MOURA & BLACKWATER COAL RAILINGS FORECAST

Abridged Version

A report prepared by Energy Economics for the Queensland Competition Authority

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1 EXECUTIVE SUMMARY

Coal railings on the Blackwater and Moura Systems are forecast to increase from 77.2 million tonnes in fiscal 2014 to 82.1 million tonnes in fiscal 2017[1]. This is an increase of 4.9 million tonnes over the three year period, at a compound annual growth rate of 2.1%.

Coal railings to the new Wiggins Island Coal Export Terminal (WICET) are forecast to be 0.9 million tonnes in fiscal 2015, increasing to 12.1 million tonnes in fiscal 2016 and 18.6 million tonnes in fiscal 2017.

We do not envisage any new mines being commissioned in the study area over the forecast period, with the major increments in railings volumes being provided by the following mine expansions and operational changes.

- A major expansion of the annual capacity of Glencore's Rolleston thermal coal mine from 12 million tonnes towards 17 million tonnes.
- The transition of Caledon's Cook colliery from a small bord & pillar operation to a 3.5 million run-of-mine tonne longwall mining system.
- Assumed reactivation of the idled Norwich Park mine late in the forecast period.
- Redirection of some tonnage from the Port of Hay Point to RG Tanna Coal Terminal (RGTCT).
- Progressive expansion of the Baralaba mine towards an eventual annual capacity of 3.5 million tonnes.

Most of the above railing increments are associated with tonnage allocation commitments at WICET.

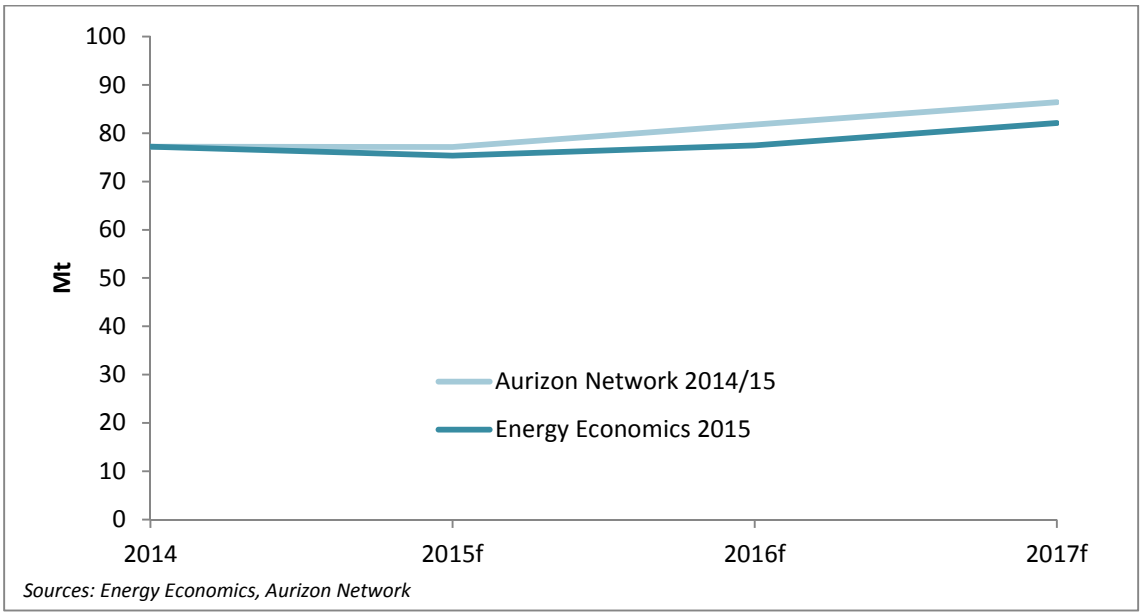
Counterbalancing the above are the following main reductions in coal railings expected in the study area.

- Closure of the BHP Billion Mitsubishi Alliance's six million tonne per year Crinum longwall mine on exhaustion of reserves in fiscal 2016.
- A production cut at one mine as its existing rail and port take-or-pay commitments expire.

Over the course of the three forecast years, fiscal years 2015 through 2017, Energy Economics estimates that a total volume of 234.9 million tonnes of coal will be railed on the Blackwater and Moura rail systems. This figure is 4.2% lower than the Aurizon Network forecast of 245.3 million tonnes, with 5.3% and 4.9% differences occurring in fiscal 2016 and fiscal 2017 respectively, as graphed and tabulated overleaf.

[1] Rail System groupings as per Aurizon Network (Vermont to Gladstone railings allocated to Goonyella System. Crinum and Kestrel railings to Hay Point allocated to Blackwater System. Coal railings to Cement Australia excluded.)

Figure 1 Blackwater and Moura System coal railings forecast comparison



Sources: Energy Economics, Aurizon Network

Table 1 Blackwater and Moura Systems coal railings forecast comparison

Financial year to June	2014	2015f	2016f	2017f	Total 2015 - 2017
Aurizon Network 2014/15	**77.2**	**77.1**	**81.8**	**86.4**	**245.3**
- Moura System	12.4	13.3	13.5	15.8	
- Blackwater System	64.8	63.8	68.3	70.6	
Energy Economics 2015	**77.2**	**75.3**	**77.5**	**82.1**	**234.9**
- Moura System	12.4	11.9	13.6	14.3	
- Blackwater System	64.8	63.4	63.9	67.8	
Difference	-	-1.8	-4.3	-4.3	-10.4
% Difference	-	-2.3	-5.3	-4.9	-4.2
Energy Economics 2014	**76.6**	**73.4**	**77.0**	**83.1**	**233.5**
EE 15 - EE 14	0.6	1.9	0.5	-1.0	1.4
% Difference	0.8	2.6	0.6	-1.2	0.6

Notes:
- *The AN forecast incorporates unpublished updates.*
- *AN FY2014 data adjusted to actuals.*
- *Rail System groupings as per AN (Vermont to Gladstone railings allocated to Goonyella System. Crinum and Kestrel railings to Hay Point allocated to Blackwater System. Coal railings to Cement Australia excluded.)*

The Aurizon Network forecasts appear to take a top down approach, with individual projects being allocated a percentage of their contracted railings within pre-defined total system railings. The form of the Aurizon Network forecast data, as made available to Energy Economics, renders detailed comparisons at the mine level of limited value.

It is noted that the list of mines and projects within Energy Economics' forecasts and in Aurizon Network's forecasts are almost identical – the differences primarily revolve around the scale and timing of production from these operations.

The cumulative tonnage over our three year forecast is 1.4% higher than the April 2014 forecast we prepared for the QCA. This results primarily from increased production expectations for the Rolleston and Cook mines, which have both progressed mine capacity expansion projects more rapidly than previously expected.

We have not included railings from any greenfield coal mining projects into the forecasts. While advanced projects exist in the study area that could technically be developed within the forecast horizon, we expect development of such projects will be delayed until market conditions show signs of improvement.

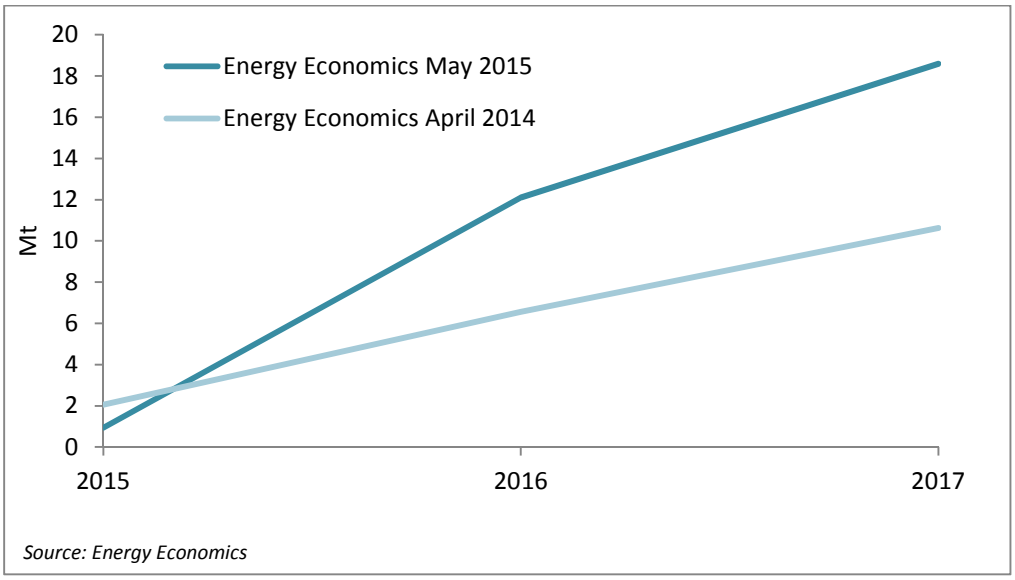
It is noted that forecasting uncertainties are greater under the current weak market conditions, compared with boom times when mine expansions and developments can be assumed to be progressed consistently and with some urgency. The potential for unexpected mine closure and delays in mine expansion plans is high in the current environment, particularly in the metallurgical coal sector.

Take-or-pay provisions in below-rail, above-rail and port contracts continue to be an impediment to the closure of mines during the cyclical downturn in coal prices – impacting the efficiency of the coal market in adjusting to changed conditions. We have therefore not factored into our forecasts any mine closures beyond those announced by the owners or dictated by exhaustion of coal reserves. Mines that do remain in operation will generally strive to maximise production almost regardless of the existence of take-or-pay obligations, as increased output typically lowers the unit cost of production and moderates the impact on profit during periods of lower prices.

Wiggins Island Coal Export Terminal railings

Coal railings to WICET will be via both the Moura and Blackwater Systems. Over the course of the three forecast years, fiscal years 2015 through 2017, Energy Economics estimates that the total volume of coal railed to WICET will be 31.6 million tonnes. This compares with 19.2 million tonnes in our April 2014 forecast.

Figure 2 Energy Economics 2014 & 2015 forecasts of railings to WICET



Source: Energy Economics

A major difference is that we now expect that the stringent take-or-pay conditions on WICET throughput allocations will result in shareholders prioritising fulfilment of these obligations over railings to other destinations.

Another major difference between the forecasts relates to the aforementioned changes to our expectations for Cook and Rolleston mines. For fiscal 2017 our forecast railings to WICET from Cook and Rolleston are 2.3 million tonnes and 5.4 million tonnes higher respectively than our previous forecast.

Three of the eight WICET foundation shareholders are not expected to supply any coal from their own mining operations to the terminal within the study period.

Domestic Coal Demand

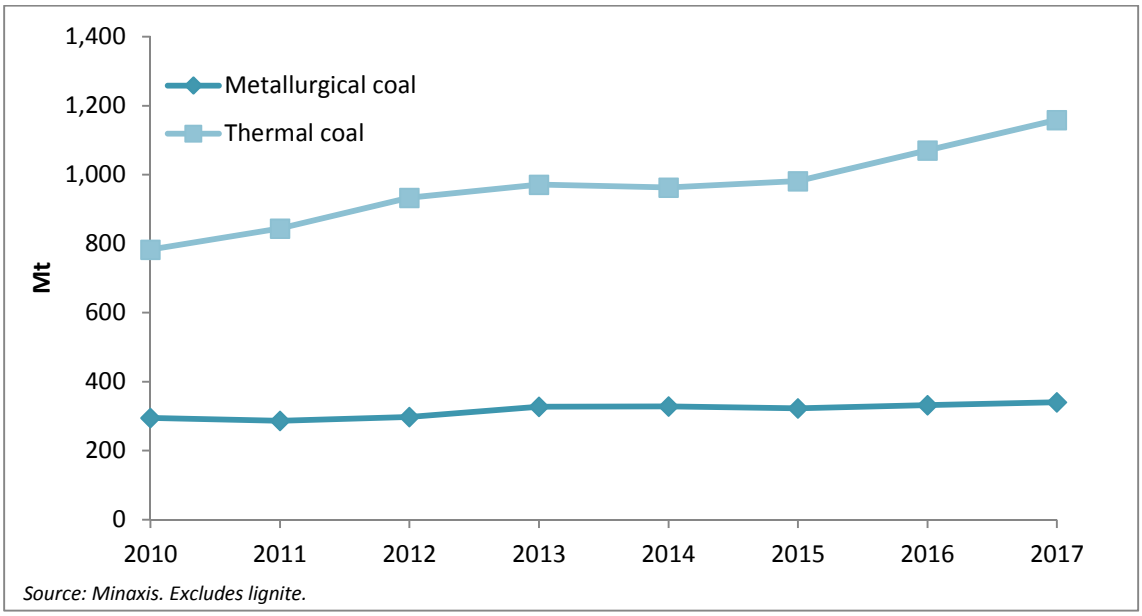
Railings to domestic customers within the Moura/Blackwater catchment area are expected to be fairly static over the forecast period – railings to customers in the study area were 8.5 million tonnes in fiscal 2014 (excluding railings to Cement Australia) and are forecast to be 8.4 million tonnes in fiscal 2017. Expectations of future gas price rises have moderated, hence recovery in coal-fired power station load factors in Queensland is expected to be muted.

International Metallurgical Coal Demand

Global metallurgical coal imports are forecast to fall by 5.5 million tonnes in 2015, driven by a sharp fall in China's demand. Imports are then forecast to recover, with overall compound annual growth of 1.2% between 2014 and 2017.

While the average cash cost of Queensland's metallurgical coal mines is lower than those of its main competitors, and Queensland is expected to continue to grow market share as a consequence, higher cost metallurgical coal mines in Queensland will remain under significant pressure.

Figure 3 Internationally traded coal demand



Source: Minaxis. Excludes lignite.

International Thermal Coal Demand

Thermal coal imports are forecast to recover from a China driven downturn in 2014 to achieve compound annual growth of 6.4% from 2014 to 2017.

China's thermal coal imports are expected to fall again this year under the weight of restrictions on coal consumption near major cities, increased import duties and restrictions on lower quality coals (measures to reduce air pollution and to support the local coal industry). But a strong recovery in China's thermal coal imports is forecast for 2016 and 2017; driven by attrition of high cost domestic thermal coal production. Most of the Chinese thermal coal mining industry is loss making at current prices. India is forecast to import 58 million tonnes more thermal coal in 2017 than it did in 2014, supported by ongoing strong population and economic growth and increasing electricity intensity from current very low levels.

2 INTRODUCTION

In March 2015, the Queensland Competition Authority (QCA) engaged Energy Economics to assist in evaluating coal tonnage forecasts submitted to it by Aurizon Network Pty Ltd (Aurizon).

Specifically, Energy Economics was asked to provide an independent review of coal railings to the Wiggins Island Coal Export Terminal (WICET) between fiscal 2015 and fiscal 2017. The scope of the review extended to cover all coal railings on the wider Moura and Blackwater systems, in order to take into consideration inter-relationships between railings to the various domestic consumers and export terminals on these two rail systems.

In formulating its view on future coal railings Energy Economics has considered the following parameters.

- Coal demand and supply in both domestic and international markets;
- Appraisal of current mine capacities, mine expansion projects, new mine developments, and both current and future mining issues;
- Coal reserves and mine life;
- Mining costs;
- Rail system capacity, contractual arrangements, charges and take-or-pay commitments; and
- Port terminal capacity, contractual arrangements, charges and take-or-pay commitments.

This version of the report has been abridged to exclude confidential and proprietary stakeholder information and detailed mine forecasts. This version is intended for publication by the QCA on its web site.

3 DOMESTIC COAL DEMAND

Coal demand in Queensland is dominated by the electricity generation sector, which accounts for 90% of coal distributions within the state (Table 2). The non-ferrous metals processing sector and the cement manufacturing industry are also significant coal consumers in Queensland, accounting for 8.1% and 1.0% of intra-state coal distributions respectively. Together, these three end-use sectors account for 98.6% of domestic coal distributions in Queensland.

Coal deliveries to Queensland customers totalled 22.7 million tonnes in fiscal 2014. However, much of this coal is delivered by conveyor to mine-mouth power stations, with some deliveries also by road to smaller customers. Coal transported on the Moura and Blackwater rail systems to domestic customers totalled 8.8 million tonnes in fiscal 2014. This represents 11% of total railings on the Moura and Blackwater lines, with railings to export terminals at the Port of Gladstone making up the other 89%.

Table 2 Coal distribution within Queensland by district (tonnes)

	2013-2014			
	Southern	Central	Northern	**Total**
Consumer group				
Agriculture	80	4,986		5,066
Agriculture,forestry,fishing and hunting	455			455
Basic non-ferrous metals		1,590,554	253,080	1,843,634
Beverages and malt			1,448	1,448
Cement and concrete products	221,220			221,220
Chemical,petroleum and coal products			68,221	68,221
Clay products and refractories	6,941			6,941
Coal		571		571
Construction materials	2,975			2,975
Electricity	13,581,239	6,738,542		20,319,781
Fruit and vegetable products	13,162			13,162
Health	3,676			3,676
Meat products	64,637	18,152	10,434	93,223
Metallic minerals		8,104		8,104
Milk products	1,305			1,305
Mining				
Not known		5,671		5,671
Other non-metallic minerals	163			163
Paper,paper products,printing and publishing	51,667			51,667
Railway transport		950		950
Road and transport		407		407
Sugar			46,283	46,283
Transport and storage				
Wholesale and retail trade	6,164			6,164
State total	13,953,684	8,367,937	379,466	22,701,087

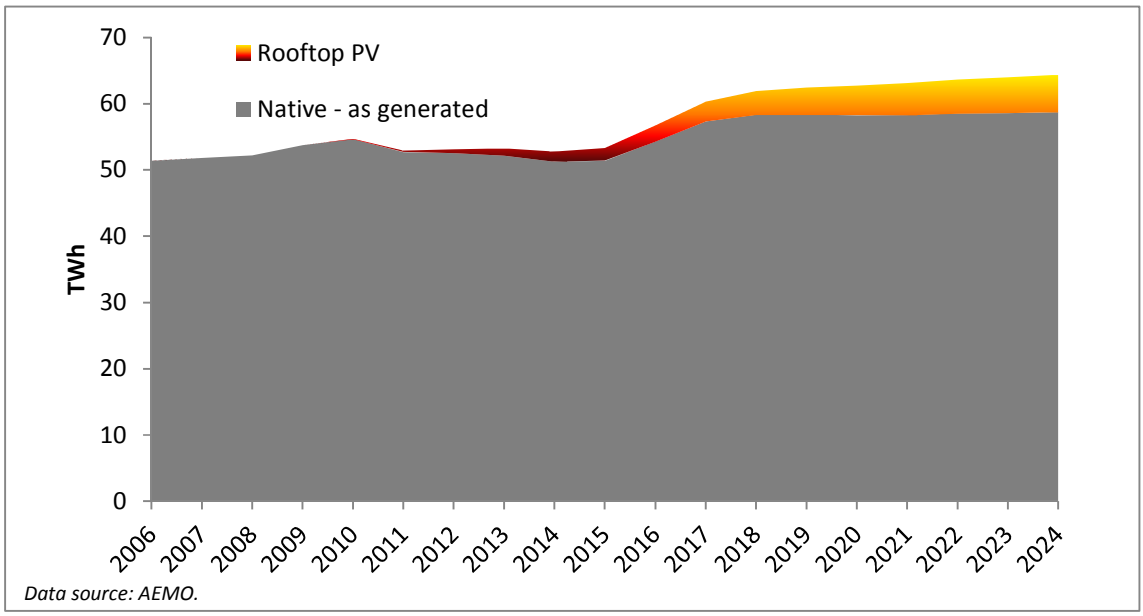
Data Source: DNRM

3.1 Electricity sector

Over the past decade sharp rises in electricity prices have constrained electricity consumption across eastern Australia. The price rises were mainly driven by excessive expenditure on transmission

infrastructure, the cost of which was passed through to consumers. The introduction of the carbon tax from July 2012 further increased electricity prices (and had a disproportionate impact on coal-fired generation, as it was designed to do) before its repeal in July 2014. Electricity demand has as a consequence plateaued in Queensland over the last eight years. Forecasts by the Australian Energy Market Operator, however, indicate a resumption in demand growth over the next few years[2].

Figure 4 Electricity demand in Queensland



Data source: AEMO.

Table 3 Electricity demand in Queensland (TWh)

FY ending June	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Native - as gen.	51.4	51.8	52.2	53.7	54.7	52.7	52.5	52.1	51.2	51.4	54.3	57.3
Rooftop PV	0.0	0.0	0.0	0.0	0.1	0.2	0.5	1.1	1.5	1.9	2.5	3.0
Total	**51.4**	**51.8**	**52.2**	**53.7**	**54.7**	**52.9**	**53.1**	**53.2**	**52.7**	**53.3**	**56.8**	**60.4**

Data source: AEMO December 2014 update. NB excludes electricity 'exported' to New South Wales

Burgeoning electricity consumption by Queensland's coal seam gas industry underpins the forecast surge in electricity demand. Electric compressors will be used to pump gas by pipeline from the inland gas-fields to the new LNG plants in Gladstone, using power sourced from the Queensland electricity grid.[3]

The Australian Energy Market Operator's latest forecasts for Queensland through fiscal 2024 include the following main drivers:

- A 15.3% average annual increase in large industrial load consumption based on its estimates of liquefied natural gas production ramp up schedules. Large industrial demand excluding LNG is forecast to decline due to the closure of BP's Bulwer Island refinery in Brisbane in May 2015.

[2] Australian Energy Market Operator, 17 December 2014: National Electricity Forecasting Report Update

[3] Jacobs SKM 24 June 2014: Projections of Gas and Electricity Used in LNG

- A 26.2% average annual increase in rooftop photovoltaic output despite a reduction in Queensland's feed-in tariff from 8 cents/kWh to approximately 6 cents/kWh.
- A 1.9% average annual decline in residential and commercial consumption.

The combination of weak electricity demand, growth in rooftop photovoltaic capacity, and declining electricity exports to New South Wales has resulted in on-grid generation in Queensland falling every year from fiscal 2010 to fiscal 2014. On-grid generation in Queensland was in fact lower in fiscal 2014 than it had been in any year since fiscal 2004.

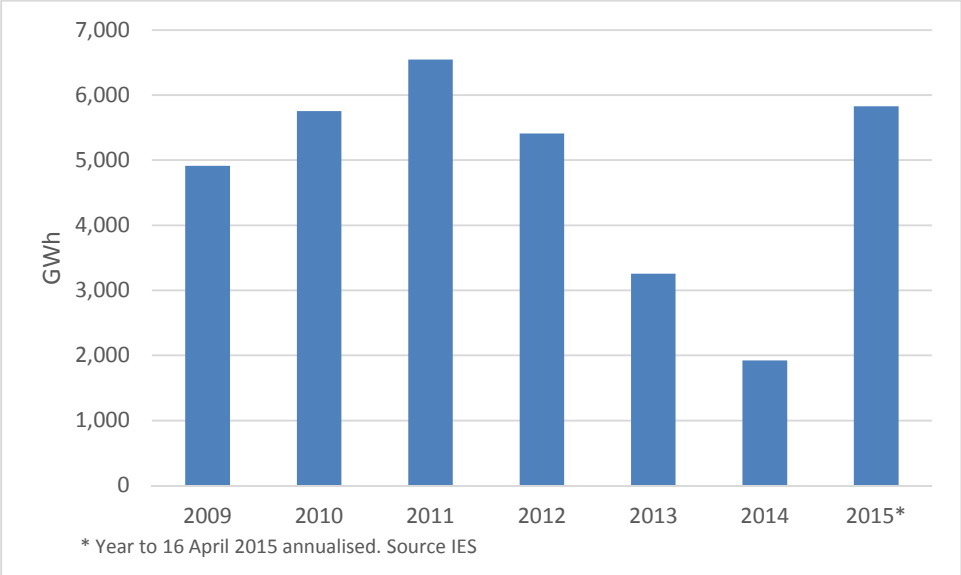
Table 4 NEM Electricity generation by fuel in Queensland (TWh)

FY ending June	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015*
Coal	46.8	50.3	50.9	53.2	51.5	50.3	51.2	50.0	45.8	44.8	43.7	39.9	43.8
Gas	0.6	0.7	1.3	3.2	5.4	5.7	5.6	8.4	11.2	11.0	9.6	10.9	13.5
Hydro	0.4	0.4	1.0	0.6	1.0	0.9	0.8	0.6	1.0	0.7	0.7	0.8	0.7
Total	**47.8**	**51.5**	**53.2**	**57.0**	**57.9**	**56.9**	**57.6**	**59.0**	**58.0**	**56.6**	**54.0**	**51.6**	**58.0**
Increase		3.7	1.7	3.8	1.0	-1.0	0.7	1.4	-1.0	-1.4	-2.6	-2.4	4.0
% Increase		7.8	3.3	7.1	1.7	-1.8	1.3	2.4	-1.7	-2.4	-4.5	-4.4	7.4

*Data source: NEM; extrated by IES. * 2015 data is year to 17 March annualised*

Recently, however, there has been an 'export' led recovery in Queensland's electricity generation, with net electricity outflows to other states bouncing back strongly in fiscal 2015 to date (graphed below).

Figure 5 Queensland's net interstate electricity outflows (GWh, fiscal years)



Electricity generated by low cost mine-mouth power stations in southern Queensland is displacing more expensive generation from coal-fired power stations in the Lithgow area of New South Wales. Of the two power stations in the Lithgow area, the 1,000 MW Wallerawang power station was placed on care and maintenance last year, and output from the nearby 1,400 MW Mount Piper power station is tracking towards a 4,500 GWh fall in output in fiscal 2015. Low demand and high fuel costs are the root

causes of the generation cuts at Lithgow; with relatively high mining costs coupled with expiry of low cost long-term coal supply contracts compromising the competitiveness of these power stations. One of the main collieries in the Lithgow area, Angus Place, was placed onto a 'care and maintenance' status in November 2014. The reduction in Lithgow electricity generation is therefore unlikely to be reversed within the forecast period, hence the recent recovery in Queensland's electricity exports is expected to be sustained over this timeframe.

We note that there is significant power generation overcapacity in Queensland, due to the commissioning of new generating units (coal, gas and photovoltaic) during the last decade of flat electricity demand. There is a total of over 13,000 MW of capacity installed in Queensland, while peak demand is under 9,000 MW. There appears to be no need for the construction of any new fossil-fuel power station units in Queensland within a ten year timeframe.

Indeed, for the first time in the National Electricity Market's (NEM) history, as a result of decreasing operational consumption, the Australian Energy Market Operator's most recent forecast envisaged no new capacity being required in any NEM region over the next 10 years.[4]

The proportion of forecast electricity demand to be met by the various fuel sources is discussed in the following sections.

3.1.1 Renewable energy

As tabulated and graphed previously, the AEMO estimates electricity generation by rooftop photovoltaic units will increase from negligible levels in fiscal 2009 to 3.0 TWh in fiscal 2017.

The Queensland Government's Solar Bonus Scheme pays eligible customers for the surplus electricity generated from their solar photovoltaic panel systems, which is fed back into the electricity grid. Customers who have joined the Scheme since 10 July 2012 have been paid 8 cents per kilowatt hour for surplus electricity fed into the grid, compared with 44 cents per kilowatt hour for pre-existing customers[5]. Capacity growth is expected to remain strong despite the further reduction of the feed-in tariff to approximately 6 cents per kilowatt hour.

The Australian Government's Large-scale Renewable Energy Target drives investment in renewable generation capacity. In June 2015 the target for 2020 was reduced from 41,000 GWh to 33,000 GWh, largely in response to declining overall electricity demand forecasts and prospects of the scheme exacerbating overcapacity. Queensland has almost 2,000 MW of wind generation proposed in 10 projects, of which the largest are the Kennedy (650 MW) and Coopers Gap (350 MW) wind farm

[4] Australian Energy Market Operator, 2014 Electricity Statement of Opportunities

[5] Queensland Government, Department of Energy & Water, http://www.cleanenergy.qld.gov.au/demand-side/solar-bonus-scheme.htm

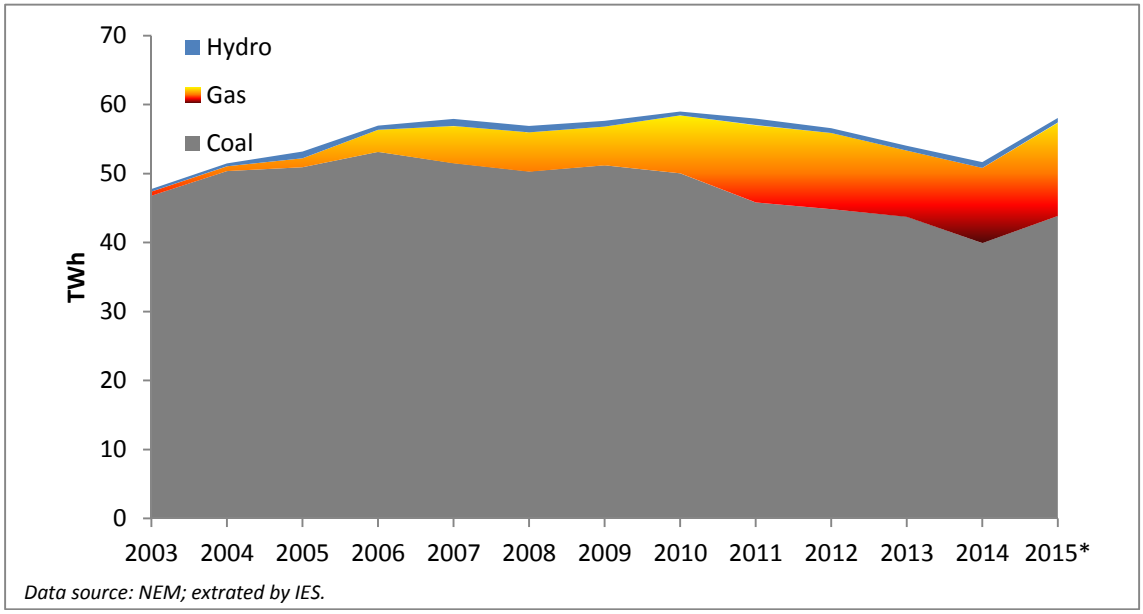
projects. Construction of the Solar Boost Project at Kogan Creek will contribute 44 MW of capacity from this year.

Subsidised wind and solar generation capacity will continue to grow in Queensland despite the chronic overcapacity already in the system.

3.1.2 Gas-fired generation

Substantial additional gas-fired generation capacity has been commissioned in Queensland over the past ten years. Gas-fired electricity generation in the state grew at a remarkable compound rate of 41% per year between fiscal years 2004 and 2012, but has since flattened due to slowing capacity growth and episodic higher gas prices.

Figure 6 NEM electricity generation by fuel in Queensland



Data source: NEM; extrated by IES.

Low domestic gas prices are currently incentivising gas-fired electricity generation. With exports of LNG from Gladstone having recently commenced the local gas sector is no longer isolated from international markets. As LNG exports become established and grow, export parity netback (the contract price of LNG sold by Gladstone producers to East Asian customers, less transport and processing charges) will become one of the primary influences on Queensland domestic gas prices.

But substantial falls in international LNG and oil prices have lowered expectations of future netback gas price levels in Queensland. Spot LNG prices into Japan fell from US$17.3 per gigajoule in March 2014 to US$7.6 in March 2015. After converting these prices into Australian dollars the LNG spot price has fallen by 49% over the past year, from $19.1 to $9.8 per gigajoule.

LNG exports from Queensland are sold under long term contracts into East Asia, with prices typically indexed indirectly to the price of Brent Crude oil. Brent oil has also fallen 40% in price; from US$104 in August 2014 to US$62.70 in mid-April 2015.

Current international LNG and oil spot prices may not be sustainable over the long term, nevertheless concerns over future domestic gas price rises have eased considerably over the past year. East coast Australia gas prices have been volatile since 2012; with Queensland hub prices increasing sharply to over $7 per gigajoule in the March 2013 before tumbling progressively to below $2 per gigajoule in the December 2014 quarter and them surging again to over $6 per gigajoule by mid-2015 (albeit being during the winter demand period when prices are typically elevated).

It is noted that, by comparison, the current spot price for export grade thermal coal is A$2.90 per gigajoule (gross as received basis) loaded onto a vessel at port. Prices for domestic grade coal are generally considerably cheaper than export prices. However any shift in generation from gas-fired power stations to coal-fired generation is now expected to be far less pronounced than when netback gas prices of A$8 per gigajoule were mooted.

3.1.3 Coal-fired generation

Queensland's coal-fired power stations have operated at low capacity utilisation since early last decade, when substantial additional coal-fired generating capacity was commissioned. New coal-fired power stations constructed at that time included Callide C (900 MW), Millmerran (850 MW) and Kogan Creek (750 MW), which came on line in 2001, 2002 and 2007 respectively.

Coal-fired generation in Queensland peaked at 53.2 TWh in fiscal 2006, but has fallen nearly every year since to a level of 39.9 TWh in fiscal 2014. In October 2012 Stanwell Corporation announced that it would take two units off-line for two years at its Tarong Power Station, or until market conditions improved. Tarong unit 4 was returned to service in 2014, but Tarong unit 2 remains idle.

Some recovery of coal-fired generation is expected over the forecast period, as a result of the improved outlook for electricity demand, the expected improvement in the price competitiveness of coal versus gas and the removal of the carbon tax.

Energy Economics does not expect that there will be any major changes to the rank and quality of the coal delivered to Queensland's power stations over the forecast period. Coal-burn is therefore expected to recover in proportion to the increasing levels of generation. The substantial spare capacity currently available at existing power stations will be increasingly utilised in future.

Most of the coal-fired power stations in Queensland are mine-mouth operations. Only the Gladstone and Stanwell power stations are currently supplied coal by rail. The Stanwell Power Station has been operating at low capacity utilisation over recent years, hitting a low of only 54% in fiscal 2011, when the Queensland floods reduced electricity demand, curtailed plant operations and cut coal supply.

Over recent years the load factor has remained in a narrow range of 65% to 66%, with no real sign of recovery in the 2015 year-to-date generation data. As a point of reference, Stanwell Power Station had an average load factor of 80% around the beginning of the century.

Since the Blackwater mine ceased to be a coal supplier to the Stanwell Power Station in 2010, the Curragh mine has been its sole supplier, and is expected to continue to be so over the forecast period. Load factors are expected to increase to 67% in fiscal 2016 and 68% in fiscal 2017, with coal deliveries from Curragh of 3.1 million tonnes in each of those years.

Load factors at the Gladstone Power Station followed a similar trend to Stanwell's. Gladstone load factors fell from 49% in fiscal 2010 to only 43% in fiscal 2011. Gross electricity generation of 6,275 GWh in fiscal 2011 was in stark contrast to the peak level of 10,415 GWh in fiscal 2001. The falls in output in fiscal 2011 and again in fiscal 2013 were despite the Boyne Island aluminium smelter (Gladstone Power Station's major customer) maintaining constant aluminium production over recent years.

Energy Economics expects Gladstone Power Station will be predominantly supplied by the Rolleston, Ensham and Callide/Boundary Hill mines over the forecast period. It is noted that coal supplied by the Callide/Boundary Hill mine, comprising about 30% of the feed, is of sub-bituminous rank and has lower energy content per tonne than the other coals supplied which are bituminous rank. Hence, more coal is consumed per unit of electricity at the Gladstone Power Station than at the Stanwell Power Station, with the latter consuming entirely bituminous coal.

The 190 MW Collinsville coal-fired power station was decommissioned in 2012. Prior to its closure this power station was supplied some 0.2 million tonnes of coal annually by truck from the adjacent Collinsville mine. The closure of the power station freed up additional coal produced by Collinsville mine to be railed to the Abbot Point Coal Terminal or to other domestic customers.

3.2 Non-ferrous metals sector

There are three coal consumers in the non-ferrous metals sector.

Queensland Nickel Pty Ltd consumes about 300,000 tonnes of coal per year at its refinery located at Cobarra, near the township of Yabulu, northwest of Townsville. Queensland Nickel sources its coal mainly from the Collinsville mine, with the coal being railed via the Newlands rail system and the North Coast line.

The other two consumers in this sector are both Rio Tinto controlled alumina refineries located at Gladstone. *Queensland Alumina Limited* (QAL) operates the larger of the two refineries, which produced 3.48 million tonnes of alumina in fiscal 2014. For the past 45 years, QAL has sourced its coal, for the purpose of power and steam generation, from the Callide/Boundary Hill mine, with minor additional tonnages from various other mines, including Dawson. Both Callide and Dawson are controlled by Anglo American and the coal is transported on the Moura rail system. QAL's coal

consumption was 1.3 million tonnes in fiscal 2012 but fell to 1.1 million tonnes in fiscal 2013 as alumina production was impacted by Cyclone Oswald in the March 2013 quarter. Future QAL coal consumption is expected to be fairly steady at around 1.3 million tonnes per year.

The other refinery, *Yarwun*, is operated by Rio Tinto Alcan and produced 2.65 million tonnes of alumina in fiscal 2014. Yarwun (previously known as Comalco Alumina Refinery) has been in operation since the December 2004 quarter and was expanded in mid-2012 from 1.4 million tonnes to 3.4 million tonnes of annual alumina production capacity. The increased capacity at the Yarwun refinery did not result in much of a boost for coal demand, as a gas cogeneration plant was constructed to service the expansion. Energy Economics forecasts future annual coal consumption will be fairly constant at 0.3 million tonnes. Yarwun's coal requirements are mainly supplied by the Callide/Boundary Hill mine.

Alumina production at the two plants has not been affected by chronic low prices for aluminium. The Queensland Alumina plant is world-scale and the Yarwun plant is relatively new. The international competitiveness of both plants has improved in recent times by the sharp fall in the Australian dollar, so both refineries are likely to continue normal operations through the forecast period despite the weak aluminium market.

3.3 Selected other Queensland coal demand

Cement Australia's Gladstone plant at Fisherman's Landing consumes some 200,000 tonnes of coal per year. Historically its coal has been sourced by rail from the Blackwater mine, with some sporadic supplies also originating from the Cook, Ensham, Gregory and Kestrel mines.

The *Bowen Coke Works* is part of Xstrata Zinc and produces metallurgical coke, nut coke and breeze. Most of the metallurgical coke is consumed in Xstrata Zinc's Mt Isa lead smelter, which uses about 37,000 tonnes of coke per year, while the remainder is exported. The nut coke is used in aluminium smelting, while the breeze (fines) is used in fuel production. Most of the coal for the coke works is supplied by rail from Xstrata's Collinsville mine. In November 2011, Bowen Coke Works began a project to upgrade 14 of its 54 beehive ovens with under-floor flues. The project aimed to increase production at Bowen Coke by 30% and reduce emissions, however no substantial increase in coal consumption, relative to historical levels, has been evident to date. Future coal consumption is expected to be about 80,000 tonnes per year.

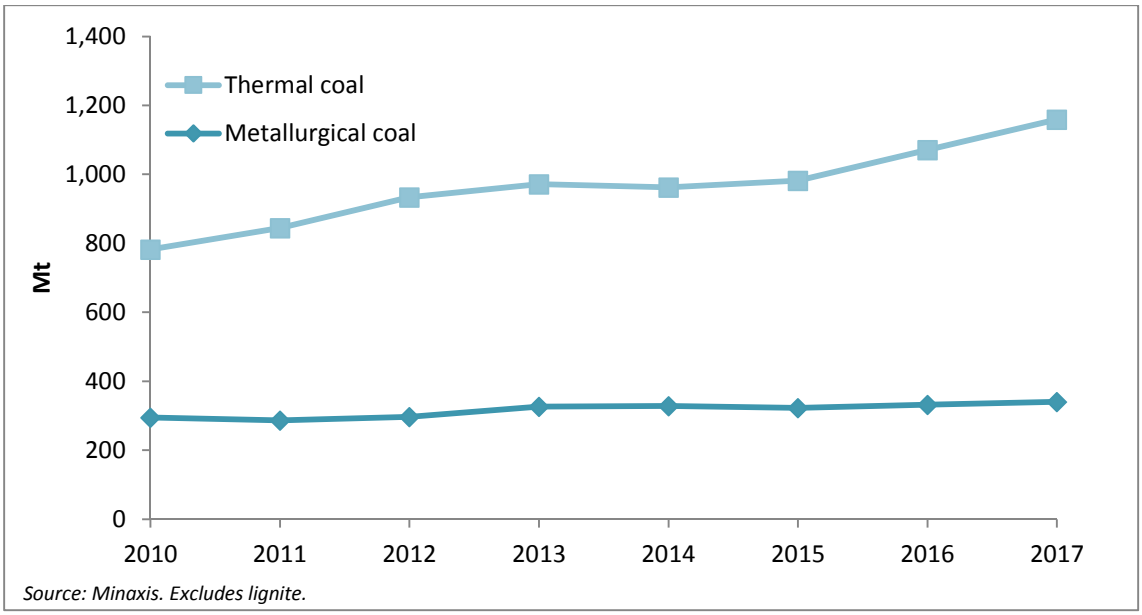
4 INTERNATIONAL COAL MARKETS

Energy Economics engaged fellow coal consultancy MinAxis Pty Ltd to forecast international coal trade volumes for use in this assignment. MinAxis estimates that global demand for metallurgical coal imports will fall by six million tonnes during 2015, but over the full 3 year forecast period will grow at an average rate of 4 million tonnes per year; from 328.5 million tonnes in 2014 to 340.2 million tonnes in 2017. Chinese metallurgical coal imports are expected to fall by six million tonnes this year and then

only increase by four million tonnes in total during 2016 and 2017. In China the *rate* of migration from rural areas to the cities is flattening - impacting steel demand in the construction sector.

Although the forecast growth in international metallurgical coal market demand is modest, the weakening of the Australian dollar has reinforced the cost advantage that Australian exporters have, on average, over their main competitors in the United States. The large low cost metallurgical coal producers within the study area are reasonably positioned to maintain or increase their share of the international market, however it is noted that the smaller, higher cost metallurgical coal mines will continue to face a difficult profit environment, particularly in fiscal 2016.

Figure 7 Internationally traded coal demand



Source: Minaxis. Excludes lignite.

World thermal coal imports, excluding lignite, are forecast to grow from 962.6 million tonnes in 2014 to 1,158.8 million tonnes in 2017 – an average increase of 65 million tonnes per year. The outlook for thermal coal is driven by analysis of the electricity consumption requirements of a rapidly rising global population, counterbalanced by strong growth in gas-fired generation and renewable energy. The United States Census Bureau estimates world population will grow from 6.9 billion in 2010 to 7.6 billion people in 2020; a rate equivalent to adding a billion people to world population every 13 years.

Queensland's coal exports are comprised of 74% metallurgical coal and 26% thermal coal. Over recent years Queensland's thermal coal exports have been mainly sold within the Pacific Rim and Indian Ocean markets, which together take 99% of the state's thermal coal exports. Atlantic Basin and Mediterranean thermal coal markets, which take the other 1% of Queensland's thermal coal exports, are mainly supplied by Russia, Colombia, Venezuela and the United States. Over recent years there has been a glut of supply into Europe, to the degree that spot thermal coal prices delivered on the dock to the coal importing ports of Europe have been cheaper than prices for equivalent coal loaded onto vessels at the exporting ports of Australia. The economics of thermal coal exports from Australia to the

Atlantic markets are also made difficult by the cost of ocean freight to distant markets, which is relatively high compared to the modest per tonne value of thermal coal.

Queensland's higher value metallurgical coal exports are more widely distributed, with the countries of the Pacific Rim and Indian Ocean taking 80% of the state's metallurgical coal exports and the Atlantic Basin and Mediterranean markets accounting for 20% of volumes.

Table 5 Queensland's coal exports by type, Mt

Year to June	2010	2011	2012	2013	2014	%
Metallurgical	124.505	116.319	118.054	128.458	153.920	74
Thermal	58.627	46.176	46.881	51.136	54.699	26
State total	183.132	162.495	164.935	179.594	208.619	100

Data Source: DNRM

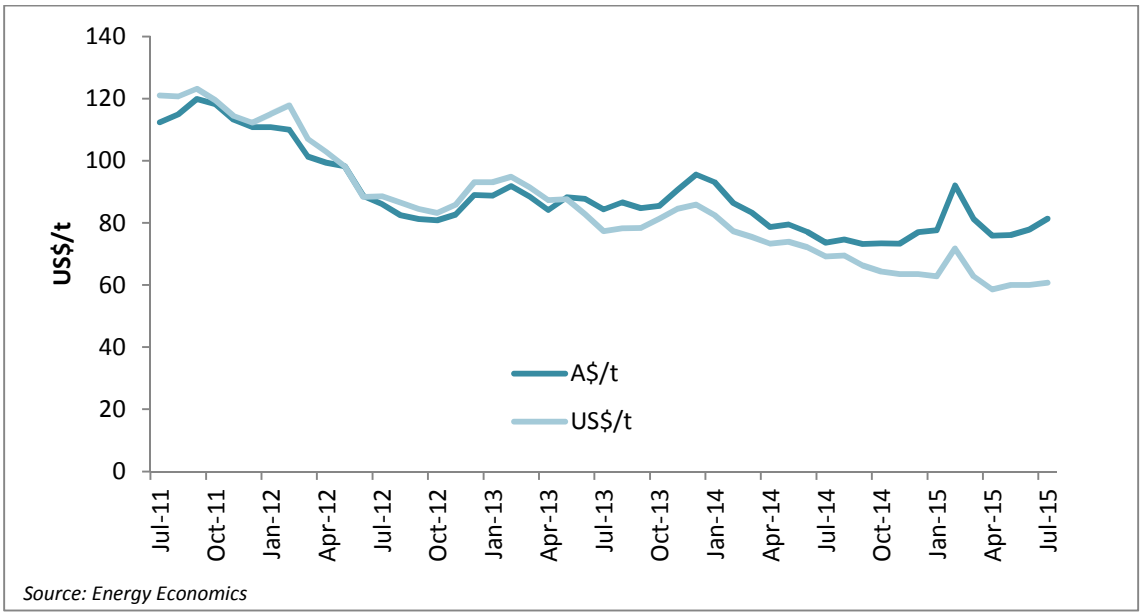
Just five countries - Japan, India, South Korea, China and Taiwan - account for 82% of Queensland's total exports.

4.1 Thermal coal

Thermal coal spot prices reached a peak of US$122 per tonne (loaded at the Port of Newcastle) in October 2011, but prices have fallen fairly continuously since then to a level of US$60.75 per tonne at the time of writing. The weakness in thermal coal prices was initially the result of a surge in supply - in part a recovery following weather induced supply constraints in 2011 and in part through construction of additional supply capacity at a rate that has subsequently proven to be in excess of demand. Growth in imports remained strong in in 2011 and 2012, but weakened through 2013 and 2014 – prolonging the period of market weakness. Global thermal coal imports declined in 2014 for the first time in over 20 years, as Chinese imports, excluding lignite, plunged from 185.7 million tonnes in 2013 to 160.3 million tonnes in 2014.

In early 2015 spot prices spiked temporarily as a result of extended mine shutdowns over the Christmas & New Year period and flooding in the Hunter Valley in April 2015.

Figure 8 Thermal coal spot price – FOB Newcastle



Source: Energy Economics

Over the long term higher thermal coal prices will be necessary to encourage development of a new generation of mines in new mining provinces, as these will generally be located further inland, be at greater depth or have lower energy content than current mines. In other words, they will typically have higher production costs per unit of net energy contained.

However the time horizon for the development of mines in higher cost provinces has been pushed back by the slowing of demand growth internationally. Thermal coal market demand through 2017 is now expected to be comfortably supplied by expansions of existing mines and by the development of new mines within existing mining districts with similar cost structures to existing mines. Hence substantive price increases for thermal coal are not considered likely within the forecast period.

The electricity sector accounts for over 90% of thermal coal consumption. The fundamentals of world electricity demand remain strong. In addition to the world's population growing by a billion people every 13 years, the IEA estimates there are 1.3 billion people in the world without access to electricity. Furthermore, average global electricity consumption per person is steadily increasing.

Gas and renewable energy will continue to rapidly grow their share of world energy markets, but substantial increases in coal consumption will also be required to meet global energy demand. Coal continues to be the lowest cost fuel for electricity generation in most regions of the world, although gas pricing has fallen as ongoing improvements in fracking and horizontal drilling technology continue to drive down the costs of shale gas and shale oil. Oil-fired electricity generation is in long-term decline, with no real prospects of resurgence despite lower prices. In the atrophied nuclear sector long lead times are expected for new capacity. In Europe and most of Asia there is little remaining potential for large scale hydro-electric developments, while other renewable energy sources remain expensive.

A continued shift away from nuclear power following the reactor melt-down at the Fukushima-Daiichi nuclear power station in March 2011 will likely result in increased demand for both coal and gas. Few countries located near tectonic plate boundaries, where earthquakes and tsunamis are most common, are expected to risk building nuclear power stations in future. Plate boundaries extend the length of the west coasts of North America and South America, transect the Mediterranean region and pass through or near the island nations of eastern Asia (including Japan, Taiwan and the Philippines). Japanese utilities announced a stream of new coal-fired power projects in the first quarter of 2015 as they recognise new nuclear units are off the agenda.

Europe's thermal coal demand is expected to grow relatively slowly due to static/declining population, low economic growth, carbon constraints and a decline in heavy industry as a proportion of GDP. Most incremental demand for imported thermal coal will be from China (from 2016), India and Southeast Asia – areas which are increasingly the world's manufacturing hubs and which also contain most of the world's population.

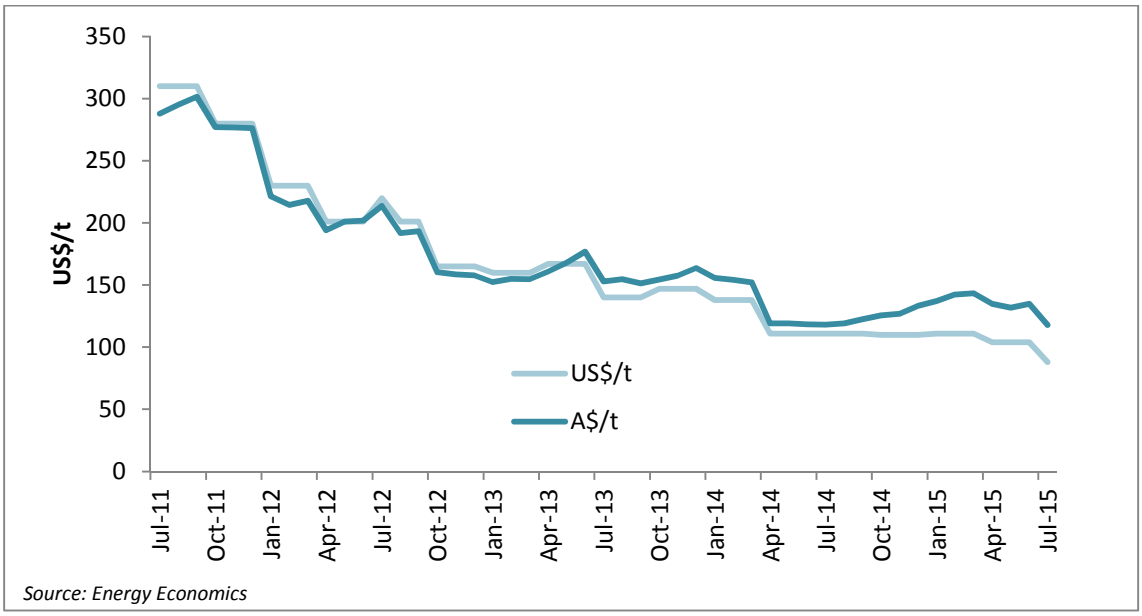
China's thermal coal imports are expected to decline again this year following the implementation of new controls on the burning of low quality coal and on coal consumption near major urban centres, plus increased taxes on coal imports. However at current prices imported coal remains very competitive into south-eastern China, compared with domestic thermal coal transported from the north of the country. Much of the Chinese thermal coal production sector is making losses at current price levels. Minaxis forecasts a sharp recovery in Chinese thermal coal imports in 2016 and 2017 and ongoing very strong growth in India's thermal coal imports.

4.2 Metallurgical coal

Metallurgical coal prices have fallen even more sharply over recent years than thermal coal prices. Contract prices for premium hard coking coal peaked at US$330 per tonne (loaded at Queensland ports) in the June 2011 quarter, but have fallen quite steadily since that time. The recently negotiated contract price for the September 2015 quarter is US$93 per tonne, which is down 15% from US$109.5 per tonne for the March 2015 quarter. For metallurgical coal, as for thermal coal the root cause of the initial phase of the price fall was excessive growth in supply capacity – including the strong recovery in Australian exports after the severe 2011 wet season. Global metallurgical coal imports also fell by 2.8% in 2011, helping to spark the start of the price decline, however imports then grew by 4% in 2012 and 10% in 2013.

Substantial readjustment in export supply capacity occurred from 2012 through 2014, bring the markets closer to supply-demand balance, however this was undone by an anaemic 0.4% increase in global metallurgical coal imports in 2014. Chinese imports tipped rapidly from strong growth in 2013 to sharp falls in 2014, with that trend continuing through the first half of 2015.

Figure 9 Hard coking coal (Curragh) quarterly price FOB Queensland



Source: Energy Economics

A further round of capacity adjustments may be needed in fiscal 2016, of which US exporters will bear the brunt due to the strength of the greenback against the currencies of other major exporting countries.

Steel demand is concentrated in sectors susceptible to investment deferral, such as infrastructure, construction, shipbuilding and manufacturing of cars and other consumer goods. Metallurgical coal demand is, therefore, affected to a greater degree by any weakness in economic growth than is thermal coal.

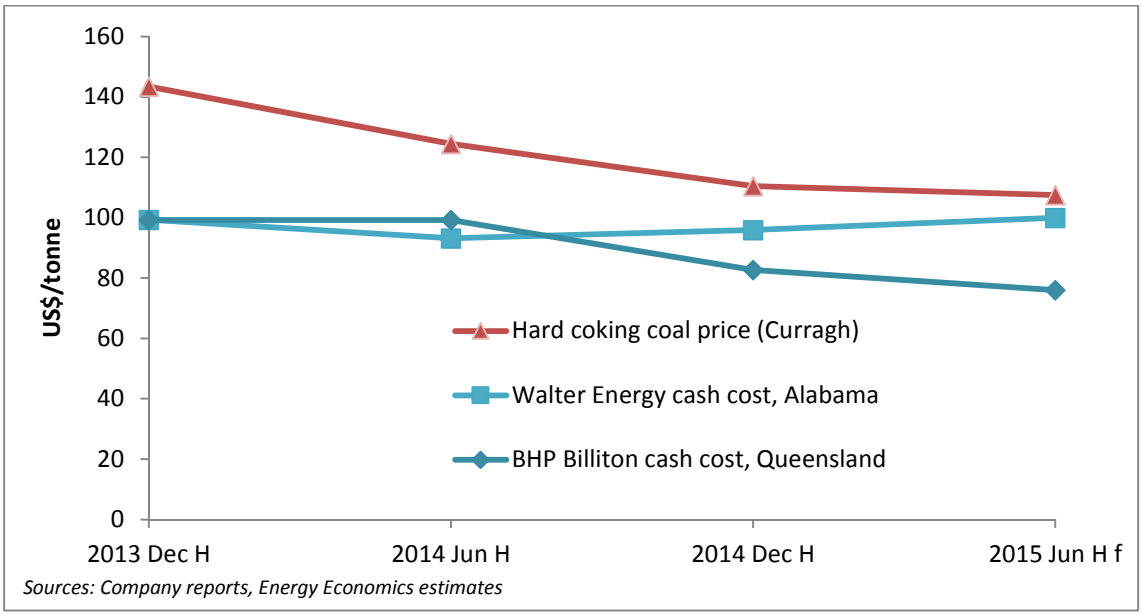
China is no longer a particularly low cost steel producer, investment in steel intensive infrastructure projects is waning, and the government is working to restrain a real estate bubble and rebalance the economy. Minaxis forecasts that China's metallurgical coal imports will remain subdued, with forecast imports of 65 million tonnes in 2017 being lower than the 2014 level of 68 million tonnes.

Recovery in European demand (off a low base) and increased growth in Indian imports will counterbalance the weaker Chinese demand.

On the supply side, the United States is Australia's biggest competitor in the international metallurgical coal trade, although its market share has fallen from 21% in 2012 to 17% in 2014, while Australia's share has increased from 48% to 56% over the same timeframe. United States exports are expected to fall again this year, as many producers are unprofitable at current international prices and exchange rates. We estimate the cash production cost of BHP Billiton's Queensland metallurgical coal operations has continued to fall in the half year to June 2015, aided by a further 12 per cent fall in the Australian dollar relative to the United States dollar (graphed overleaf). This compares with an expected slight

increase in cash costs to US$100 per tonne this year for the US metallurgical coal operations of major North American producer Walter Energy.

Figure 10 Major producer metallurgical coal cash cost comparison



Sources: Company reports, Energy Economics estimates

BHP Billiton and Walter Energy are among the lowest cost coking coal producers in their respective countries, yet the profitability of even these companies is being squeezed as Chinese import demand falls. Appalachian metallurgical and thermal coal producer Patriot Coal filed for Chapter 11 bankruptcy protection in May 2015: another indication of the poor financial position of United States metallurgical coal producers. Walter Energy itself filed for Chapter 11 bankruptcy protection in July 2015.

Additional supply is still being commissioned and will place more coal into an already weak market. In Mozambique, Vale is expanding the annual capacity of its Moatize mine from 11 million to 22 million tonnes (ca. 60% of which will be coking coal) and developing the 18 million tonne per year Nacala rail and port corridor to overcome severe capacity restrictions on the existing Senna rail system. By the end of March 2015 the completion percentages of the various components of the project were 86% for the mine expansion, 99% for the new sections of the railway, 57% for the brownfield sections of the railway and 97% at the port. The project completion target is the September 2015 quarter. In Indonesia production is expected to commence from BHP Billiton's one million tonne per year Maruwai trial mine within months. In Queensland, metallurgical coal capacity, conceived and initiated during the boom, will continue to come on stream at projects such as the Cook colliery expansion and the Grosvenor project.

Through 2015 a combination of falling global metallurgical coal imports and new supply coming on stream will see renewed pressure on existing high cost producers. While the average cash cost of Queensland's metallurgical coal mines is lower than those of its main competitors, and Queensland is

expected to continue to grow market share as a consequence, the higher cost metallurgical coal mines in Queensland will come under significant pressure.

The recovery of the international metallurgical market can be expected to be a drawn out process. Energy Economics sees little scope for the development of Greenfield metallurgical coal mine projects in Central Queensland over the next few years, beyond those currently committed.

5 COAL RAILINGS ANALYSIS

Energy Economics forecasts that coal railings on the Blackwater and Moura Systems will increase from 77.2 million tonnes in fiscal 2014 to 82.1 million tonnes in fiscal 2017[6]. This is an increase of 4.9 million tonnes over the three year period at a compound annual growth rate of 2.1%.

Coal railings to the new Wiggins Island Coal Export Terminal (WICET) are forecast to be 0.9 million tonnes in fiscal 2015, increasing to 12.1 million tonnes in fiscal 2016 and 18.6 million tonnes in fiscal 2017.

We do not envisage any new mines being commissioned in the study area over the forecast period, with the major increments in railings volumes being provided by mine expansions and operational changes as below.

- A major expansion of the annual capacity of Glencore's Rolleston thermal coal mine from 12 million tonnes towards 17 million tonnes.
- The transition of Caledon's Cook colliery from a small bord & pillar operation to a 3.5 million run-of-mine tonne longwall mining system.
- Assumed reactivation of the Norwich Park Mine late in the forecast period. BHP Billion Mitsubishi Alliance placed Norwich Park on care and maintenance in May 2012.
- Redirection of some tonnage from the Port of Hay Point to RGTCT.
- Progressive expansion of the Baralaba mine towards an eventual annual capacity of 3.5 million tonnes.

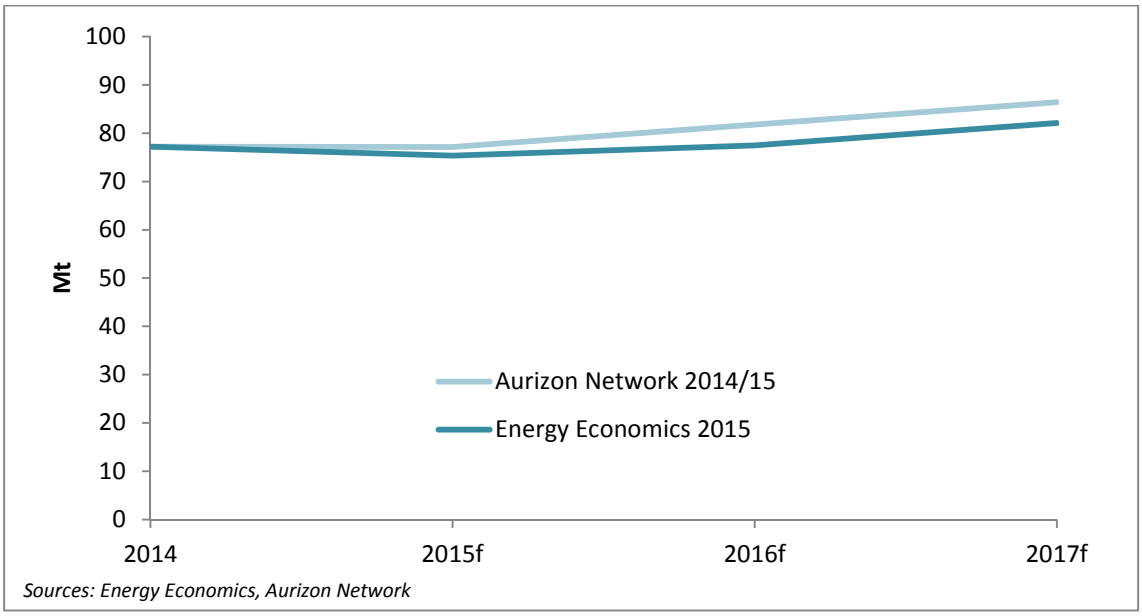
Most of the above railing increments are associated with tonnage allocation commitments at WICET. Counterbalancing the above are the following main reductions in coal railings in the study area.

- Closure of the BHP Billion Mitsubishi Alliance's six million tonne per year Crinum longwall mine on exhaustion of reserves in fiscal 2016.
- A production cut at the [redacted] mine as its existing rail and port take-or-pay commitments expire.

Over the course of the three forecast years, fiscal years 2015 through 2017, Energy Economics estimates that a total volume of 234.9 million tonnes of coal will be railed on the Blackwater and Moura rail systems. This figure is 4.2% lower than the Aurizon Network forecast of 245.3 million tonnes, with 5.3 and 4.9% differences occurring in fiscal 2016 and fiscal 2017 respectively, as graphed and tabulated overleaf.

[6] Rail System groupings as per AN (Vermont to Gladstone railings allocated to Goonyella System. Crinum and Kestrel railings to Hay Point allocated to Blackwater System. Coal railings to Cement Australia excluded.)

Figure 11 Blackwater and Moura System coal railings forecast comparison



Sources: Energy Economics, Aurizon Network

Table 6 Blackwater and Moura Systems coal railings forecast comparison

Financial year to June	2014	2015f	2016f	2017f	Total 2015 - 2017
Aurizon Network 2014/15	**77.2**	**77.1**	**81.8**	**86.4**	**245.3**
- Moura System	12.4	13.3	13.5	15.8	
- Blackwater System	64.8	63.8	68.3	70.6	
Energy Economics 2015	**77.2**	**75.3**	**77.5**	**82.1**	**234.9**
- Moura System	12.4	11.9	13.6	14.3	
- Blackwater System	64.8	63.4	63.9	67.8	
Difference	-	-1.8	-4.3	-4.3	-10.4
% Difference	-	-2.3	-5.3	-4.9	-4.2
Energy Economics 2014	**76.6**	**73.4**	**77.0**	**83.1**	**233.5**
EE 15 - EE 14	0.6	1.9	0.5	-1.0	1.4
% Difference	0.8	2.6	0.6	-1.2	0.6

Notes:
- *The AN forecast incorporates unpublished updates.*
- *AN FY2014 data adjusted to actuals.*
- *Rail System groupings as per AN (Vermont to Gladstone railings allocated to Goonyella System. Crinum and Kestrel railings to Hay Point allocated to Blackwater System. Coal railings to Cement Australia excluded.)*

The Aurizon Network forecasts appear to take a top down approach, with individual projects being allocated a percentage of their contracted railings within a pre-defined envelope of the total system forecast. The tonnages allocated to each mine, as provided to Energy Economics, are therefore not particularly meaningful, particularly in cases where a mine within a rail system has been idled or is about to close, yet is still allocated a share of the forecast railings. The form of the Aurizon Network forecast data renders detailed comparisons at the mine level of limited value. An exception is in cases where Aurizon Network has adopted forecasts prepared by consultancy John T. Boyd Company for railings to WICET.

It is noted that the list of mines and projects within Energy Economics' forecasts and in Aurizon Network's forecasts are almost identical – the differences primarily revolve around the scale and timing of production from these operations.

5.1 Transport Infrastructure Overview

The Blackwater-Moura rail network transports coal from the mines of the southern Bowen Basin and the Callide Basin to the Port of Gladstone for export and to various domestic customers in Gladstone and Stanwell. The commissioning of WICET will initially augment exports from the two pre-existing terminals at the port – the RG Tanna Coal Terminal (RGTCT) and the Barney Point Coal Terminal (BPCT). However the Barney Point facility, which is located near to residential areas of Gladstone, is to cease coal exports within one year of the commissioning of WICET. The combined annual coal exporting capacity of the port will then be 102 million tonnes, comprised of 27 million tonnes at WICET (after ramp up to full capacity) and 75 million tonnes at the RGTCT. This capacity is more than sufficient to cater for forecast railings through fiscal 2017. The highest level of annual coal exports forecast for the Port of Gladstone by Energy Economics is 77.0 million tonnes, in fiscal 2017, which would only utilise 75% of terminal capacity at the port.

The capacity of the rail system is being upgraded in line with the increased port capacity. The Wiggins Island Rail Project (WIRP) comprises the following components.[7]

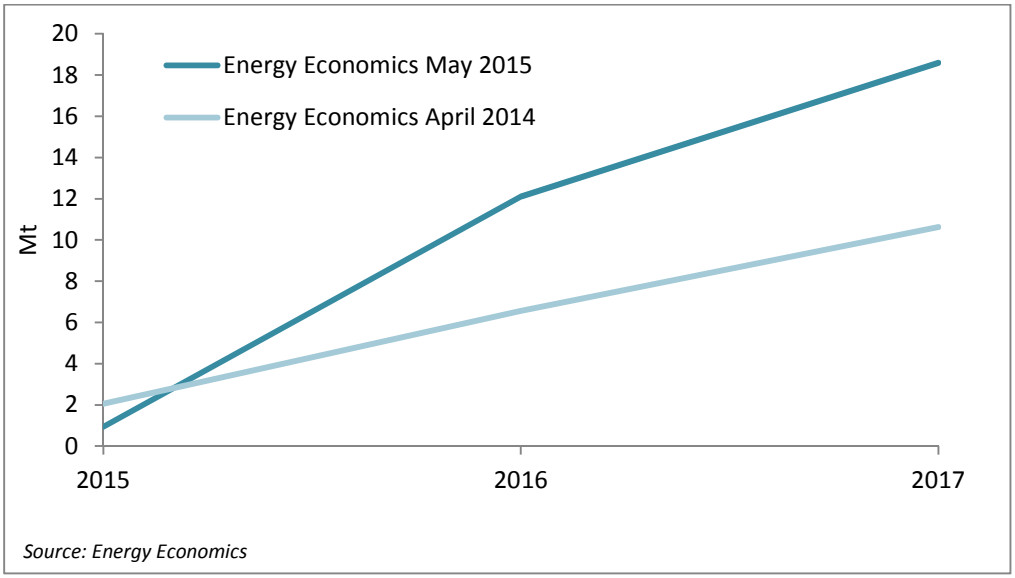
- The Balloon loop for unloading coal at WICET.
- Triplication of 3.5 km of the North Coast line through Yarwun to connect to the Wiggins Island Balloon Loop.
- An upgrade to the Moura track.
- Duplication of 18 km of track between Rocklands and Stanwell.
- Duplication of 24 km of track between Dingo and Bluff.
- Construction of a 2km passing loop on the Bauhinia Line between Kinrola and Sirius Creek.

[7] Aurizon Network http://www.aurizon.com.au/Projects-site/Pages/Wiggins-Island-Rail-Project.aspx

5.2 Wiggins Island Coal Export Terminal (WICET)

Energy Economics' analysis of coal railings to WICET for this report has resulted in a marked increase in forecast tonnages compared with our 2014 forecast.

Figure 12 Energy Economics 2014 & 2015 forecasts of railings to WICET



Source: Energy Economics

Over the course of the three forecast years, fiscal years 2015 through 2017, total railings to WICET are now forecast to be 31.6 million tonnes, compared with 19.2 million tonnes in our earlier forecast.

The major differences between the two forecasts are for the Cook and Rolleston mines. For fiscal 2017 the Cook forecast is 2.3 million tonnes higher than previously and the Rolleston forecast is 5.4 million tonnes higher than previously.

Caledon Coal's Cook colliery is being transformed from a small bord and pillar mine to a higher capacity longwall operation. The longwall project has proceeded much more rapidly than we expected. The longwall was commissioned in December 2014 and the expansion of the coal preparation facilities to cater for the expanded output was completed in May 2015.

A project to expand the annual capacity of Glencore's Rolleston mine from 12 million tonnes to 17 million tonnes has also proceeded much more rapidly than we expected. The Environmental Impact Statement process for the Rolleston expansion was completed on 23 February 2015, when the assessment report was issued by the Queensland Department of Environment and Heritage Protection to Glencore Coal Queensland Pty Ltd. The public notice for application for a mining lease was published in July 2015 and progress through to final approval will largely depend on whether objections are received requiring a Land Court of Queensland hearing.

Neither the John T. Boyd Company's nor Aurizon Networks forecasts for railings to WICET have been released into the public domain, hence comparisons with these forecasts have had to be omitted from this abridged version of the report.

5.2.1 WICET overview

WICET is a new coal terminal being constructed at the Port of Gladstone. It is located just to the west of the existing RGTCT. WICET is owned directly by its users, rather than by third party investors. Terminal handling charges will therefore be on a cost recovery basis. The Gladstone Ports Corporation will be the operator of the facility.

Financial Close for the first stage was achieved in September 2011 and construction work commenced almost immediately. After some delays, the first stage was commissioned on the 1st of May 2015. WICET will have an annual throughput capacity of 27 million tonnes.

A proposed second stage development has been postponed indefinitely due to weak international thermal coal markets. The development of the second stage is predicated on the opening up of the inland portions of the Surat Basin, with concurrent development of a rail link between that area and existing rail services through to Gladstone. Eventually the Wiggins Island Coal Export Terminal could comprise four berths and provide more than 80 Mtpy of coal export capacity.

5.2.2 Stage 1 WICET shareholders

The eight foundation shareholders on the terminal are tabulated overleaf.

Table 7 WICET Stage 1 owners and mines

Owner	Throughput allocation (Mt)	Source mine/project	Original primary source	Original secondary source	Other potential sources
Aquila Resources Pty Ltd	1.6	**Eagle Downs**	Washpool		
Bandanna Energy Limited	4.0	**Springsure Creek**	Arcturus		Dingo West
Caledon Resources Pty Ltd	4.0	**Cook**	Cook (Koorilgah)	Minyango (Koorilgah)	
Cockatoo Coal Limited	3.0	**Baralaba**	Baralaba	Wonbindi	
Glencore Coal Queensland Pty Limited *1	10.9	**Rolleston**	Rolleston		Togara North
Northern Energy Corporation Limited *2	0.5	**Colton**	Colton		
Wesfarmers Curragh Pty Limited	1.5	**Curragh**	Curragh		
Yancoal Australia Limited	1.5	**Yarrabee**	Yarrabee (Boonal)		
Total	**27.0**				

**1 As manager of the Rolleston Joint Venture. Former company name Xstrata Coal Queensland.*
**2 Now a subsidiary of New Hope Corporation Limited.*
Source: Energy Economics

5.2.3 WICET forecast comparisons

In May 2014 consultancy John T. Boyd Company undertook a detailed review of the of the production schedules for the mines and projects with a capacity allocation in WICET, and provided further review and updates in a December 2014 report.

Aurizon Network has re-cast its forecasts for railings to WICET so that they are mainly in line with a 'Mid Case' forecast prepared for the WICET users by John T. Boyd Company. Aurizon Network made two changes to the mine forecast prepared by John T. Boyd Company.

5.3 RG Tanna Coal Terminal

The RG Tanna Coal Terminal (RGTCT) is one of three coal terminals located at the Port of Gladstone. The Port of Gladstone is managed and operated by the Gladstone Ports Corporation Limited, which is a Queensland Government owned corporation. Gladstone Ports Corporation also manages and operates the Port of Rockhampton and Port of Bundaberg.

The RGTCT currently has four berths and three ship-loaders, providing annual throughput capacity of 75 million tonnes. Potential exists for a fourth ship-loader and a fifth berth to be constructed in future, which would take annual capacity to 90 – 100 million tonnes.

Throughput arrangements for the terminal appear to consist of a mix of formal contracts with take-or-pay provisions and less formal agreements without take-or-pay provisions.

5.4 Barney Point Coal Terminal

The current annual capacity of the Barney Point Coal Terminal is approximately 6 million tonnes. Following the commissioning of WICET, coal operations are to be transferred from Barney Point to RGTCT and WICET. Barney Point may then be used for 'clean' dry bulk materials and general cargos[8].

It is understood that the Barney Point Coal Terminal must be closed one year after the commissioning of WICET.

5.5 Rail

5.5.1 Below-rail

Below-rail services in the Central Queensland coal region are regulated by the Queensland Competition Authority. An Access Undertaking (UT) endorsed by the Queensland Competition Authority provides a framework for access to Aurizon Network's rail network for the purposes of operating train services. The Access Undertakings have four year terms and set out take-or-pay mechanisms to be used in the event of coal railings volumes falling below forecast. These take-or-pay provisions (along with take-or-pay provisions applying to port access and above-rail haulage) are a consideration in formulating the volume forecasts in this report - to the degree that take-or-pay provisions act as a disincentive to mine operators scaling down production or closing mines.

The general principle of the take-or-pay provisions is that they aim to provide some recompense to Aurizon Network for the fixed costs of unused train service entitlements. The take-or-pay provisions in the Access Undertakings have evolved through the years, and are therefore not uniform across all mines in the region.

The first Access Undertaking (UT1) specifies take-or-pay charges on 30% of access tariff AT3 charges and 30% of AT4 charges, with no provision for capping. A relatively small number of mines in the region are still covered by UT1.

Post-UT1 Access Undertakings require payment of 100% of AT2, AT3 and AT4 as take-or-pay charges, with a revenue cap limiting the overall amount of access charges Aurizon Network can recover. As a rough approximation these three pricing components are equivalent to about 80% of the total below-rail charge.

Take or pay conditions in the standard access agreements executed during the UT1 and UT2 regulatory periods are fixed to the arrangements in those respective access undertakings. However, the 2010

[8] July 2012, Gladstone Ports Corporation, 50 Year Strategic Plan.

standard access agreements (UT3) include provisions that take or pay conditions will be updated to be consistent with the take or pay arrangements in future undertakings. Hence, as older mines close over time there will be increasing uniformity in take-or-pay arrangements across the region.

Of particular note is that take-or-pay is only triggered when actual railings fall below forecast for a rail system as a whole for the year; hence a single operator may not have to make take-or-pay payments even if its railings fall well below expectations.

Although the take-or-pay trigger at the system level is set at 100% of the *forecast* railing volume, the liability for a particular access holder is the gap between its actual railed volume and its *contract* volume. This provides a price signal that is a disincentive to over-contracting.

Below-rail access can be relinquishment or transferred, subject to payment of prescribed penalties. Relinquishment fees for UT1 and UT2 Access Agreements are determined in accordance with those two agreements – they are not updated to be in line with the latest Undertaking. The determination of the present value of the take or pay obligations under a UT1 Access Agreement is 40% of the Access Charges that would be payable if the Access Holder operated the Train Services as prescribed over the following two years.

For post UT2 Access Agreement relinquishment costs are set higher if there is no alternative demand for the services. In this case the relinquishment fee is 50% of the Present Value of the take-or-pay-obligations. Where the train services are being relinquished to another access seeker, who will unload at the same unloading point and will predominantly utilise rail infrastructure in the same coal system, the payment is, in simple terms, based on the difference between the Present Value of the take-or-pay obligations for the existing haul versus the old haul.

5.5.2 Above-rail

Above rail services in the central Queensland coal region are currently provided by Aurizon and by Pacific National; a subsidiary of Asciano. Above rail contracts are typically of ten years duration.

Above-rail coal transport contracts are subject to take-or-pay, but generally have flexibility in terms of adjusting the volumes to be railed under the contract. Unlike ports and below-rail infrastructure, which are fixed assets, rail rolling stock can be redeployed from one contract to another at little cost, assuming adequate notice is provided. Above rail contracts also commonly cover more than one train path – it is common to have one above-rail contract covering more than one below-rail origin-destination pairing.

Above rail contracts do not need to be put in place as far in advance as below-rail and port contracts. We are informed that at present an above-rail contract can be put in place within a 6 to 12 month lead time, although of course this period will vary over time according to the utilisation levels of rolling stock in the broader region at any point in time. This low lead time is useful to developers of new mines

in terms of limiting their advance exposure to take-or-pay. Now that it is possible to arrange below-rail and above-rail contracts separately, mining companies tend to put in place below rail access arrangements early, as required, but delay formalising above-rail arrangements until much later. In fact some WICET shareholders even now do not have above-rail contracts in place for their projects.

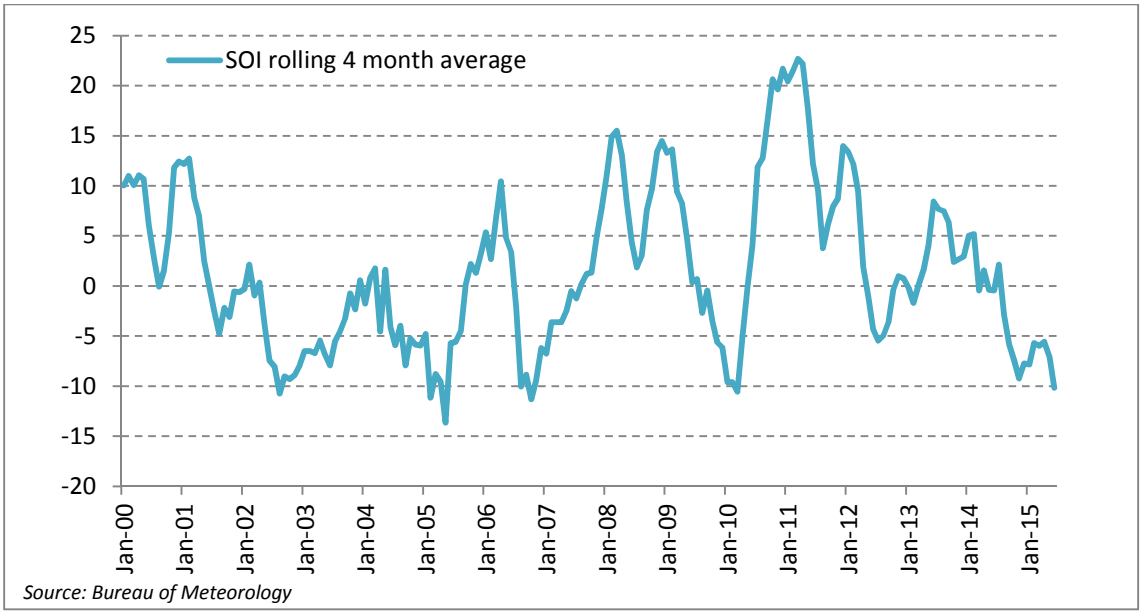
Take-or-pay provisions in above-rail contracts do still represent an impediment to the closure of mines during any cyclical downturn in coal prices – therefore impacting on the efficiency of the coal market in adjusting to changed conditions. Mines that do remain in operation will, however, strive to maximise production almost regardless of the existence of take-or-pay obligations, as increased output typically lowers the unit cost of production and moderates the impact on profit during periods of lower prices.

5.6 Wet season assumptions

Our coal railings forecasts have been formulated assuming 'normal' wet seasons in Queensland. Railings may deviate considerably from forecast in abnormally wet or dry years due to the impacts of rain and flooding on mine and transport operations; however we have included factors in our forecasts to represent the average impact of weather and other force majeure events on output.

Strongly positive Southern Oscillation Index levels are associated with La Niña weather patterns, as was the case in the disastrous 2011 wet season (graphed below).

Figure 13 Southern Oscillation Index



Source: Bureau of Meteorology

The Southern Oscillation Index has fallen well into negative territory over recent months. The Australian Government Bureau of Meteorology notes that "sustained negative values of the SOI below

minus 8 often indicate El Niño episodes."[9] Such negative values are usually accompanied by a reduction in winter and spring rainfall over eastern Australia.

On 21 July 2015 the Bureau wrote that "All international climate models surveyed by the Bureau of Meteorology indicate El Niño is likely to strengthen, and is expected to persist into early 2016."

In summary there is a likelihood of dryer than normal conditions into early 2016, facilitating coal production and exports over that timeframe.

6 MINE FORECASTS

Not provided in this report.