

NSW Coal Supply



Agenda



- The closure of Hazelwood has driven increase in generation requirement from NSW– driving an increased requirement for coal into AGL Macquarie
- AGL Macquarie is working on increasing delivery capacity and coal supply – has experienced difficulties last 12 months in getting coal onsite for consumption at Bayswater and Liddell
- AGL has been running AGL Macquarie with purpose of rationing coal during significant periods since October 2016 due to a variety of issues
- Industrial action in the Hunter Valley has the potential to provide significant interruption to coal supplies into Macquarie
- The purpose of this discussion is to advise of this emerging issue and its potential impacts on AGL’s bidding of Macquarie over Q3 and Q417

AGL's operation of AGL Macquarie and coal supply issues



AGL operation of Macquarie since acquisition



- Since AGL acquired Macquarie, AGL has:
 - spent significant amounts of capital on the assets – including seeking to improve diversity of delivery/sources
 - increased the generation volumes and availability factor of the plant (despite serious issues with Liddell in FY15/16)
 - incorporated high generation volumes and availability into forward budgets and plans
 - This all requires increased supplies of coal – have drawn down on stockpile and need to source new coal to maintain consumption rate
- Up until the period October/November 2016 AGL's operation of Macquarie was predicated on large existing stockpile and generation levels assuming Hazelwood still operating

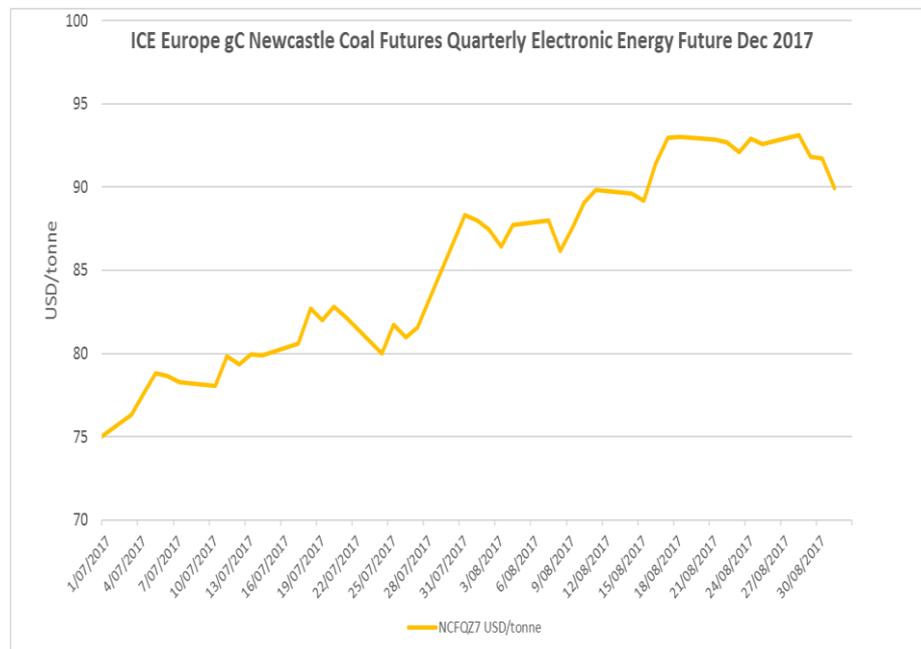
- AGL is investing significant capital to build diversity of delivery points into AGL Macquarie – at present AGL Macquarie is susceptible to interruptions on single points of failure
- AGL Macquarie consumed more coal than was delivered in FY17 – this entailed drawing down on stockpile and rationing coal
- AGL's current stockpile is at the lower end of AGL's preferred envelope of operation coming into summer

Coal Shortfalls



There have been a number of issues over the past 12 months causing AGL's coal shortfalls - the stockpile is quickly drawn down and is slow to recover:

- Failure to receive deliveries of coal over a period due to contractual dispute in relation to contract entitlements
- Extreme heat led to extreme demand in early February 2017 – resulting in depletion of stockpiles
- Bushfires interrupted deliveries on ARTC network during Summer 2017
- ARTC scheduled outages – approximately every 2 months for period of up to 5 days
- Lower than expected delivery performance through a period of changing haulage supplier
- AGL Macquarie conveyor breakdowns (Q4 2016 and Q2 2017) – impacts were exacerbated by proximity to scheduled ARTC outages
- Coal prices nearly doubled in 2016. The marginal cost of raw coal increasing from \$20-25/MWh to \$40-50/MWh equivalent - this means that any coal purchased short term will be at significantly higher cost



Note that once deliveries have been missed, it can be exceedingly difficult to reschedule due to congestion on ARTC network and limitations on AGL Macquarie infrastructure

AGL's bidding of AGL Macquarie



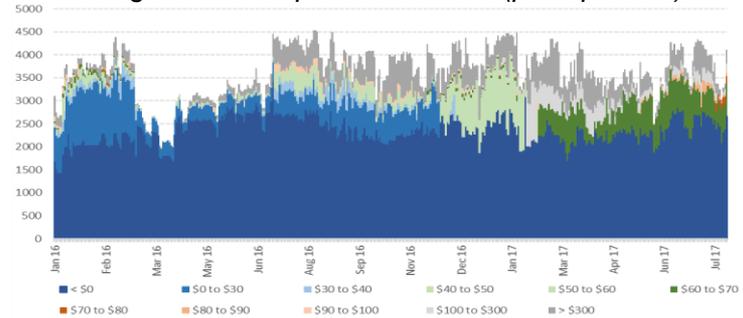
AGL operation of Macquarie since acquisition



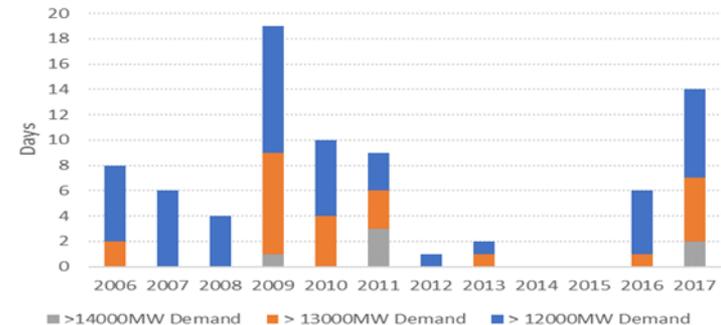
AGL has bid to ration coal during different periods:

- Oct-Nov 2016 – following a step change in coal prices (following China curtailment of production) and Engie announcement of Hazelwood closure
- Jan-Feb 2017 – heat wave and co-incident supply interruptions
 - The 2017 summer set 205 new weather records nationally over 90 days -“exceptional heat” sustained and widespread.
 - Cancellations of trains, followed by bush fires removing train lines from operation and finally an outage on the ARTC network (no coal deliveries).
 - Resulted in rapid draw down on stockpiles – AGL moved to coal rationing.

Average AGL Macquarie bid bands (peak periods)



NSW Peak Demand days since 2006



AGL Macquarie bidding – Q3 and Q4 2017



- AGL's focus is ensuring all fuel constraints are minimized for the summer period and ensuring that both the Bayswater and Liddell Power Stations can run to full capacity at times of tight demand supply conditions
- AGL's coal rationing has impacted bidding in Q3 and may impact bidding in Q4
- AGL engaged in significant attempts to ration coal during Q3
 - Sought to increase bid prices to reduce generation at times of lower demand to ration coal
- AGL seeking to acquire more coal:
 - AGL Macquarie is still seeking supplies of coal from Hunter Valley producers
 - Note that these new supply contracts are at unprecedented high prices
- Acquiring coal only part of the issue – AGL needs to support the acquisition with transportation arrangements (both external and onsite at AGL Macquarie)
- In the absence of further coal supply AGL Macquarie will need to ration coal over Q4 – this will again entail AGL bidding in a manner designed to reduce dispatch of generation

