

# CoalPlan 2030

## Laying the foundations of a future

CoalPlan 2030 examines the potential growth path for Queensland's coal industry over the next two decades to 2030, and details infrastructure requirements to support this growing industry.

**Looking forward. Delivering now.**

The Department of Infrastructure and Planning leads a coordinated Queensland Government approach to planning, infrastructure and development across the state.

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# Foreword

I am pleased to present Queensland's CoalPlan 2030 for Queensland's coal customers. This document examines the potential growth path for Queensland's coal industry over the next two decades to 2030, and details the infrastructure requirements to support this growing industry. A well planned roadmap for expansion will not only ensure security of supply but provide confidence in our ability to deliver on our customers future coal needs. The plan also aligns with the government's vision for Queensland—*Toward Q2: Tomorrow's Queensland*—a strong economy with infrastructure that anticipates growth.

Coal is Queensland's largest export industry. In 2008–09, Queensland coal exports were 159.5 million tonnes with a value of approximately \$41 billion. At 30 June 2009, the industry directly employed approximately 25 900 workers, the majority of whom live in regional areas, particularly Central Queensland.

As a guide for infrastructure planning, the coal production estimates in this plan indicate that, over the next 20 years, the Queensland coal industry has the potential to significantly increase its production of saleable coal from approximately 190 million tonnes per annum (Mtpa) to up to 340 Mtpa or more, depending on the extent of future coal development in the highly prospective Galilee and Surat Basins.

Meeting this potential growth will require considerable increased investment in rail and port capacity, as well as more skilled workers and more services at the local level.

Since 2005 the extent of infrastructure investment in relation to the coal industry has been very large. Around \$25.5 billion in rail, port and water infrastructure has either been planned, implemented, or is about to be commissioned. The Queensland Government and government-owned corporations have developed much of this infrastructure. The private sector has also provided significant coal industry infrastructure in the past, and its role looks set to expand in the future.

Queensland's coal customers have told us that they rank security of supply of coal as a key factor in building long-term business relationships. Queensland's economic and political stability, combined with the availability of high-quality coal, makes this state an attractive prospect for investors as evidenced by the number of the world's leading resource companies that have already invested here.

As a government, it is essential that we allocate resources prudently so that investment is timely and in keeping with the future needs of our coal industry. To ensure that industry is able to meet demand, CoalPlan 2030 focuses on medium to long-term infrastructure requirements. The plan is a living document and the timing and scope of projects identified here may be adjusted in the future.

CoalPlan 2030 establishes a coordinated, sustainable and environmentally responsible approach to infrastructure planning and delivery across government and industry, ensuring that the industry can maximise its growth potential over the next two decades to 2030 and beyond.

**The Honourable Stirling Hinchliffe MP**  
*Minister for Infrastructure and Planning*





## Key findings

In developing CoalPlan 2030, the state government undertook extensive research and consultation to determine the Queensland coal industry's infrastructure needs for the next 20 years. These infrastructure requirements have been determined on the basis of independent forecasts that highlight the potential growth of the coal industry to production levels of up to 340 Mtpa by 2030. These levels of production have the potential to be further enhanced by the development of large new mines in the Surat and Galilee Basins and associated rail and port infrastructure.

The government is aware that growth of this order will bring large scale change to many communities in regional Queensland. The challenge will be to ensure that affected communities receive an equitable share of the economic benefits that such growth creates.

From the forecasts undertaken, it is reasonable to expect that there will be increased export demand that will be met from coal coming out of the central and northern Bowen Basins. The Surat and Galilee Basins are also marked for large scale development and these undertakings will present significant investment opportunities for the private sector. In fact, private investment will be a key factor in whether many developments proceed. Demand for Queensland coal is the deciding factor underpinning the forecasts in this plan, as well as the final level of infrastructure built.

One uncertainty that may affect demand for coal is the emerging global response to climate change. Global response to climate change is evolving and it is important to note that this issue and its effects have been considered to the best of our ability during the forecasting and planning of coal infrastructure requirements in this plan.



## Context

With a rich endowment of approximately 30 billion tonnes of high-quality coal resources<sup>1</sup>, Queensland's coal industry is the largest in Australia. Coal is also the single largest merchandise export for the state with approximately 85 per cent of the state's coal production exported. Queensland is also the largest exporter of seaborne coal in the world, being a dominant source of supply for coking coal in many Asian and Indian steel mills.

The coal industry is a major contributor to Queensland's economy. In 2008–2009 Queensland coal exports reached a new export record of 159.5 Mtpa. Along with this growth in volume, the value of export sales more than doubled to approximately \$41 billion, reflecting record contract prices achieved earlier in the financial year. Looking forward, coal prices are expected to stabilise in the medium-term as supply and demand even out. Longer term, the increasing cost base in Australia and worldwide is likely to provide strong support for current pricing levels.

Despite the recent fluctuation in coal prices, the coal mining industry remains a major driver of employment and economic prosperity in many regional communities. The steady growth in international demand for coal and higher prices since 2004 has resulted in an unprecedented number of new greenfield mine developments, an expansion of existing mines, increased exploration activity, and new infrastructure to service the mining industry.

## Purpose of CoalPlan 2030

The Queensland Government has developed this document as a guide to the expansion path of the state's coal industry. It reflects contemporary forecasts that predict the continued increase in world demand for Queensland's coal. It also considers the challenges faced by the state's largest single merchandise export.

The plan details government and industry delivery of coal infrastructure and matches infrastructure needs with industry growth. For example, the plan details projects that may be required to expand the industry export capability over the next 20 years.

Given the importance of the coal industry to our customers and the Queensland economy, and the need for infrastructure to keep pace with industry growth, the Queensland Government is committed to regularly updating this plan to ensure it remains responsive to the changing industry environment.

## Objectives

The objectives of CoalPlan 2030 are to:

- anticipate growth, ensure timely and effective planning and provide whole-of-government coal production forecasts to assist the planning of infrastructure for coal chain systems as well as the planning of key infrastructure projects. This will provide the state with a timely roadmap for the development of Queensland's coal industry
- provide a document to strengthen the coordination and delivery of infrastructure to support industry growth
- feature the infrastructure needs of emerging regions.

<sup>1</sup> Department of Employment, Economic Development and Innovation, Queensland Mines and Energy, Queensland Government.



# CoalPlan 2030 development

CoalPlan 2030 has been compiled after extensive consultation with government, industry groups such as the Queensland Resources Council and key coal mining companies. The plan brings together ongoing planning work undertaken by rail and port operators as well as covering wider infrastructure matters.

The plan uses the targeted and detailed planning activities undertaken by a range of Queensland coal industry stakeholders including:

- QR—Coal Rail Infrastructure Master Plan, which anticipates future rail capacity and capital costs for developing paths for expanding optimal rail infrastructure
- Port authorities—master planning, which is aimed at short, medium and long-term development of port and associated facilities
- Queensland Government departments involved in infrastructure provision, investment planning, resource management and the provision of services necessary for the ongoing development of the industry. Departments include:
  - Department of Transport and Main Roads—provides planning, investment advice and coordination for road, rail and port infrastructure development
  - Queensland Treasury—provides investment planning and advice for government and controlled entities
  - Department of Employment, and Economic Development and Innovation—among its many responsibilities, administers the approval, regulation, and development of coal mining in Queensland
  - Department of Infrastructure and Planning—leads infrastructure development and planning in Queensland
  - The Department of Environment and Resource Management—leads the development of water resource plans and regional water supply strategies
- other bodies, including:
  - water boards
  - electricity network utilities such as Ergon Energy and Powerlink Queensland.

# Macroeconomic context<sup>2</sup>

Globally the demand for energy is increasing. Population growth, the desire for improved living standards, and continued industrialisation and modernisation are the main forces driving this demand.

Coal is but one source of fuel in the world's total energy supply mix—a mix that is now at a crossroad. Two compelling forces are shaping the future:

- the need to supply secure, reliable and affordable energy
- the progressive move to a carbon-constrained, efficient and environmentally sustainable energy supply.

Despite the uncertainty of what policy outcomes the future will hold around greenhouse gas mitigation, by 2030 fossil fuels are still expected to account for approximately 80 per cent of the world's primary energy mix.

The demand for coal will outstrip all other fuels in absolute terms. Oil will remain the world's primary source of energy, despite the rapid pace of development and deployment of alternative 'green' technologies<sup>3</sup>.

The increasing use of renewables—generated by improvements in energy efficiency and government policy that promotes reduced greenhouse gases—will have the greatest impact on the energy landscape of the Organisation for Economic Cooperation and Development (OECD) nations. Non-OECD countries however are expected to lead growth in the use of cheaper fossil fuels such as coal, with the dominant hub of growth occurring in the Asia-Pacific region, particularly in China and India.

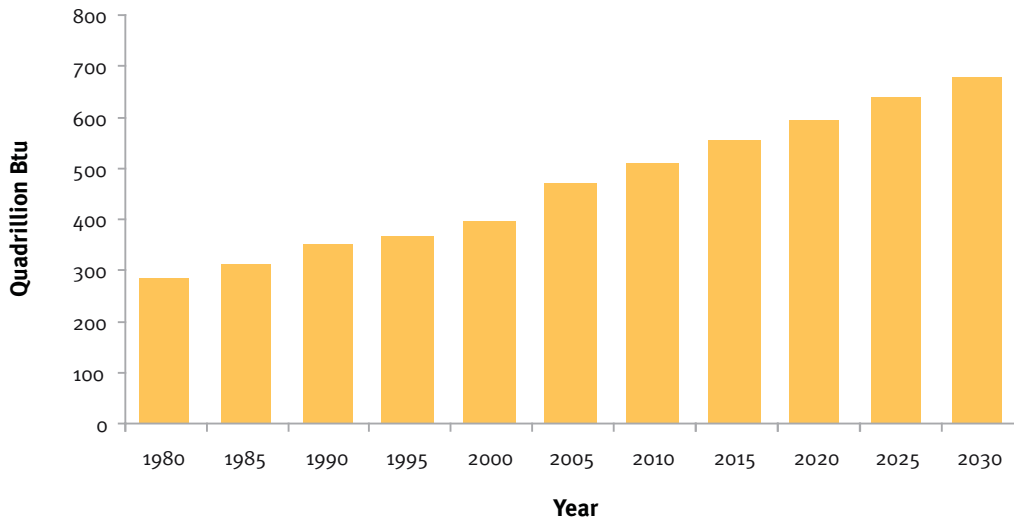
<sup>2</sup> International Energy Agency figures referred to in this section use reference scenarios that assume no new government policies beyond those already adopted by mid-2008. In other words, they do not take into account any possible mitigation strategies developed in the future.

<sup>3</sup> Energy Information Agency / International Energy Outlook (EIA/IEO)



# Global and domestic energy trends

World marketed energy consumption is projected to increase by over 33 per cent from 2010 to 2030. Total world energy use is expected to rise from 508 quadrillion British thermal units<sup>4</sup> (Btu) in 2010, 552 quadrillion Btu in 2015, to 678 quadrillion Btu in 2030<sup>5</sup>.



**Figure 1: World marketed energy consumption**

<sup>4</sup> The British thermal unit (Btu) is a traditional unit of energy equal to about 1.06 kilojoules - EIA/IEO 2009.

<sup>5</sup> EIA/IEO, 2009.



# Where growth will occur

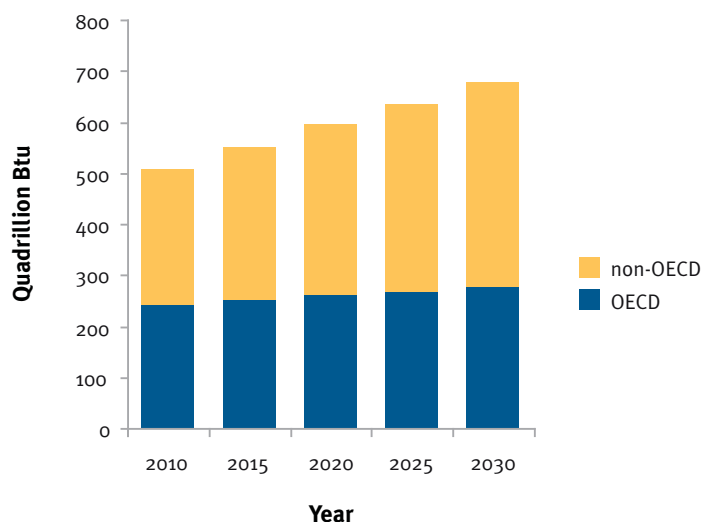
Driving the demand for energy consumption is economic growth. Economic growth is by far the most important determinant of the overall demand for energy services, but the pattern of development also has a large impact on the fuel mix demanded and used<sup>6</sup>. As a result, energy projections are very sensitive to assumptions of where growth will occur<sup>7</sup>.

Approximately 97 per cent of the projected growth in demand for coal is expected to come from non-OECD countries, mostly in Asia<sup>8</sup>. More than 75 per cent of the increase is expected to be for thermal coal for the generation of electricity. Coal's long-term growth domestically, like other OECD countries around the world, is likely to be tempered as a result of government led policies to decrease greenhouse gas emissions.

Figure 2 below illustrates the expected difference in growth between OECD and non-OECD countries.

China and India are expected to lead the growth in demand, continuing a trend that has seen the two countries grow from consuming approximately 10 per cent of the world's total energy in 1990, to 19 per cent in 2006. This represents a 90 per cent increase in consumption in only 16 years<sup>9</sup>. China's ongoing demand will be fuelled by an economy that is expected to grow at more than 6 per cent per annum to 2030, while India grows the fastest at a rate that is almost 6.5 per cent per annum, overtaking China as the fastest growing economy by the 2020s<sup>10</sup>.

By 2030, India and China combined are likely to account for 28 per cent of the world's total energy demand. Developing countries in the Asia-Pacific region are expected to show the most robust growth of all nations with energy use more than doubling by 2030. Queensland's challenge will be to continue positioning itself as a reliable source of energy for the region, while domestically operating in a carbon-constrained environment.



**Figure 2: World marketed energy consumption 2010–2030**

<sup>6</sup> World Energy Outlook 2008: Global Energy Trends to 2030.

<sup>7</sup> World Energy Outlook 2008: Global Energy Trends to 2030.

<sup>8</sup> Australian Bureau of Agricultural and Resource Economics, (ABARE) – Australian Energy Resource Assessment 2010.

<sup>9</sup> EIA, World Energy Projections Plus 2009.

<sup>10</sup> World Energy Outlook 2008, Global Energy Trends to 2030.



# The outlook for coal

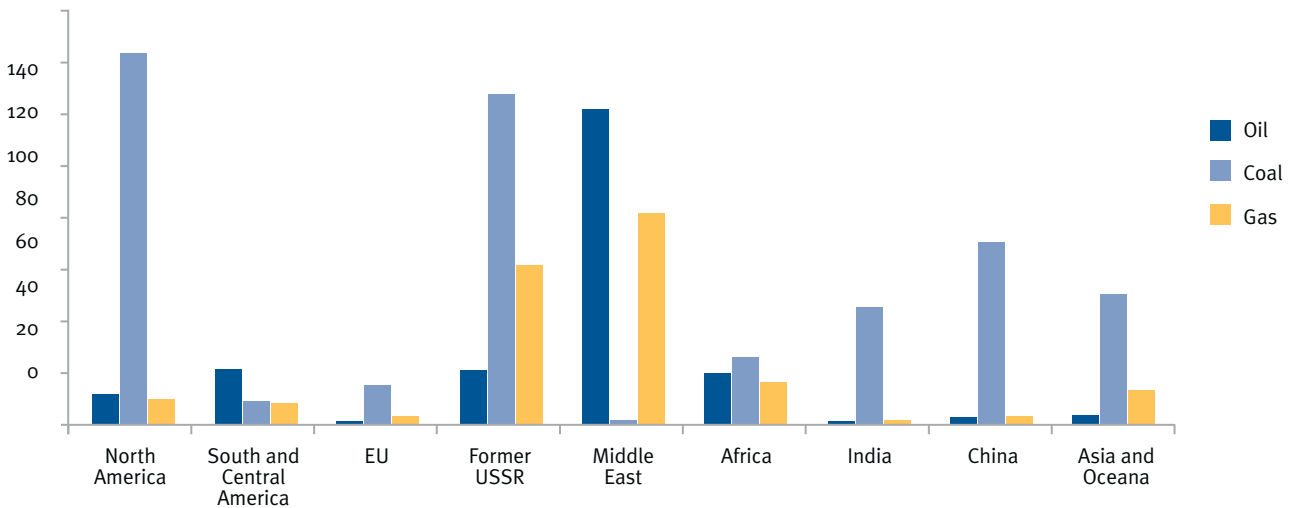
Global economic growth and demand for coal are projected to maintain coal's position as a dominant fuel source<sup>11</sup>. Under the International Energy Association's (IEA) reference scenario, coal is projected to grow at an annual rate of 1.9 per cent per annum to 2030<sup>12</sup>. In the absence of policies or legislation that limit the growth of coal use, the US, China and India are all expected to use coal in place of more expensive fuels. Together, these three nations—and in particular China and India—will account for almost 90 per cent of the projected net increase in coal consumption to 2030<sup>13</sup>.

Whilst non-OECD demand for coal is projected to increase at an annual rate of 2.8 per cent to 2030, overall coal consumption in OECD countries is projected to fall at an annual rate of 0.2 per cent over the same period. Electricity demand is also declining in OECD countries, and renewables, gas and nuclear are likely to be chosen over coal as a fuel<sup>14</sup>.

In many parts of the world, particularly in the developing world, coal is seen as a secure source of fuel supply that will provide the basis for future economic growth. In the developed world, coal is also seen as a means of maintaining levels of economic performance. As a fuel source, coal is readily available, affordable and able to provide a reliable source of power without being vulnerable to long or short-term disruptions.

The global distribution of coal also has a lot to do with the benefits it provides. Figure 3 illustrates the distribution of global fuel supplies<sup>15</sup>. Apart from the Middle East, each region in the world has varying levels of coal supply—making coal a very secure source of fuel to drive economic growth. It has been estimated that there are over 847 billion tonnes of *proven coal reserves* worldwide. This means that there are enough proven reserves of coal globally to last us around 119 years at current rates of production. In contrast, current proven oil and gas reserves are equivalent to around 46 and 63 years respectively at current production levels<sup>16</sup>.

Queensland has very large reserves of coal that will last far in excess of the period discussed in this plan.



**Figure 3: Distribution of global fuel supplies<sup>16</sup>**

<sup>11</sup> ABARE, Australian Energy Resource Assessment 2010.

<sup>12</sup> World Energy Outlook 2009, Global Energy Trends to 2030.

<sup>13</sup> EIA/IEO Outlook 2009.

<sup>14</sup> World Energy Outlook 2010, Global Energy Trends to 2030.

<sup>15</sup> World Coal Institute, <http://www.worldcoal.org/coal/where-is-coal-found/>

<sup>16</sup> World Coal Institute, <http://www.worldcoal.org/coal/where-is-coal-found/> (Information sourced on 27 August 2010).



## A continued role for coal in a carbon-constrained world

Energy is a fundamental driver of economic development. While global economic growth is underpinned by access to cheap, abundant and reliable coal-based energy, the world's dependence on coal is a key contributor to one of the greatest challenges facing the world today—climate change.

Although global economic growth will remain the most important determinant of the overall demand for energy generation and coal use, policies aimed at reducing greenhouse gas emissions may also impact on long-term demand. As one of the most significant sources of emissions globally, the Queensland Government recognises that emissions from coal use will need to be curtailed if the world is to avoid dangerous climate change.

While responses to climate change are being implemented at state and national levels, international responses will necessarily drive the global emissions reductions required by the latest science.

The potential introduction of carbon pricing and other carbon constraints internationally are relevant to accurately projecting long-term coal demand.

As the policies adopted internationally become settled—particularly those adopted in countries that are key export markets—the impacts on the Queensland coal industry will be better understood. Subsequent editions of CoalPlan 2030 will address national and international developments in climate change policy which may influence Queensland's coal production over the long-term.

## Queensland Government initiatives

As a major coal producer, and the Australian state predicted to be most impacted by climate change, Queensland also has a global responsibility to invest in those technologies and methods that will help reduce emissions both now and into the future.

In August 2009, the Queensland Government released its new climate change strategy, *ClimateQ*, which builds on *ClimateSmart 2050* by outlining new conditions for coal-fired power generation. These conditions align the government's policy on power generation with its commitment to carbon capture and storage technology, and positions Queensland's coal and power generation industries for a low-carbon future.

Both *ClimateQ* and *ClimateSmart 2050* provide a policy environment that supports low-emission coal technologies as part of a broad range of measures to help Queensland play its part in meeting any future national greenhouse gas emission targets.



## Coal production forecasts<sup>17</sup>

Coal production forecasting is essential to effective infrastructure planning. Forecasts take into consideration a range of market and macroeconomic factors such as expected steel production, additional power generation capacity, supply constraints and the likely effects of government policies both domestically and internationally. Adding to this sensitivity is uncertainty in relation to national and international climate change policy.

At the United Nations climate change conference held in Copenhagen in December 2009, major developed and developing economies agreed for the first time to take action to limit temperature rise to two degrees, and pledged mid-term emission reduction targets as the first step towards achieving that goal. Australia pledged to reduce emissions by at least 5 per cent below 2000 levels by 2020, and pledges were received from a number of Queensland's key coal export markets, including Japan, China, Korea and India.

The emission reduction targets committed by Queensland's coal buyers will, in turn, influence the policies these countries implement to reduce emissions—and this may impact on long-term demand for coal. However the significance of the impact is unclear. The Copenhagen conference fell short of delivering a legally-binding successor to the Kyoto Protocol, and pending the conclusion of ongoing negotiations, uncertainty regarding the global response to climate change will remain.

The Queensland Government continues to support ambitious global action on climate change and supports a carbon price as the most efficient means of reducing emissions. The government also recognises that if introduced either domestically or in key coal export markets, a carbon price will have implications for the planning, design, construction and management of coal-related infrastructure in Queensland. It is within this uncertain environment that CoalPlan 2030 attempts to forecast coal production for the next 20 years.

Despite the uncertainty that long-term forecasting presents, the government needs a strategy for dealing with potential growth in the coal industry to ensure continued security of supply for our coal customers. This document fills that need.

## Historical coal production

Australia is the world's largest exporter of seaborne-traded black coal and the fourth largest producer behind China, the US and India. The majority (approximately 97 per cent) of Australian black coal is produced in Queensland and New South Wales.

Queensland exports approximately 85 per cent of its coal production. Queensland coal exports comprise metallurgical (coking) coal and thermal coal. Metallurgical coal is used to manufacture coke—an essential component in steel production— while thermal coal is used to generate electricity and process heat in industry.

Queensland is the dominant Australian producer of metallurgical coal, and exported around 119 million tonnes (Mt) in the 2009 calendar year, comprising over 80 per cent of the Australian export total of 144 Mt. Over the 2008–09 period, Queensland exported 112 Mt of metallurgical coal.

Thermal coal exports from Queensland were around 59 Mt in 2009, comprising just over 40 per cent of Australia's total thermal coal exports. Over the 2008–09 year, actual thermal coal exports totalled 48 Mt.

Coal railings in 2008–09 totalled 170.2 Mt, a 5.2 Mt or 3.2 per cent increase on 2007–08. Record coal exports of 159.5 Mt were achieved in 2008–09, a 4.6 per cent increase on the previous year. Queensland's coal industry achieved this record level of exports despite an initial sharp decline in coal demand as a result of the global financial crisis. Queensland's coal industry achieved this record level of exports despite an initial sharp decline in coal demand as a result of the global financial crisis. 2009–10 has seen a strong rebound in coal demand with coal exports on track to achieve a new record of around 183 Mt, representing a 14.7 per cent increase on 2008–09. Record exports have been driven by continuing strong demand from China and India, as well as the return of demand from our traditional export markets.

<sup>17</sup> The majority of the forecasts provided in the 'Coal Production Forecasts' of CoalPlan 2030 have been prepared for the Queensland Government by Wood Mackenzie (Australia) Pty Ltd.



# Factors affecting coal production forecasts

## Impact of the 2008 global financial crisis

Wood Mackenzie is forecasting a 2.5 per cent increase in global Gross Domestic Product (GDP) growth in 2010, with a projected recovery of 2.9 per cent in 2011, 3.3 per cent in 2012 and 3.6 per cent by 2013. In arriving at these figures, Wood Mackenzie has considered GDP growth in terms of import tonnage weighted averages for 15 major thermal and metallurgical coal importers.

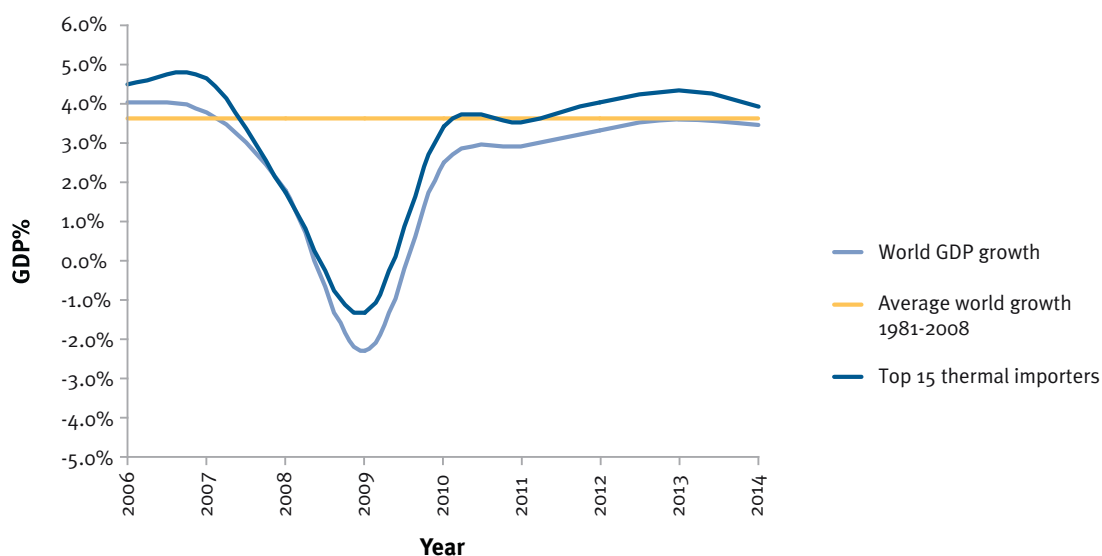


Figure 4: GDP impact on thermal coal importers

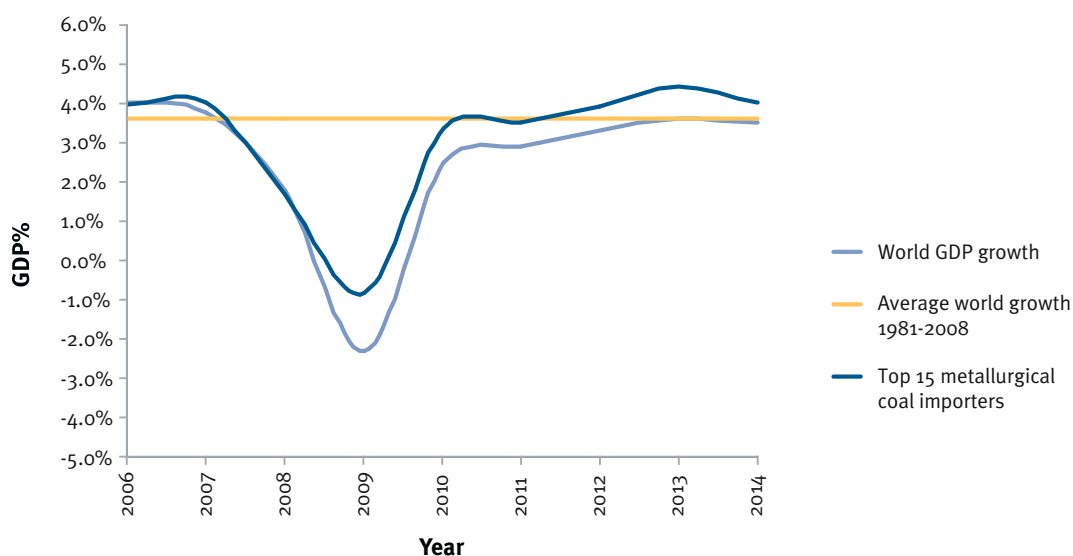
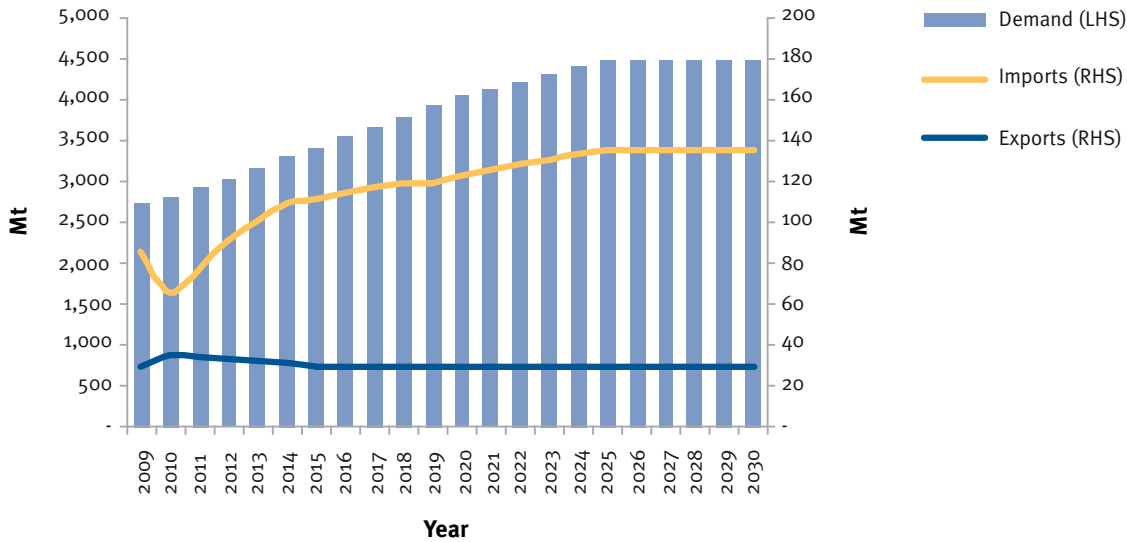


Figure 5: GDP impact on metallurgical coal importers



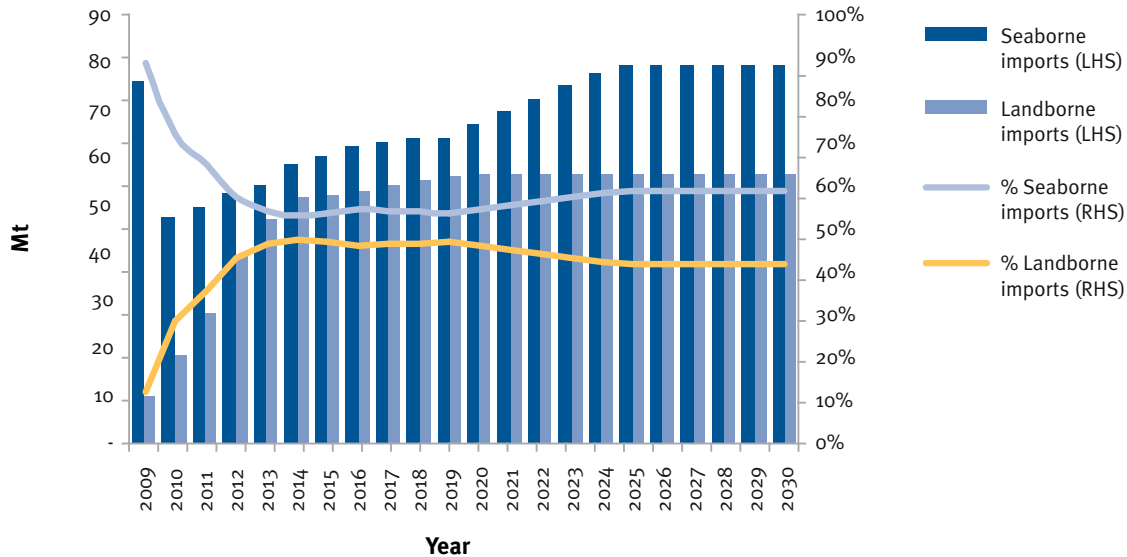
## Chinese import demand

China, the world's largest coal producer, can significantly affect the seaborne trade in coal. Wood Mackenzie forecasts that China's total coal demand will increase by over 1700 Mt between 2009 and 2025. China will remain a net importer for the foreseeable future. Structural changes in the balance of Chinese coal imports will see an increasing role for land-borne imports from Mongolia, the key emerging coal supplier for neighbouring China.



Source: Wood Mackenzie

Figure 6: Chinese forecast net trade position



Source: Wood Mackenzie

Figure 7: Chinese forecast import balance

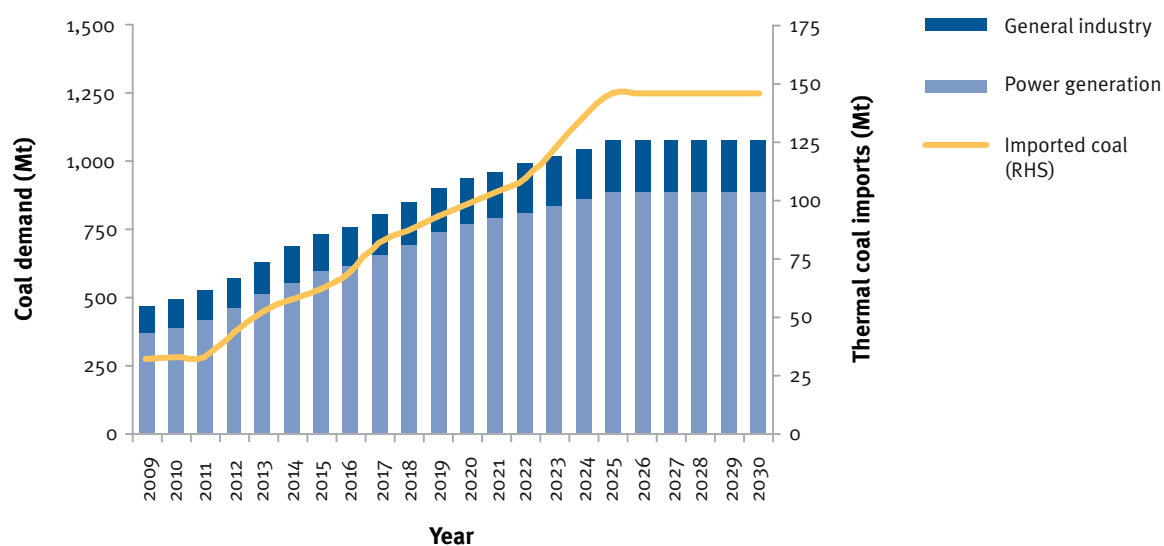


## Indian import demand

Wood Mackenzie forecasts coal exports to India will increase strongly, with demand driven largely by the expansion of coal-fired electricity generation and the growth in steel production. The Indian Government's aim of providing electricity to all citizens is driving massive expansion of coal-fired electricity generation. Wood Mackenzie forecasts that demand for coal imports could grow substantially post-2011 as economic recovery progresses and large coastal power plants, using imported coal, are commissioned. Australian Bureau of Agricultural and Resource Economics (ABARE) notes that India is projected to remain one of the fastest growing thermal coal import markets, with imports expected to double between 2009 and 2015<sup>18</sup>.

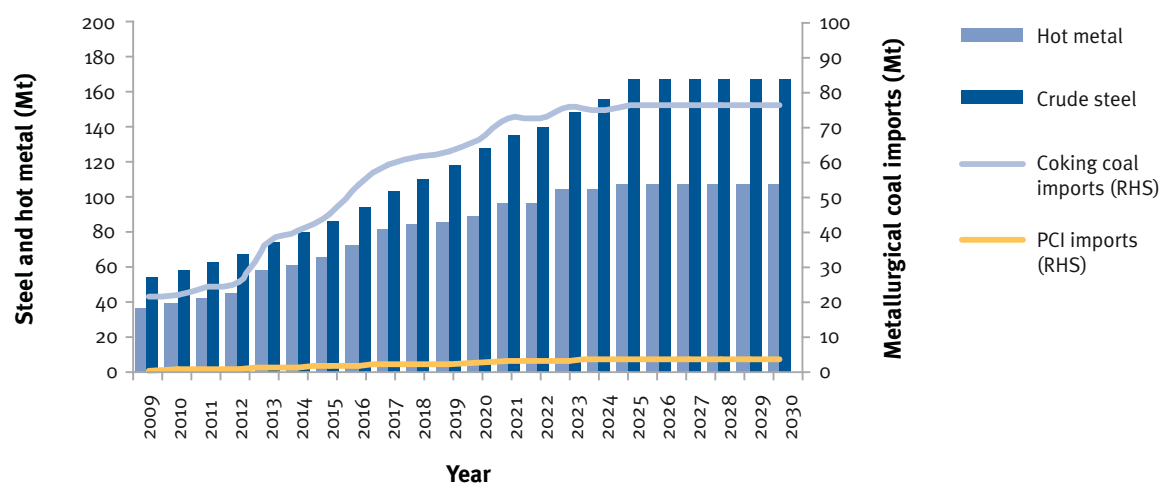
Wood Mackenzie believes that India's steel industry has strong long-term growth potential due to very low per capita steel consumption of 45 kilograms (world average 200 kilograms). Conventional blast furnace route of iron and steel making will see consistent growth together with the associated expansion of coke oven capacity.

<sup>18</sup> ABARE Australian Commodities. March 2010.



Source: Wood Mackenzie

Figure 8: Indian thermal coal demand and imports



Source: Wood Mackenzie

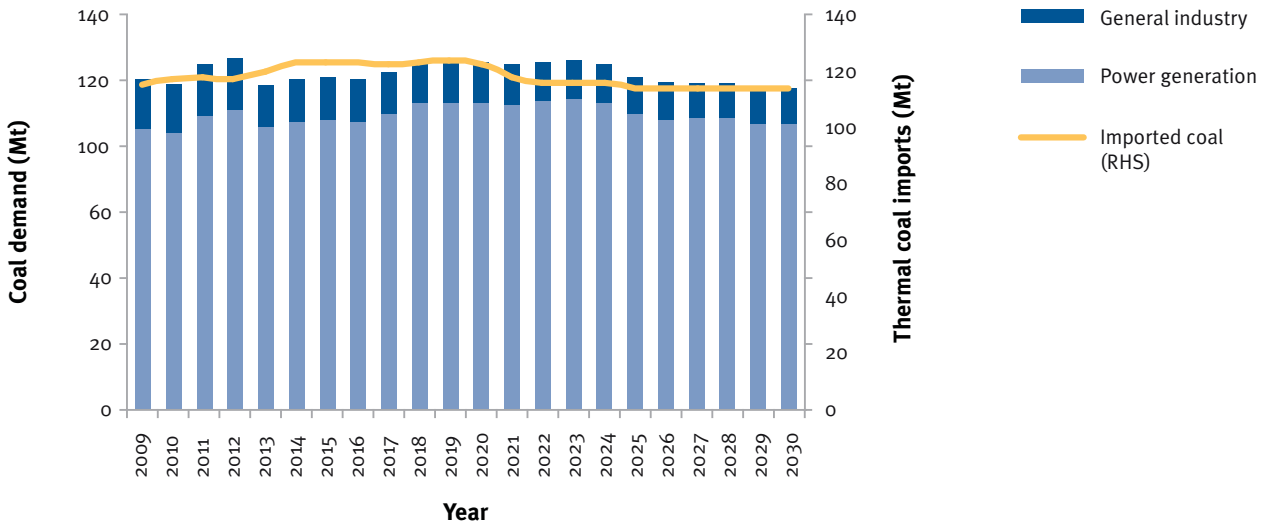
Figure 9: Indian steel and hot metal production against metallurgical coal imports by type



## Japanese import demand

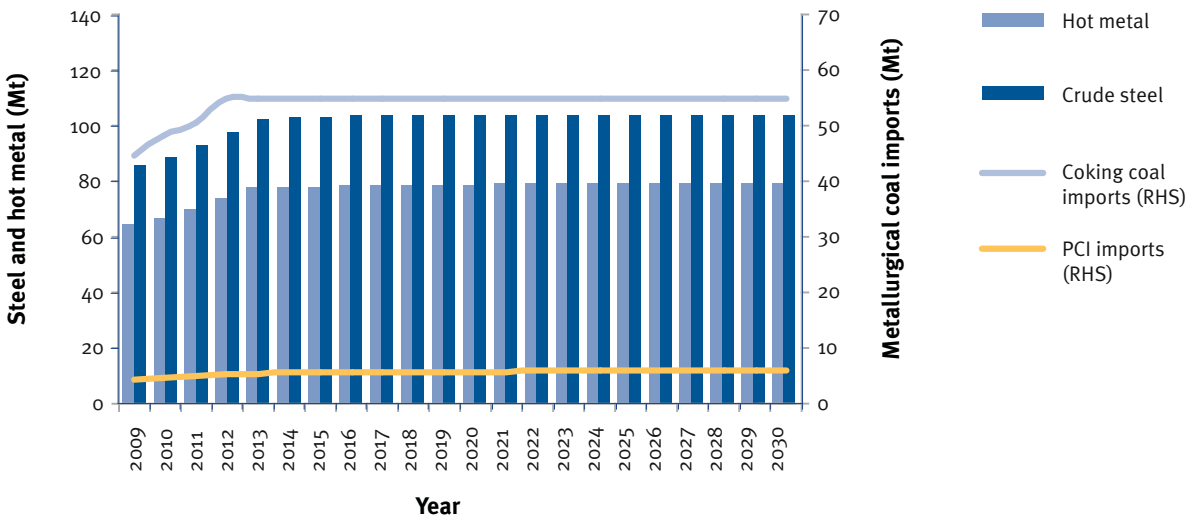
Wood Mackenzie forecasts that export of coal to Japan will remain steady, with demand driven largely by the expansion of coal-fired electricity generation and the growth in steel production. Despite the slowdown in crude steel production in the fourth quarter of 2008, Japanese crude steel production was still the second highest on record in 2008, and Japan exported a record 38.5 million tonnes of steel products in 2008. The rise in exports was mainly due to a sharp increase in heavy plate exports to South Korea.

New coal technologies being utilised in Japan (super-critical power plants and integrated coal gasification combined cycle) are being developed to improve thermal efficiencies of coal-fired power. Along with environmental reasons and the projected long-term decline in Japan's population, this will be expected to contribute to a slow decline in Japanese demand for thermal coal after 2024.



Source: Wood Mackenzie

Figure 10: Thermal coal import demand



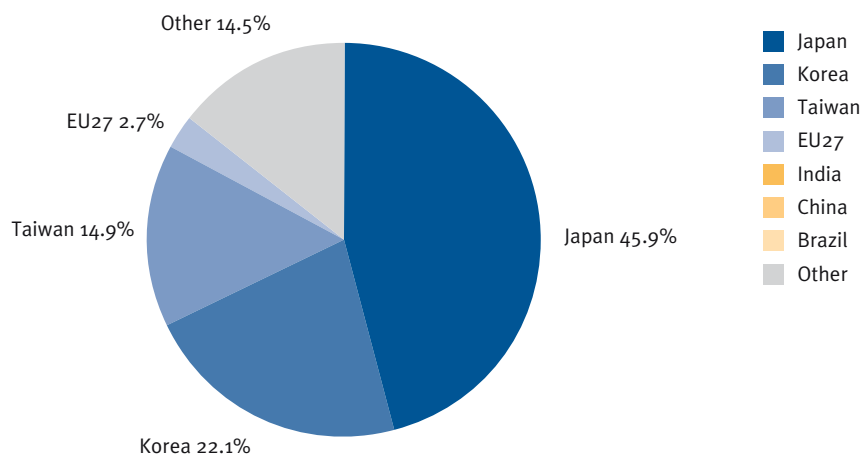
Source: Wood Mackenzie

Figure 11: Metallurgical coal import demand



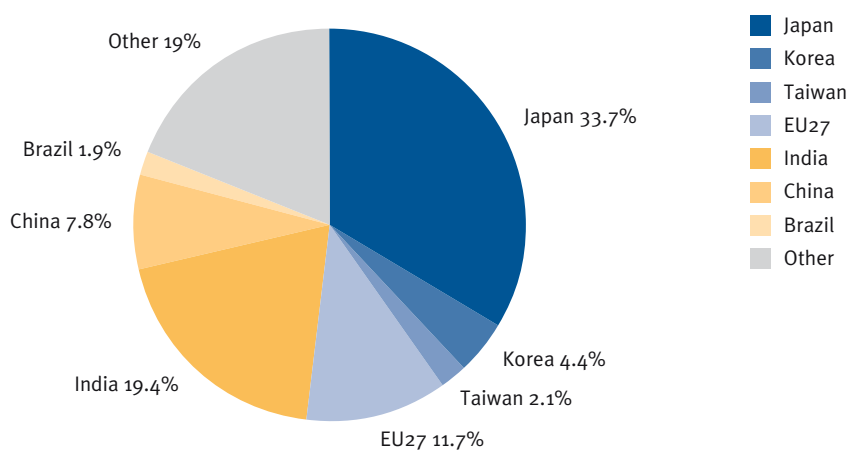
# Markets and competitors

Japan remains Australia's most important market for coal, importing approximately 40 per cent of all Australian exports (both metallurgical and thermal coal). The other North Asian economies of Taiwan and South Korea are the next most important destinations for Australian exports, although China, India and Brazil are growing in importance for metallurgical coal exports.



Source: ABARE (Australian Mineral Statistics, September Quarter 2009)

**Figure 10: Thermal coal export destinations 2008–09**



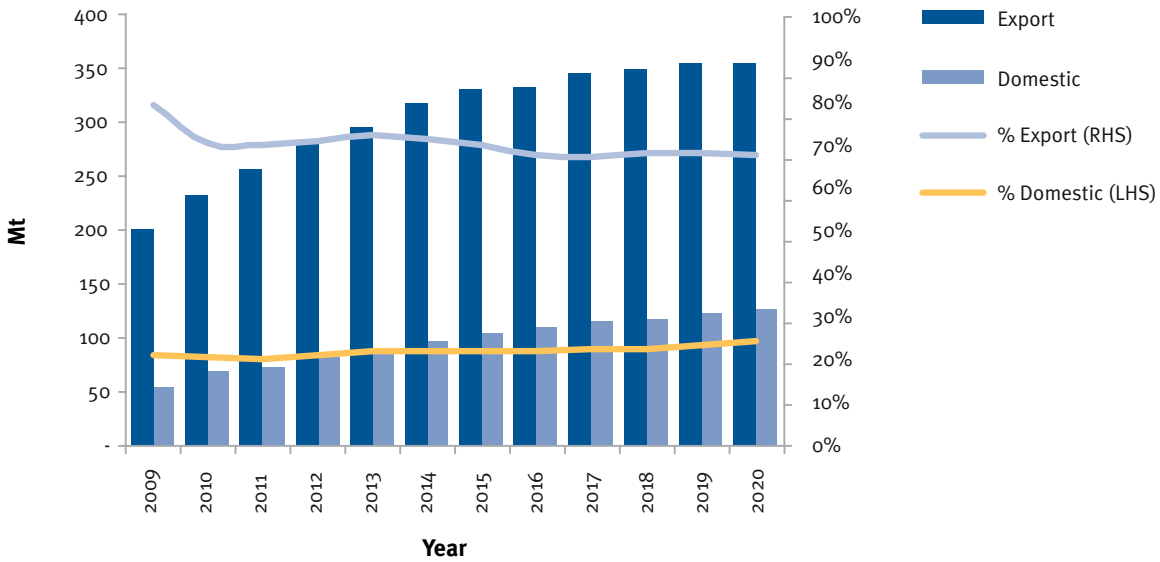
Source: ABARE (Australian Mineral Statistics, September Quarter 2009)

**Figure 11: Metallurgical coal export destinations 2008–09**



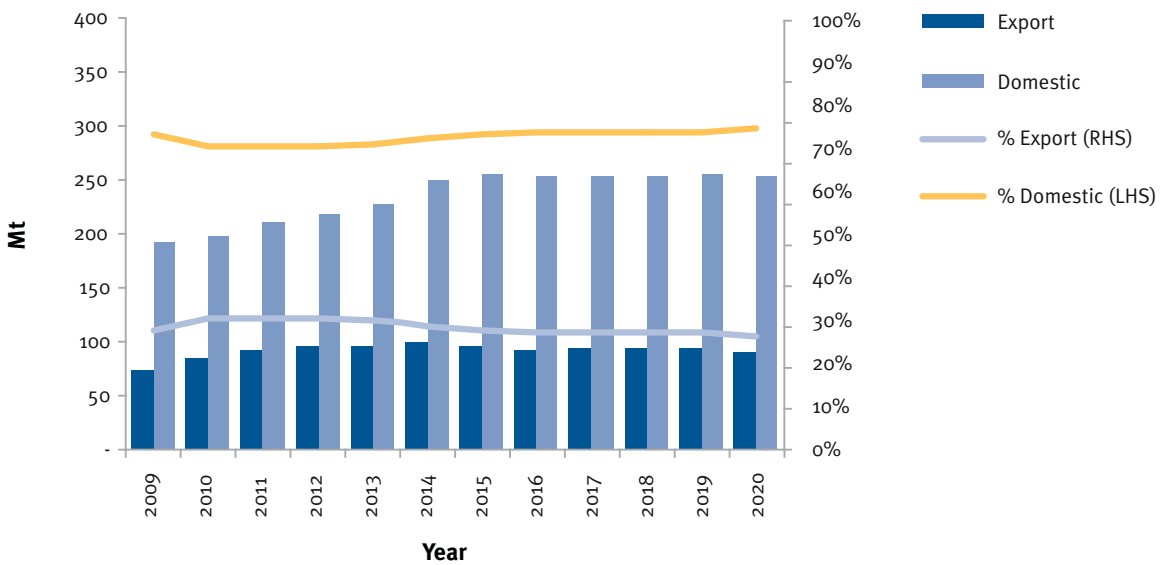
## Competitors

Australia's competitors are experiencing strong growth in exports, with Indonesian and South African thermal coal exports forecast to increase.



Source Wood Mackenzie

Figure 12: Indonesian thermal coal production forecast



Source Wood Mackenzie

Figure 13: South African thermal coal production forecast



Wood Mackenzie forecasts export growth for both South Africa and Indonesia. Indonesian production growth is forecast to continue in the period to 2020 and stabilise thereafter to 2030. Indonesian exports are dominated by thermal coal, competing head-to-head with Australian thermal coal exports in the Asia–Pacific markets.

South Africa is a competitive supplier of thermal coal to both Europe and Asia, and has a freight advantage in supplying European markets. The short-term reduction in demand for Atlantic market import coal is seeing South African thermal coal being sold into India, displacing traditional Pacific market suppliers such as Indonesia and Australia. Similar to Australia, the capacity of South African suppliers to expand export supply is constrained by the available port-rail infrastructure.

Australian market dominance is forecast to continue in the metallurgical market. It is not expected that sufficient additional supply from established (Canada, US, Russia) or emerging sources (Mozambique, Indonesia) is likely to greatly affect the demand for Australian coals.



# Production forecasts

The following forecasts are based on the work conducted by Wood Mackenzie and ABARE, and the following assumptions are made in relation to these forecasts.

Wood Mackenzie have considered the potential impact of a proposed Carbon Pollution Reduction Scheme (CPRS) type arrangement, which in its current proposed form is estimated to affect the free-on-board cost structure of Australian coal exporters by between A\$3 and A\$5 (Australian dollar) per tonne. This is likely to be marginal in relation to other cost drivers (for example, diesel prices, foreign exchange movements, and port infrastructure prices). At present, the implementation of a CPRS in Australia will be delayed until after the conclusion of the current Kyoto commitment period, which finishes at the end of 2012.

Given the Queensland coal industry is overwhelmingly geared towards servicing overseas demand, factors influencing global demand over the next 20 years will arguably be more important than supply-side pressures imposed by any potential CPRS. The extent to which global mitigation will place pressure on global demand for coal over the next 20 years remains uncertain.

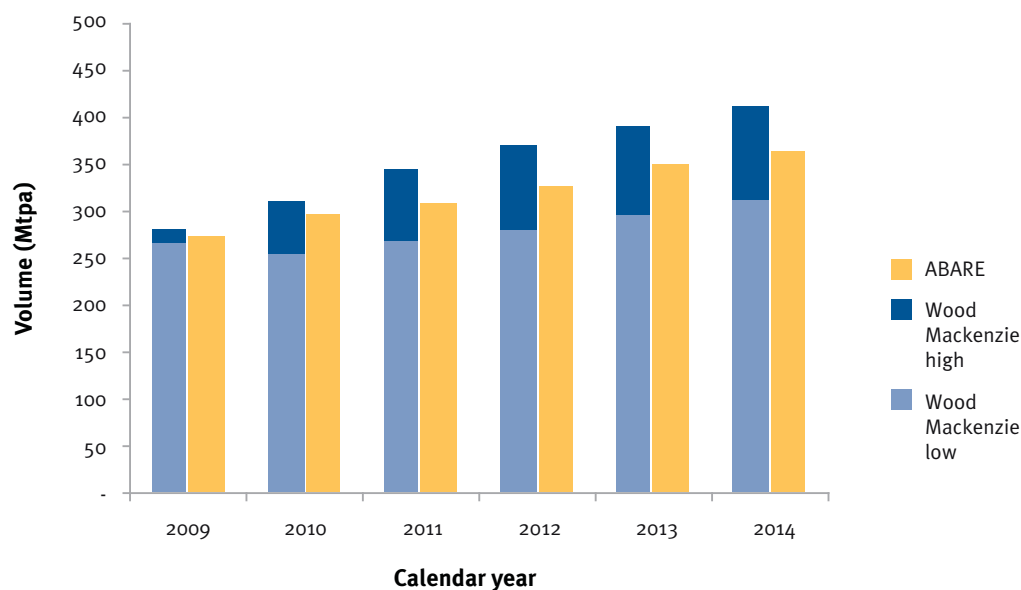
Due to the inherent complexity of forming projections in such an uncertain future market, the Wood Mackenzie forecasts do not take the impact of future global mitigation into account.

In compiling this plan, reference has been made to the low and high case forecasts provided by Wood Mackenzie. These forecasts consider likely world demand and potential production growth of the Queensland industry through to 2030. In the period 2009 to 2014, these forecasts have been compared to the current ABARE view on Australian exports.



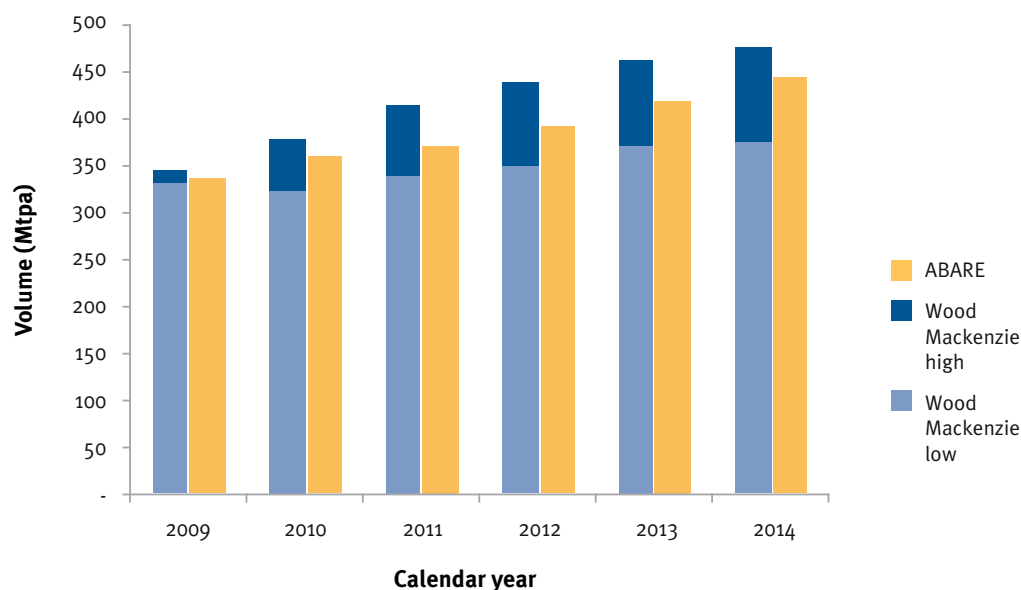
# Five-year outlook— Australian exports and supply

Wood Mackenzie's Australian forecasts have been base-lined against the current ABARE view of growth in export supply from Australia, for both metallurgical and thermal coal exports over the 2009-2014 period (i.e. five years from the base year).



Source: ABARE (Australian Mineral Statistics, March Quarter 2010) / Wood Mackenzie

Figure 14: Australian exports outlook to 2014

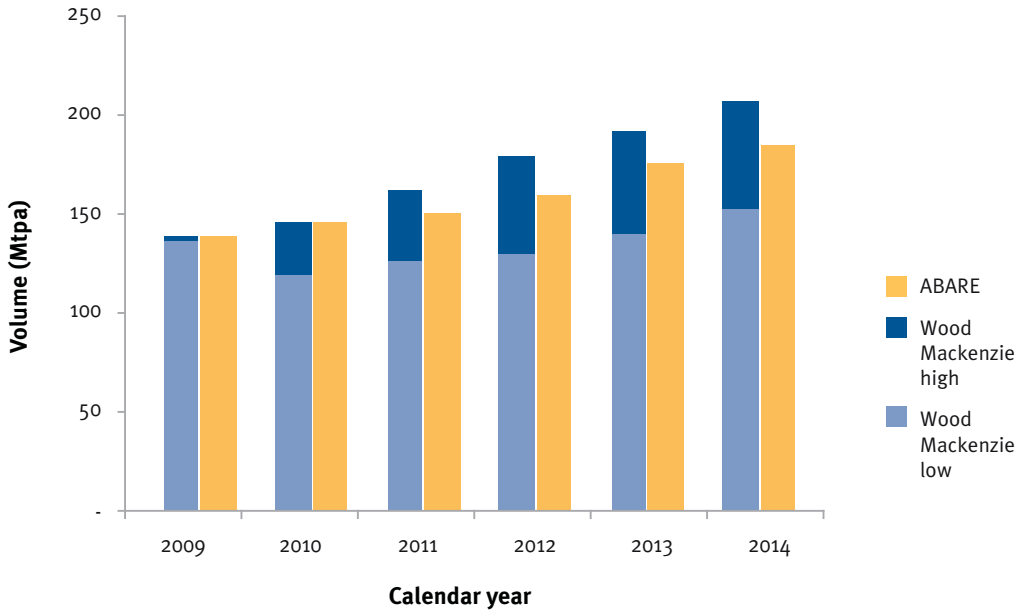


Source: ABARE (Australian Mineral Statistics, March Quarter 2010) / Wood Mackenzie

Figure 15: Australian production outlook to 2014

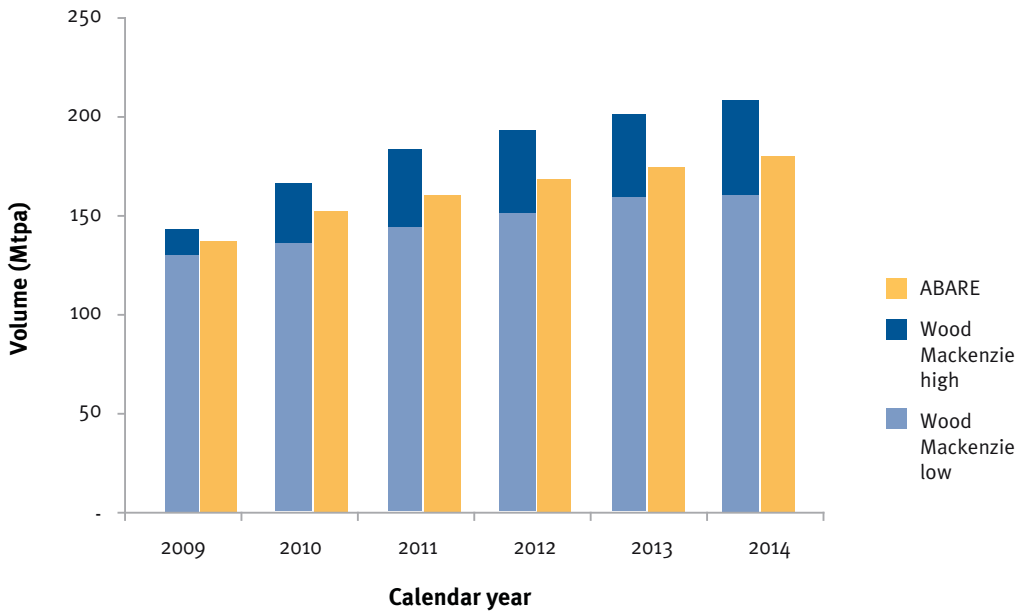


These forecasts indicate a strong upward direction for Queensland coal exports. Both the Wood Mackenzie cases—the high case asset-by-asset forecasts of supply capacity and the low case of modelled import demand for Australian coal—display strong growth.



Source: ABARE (Australian Mineral Statistics, March Quarter 2010) / Wood Mackenzie

Figure 16: Australian thermal coal export outlook to 2014

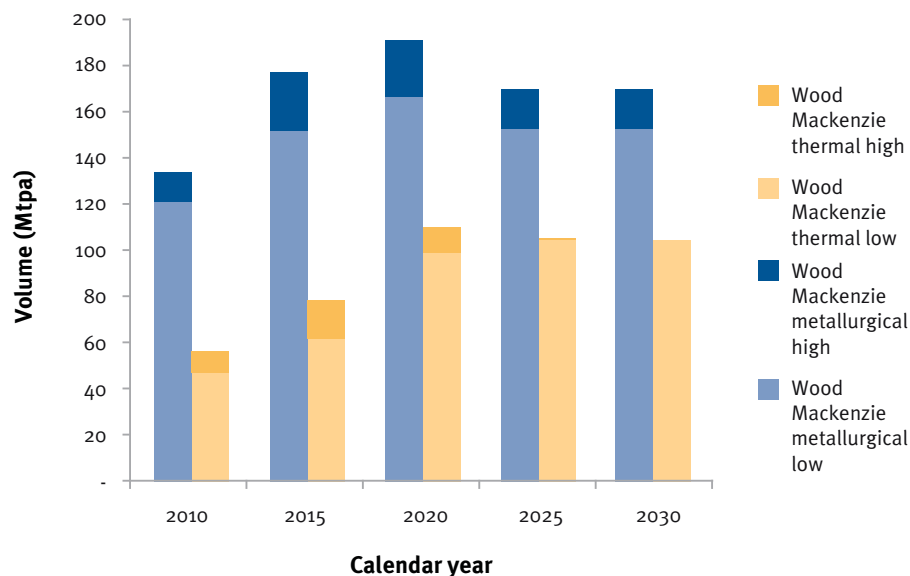


Source: ABARE (Australian Mineral Statistics, March Quarter 2010) / Wood Mackenzie

Figure 17: Australian metallurgical coal export outlook to 2014

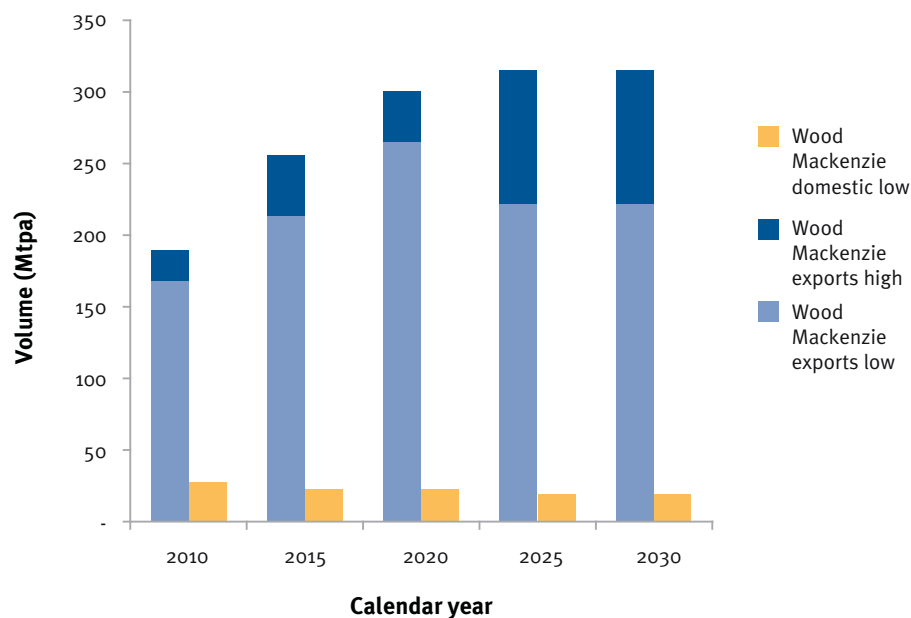


# Long-term outlook— Queensland exports and supply



Source: Wood Mackenzie coal supply service – Australasia / coal market service

**Figure 18: Queensland exports forecast—thermal and metallurgical coal\***



Source: Wood Mackenzie coal supply service – Australasia / coal market service

**Figure 19: Queensland exports and production forecast—thermal and metallurgical coal\***

\* Note that these Wood Mackenzie forecasts assume only modest thermal coal production in the Galilee and Surat Basins. If full development of currently proposed mines in the Galilee and Surat Basins is realised production volumes could be considerably higher than forecast.



Wood Mackenzie forecast strong supply and import demand cases for Queensland coal in the 2010 to 2020 period. Their forecast considered emerging uncertainty over the 2020 to 2030 period as some existing mine reserves are exhausted, and as some emerging supply markets begin to challenge Australian exports in the market on a cost-competitive basis.

In its high scenario forecast, Wood Mackenzie predicts Queensland exports and production peaking at approximately 340 Mtpa in 2030, including a continued role for domestic production in coal-fired power generation in Queensland in the vicinity of 20 Mtpa (Figure 19). This high scenario forecast assumes a conservative yield from coal production in the Galilee and Surat Basins. If full development of currently proposed mines in the Galilee and Surat Basins is realised production volumes could be considerably higher than forecast. In its low scenario forecast, Wood Mackenzie predicts Queensland exports and production peaking at approximately 240 Mtpa in 2030, including a continued role for domestic production in coal-fired power generation in Queensland in the vicinity of 20 Mtpa (Figure 19). Whatever eventual demand scenario emerges, to ensure continued security of supply, there will be a requirement that going forward our combined rail and port system has a nominal capacity at any one time of around 25 percent in excess of our target export throughput. This apparent 'excess capacity' reflects the significant step-changes of capacity upgrades (particularly for port expansions) as they are implemented creating unused capacity for a period, the loss of capacity due to unplanned mine, rail and port system interactions, and the usual annual system impact of our wet-season.

The key export growth market for Queensland is the seaborne metallurgical coal market, and particularly the emerging metallurgical import demand markets of China and India, with Japan remaining an important trading partner as well.

## Forecast by region

Wood Mackenzie forecast that coal production from mines in the northern Bowen Basin will grow significantly during the period of CoalPlan 2030.

With the development of the Goonyella-Abbott Point Rail Expansion Project (including the Northern Missing Link) scheduled for completion in 2012, coal mines in the northern section of the central Bowen Basin will be expanding production and could increasingly use Abbot Point as their export port. Therefore, over the longer term, as total coal exports through Abbot Point increase, the greater proportion of coal exports will originate from mines in the central Bowen Basin.

The Surat Basin is also expected to experience major changes and become an important region of supply, with large coal mining projects advancing at Wandoan and Cameby Downs. In addition, a number of other deposits including Woori and Elimatta could be developed in the near to medium term. While some export production from these projects is expected before 2015, large tonnages from these mines is not likely to occur until some time after 2015 as production is ramped up. A large upsurge in Surat Basin coal exports relies on the completion of the Surat Basin Railway.

The Galilee Basin is also expected to grow substantially and become an important region of supply, with large coal mining projects proposed near the township of Alpha. It is unlikely that export production from these projects will occur before late 2013. Export of coal from the Galilee Basin will rely on the development of a new, stand alone rail system from the Basin to Abbot Point.

## Coal prices

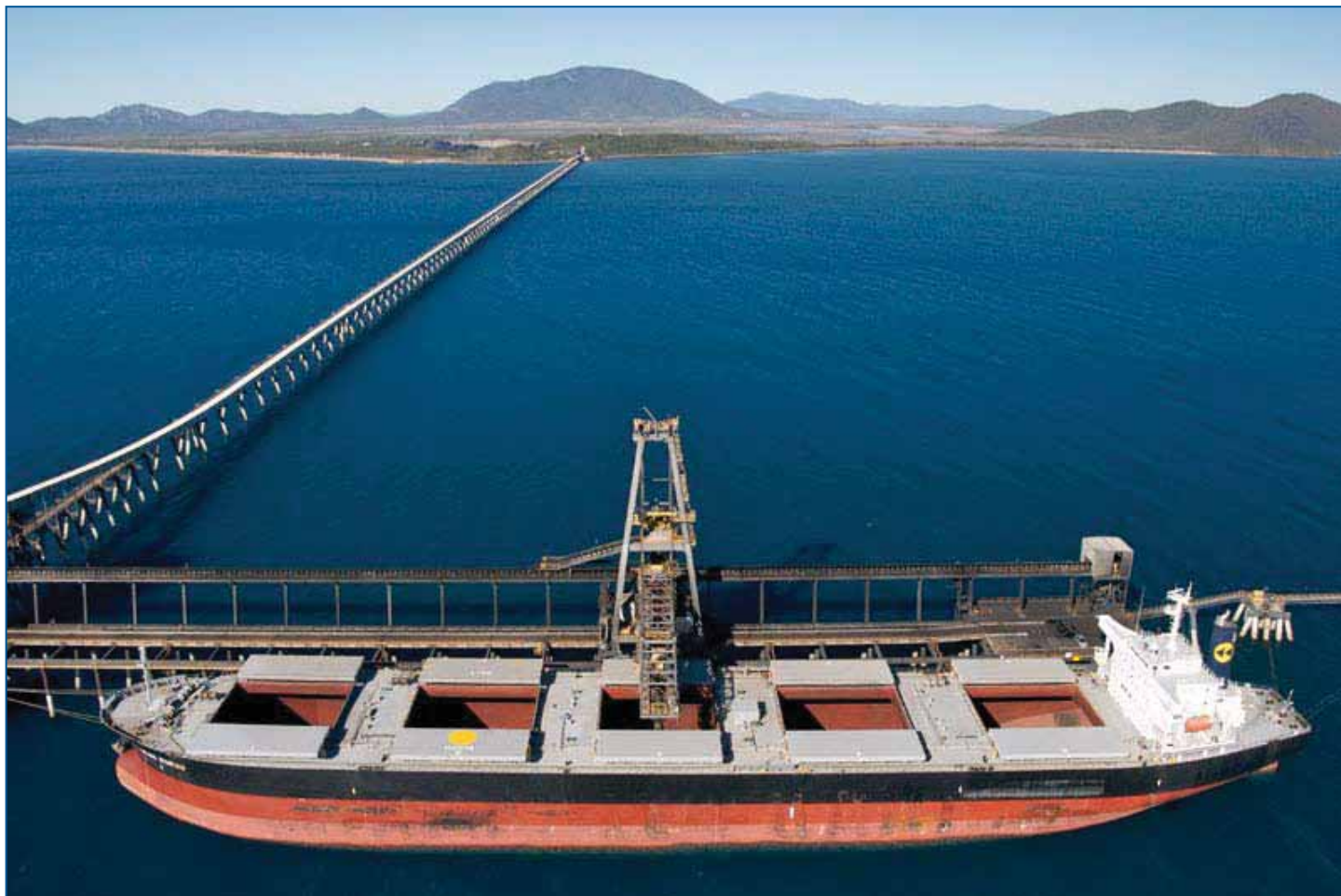
The early part of 2008 saw strong upward movement in coal prices brought about by a combination of supply constraints and strong international demand.

The surge in the average export price of hard coking coal in 2008 was significant with prices increasing to over \$A400 per tonne in November, averaging \$A293 per tonne for the 2008-2009 financial year. This compares to an average of \$A117 per tonne in 2007-2008 and an average of \$A114 per tonne in 2006-2007.

Similarly, there was a large increase in the price of thermal coal with prices reaching \$A165 per tonne in November 2008. This compares to an average of \$A72 per tonne in 2007-2008 and an average of \$A60 per tonne in 2006-2007.

April 2010 saw the introduction of a new system of quarterly priced contracts for metallurgical coal, a system which is expected to largely replace the former system of benchmark annually negotiated contracts.

Most of Queensland's export thermal coal is still sold under annual contracts. Coal prices are expected to stabilise in the medium term as new mines come on stream to meet demand. Longer term, continued demand growth and an increasing cost base in Australia and worldwide is likely to put a strong floor under current pricing levels. Wood Mackenzie forecast no reduction in 2010 real price levels for either thermal or metallurgical coal in the period to 2030.



## Future forecasting

The infrastructure requirements of the coal industry will change over time. As available forecasts differ in methodology, assumptions and data sources, the Coal Infrastructure Taskforce within Queensland Government will continue to:

- gather industry-wide data
- monitor industry trends
- monitor the development of new mines, and expansions to existing mines.

This will provide our customers with a more consistent outlook of future industry growth potential, which will be useful for not only our policy and planning purposes but our valued customers.



# Mineral Resource Rent Tax

In July 2010, the Commonwealth government announced the introduction of a Mineral Resource Rent Tax (MRRT). The MRRT will only apply to iron ore and coal mining businesses whose profits exceed \$50 million per year.

The MRRT is proposed at a nominal rate of 30 per cent with a trigger threshold that is the 10 year bond rate plus 7 per cent.

As a starting base for the transition, companies have a choice of either choosing 'market-value' of an existing investment or the 'book-value' of project assets.

If a company chooses to use book value, depreciation will be over 5 years with the book value of mining rights not accounted for. An uplift of the government long term bond rate plus 7% will apply to the book value.

If market value is used, depreciation will be based on the effective life of the project (up to 25 years). The market value is to be

determined as at 1 May 2010 and will include the value of mining rights. No uplift will apply if the market value methodology is chosen.

MRRT losses will be transferable to other iron ore or coal projects in Australia. Companies with projects under development can offset project expenditure against MRRT assessable receipts from profitable projects. This is to encourage further mining investment. Any MRRT losses not utilised will be carried forward at the government long-term bond rate plus 7%.

The Commonwealth government has announced that the taxation arrangements will apply from 1 July 2012.





# Coal systems

The four coal systems that currently operate in Queensland are the:

- Newlands System
- Goonyella System
- Blackwater–Moura System
- Western System.

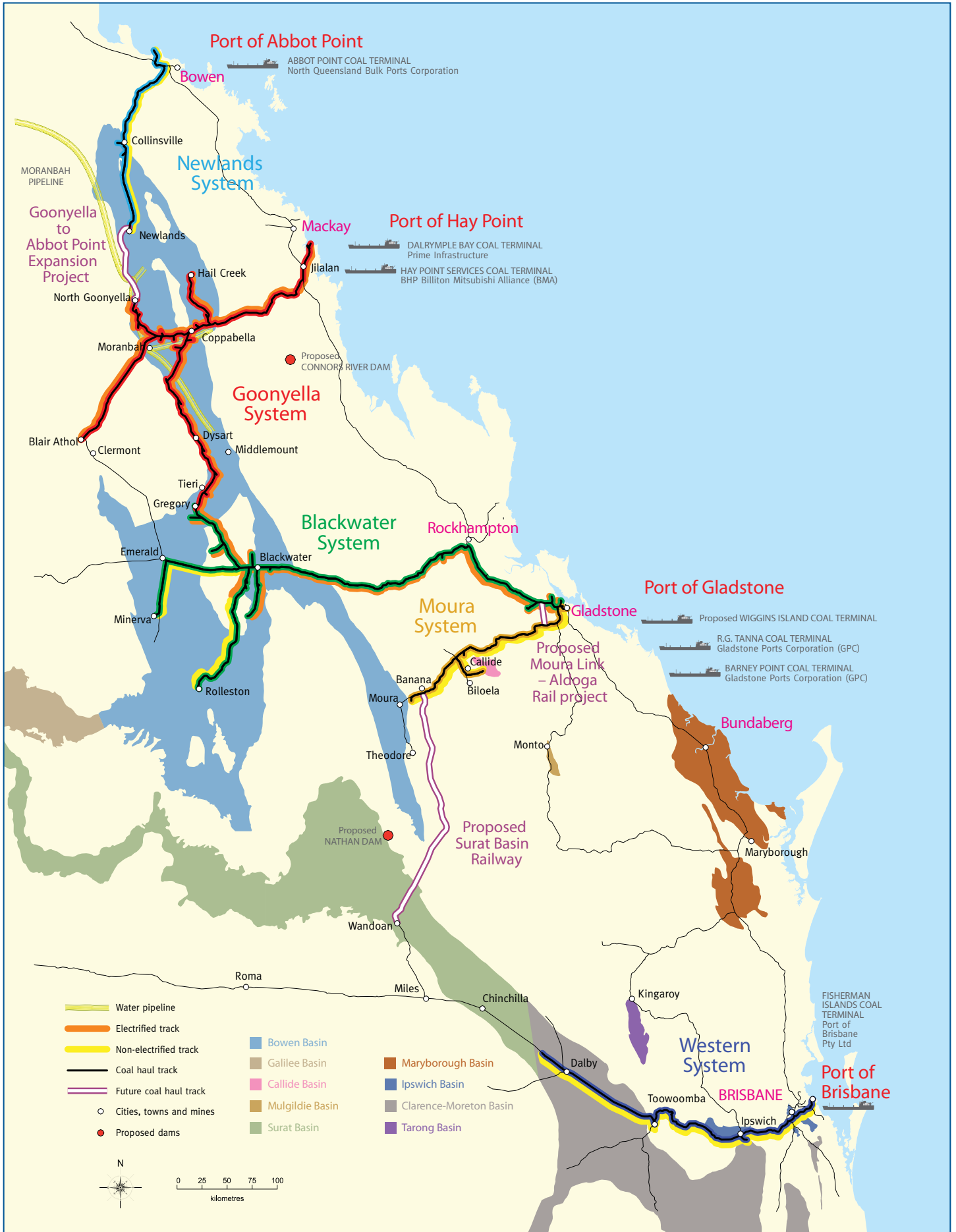
Our state's ability to expand coal exports to meet global demand depends on the capacity of its coal systems to handle additional output from mines. A coal system comprises:

- mines and associated coal preparation plants, coal stockpiles, and rail load-out facilities
- regional road, power and water infrastructure
- a rail network and rail-haul providers that deliver product coal to domestic users and export ports
- one or more coal export terminals
- a deep-water export coal port, and supporting infrastructure and services
- bulk carriers to transport the coal overseas.

The Queensland Government, working with industry, is currently facilitating the provision of infrastructure to meet forecast demand. This plan examines projects funded by both the public and private sectors.



# Queensland's coal systems map



# Newlands System

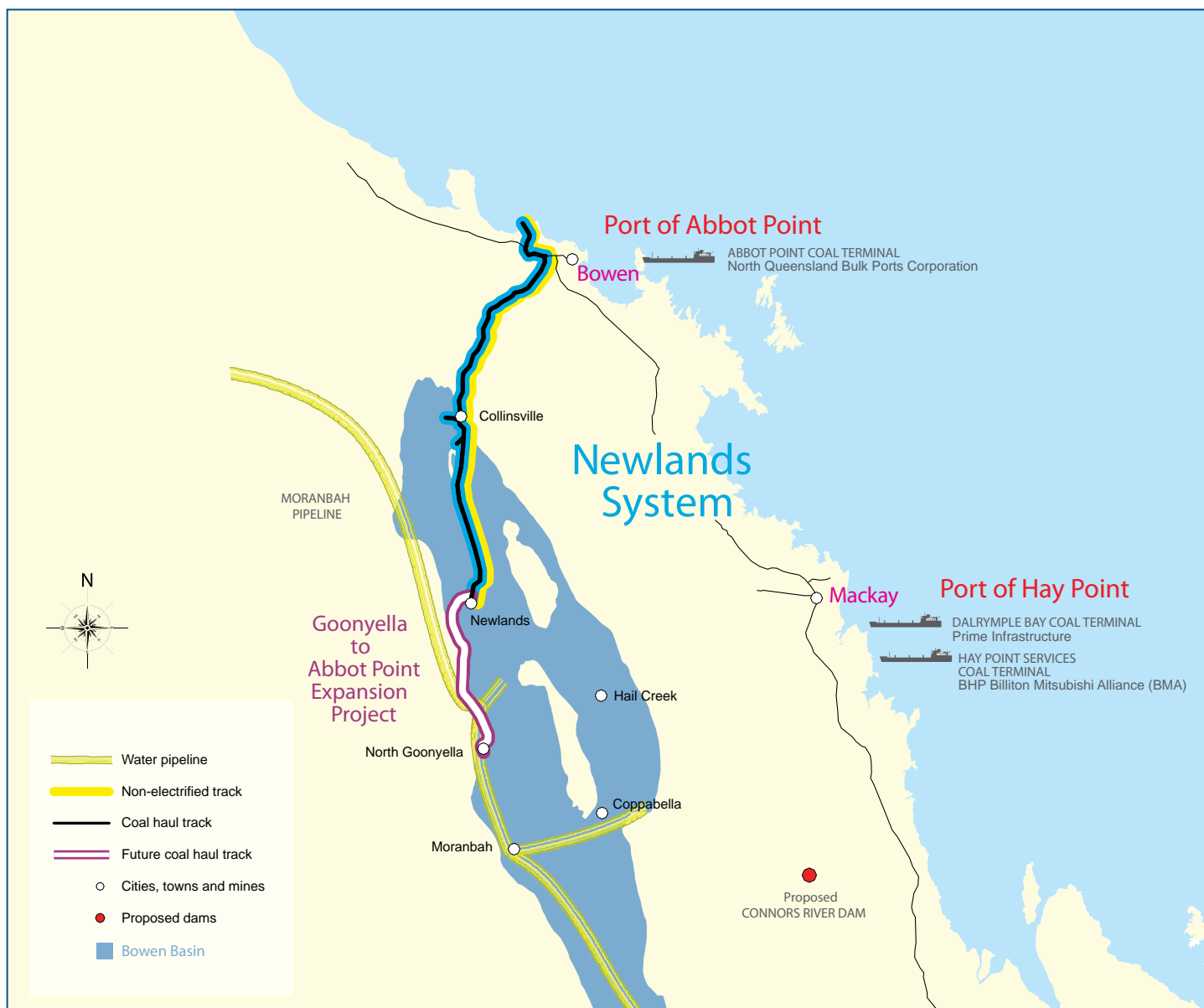


Figure 20: Newlands System map

## Water

At present, the main water supply scheme for mines and townships in the Newlands System is from the Bowen Broken Water Supply Scheme (Bowen River Weir and Gattonvale off-stream storage and Eungella Dam).

Potential water supply options including developing the Connors River Dam and/or raising of the Burdekin Falls Dam and/or augmentation of existing infrastructure in the Bowen Broken Water Supply Scheme, and associated pipelines could result in additional water to this system. In addition, and if proven to be commercially viable, the proposed Water for Bowen project is a potential supply option for the Abbot Point Coal Terminal.

## Power

The National Electricity Market powers most of the coal infrastructure in the Newlands System. Load increases at several substations within the system will create the need to either replace existing transformers with larger units or add additional transformers to maintain N-1 capacity (normal function when one major equipment item is out of service). Additional 132-kilovolt feeder capacity may be required to accommodate load growth as coal production increases. Electrifying the Newlands System would also require the accommodation of rail feeder stations and their associated 132- or 275-kilovolt transmission lines.



## Newlands System infrastructure projects

The 2009 Coal Infrastructure Program of Actions<sup>19</sup> identifies \$4.7 billion worth of completed, committed and planned investment for the Newlands System. Several of these key infrastructure projects could progressively increase the system's rail and port capacities to more than 100 Mtpa over the next several years. However, these significant increases depend on the completion of the following infrastructure projects.

### Goonyella to Abbot Point Rail Expansion (GAP) Project

This project predominantly forming part of the Newlands rail system involves development of a new rail link (the Northern Missing Link) between North Goonyella and the Newlands rail system (together with other system expansions) to enable the increased export of coal through Abbot Point with throughput up to 50 Mtpa. Planning for expansion beyond 50 Mtpa capacity is also being progressed and is likely to require full-system electrification to enable the use of 10 000 tonne trains rather than the 4600-tonne diesel trains currently used. The Abbot Point Coal Terminal will require rail upgrades including two more balloon loops and additional holding roads to deliver this extra coal.

In April 2010 the Queensland Premier announced the approval of the \$1.1 billion GAP project. The project is expected to be completed in early 2012.

### New coal terminal developments at Abbot Point

North Queensland Bulk Ports Corporation (NQBPC) is currently expanding the Abbot Point Coal Terminal to a 50 Mtpa capacity. A \$95 million expansion from 21 to 25 Mtpa was completed in June 2009. A further 25Mtpa expansion to 50Mtpa and costing \$818 million is on-track for completion by June 2011.

Further to the current 50 Mtpa expansion, NQBPC has also been exploring the further development of the port potentially to a capacity of 230 Mtpa. To facilitate this process, in early 2010 NQBPC called for Expressions of Interest (EOI) for the development of two additional coal terminals of 30 Mtpa each.

After considering the EOI received, in April 2010, NQBPC announced the awarding of Preferred Developer status to BHP Billiton and Hancock Coal to build two new coal terminals. The new coal terminals will be single-user terminals providing BHP Billiton and Hancock Coal with the capacity to export 30 Mtpa of coal each. Both BHP Billiton and Hancock Coal have expressed interest in working with NQBPC in optimizing the area to potentially increase capacity from 30 Mtpa to 50 Mtpa for BHP Billiton and from 30 Mtpa to 60 Mtpa for Hancock Coal. This expansion from a combined 60 Mtpa to a combined 110 Mtpa would be subject to a range of investigations and approvals.

NQBPC is also considering further developments at Abbot Point referred to as Terminals 4-7. This development could involve additional coal export terminals with a nominal capacity of 120 Mtpa.

### Multi-Cargo Facility Development

The Queensland government together with NQBPC is progressing a vision to develop the Port of Abbot Point as North Queensland's premier port, servicing one of Northern Australia's major industrial hubs.

To support this major expansion of the Port of Abbot Point, the Queensland government has developed an associated State Development Area immediately adjacent to Abbot Point covering an area of 16,230 hectares. As part of the overall development NQBPC is planning to develop an Abbot Point Multi Cargo Facility Project (the MCF) involving the construction of a protected harbour at Abbot Point capable of handling multiple cargoes, including coal exports.

The project involves the development of an off-shore Multi-Cargo Ship-loading Facility including up to 12 new multi-cargo ship-berths, a 10-berth tug base, a maneuvering Basin and an approach channel. This off-shore component will be linked via a transport infrastructure corridor to a major on-shore Multi-Cargo Facility Stockyard (MCFS) located immediately south within the State Development Area. This MCFS is expected to have an ultimate stockyard capacity of 120 Mtpa.

The capital cost of Stage 1 of the project is expected to be approximately \$1.25 billion, with a further Stage 2 taking the full project cost to \$1.8 billion. The project has been awarded Project of State Significant status and the associated Environment Impact Assessment process has already commenced.

The MCF is designed to service multi-cargo export and import, of which coal export is expected to be the largest export commodity. Based on current plans the off-shore MCF would provide ship-loading services to its own attached on-shore MCFS with capacity

<sup>19</sup> Coal Infrastructure Taskforce, *Coal Infrastructure Program of Actions*, Department of Infrastructure and Planning, Brisbane, 2009.



of 120 Mtpa as well as to the planned BHP-Billiton and Hancock Coal stockyards of initial combined capacity of 60Mtpa. This would require a total MCF capacity of 180Mtpa. If however the proposed BHP-Billiton and Hancock Coal coal stockyards are expanded to 50 and 60Mtpa capacities respectively, this would take the required ultimate MCF capacity to 230Mtpa.

Several other proponents are progressing projects to export coal through Abbot Point, including Waratah Coal and AMCI. Waratah Coal plans to export 40 Mtpa and AMCI potentially up to 20 Mtpa. The stockpile requirements of these projects could be easily accommodated within the planned 120Mtpa MCFS.

### Abbot Point water requirements

Any expansion to the Port will also increase water needs of the area. Government will need to work with NQBPC to ensure it plans for and meets these water sourcing needs. Potential options for NQBPC include water from the proposed Water for Bowen Project, recycling fit-for-purpose water from the Bowen sewage treatment plant and from the Peter Faust Dam.

### Connors River Dam

The planned Connors River Dam and Pipeline Project were identified within the Central Queensland Regional Water Supply Strategy as the preferred medium to long-term water supply solution to meet future water demands in the Bowen Basin region<sup>20</sup>.

This project is currently seeking water allocation requests from regional customers as part of finalizing its business case. If the project proves to be commercially viable, this dam would ensure water security for the Bowen Basin coalfields and provide additional water for future developments. The dam is expected to have a storage capacity of approximately 373,700 ML. The project includes a major pipeline from the proposed dam site to a location in the vicinity of Moranbah. There is also potential for further pipeline extension to service proposed Galilee Basin coal mines.

### Raising Burdekin Falls Dam

A raised Burdekin Falls Dam has the potential to support future urban, mining and industrial growth as well as provide opportunities for development of hydro-electricity power generation. Through construction of associated distribution infrastructure, for example Water for Bowen, the additional capacity would underpin the water supply to the Bowen/Abbot Point area.

A preliminary business case for a two metre raising of the dam wall, undertaken by SunWater, has indicated that the raised structure would increase the existing capacity by approximately 586 000 ML to provide almost 2 446 000 ML of total storage and may make available up to an additional 150 000 ML of water per annum for use by mining, industrial, urban and agricultural use.

### Water for Bowen project

If supported by a sound business case underwritten by commercial contracts, the Water for Bowen project aims to supply up to 60 000 ML of water per year for industrial, urban and agricultural expansion in the Bowen region via a new 150 km pipeline and channel system extending from the Burdekin River, 130 km to the north, via a route across the coastal plain to Bowen. The provision of this additional water may require the raising of Burdekin Falls Dam. The Water for Bowen project could also be a potential supply option for the Abbot Point Coal Terminal.

<sup>20</sup> Connors River Dam and Pipelines Project – Project Newsletter Ed, 3 August 2009.



Tables 1 to 5 further describe recently completed, committed or planned projects in the Newlands System.

**Table 1: Recently completed rail and port infrastructure projects—Newlands System**

Project	Additional capacity gained (Mtpa)	Completed	Capital expenditure
Abbot Point Coal Terminal expansion—X21 (21 Mtpa)	6	November 2007	\$116 million
Abbot Point Coal Terminal X25 (25 Mtpa)	4	June 2009	\$95 million

**Table 2: Recently completed water infrastructure projects—Newlands System**

Project	Yield	Completed	Capital expenditure
Moranbah Pipeline Projects, including eastern and southern extensions.	17 000 ML per year. Can be augmented to provide 23 000 ML per year if required in the future	August 2007	\$300 million

**Table 3: Rail and port infrastructure under construction—Newlands System**

Project	Additional capacity gained (Mtpa)	Possible completion date
Abbot Point Coal Terminal X50 (25–50 Mtpa)	25	Mid 2011

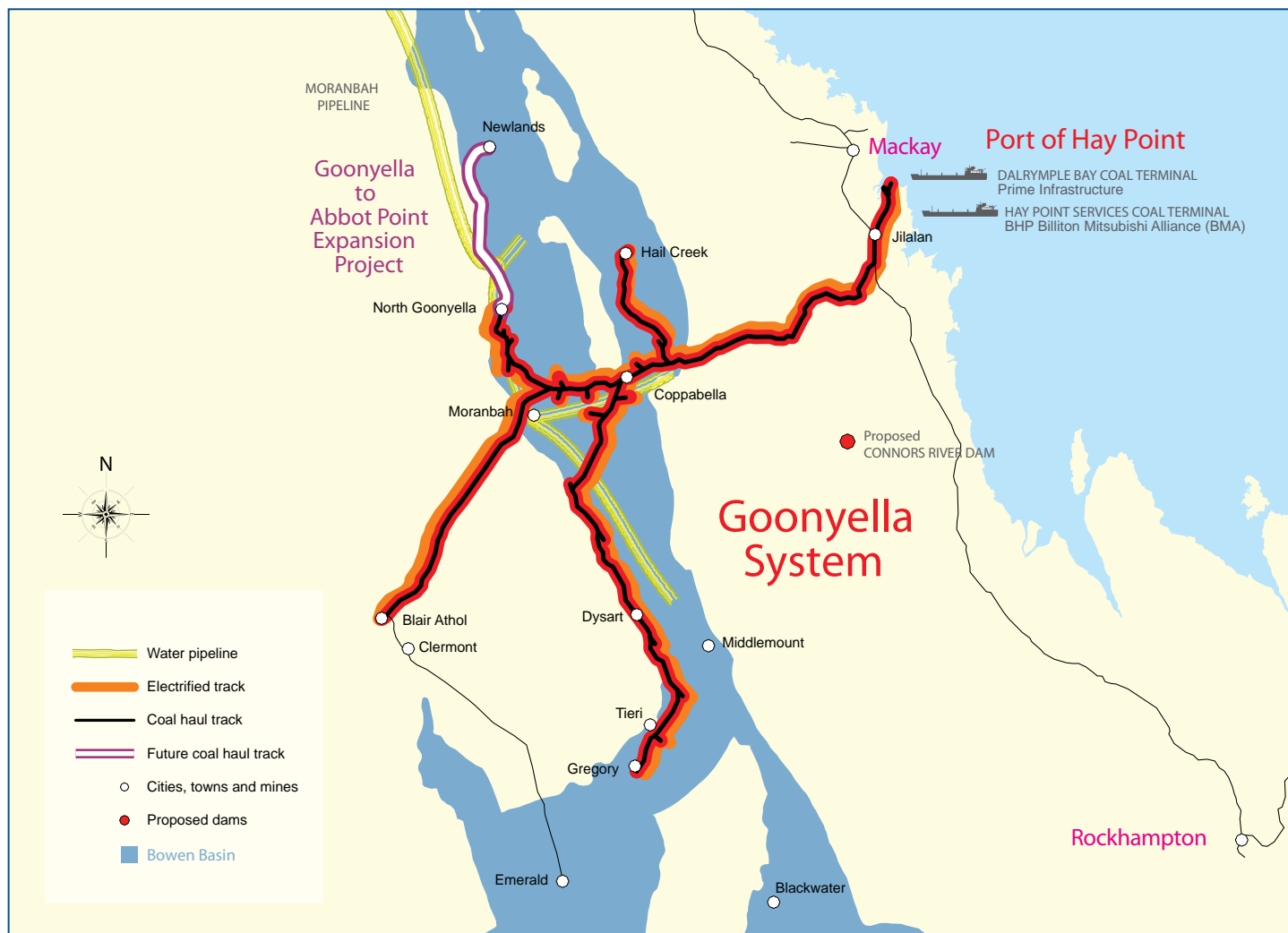
**Table 4: Planned rail and port infrastructure projects—Newlands System**

Project	Additional capacity gained (Mtpa)	Possible completion date
Goonyella to Abbot Point rail expansion project, including the Northern Missing Link	31 (Stage 1 to 50 Mtpa)	Stage 1 – Jan 2012.
	30 (Stage 2 to 80 Mtpa)	Stage 2 expansion will be aligned with the expansion requirements of the proposed BHP Billiton terminal comprising a Stage 1 of 30 Mtpa, possibly in late 2015.
	20 (Stage 3 to 100 Mtpa)	
BHP Billiton Coal Terminal 50 Mtpa	30 – Stage 1	Stage 1 – Late 2015
	20 – Stage 2	Stage 2 – 2023
Hancock Coal Terminal 60 Mtpa	30 – Stage 1	Stage 1 – mid 2014
	30 – Stage 2	Stage 2 – 2018

**Table 5: Proposed water infrastructure projects—Newlands System**

Project	Yield	Possible completion date
Connors River Dam and pipelines	Potential capacity: 373 700 ML Estimated yield: About 50 400 ML per year of high-reliability water	Final business plan to be completed late 2010. If feasible, possible construction by 2013/14
Two metre raising Burdekin Falls Dam	Up to 150 000 ML of medium priority water	Project only at feasibility stage
Water for Bowen pipeline and channel	Possible transport of up to 60 000 ML of water	Project at feasibility stage

# Goonyella System



**Figure 21: Goonyella System map**

Currently the Goonyella System primarily services more than 30 coal mines in the northern and central areas of the Bowen Basin. Rail transports coal from a range of mines to the two export terminals at the Port of Hay Point, the Dalrymple Bay Coal Terminal and the Hay Point Services Coal Terminal. The system boundaries are Blair Athol in the west, Gregory Branch junction in the south, the Port of Hay Point in the east and the North Goonyella mine in the north.

## Rail

The Goonyella System's current nominal rail network capacity is 132 Mtpa, with a current system capacity of around 112 Mtpa. The network is fully electrified and uses 10 000 tonne trains with high-capacity utilisation.

The Goonyella rail network is already connected to the Blackwater network in the south. This enables exports via Gladstone, particularly from the southern Goonyella mines, and the blending of Goonyella coal with other coal exported through Gladstone. This link between the Hay Point and Gladstone export paths provides some additional flexibility in enabling Goonyella based mines to also export through the port of Gladstone. A connection between the North Goonyella spur and the Newlands System, via the Northern Missing Link, will also enable more Goonyella system coal to be exported through the port of Abbot Point and release additional capacity on the Goonyella system to service the port of Hay Point.



## Port

The BHP Billiton Mitsubishi Alliance owns and operates the Hay Point Services Coal Terminal, as a dedicated single-user facility. In 2007 the terminal's capacity expanded to 44 Mtpa. Studies are currently investigating expanding the terminal to about 55 Mtpa.

In June 2009 the Dalrymple Bay Coal Terminal completed an expansion to 85 Mtpa capacity. Operators Prime Infrastructure have also completed feasibility studies for further staged expansions to 105, 116 and potentially up to 153 Mtpa capacity. If approved, the state government would need to explore additional water options for the terminal.

## Water

Currently, the water supply for mines and townships in the Goonyella System is transported by the Newlands Pipeline, Saraji Pipeline, Burdekin–Moranbah Pipeline, and Eungella Water Pipelines, and through water schemes that are privately owned and operated by the mining companies.

Potential water supply options include:

- the proposed Connors River Dam and associated pipeline to Moranbah
- raising of the Burdekin Falls Dam
- Upgrade and/or duplication of existing Burdekin to Moranbah pipeline.

The Connors River Dam and Pipeline Project was identified within the Central Queensland Regional Water Supply Strategy as the preferred medium to long-term water supply solution to meet future water demands in the Bowen Basin region<sup>21</sup>.

A raised Burdekin Falls Dam also has the potential to support future urban, mining and industrial growth as well as provide opportunities for development of green power (hydro-electricity power generation). Through construction of associated distribution infrastructure, for example a potential duplication of the Burdekin–Moranbah Pipeline, the additional capacity would underpin the water supply to the Bowen Basin Coalfields.

SunWater could supply water for the Bowen Basin and Galilee Basin from the proposed Connors River Dam, and pipeline to Moranbah and then to the Galilee Basin.

Additional supplies could be delivered from the Burdekin Falls Dam by duplication of the existing Burdekin–Moranbah Pipeline.

## Power

Like the Newlands System, the National Electricity Market powers most of the coal infrastructure in this system. Load increases at several substations within the Goonyella System will create the need to either replace existing transformers with larger units or add additional transformers to maintain N-1 capacity (normal function when one major equipment item is out of service). Additional 132 kilovolt (kV) feeder capacity may also be needed to accommodate load growth. The feeder station currently being constructed at Dalrymple Bay Coal Terminal will need a 132 kV transmission line.

## Dalrymple Bay Coal Chain

Located inland to the west of Mackay, the Dalrymple Bay Coal Chain is a major coal supply chain network that extends over 300 km. Coal is transported from 22 coal producing mines at 20 load points onto trains that are two kilometres long terminating at the Port of Hay Point where the coal is loaded by the Dalrymple Bay Coal Terminal onto ships for export.

In 2007 in response to constraints and increasing ship queues, the Queensland government and Queensland Resources Council jointly commissioned the O'Donnell Review of the Goonyella Coal Chain performance. The review identified a need for a stronger coal chain coordination role in planning and driving improved system performance, a lack of short-term rail-haul capacity and the need for a similar review of port and terminal systems performance.

In response to the O'Donnell Review Report, a Dalrymple Coal Chain Board (DBCCB) has been established, a Coal Chain Coordinator appointed, an Integrated Logistics Centre has been established and both long-term and short-term system improvements have commenced. QR Limited immediately ordered an additional 25 locomotives and established business improvement programs on both the Goonyella and Blackwater rail systems.

The work program of the DBCC Integrated Logistics Centre is still developing but improved system performance is gathering pace. Since the Review, the DBCC performance has significantly improved. Year on year figures show that performance is up 34 per cent over the financial years 2008-09 to 2009-10 having grown from just over 47.1 Mtpa to 63.1 Mtpa. This performance has been assisted by the completion of DBCT's expansion from 68 to 85 Mtpa capacity, additional rollingstock deployments including the commencement of Pacific National rail services in June 2009, improved rail in-loading performance, reduced train cycle times and improved rail productivity generally. Despite this improved performance, significant further improvement in DBCC efficiency and system performance is being vigorously pursued.

<sup>21</sup> Connors River Dam and Pipelines Project – Project Newsletter Ed. 03, August 2009.



## Goonyella System infrastructure projects

Since 2005 more than \$5.4 billion has been allocated to completed, committed and planned infrastructure projects in the Goonyella System. Several planned key infrastructure projects will increase rail and port capacity to around 140 Mtpa by mid-2013.

Key components of this expansion program include the following projects.

### Jilalan Rail Yard upgrade

This \$500 million upgrade, comprising a \$190 million below-rail component and a \$310 million above-rail component commenced in April 2008. The below-rail component was completed in August 2009 and above-rail completed in January 2010. The rail yard upgrade has increased Goonyella rail system's track capacity to 132 Mtpa and included two new bypass tracks, two train provisioning tracks additional maintenance tracks, and new rollingstock maintenance facilities.

### Dalrymple Bay Coal Terminal expansion

In June 2009 Prime Infrastructure completed expansion of this terminal from 68 to 85 Mtpa capacity.

### Hay Point Services Coal Terminal expansion

A feasibility study to investigate expanding this terminal from 44 to 55 Mtpa is currently being finalized. If this project proceeds completion is expected by 2014.



Tables 6 and 7 further describe recently completed, committed or planned projects for the Goonyella System.

**Table 6: Recently completed rail and port infrastructure projects—Goonyella System**

Project	Additional capacity gained (Mtpa)	Completion date	Capital expenditure
Signalling—Connors Range	5	July 2007	\$3 million
Third rail loop—Dalrymple Bay Coal Terminal	5	November 2007	\$107 million
Coppabella yard upgrade	3	March 2008	\$26 million
Broadlea—Watonga duplication	1	October 2008	\$70 million
Harrow crossing loop	1	October 2008	\$14 million
Channel dredging—Port of Hay Point	2	December 2006	\$60 million
Dalrymple Bay Coal Terminal (54–68 Mtpa) <sup>22</sup>	14	March 2008	\$565 million
Hay Point Services Coal Terminal (34–44 Mtpa) <sup>23</sup>	10	August 2007	\$300 million
Dalrymple Bay Coal Terminal 7X project, phase 2–3 (68–85 Mtpa)	17	June 2009	\$707 million
Jilalan Rail Yard upgrade to facilitate 130 Mtpa capacity on the Goonyella Rail System	20	Below rail completed August 2009	\$190 million below rail
		Above rail completed January 2010	\$310 million above rail
Coppabella – Ingsdon track duplication	2	April 2010	\$80 million

**Table 7: Planned infrastructure projects—Goonyella System**

Project	Additional capacity gained (Mtpa)	Possible completion date	Capital Expenditure
Hay Point Services Coal Terminal (44–55 Mtpa)	11	2014	HPCST \$675M
Dalrymple Bay Coal Terminal Stage 8	26	2016	DBCT \$2106M

<sup>22</sup> Babcock & Brown Infrastructure, *Dalrymple Bay Coal Terminal*, 2007, viewed 25 November 2008, [www.bbinfrastructure.com.au](http://www.bbinfrastructure.com.au).

<sup>23</sup> BHP Billiton Mitsubishi Alliance, *Hay Point Terminal*, BHP Billiton Mitsubishi Alliance, 2008, viewed 25 November 2008, [www.bmacoal.com](http://www.bmacoal.com).

## Goonyella System future expansion

Expansions over the period to 2014 are expected to increase the Goonyella rail and port system capacity to around 140 Mtpa.

Further expansion of the rail system to around 186Mtpa is being planned and would require a number of key upgrades including:

- triplication of critical rail sections (including Connors Range)
- duplication of key branch lines as required
- additional holding roads at Jilalan and Coppabella
- an additional unloading balloon loop at DBCT
- grade separation of unloading loop entry and exit roads at HPSCT and DBCT
- new power feeder stations at Wotonga and Peak Downs.

These rail upgrades will be progressed as Dalrymple Bay Coal Terminal is expanded to 111 Mtpa and Hay Point Services Coal Terminal to 55 Mtpa.

Development of a new port at Dudgeon Point, around 5 kilometres north of Hay Point, is another expansion option currently being investigated. Development of any Dudgeon Point terminal/s is likely to involve higher development costs as it is a greenfield site with significant additional infrastructure being required.

# Blackwater–Moura System



**Figure 22: Blackwater–Moura System map**

The Southern Bowen Basin region is serviced by the Blackwater and Moura rail systems. The Blackwater System services about 12 Central Queensland coal mines and transports export coal to the Port of Gladstone’s RG Tanna Coal Terminal and Barney Point Coal Terminal, and domestic coal to Stanwell Power Station, the Gladstone Power Station, and Fisherman’s Landing.

The Moura System services four coal mines at Dawson, Baralaba, Boundary Hill and Callide. It transports export coal to Gladstone coal terminals and domestic coal to Gladstone Power Station, the Rio Tinto Alumina Refinery and Queensland Alumina Limited Refinery.



## Rail

The Blackwater–Moura System’s current nominal rail capacity, servicing both export and domestic railings, is 86 Mtpa. The Blackwater System is serviced by both diesel and electric traction trains, and can accommodate trains of 8000 tonne capacity. QR is progressing plans to increase track capacity to approximately 130 Mtpa to support the development of a proposed new Wiggins Island Coal Export Terminal at Gladstone.

Developing the proposed Wiggins Island Coal Export Terminal, located just north of the current RG Tanna Coal Terminal, will require significant rearrangement of the rail network on the northern approaches to Gladstone and a new rail link developed between the Moura Line south-west of Gladstone to the North Coast Line near Aldoga.

The Moura System currently carries smaller, diesel-powered trains, and transports coal for both export and domestic use. This network will require a range of upgrades to meet forecast export growth from new and existing Moura System mines as well as from a proposed Surat Basin Railway.

The Surat Basin Railway is a proposed 210 kilometre rail line between the townships of Wandoan and Banana that will link Surat Basin mines to the Moura Line at Banana and allow Surat Basin mines to export coal through the Port of Gladstone.

If the Surat Basin Railway proceeds, the Moura System will require significant track upgrades, including the proposed Moura Link–Aldoga Rail Expansion Project, which would enable coal trains from the Moura System to approach the Wiggins Island Coal Export Terminal more efficiently from the north via the Blackwater System.

## Port

Blackwater–Moura System coal exports through the port of Gladstone are delivered via the RG Tanna and Barney Point Coal Terminals. Gladstone’s largest coal terminal the RG Tanna Coal Terminal has a current capacity of 68Mtpa with potential for a further expansion to 75Mtpa.

The Barney Point Coal Terminal has a capacity of 7 Mtpa. Its location up-wind of the Gladstone CBD makes it unsuitable for future expansion and the terminal is expected to discontinue as a coal export terminal within the next five years once the proposed Wiggins Island Coal Export Terminal becomes operational and is operating effectively.

The proposed Wiggins Island Coal Export Terminal (WICET) Project has completed its detailed engineering design. The State Government gave the project environmental planning approval in January 2008 and the Commonwealth Government in April 2008.

Stage 1 of the WICET will initially create capacity of at least 20 Mtpa, with the potential to reach a capacity of approximately 70 Mtpa to 85Mtpa, delivered in incremental stages. In December 2009, the State Government, Gladstone Ports Corporation and the WICET Group executed a framework deed under which WICET will secure funding and relevant approvals for the design, construction and development of stage 1. If the proposed WICET eventually proceeds as planned to a 70 Mtpa to 85Mtpa capacity terminal, it will increase Gladstone’s overall coal export capacity to between 142-157Mtpa.

## Water

Water is supplied to the townships and mines in the Blackwater–Moura System via the Nogoia Mackenzie Water Supply Scheme (e.g. Blackwater Pipeline), Dawson Valley Water Supply Scheme and from water schemes that are privately owned and operated by the mining companies.

The proposed Nathan Dam on the Dawson River in Banana Shire is in its planning stages, and if developed will serve industrial, mining and agricultural interests in this region. This dam could also serve as a contingency storage to improve the security of supply for the region. Coal seam gas water is also a potential supply option.

## Power

The National Electricity Market powers most of the coal infrastructure in this system. Load increases at several substations located within the Blackwater–Moura System will create the need to either replace existing transformers with larger units or add additional transformers to maintain N-1 capacity (normal function when one major equipment item is out of service). Additional 132 kV feeder capacity will be required for growth in the rail electric traction load. Feeder stations planned for Raglan, Wycarbah, Duaringa and Bluff will require transmission lines in the short to medium term.

## Blackwater–Moura System infrastructure projects

The state government has allocated approximately \$6.6 billion for completed, committed and planned investments in the Blackwater–Moura System. Several of the key infrastructure projects could increase the system’s rail and port capacity to 130 Mtpa over several years. However, this significant increase in transport capacity depends on the following large infrastructure projects.



## Blackwater–Moura System infrastructure projects

### Surat Basin Railway

An exclusive mandate has been granted by the Queensland government to a private sector consortium to develop a new 210 km railway from Wandoan to Banana, which will allow transport of Surat Basin coal through the Port of Gladstone for export. The project's full feasibility study is currently being finalised with financial close expected in 2011.

The development of the Surat Basin Railway project potentially creates significant export opportunities for new and expanding mine development projects located in the Surat Basin.

### Blackwater–Moura System works

The Moura line and the rail system around the Gladstone area would require major upgrades to handle the RG Tanna Coal Terminal's additional capacity and efficiently service the Wiggins Island Coal Export Terminal.

If the Surat Basin Railway proceeds, QR plans to upgrade the Moura System initially to 40 Mtpa and potentially to about 70 Mtpa.

The Gladstone area would need significant works to meet additional demand and interface with the proposed Wiggins Island Coal Export Terminal. Several track duplication projects, including upgrade works at the Callemondah Rail Yard, would be needed to support rail works associated with the Wiggins Island Coal Export Terminal Stage 1 development (to 25 Mtpa) and the proposed Moura Link–Aldoga Rail Project.

The Moura Link–Aldoga Rail Project comprises a new 25km rail link between the Moura Line west of Gladstone joining to the North Coast Line near Aldoga. As part of this project, a new Aldoga Rail Yard is to be developed providing facilities to allow re-ordering of trains, locomotive provisioning and rollingstock maintenance. The yard is being designed to cater for ultimate system capacity to service rail traffic in the Aldoga–Gladstone areas as well as providing capacity relief to the existing Callemondah Rail Yard. A further duplication of a section of the North Coast line (creating a total of four tracks) between Aldoga and the Wiggins Island Coal Export Terminal rail balloon-loop is to be developed to handle increased coal traffic generated by the Wiggins Island Coal Export Terminal.

## Wiggins Island Coal Export Terminal

The development of the Wiggins Island Coal Export Terminal is being progressed by a consortium of Queensland coal companies. The Wiggins Island Coal Export Terminal Project has already been granted all necessary environmental planning approvals. A full feasibility study was initially completed in December 2008, but with the intervention of the global financial crisis commitment to the project was put on hold. Following new coal price rises commencing in April 2010 the project has now received revised tonnage requests from miners and is currently finalizing its feasibility study. Subject to achieving financial close, the consortium of coal companies indicates it is aiming for first shipments through the terminal in 2013.

The current plan proposes to expand capacity incrementally across four stages. Stage 1 will provide up to 25 Mtpa of capacity and be in place by mid-2013. Stage 2 will take capacity to 50 Mtpa, while Stage 3 could add a further 20 Mtpa, bringing the terminal's capacity to 70 Mtpa. Although a fourth stage could increase total capacity to about 85 Mtpa, this stage would be subject to further feasibility study, and depend on future market conditions.

### Nathan Dam

The proposed Nathan Dam was identified in the Central Queensland Regional Water Supply Strategy 2006 as an option to supply mining demands in the upper Dawson, agricultural demands in the Dawson Valley and high priority urban and industrial demands. If the proposed Nathan Dam proves to be commercially viable and proceeds, it would also provide water vital to the efficient development of Surat Basin coal.

The expected capacity is 880 000 ML with an estimated per annum yield of 190 000 ML of medium-priority water (or about 70 000 ML of high-priority water). Nathan Dam could also potentially serve as a contingency storage to improve the security of supply for the region.

The proposed Nathan Dam project could be connected by pipeline to the Surat Basin. The proposed development of Nathan Dam is being considered as part of an integrated project with the production and use of coal seam gas water (Surat Dawson Integrated Water Project).



Tables 8 to 10 further describe recently completed, committed or planned projects for the Blackwater–Moura System.

**Table 8: Recently completed rail and port infrastructure projects – Blackwater–Moura System**

Project	Additional capacity gained (Mtpa)	Completed	Capital expenditure
Windah–Grantleigh duplication	6	May 2006	\$26 million
Bluff–Blackwater duplication	4	June 2007	\$53 million
Aroona–Duaringa duplication	2	September 2007	\$30 million
Yan Yan crossing loop	0	September 2007	\$12 million
Blackwater–Burngrove duplication	5.5	December 2007	\$36 million
Callemondah third spur	2	April 2008	\$39 million
Westwood–Wycarbah duplication	1.5	August 2008	\$32 million
RG Tanna Coal Terminal (40–68 Mtpa)	28	December 2007	\$774 million
Barney Point Coal Terminal (5–7 Mtpa)	2	October 2006	\$3 million

**Table 9: Planned rail and port infrastructure projects – Blackwater–Moura System**

Project	Additional capacity gained (Mtpa)	Possible completion date
Moura Link–Aldoga Rail project	3	2012/13
Surat Basin Railway <sup>24</sup>	42	Operational by 2012/13 30 Mtpa by 2015
Wiggins Island Coal Terminal Stage 1 (25 Mtpa)	25	First shipments possible mid 2013
Wiggins Island Coal Terminal Stage 2 (25–50 Mtpa)	25	
Wiggins Island Coal Terminal Stage 3 (50–70 Mtpa)	20	
Wiggins Island Coal Terminal Stage 4 (70–85 Mtpa)	15	

**Table 10: Proposed water infrastructure projects – Blackwater–Moura System**

Project	Capacity/yield	Possible completion date
Nathan Dam and pipelines feasibility project	Capacity: 880 000 ML Estimated yield: 190 000 ML per year medium priority or equivalent 70 000 high priority	If approved, 2015–16

<sup>24</sup> Private sector project. [www.suratBasinrail.com.au](http://www.suratBasinrail.com.au).



## Blackwater–Moura System future expansion

Expansions over the short to medium term could increase the Blackwater–Moura System’s rail and port capacity to 130 Mtpa.

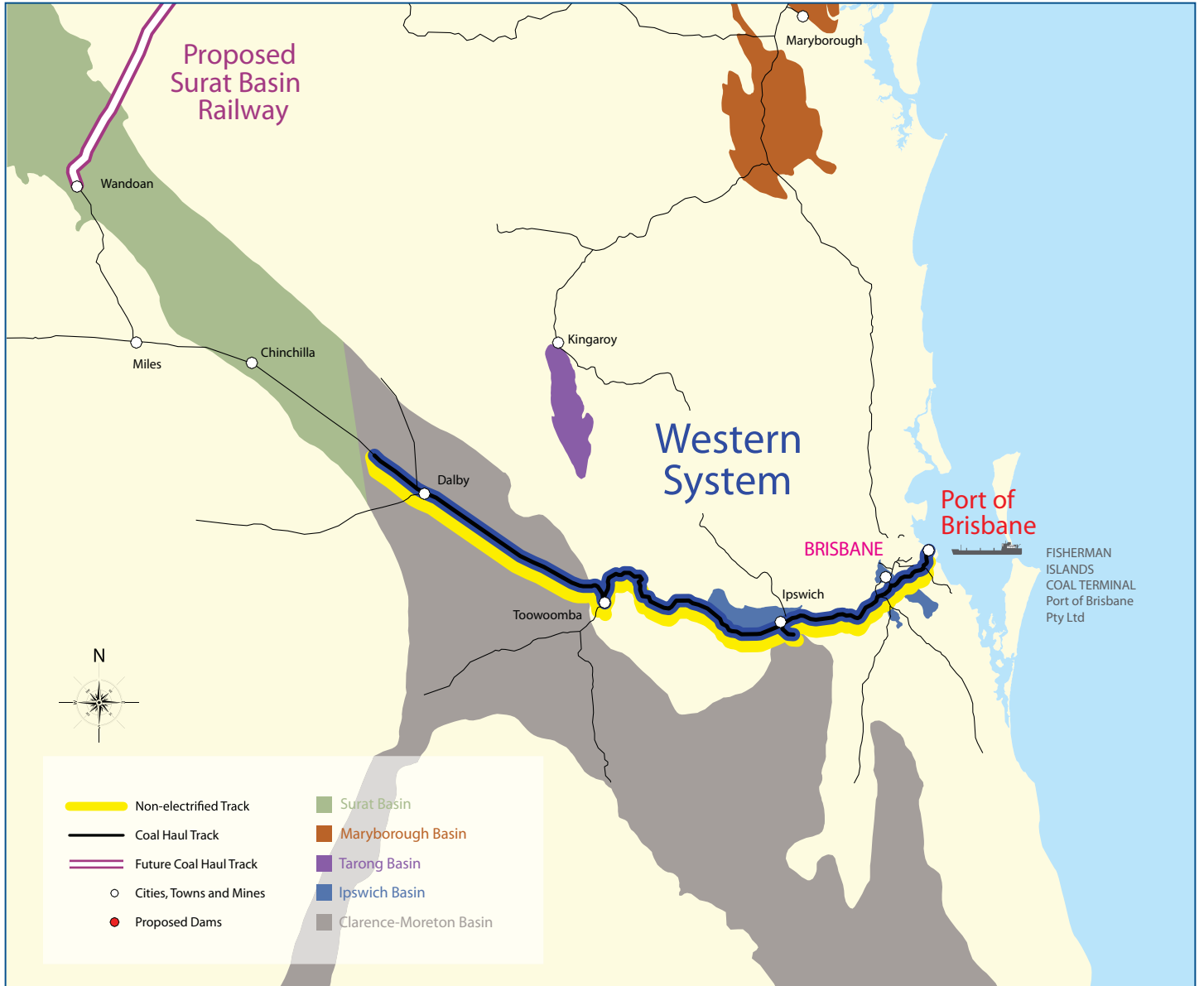
In addition to currently planned port expansions, Xstrata Coal in collaboration with Queensland Government and Gladstone Ports Corporation, is currently progressing pre-feasibility studies and environmental assessments to support the development of a proposed Balaclava Island Coal Export Terminal with capacity of up to 35Mtpa at Port Alma. Port Alma is situated approximately 40km north of Gladstone, and is a port administered by the Gladstone Ports Corporation.

In May 2010, the Balaclava Island Coal Export Terminal project was declared a Significant Project under the *State Development and Public Works Organisation Act 1971*, by the Coordinator-General. An associated environmental impact assessment process has commenced.

The Balaclava Island Coal Export Terminal Project if it proceeds will comprise the following elements: a 13.5km rail spur from the existing North Coast rail line to the coal stockpile; a coal stockpile facility built on high ground approximately 5km from its shiploader; an overland conveyor to transport coal from the stockpile to the proposed ship loading facility; and a new ship loading facility located on Balaclava Island. The development of a coal export terminal at Balaclava Island would avoid further congestion at existing coal terminals at the Port of Gladstone and Dalrymple Bay and increase the Volume of exports to global markets from Queensland’s Bowen and Surat Basins.



# Western System



**Figure 23: Western System map**

The Western System is located in south and south-western Queensland, and primarily services the Surat Basin coal mines near Macalister, Oakey and Ipswich (Clarence/Moreton Basin). Coal is transported across the Darling Downs, down the Toowoomba Range, through the Lockyer Valley and along the Brisbane suburban rail system to the Port of Brisbane. Coal for domestic use is transported to the Swanbank Power Station<sup>25</sup>.

This system's greatest challenge has always been finding ways to increase the number of available train paths to carry coal down the Toowoomba Range and through the Brisbane metropolitan rail system which is relatively congested with passenger rail services.

If the Surat Basin Railway proceeds, further upgrades will likely occur at the western end of the system. This could enable exports through the Port of Gladstone from existing coal mines and from new or expanded coal mines in the eastern Surat Basin, south of Wandoan.

## Rail

The Western System has limited potential for expansion due to the constraints of the Brisbane suburban rail network, and the 680-metre and 1940-tonnage limit on train sizes. Current rail capacity is 7 Mtpa.

<sup>25</sup> *Coal Rail Infrastructure Master Plan*, Brisbane, 2006, p. 91, viewed 25 November 2008, [www.networkaccess.qr.com.au](http://www.networkaccess.qr.com.au).



## Port

The Fisherman's Island Coal Terminal at the Port of Brisbane currently exports around 6.5 Mtpa and is currently being expanded to 10 Mtpa.

### Western System infrastructure projects

Currently, there is approximately \$155 million in committed and planned investment for the Western System. Tables 11 and 12 illustrate these infrastructure projects.

**Table 11: Recently completed infrastructure projects—Western System**

Project	Additional capacity gained (Mtpa)	Completion date	Capital expenditure
Track upgrades	3	June 2007	\$30 million

**Table 12: Planned rail and port infrastructure projects—Western System**

Project	Additional capacity gained (Mtpa)	Possible completion date
Capacity and track strengthening works	0.8	June 2011
Fisherman's Island Coal Terminal (7–10 Mtpa) <sup>26</sup>	3	October 2010

<sup>26</sup> Private sector project by Queensland Bulk Handling Pty Ltd.

### Western System future expansion

The Western System has limited options for expansion. While the Port of Brisbane could potentially handle up to 12 Mtpa of coal, the rail system through Brisbane's suburban rail network is likely to remain constrained. Additionally, the Surat Basin Railway would provide access to an alternative export port, negating a strong commercial need to increase exports via the Port of Brisbane.



# Future coal systems

## Surat Basin



Figure 24: Surat Basin map



The Surat Basin contains more than 4 billion tonnes of proven thermal coal resources.

## Surat Basin infrastructure projects

Significant planning work is underway on major projects that could enable the export of coal from the Surat Basin by mid 2013.

### Surat Basin Railway

The proposed Surat Basin Railway is the key infrastructure item needed to develop major mine activity in the Surat Basin. The project will enable exports out of the Surat Basin to reach about 60 Mtpa by 2030. The project involves the construction of a 210 km railway between Wandoan and Banana. The development of the Surat Basin Railway is also likely to stimulate upgrades to the rail network south of Wandoan that eventually links to the Western rail system. This could allow a significant export of Southern Surat and Clarence/Moreton coal through the port of Gladstone.

### Wiggins Island Coal Terminal

Expanded Western System exports could be exported through the proposed Wiggins Island Coal Export Terminal at Gladstone.

### Balaclava Island coal terminal

Xstrata Coal has funded a pre-feasibility study on developing a new coal terminal at Balaclava Island.

## Wandoan Coal project

Xstrata Coal's Wandoan Coal project has received environmental approval from the Queensland Government in accordance with conditions as set out by the Coordinator-General's report for the project, released on 12 November 2010. Further assessment and approval is required from the Commonwealth Minister for the Environment in regard to matters of national environmental significance. A decision by the Commonwealth is likely to be reached by early 2011. The proposed Wandoan Coal mine will extract coal at a rate of approximately 30 Mt per annum (run of mine coal) over a 30-year period.

### Nathan Dam

Water is an essential element to coal production and the proposed Nathan Dam may be vital to the efficient development of Surat Basin coal.

The expected capacity is 880 000 ML with an estimated per annum yield of 190 000 ML of medium-priority water (or about 70 000 ML of high-priority water). Nathan Dam could also potentially serve as a contingency storage to improve the security of supply for the region.

The proposed Nathan Dam project could be connected by pipeline to the Surat Basin. The proposed development of Nathan Dam is being considered as part of an integrated project with the production and use of coal seam gas water (Surat Dawson Integrated Water Project).



# Galilee Basin

The Galilee Basin is located 200 km west of the Bowen Basin and connects to it across the Springsure Shelf. The Basin contains large deposits of mainly high-volatile, low-sulphur thermal coal of Permian age.

The remote location and lack of supporting water, power and rail infrastructure, as well as past thermal coal prices, have previously precluded developing large-scale coal mining projects in this Basin.

However, record coal prices in early 2008 stimulated new interest in coal development at the eastern margin of the Basin, specifically thermal coal mines and in situ underground coal gasification projects.

Mining and exporting coal from the Galilee Basin to international customers presents several challenges, including:

- higher transport costs due to distances between existing Queensland coal ports and the mine
- additional rail capacity development that does not affect current coal shipments across existing rail infrastructure
- difficult access to terminal capacity at the existing or expanded coal ports.

The developers of mining plans for coal deposits in the Galilee Basin are considering solutions to these challenges, including new rail and port infrastructure.

The rail options being investigated include establishment of:

- a new rail corridor from the Galilee Basin to the port of Abbot Point
- an open-access railway probably of a standard gauge to be serviced by trains with carrying capacity of up to 24,000 tonnes.

Coal mining activity in the Galilee Basin on the scale being planned would also require access to significant quantities of water.

Mines will probably access water from various sources, including local bores, mine dewatering and a new pipeline to existing or new storages. Coal developers in the Galilee Basin are currently consulting with the government on water requirements for their mining activities and likely water sources.

While the existing Lilyvale–Clermont–Barcardine, 132 kV power line (owned by Ergon Energy) traverses the Galilee Basin, the intensive mining methods used will require additional electricity supplies. The provision of these supplies is currently the subject of negotiation.

## Galilee Basin infrastructure projects

Significant planning work is underway on major projects that could enable the export of coal from the Galilee Basin by late 2013.

### Hancock Coal

Hancock Prospecting Pty Ltd (Hancock Coal) is one of a number of interested parties that have approached the Queensland Government proposing to export 60 Mtpa of Galilee Basin coal. Two mines (the Alpha Coal Project and the Kevin's Corner Coal Project) each of 30Mtpa capacity are proposed by Hancock Coal. Both projects have been declared 'significant projects' under the *State Development Public Works Organisation (SDPWO Act) 1971*. An Environmental Impact Statement (EIS) process for both projects is underway. The coal from both projects would be exported through the Port of Abbot Point, via a 495km standard gauge rail network utilising approximately 3.2 kilometre long trains.

### Waratah Coal

Waratah Coal Pty Ltd (Waratah Coal), is also proposing to export coal from the Galilee Basin through the Port of Abbot Point using a standard gauge rail network which the company has expressed an interest in constructing. Waratah Coal proposes to export 40 Mtpa and has plans to build a 900 Mega Watt (MW) coal-fired power station which will incorporate carbon capture and storage technology. Both of these projects have been declared 'significant projects' under the *SDPWO Act 1971*. The EIS process for both the mine and the power station is underway.

### AMCI Limited

AMCI Limited, in partnership with Bandana Pty Ltd, (AMCI) is proposing to export coal from the Galilee Basin through the Port of Abbot Point via third party access to the proposed rail network. It is proposed that this project will export between 15-20 Mtpa. The project has been declared a 'significant project' under the *SDPWO Act 1971*. The EIS process for the mine is underway.

### Other major proponents

Other major companies with mining and gas tenements in the Galilee Basin include Adani, Linc Energy and Vale.

In order to facilitate a more optimal development of infrastructure and potentially overcome competitive tensions, the Department of Infrastructure and Planning (DIP) has, since late 2009, convened a number of information exchange meetings known as the Galilee Basin Common Issues Forum (GCIF). The GCIF aims to address issues associated with the development of the Galilee Coal Basin.

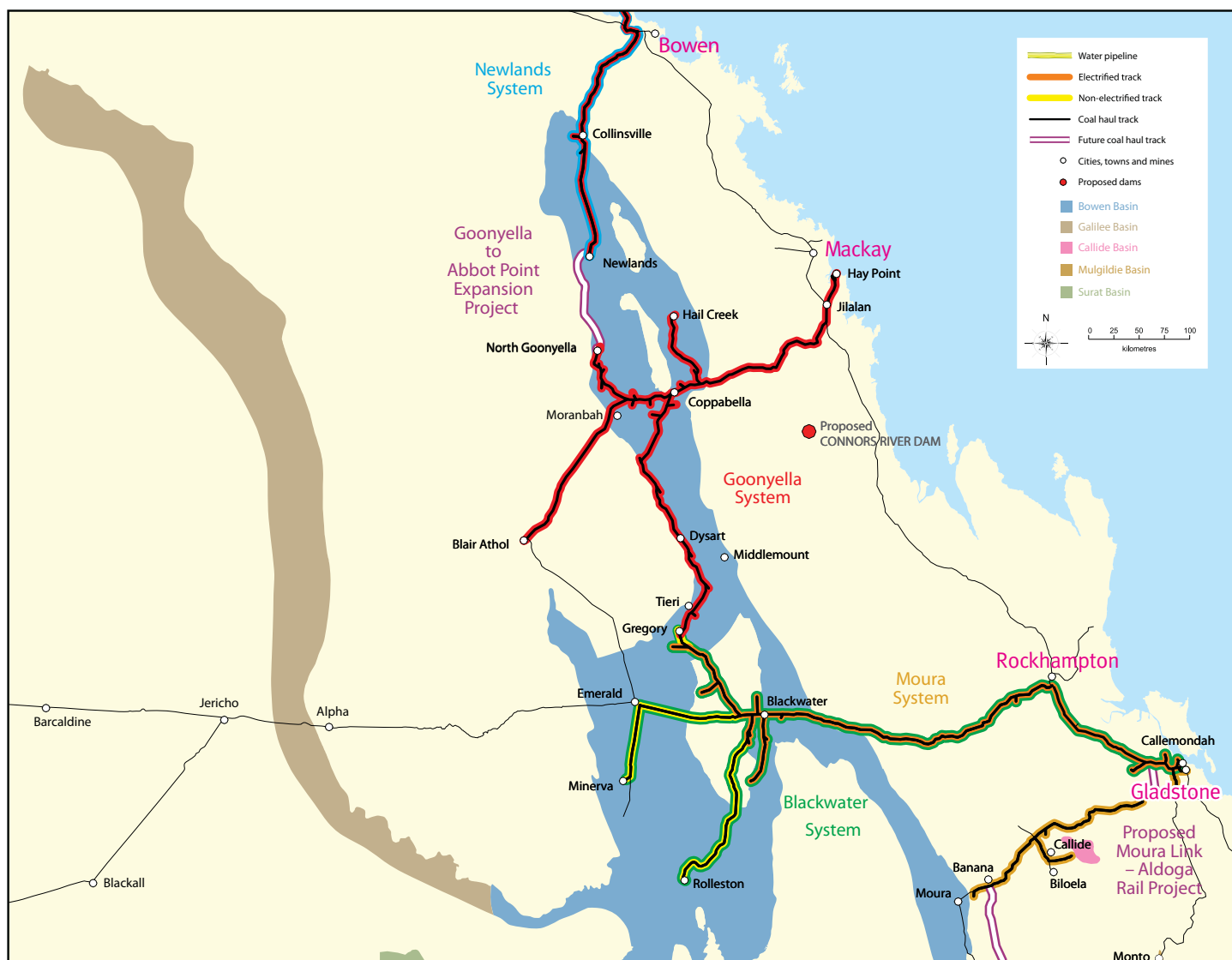


Figure 25: Galilee Basin map



## Regional planning

Regional planning in locations associated with future coal development is strategically important to ensuring security of supply to our coal customers. As the planned development of major new coal projects will stimulate rapid population growth in some regions, it is important that regions and centres are prepared for the increasing demands placed on their services.

Forecasts indicate that new coal mining growth in Queensland will be mainly concentrated in the Bowen, Surat and the Galilee Basins. A number of centres in the Surat Basin will be affected as coal production rapidly increases from mid-2013. The same may occur in the Galilee Basin particularly around the township of Alpha. A number of centres in the Bowen Basin will also experience significant growth, but due to existing high levels of activity, the impact may be less apparent.

Regional planning will need to ensure that regional centres have an appropriate level of services such as power, accommodation, retail, transport, recreation, health, education, emergency services, water and other services to support the flow-on affects from increased mining activities.

This planning will require close consultation between local and state government, local businesses and mining companies.

As part of a suite of solutions addressing this issue, the state government's *Sustainable Resource Communities Policy* has also helped to address many of the social issues associated with mining. This initiative has a strong emphasis on the social impact assessment of projects, with the aim of bringing companies, communities and government together to address the issues affecting a community.

## Skills development

Another important feature of fostering strong security of supply is in developing workers' skills and attracting labour—two key challenges for the state's coal industry. Despite advances in mechanisation, the coal industry employs approximately 25 900 people (14 000 employees and 11 900 contractors) in the fourth quarter of the 2008-2009 financial year and is one of the state's leading employers.

To keep people attracted to the industry, the state government recognises the importance of developing and maintaining liveability in regional Queensland, and has developed two key initiatives to address these issues—Growing Liveable Regions and the Sustainable Resource Communities Policy discussed above. In addition, the Department of Education and Training (DET) is investing in training infrastructure to meet the future needs of the mining industry, particularly in growth areas.

## Conclusion

The extent of infrastructure investment in the coal industry is very broad. Over the next 20 years, Queensland's coal production will expand substantially. This increase will require more rail and port capacity, skilled workers and services at the local level.

The total level of infrastructure required will depend on what industry actually needs, which will, in turn, depend upon our customers' demand. In all likelihood, future strategies to mitigate greenhouse gas emissions may also influence this demand.

Despite the uncertainty that accompanies long-range forecasts, the government needs a strategy to meet demand growth from its customers. Since 2005 the state government has planned, implemented or commissioned approximately \$25.5 billion worth of rail, port and water infrastructure. The state government and government-owned corporations have developed much of this infrastructure. Major projects for the near future include the Surat Basin Railway, Abbot Point Coal Terminal and multi-cargo facility and the proposed Wiggins Island Coal Export Terminal. Appropriate commercial arrangements between coal chain stakeholders must underpin all these projects.

CoalPlan 2030 outlines a coordinated approach to planning and delivery of infrastructure across government and industry. This planning and delivery will ensure that industry meets its security of supply obligations to its customers whilst also remaining an important contributor to Queensland's economy for years to come.



# Abbreviations

ABARE	Australian Bureau of Agricultural and Resource Economics	Hancock Coal	Hancock Prospecting Pty Ltd
ACA	Anglo Coal Australia	IGCC	Integrated gasification combined cycle
ACALET	ACA Low Emissions Technologies Ltd	km	Kilometres
APP	Asia Pacific Partnership	kV	Kilovolt
APSDA	Abbot Point State Development Area	MW	Megawatt
BMA	BHP Billiton Mitsubishi Alliance	ML	Megalitres
BP	British Petroleum	Mtpa	Million tonnes per annum
CGI	Carbon Geostorage Initiative	NGER	National greenhouse and energy reporting system
CCS	Carbon capture and storage	NQBP	North Queensland Bulk Ports Corporation Limited
CO	Carbon dioxide	OECD	Organisation for Economic Cooperation and Development
CPRS	Carbon pollution reduction scheme	OGOC	Office of Government Owned Corporations
CSIRO	Commonwealth Scientific and Industrial Research Organisation	PCC	Post combustion capture
CSG	Coal Seam Gas	QGS	Queensland Gas Scheme
DIP	Department of Infrastructure and Planning	QR	QR National
DEEDI	Department of Employment, Economic Development and Innovation	QRC	Queensland Resources Council
DET	Department of Employment and Training	QREF	Queensland Renewable Energy Fund
DERM	Department of Environment and Resource Management	QT	Queensland Transport
EIA	Energy Information Agency	tCO <sub>2</sub> -e	Tonne of carbon dioxide equivalents
EIS	Environmental impact statement	UGC	Underground Coal Gasification
EITE	Energy intensive trade exposed industry	UNCCC	United Nations Climate Change Conference
EPBCA	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	WHAM	Whitsunday, Hinterland and Mackay region
FIFO	Fly-in, fly-out workers	WWF	World Wildlife Fund
FOB	Free-on-board		
GW	Gigawatt		



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