Wholesale gas market focus report: Gas Supply Hub

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AUSTRALIAN ENERGY REGULATOR

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Executive summary

The Gas Supply Hub (GSH) is an electronic trading platform introduced in 2014 to provide options for short-term trading of gas 'upstream' to complement the use of long-term gas contracts.

The GSH has matured significantly since its establishment over a decade ago and is delivering on its aims of supporting competition and efficiency in the broader east coast wholesale gas market. Both the number of participants utilising the GSH and the resulting trade has grown significantly in recent years. The GSH is also supporting efficient gas delivery and improved price discovery.

The performance of the GSH could be further enhanced by growing liquidity beyond Wallumbilla, improving price transparency through on-screen trading and greater use of medium- and long-term products. Much of this may occur as the GSH matures further.

A previous Government review that identified several incremental reforms aimed at improving the performance of the GSH are in progress.[1] Given the processes already underway, we do not have any further recommendations on improving the GSH market design at this time.

Background

Amendments to the National Gas Law in May 2024 expanded the AER's wholesale gas market monitoring and reporting powers and obligations to include responsibilities for assessing competition and efficiency in the wholesale gas markets. This is our second report under these expanded responsibilities and it focuses on the extent to which the GSH has achieved its intended aims and improved competition and efficiency in the east coast wholesale gas market.

Analysis presented in this report is based on data reported by AEMO on GSH trade between 1 January 2014 and 30 September 2024 and feedback provided by a range of market participants.

Key insights

Liquidity has grown significantly in Wallumbilla but there is still room for growth

[1] Energy Ministers' Meeting, Summary of measures: Priority reforms for a more secure, resilient and flexible east coast gas market, 2022.

The GSH now represents a significant proportion of gas trading in the east coast gas market due to the substantial growth in the volume and frequency of trade at Wallumbilla in recent years.

Growth in liquidity at Wallumbilla has provided several benefits to the broader east coast gas market, with participants having more options to buy and sell gas to balance contract positions and respond to changing market conditions. Trade at Wallumbilla has supported efficient commodity trading between north and south markets to meet seasonal demand and LNG exports. Analysis of prices also suggests that trade has supported price efficiency, with prices on the GSH comparable to the broader gas market.

Trade has been limited in other locations. The Wilton and Culcairn hubs are seldom used, while trade at Moomba has been low and sporadic. The Wilton and Culcairn hubs are relatively new additions to the market. Liquidity may grow over time, with participants noting they are useful locations. Growth in liquidity at locations outside Wallumbilla would provide a more interconnected set of trading hubs and may provide additional efficiency benefits.

Participation on the GSH is growing and there are no significant barriers to participation

Participation on the GSH has increased and exporters, producers, GPG gentailers and traders are all well represented. Participation is more limited among industrial customers and other gas retailers, which may be due to the location and products offered on the GSH typically being less appropriate for their needs.

There are no significant barriers to participation on the GSH and levels of concentration tend to be lower than other facilitated gas markets. However, many participants reported that fees and prudential requirements may discourage trade, particularly in relation to medium- and long-term products.

Bilateral negotiation on the GSH has improved access to trading but limited price transparency

The use of bilaterally negotiated trades settled ‘off-screen’ on the GSH have grown significantly in recent years and are now the primary form of trade.

Off-screen trading on the GSH appears to have lowered barriers to trade for a range of participants, rather than entrenching exclusive trade among market incumbents. The GSH provides prudential and settlement services that reduce the risks and administrative burden faced by participants wanting to trade without an established Master Gas Supply Agreement (MGSA). By providing a quick and efficient platform for participants to trade bilaterally who may not otherwise be able to, off-screen trade appears to be supporting a larger number of trading relationships between participants.

On the other hand, high levels of bilaterally negotiated trade limit price transparency. This form of trading does not support price discovery as prices and other terms agreed between the parties are not visible to the wider market.

Trading ‘on-screen’ provides participants greater visibility of prices being offered on the platform and while it is currently limited by lower volumes of trade, it does still appear to be supporting price transparency. Liquidity has improved in terms of the frequency and participation of on-screen trading, with the bid-offer spread for short-term on-screen products

at Wallumbilla declining in recent years and participants reporting use of the exchange to monitor market conditions.

However, despite these improvements some participants still perceive the GSH benchmark price as unreliable. A new ASX Wallumbilla deliverable futures product introduced in August may support a more robust forward price.

The GSH provides more options to efficiently buy and sell gas and respond to market conditions

The GSH is supporting efficient trading of gas between buyers and sellers. Most participants use short-term trading on the GSH to complement long-term gas contracts or provide a more flexible alternative to downstream spot markets.

Participants use of the GSH has matured, and they are increasingly using both buying and selling to balance their positions and respond to market events, for example those caused by variations in LNG production or reduced gas-powered generation.

The GSH has mechanisms to support efficient gas delivery, but there is scope for improvement

The GSH provides several mechanisms to deliver gas more efficiently. AEMO's netting process has made gas trade more efficient by allowing participants to only physically deliver on their net position each day. However, participants reported concerns that netting can add additional administrative burden and anonymity is not always maintained. Governments are progressing the implementation of an anonymous and automated delivery system for the GSH that would likely address these concerns and improve uptake and benefits of netting.[2]

A spread product introduced in 2017 has not been popular on GSH and trade in this product has largely declined. Off-screen gas swaps arranged by participants appear more popular and AEMO will be introducing a swap product in 2025.

[2] Energy Ministers' Meeting, Summary of measures: Priority reforms for a more secure, resilient and flexible east coast gas market, 2022.

1 Background

AER expanded role in wholesale gas markets

The AER monitors the performance of the east coast wholesale gas markets. Amendments to the National Gas Law in May 2024 expanded the AER's market monitoring and reporting powers and obligations to include the performance of the wholesale gas markets, the effect of financial risk management products and bilateral trading agreements. With these changes, we are required to monitor and review the performance of the wholesale gas markets, including identifying whether there is effective competition in the market and whether any market features may be detrimental to effective competition or efficiency.[3]

This is our second focus report under expanded market monitoring and reporting responsibilities and focuses on the GSH. The report investigates the extent to which the GSH has supported efficiency and competition in the east coast gas market.

We intend to publish 3 focus reports. Our first report on the Day Ahead Auction was released in October 2024 and our final report on downstream gas markets (the Short Term Trading Market and the Victorian Declared Wholesale Gas Market) will follow in early 2025. These reports will lay the foundation for AER reporting of gas market competition, in addition to building up analysis and key issues for development of the biennial wholesale gas competition report in 2026.

The Gas Supply Hub

The GSH is an electronic trading platform that was introduced in 2014 to support trade of 'upstream' wholesale gas in response to the development of LNG exports in Queensland. The introduction of the GSH formed part of a broader strategy to develop short-term markets for the east coast that would complement long-term gas contracts by improving short-term liquidity and introducing transparency and price discovery to a market largely based on opaque contractual arrangements.[4]

Key features of the GSH include:

- **Upstream trading hubs:** Participants can trade at several hubs that pool together buyers and sellers into a single market located at natural points of trade in the upstream pipeline network. The hubs are located at Wallumbilla in Queensland (includes trading on the Roma-Brisbane pipeline, South West Queensland Pipeline and Queensland Gas Pipeline), Moomba in South Australia (includes locations on the Moomba to Adelaide

[3] Section 30AC of the National Gas Law.

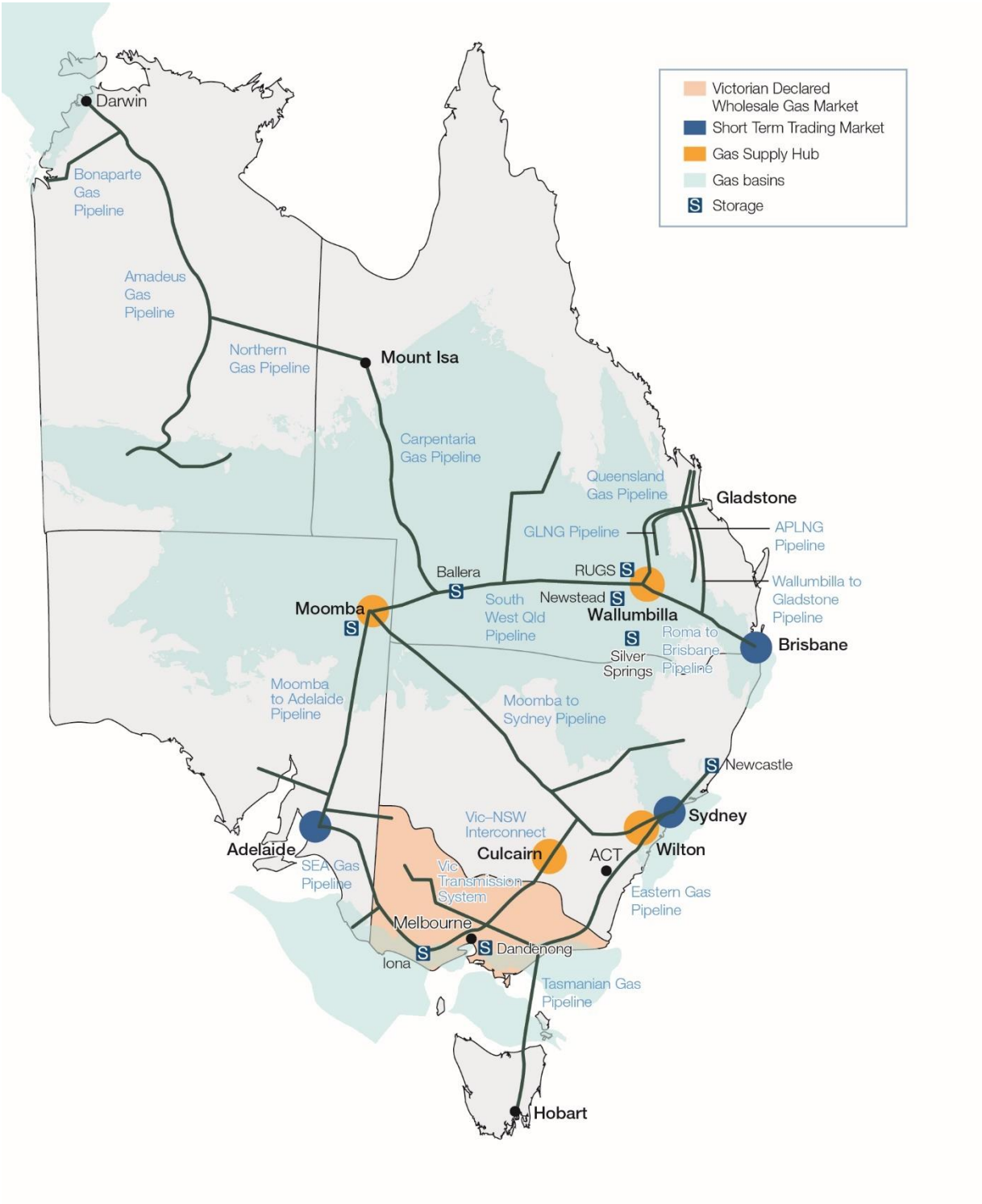
[4] BREE, Eastern Australian Domestic Gas Market Study, 2013.

Pipeline and Moomba to Sydney Pipeline), Culcairn in Victoria[5] and Wilton in New South Wales. Wallumbilla is the original and largest hub (Figure 1).

- **Centralised settlement:** The platform gives participants the ability to trade gas using standard terms and conditions and settlement functions managed centrally by AEMO.
- **On-screen and off-screen trade:** Participants can trade by submitting anonymous bids and offers to the platform 'on-screen' and are then matched based on price and quantity. Alternatively, trades can be negotiated privately by participants 'off-screen', either bilaterally or through a broker, with the trade then registered on the GSH.

[5] The hub is technically located outside the Victorian border in New South Wales but serves as the entry point to the Victorian Transmission System.

Figure 1 Eastern gas basins, markets, pipelines and storage

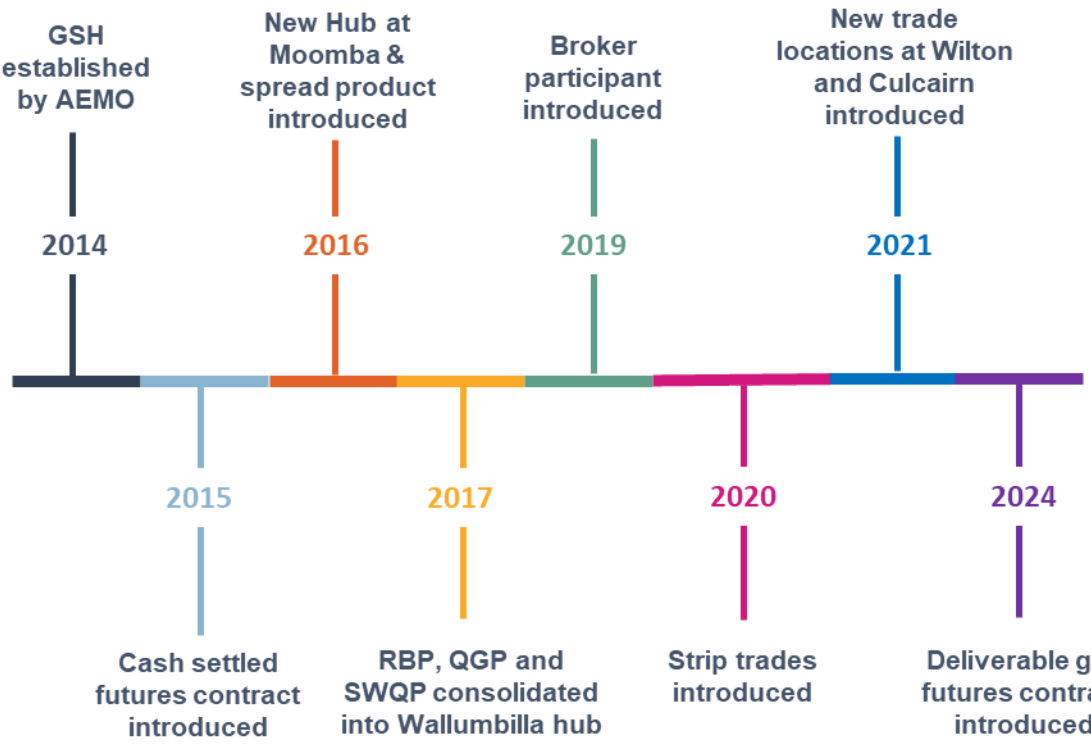


Source: AER analysis using Natural Gas Services Bulletin Board data.

Since 2014 new locations, financial products and trading rules have been introduced to the GSH to improve liquidity and participation (Figure 2). These additions have aimed to bring additional benefits to competition and efficiency in the east coast gas market, specifically:

- Providing more options for upstream trade to improve the efficiency of commodity trades and make the market more accessible and therefore competitive, leading to downward pressure on prices.
- Providing financial products that are supported by underlying liquid trade of physical gas to support a stable, trusted forward price for gas. This is intended to provide participants greater confidence in their investments, hedging strategies and long-term contracting agreements.

Figure 2 Timeline of Gas Supply Hub developments - 2014 to 2024



The Gas Supply Hub operates within the larger east coast gas market

The GSH is not a standalone market for trading gas, rather it is a component of the larger east coast gas market. The GSH exists primarily to complement the contract market for wholesale gas, which is the majority of trade on the east coast. Gas contracts in the wholesale market (also known as Gas Supply Agreements) are long-term agreements (typically 1-2 years) for producers to supply large retailers and gas-powered generators. They may also supply retailers and aggregators, who on-sell to commercial and industrial users downstream, and large industrial users. The GSH primarily provides participants with existing gas portfolios the option to adjust their contracted positions by engaging in short- to medium-term secondary trades, typically for delivery within three months. However, the shift in recent years towards

shorter-term gas contracts, [6] coupled with the ability to trade gas a year out on the GSH, may be increasing its substitutability with gas contracts for some participants.

Participants have two primary alternatives to the GSH for short-term trading of physical gas:

- **Bilateral contracts using a Master Gas Supply Agreement (MGSA):** Participants who have an existing Master Supply Agreement with a counter party can use the same contractual arrangements to negotiate shorter-term contracts. This is the primary substitute for trading on the GSH as it provides participants voluntary and tailored options for trading gas upstream.
- **Facilitated spot markets:** Participants can buy and sell spot gas using short-term trading markets in Brisbane, Sydney and Adelaide and the DWGM in Victoria. Products available on the GSH for delivery of gas within a week are likely the closest substitute to these spot markets.

Whether the GSH is useful and providing a genuine alternative will vary between participants, as well as depend upon existing contract arrangements, transport, delivery timeframes and location requirements.

The level of liquidity and concentration varies between the trading hubs and the substitutability of each will depend upon a participant's business strategy and access to transportation services. For instance, a large exporter may not see southern hubs as substitutable for gas delivered at Wallumbilla, however, a trader may see all hubs as substitutable when offering gas on the GSH.

Our approach

Assessment considerations

In assessing the performance of the GSH we have sought to identify the ways in which the GSH can deliver competition or efficiency benefits to the broader east coast gas market, and then consider whether the current arrangements are delivering against those aims.

We consider that a well-designed GSH can aid efficiency and competition by providing:

- **Efficient gas trading and delivery** – more opportunities to match buyers and sellers trading physical gas in the short to medium term and options to deliver gas more efficiently between regions.
- **Price transparency** – price signals that support price discovery and forward-looking decisions to more efficiently manage gas portfolios.
- **Access to market** – an accessible platform for new entrants to trade gas and for incumbents to find new trade partners.

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6 ACCC, Gas inquiry 2017–2025, interim report, Australian Competition and Consumer Commission, July 2022, pp. 81.

In assessing whether the GSH is delivering on these aims, we have considered a range of metrics:

- **Liquidity** – Factors that impact the ability for participants to exchange gas. This includes a participant's access to buying and selling in terms of the volume, timing, location and prices of gas available to trade.
- **Participation** – Whether participation reflects an accessible market and provides opportunities for a range of participants. This includes consideration of the number of participants using the GSH, the mix of participant types and their levels of trading activity.
- **Trading activity of participants** – How participants are using the GSH to buy and sell gas, how they are using the features and products available on the GSH, whether the GSH acts as a complement or substitute to bilateral trade and facilitated markets, and how this behaviour fits into the wider east coast gas and electricity markets.

Our Wholesale Market Monitoring and Reporting Guidelines[7] provide more information on our general approach to monitoring and reporting on the wholesale gas and electricity markets, including the structure-conduct-performance analytical framework. We have sought to apply this framework where relevant in this report. However, its application has more utility in broader market assessments than in the analysis of voluntary platforms like the GSH which form just one part of those markets.

Data analysis

The analysis in this report is based on data reported by AEMO on GSH gas trade between 1 January 2014 and 30 September 2024.

We classified individual participants into groups to avoid the disclosure of commercially sensitive market outcomes and information that might reveal future participant behaviour. The 3 groups are:

1. Exporters and producers
2. Industrials, traders and retailers
3. GPG gentailers

Industrials, retailers[8] and traders have been combined to ensure participant confidentiality. Broadly, the 3 groups represent participants with the greatest similarity in operations and possible incentives.

As a result of the breadth of the groups and the diversity among participants, trends at the group level are not always consistent between participants within that group. For example, producers with access to export facilities may exhibit different strategies to those that only

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7 AER, Enhanced wholesale market monitoring guideline, November 2024

8 Retailers are typically smaller by trade volume in gas markets than gentailers and don't buy gas for electricity generation.

supply domestic markets. However, given the relatively small number of active participants in the producer category, we have grouped them together.

Where possible and relevant, we describe diversity within each group without reporting specific data that would allow precise analysis of individual participant activities or outcomes.

Appendix A provides a comprehensive list of participants who are using the GSH in 2024 and their relevant groups.

Participant insights

To support our analysis of the market, we contacted a range of participants that had actively traded on the GSH to seek their views on how they use the GSH and whether they view liquidity and product offerings on the GSH as adequate for their needs. We received input from 18 individual participants, which represents two-thirds of total active market participants. The sample included representatives of the 3 participant groups and diversity in the size of participants and their levels of participation on the GSH.

We asked each participant a standard list of questions. The questions addressed the participants' use of the GSH, perceptions of the GSH compared with alternatives, perspectives on liquidity and any suggestions for how the GSH could be improved.

2 Liquidity and pricing on the Gas Supply Hub

Liquidity is both a source and product of competitiveness and efficiency in the gas market. Higher volumes and frequency of buying and selling help the market achieve an efficient price and allocate gas to its most productive use. In turn, this improves opportunities for further trading and new participants to enter the market. Higher levels of liquidity on the GSH has the additional benefit of improving transparency of gas trade by shifting gas from opaque contract-based arrangements to a centralised and publicly available platform.

Liquidity on the GSH has grown substantially since 2014 and the GSH is now a significant proportion of the wholesale gas market. The growth in quantities traded has also been significant in winter months, suggesting the GSH is supporting the efficient flow of gas from the north to overcome seasonal supply shortfalls in the south.

However, this picture largely relates to trade at Wallumbilla, with other hubs experiencing substantially less growth. Improved liquidity in these southern locations would likely support more efficient allocation of gas resources across locations and encourage participation from industrials and retailers. Given the time taken for the Wallumbilla hub to develop, it may take time for newer hubs to grow and be fully utilised by participants.

GSH trade has grown significantly at Wallumbilla

The volume and frequency of gas traded on the GSH has increased significantly and is on track to be higher again in 2024 (Figure 3).

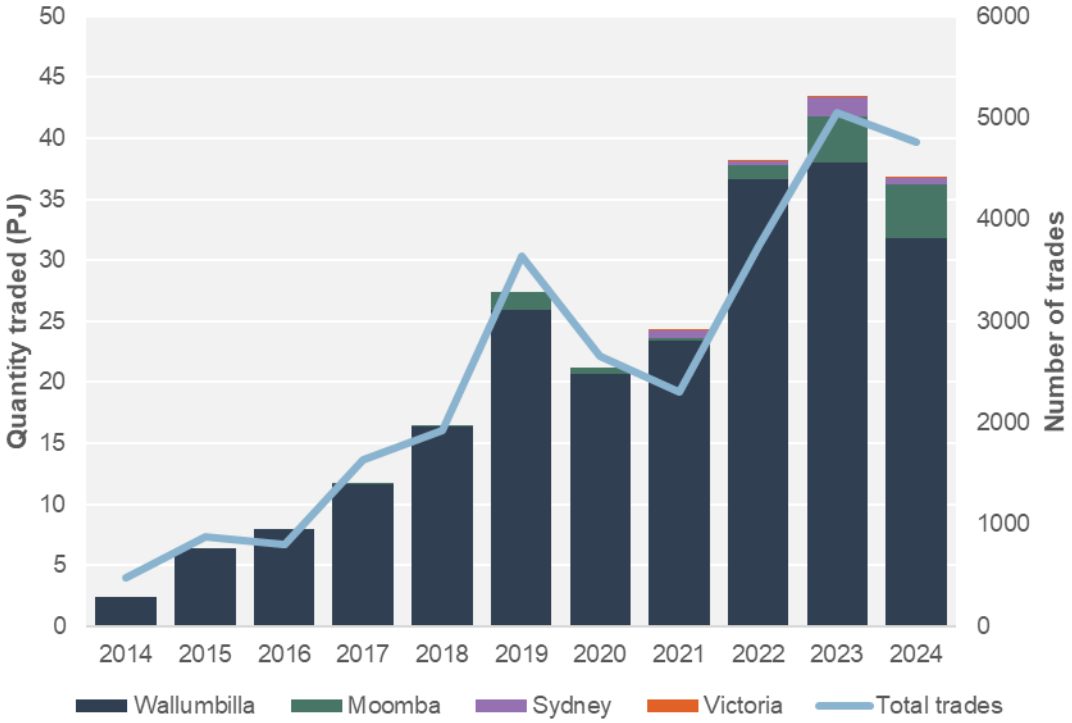
In relation to individual hubs:

- Clear majority of gas is traded at the Wallumbilla Hub, accounting for around 85% of trade.
- Trade on the Moomba hub was low and sporadic, however there are some indications Moomba is becoming more popular with a significant jump to over 4PJ traded in 2023 and 2024 on track to be higher.
- Wilton and Culcairn are newer additions to the GSH – however they remain seldom used, with volumes typically less than a 1 PJ a year.

AEMO is planning to include additional trading locations on the Eastern Gas Pipeline near southern production at Longford and at the Underground Iona Storage Facility. The proposed implementation of these trade locations is scheduled for 6 March 2025.[9] Participants have suggested these points would add considerable value to southern trading locations and may improve liquidity overall.

[9] AEMO, Amendment of Notice of determination, 4 November 2024

Figure 3 Quantity traded by hub location – 1 January 2014 to 30 September 2024



Source: AER analysis using Gas Supply Hub data.

To understand whether increased trade on the GSH reflects broader market trends or whether the GSH has become a larger proportion of overall trade, we have considered two measures:

- The churn rate for Wallumbilla which measures the proportion of gas flowing through the hub relative to the total gas flows in the region. This gives an indication of the GSH's size relative to total gas trade flowing through Wallumbilla (Figure 4).
- The level of domestic trade relative to net trade in other facilitated markets.[10] While it is not possible to identify trade intended for domestic use in the data, we can use a rough approximation by considering purchases that are not from exporters and producers (Figure 5).

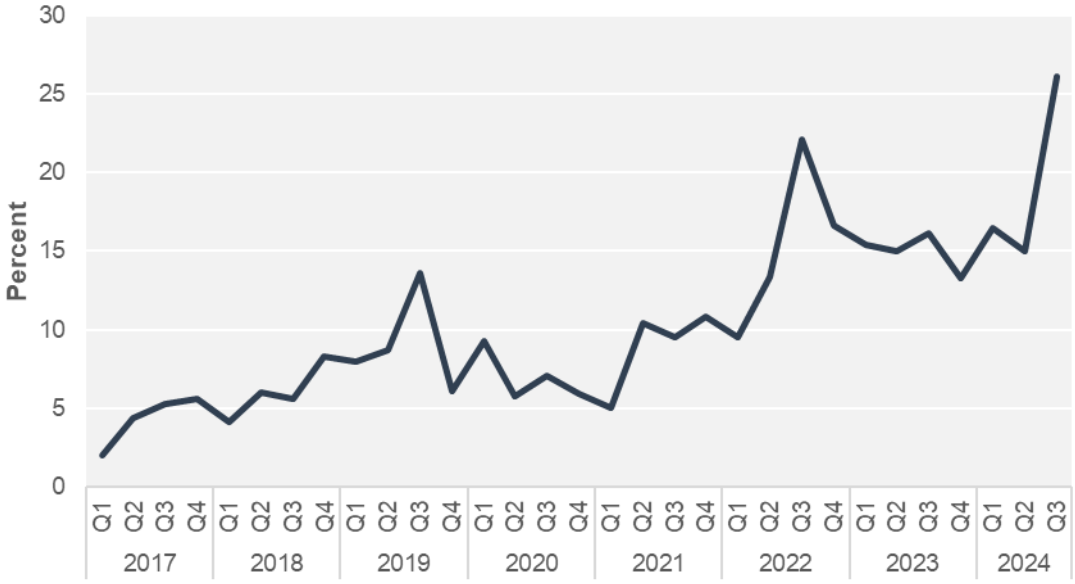
The GSH has grown considerably as a proportion of the wholesale gas market. The churn rate for Wallumbilla has averaged around 16% in recent years, and was at a record high of 26% in the third quarter of 2024.

Domestic demand on the GSH has also grown considerably, and in recent years has been surpassing net demand on the Victorian DWGM and Sydney STTM. While this will partly reflect the broader range of delivery timeframes available on the GSH (STTMs and the DWGM

[10] Net trade for STTM and DWGM facilitated markets captures the trade for spot gas, after netting scheduled buy and sell quantities based primarily on the underlying contracted gas that also flows through these markets.

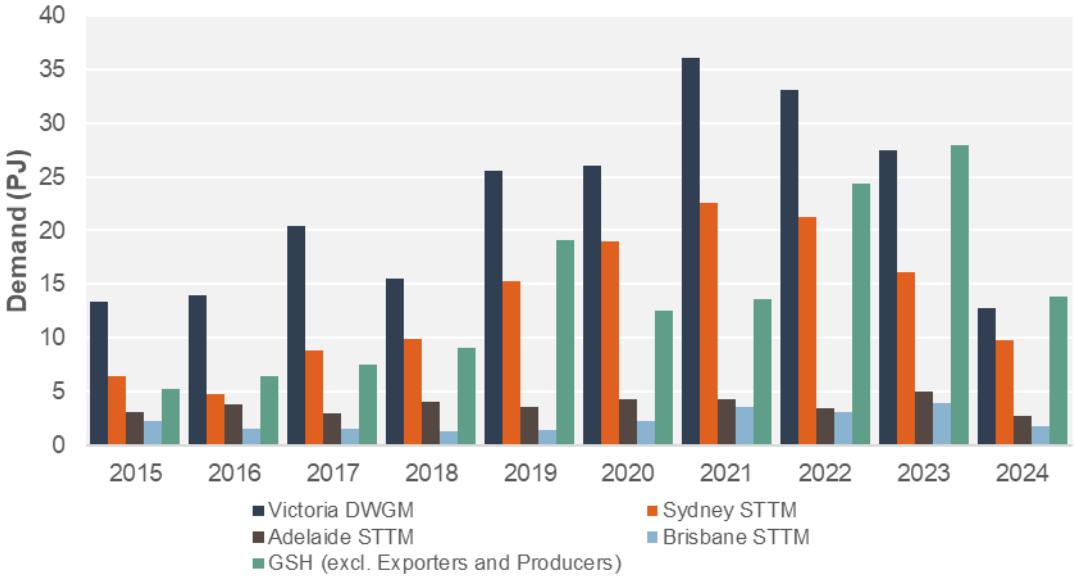
are exclusively spot trading), it nonetheless highlights the growing use of the GSH by participants to meet their demand.

Figure 4 Wallumbilla churn rate, 2017 to 2024



Source: AER analysis using Gas Supply Hub data
Note: The churn rate represents the proportion of gas traded at each hub relative to the total gas supply in each region.

Figure 5 East coast gas demand, 1 January 2015 to 30 September 2024



Source: AER analysis using Gas Supply Hub data

The GSH supports gas trade between north and south markets

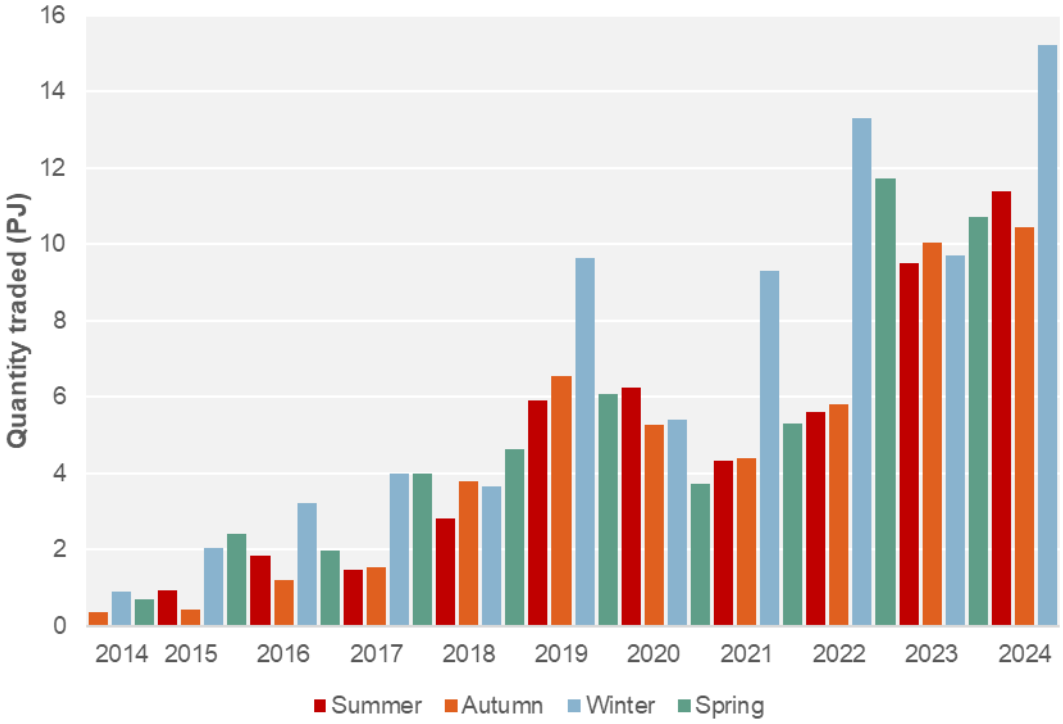
Gas traded on the GSH often follows a seasonal trend that supports efficient commodity trading between north and south markets. In winter months, gas will flow in higher volumes

from production facilities in Queensland down to demand centres in the south (to meet residential heating demand). On the GSH, a majority of gas is delivered to the Wallumbilla hub by exporters and producers supplying domestic customers who will transport the gas to major demand centres, largely in the south.

Seasonal dynamics have been evident on the GSH over most years and since 2019 the gas delivered in winter has been significantly higher, suggesting the GSH is supporting flows south (Figure 6). This increase also coincides with the introduction of the Day Ahead Auction which has also likely complemented trading on the GSH.

However, since 2023 there has also been substantial growth in all seasons. This may be partly due to the growth of LNG demand during summer (the northern hemisphere's winter) that has led to greater gas flows north that may have increased demand at Wallumbilla.[11]

Figure 6 Total gas traded in winter, summer and shoulder months by delivery date, 1 January 2014 to 30 September 2024



Source: AER analysis using Gas Supply Hub data

[11] AER, State of the Energy Market 2024, Australian Energy Regulator, p. 180

Prices on the GSH are comparable to the broader gas market

Growth in liquidity on the GSH should support price efficiency because higher levels of buying and selling will lead to prices being bid down to a level more closely reflecting underlying costs.

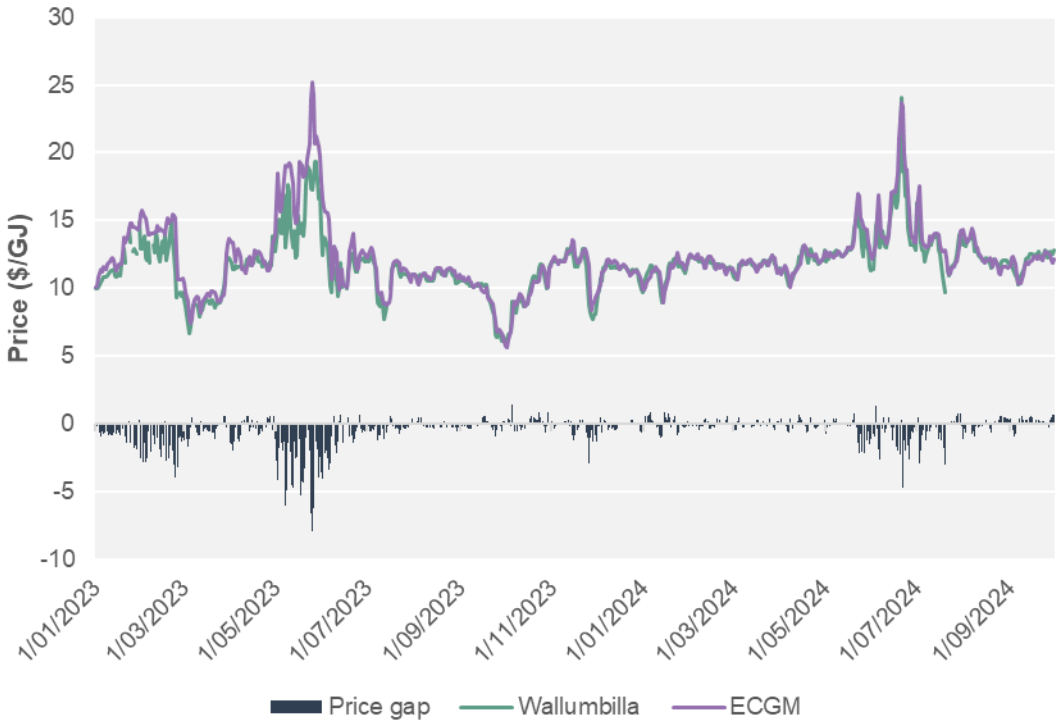
To assess price efficiency, we compared prices on the GSH with average prices in the wider wholesale gas market. While it is outside the scope of this report to consider the cost-reflectiveness of prices in the entire wholesale market, any observed differences with the GSH may indicate the platform is not performing efficiently given the relative maturity and size of other facilitated markets (noting that some discrepancy is to be expected where it reflects different trading structures and product offerings).

A comparison of prices in spot markets with equivalent products on the GSH shows that the GSH has been providing comparatively efficient prices (Figure 7). Prices have been closely aligned in recent years, with a price gap typically less than $0.5 per gigajoule, which likely reflects the transport premiums between Wallumbilla and downstream markets.

The price gap grows and GSH prices are lower during high price events. Over winter in 2023 and 2024, the higher price gap was likely due to cold weather combined with supply constraints at Longford that put comparatively more upward pressure on prices at key demand centres in the south. This differential was larger during 2023, likely due to the additional constraints on the Moomba to Sydney Pipeline that restricted cheaper gas being offered into downstream markets.[12]

[12] AER, Wholesale Markets quarterly – Q2 2023, Australian Energy Regulator, p. 12.

Figure 7 East coast gas price comparison, spot and day-ahead for 2023 and 2024



Source: AER analysis of Gas Supply Hub, Short Term Trading Market and Victorian Declared Wholesale Gas Market data.
Notes: The East Coast Gas Market (ECGM) and Wallumbilla prices are volumed weighted averages. The ECGM is a simple average across Brisbane, Sydney and Adelaide STTM's and the Victorian DWGM. The Wallumbilla price is on-the-day and day-ahead prices for on-screen and off-screen trades at the Wallumbilla hub.

New deliverable futures contract may support a more robust forward price

Liquidity and efficient pricing on the GSH provides participants confidence in using financial products that are settled by reference to physical trades on the GSH. Financial products can improve access and efficiency in the gas market by providing further liquidity and robust forward prices. This can help participants negotiate contract prices more transparently, manage their exposure to price volatility and provide greater investment certainty.

In August 2024, a new Wallumbilla deliverable futures contract was introduced on the ASX. This product allows participants to trade a futures contract that transfers into a monthly GSH product at expiry, requiring physical delivery of any open positions held at that time. By requiring a physical trade to occur, basis risk[13] is reduced because participants are able to

[13] Basis risk is the difference between the price of the futures contract and the price of the underlying asset at the time of settlement. In the case of a gas futures contracts using gas spot prices as a reference, this would mean the difference between the price agreed to for a futures contract and the gas spot price on the day of settlement.

trade using the underlying GSH price and the guarantee of a physical trade gives confidence for future cash flows.

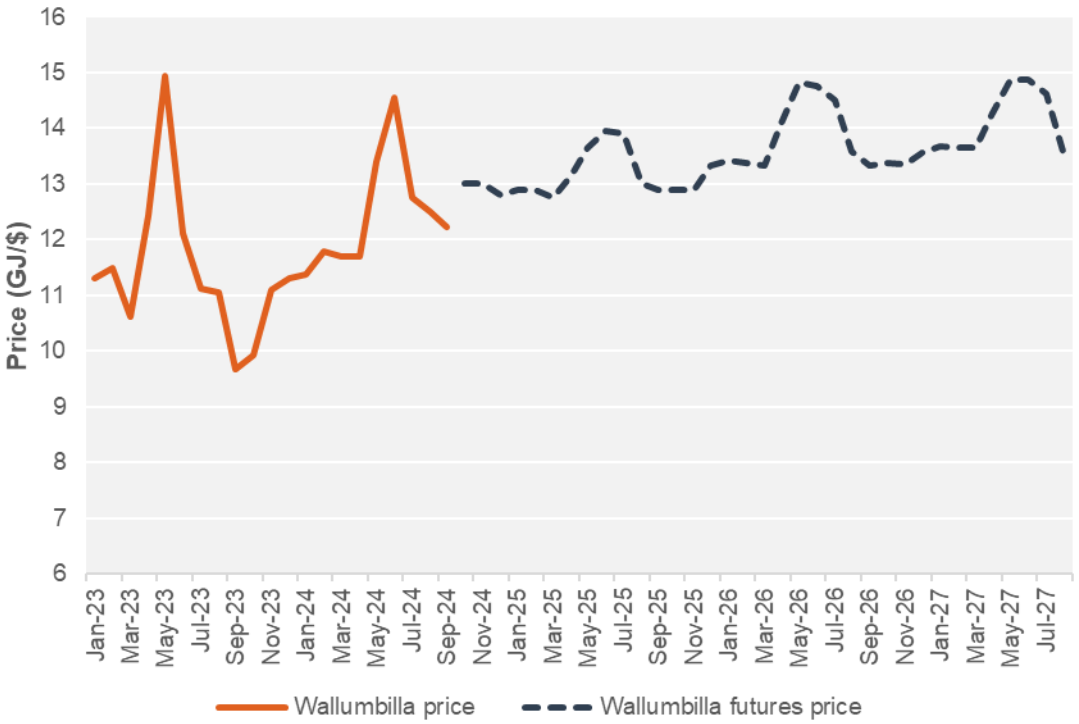
The product replaces a previous cash-settled version that used the Wallumbilla hub benchmark as the reference price, introduced in 2015.[14] The product was not traded and ultimately delisted in 2022 due to concern by participants that low levels of liquidity on the GSH created significant risks in relying on physical trades and the benchmark price.[15] Feedback from participants suggests there remains little confidence in using the benchmark price, with many participants indicating that they prefer to use alternative price data to guide their business decisions, such as STTM prices or broker price curves.

There has been a small but growing volume of trade in the new futures product, with forward prices on gas now established three years out (Figure 8). While it is too early to evaluate performance of the new product, early trade is promising. Growth in liquidity of the new product could have several benefits for the wider gas market by improving risk management, price transparency and access to physical gas.

14 The Benchmark price is published daily by AEMO and is calculated using a volume weighted average of on-screen, day-ahead prices at the Wallumbilla hub. In determining the price, AEMO only considers trades of at least 5 terajoules and if there are not trades that fit this criteria on a given day, bids and offers displayed on the screen for at least 5 minutes are used instead.

15 DCCEEW, Options to advance the east coast gas market, 2021, p. 70.

Figure 8 Wallumbilla gas price and futures price, 2023 to 2027



Source: AER analysis of Gas Supply Hub and ASX data.
Note: The Wallumbilla price is a volume weighted average of all prices at the GSH Wallumbilla hub trading location. The Wallumbilla futures price is the settlement price for the futures product calculated daily by ASX and shows data reported on 30 September 2024.

Many participants indicated they intended to use the product or were interested in using it and noted it would be a helpful in managing risk. However, some noted that their participation would depend on the liquidity of the product. Participants also noted two potential constraints in the uptake of the product:

- Many participants do not have the systems, resourcing or internal mandate to trade in financial products on the ASX. While this may not be a long-term barrier if the product is valued, it will likely constrain growth in the short-term.
- Given the futures contract is tied to a netted monthly product, trade may also be constrained by broader concern with the anonymity of netted trading (chapter 6).

3 Access and participation on the Gas Supply Hub

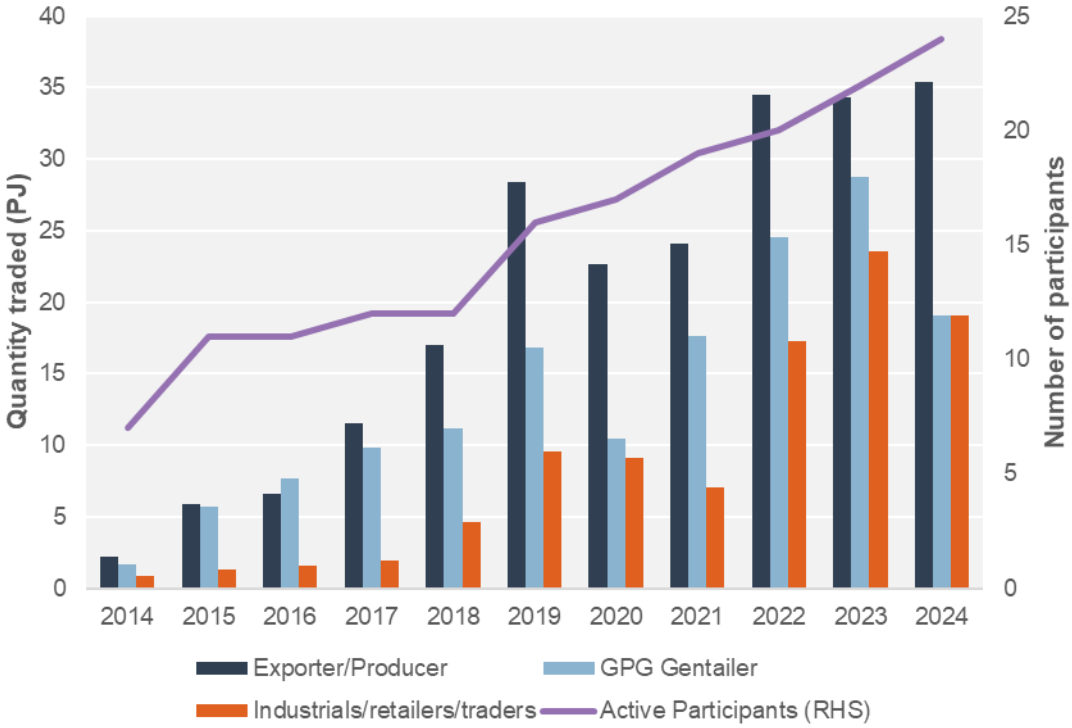
The number of participants using the GSH has steadily grown alongside growth in liquidity. While participant groups are skewed towards large exporters, producers and GPG gentailers, our analysis suggests participation is driven by trading preferences and the usefulness of hub locations, rather than by any significant barriers to participation. Growth in participation on the GSH has also led to a decline in market concentration and it is now lower compared to other facilitated gas markets.

More participants are using the GSH across most participant groups

Growth in liquidity is partly driven by increasing participation on the GSH, both in terms of the number and type of participants.

The number of participants has steadily increased since 2014 across all participant groups, with 24 active participants trading on the GSH in 2024 (Figure 9). While most trade in the early years of the GSH was between exporters, producers and GPG gentailers, in recent years, traders and industrials have also traded in larger quantities.

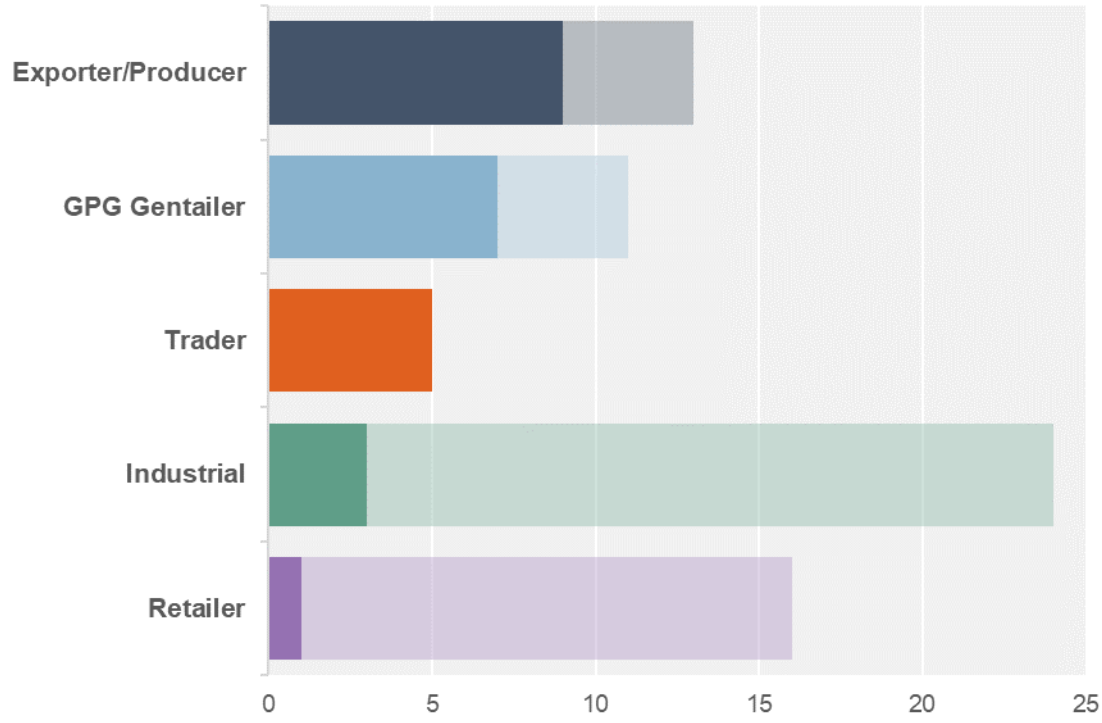
Figure 9 Active participants and trade by participant group, 1 January 2014 to 30 September 2024



Source: AER analysis using Gas Supply Hub data
Note: We consider a participant 'active' if it makes at least 12 trades in a year. Quantity traded is double total traded quantity on the GSH because it includes buying and selling from each participant.

Figure 10 compares the number of participants using the GSH (bolded line) with the number of participants operating in the wider facilitated markets (transparent line). Exporters, producers, GPG gentailers and traders are all now well represented on the GSH relative to the broader wholesale market. Industrials and retailers have seen some growth in recent years, but only a small proportion are represented relative to the wider market.

Figure 10 Profile of gas market participants using the Gas Supply Hub in 2024



Source: AER analysis using Gas Supply Hub data and gas bulletin board data

While there may be opportunities for greater participation among industrials and retailers, there are several potential reasons for the under-representation:

- Upstream trade is likely further away from their customers compared to downstream spot markets.
- These groups include a larger number of small participants without the relationships or trade expertise to engage in trade on the GSH.
- These groups may prefer longer-term contracting to minimise supply risk, particularly smaller participants with fewer options to manage risk.

It is also likely that some retailers and industrials are indirectly participating in trade on the GSH by using traders, GPG gentailers or brokers that act as aggregators for multiple smaller participants.

The growth that has been evident in recent years for industrials largely reflects a small number of participants with business interests located near the trading hubs. Further growth in participation of this group may depend upon growth in liquidity for southern hub locations and the expansion of the GSH to additional locations closer to demand centres (Chapter 2).

Market concentration has been declining

To determine participant concentration we have considered participant shares in buying and selling and estimated the Herfindahl-Hirschman Index (HHI).[16] HHI is a commonly used measure of market concentration in competition analysis. However, in the context of the GSH this measure should be interpreted with care as participants are not solely reliant on the GSH to source gas. High levels of concentration could reflect the greater value some participants place on using the GSH for trade, and conversely low levels of concentration could reflect participants trading on the GSH out of necessity due to higher barriers to entry in other areas of the market.

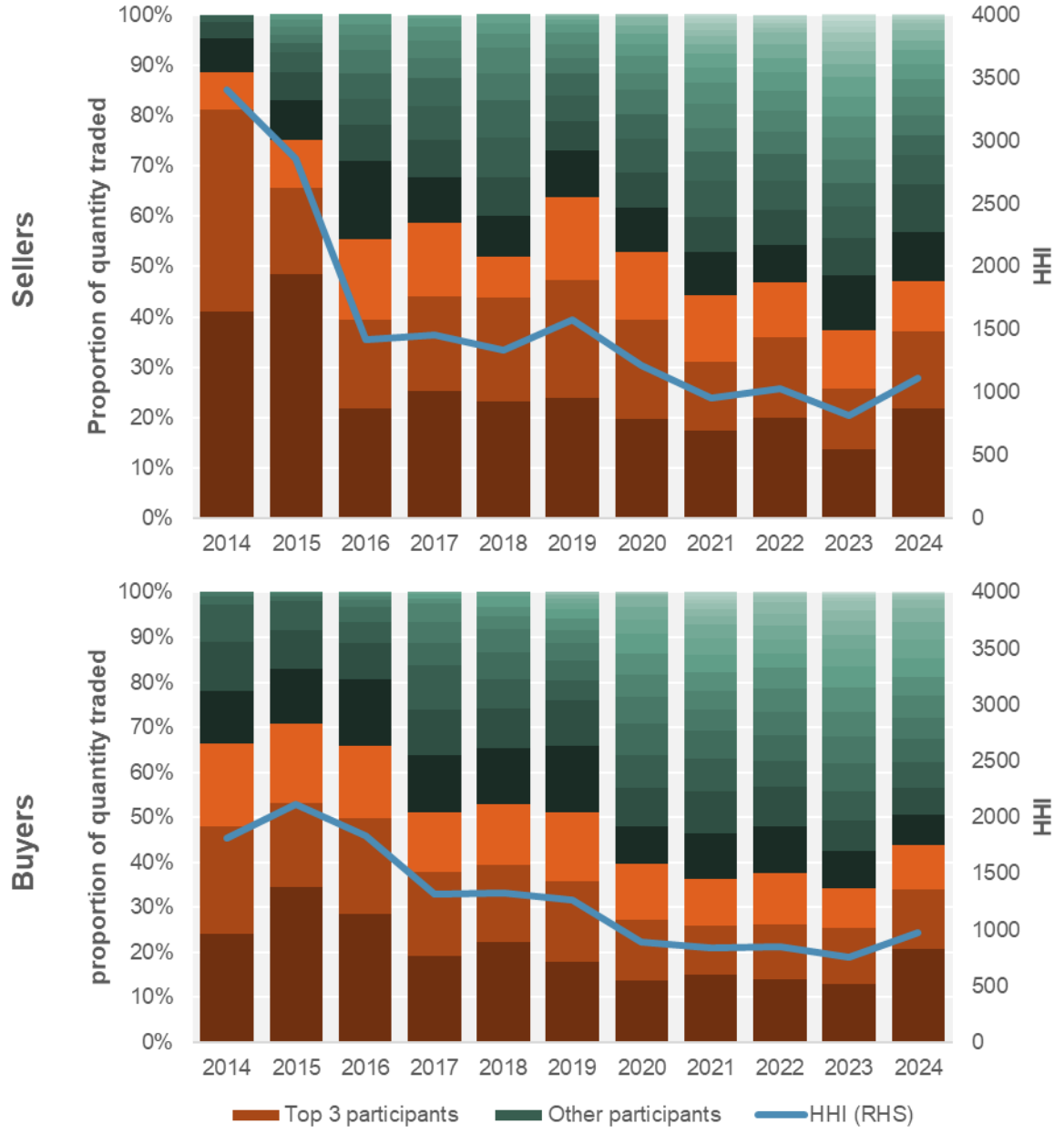
Nevertheless, HHI can be useful in providing a simplified measure of market participation and provide insight as to how this is changing overtime. Lower levels of concentration among buyers and sellers reduces the risk of liquidity shocks and give participants greater certainty in transacting on the platform.

Market concentration has declined with increased participation and the level of concentration tends to be lower compared to other facilitated gas markets,[17] however the top three providers of liquidity still account for a significant proportion of trade on the GSH (Figure 11). The top three participants have varied over time for both buyers and sellers, likely reflecting the optional nature of the GSH. However, the supply of gas has tended to be dominated by a few large exporters and producers, which likely reflects the GSH's proximity to production and LNG facilities that makes trade for these participants more useful.

16 The HHI of the GSH is derived from calculating the sum of squared share of capacity won across all facilities for all participants that year. HHI can range from zero (in a market with many small firms) to 10 000 for a monopoly. The US Federal Energy Regulatory Commission merger policy thresholds broadly categorise an HHI below 1000 as not concentrated, an HHI of 1000 to 1800 as moderately concentrated, and an HHI above 1800 as highly concentrated.

17 AER, State of the Energy Market 2024, Australian Energy Regulator, p. 185.

Figure 11 HHI and participant buying and selling by trade proportion, 1 January 2014 to 30 September 2024



Source: AER analysis using Gas Supply Hub data
Note: Each colour shade in the bar graph represents the trade proportion of an individual participant. The HHI of the GSH is derived from calculating the sum of squared share of quantity traded for all participants that year. HHI can range from zero (in a market with many small firms) to 10 000 for a monopoly. The US Federal Energy Regulatory Commission merger policy thresholds broadly categorise an HHI below 1000 as not concentrated, an HHI of 1000 to 1800 as moderately concentrated, and an HHI above 1800 as highly concentrated.

Some participants report trading fees and prudential requirements discourage participation

Participants were largely positive about their experience using the GSH and no major barriers to participation were reported. However, many participants noted that the structure of trading fees and prudential requirements may play a role in limiting growth of the platform.

Many participants suggested that variable fees[18] added up significantly and played a part in preferencing trade under contract arrangements rather than on the GSH. In particular, it was suggested that variable fees are limiting liquidity of long-term products and swaps that typically involve larger volumes and therefore incur larger variable costs. Some participants also suggested that high variable fees can lead to inefficient trading. For instance, a participant might use a monthly product despite trading slightly fewer days, rather than the daily product that would incur higher variable fees.

Participants also suggested that prudential requirements can act as a barrier to participation, particularly for long- and medium-term trades. Prudentials are largely viewed by participants as a positive feature of the GSH. Stakeholders noted that credit requirements and settlement services with a trusted counterparty can facilitate trades between participants without an established MGSA that may otherwise have been too risky or burdensome to manage through contractual arrangements. However, some features of the prudential system were seen as a barrier to greater uptake of trade:

- Separate prudential requirements across AEMO-facilitated markets were viewed as overly burdensome and likely limited the level of cross-market trade. It was suggested that this was particularly difficult for smaller participants to manage.
- Long- and medium-term trades involve larger volumes of gas and the prudential requirements are typically larger than what is required for a GSA.

Participants recommended combining prudentials across AEMO-facilitated markets so that a net position is taken into account. This proposal has been explored in a previous government review of the east coast gas market and is being progressed.[19]

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18 GSH participants pay $0.03/GJ for daily products, $0.02/GJ for weekly products and $0.01/GJ for monthly products.

19 Energy Ministers' Meeting, Summary of measures: Priority reforms for a more secure, resilient and flexible east coast gas market, 2022.

4 Price discovery and on-screen and off-screen trading on the Gas Supply Hub

The GSH provides participants the option to trade on-screen by anonymously submitting bids and offers for products to be matched on the exchange at nominated prices or off-screen using existing bilateral arrangements to trade products with standard terms settled through the exchange.

On-screen trading aims to promote transparency and price discovery in the gas market by providing visibility of prices being offered on the platform and the ability to engage anonymously in negotiating on these prices. While off-screen trade is struck bilaterally and typically without the visibility of the market, it has the benefit of flexibility in trade negotiations and conditions with the counter party.

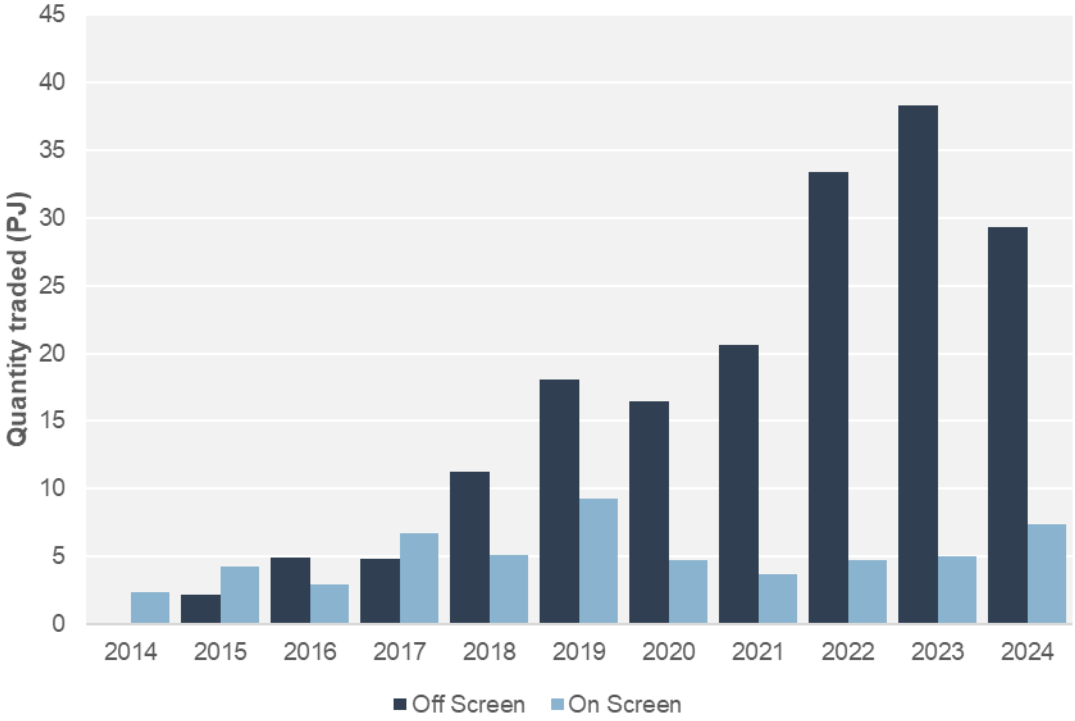
Off-screen has become the preferred method for trade on the GSH. This is likely due to the established systems and relationships participants have in place to trade bilaterally, the ease and flexibility it can provide and the increase in broker facilitated trade. The rise of off-screen trade has not supported exclusive trade among market incumbents, on the contrary off-screen trade appears to be supporting a larger number of trading relationships between participants.

Despite the relatively small volumes of gas traded on-screen, we also find evidence that on-screen trade has nonetheless supported price discovery and frequent short-term trading in smaller volumes.

GSH growth is driven by increasing use of off-screen, broker facilitated trade

Since 2018 there has been significant growth in off-screen trade and this accounts for almost all growth in traded volumes on the GSH since 2021 (Figure 12). While on-screen trade has not grown over the same period, the volume traded has remained around 5 PJs a year.

Figure 12 Quantity traded by trade type, 1 January 2014 to 30 September 2024



Source: AER analysis using Gas Supply Hub data

Participant feedback highlighted several reasons for the popularity of off-screen trade:

- Bilaterally negotiated trade gives participants flexibility to meet preferences in price, volume and delivery arrangements that on-screen trade cannot provide. For instance, several participants noted that multi-leg, multi-participant trade, or conditional (swap) trades would only be possible to negotiate off-screen.
- Off-screen trade is the more direct alternative to short-term trading using MGSAs. Many participants noted that off-screen trade on the GSH allowed participants to engage in trades with counterparties they did not have an established MGSA with because it reduced credit risks. In some instances, off-screen trade was also preferred where volumes traded bilaterally weren't significant enough to warrant the additional processes required to trade using an existing MGSA and transaction notice.
- Participants regularly use brokers to trade gas and off-screen trade provides an avenue for this on the GSH, either registering trades that were pre-matched by a broker or having the broker facilitate and register the trades themselves.
- Participants may be using off-screen trade rather than on-screen due to concerns with anonymity. Trading positions can be revealed when delivery obligations are issued as part of the netting process for on-screen trades (chapter 6).

Participants suggested that the popularity of broker facilitated trading was a key reason for the growth of off-screen trade in recent years. In some respects, broker facilitated off-screen trade acts as an alternative to on-screen trade. Participants highlighted several benefits broker trades provide for trading efficiency and price discovery:

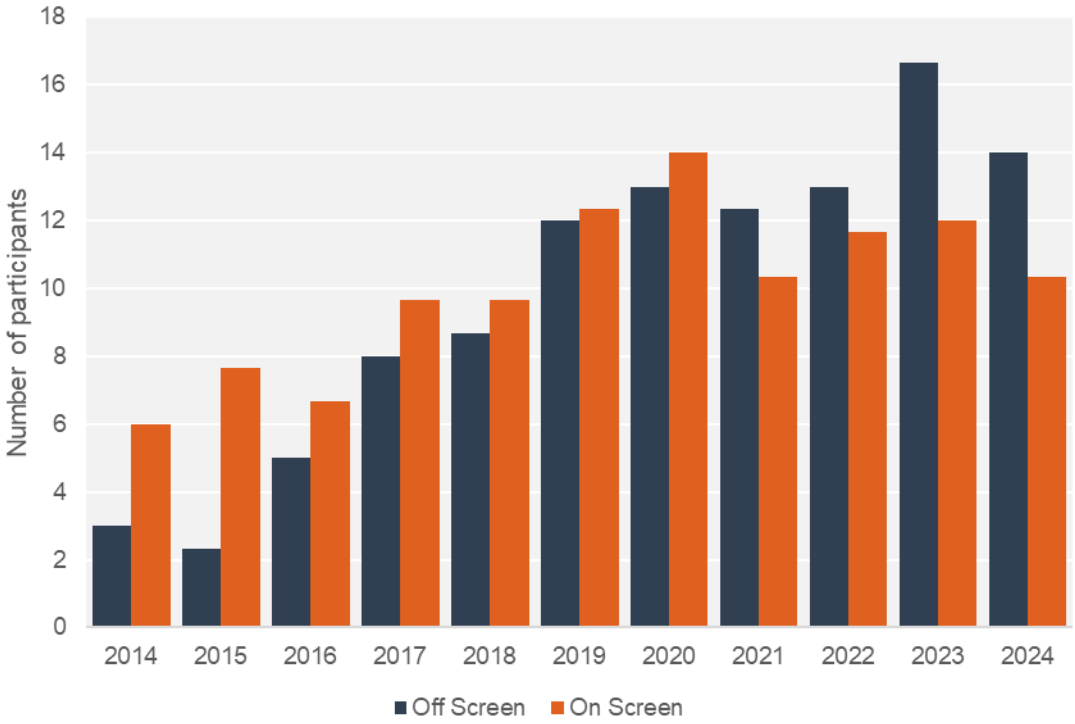
- Brokers can save time and resources through direct bilateral negotiation with counter-parties. The savings can be significant in comparison to constant, incremental price negotiation through bids and offers on-screen.
- Brokers help facilitate trades with bespoke structures or multiple parties involved. Participants often do not have the resources and/or are unwilling to take on the coordination risks of executing complex trades themselves.
- Brokers are trusted in managing commercially sensitive information which can give participants greater confidence in revealing their full position and matching more efficiently.
- Brokers can use their position to provide robust and trusted price signals. Participants reported using broker forward price curves to guide decision making and some suggested this is a more reliable price signal in comparison to prices reported through the GSH.

Trade partners are diverse on-screen and off-screen

There is a risk that the combination of relatively high levels of concentration and off-screen trading on the GSH could skew the benefits of growing liquidity towards a few large participants – while smaller or newer entrants who do not have established bilateral relationships may struggle to access the growing market.

However, this has not been the case – the number of counterparties trading with dominant suppliers of gas on the GSH has grown for on-screen and off-screen trades (Figure 13). While the top 3 sellers engaged a wider pool of counterparties on-screen in the early years of the GSH, this trend has reversed over time and there is now a larger number of counterparties engaged off-screen.

Figure 13 Average number of counterparties among top 3 sellers, 1 January 2014 to 30 September 2024



Source: AER analysis using Gas Supply Hub data

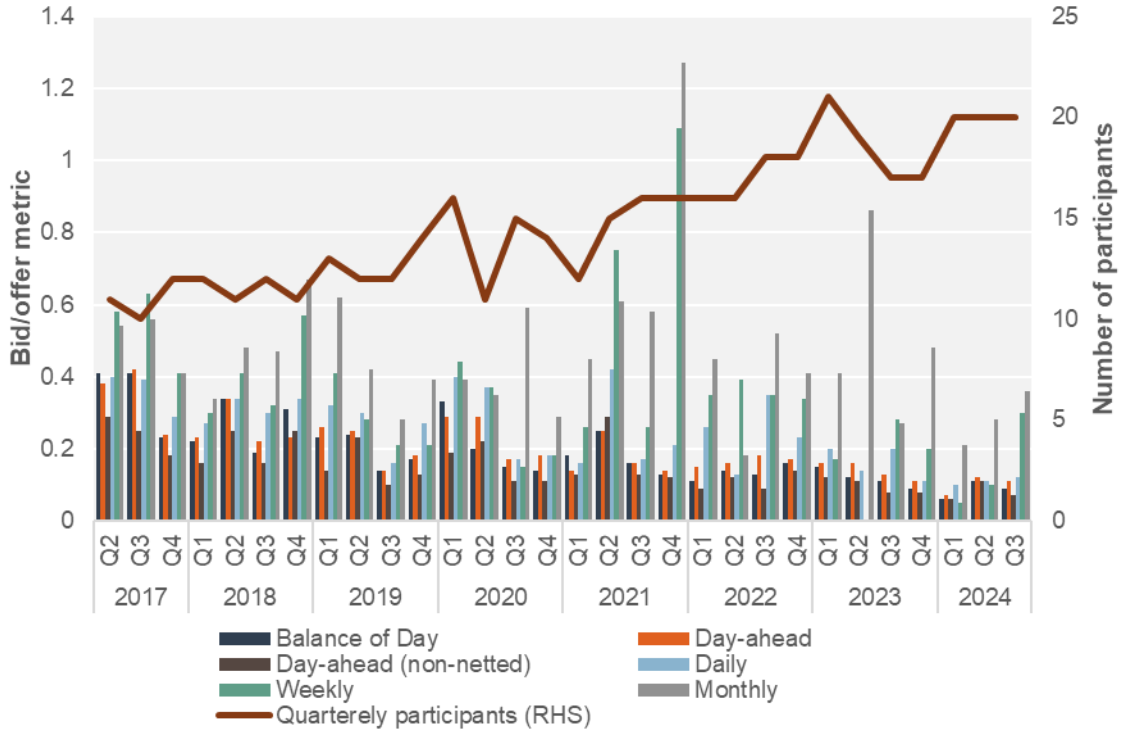
Despite lower volumes, on-screen trade continues to support short-term trades and liquidity is improving

While overall volumes traded on-screen have remained at a similar level, other measures suggest liquidity has still improved.

The bid/offer spread measures the difference between the highest bid (buy) and lowest offer (sell) for on-screen trade. A declining bid-offer spread on the GSH indicates higher levels of participation, which leads to greater price discovery and a declining margin between bids and offers.

Despite the lack of growth in on-screen trading, the bid/offer spread for short-term on-screen products at Wallumbilla have largely been declining (Figure 14). The number of participants trading on-screen has been growing steadily, suggesting that participants may be trading smaller volumes at a higher frequency.

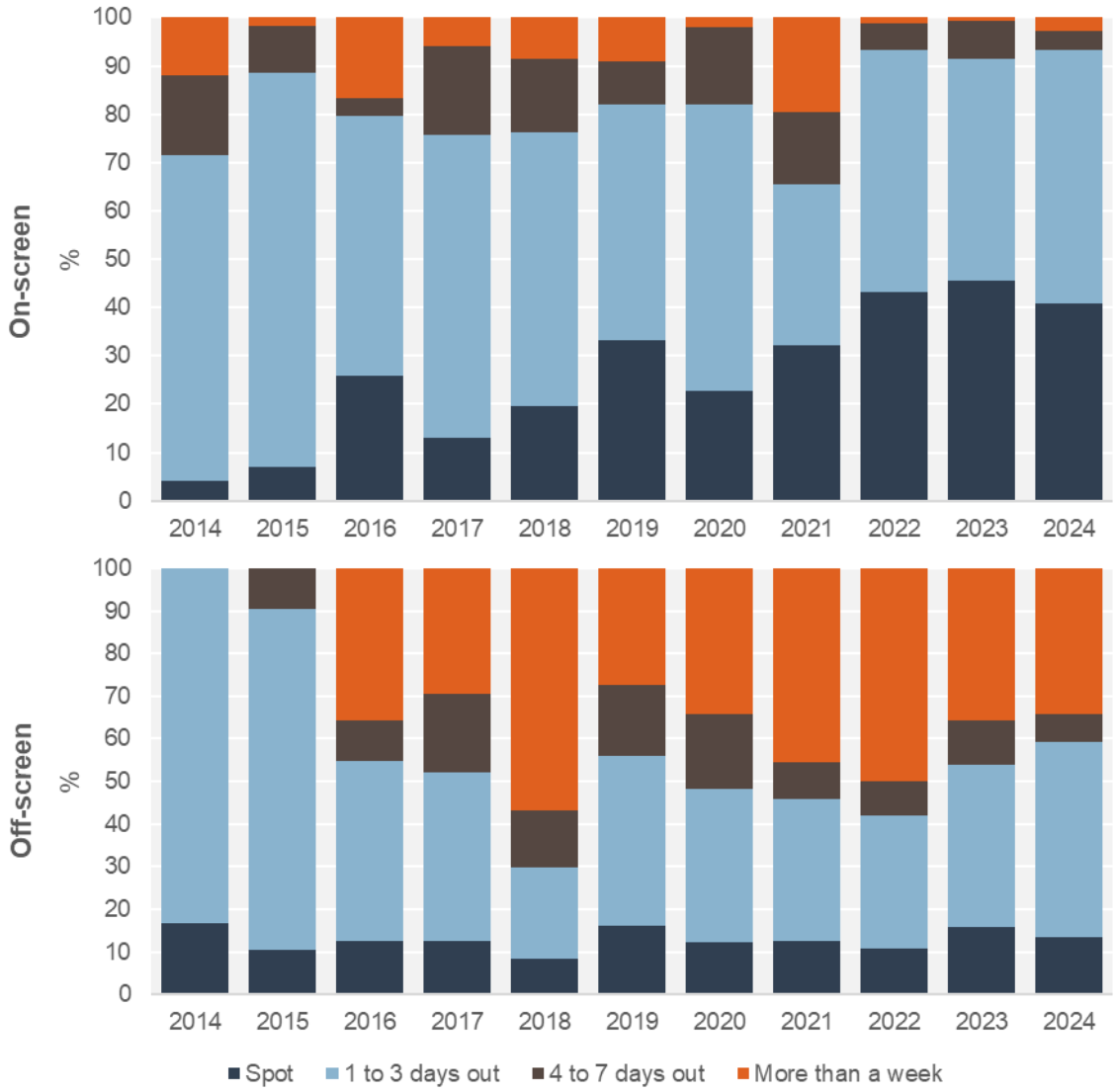
Figure 14 Bid/offer metric and monthly on-screen participants at Wallumbilla hub location, 2017 to 2024



Source: AER analysis using Gas Supply Hub data

On-screen trade tends to be used primarily for spot trading or near-term trade for delivery within three days, in comparison to off-screen trade that supports a variety of timeframes (Figure 15).

Figure 15 Proportion of trade by delivery date and trade type, 1 January 2014 to 30 September 2024



Source: AER analysis using Gas Supply Hub data

Several participants mentioned using the GSH on-screen platform to monitor bids and offers and look for opportunities where they arise. This suggests that despite lower volumes, on-screen trade is still providing a useful point of transparency for many market participants.

5 How participants are using the Gas Supply Hub

Our analysis of participant trading on the GSH suggests the platform is supporting efficiency of commodity trades in the wholesale gas market by providing participants more options to buy and sell gas to balance their contract positions and respond to changing market conditions.

The GSH primarily supports short-term trading to balance positions upstream. This serves a similar purpose to downstream spot markets with the advantage of a more diverse set of products that that allow participants to trade over a variety of short timeframes, typically for delivery within the week. However, there has also been substantial growth of gas traded for delivery weeks or months in advance which, unlike other facilitated spot markets, provides participants with options to manage positions or respond to changing market conditions over a longer timeframe.

Despite the flexibility of the GSH in comparison to facilitated spot markets, the GSH is still viewed primarily as a complement to long-term gas contracts rather than an alternative. Many participants suggested this was due to the greater flexibility a MGSA provides to tailor conditions that reduce risks over the long term and lower administrative costs in comparison to the GSH when trading larger volumes.

Participants use short-term trading to balance their long-term gas positions

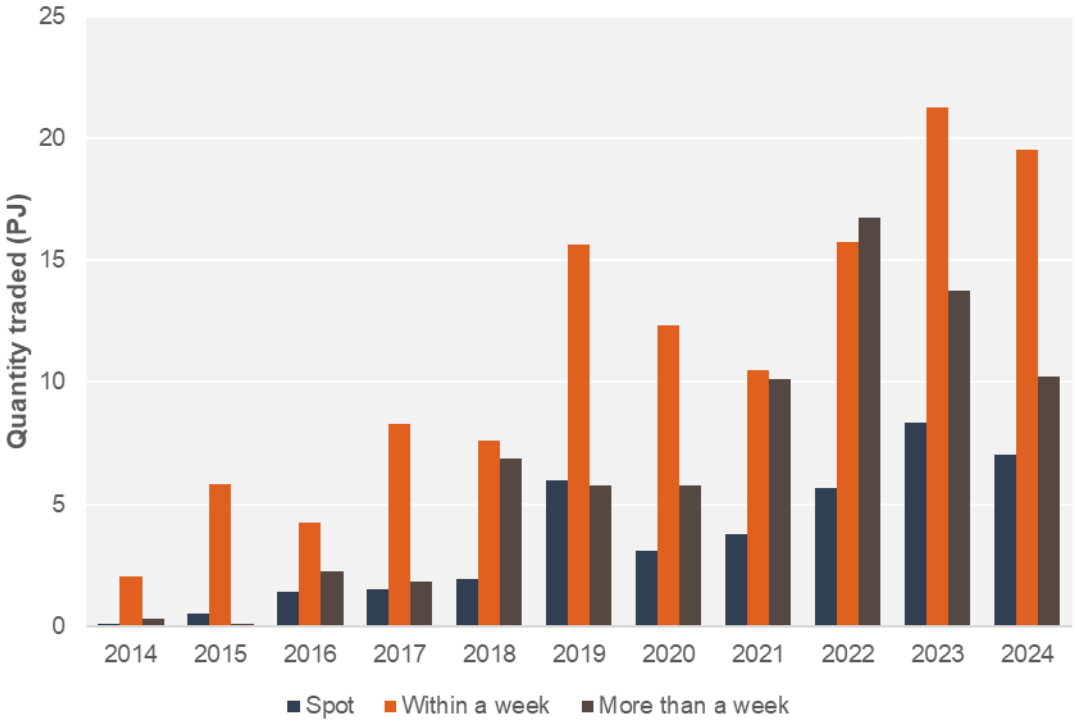
Participants can trade gas on the GSH up to a year out, which allows them to adjust long-term contract positions according to expected changes in demand and supply. Participants may need to adjust their positions in response to medium-term outlooks (for instance predicted demand heading into winter) or short-term outlooks (for instance sudden weather events or infrastructure outages restricting supply). Products on the GSH include a variety of lengths and delivery dates to give participants flexibility in managing their positions according to different needs.

The majority of gas traded on the GSH is for short-term delivery within a week (Figure 16). Nonetheless, there has still been considerable growth in longer term trading which has partly been driven by the introduction of daily strip trades. Strip trades allow participants more flexibility, providing the ability to bundle a string of daily products together over a selection of days, which can be traded further out (for delivery periods similar to monthly products).

Since 2023 there has been some decline in longer term trades and significant growth in short-term trades. Several participants suggested this is partly due to the Gas Price Order

introduced by government in 2022 and the subsequent mandatory Gas Market Code.[20] Under these arrangements, trades on the GSH for delivery within three days have been exempt from the price cap and price rules under the code and participants have suggested this has discouraged uptake of longer-term products that are not exempt. However, some individual participants have an exemption from the pricing rules for long- and short-term trades[21] and the shift towards short-term trades is likely influenced by a range of factors, including an increased preference for shorter term trading in response to the volatility of 2022.

Figure 16 Traded quantities by delivery time from trade, 1 January 2014 to 30 September 2024



Source: AER analysis using Gas Supply Hub data

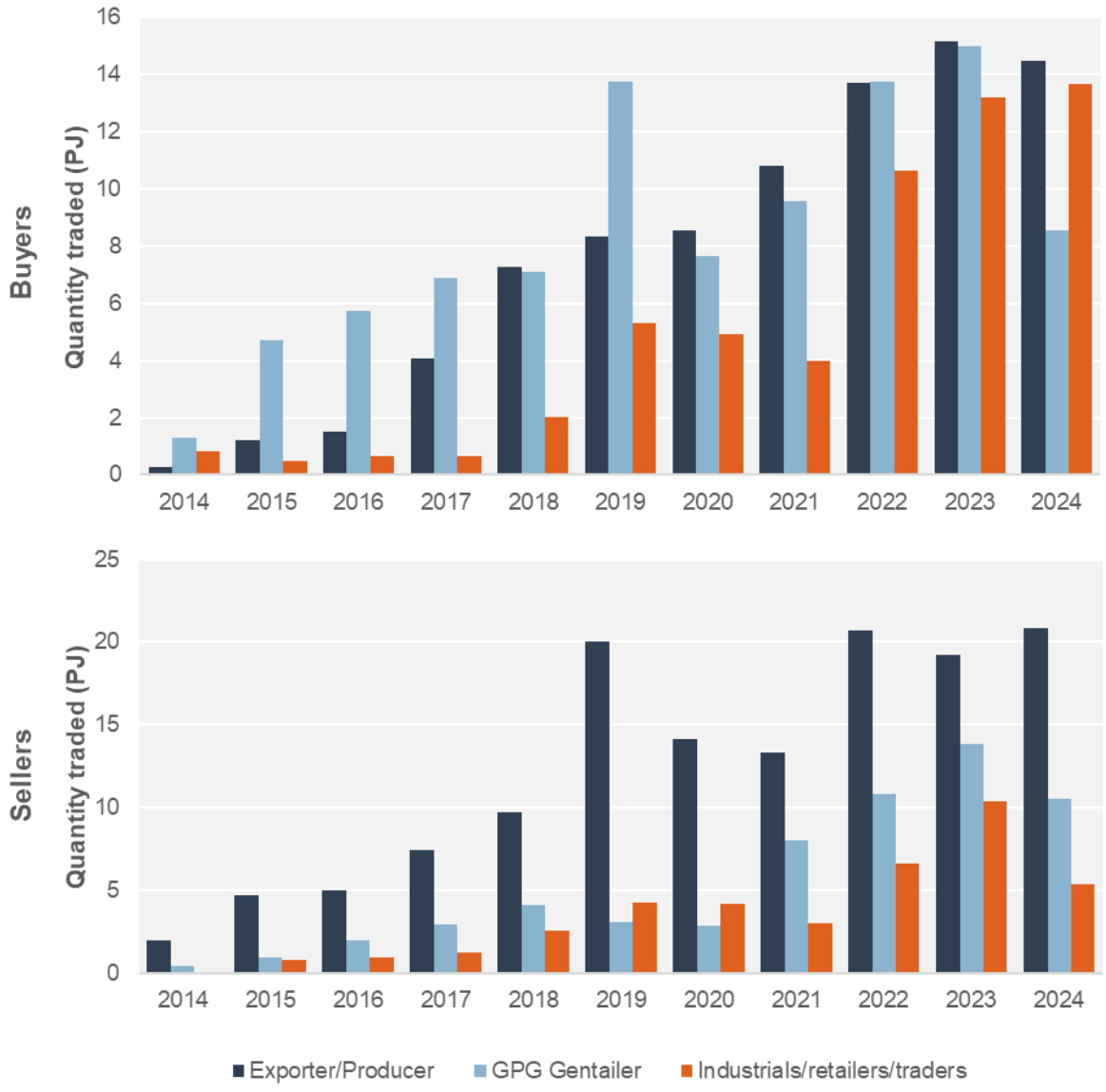
20 The Gas Price Order was introduced in 2022 as part of the Energy Price Relief Plan and implemented a $12 per GJ price cap. This was continued under the Gas Market Code, introduced in July 2023. See Department of Climate Change, Energy, the Environment and Water, Gas Market Code, Accessed 20 November 2024, Gas Market Code.

21 Small producers who produce less than 100 PJ of gas per year and who supply that gas to the domestic market are deemed exempt from the pricing rules. Also, suppliers can apply for a conditional Ministerial exemption from the pricing requirements of the code.

Participants are using the GSH to respond to changing market conditions

Changes in buying and selling by participant groups on the GSH suggest the platform is supporting participants respond to market events more efficiently (Figure 17).

Figure 17 Buying and selling on the GSH by participant group, 1 January 2014 to 30 September 2024



Source: AER analysis using Gas Supply Hub data

Exporters and producers sell large quantities of gas to GPG gentailers and significant shifts have occurred in recent years in response to supply and demand conditions in north and south markets:

- In 2019, there was a large increase in trade between exporters and producers and GPG gentailers. This was likely due to record high production in Queensland and high demand from southern markets to alleviate supply constraints and heating demands in winter.

- Since 2022 there has been a significant step-change in trade which is likely driven by the depletion of southern gas reserves requiring greater reliance from southern states on Queensland production.

Traders have also begun using the GSH more significantly from 2019 and are now a major provider of liquidity on the platform. Traders are likely arbitraging between north and south markets to move gas from places of low value to high value. The increase in trader activity on the GSH coincides with the introduction of the Day Ahead Auction, which has provided traders with access to cheap, short-term transport capacity and facilitates arbitrage.

GPG gentailers have been increasingly selling gas

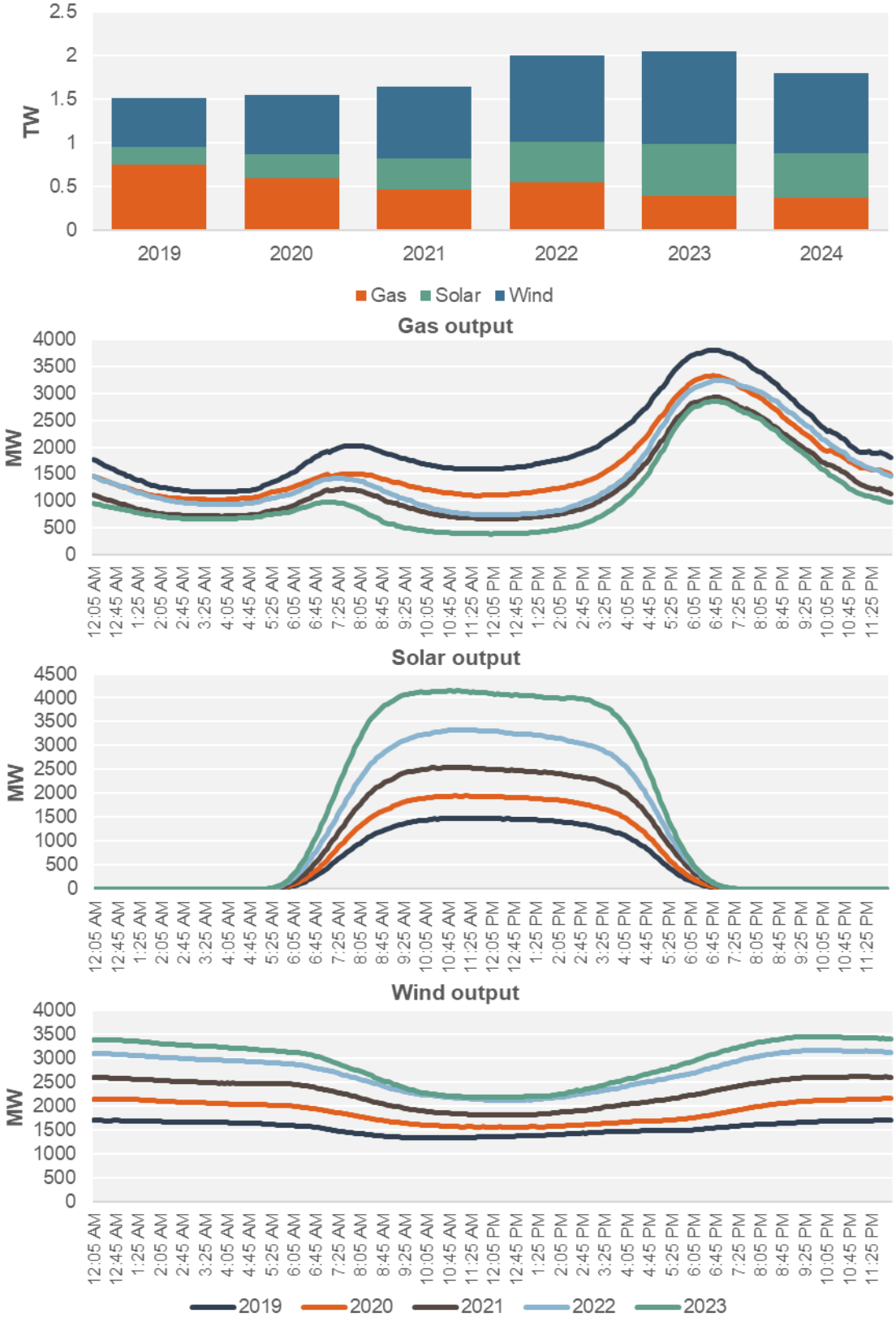
GPG gentailers historically buy gas on the GSH to adjust their positions for electricity generation or supply their retail customers. However, in recent years there has also been a significant shift in GPG gentailers selling gas onto the GSH (Figure 17). GPG gentailers may be adjusting their long-term contract positions by selling excess gas in response to growth in wind and solar generation that has reduced demand for GPG generation throughout the day (Figure 18).

While the shift from gas to wind and solar generation during the day began well before 2021, it does coincide with significant impacts to prices, with record high levels of negative prices during the day observed in 2021.[22] These dynamics would likely have impacted the profitability of GPG generation during the day and may have led to GPG gentailers selling gas previously contracted for generation through the GSH.

Other market events would also likely play a role in these shifts – for instance, changes to retail customer demand and contracted positions. These dynamics and the links between gas and electricity markets more broadly will be a priority for further exploration through our new gas wholesale market monitoring role. Using our new information gathering powers, we can also investigate the evolution of gas contracting more directly.

[22] AER, Wholesale Markets quarterly – Q4 2021, Australian Energy Regulator, p. 4.

Figure 18 NEM outputs by generation type, 2019 to 2023



Source: AER analysis using Gas Supply Hub and AEMO data.

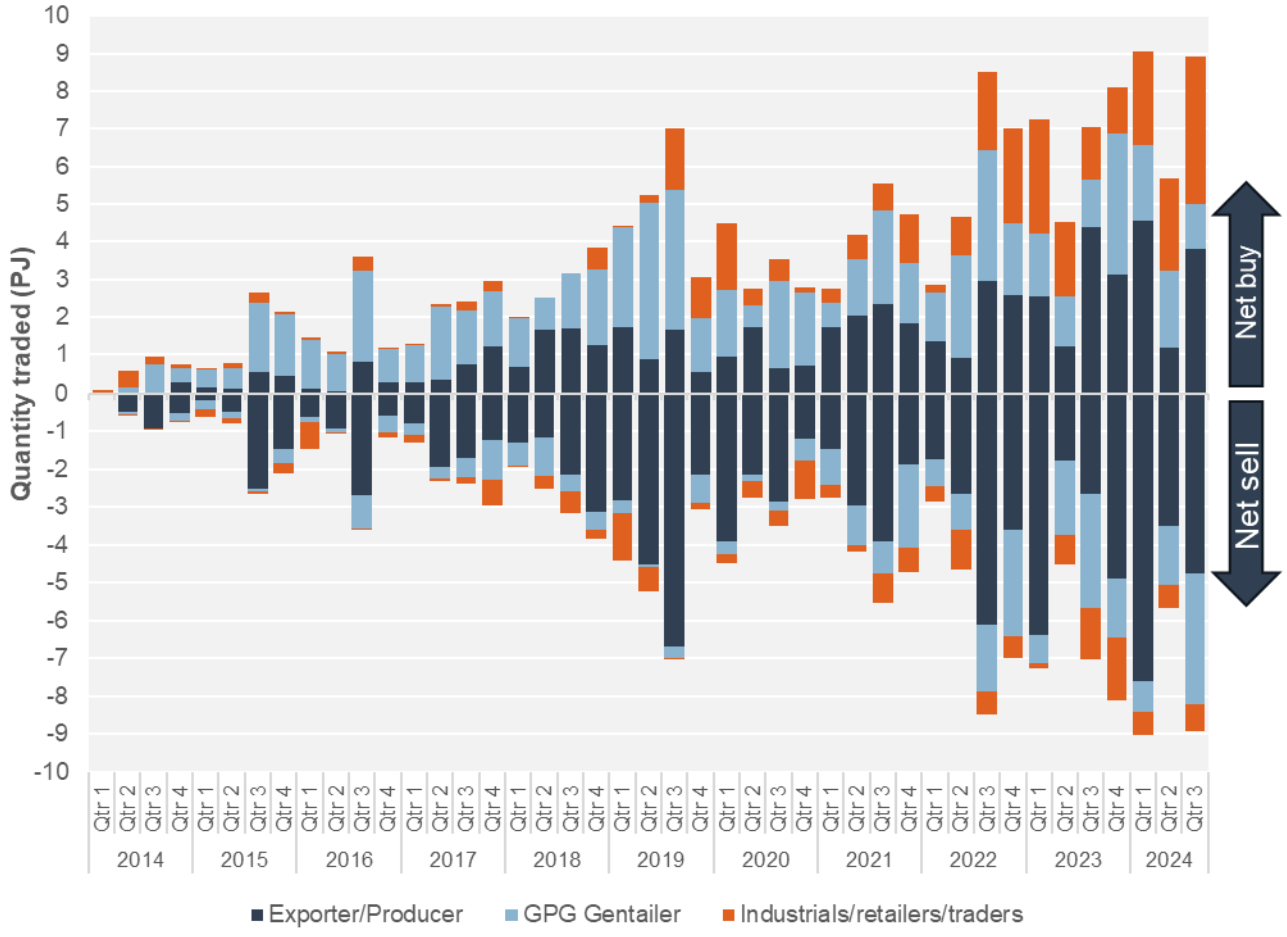
Use of the GSH has matured

As liquidity and participation on the GSH has grown, use of the platform to balance gas portfolios has matured. Participant groups increasingly include a mix of net buyers and sellers that reflect more varied use of the platform and responses to market conditions. Individual participants are also using the platform to balance and offset their positions in larger quantities.

Figure 19 shows net trade on the GSH, which measures the difference between each participants buying and selling to find their net position on a given day. For instance, a participant that buys 10 TJ and sells 5 TJ would have a net buy position of 5 TJ.

Most participant groups have trended towards a mix of net buyers and net sellers. In earlier years of the GSH, exporters and producers were predominantly net sellers and GPG gentailers were predominantly net buyers. While on balance this has remained true, both groups now include a mix of net buyers and sellers. Similarly, industrials, retailers and traders include a mix, however they have been predominately net buyers in recent years.

Figure 19 Net trade by delivery date and participant group, 1 January 2014 to 30 September 2024

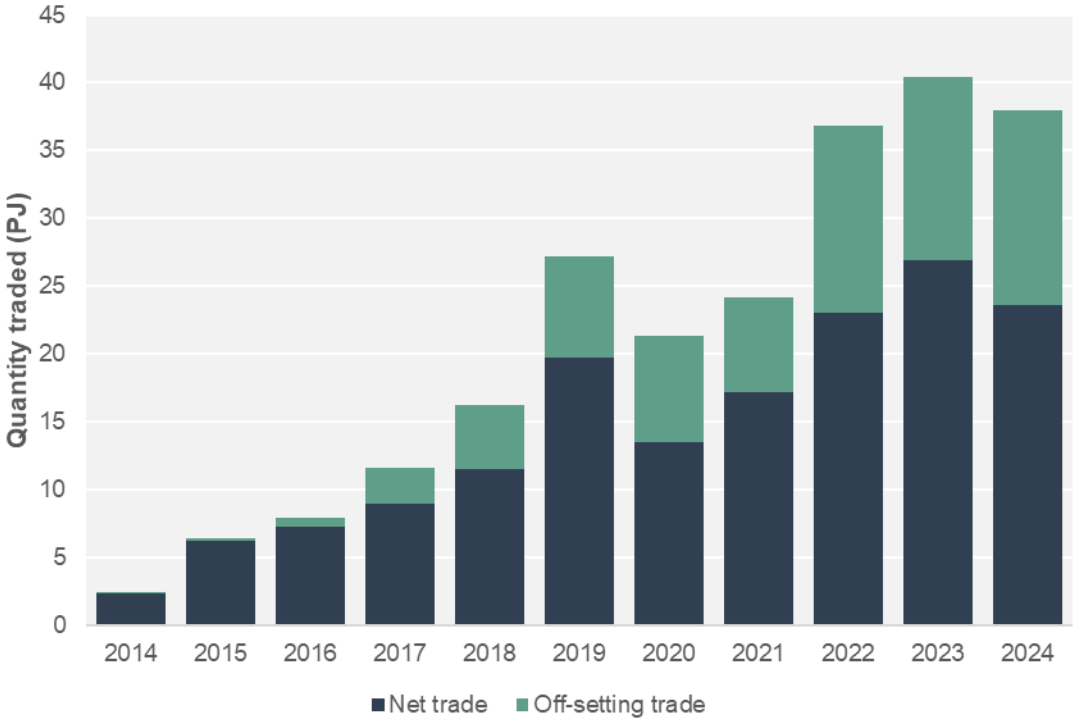


Source: AER analysis using Gas Supply Hub data
Note: The net trade measure aggregates the net buy and net sell position of each participant by group and therefore participant groups can have a mix of net buy and net sell positions in a given quarter.

There was very little offsetting trade in the early years of the GSH as most participants exclusively bought or sold on the platform (Figure 20). Offsetting trade measures the volume of gas that has been netted off by a participants position each delivery day.

This likely reflected the initial low levels of participation and narrow use of the GSH. However, over time participants have increasingly engaged in a mix of buying and selling each day, with offsetting positions that now make up around 40% of total trade. This trend may also reflect growth in location swaps. When participants swap gas, they create a buy and sell position at the trading locations where the gas is being swapped (Chapter 6).

Figure 20 Total trade by net and offsetting trade and by delivery date, 1 January 2014 to 30 September 2024



Source: AER analysis using Gas Supply Hub data

6 Gas delivery on the Gas Supply Hub

The GSH platform provides several mechanisms for participants to more efficiently deliver gas traded on the GSH. Swaps, spreads and netting delivery obligations reduce or remove the need for participants to physically deliver gas. These mechanisms can improve efficiency in gas delivery by avoiding unnecessary gas transportation costs and providing access to trading locations with constrained transportation capacity by bypassing pipelines entirely.

Feedback on the usefulness of these products varied between participants and depended upon their individual gas portfolios and transportation requirements. The development of an automatic and anonymised netting process would likely improve efficiency by further reducing the volume of traded gas that needs to be delivered.

Netting can improve efficiency of trade, but is not used by all participants

While all gas traded on the GSH is financially settled, not all of it needs to be delivered by participants. Through AEMO's netting process, participants only need to deliver on their net position each day (Box 6.1). This can make gas trade on the GSH more efficient because participants do not have to deliver any offsetting positions. Reducing the overall volume of trade that requires physical delivery also saves administrative costs associated with nominations, measurement and communication of actual gas deliveries.

Participants confirmed that netting benefits portfolio management and administration for some, particularly larger participants. However, it was also suggested that netting can add administrative burden because delivery obligations must be organised by participants on a daily basis rather than planned ahead of time. For instance, a participant who sells a monthly product must wait for GSH delivery obligations each day to make pipeline nominations rather than put through all nominations ahead of time. The additional administration burden can also act as a barrier for smaller participants who may not have the resources to manage daily delivery obligations. Participants also noted concerns with the anonymity of the netting process for on-screen trade, because a participant's position can be revealed when delivery obligations are issued. These issues are mitigated to some extent for off-screen trades because they provide participants the option to select non-netted versions of products that are eligible for netting.

Box 6.1 Netting of delivery obligations

Every gas day, AEMO matches participants with a net buy or sell position at each trading location to form a delivery schedule so that only participants with a net position will be issued a delivery obligation.

Example of daily delivery obligations determined by AEMO

The netting of delivery obligations is applicable to all Day-ahead (netted), Daily, Weekly and Monthly products, however off-screen, pre-matched trades at Wallumbilla and Moomba trade locations can use a non-netted version of the product.

There has been growth in gas eligible for netting, which means there may be room to increase the proportion of gas netted out of delivery obligations by reducing the administrative challenges faced by participants in organising daily delivery obligations. For instance, governments are progressing the implementation of an anonymous and automated delivery system for the GSH, which would allow delivery obligations to be managed by a central hub operator, rather than participants.[23]

[23] DCCEEW, Options to advance the east coast gas market, 2021, p. 30

Spreads and gas swaps also remove the need to physically deliver gas

The GSH provides two other options for removing the need to physically deliver gas between trading locations:

- A spread product introduced in 2017 that allows participants to trade gas between two locations while only financially settling the price differential between two locations, effectively the implied cost of transport. This provides an avenue for a participant to transfer gas from one location to another without needing transport capacity.
- Time and location swaps, which are not currently offered on the GSH as products but can be manually made by participants that agree to an identical set of buying and selling trades at different locations or time periods, allowing them to effectively swap ownership of gas without needing to deliver it.

The spread product has not been popular on the GSH and has largely declined since its introduction in 2017. Gas swaps may be more prevalent because they can occur off-screen (Chapter 4). However, because they are not tied to any official product on the GSH, it has not been possible to identify them accurately in the data. We have previously noted one example of a gas swap occurring on the GSH, due to the substantial volumes of gas involved.[24]

Participant feedback suggests location and time swaps may be quite prevalent on the GSH. Participants noted that they are often used when a MGSA is not available. Participants also noted that location swaps can provide significant efficiencies by avoiding transportation and time swaps may also improve trading over longer timeframes. We will investigate gas swaps further as part of the biennial gas competition report.

AEMO plans to introduce a swap product in 2025.[25] Participants were positive about its introduction, identifying potential benefits in lower prudential requirements and more accurate on-screen pricing signals. However, it was also noted that informal swaps will likely still play a part in trade on the GSH because many swaps currently occurring are conditional, multi-leg trades off-screen that can't be facilitated by a standardised product.

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24 AER, Wholesale Markets quarterly – Q1 2024, Australian Energy Regulator.

25 AEMO, Proposed changes to GSH Exchange Agreement, 2024

Appendix A – Gas Supply Hub participants by grouping

Exporters/ Producers	GPG Gentailers	Traders	Industrials	Retailers
Arrow Energy	AGL	Eastern Energy	Incitec Pivot	Ergon Energy
Australia Pacific LNG	Alinta Energy	Macquarie Bank	Infrabuild	–
GLNG	CleanCo	PetroChina	Orica	–
Santos	Origin Energy	SGMT	–	–
Senex	Pelican Point Power	Agora Retail	–	–
Walloons	Shell Energy Australia	–	–	–
Westside	Energy Australia	–	–	–
Beach Energy	–	–	–	–

Note: Participants in this list were active on the GSH in 2024. We aggregate traders, industrial and retail participants in our reporting for confidentiality reasons. CleanCo is not strictly a 'gentailer' in the NEM but is included in this grouping due to its gas-powered generation demand. One trader previously reported as a retailer has been updated to Trader.