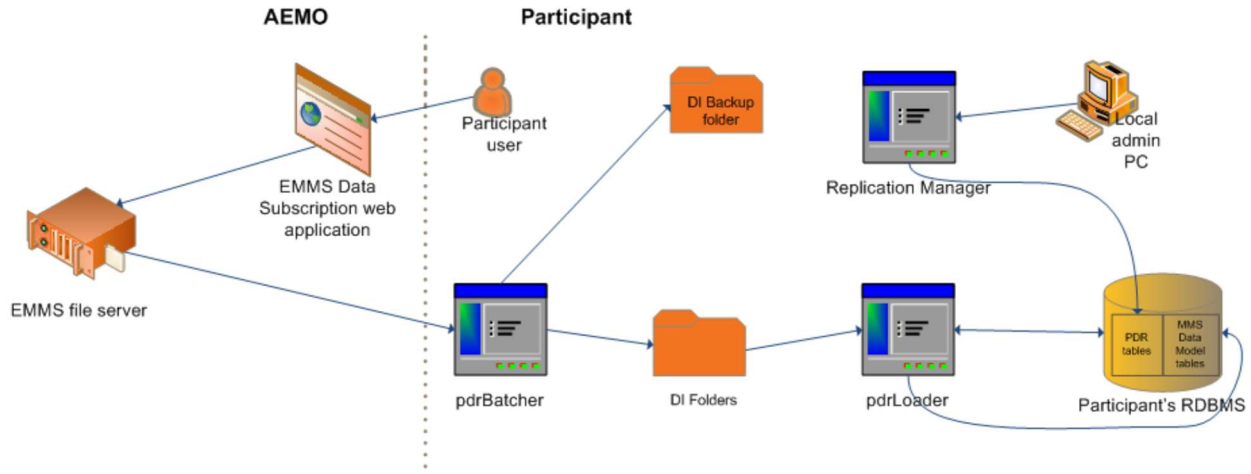
DI documentation and software bundles are available on the AEMO website at

http://www.aemo.com.au/Gas/IT-systems-and-change

Guide to Capacity Trading and Day-ahead Auction Reports

Guide to GSH Reports

Figure 32 Standard Data Interchange implementation



Core DI components

- Data Model – Establishes the target tables in a participant's DBMS conforming to the market data Model, including database tables, indexes, and constraints.
- Participant file server – The publishing point from AEMO systems to participant systems, with each participant allocated an account and access to private and public areas.
- Participant Data Replication Batcher (pdrBatcher) – Application responsible for transferring files from AEMO's participant file server to the participant's local Data Interchange folders.
- Participant Data Replication Loader (pdrLoader) – Application responsible for loading files from participant's local Data Interchange folders to the participant's DBMS.