CENTRAL QUEENSLAND COAL RAILINGS FORECAST

A report prepared by Energy Economics for the Queensland Competition Authority

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1 EXECUTIVE SUMMARY

Export coal markets are forecast to remain weak in fiscal 2014, with overcapacity and low prices prevailing throughout the year. However the weak market conditions are due primarily to over exuberance in bringing new production capacity on stream, rather than any prolonged weakness in global demand for coal imports. Significant growth in international trade volumes is expected in fiscal 2014, driven by Asian coal demand, and Queensland mines will participate strongly in that growth. Of critical importance is the recent fall in the value of the Australian dollar against the US dollar, which improves the competitive position of Australian metallurgical coal producers against their main competitors in the United States. We expect United States metallurgical coal exports to decline in fiscal 2014, with Central Queensland producers recovering market share that was lost during the 2011 floods. Energy Economics forecasts growth in Central Queensland coal railings from 175.3 million tonnes estimated for fiscal 2013 to 193.3 million tonnes in fiscal 2014, as detailed in Table 1.

Table 1 Central Queensland coal railings by destination, Mt

Fiscal year	2010e	2011e	2012e	2013f	2014f
Queensland Consumers					
Gladstone Power Station	3.5	3.1	3.4	2.9	3.3
Stanwell Power Station	2.9	2.4	2.7	2.8	2.9
QAL	1.5	1.2	1.3	1.2	1.3
Yarwun, Alcan	0.3	0.0	0.0	0.2	0.2
Cement Aus.	0.2	0.2	0.2	0.2	0.2
Bowen Coke	0.1	0.1	0.0	0.1	0.1
QNI Yabulu	0.3	0.3	0.2	0.3	0.3
Subtotal	**8.8**	**7.3**	**8.0**	**7.8**	**8.4**
Export & Interstate					
Abott Point port	17.3	15.4	13.6	16.7	21.8
Hay Point port	99.4	88.6	85.2	93.3	98.7
Gladstone port	61.1	52.9	60.2	57.6	64.2
Subtotal	**177.8**	**156.9**	**159.1**	**167.5**	**184.7**
Total	**186.6**	**164.2**	**167.0**	**175.3**	**193.1**

Source: Energy Economics

In its submission to the QCA, Aurizon Network forecast fiscal 2014 railings of 186.0 million tonnes. This estimate excluded railings via the new link between the Goonyella and Newlands rail systems (the Goonyella Abbot Point Expansion, or GAPE). Energy Economics forecasts coal railings excluding coal transported on the GAPE railway will be 186.8 million tonnes in fiscal 2014, as tabulated below. The 0.8 million tonne (0.4%) difference between the Energy Economics forecast and the Aurizon Network forecast is considered to be well within the potential range of forecasting error. Energy Economics therefore concludes that the Aurizon Network forecast of Central Queensland coal railings is reasonable.

Table 2 Central Queensland coal railings by rail system, Mt

Fiscal year	2010e	2011e	2012f	2013f	2013f
Including GAP					
Newlands	17.6	15.8	13.9	17.1	22.2
Goonyella	99.5	88.6	85.3	93.3	98.7
Blackwater	58.2	49.9	54.9	54.5	60.1
Moura	11.3	9.9	13.0	10.5	12.1
Subtotal	**186.6**	**164.2**	**167.0**	**175.3**	**193.1**
Excluding GAP					
Newlands	17.6	15.8	13.7	14.0	15.9
Goonyella	99.5	88.6	85.3	93.3	98.7
Blackwater	58.2	49.9	54.9	54.5	60.1
Moura	11.3	9.9	13.0	10.5	12.1
Subtotal	**186.6**	**164.2**	**166.9**	**172.3**	**186.8**

Source: Energy Economics

Table 3 Aurizon and Energy Economics fiscal 2014 railings forecast comparison, Mt

	Aurizon Network	Energy Economics	Differ-ence	%
Rail System				
Newlands	15.8	15.9	0.1	0.4
Goonyella	99.0	98.7	-0.3	-0.3
Blackwater	57.7	60.1	2.4	4.2
Moura	13.5	12.1	-1.4	-10.5
Total	**186.0**	**186.8**	0.8	0.4

Note: Excludes GAPE railings

The levels of coal railings forecast by Energy Economics for fiscal 2013 are not expected to be constrained by rail and port capacity. There are comfortable margins between forecast railings and the throughput capacity at each of the three ports that service the coal mines of Central Queensland. In formulating our coal railings forecast we have assumed a 'normal' wet season in Queensland in fiscal 2013.

It is noted that the balance of risks to our forecast is weighted to the downside. Mining costs remain high in relation to current price levels, particularly for some opencast operations with high overburden to coal ratios. We have not factored any further mine closures into our forecasts, however this cannot be ruled out if prices remain low or if the fall in the Australian dollar is not sustained.

2 INTRODUCTION

In April 2013, the Queensland Competition Authority (QCA) engaged Energy Economics to assist it in verifying the reasonableness of traffic volume forecasts submitted to the QCA by Aurizon Network Pty Ltd (Aurizon). Specifically, Energy Economics was asked to provide an independent review of coal railings from the mines of Central Queensland to various ports and domestic customers for the year ending June 30 2014 (fiscal 2014).

Under the terms of Aurizon Network's 2010 access undertaking, which came into effect on 1 October 2010 and is due to expire in 2013, Aurizon Network is required to submit an Annual Review of Reference Tariffs to the QCA. The Annual Review of Reference Tariffs includes updated railing volume forecasts.

In formulating its view on future coal railings Energy Economics has based its evaluations on the parameters listed below.

- An appraisal of current mine capacity and capacity expansion projects;
- Potential changes at the mine/company level in terms of railing practices, changes in contractual arrangements, mine problems, new markets or contracts, etc;
- Domestic and international market conditions;
- Coal reserves;
- Mining costs;
- Port capacity and charges; and
- Rail infrastructure capacity and charges.

There are two components to this report, as provided to the QCA. The first is the main body of the report, which is provided on the basis that it can be made available for general dissemination by the QCA. The second part is a confidential appendix containing detailed railings forecasts on a mine-by-mine basis.

3 DOMESTIC COAL DEMAND

Coal demand in Queensland is dominated by the electricity generation sector (91.0% of coal receival), the non-ferrous metals processing sector (6.7%) and the cement sector (0.8%). Other end-use sectors combined account for only 1.5% of total coal distributions.

Table 4 Coal distribution within Queensland by district (tonnes)

	2010-2011			
	Northern	Central	Southern	**Total**
Consumer group				
Agriculture	-	-	881	881
Basic Metal Products	-	-	-	-
Basic Non-Ferrous Metals	321,969	1,199,251	-	1,521,220
Beverages And Malt	112	-	-	112
Cement And Concrete Products	-	-	188,782	188,782
Chemical,Petroleum And Coal Products	64,047	-	-	64,047
Clay Products And Refractories	-	-	5,794	5,794
Coal	-	2,650	14,750	17,400
Electricity	243,457	5,399,799	14,870,096	20,513,352
Fruit And Vegetable Products	-	-	21,344	21,344
Glass And Glass Products	-	-	-	-
Health	-	-	3,457	3,457
Meat Products	7,674	5,364	57,748	70,786
Milk Products	-	-	1,177	1,177
Mining	-	326	-	326
Not Known	-	1,607	-	1,607
Other Non-Metallic Minerals	-	-	331	331
Paper,Paper Products,Printing And Publishing	-	-	97,953	97,953
Railway Transport	96	333	-	429
Road And Transport	-	2,355	516	2,871
Services To Transport	-	-	-	-
Sugar	20,469	258	2,948	23,675
Wholesale And Retail Trade	-	-	1,623	1,623
Wood,Wood Products And Furniture	-	-	4,211	4,211
Agriculture,Forestry,Fishing And Hunting	-	125	100	225
Construction Materials	-	-	1,573	1,573
State total	657,824	6,612,068	15,273,284	22,543,176

Data Source: DEEDI

3.1 Electricity

Grid electricity demand has stagnated in Queensland over recent years, with large increases in retail electricity prices encouraging consumer conservation measures and roof-top photovoltaic systems displacing grid demand. Electricity generation by Queensland power stations connected into the National Electricity Market was lower in fiscal 2012 than it had been six years earlier. Table 5 and Figure 1 show generation by fuel type in the National Electricity Market in Queensland.

Table 5 NEM Electricity generation by fuel in Queensland (TWh)

FY ending June	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013f	2014f
Coal	46.8	50.3	50.9	53.2	51.5	50.3	51.2	50.0	45.8	44.8	43.8	46.6
Gas	0.6	0.7	1.3	3.2	5.4	5.7	5.6	8.4	11.2	11.0	9.7	10.7
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
Total	**47.8**	**51.5**	**53.2**	**57.0**	**57.9**	**56.9**	**57.6**	**59.0**	**58.0**	**56.6**	**54.3**	**58.1**
Increase		3.7	1.7	3.8	1.0	-1.0	0.7	1.4	-1.0	-1.4	-2.3	3.8
% Increase		7.8	3.3	7.1	1.7	-1.8	1.3	2.4	-1.7	-2.4	-4.1	7.0

Data source: IES

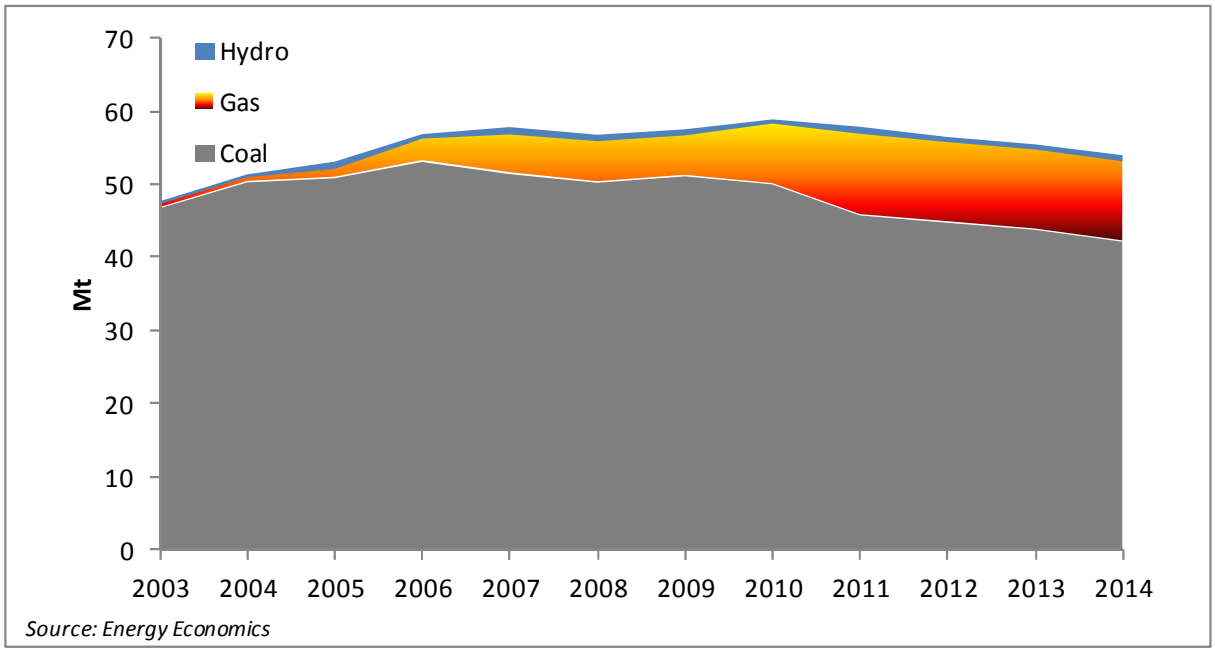
There are two main causes for the stagnation in National Energy Market generation.

- Sharp rises in electricity prices are constraining electricity consumption across eastern Australia. The introduction of the carbon tax from July 2012 further increased electricity prices and is having a disproportionate impact on coal-fired generation, as it is designed to do.
- A surge in roof-top photovoltaic systems is supplying consumers at source, reducing demand via the National Energy Market grid. Electricity industry forecaster Intelligent Energy Systems Pty Ltd (IES) estimates that annual generation from photovoltaic systems in Queensland has increased from negligible levels pre 2010 to 838 GWh in 2012. Furthermore, IES estimates yearly generation with current photovoltaic capacity is 1,213 GWh.

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.

Significant additional gas-fired generation has also been commissioned in Queensland and elsewhere in the National Electricity Market, for example the 630 MW base and intermediate load Darling Downs Power Station (a combined cycle gas turbine), which was commissioned in Queensland in November 2010. Gas-fired electricity generation in Queensland grew at a compound annual rate of 41% between fiscal years 2004 and 2012.

Figure 1 NEM Electricity generation by fuel in Queensland (TWh)



Source: Energy Economics

The mix of flat demand and increased generation capacity - coal, gas and photovoltaic - has resulted in substantial overcapacity in Queensland. There is a total of over 13,000 MW of capacity installed and peak demand of 8,760 MW in 2012. There appears to be no need for the construction of any new fossil-fired plant within the next ten years. Subsidised wind and solar capacity will, however, continue to grow despite the chronic overcapacity already in the system.

Coal-fired electricity generation in Queensland peaked at 53.2 TWh in fiscal 2006, but has fallen nearly every year since, to reach a level of 44.8 TWH in fiscal 2012. In October 2012 Stanwell Corporation announced that it would take two units of its Tarong Power Station off-line for two years or until market conditions improve.

Over the long term, coal-burn in Queensland power stations is expected to recover as the substantial spare capacity at existing power stations is more fully utilised.

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 – with load factors being 67% in fiscal 2009 and 69% in fiscal 2010. The load factor fell to only 54% in fiscal 2011 as the Queensland floods reduced electricity demand, curtailed plant operations and cut coal supply. The rail line between Stanwell's coal source, Curragh Mine, and the power station was out of service from the 1st to the 19th of January 2011, during which time power generation was cut back to conserve coal inventories. After the rail line reopened, Stanwell Power Station received coal deliveries of varying quantity and quality due to pit flooding at the mine. The coal quality problems caused operational issues at the power station. During the floods essential employees were flown

into Stanwell Power Station by helicopter. Coal consumption fell from 3.01 million tonnes in fiscal 2010 to 2.45 million tonnes in fiscal 2011. Coal railings recovered to 2.7 million tonnes in fiscal 2012 and the load factor is on track to recover to 64% in fiscal 2013. The Blackwater mine was also an important supplier of coal to the Stanwell Power Station up until fiscal 2011, but Curragh mine is expected to be the only significant coal supplier in fiscal 2014.

Load factors at the Gladstone Power Station followed a similar trend to those outlined above for Stanwell. 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.

The small 190 MW Collinsville coal-fired plant was closed in 2012. This power station was supplied some 0.2 Mt of coal by truck from the adjacent Collinsville mine. The closure of the power station will free 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

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. Coal is sourced from the Collinsville mine and railed via the Newlands rail system and the North Coast line.

The other two consumers in this sector are both alumina refineries located at Gladstone, and both are controlled by Rio Tinto. *Queensland Alumina Limited* (QAL) operates the larger of the two refineries, which produced 3.68 million tonnes of alumina in fiscal 2012. For the past 43 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 the Dawson and Cook mines. Both Callide and Dawson are controlled by Anglo American and the coal is transported on the Moura rail system. QAL's annual coal consumption was 1.3 million tonnes in fiscal 2012 but we expect it to fall to 1.2 million tonnes in fiscal 2013 as alumina production was impacted by Cyclone Oswald in the March 2013 quarter. The refinery resumed normal production by the end of that quarter we forecast that fiscal 2014 coal consumption will recover to 1.3 million tonnes.

The other refinery, *Yarwun*, is operated by Rio Tinto Alcan and produced 1.41 million tonnes of alumina in fiscal 2012. Yarwun (previously known as Comalco Alumina Refinery) has only been in operation since the December 2004 quarter, but has already been expanded from 1.4 million tonnes capacity to 3.4 million tonnes. All of Yarwun's coal requirements are 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 new, so both refineries appear likely to continue normal operations through the forecast period despite the weak aluminium market.

The doubling of capacity at the Yarwun refinery in mid 2012 will not result in much of a boost for coal demand, as a gas cogeneration plant has been constructed to service the expansion. Although the schedule for the main Yarwun expansion project was pushed back into 2012, the co-generation plant was kept on original schedule and was commissioned in August 2010. Yarwun had an excess of steam/electricity generation capacity between the commissioning of the cogeneration plant and the commissioning of the refinery expansion. Yarwun's coal consumption was about 300,000 tonnes prior to the commissioning of the cogeneration plant, but dropped to very low levels in fiscal years 2011 and 2012.

3.3 Selected other Queensland 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 from the Blackwater mine, with some supplies also understood to originate from the Cook and Ensham 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. Bowen Coke's coal consumption was 61,000 tonnes in 2011. Historically all of the coal for the coke works has been supplied by rail from Xstrata's Collinsville mine. The Collinsville mine is understood to be transitioning away from producing coking coal (in favour of thermal coal production) and the completion of the rail connection with the Goonyella rail system has opened up the potential for new coal supply sources for the coke ovens. In November 2011, Bowen Coke Works began a project to upgrade 14 of the 54 beehive ovens with under-floor flues. The project was due for completion in late 2012 and aimed to increase production at Bowen Coke by 30% and reduce emissions. Coal consumption will also increase by 30%.

4 INTERNATIONAL COAL MARKETS

Queensland's coal exports are comprised of 72% metallurgical coal and 28% thermal coal. Over recent years Queensland's thermal coal exports have been mainly constrained to distribution within the Pacific Rim and Indian Ocean markets, which 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 at the coal importing ports of Europe have been cheaper than at the coal exporting ports of Australia. Ocean freight costs further discourage transport of relatively low value thermal coal to distant markets.

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

Table 6 Queensland's coal exports by type, Mt

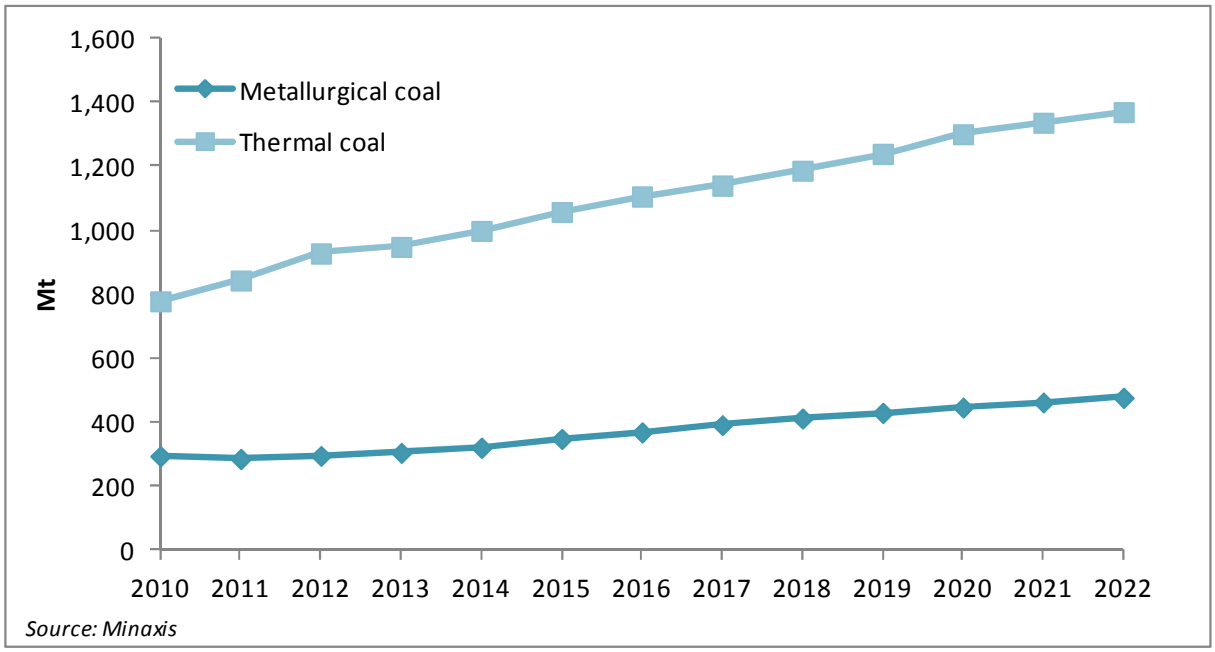
	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	%
Metallurgical	112.414	110.243	124.734	116.304	118.054	72
Thermal	39.669	49.730	58.388	46.190	46.806	28
State total	152.083	159.973	183.122	162.495	164.861	100

Data Source: DNRM

Just five countries - Japan, India, South Korea, China and Taiwan - account for 80% of Queensland's total exports.

Overcapacity is expected to continue to be the main theme in international coal markets in fiscal 2014, with prices for Queensland's metallurgical and thermal coal exports expected to remain low through the year. Growth in supply capacity has outpaced demand growth over recent years. However, it is important to note that demand has continued to grow and is forecast to continue to do so through fiscal 2014. Energy Economics has engaged fellow coal consultancy MinAxis Pty Ltd to forecast international coal trade volumes. MinAxis estimates that demand for metallurgical coal imports will grow by 9 million tonnes in 2013 and 16 million tonnes in 2014 – an average of 12 million tonnes per year over that period. Similarly, world thermal coal imports are forecast to grow by 21 million tonnes in 2013 and 50 million tonnes in 2014 – an average of 35 million tonnes per year.

Figure 2 Internationally traded coal demand



4.1 Thermal coal

Thermal coal spot prices in the Asia-Pacific market were pushed higher by a combination of strong demand and constrained supply to reach a peak of US$122 per tonne (loaded at the Port of Newcastle) in October 2011, however prices have fallen since then as supply capacity has progressively recovered and overtaken demand. Spot prices were US$87 per tonne at the time of writing.

International thermal coal markets are currently characterised by strong growth in demand, but even stronger growth in supply capacity. This position of overcapacity is expected to remain in place through the forecast period to mid 2014. Thermal coal imports rose by about 10% in 2012, driven primarily by rising Asian electricity consumption.

The world's population grew from 6.1 billion in 2000 to 7.0 billion at the beginning of 2012. Continued growth at that rate would see global population increase by another billion people by 2022. Furthermore, electricity consumption per person is continuing to increase, even in economically mature economies. Some of the historical drivers for this trend have been increased use of air-conditioning, larger average house sizes, growth in internet and computer usage and the switch to large-screen televisions. In future, the impact of electric hybrid cars is expected to be considerable. The outlook for electricity demand is, therefore, extremely strong. The electricity sector accounts for over 90% of thermal coal consumption.

Gas and renewable energy will continue to rapidly grow their share of world energy markets, but substantial growth 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. Oil-fired electricity generation is in long-term decline due to its cost and limited reserves. 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 incremental demand increases for both coal and gas. Few countries 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).

The safety concerns raised by the Fukushima-Daiichi accident will delay new nuclear power projects even in tectonically stable parts of the world. It appears likely that governments will demand more safeguards on nuclear facilities, pushing up their capital costs and making them less competitive with gas, coal and renewable energy generation. It is now unlikely any new-start construction of nuclear power stations will take place in Western Europe in time for commissioning within a ten year horizon. This may also be the case in the United States.

European coal imports recovered strongly in 2011, after two years of declines, and remained strong in 2012 despite the regions economic problems. This was due to high gas prices, the shutdown of seven of Germany's oldest nuclear plants in response to the Fukushima disaster and reduced costs for carbon emission allocations. In future 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, India and Southeast Asia – areas which are increasingly becoming the world's manufacturing hubs and which also contain most of the world's population.

China's thermal coal imports increased to 177 million tonnes in 2012, as domestic thermal coal production again failed to match growth in demand. China's thermal coal imports are expected to increase more slowly in fiscal 2014 as the economy slows, however at current prices imported coal remains very competitive into southeastern China, compared with domestic thermal coal transported from the north of the country.

In fiscal 2014 Japanese thermal coal imports will continue to be supported by the shutdown of most of Japan's 54 commercial nuclear reactors in the aftermath of the Fukushima Daiichi disaster.

India's thermal coal imports increased by 25% in 2012; driven by the commissioning of new coal-fired power stations. Indian thermal coal imports are expected to continue to grow strongly over the long term, with the main drivers being the chronic deficit between electricity supply and demand, flat

domestic thermal coal production, a rapidly growing population and increased electricity consumption per capita.

On the supply side of the equation, USA domestic gas prices are recovering – halting the inroads that gas made last year into coal's market share in the domestic electricity sector. Very low gas prices in early 2012 pushed thermal coal out onto the export market, but this process is likely to go into reverse in fiscal 2014. Over the past few years the USA has transitioned from being a large net importer of thermal coal to a net exporter. A surge in gas production resulted from improvements in horizontal drilling and rock fracturing techniques in shale deposits, which have increased gas extraction rates and gas reserves. The price of gas at Henry Hub fell to a monthly average of US$1.95 per million British-thermal-units in April 2012, its lowest level since February 1999. In comparison the annual average price of gas peaked at US$8.86 per million British-thermal-units in 2008. Some US thermal coal producers were prepared to export coal at prices that just cover their cash production costs, in order to keep their mines operating until domestic demand recovered. US gas prices were considered to be unsustainable at below US$4 per million British-thermal-units and drilling rig counts in the US gas sector fell from 900 in late 2011 to 400 in early 2013. Henry Hub gas prices have therefore recovered fairly steadily since April 2012 and reached US$4.17 in April 2013.

4.2 Metallurgical coal

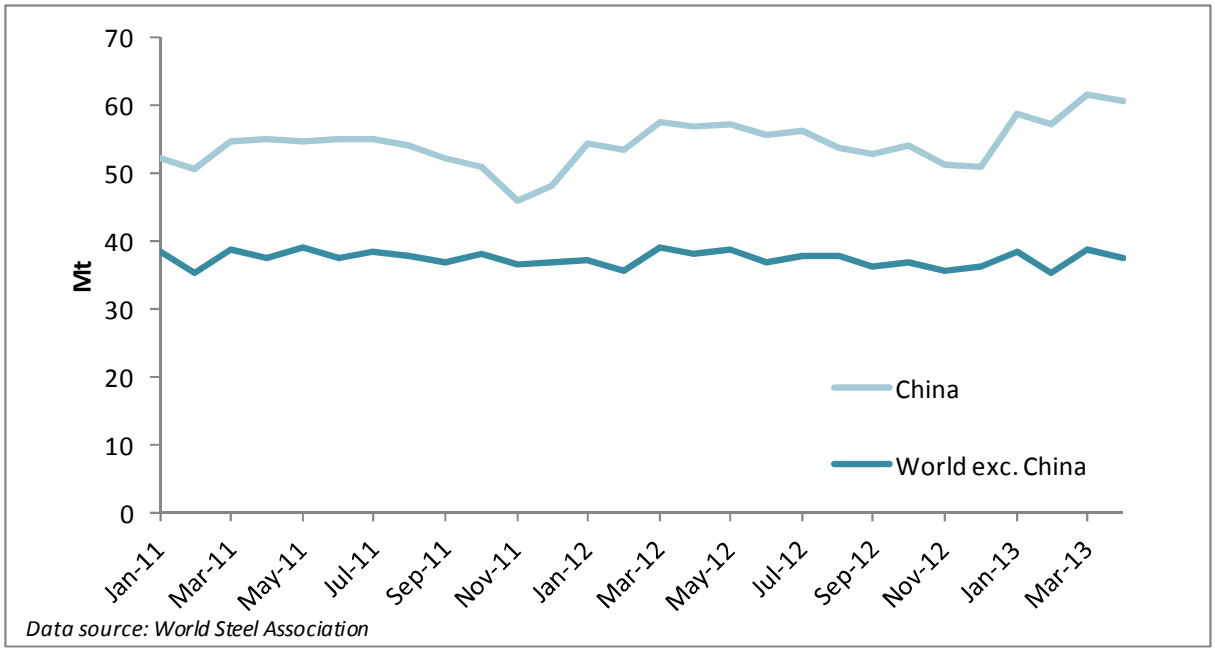
The World Steel Association released its short-term forecast of apparent steel use in April 2013. It forecasts growth in global finished steel consumption will increase from 1.2% in 2012 to 2.9% in 2013 then increase further to 3.2% in 2014. MinAxis expects growth in metallurgical coal imports to be somewhat higher (3.1% in 2013 and 5.2% in 2014) than the above steel consumption growth rates. This is primarily due to the impact of relatively slow growth in domestic metallurgical coal production in India and China, necessitating higher rates of coal imports.

Downside risks to the forecasts remain. 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 produces more iron than the rest of the world combined and growth in iron production in the rest of the world is very low. Global coking coal consumption therefore depends greatly on what happens in China. 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. Recent volatility in monthly Chinese pig iron production levels is depicted in the graphed below, with underlying growth being much lower than that which characterised the Chinese industry pre-2011.

However, lower international coking coal prices, relative to domestic coal pricing, are expected to sustain Chinese metallurgical coal import levels despite a slowdown in steel intensive sectors of the Chinese economy.

Figure 3 Pig Iron monthly production, China versus the rest of the world



Data source: World Steel Association

Indian imports are forecast by MinAxis to increase from 38 million tonnes in 2012 to 44 million tonnes in 2014. Indian pig iron production was up only 0.6% in 2011 due to a ban on iron ore mining in the southern state of Karnataka that was imposed by India's highest court in August 2011. The ban, imposed due to breaches in environmental conditions, was lifted in mid 2012, enabling a 3.4 million tonne increase in iron production for the year. Expansions of coke oven and blast furnace capacities are expected to support ongoing increases in Indian demand for coking coal imports. The growth potential of domestic coking coal production is limited by high costs, limited reserves and poor coal quality.

Japan's pig iron output was 81.4 million tonnes in 2012, practically unchanged from 81.0 Mt in 2011, and is tracking at very similar levels in 2013 to date. Some growth is expected in fiscal 2013 due to the impact of the lower value of the yen on steel demand and also due to steel consumption for post-earthquake reconstruction projects.

The ramping up of production from the new Hyundai integrated steel mill in Korea resulted in pig iron production growing by 20% in 2011. Similarly, production from the new Dragon Steel integrated steel mill in Taiwan saw pig iron production grow 38% in 2011. However weak steel prices saw production fall slightly in both countries in 2012 and the outlook there is flat.

On the supply side, competition will remain intense, as Queensland producers continue to look to regain market share lost during 2011. Mozambique's new coking coal industry has ramped up exports to meaningful levels, but the next major step-up in exports awaits construction of the new Nacala port and rail corridor, which is not expected to be commissioned until well after the end of fiscal 2014. Much of Queensland's cost advantage over competitors in Canada and a resurgent

United States has been whittled away by increasing costs across the board and the strong Australian dollar. In this regard the recent 9% fall in the value of the Australian dollar against the United States dollar is very significant, particularly set alongside the robust cost-cutting taking place across the Queensland coal sector. United States exports are expected to fall from recent peaks due to the inability of many producers to be profitable at current international prices, combined with some diversion of lower grades of metallurgical coal back into the domestic thermal coal market. The United States is Australia's biggest competitor in the international metallurgical coal trade, with 20% of the market versus Australia's 50%. The expected fall in United States metallurgical coal exports would therefore leave Australia to supply most of the fiscal 2014 increase in global import demand.

5 COAL RAILINGS

The tonnages of coal transported by rail in Central Queensland fell sharply in fiscal 2011 as a result of the extreme wet season and flooding that affected most of the state in late 2010 and early 2011. Since that time the recovery in coal production and transport has been muted.

Many opencast pits still contained excess water as they entered the 2011-12 wet season, however a relatively benign 2012 wet season (albeit with some high intensity events late in the season) and government provisions for additional mine water discharge, under the Transitional Environment Program, resulted in coal producers appearing to be in a better position to increase production as they approached the start of the fiscal 2013 year. However, expectations of much improved railings in fiscal 2013 will not to be realised, with weaker than expected international markets leading to production cutbacks and Cyclone Oswald impacting rail and mine operations in the Moura and Blackwater areas in the March 2013 quarter.

Export markets are forecast to remain weak though fiscal 2014, with overcapacity and low prices expected to prevail throughout the year. However the weak market conditions are due primarily to over exuberance in bringing new production capacity on stream, rather than any marked reduction in global coal imports. Substantial growth in international trade volumes is expected over the next year and Queensland mines will participate in that growth. Of critical importance is the recent fall in the value of the Australian dollar against the US dollar, which improves the competitive position of Australian metallurgical coal producers against their main competitors in the United States. Energy Economics forecasts growth in Central Queensland coal railings from 175.3 million tonnes estimated for fiscal 2013 to 193.3 million tonnes in fiscal 2014, as detailed in Table 7.

Table 7 Central Queensland coal railings by destination, Mt

Fiscal year	2010e	2011e	2012e	2013f	2014f
Queensland Consumers					
Gladstone Power Station	3.5	3.1	3.4	2.9	3.3
Stanwell Power Station	2.9	2.4	2.7	2.8	2.9
QAL	1.5	1.2	1.3	1.2	1.3
Yarwun, Alcan	0.3	0.0	0.0	0.2	0.2
Cement Aus.	0.2	0.2	0.2	0.2	0.2
Bowen Coke	0.1	0.1	0.0	0.1	0.1
QNI Yabulu	0.3	0.3	0.2	0.3	0.3
Subtotal	**8.8**	**7.3**	**8.0**	**7.8**	**8.4**
Export & Interstate					
Abott Point port	17.3	15.4	13.6	16.7	21.8
Hay Point port	99.4	88.6	85.2	93.3	98.7
Gladstone port	61.1	52.9	60.2	57.6	64.2
Subtotal	**177.8**	**156.9**	**159.1**	**167.5**	**184.7**
Total	**186.6**	**164.2**	**167.0**	**175.3**	**193.1**

Source: Energy Economics

In its submission to the QCA, Aurizon Network forecast fiscal 2014 railings of 186.0 million tonnes. This estimate excluded railings via the new link between the Goonyella and Newlands rail systems

(the Goonyella Abbot Point Expansion, or GAPE). Energy Economics forecasts coal railings excluding coal transported on the GAPE railway will be 186.8 million tonnes in fiscal 2014, as tabulated below. The 0.8 million tonne (0.4%) difference between the Energy Economics forecast and the Aurizon Network forecast is considered to be well within the potential range of forecasting error. Energy Economics therefore concludes that the Aurizon Network forecast of Central Queensland coal railings is reasonable.

Table 8 Central Queensland coal railings by rail system, Mt

Fiscal year	2010e	2011e	2012f	2013f	2013f
Including GAP					
Newlands	17.6	15.8	13.9	17.1	22.2
Goonyella	99.5	88.6	85.3	93.3	98.7
Blackwater	58.2	49.9	54.9	54.5	60.1
Moura	11.3	9.9	13.0	10.5	12.1
Subtotal	**186.6**	**164.2**	**167.0**	**175.3**	**193.1**
Excluding GAP					
Newlands	17.6	15.8	13.7	14.0	15.9
Goonyella	99.5	88.6	85.3	93.3	98.7
Blackwater	58.2	49.9	54.9	54.5	60.1
Moura	11.3	9.9	13.0	10.5	12.1
Subtotal	**186.6**	**164.2**	**166.9**	**172.3**	**186.8**

Source: Energy Economics

Table 9 Aurizon and Energy Economics fiscal 2014 railings forecast comparison, Mt

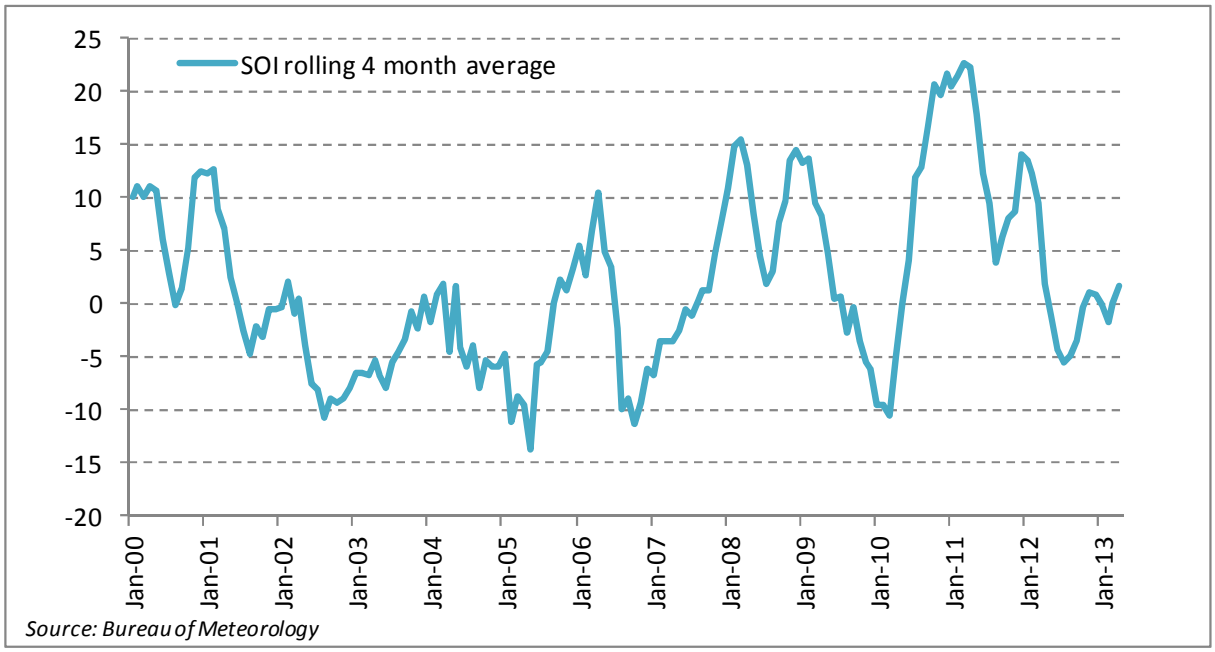
	Aurizon Network	Energy Economics	Differ-ence	%
Rail System				
Newlands	15.8	15.9	0.1	0.4
Goonyella	99.0	98.7	-0.3	-0.3
Blackwater	57.7	60.1	2.4	4.2
Moura	13.5	12.1	-1.4	-10.5
Total	**186.0**	**186.8**	0.8	0.4

Note: Excludes GAPE railings

5.1 Wet season assumptions

In formulating our coal railings forecast we have assumed a 'normal' wet season in Queensland in fiscal 2014. The Southern Oscillation Index (graphed below) is around zero, indicating average rainfall levels for Queensland. Strongly positive Southern Oscillation Index levels are associated with La Niña weather patterns, as was the case in the disastrous 2011 wet season. On 21 May 2013 the Australian Government Bureau of Meteorology wrote "International climate models surveyed by the Bureau of Meteorology suggest the tropical Pacific will remain ENSO-neutral through the southern hemisphere winter."

Figure 4 Southern Oscillation Index



Although the predictive power of the Southern Oscillation Index is limited with regard to next summer, a large part of the problem that occurred in 2011 was that the preceding dry season was in fact quite wet and high antecedent moisture conditions exacerbated the impact of the wet season rainfall.

5.2 Transport Infrastructure

Energy Economics forecast of coal railings in Central Queensland for fiscal 2014 is 193.1 million tonnes. This is only 6.5 million tonnes higher than the peak historical railings of 186.6 million tonnes achieved in fiscal 2010. The annual capacity of the three ports that service Central Queensland coal mines is expected to remain at 257 million tonnes in fiscal 2014 (Abbot Point 50 million tonnes, Hay Point 129 million tonnes, and Gladstone 78 million tonnes). This compares with forecast railings to port of 184.7 million tonnes of coal in fiscal 2014. There are comfortable margins between forecast railing and throughput capacity at all three ports.

The first stage of the Wiggins Island Coal Export Terminal is now not scheduled to be commissioned until 2015. In its latest quarterly reports BHP Billiton wrote that the stage three capacity expansion of the Hay Point Coal Terminal, from 44 Mtpy to 55 Mtpy is expected to be completed in calendar year 2014. Given that fiscal 2013 throughput to date at the Hay Point Coal Terminal is running at an annualised rate of 32 Mtpy, any delay in the completion of this expansion would not materially impact our forecasts.

5.3 Mine overview

Detailed forecasts of coal railings by mine and destination have been provided to the QCA as a confidential appendix to this report. An overview of the major changes in coal railings that we are forecasting between fiscal 2012 and fiscal 2014 are as follows.

5.3.1 New Mines

Clermont: Clermont is the designated successor to Blair Athol, which will have exhausted its economic coal reserves by around 2016. Coal production commenced in the June 2010 quarter and is building up towards it ultimate production rate of 12.2 Mtpy.

Daunia: First production was achieved at the Daunia opencast mine in the March 2013 quarter, which was ahead of schedule. At the end of that quarter the overall project was 89% complete. The mine is ramping up to its annual capacity of 4.5 million tonnes.

Caval Ridge: This project is essentially a northern extension of the Peak Downs mine reserves. Development of Caval Ridge as a separate opencast mine, with its own washery, was the lowest cost expansion option, as it will involve substantially shorter raw coal haul distances. As of March 2013 the overall Phase 1 project was 59% complete and planned completion remained calendar 2014. Stage one annual capacity will be 5.5 million tonnes, but only modest amounts of product coal, if any, are likely to be railed to port within fiscal 2014.

Grosvenor: By early 2013 the access road for this longwall project was complete and bulk earthworks were under way. First development coal from Grosvenor is expected in 2014, with the commissioning of the longwall to follow in 2016. The project is designed to initially produce up to 7 million tonnes per annum of run-of-mine coal, which would be processed to produce approximately 5 million tonnes of coking coal for export.

Middlemount: Middlemount commenced production proper in fiscal 2012 and is slowly ramping up towards its annual capacity of 3.8 million tonnes of product coal.

5.3.2 Mine closures

Blair Athol: Blair Athol Mine closed in November 2012 as the mine's economic reserves were exhausted. A Rio Tinto representative said "As coal prices rose in recent times we looked to extend the life of the mine by mining a poorer quality coal and harder to reach seam for a few more years. Unfortunately, the recent significant drop in thermal coal prices, and other factors such as rising costs and the foreign exchange rate mean this is no longer a feasible option".

Norwich Park: BHP Billiton announced in April 2012 that the joint venture partners intended to cease production at the mine indefinitely, as the mine had been "losing money for several months". The mine halted production on 11 May 2012. The idling of the mine was despite BHP Billiton reporting in 2011 that the mine had marketable open-cut coal reserves of 194 million tonnes and a mine life of 30 years. Mining is likely to recommence in when coking coal prices recover and/or a lower cost mine plan can be identified, however we have assumed Norwich Park will not produce or rail any coal in fiscal 2014.

Gregory: Gregory opencast mine ceased production on 10 October 2012. The BMA had continued to operate Gregory opencast in the years leading up to its closure despite it being one of BHP Billiton's highest cost coking coal mines, but the fall in prices in 2012 made ongoing operation unviable.

We have not factored in any further mine closures in 2014, in part because of the recent fall in the value of the Australian dollar relative to the United States dollar and also in part to the renewed focus on cost cutting across the industry. However, some mines remain sub-economics at current prices, costs, tax rates and exchange rates. Most such mines are opencast operations that have had their economics lives prolonged during the boom but now operate at very overburden to coal ratios. There remains substantial risk of further mine closures should coal prices fall further or if cost reduction measures are not sufficiently successful.

5.3.3 Mining problems and recoveries

Blackwater: Continued recovery after the 2011 floods, 2012 industrial action and Cyclone Oswald.

Burton: Production from Peabody's Burton operation fell to low levels in 2012 as the mine transitioned to new production pits with high overburden to coal ratios. Costs are high and production will need to recover to secure the mines future.

Carborough Downs: On 31 May 2012 Vale declared force majeure due to the detection of high levels of carbon monoxide at the mine, which forced the withdrawal of underground personnel on 29 May. Vale announced lifting of the force majeure on 27 August 2012. Production fell to 1.4 million tones in fiscal 2012, but is now up to an annual rate of 1.8 million tonnes.

Coppabella: Raw coal production had fallen to well below washery capacity since 2005. New owner Peabody Energy focused on overcoming an overburden deficit during 2012, while at the same time catching up on deferred major maintenance. These programmes and ongoing recovery from the 2011 wet season resulted in recovery in coal production in fiscal 2012.

Cyclone Oswald: In late January 2013 rain associated with ex-tropical cyclone Oswald caused widespread flooding in the southeastern part of the study area, Mines in the Moura area (Dawson, Callide and Baralaba) were particularly severely affected by prolonged rail track outages and reduced

mining output. Mines in the Blackwater area suffered less direct impact, but were also constrained by rail washouts. Two large mines in the area, Rolleston and Curragh, reported production cutbacks forced by full coal product stockpiles. Curragh reported record metallurgical coal stockpile build to 380,000t.

Ensham: Ensham has cut back its expensive opencast operations, idling one of its four draglines and cut its workforce, however this has been counterbalanced by full production being achieved in late 2012 at its new underground bord and pillar mine.

Moranbah North: On 7 November 2011 a major roof-fall occurred in an access drift and production was halted until the March 2012 quarter. Recovery in production to normal levels occurred in 2012 and should add 1.3 million tonnes to annual railings in fiscal 2014 over fiscal 2012 levels.

5.3.4 Mine Expansions

Kestrel: A new longwall system will increase panel width from 252m to 375m, which should substantially increase capacity. The expansion is designed to result in production capacity increasing to 5.7 Mtpy of marketable coal from 2013.

Lake Vermont: In 2011 Jellinbah Group commenced the expansion of its Lake Vermont mine to an 8 Mtpy operation. It is slated to operate at an annual production rate of 6 million tonnes from 2013 and 8 million tonnes production level from 2015, as logistic infrastructure becomes available.

Millennium: Production continues to ramp up towards capacity of 3 Mtpy.

Rolleston: This opencast thermal coal mine is being expanded to an annual capacity of 12 million tonnes, with production expected to reach 10.7 million tonnes in fiscal 2014.

South Walker Creek: In 2012 the washery was upgraded by Sedgman, with commissioning achieved in the December quarter. The mine achieved a record calendar year production of 4.0 million tonnes of marketable coal in 2012 and a record quarterly production of 1.19 Mt in the March 2013 quarter.