National Electricity Market

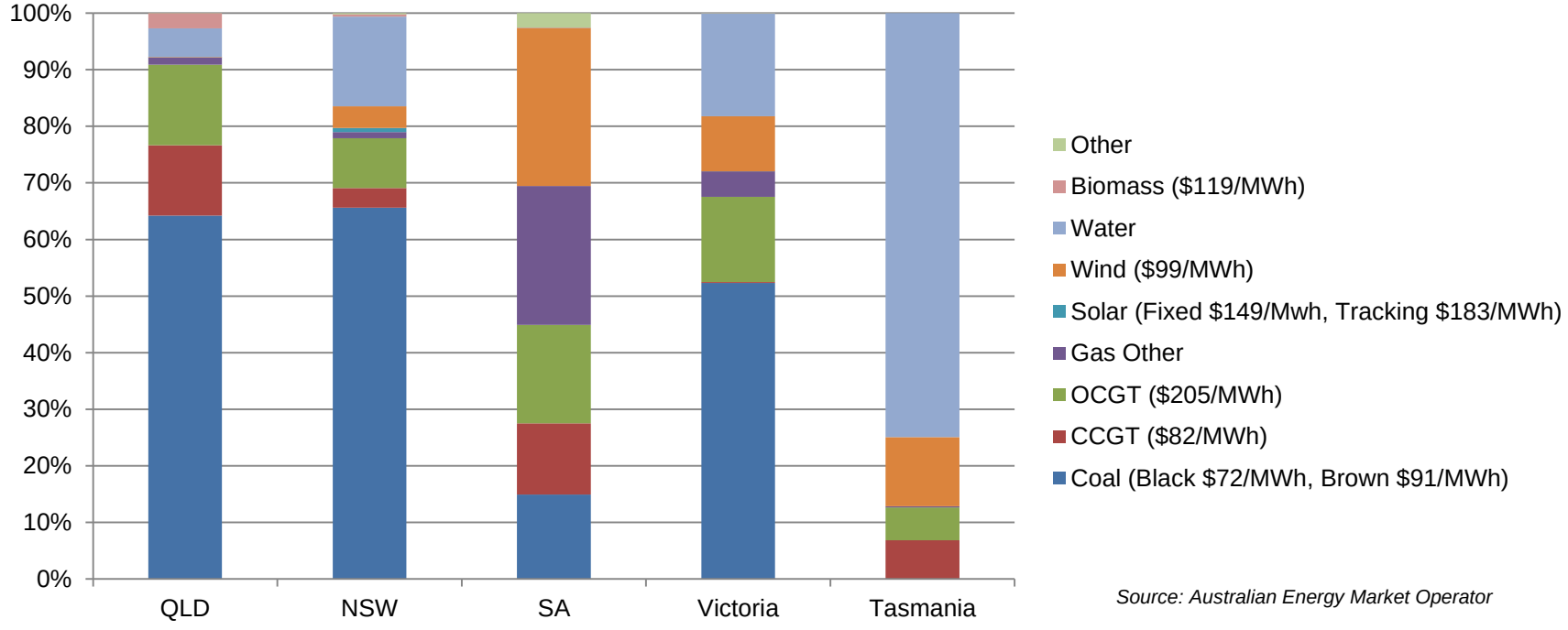
May 2016

SOUTH AUSTRALIA

Government of South Australia

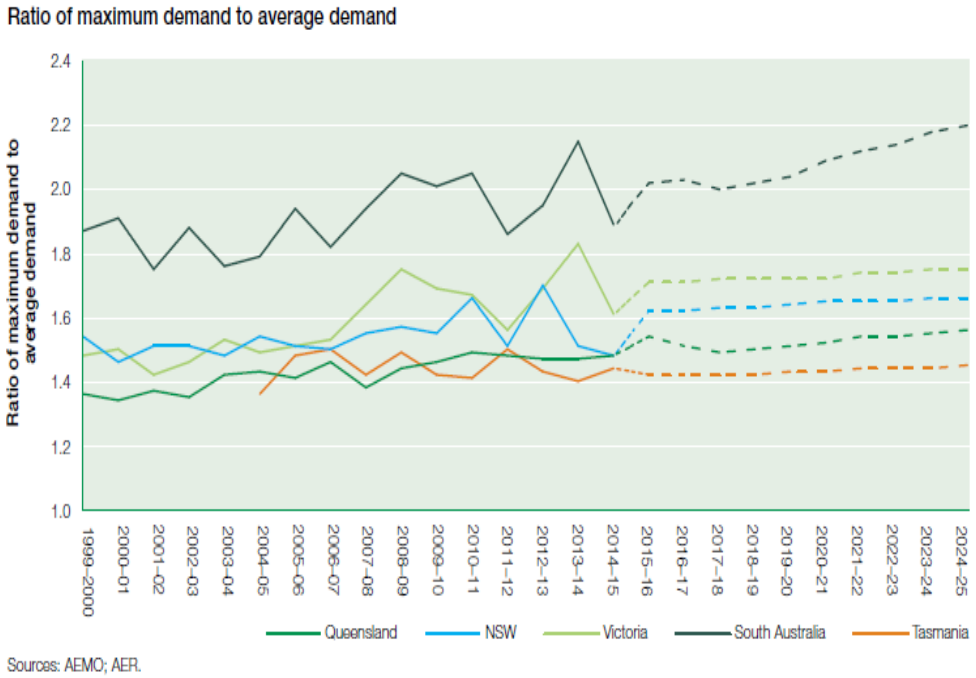
Department of State Development

Chart 1: SA has a different generation mix

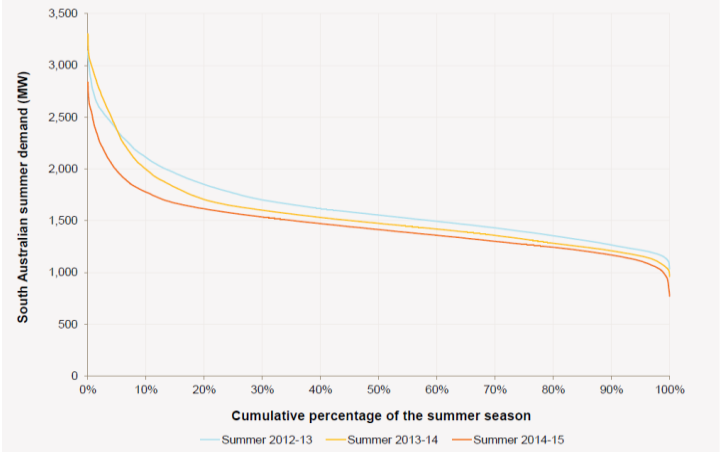


Source: Australian Energy Market Operator

Chart 2: SA has peakier demand



Sources: AEMO; AER.



This figure represents the percentage of the time that demand is at or above a given level

In 2014/15 maximum demand was 2872MW and minimum demand 790MW

Chart 3: Solar PV behind the meter is a driver

Fig 1. 2011-12 summer 90% POE minimum demand load profile for South Australia

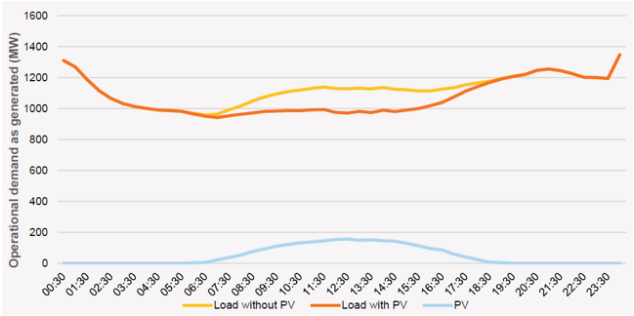


Fig 2. 2014-15 Summer 90% POE minimum demand load profile for South Australia

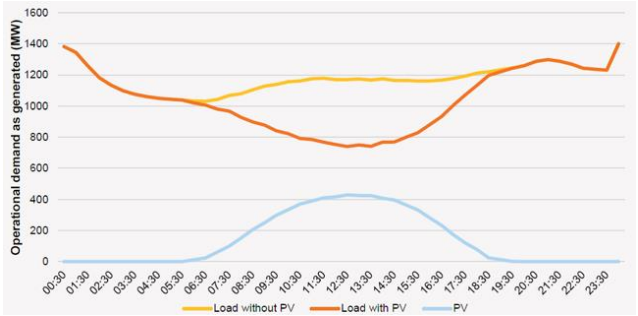
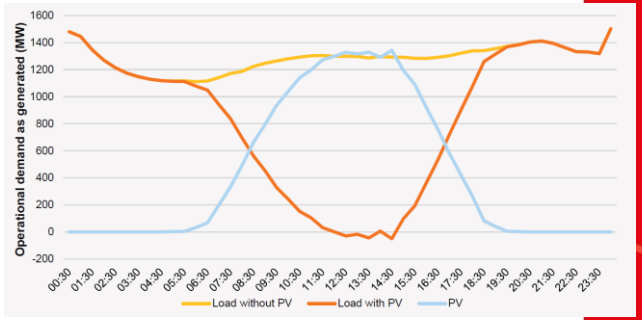
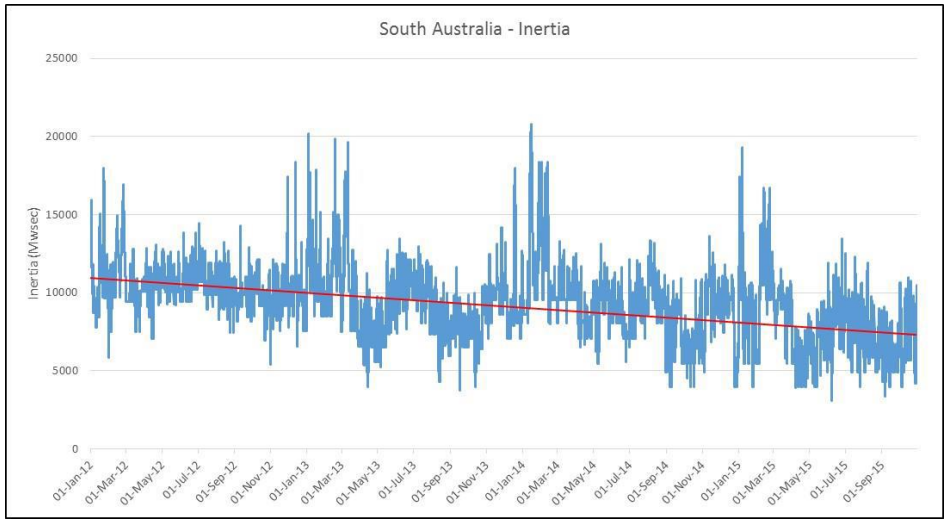


Fig 3. 2024-25 summer 90% POE minimum demand load profile for South Australia



Source: Australian Energy Market Operator

Chart 4: The system is becoming more difficult to manage



Rate of Change of Frequency is determined by the contingency size at separation, and the inertia of the SA Power System.

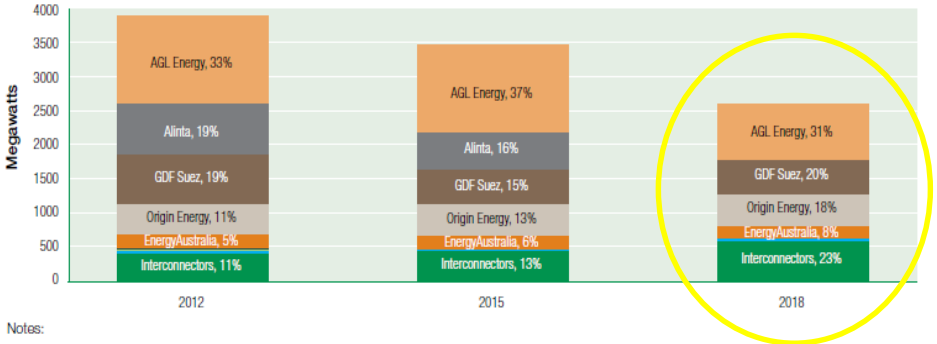
AEMO continues to manage the security of the system effectively but there is a trend decline in inertia.

Source:Australian Energy Market Operator

Chart 5: SA market is concentrated & vertically integrated

The interconnector is important

South Australian capacity and ownership



Notes:

Capacity based on summer availability, except wind, which is adjusted for an average contribution factor. Interconnector capacity is based on observed flows when the price differential between regions exceeds $10 per MWh in favour of the importing region; the data exclude trading intervals in which counter flows were observed (that is, when electricity was imported from a high priced region into a lower priced region).

Capacity subject to power purchase agreements is attributed to the party with control over output.

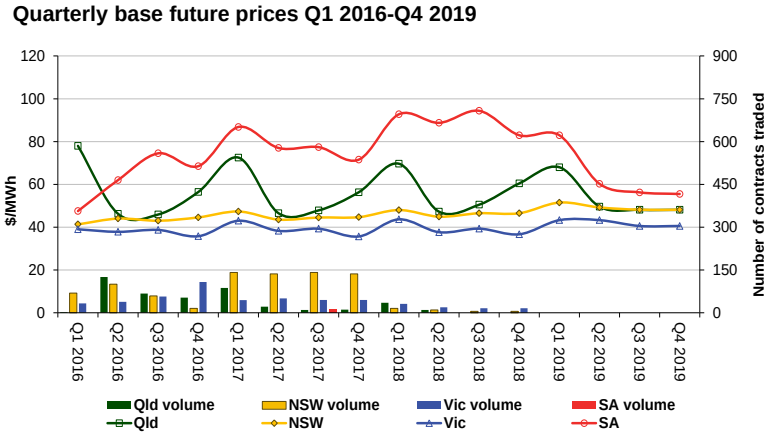
Sources: AEMO; AER.

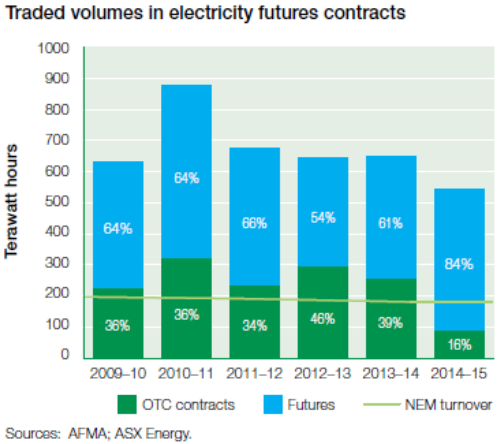
GDF Suez is not making its full capacity available to the market at this time.

AGL Energy and Origin Energy have the most capacity available but also use this capacity to manage their large electricity retail positions.

Inter-regional management of a position is difficult because the risk management product over the interconnector is not firm.

Chart 6: The futures market reflects our underlying problem





In 2014-15 SA accounted for:
2% of traded volumes of futures on the ASX
4% of traded volumes of over-the-counter contracts

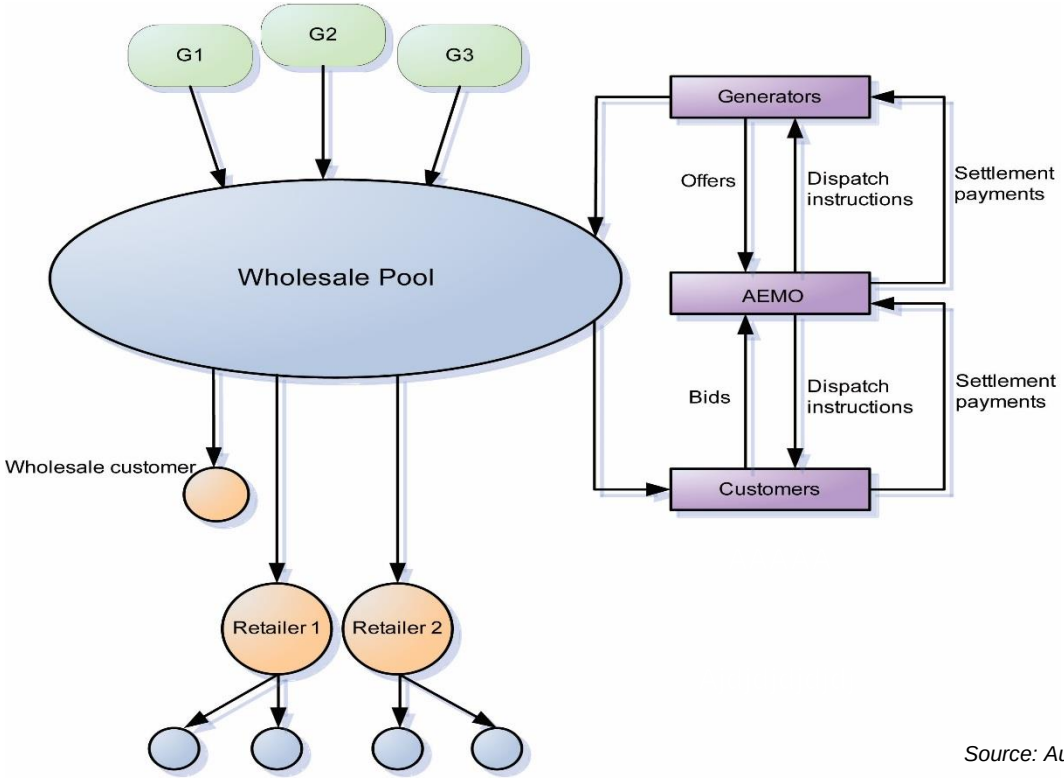
Retailers can enter into financial contracts with generators or other parties to manage the risk of unanticipated wholesale prices.

Over-the-counter markets, comprise direct contracting between counterparties, often assisted by a broker

The exchange traded market, comprises electricity futures products traded on the Australian Securities Exchange.

Source: Australian Energy Regulator

Chart 7: The NEM market structure is daunting

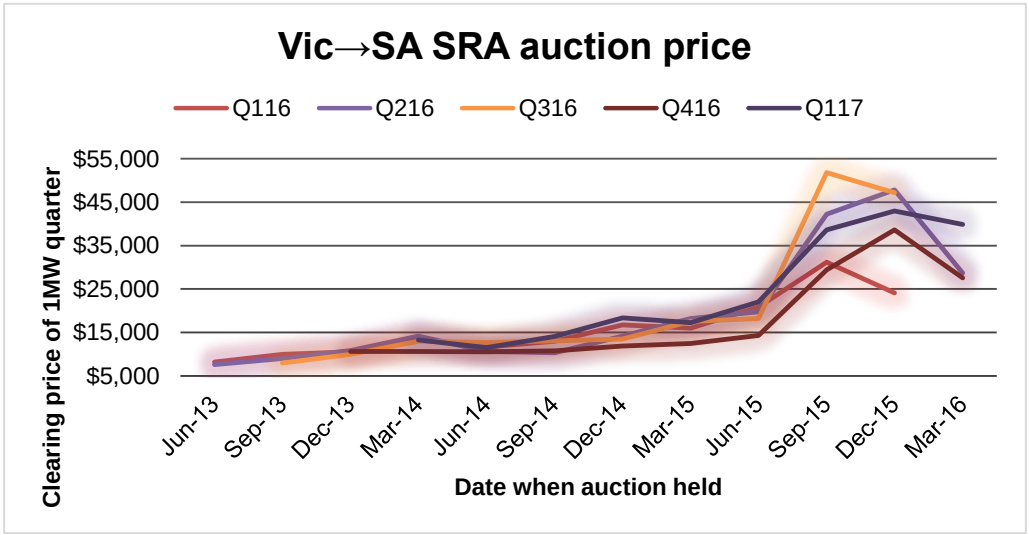


Source: Australian Energy Regulator

Chart 8: Vic ► SA Settlement Residue Auction

Residue = 460 * ($100-$50) = $23,000

- Vic hedge + Vic→SA SRA = (non-firm) SA hedge



- Each quarter's revenue auctioned in 12 tranches of 700 one MW instruments
- Recent Vic→SA auctions selling at very high price - Indicative of major separation of the two markets

Source: Australian Energy Market Operator

Chart 9: NEM processes are unhelpfully complex