CENTRAL QUEENSLAND COAL RAILINGS FORECAST

Abridged Version

A report prepared by Energy Economics for the Queensland Competition Authority

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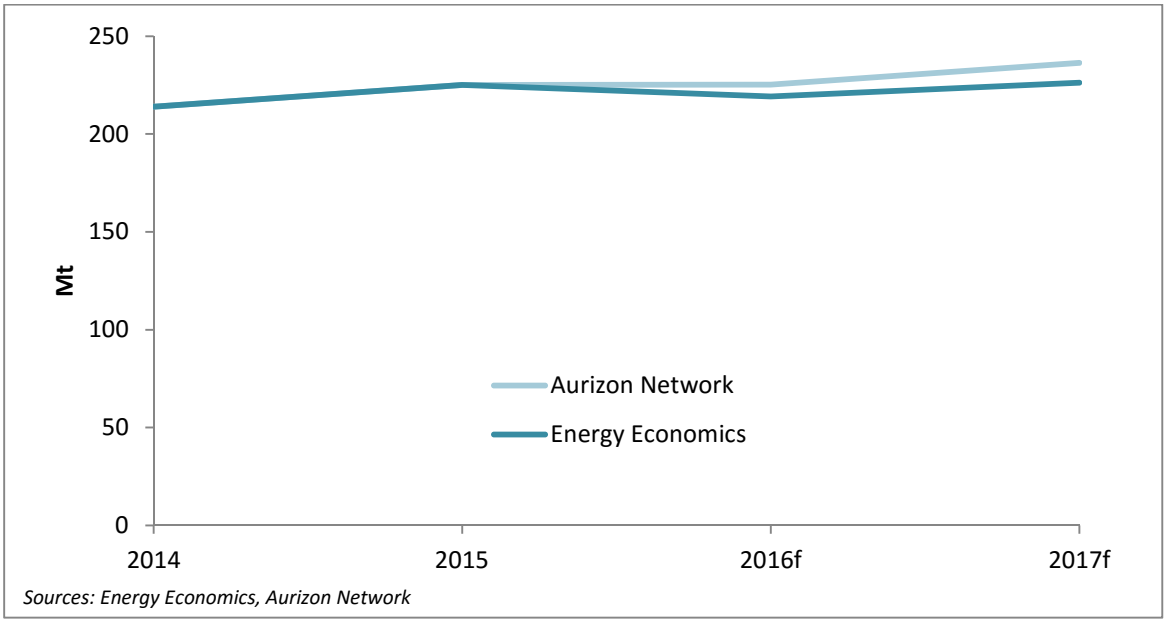
Energy Economics Pty Ltd
65 Wentworth Avenue
Killara, NSW, Australia 2071

TABLE OF CONTENTS

1 EXECUTIVE SUMMARY

Energy Economics forecasts that coal railings in the Central Queensland coal region will increase from 225.0 million tonnes in fiscal 2015 to 226.3 million tonnes in fiscal 2017[1]. This is an increase of only 1.3 million tonnes over the two year period, at a compound annual growth rate of 0.3%. Railings are expected to fall by 5.9 million tonnes in fiscal 2016, due to mine closures and production cuts in an environment of low international metallurgical coal prices, then increase by 7.1 million tonnes in fiscal 2017 as demand recovers and ongoing supply side readjustments favour low cost Queensland metallurgical coal producers.

Figure 1 Central Queensland railings forecast comparison



Sources: Energy Economics, Aurizon Network

Over the remaining two years of the forecast period Energy Economics forecasts coal railings in Central Queensland will total 445.4 million tonnes, which is 3.5% below the Aurizon Network forecast of 461.7 million tonnes.

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 form of the Aurizon Network forecast data as provided renders detailed comparisons at the mine level of limited value. The Aurizon Network railings forecasts were published in December 2014. Since that time a number of mine production cutbacks have been announced in mining companies regulatory filings. It would appear likely that this timing difference accounts for some of the differences between the Aurizon Network and Energy Economics tonnage forecasts.

[1] All figures exclude railings to Cement Australia, Bowen Coke and Queensland Nickel.

Table 1 Central Queensland railings forecast comparison, Mt

Fiscal year	2014	2015	2016f	2017f
Aurizon Network				
Newlands (exc. GAPE)	11.6	14.3	13.9	13.9
GAPE	12.5	15.3	17.5	19.4
Goonyella	112.5	119.6	112.1	116.7
Blackwater	64.8	63.5	68.3	70.6
Moura	12.4	12.3	13.5	15.8
Subtotal	**213.9**	**225.0**	**225.3**	**236.4**
Energy Economics				
Newlands (exc. GAPE)	11.6	14.3	12.0	11.5
GAPE	12.5	15.3	15.3	17.0
Goonyella	112.5	119.6	112.1	115.6
Blackwater	64.8	63.5	66.2	67.8
Moura	12.4	12.3	13.6	14.3
Subtotal	**213.9**	**225.0**	**219.1**	**226.3**
Differences				
Newlands (exc. GAPE)			-1.9	-2.4
GAPE			-2.2	-2.4
Goonyella			0.0	-1.1
Blackwater			-2.1	-2.8
Moura			0.1	-1.5
Subtotal			**-6.1**	**-10.1**

Notes:
- *FY2014 and FY2015 data are actuals.*
- *Historical data and Energy Economics forecasts exclude railings to Cement Australia, Bowen Coke & Queensland Nickel.*
- *The AN forecast incorporates unpublished updates.*
- *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).*

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.

In fiscal 2016 two longwall mines, Crinum and Newlands Northern, are expected to close in the Central Queensland coal region. These closures account for much of the aforementioned 5.9 million tonne fall in forecast coal railings this fiscal year. Also negatively impacting fiscal 2016 railings will be production cutbacks announced this year for the Collinsville, North Goonyella, Burton and Coppabella mines in response to lower metallurgical coal prices; as well as the full year impact of the closure of the Isaac Plains coal mine at the end of 2014.

The above mine closures and production cuts are expected to be partly counterbalanced by production increases at other mines in the region in fiscal 2016, the largest of which are at the Rolleston, Cook, Oaky Creek and Kestrel mines.

Turning to fiscal 2017, our forecast 7.1 million tonne increase in railings is driven by assumed reactivation of the idled Norwich Park mine, expansions at the Rolleston and Baralaba mines, ramping

up of longwall operations at the new Grosvenor mine, initiation of mining at the Byerwen project and further ramping up of longwall production at the Kestrel mine. The main reductions in railings forecast for fiscal 2017 are the full year impacts of the closures of the Crinum and Newlands Northern underground mines.

Domestic Coal Demand

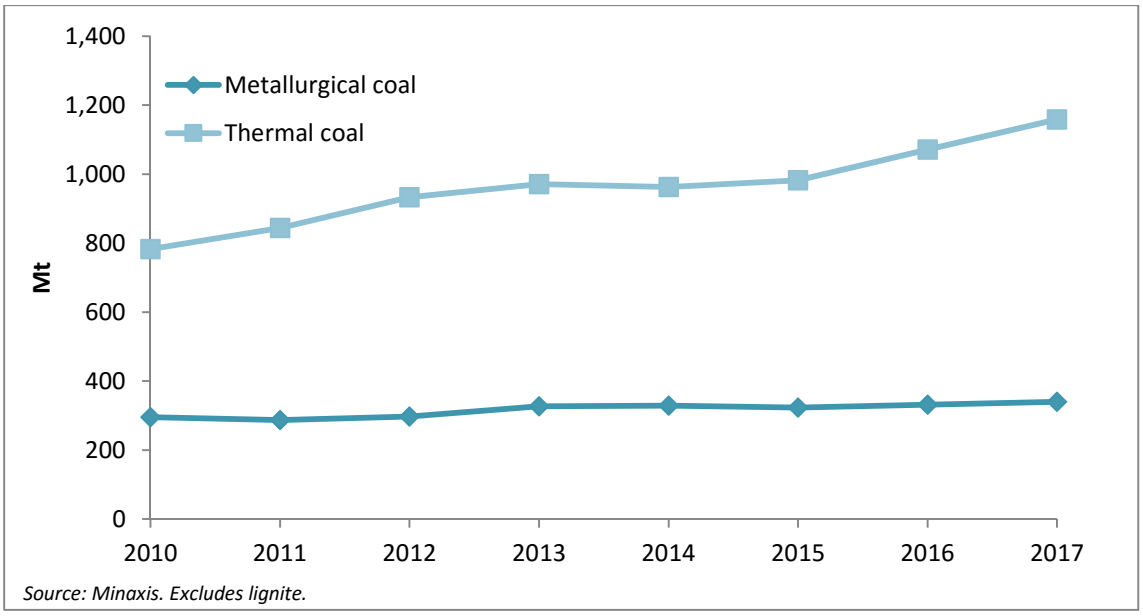
Railings to domestic customers within the Central Queensland coal region are expected to be fairly static over the forecast period – railings to customers in the study area were 8.5 million tonnes in fiscal 2014 (excluding railings to Cement Australia, Bowen Coke and Queensland Nickel) and are forecast 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 2 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 and 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 independently evaluate coal tonnage forecasts submitted to the QCA by Aurizon Network Pty Ltd (Aurizon) as part of the UT4 rail access undertaking process.

In July 2015 Energy Economics provided a report to the QCA which evaluated coal railings on the Moura and Blackwater rail systems in Central Queensland between fiscal 2015 and fiscal 2017. That report was commissioned by the QCA as part of its evaluation of rail access arrangements for the new Wiggins Island Coal Export Terminal (WICET).

This report provides an independent review of coal railings in the wider Central Queensland region between fiscal 2015 and fiscal 2017. Some minor revisions have been made to our earlier railings forecasts for the Moura and Blackwater rail systems, due to the availability of new fiscal 2015 railings data. In addition, the forecasts for some mines on the Moura & Blackwater rail systems have been updated in light of new information. In the main these changes have been minor in nature, with the most significant change being revision of the forecast closure date of the Crinum mine from early fiscal 2015 to third quarter fiscal 2015.

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 99% 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 Central Queensland rail systems to domestic customers totalled 8.8 million tonnes in fiscal 2014[2], which represents 4.1% of total Central Queensland coal railings. Railings to port terminals for export and inter-state distributions make up the other 95.9%.

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

[2] Excluding minor railings to the Bowen Coke Works and Queensland Nickel

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 this 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 past eight years. Forecasts by the Australian Energy Market Operator, however, indicate a resumption in demand growth over the next 2-3 years[3].

Figure 3 Electricity demand in Queensland

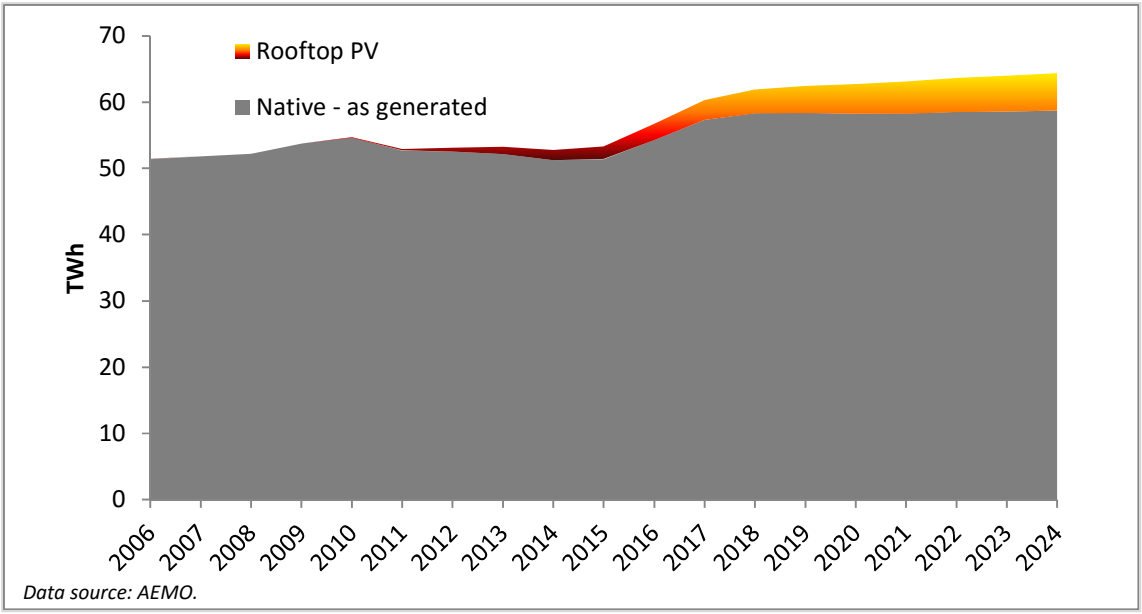


Table 3 Electricity demand in Queensland (TWh)

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

Expectations of burgeoning electricity consumption by Queensland's coal seam gas industry underpin this 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.[4]

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

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

The Australian Energy Market Operator's electricity 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 May 2015 closure of BP's Bulwer Island refinery.
- 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.

Historically, the combination of weak electricity demand, growth in rooftop photovoltaic capacity, and declining electricity exports to New South Wales 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.

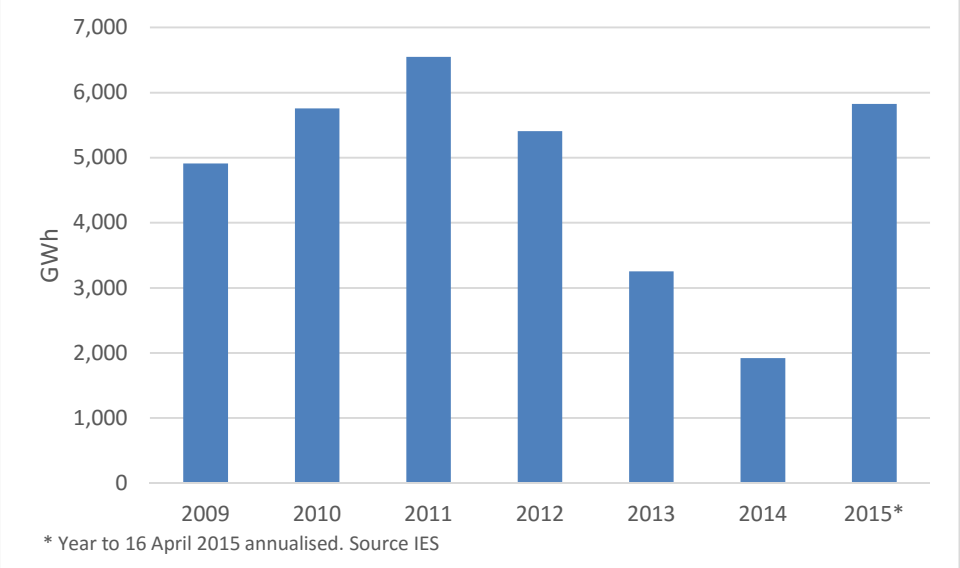
Table 4 NEM Electricity generation by fuel in Queensland (TWh)

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 (graphed below).

Figure 4 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 was tracking towards a 4,500 GWh decrease in fiscal 2015. Low demand and high fuel costs are the root causes of the generation cuts at Lithgow, with expiry of low cost long-term coal supply contracts and increased coal supply costs compromising the competitiveness of these power stations. One of the main collieries in the Lithgow area, Angus Place, was placed on 'care and maintenance' 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 a 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 the Australian Energy Market Operator's recent forecast envisaged no new capacity being required in any NEM region over the next 10 years.[5]

The distribution of Queensland's forecast electricity demand between competing 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 to 3.0 TWh in fiscal 2017, from negligible levels in fiscal 2009.

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[6]. Capacity growth is expected to remain strong despite the further reduction of the feed-in tariff to approximately 6 cents per kilowatt hour this year.

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

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

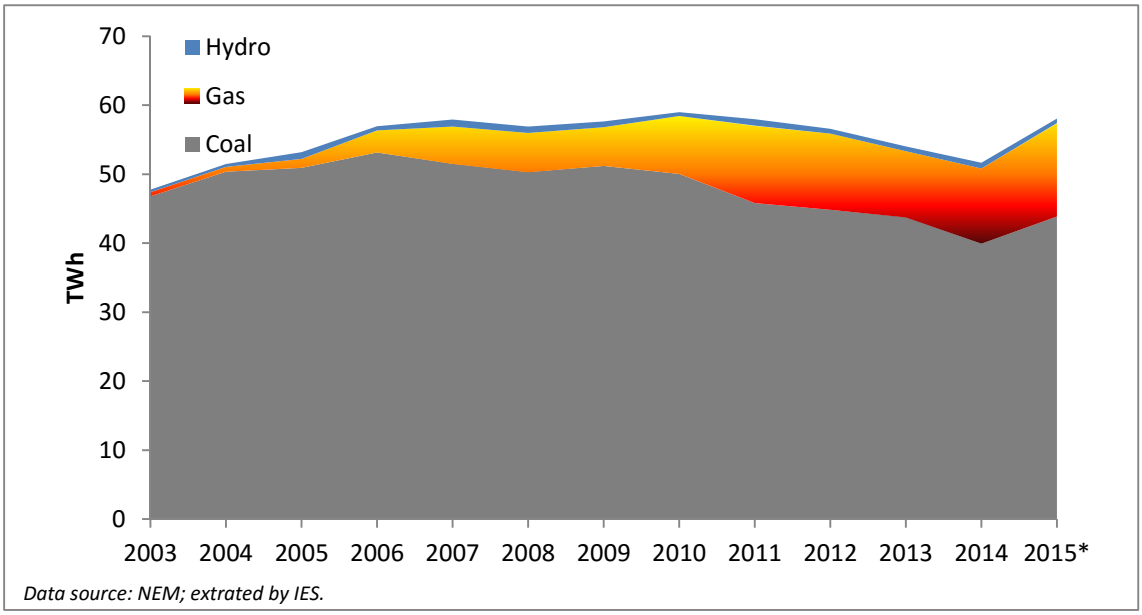
The Australian Government's Large-scale Renewable Energy Target drives investment in renewable generation capacity. In June 2015 the target for 2020 was reduced from 41,000 GWh to 33,000 GWh, largely in response to declining overall electricity demand forecasts and prospects of the scheme exacerbating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

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, which grew at the remarkable compound rate of 41% per year between fiscal years 2004 and 2012, has since flattened due to slowing capacity growth and episodic higher gas prices.

Figure 5 NEM electricity generation by fuel in Queensland



Data source: NEM; extrated by IES.

With exports of LNG from Gladstone having recently commenced, the Queensland 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's domestic gas prices.

But substantial falls in international LNG and oil prices have lowered expectations of future netback gas price levels in Queensland. 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 prices fell 53% from US$108 in March 2014 to US$50.70 in early-September 2015.

Spot LNG prices into Japan fell from US$17.3 per gigajoule in March 2014 to US$7.5 in July 2015. After converting these prices into Australian dollars the LNG spot price has fallen by 47% over the past year and a half, from $19.1 to $10.1 per gigajoule.

Current low international spot prices for LNG and oil 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 March 2013 before tumbling progressively to below $2 per gigajoule in the December 2014 quarter and then surging again to over $6 per gigajoule in mid-2015 (during the winter demand period when prices are typically elevated). The hub price in Queensland was back down to $3.64 on 4 September 2015.

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 and prices for domestic grade coal are generally considerably cheaper than export prices. However, we now expect the switch to burning more coal and less gas will 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 of 3.1 million tonnes from Curragh 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 Collinsville coal to be railed to the Abbot Point Coal Terminal or 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 this 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 alumina 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 in 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 by 30% and reduce emissions, however there is no evidence of a substantial increase in coal consumption relative to historical levels. Future coal consumption is expected to be about 80,000 tonnes per year.

4 INTERNATIONAL COAL MARKETS

4.1 Queensland Coal Exports

Queensland's coal exports comprise 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 have together taken 99% of the state's thermal coal exports. Atlantic Basin and Mediterranean thermal coal markets, which take the other 1%, are mainly supplied by Russia, Colombia, Venezuela and the United States.

The economics of thermal coal exports from Australia to the Atlantic markets are 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. However, over recent years there has also been a glut of supply into Europe, to the degree that thermal coal spot 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.

Queensland's higher value metallurgical coals 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%.

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

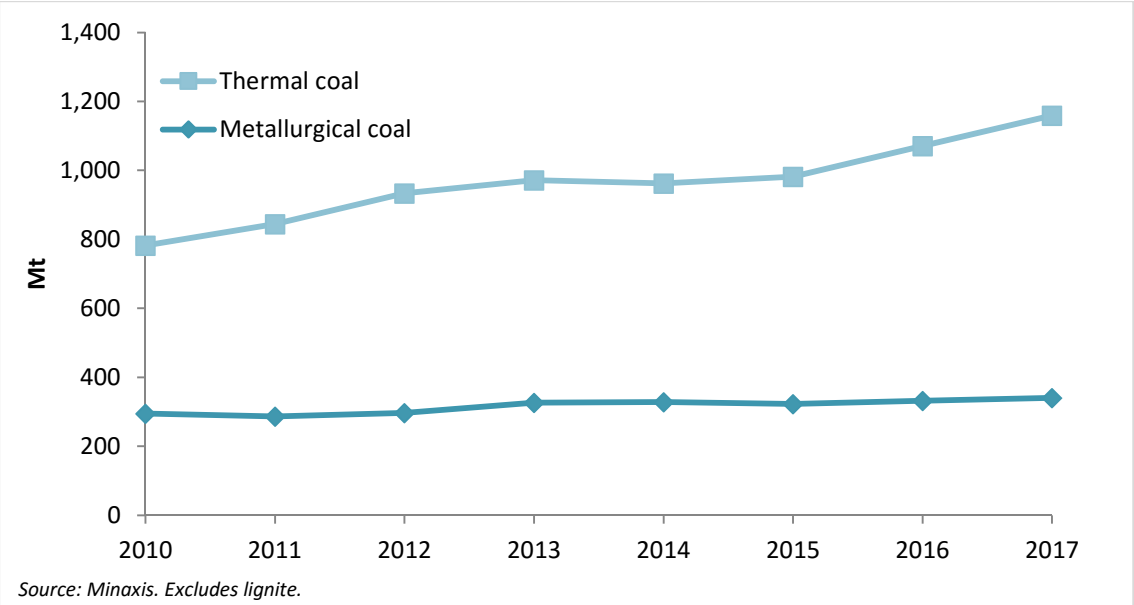
Just five Asian countries - Japan, India, South Korea, China and Taiwan - account for 82% of Queensland's total coal exports.

4.2 International demand overview

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. This is largely impacted by Chinese demand trends, where 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. Significantly, the rate of migration from rural areas to the cities In China is flattening, which impacts steel demand in the construction sector.

Although the forecast growth in international metallurgical coal demand is modest, the weakening of the Australian dollar has reinforced Australian exporter's cost advantage, 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 smaller, higher cost metallurgical coal mines will continue to face a difficult profit environment, particularly through the remainder of fiscal 2016.

Figure 6 Internationally traded coal demand



Source: Minaxis. Excludes lignite.

World thermal coal imports, excluding lignite, are forecast by Minaxis to grow from 962.6 million tonnes in 2014 to 1,158.8 million tonnes in 2017, with 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.

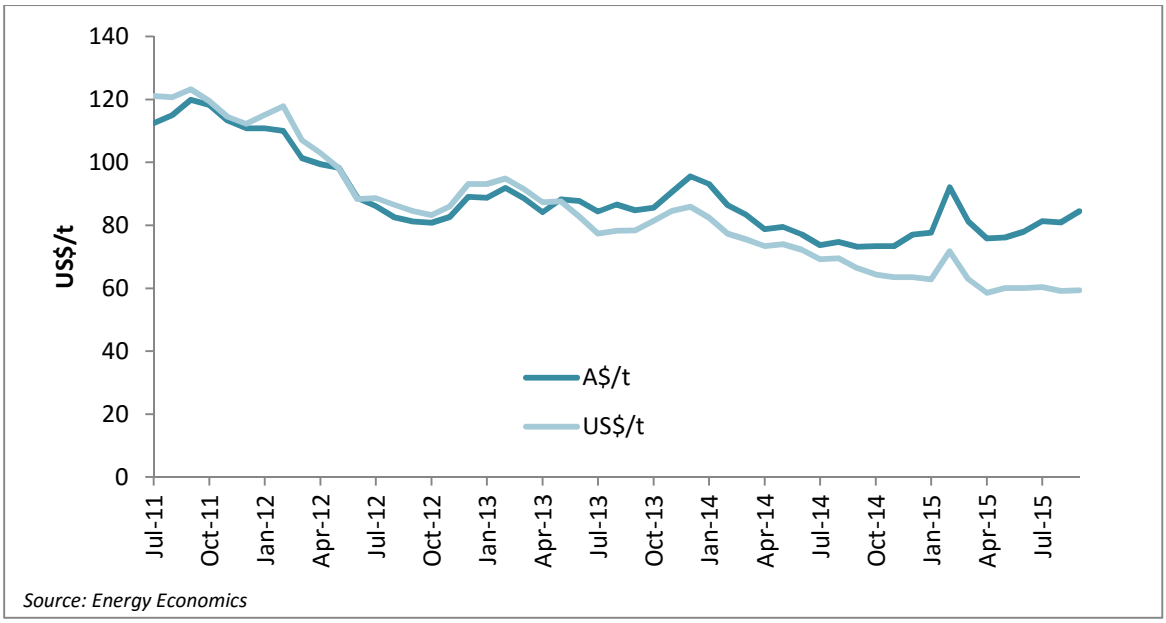
4.3 Thermal coal

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$59 per tonne at the time of writing. The fall in thermal coal prices was initially the result of a surge in supply - in part a supply recovery following weather induced 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 7 Thermal coal spot price – FOB Newcastle



Source: Energy Economics

Over the long term a substantial recovery in 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 limited 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 half 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.

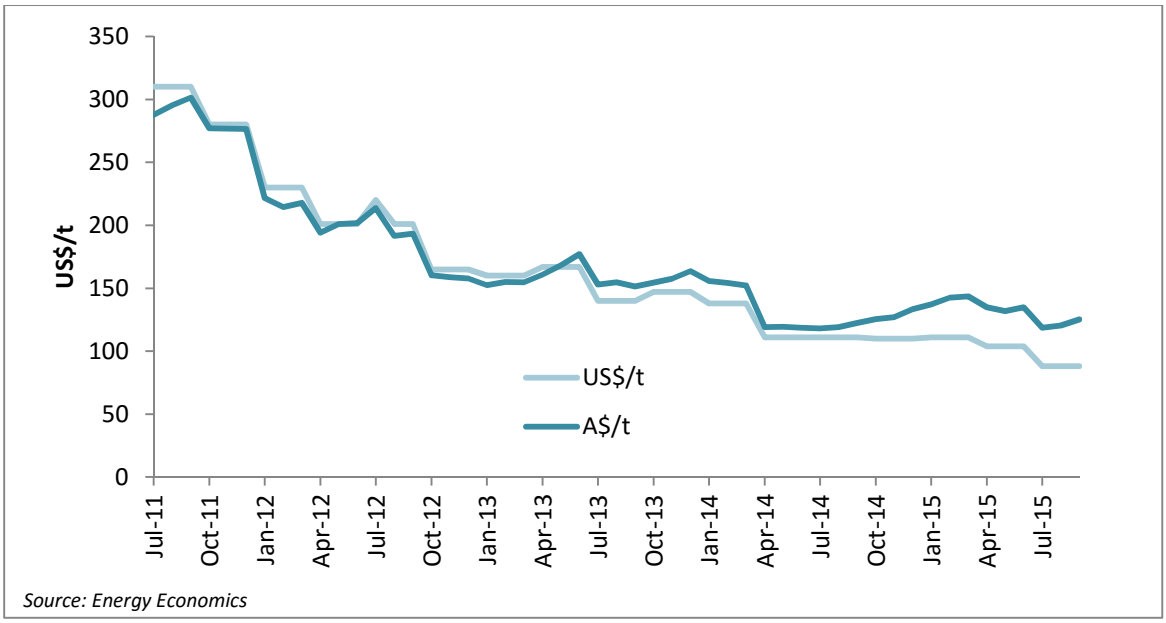
China's thermal coal imports are expected to decline again this year following the implementation of new controls on the burning of low quality coal and on coal consumption near major urban centres, plus increased taxes on coal imports. However at current prices imported coal remains very competitive 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.

4.4 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 negotiated contract price for the September 2015 quarter was 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 8 Hard coking coal (Curragh) quarterly price FOB Queensland



Source: Energy Economics

A further round of capacity adjustments may be needed during 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.

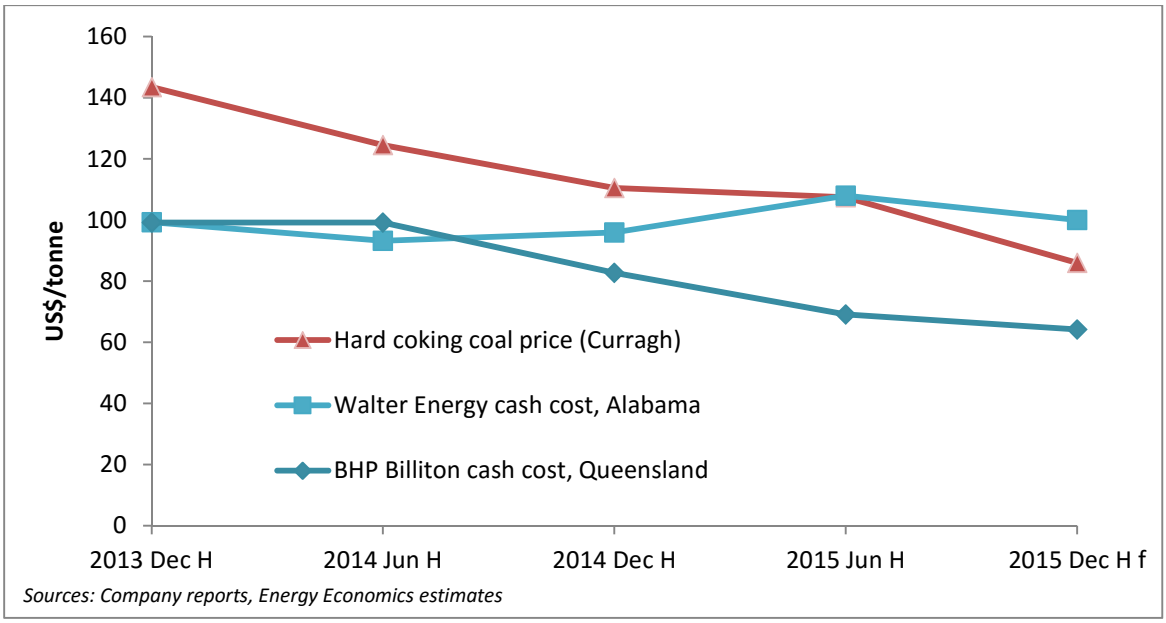
China is no longer a particularly low cost steel producer, investment in steel intensive infrastructure projects is waning, and the government is working to restrain a real estate bubble and rebalance the economy. Minaxis forecasts that China's metallurgical coal imports will remain subdued, with forecast 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 are forecast to 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. The average cash production costs of BHP Billiton's Queensland metallurgical coal operations fell to US$69 in the June 2015 half year, driven by the falling value of the Australian dollar relative to the United States dollar, increased equipment and wash-plant utilisation rates and a continued reduction in labour, contractor and maintenance costs. We estimate BHP Billiton's Queensland costs will fall further to US$64 per tonne FOB, including royalties, in the current half, before ticking up in early 2016 due to the closure of the low cost Crinum longwall mine. This compares with an expected cash cost of US$100 per tonne this half for the US metallurgical coal operations of major North American producer Walter Energy.

Figure 9 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. Construction of the Nacala-à-Velha port and the greenfield segments of the railway has been completed. By the end of June 2015 the revamp of the brownfield sections of the railway was 74%

complete and the mine expansion was around 90% complete. The project is likely to be completed before the end of 2015.

In Indonesia production commenced from BHP Billiton's one million tonne per year Maruwai trial mine in the September 2015 quarter. 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.

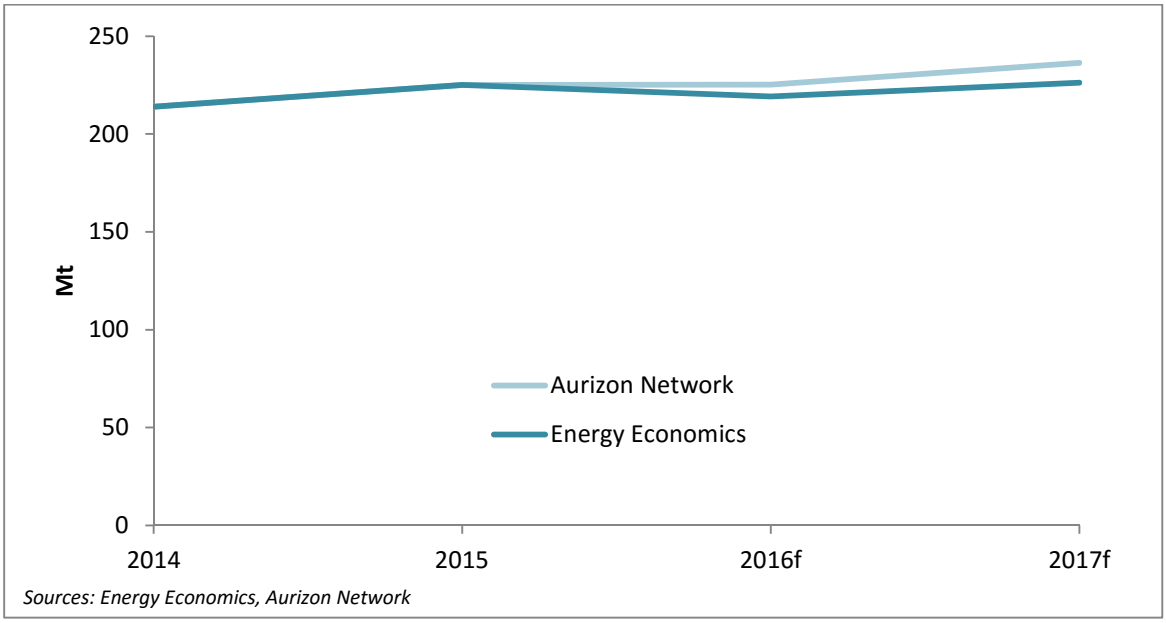
Through 2015 a combination of falling global metallurgical coal imports and robust supply is seeing renewed pressure on high cost producers. While the average cash cost of Queensland's metallurgical coal mines is lower than those of its main competitors, and Queensland is expected to continue to grow 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 in the Central Queensland coal region will increase from 225.0 million tonnes in fiscal 2015 to 226.3 million tonnes in fiscal 2017[7]. This is an increase of only 1.3 million tonnes over the two year period, at a compound annual growth rate of 0.3%. Railings are expected to fall by 5.9 million tonnes in fiscal 2016, due to mine closures and production cuts in an environment of low international metallurgical coal prices, then increase by 7.1 million tonnes in fiscal 2017 as demand recovers and ongoing supply side readjustments favour low cost Queensland metallurgical coal producers.

Figure 10 Central Queensland railings forecast comparison



Sources: Energy Economics, Aurizon Network

Over the course of the remaining two years of the forecast period Energy Economics estimates coal railings in Central Queensland will total 445.4 million tonnes, which is 3.5% below the Aurizon Network forecast of 461.7 million tonnes.

[7] All figures exclude railings to Cement Australia, Bowen Coke and Queensland Nickel.

Table 6 Central Queensland railings forecast comparison, Mt

Fiscal year	2014	2015	2016f	2017f
Aurizon Network				
Newlands (exc. GAPE)	11.6	14.3	13.9	13.9
GAPE	12.5	15.3	17.5	19.4
Goonyella	112.5	119.6	112.1	116.7
Blackwater	64.8	63.5	68.3	70.6
Moura	12.4	12.3	13.5	15.8
Subtotal	**213.9**	**225.0**	**225.3**	**236.4**
Energy Economics				
Newlands (exc. GAPE)	11.6	14.3	12.0	11.5
GAPE	12.5	15.3	15.3	17.0
Goonyella	112.5	119.6	112.1	115.6
Blackwater	64.8	63.5	66.2	67.8
Moura	12.4	12.3	13.6	14.3
Subtotal	**213.9**	**225.0**	**219.1**	**226.3**
Differences				
Newlands (exc. GAPE)			-1.9	-2.4
GAPE			-2.2	-2.4
Goonyella			0.0	-1.1
Blackwater			-2.1	-2.8
Moura			0.1	-1.5
Subtotal			**-6.1**	**-10.1**

Notes:
- *FY2014 and FY2015 data are actuals.*
- *Historical data and Energy Economics forecasts exclude railings to Cement Australia, Bowen Coke & Queensland Nickel.*
- *The AN forecast incorporates unpublished updates.*
- *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).*

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. Aurizon Network does not publish its forecasting methodology, so Energy Economics is not aware if the form of its output is a result of Aurizon's forecast method or if it is designed to provide some protection to the confidentiality of stakeholder information. The form of the Aurizon Network forecast data renders detailed comparisons at the mine level of limited value. An exception is where Aurizon Network has adopted forecasts prepared by consultancy John T. Boyd Company for railings to WICET (although Aurizon has modified the forecasts for two of the eight foundation WICET shareholders).

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 Aurizon Network railings forecasts were published in December 2014. Since that time a number of mine production cutbacks have been announced in mining companies regulatory filings. It would appear likely that this timing difference accounts for some of the differences between the Aurizon Network and Energy Economics tonnage forecasts.

Fiscal 2016 forecast

In fiscal 2016 two longwall mines are expected to close in the Central Queensland coal region. These closures account for much of the aforementioned 5.9 million tonne fall in forecast coal railings this fiscal year.

- BHP Billiton wrote in its June 2015 quarterly report that "At current mining rates, operations at Crinum are expected to cease in the first quarter of the 2016 calendar year as the mine approaches the end of its economic reserve life." Crinum, which is located at Gregory, produced 6.6 million tonnes of marketable coal in fiscal 2015. Coal from Crinum is railed on the Blackwater and Goonyella systems.
- Glencore reported marketable coal reserves for Newlands underground operations of 2 million tonnes as of the end of 2014. This indicates the Newlands Northern longwall mine will close before the end of calendar 2015, assuming an annual production rate of 2.5 to 3.0 million tonnes of marketable coal. Coal from Newlands Northern is railed on the Newlands system.

Also negatively impacting fiscal 2016 railings will be production cutbacks announced this year at the Collinsville, North Goonyella, Burton and Coppabella mines in response to lower metallurgical coal prices; as well as the full year impact of the closure of the Isaac Plains coal mine at the end of 2014.

The above mine closures and production cuts are expected to be partly counterbalanced by production increases at other mines in the region in fiscal 2016, the largest of which are as follows.

- An increase in output from Glencore's Rolleston mine to around the current 12 million tonne nameplate capacity of the mine in response to take-or-pay commitments at the new Wiggins Island Coal Export Terminal.
- The continued transition of Caledon's Cook colliery from a small bord & pillar operation to a 3.5 million tonne run-of-mine tonne longwall mining system.
- An assumed recovery in coal railings from Xstrata's Oaky Creek complex after a fall in production in fiscal 2015.
- An increase in production from Rio Tinto's Kestrel mine as its new longwall system ramps up production towards capacity.

The new Drake mine is not expected to substantially increase total railings following a decision by QCoal that this mine will share the existing processing and load-out facilities of the nearby Sonoma mine.

Fiscal 2017 forecast

Turning to fiscal 2017, our forecast 7.1 million tonne increase in railings is driven by the following main changes to forecast mine output.

- We have assumed mining at the idled Norwich Park mine (which the BHP Billion Mitsubishi Alliance placed on care and maintenance in May 2012) will be reactivated in fiscal 2017 and that it will produce some three million tonnes over the latter part of the year. Previously we had forecast Norwich Park would restart this year, but revised our view in light of the further weakening of coking coal prices. Recently released guidance by BHP Billiton that production from its Queensland coal operations will fall this fiscal year supports the view that the restart of Norwich Park will be pushed beyond fiscal 2016.
- We expect Glencore's planned expansion of the Rolleston mine from 12 to 17 million tonnes of annual capacity to be approved in a timely manner, with output starting to ramp up from fiscal 2017.
- We have factored in a 1.8 million tonne increase in production in fiscal 2017 from the ramp up of Anglo American's new Grosvenor longwall mine.
- The forecasts factor in progressive expansion of the Baralaba mine towards an eventual annual capacity of 3.5 million tonnes.
- We expect construction of QCoal's Byerwen project to be initiated this year, in time for the production of an initial 0.9 million tonnes of coking coal in fiscal 2017.
- A further 0.7 million tonne increase in production is expected from the Kestrel mine as its new longwall continues to ramp up to full production.

The main reductions in railings forecast for fiscal 2017 are the full year impacts of the closures of the Crinum and Newlands northern underground mines, reducing railings by 3.6 and 0.8 million tonnes respectively. We also expect a production cut at the [redacted] mine as its existing rail and port take-or-pay commitments expire.

5.1 Transport infrastructure overview

Three ports provide shiploading capacity for the Central Queensland coal region – Abbot Point, Hay Point and Gladstone. Port capacity and throughput are tabulated below. Over the five fiscal years 2011 to 2015 the average capacity utilisation of the coal terminals at these ports rose from 60% to 81%, but this is forecast to fall to 71% this year and 75% in fiscal 2017 due mainly to the new port capacity outlined below.

Two terminal expansion projects have recently been commissioned. The annual capacity of the Hay Point Coal Terminal was expanded by 11 million tonnes, with commissioning completed in the June 2015 quarter, and stage one of the new Wiggins Island Coal Export Terminal at Gladstone has provided 27 million tonnes of annual capacity from June 2015. The region is expected to have 292 million tonnes of annual port capacity available in fiscal 2017, compared with our forecast export railings of 218 million tonnes.

We have excluded from the table below proposed new coal terminals being planned for the Port of Abbot Point. The most advanced of these projects are designed primarily to service the opening up coal mining in the Galilee Basin, analysis of which is not included in the brief for this assignment.

There are comfortable margins between forecast railings and port throughput capacity at all three ports throughout the forecast period.

Table 7 Port capacity, throughput and utilisation

Year to June	2011	2012	2013	2014	2015	2016	2017
Capacity	**260**	**260**	**260**	**260**	**261**	**298**	**292**
Abbot Point *	50	50	50	50	50	50	50
Hay Point	129	129	129	129	129	140	140
- Dudgeon Point	-	-	-	-	-	-	-
- Dalrymple Bay	*85*	*85*	*85*	*85*	*85*	*85*	*85*
- Hay Point	*44*	*44*	*44*	*44*	*44*	*55*	*55*
Gladstone	81	81	81	81	82	108	102
- Wiggins Island	-	-	-	-	*1*	*27*	*27*
- RG Tanna	*75*	*75*	*75*	*75*	*75*	*75*	*75*
- Barney Point	*6*	*6*	*6*	*6*	*6*	*6*	-
Throughput	**156.1**	**156.2**	**171.6**	**200.8**	**212.2**	**210.9**	**217.9**
Abbot Point	15.1	13.6	17.7	22.9	28.7	27.3	28.5
Hay Point	87.8	82.9	96.5	108.3	115.0	109.6	112.2
Gladstone	53.2	59.8	57.3	69.6	68.5	74.1	77.1
Capacity Utilisation %	**60**	**60**	**66**	**77**	**81**	**71**	**75**
Abbot Point	30	27	35	46	57	55	57
Hay Point	68	64	75	84	89	78	80
Gladstone	66	74	71	86	84	69	76
Spare port capacity	**104**	**104**	**88**	**59**	**49**	**87**	**74**

*Source: Energy Economics. * Tabulated Abbot Point capacity is for the existing terminal only*

There are four major rail systems that services the coal mines of Central Queensland: Newlands, Goonyella, Blackwater and Moura. With the 2012 completion of the 69 kilometre Northern Missing Link railway, connecting the Goonyella and Newlands Systems, the major Newlands, Goonyella and Blackwater rail systems of Central Queensland are now fully integrated. The Goonyella to Abbot Point Expansion (GAPE) project also included upgrades to the existing Newlands line that resulted in track capacity increasing to 50 million tonnes per year, to match the Abbot Point Coal Terminal capacity.

More recent rail projects in the region have involve capacity upgrades to the Moura, Blackwater and Goonyella systems. The recently completed Wiggins Island Rail Project (WIRP) comprised the following components.[8]

- 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.

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

- 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

Elsewhere, Aurizon's Goonyella Rail Expansion Project "will lift coal haulage capacity from 129 million tonnes per annum (mtpa) to 140 mtpa on the Goonyella System". This is in line with the export coal terminal capacity at the port of Hay Point, following the aforementioned expansion of the Hay Point Coal Terminal.

5.2 Abbot Point Coal Terminal

On 1 June 2011, the Queensland Government finalised the 99 year lease of the existing terminal to Mundra Port Holding Trust, a subsidiary of Indian company Adani. The terminal is currently operated by Abbot Point Bulkcoal Pty Ltd which is a subsidiary of Glencore.

Annual throughput capacity at the existing terminal (Terminal 1) is 50 million tonnes[9]. There are various projects underway to develop additional coal terminals at Abbot Point, however these are primarily designed to cater for proposed new mines in the Galilee Basin.

5.3 Proposed Dudgeon Point Coal Terminal

In September 2011 an Initial Advice Statement was submitted to the Department of State Development, Infrastructure and Planning for two separate new coal export terminals at Dudgeon Point, with combined annual export capacity of up to 180 million tonnes of coal. The site is approximately 4 kilometres northwest of the two existing coal terminals at the Port of Hay Point.

The project proponents were identified as:

- North Queensland Bulk Ports Corporation Ltd
- Adani Mining Pty Ltd
- Dudgeon Point Project Management Pty Ltd

Dudgeon Point Project Management is a subsidiary of Brookfield, which also indirectly owns the lease on the nearby Dalrymple Bay Coal Terminal.

Terms of Reference for the Environmental Impact Statement were released in June 2012 and in May 2013 North Queensland Bulk Ports published the following indicative development timeline.

- Early 2014: Submission of Draft Environmental Impact Statement (EIS)
- Mid 2014: Anticipated gaining of State and Federal Government approvals
- Mid to late 2015: Begin construction of support facilities (rail, roads, buildings, dredging)

[9] North Queensland Bulk Port Corporation: http://www.nqbp.com.au/abbot-point/

- Late 2015: Begin construction of one or both coal terminals
- 2018/9: Stage 1 of the development begins exporting coal.

In June 2013, the proponents announced a one year delay in the development schedule in response to market conditions. In June 2014 the project was shelved due to the continuing coal industry downturn, with North Queensland Bulk Ports cancelling the declaration of the Dudgeon Point Coal Terminals Project as a coordinated project.

5.4 Dalrymple Bay Coal Terminal

The Dalrymple Bay Coal Terminal (DBCT) at the Port of Hay Point is owned by the Queensland Government and is leased to DBCT Management through a 50 year lease with a further 49 year option. DBCT Management is a subsidiary of Canadian multinational company Brookfield, through one of its listed entities, Brookfield Infrastructure Partners. DBCT is declared for third party access under the Queensland Competition Authority Act with terms and conditions of access regulated by a QCA approved access undertaking.

DBCT has a current nameplate annual capacity of 85 million tonnes. All of this capacity is currently contracted to coal producers located in the Bowen Basin coalfields. The highest throughput achieved in a fiscal year was 71.55 million tonnes, in fiscal 2015.

5.5 Hay Point Coal Terminal

The Hay Point Coal Terminal (HPCT) at the Port of Hay Point is owned by the BHP Billiton Mitsubishi Alliance. Its annual throughput capacity was expanded from 44 million tonne to 55 million tonnes in the June 2015 quarter. The expansion project also incorporated works to reduce the vulnerability of the facility to storms. The record fiscal year throughput achieved to date at this terminal was 43.43 million tonnes in fiscal 2015.

5.6 Wiggins Island Coal Export Terminal

WICET is a new coal terminal 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 are therefore on a cost recovery basis. The Gladstone Ports Corporation is 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. After ramping up to full capacity WICET will have an annual throughput capability 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.

5.6.1 Stage 1 WICET shareholders

The eight foundation shareholders on the terminal are tabulated below.

Table 8 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

5.7 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.

5.8 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[10].

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

5.9 Port take-or-pay considerations

Not provided in this version of the report.

5.10 Rail take-or-pay considerations

5.10.1 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.

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

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 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.

5.10.2 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 often 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.

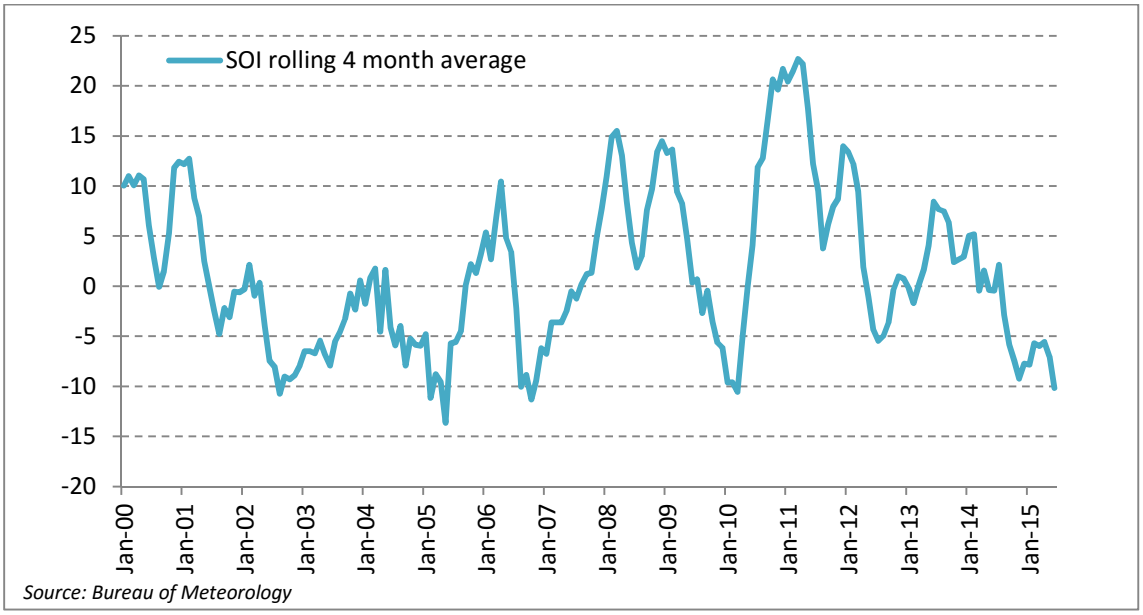
Take-or-pay provisions in above-rail contracts do still, despite recent increased flexibility, represent an impediment to the closure of mines during any cyclical downturn in coal prices – therefore impacting the efficiency of the coal market in adjusting to changed conditions. Mines that remain in operation 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.

5.11 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 11 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."[11] 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.

[11] Australian Government Bureau of Meteorology http://www.bom.gov.au/climate/glossary/soi.shtml

6 MINE FORECASTS

Not provided in this version of the report